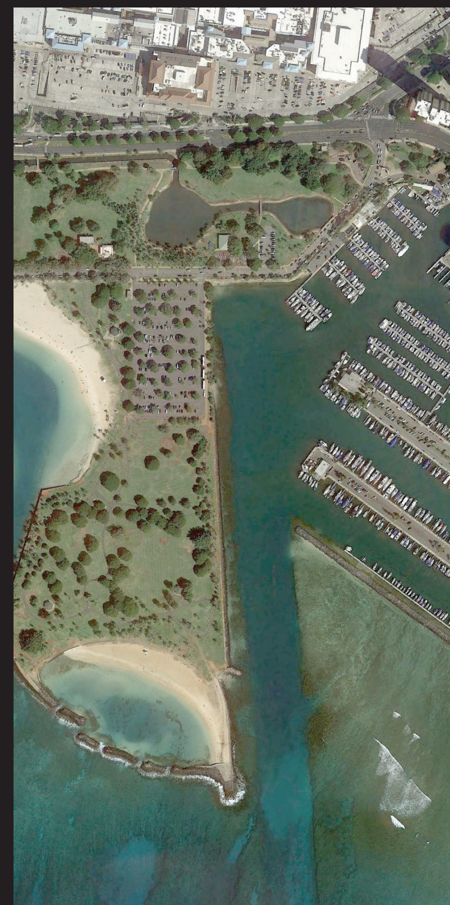
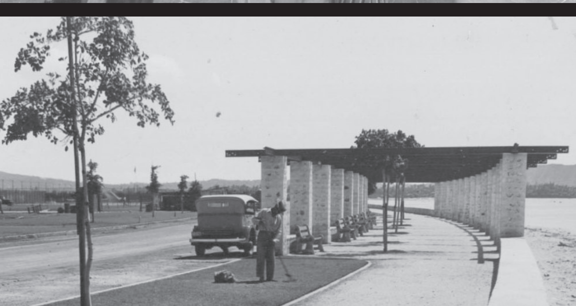
VOL. 2



Ala Moana Regional Park and Magic Island Improvements Second Draft Environmental Impact Statement



February 2019

City and County of Honolulu · State of Hawaii

BELT COLLINS

BRV BIEDERMAN REDEVELOPMENT VENTURES

WCITARCHITECTURE

PAGE IS INTENTIONALLY LEFT BLANK

SECOND DRAFT ENVIRONMENTAL IMPACT STATEMENT

ALA MOANA REGIONAL PARK AND MAGIC ISLAND IMPROVEMENTS

VOLUME 2 OF 2

Waikīkī, Island of O'ahu, Hawai'i
Tax Map Keys: (1) 2-3-037:001, 022, 023, and 025

Date: February 2019

Prepared for:

The City and County of Honolulu
Department of Design and Construction

Prepared by:
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, HI 96819

Project Number: 2015-71-0100

PAGE IS INTENTIONALLY LEFT BLANK

APPENDICES

APPENDIX A

Comments and Responses on the EISPN/Copy of EISPN Distribution Letter: State of Hawaiʻi, City And County Of Honolulu, Organizations, Individual Stakeholders And Park Users

APPENDIX B

Traffic Evaluation Ala Moana Regional Park, Honolulu, Oʻahu, Hawaiʻi June 2018

APPENDIX C

Ala Moana Regional Park, Parking Occupancy Study

APPENDIX D-1

HRS Chapter 6E-8 Letter of Determination

APPENDIX D-2

Draft Literature Review and Field Inspection with Cultural Section for
the Ala Moana Regional Park Master Plan Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu
TMKs: [1] 2-3-037:001, 022, 023 and 025

APPENDIX D-3

Draft Cultural Impact Assessment for the Ala Moana Regional Park Master Plan Project, Waikīkī and Honolulu Ahupuaʻa, Honolulu District, Oʻahu, TMKs: (1)2-3-037:001, 022, 023, 025

APPENDIX D-4

Ala Moana Regional Park Improvements Plan
Historic Feature Review and Retrofit Assessment

APPENDIX E

Biological Resources Survey Report for Ala Moana Regional Park and Magic Island, Island of Oʻahu

APPENDIX F-1

Baseline Assessment of the Marine Environment Ala Moana Regional Park Beach Replenishment Honolulu, Hawaiʻi

APPENDIX F-2

Baseline Assessment of the Marine Environment Ala Moana Regional Park Beach Replenishment Donor Sites, Honolulu, Hawaiʻi

APPENDIX G

Coastal Assessment and Design Report Ala Moana Regional Park Beach Nourishment Project Honolulu, Oʻahu, Hawaiʻi

PAGE IS INTENTIONALLY LEFT BLANK

Appendix A

Comments and Responses on the EISPN/Copy of EISPN Distribution Letter

PAGE IS INTENTIONALLY LEFT BLANK

STATE OF HAWAIʻI

PAGE IS INTENTIONALLY LEFT BLANK

DAVID Y. IGE
GOVERNOR

RODERICK K. BECKER
Comptroller

AUDREY HIDANO
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

DEC 29 2017

(P)1398.7

Ms. Joanne E. Hiramatsu, Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, HI 96819-4554

Dear Ms. Hiramatsu:

Subject: Environmental Impact Statement Preparation Notice for
Ala Moana Regional Park and Magic Island Improvements
Honolulu, Oahu, Hawaii
TMK: (1) 2-3-037:001, 002, 022, 023, and 025

Thank you for the opportunity to comment on the subject project. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities and we have no comments to offer at this time.

If you have any questions, your staff may please contact Ms. Dora Choy of the Planning Branch at 586-0488.

Sincerely,

KEITH S. KOGACHI
Acting Public Works Administrator

DC:lnn
c: Mr. Cory Shibata, DAGS-CSD

RECEIVED
2018 JAN -3 PM 3:32
BELT COLLINS HAWAII

BELT COLLINS

May 7, 2018
2015-71-0100/18P-017

Mr. Keith S. Kogachi
Department of Accounting and General Services
State of Hawaiʻi
P.O. Box 119
Honolulu, Hawaiʻi 96810-0119

Dear Mr. Kogachi:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for your reviewing the EISPN. Your response dated December 29, 2017, indicated that the Department of Accounting and General Services, has no comments at this time.

Thank you for your response and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com
Belt Collins Hawaii is an Equal Opportunity Employer

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

RECEIVED
2018 JAN 15 AM 8: 14
BELT COLLINS HAWAII

ARTHUR J. LOGAN
MAJOR GENERAL
ADJUTANT GENERAL

KENNETH S. HARA
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL

January 09, 2018

Belt Collins Hawaii LLC
Attn: Ms. Joann Hiramatsu
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu:

Subject: Environmental Impact Statement Preparation Notice (EISPN) Ala Moana Reginal Park and Magic Island Improvements Tax Map Key: (1) 2-3-37:001, 002, 022, 023, 025 Honolulu, O'ahu, Hawai'i

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the proposed project.

Should you have any questions or concerns, please have your staff contact Ms. Shao Yu Lee, our Land Manager on Oahu, at (808) 733-4222.

Sincerely,

NEAL S. MITSUYOSHI, P.E.
Colonel, Hawaii National Guard
Chief Engineering Officer

c: Ms. Elaine Morisato, City & County of Honolulu
Ms. Havinne Okamura, HI-EMA
Mr. Albert Chong, HI-EMA
Mr. Karl Motoyama, Hawaii Army National Guard Environmental (HIARNG-ENV)
Maj Nhut Dao, 154th Civil Engineer Squadron (154th CES)

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-030

Colonel Neal S. Mitsuyoshi, Chief Engineering Officer
Hawaiʻi National Guard
Department of Defense
Office of the Adjutant General
State of Hawaiʻi
3949 Diamond Head Road
Honolulu, HI 96816-4495

Dear Colonel Mitsuyoshi:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN. Your response dated January 9, 2018 indicated that the Department of Defense has no comment to offer relative to the proposed project.

Thank you for your response and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

SHAN S. TSUTSUI
LT. GOVERNOR
STATE OF HAWAII

JOBIE M. K. MASAGATANI
CHAIRMAN
HAWAIIAN HOMES COMMISSION

WILLIAM J. AILA, JR.
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

January 11, 2018

Attention: Joanne E. Hiramatsu, Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawai`i 96819

Dear Ms. Hiramatsu:

Subject: Environmental Impact Statement Preparation Notice (EISPN) Ala Moana Regional Park and Magic Island Improvements, TMK: (1) 2-3-37:001, 002, 023,025 Honolulu, O'ahu

The Department of Hawaiian Home Lands acknowledges receiving the request for comments on the above-cited project. After reviewing the materials submitted, due to its lack of proximity to Hawaiian Home Lands, we do not anticipate any impacts to our lands or beneficiaries from the project.

However, we highly encourage all agencies to consult with Hawaiian Homestead community associations and other (N)native Hawaiian organizations when preparing environmental assessments in order to better assess potential impacts to cultural and natural resources, access and other rights of Native Hawaiians.

Mahalo for the opportunity to provide comments. If you have any questions, please call Rae Ann Hyatt, at 620-9480 or contact via email at raeann.p.hyatt@hawaii.gov.

Sincerely,

M. Kaleo Manuel
Acting Planning Program Manager

RECEIVED
2018 JAN 16 PM 4:09
BELT COLLINS HAWAII

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-022

M. Kaleo Manuel
Acting Planning Program Manager
Department of Hawaiian Homelands
State of Hawai'i
P.O. Box 1879
Honolulu, HI 96805

Dear Mr. Manuel:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for reviewing the EISPN. Your comment, dated January 11, 2018, indicated that the Department of Hawaiian Home Lands does not anticipate any impacts to its lands or beneficiaries at this time, however, you encourage consultation with Hawaiian Homestead community associations and other Native Hawaiian organizations. As part of the Chapter 343 environmental review process, the proposing agency shares plans and encourages input from all residents and community groups.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com
Belt Collins Hawaii is an Equal Opportunity Employer

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 17-332

January 19, 2018

Ms. Joanne Hiramatsu
Director of Planning
Belt Collins Hawaii, LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554
Email: jhiramatsu@bchdesign.com

Dear Ms. Hiramatsu:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for Ala Moana Regional Park and Magic Island Improvements
TMK: 2-3-37:001, 002 022, 023, 025

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your EISPN to our office via the OEQC link:
http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

We understand from the OEQC publication form project summary that *"The city is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park and the Magic Island peninsula (Magic Island) grounds and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans. The project area receives the most usage of any other park in the State and is also one of the oldest. Many park users visit daily or several times during the week. The City wishes to extend the Parks' longevity as a gradual increase in visits is forecasted for the foreseeable future. Some of the major improvements include sand replenishment, renovations to existing structures, improving pond edges, widening access over the drainage canal along Ala Moana Boulevard, create a wider promenade along Ala Moana Park Drive and reconfiguring the parking."*

Hawaii's environmental review laws require Environmental Assessments (EAs) and Environmental Impact Statements (EISs) to consider health in the discussion and the mitigation measures to reduce negative impacts. In its definition of 'impacts,' §11-200-2, Hawaii Administrative Rules (HAR) includes health effects, whether primary (direct), secondary (indirect), or cumulative. Further, §11-200-12(b)(5), HAR, lists public health as one of the criteria for determining whether an action may have a significant impact on the environment.

We advocate that you consider health from a broad perspective; one that accounts for the social, economic, and environmental determinants of health and wellbeing. Community well-being can be impacted by access to physical activity, health care, feelings of social connectedness and safety. Design solutions that take these factors into consideration positively contribute to the social determinants of health in a community, improving the well-being of those who live there by influencing health promoting behaviors. Social determinants contribute to preventable chronic diseases such as asthma, diabetes, obesity, and cardiovascular disease.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments to support sustainable healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

Please note that all wastewater plans must conform to applicable provisions (HAR, Chapter 11-62, "Wastewater Systems"). We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: http://health.hawaii.gov/wastewater and contact the Planning and Design Section of the Wastewater Branch (WWB) at (808) 586-4294.

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.hawaii.gov or call (808) 586-4200.

The *Final Report: Oahu Inactive Landfills Relative Risk Investigation*, dated 2006, prepared by URS Corporation for Board of Water Supply, lists an Ala Moana Dump that was operated between 1926 and 1930 on TMK: (1) 2-3-037:001. The Department of Health, Solid and Hazardous Waste Branch does not have any specific information regarding the specific location of the landfill, other than as described in the subject report. Any environmental investigation, and/or design and construction plans should accommodate the possibility of encountering waste, ash, and/or contaminated soil. Assessment, management, and disposal of any waste shall be in accordance with applicable federal, state, and local laws and regulations.

Any waste generated by the project (that is not a hazardous waste as defined in state hazardous waste laws and regulations), needs to be disposed of at a solid waste management facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. You may wish you review the Minimizing Construction & Demolition Waste Management Guide at: http://health.hawaii.gov/shwb/files/2016/05/constdem16.pdf Additional information is accessible at: http://health.hawaii.gov/shwb. For specific questions call (808) 586-4226.

If the site is found to be contaminated, then all removal and remedial actions to clean up hazardous substance or oil releases by past and present owners/tenants must comply with State Law (HRS, Chapter 128D, "Environmental Response Law", Chapter 451, "State Contingency Plan"). To identify HEER records related to the property, visit http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records. For information on site assessment and cleanup programs review: http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/site-assessment-and-cleanup-programs. Any specific questions should be directed to the HEER office at (808) 586-4249.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: http://health.hawaii.gov/irhb/noise EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

The Hawaii Disability and Communication Access Board (DCAB) recommends the inclusion of access for persons with disabilities through all phases of design and construction. New construction and alteration work shall comply with all applicable accessibility requirements. Projects covered by §103-50, Hawaii Revised Statutes, and Hawaii Administrative Rules Title 11 Chapter 216 shall seek advice and recommendations from DCAB on any construction plans prior to commencing with construction. If you have any questions please contact DCAB at (808) 586-8121 or dcab@doh.hawaii.gov.

In 2015, Hawaii passed Act 97 which amended Hawaii's Renewable Portfolio Standards by setting a goal for Hawaii to become one hundred percent renewable by the year 2045. To reach this goal Hawaii should transform its transportation sector from the use of fossil fuels to renewable fuel, electric vehicles (EV)s, and public transit systems including bikeshare programs. To address "range anxiety" and facilitate the adoption of EVs, it is essential that EV charging stations be added to any planned parking areas open to the EV driving public. All future plans should strive to encourage the use of personal bicycles though the development of designated bike lanes and class A bike trails. All efforts should be made to reduce harmful vehicle emissions, reduce vehicle miles travelled (VMT's), encourage alternative modes of transport and increase physical activity.

Hawaii's climate is changing. Sea level rise and the associated coastal impacts have the potential to harm an array of natural and built environments in Hawaii. For additional information on projected sea level rise in Hawaii, EPO recommends that you visit the State of Hawaii Climate Adaptation Portal: http://climateadaptation.hawaii.gov

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed an environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We hope this information is helpful. If you have any questions please contact us at DOH.epo@doh.hawaii.gov or call us at (808) 586-4337. Thank you for the opportunity to comment.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office

LM:nn

c: Robert Kroning, Director, C&C Dept. of Design & Construction (via email: rkroning@honolulu.gov)
DOH: DDEH, EMD, CWB, WWB, SHWB, CAB, HEER, IRHB, PHP, DCAB {via email only}

Attachment 1: Office of Environmental Quality Control (OEQC) viewer (of some past EA's, EIS's in area)
Attachment 2: U.S. EPA EJSCREEN Report for Project Area

Attachment 1: Office of Environmental Quality Control (OEQC) viewer (of some past EA's, EIS's in area)

Attachment 2: U.S. EPA EJSCREEN Report for Project Area

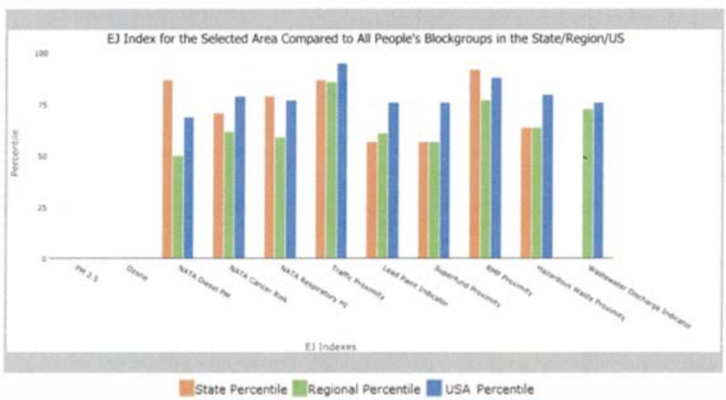
EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.288956,-157.846550, HAWAII, EPA Region 9

Approximate Population: 33,144
Input Area (sq. miles): 3.14
(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	87	50	69
EJ Index for NATA* Air Toxics Cancer Risk	71	62	79
EJ Index for NATA* Respiratory Hazard Index	79	59	77
EJ Index for Traffic Proximity and Volume	87	86	95
EJ Index for Lead Paint Indicator	57	61	76
EJ Index for Superfund Proximity	57	57	76
EJ Index for RMP Proximity	92	77	88
EJ Index for Hazardous Waste Proximity	64	64	80
EJ Index for Wastewater Discharge Indicator	N/A	73	76



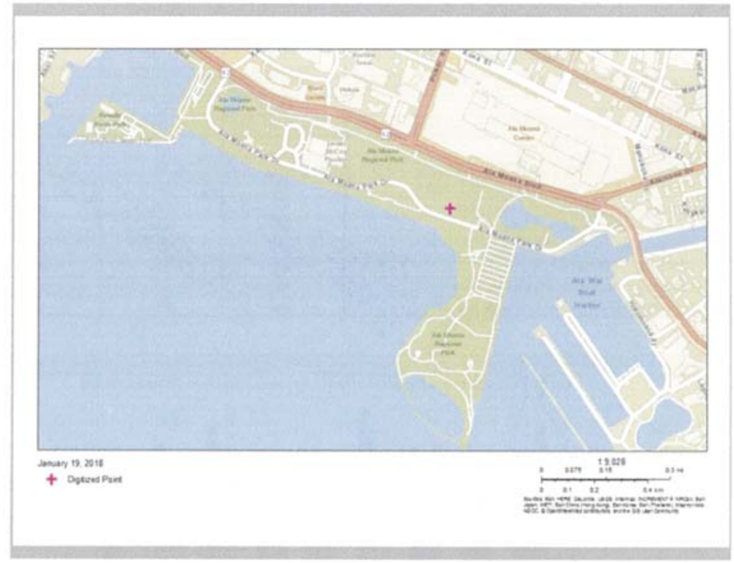
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.288956,-157.846550, HAWAII, EPA Region 9

Approximate Population: 33,144
Input Area (sq. miles): 3.14
(The study area contains 1 blockgroup(s) with zero population.)



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.288956,-157.846550, HAWAII, EPA Region 9

Approximate Population: 33,144

Input Area (sq. miles): 3.14

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu g/m^3$)	N/A	N/A	N/A	9.9	N/A	9.14	N/A
Ozone (ppb)	N/A	N/A	N/A	41.8	N/A	38.4	N/A
NATA* Diesel PM ($\mu g/m^3$)	0.433	0.149	93	0.978	<50th	0.938	<50th
NATA* Cancer Risk (lifetime risk per million)	57	34	97	43	90-95th	40	90-95th
NATA* Respiratory Hazard Index	2.3	1	98	2	60-70th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	2900	1000	90	1100	89	590	95
Lead Paint Indicator (% Pre-1960 Housing)	0.094	0.16	46	0.24	44	0.29	35
Superfund Proximity (site count/km distance)	0.055	0.1	50	0.15	40	0.13	46
RMP Proximity (facility count/km distance)	1.4	0.39	94	0.98	79	0.73	84
Hazardous Waste Proximity (facility count/km distance)	0.081	0.1	66	0.12	59	0.093	67
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	0.04	N/A	13	59	30	40
Demographic Indicators							
Demographic Index	53%	51%	55	47%	59	36%	75
Minority Population	75%	77%	36	59%	64	38%	82
Low Income Population	31%	26%	66	36%	46	34%	48
Linguistically Isolated Population	18%	6%	91	9%	82	5%	91
Population With Less Than High School Education	9%	9%	63	17%	40	13%	46
Population Under 5 years of age	4%	6%	27	7%	27	6%	29
Population over 64 years of age	22%	16%	79	13%	87	14%	85

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-031

Ms. Laura Leialoha Philips McIntyre, AICP
Environmental Planning Office
Department of Health
State of Hawaiʻi
P.O. Box 3378
Honolulu, HI 96801

Dear Ms. McIntyre:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for your letter of January 19, 2018. The responses to your comments below follow in the order of topics in your letter.

- **Review of State and Federal environmental health land use guidance:** The Draft Environmental Impact Statement (DEIS) will address all applicable State and Federal guidelines while considering health and well-being from a broad perspective.
- **Clean Water Branch Review and/or National Pollutant Discharge Elimination System (NPDES):** Section 401 Water Quality Certification (WQC) will be required and addressed in the DEIS. Requirements for the NPDES permits will also be addressed.
- **Wastewater:** The Parks are served by the City and County's wastewater system. No new wastewater facilities will be needed for improved public facilities**.**
- **Air pollution control measures:** Best Management Practices (BMPs) will be identified to control air quality impacts during construction. There are no stationary sources generating emissions in the Parks.
- **Generated or found waste:** Any waste found as a remnant of the Ala Moana Dump, which operated between 1926 and 1930, or generated waste, will be assessed, managed, and disposed in accordance with applicable federal, state, and local laws and regulations. Any hazardous waste/materials will be disposed of following appropriate procedures.
- **Generation of Noise:** The property is zoned Preservation which falls under the Class A district for noise. No adverse noise impacts are anticipated during land

construction activities. If deemed above allowed Class A noise levels, the project will obtain a noise permit.

- **Hawaiʻi Environmental Portal and The Office of Environmental Quality Control viewer:** Thank you for providing links to both sites; they will be utilized in completion of the DEIS.
- **Hawaiʻi Disabilities and Communication Access Board (DCAB), inclusion of access for persons with disabilities through all phases of design and construction:** The DEIS will include an assessment of the conformance of the proposed actions to regulations and guidelines for accessibility for persons with disabilities.
- **Transportation sector's role in Hawaii's Renewable Portfolio Standards:** Charging stations and alternative forms of transportation will be addressed in the DEIS.
- **Climate change:** The DEIS will address climate change and impacts to the proposed actions.
- **Environmental Justice (EJ) mapping and screening tool (EJSCREEN):** Thank you for providing information to the EJSCREEN website; its tools will be used when considering aspects of public health and environment.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 19, 2018

Belt Collins Hawaii LLC
Attention: Ms. Joanne E. Hiramatsu
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554

via email: jhiramatsu@beltcollins.com

Dear Ms. Hiramatsu:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for **Ala Moana Regional Park and Magic Island Improvements**

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (a) Division of State Parks, (b) Land Division – Oahu District, (c) Division of Boating & Ocean Recreation, (d) Office of Conservation & Coastal Lands, and (e) Division of Aquatic Resources on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

57505

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
STATE PARKS DIV
18 JAN -2 AM 10:23
DEPT OF LAND & NATURAL RESOURCES

RECEIVED
LAND DIVISION
JAN -3 AM 10:38

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 28, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__ Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
__ Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for **Ala Moana Regional Park and Magic Island Improvements**
LOCATION: Honolulu, Island of Oahu; TMK No. (1) 2-3-037:001, 002, 022, 023, 025
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. Please submit any comments by **January 18, 2018.**

The EISPN can be found on-line at: http://health.hawaii.gov/oeqc/ *(Click on the Current Environmental Notice in the middle of the page.)*

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed:
Print Name: CURT A COTTRELL
Date: 1.2.18

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED LAND DIVISION
2018 JAN -9 AM 6:41
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

December 28, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__ Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
__ Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for **Ala Moana Regional Park and Magic Island Improvements**
LOCATION: Honolulu, Island of Oahu; TMK No. (1) 2-3-037:001, 002, 022, 023, 025
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. Please submit any comments by **January 18, 2018.**

The EISPN can be found on-line at: http://health.hawaii.gov/oeqc/ (Click on the Current Environmental Notice in the middle of the page.)

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

Any improvements on lands, including submerged lands under the Land Board jurisdiction needs a land disposition from the Board.

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: Darlene Bryant-Takamatsu

Print Name: Darlene Bryant-Takamatsu
Date: 1/8/18

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED LAND DIVISION
2018 JAN 11 AM 10:55
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

December 28, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__ Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
__ Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for **Ala Moana Regional Park and Magic Island Improvements**
LOCATION: Honolulu, Island of Oahu; TMK No. (1) 2-3-037:001, 002, 022, 023, 025
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. Please submit any comments by **January 18, 2018.**

The EISPN can be found on-line at: http://health.hawaii.gov/oeqc/ (Click on the Current Environmental Notice in the middle of the page.)

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed:

Print Name: Edward R. Underwood
Date: 12/29/17

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

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

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED LAND DIVISION
2018 JAN 19 A 6:18
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

DLNR:OCCL:.SL

Correspondence OA-18-128

JAN 18 2018

MEMORANDUM:

TO: Russel Tsuji, Land Administrator

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: Reply to Request for Comments on the Environmental Impact Statement Preparation Notice (EISPN) for Ala Moana Regional Park and Magic Island Improvements

The Office of Conservation and Coastal Lands (OCCL) has reviewed the Environmental Impact Statement Preparation Notice (EISPN) for Ala Moana Regional Park (AMRP) and Magic Island Peninsula Improvements from Belt Collins Hawaii LLC on behalf of the City and County of Honolulu, Department of Design and Construction (the City) and offers the following comments.

The OCCL commends the City's efforts to improve this important public park and beach resource. Please consider the OCCL, including our Hawaii Sea Grant coastal geologist, a resource for assistance related to beach restoration or management at AMRP and Magic Island.

The OCCL suggests that the City and its representatives consider sea level rise carefully in the Draft EIS. As you probably are aware, the State released its Sea Level Rise Vulnerability and Adaptation Report and companion Hawaii Sea Level Rise Viewer recently (both available at climateadaptation.hawaii.gov). The data indicates significant flooding of the beach and backshore occurs at AMRP with as little as 1 foot of sea level rise. In fact, beach flooding and overwash was a significant problem at AMRP during elevated tides this summer. This type of repeat flooding will occur more frequently and with more severity over the coming decades. Maps of sea level rise exposure areas at AMRP from the Hawaii Sea Level Rise Viewer and the Hawaii Sea Level Rise Vulnerability and Adaptation Report are enclosed for your reference.

DAVID Y. IGE
GOVERNOR OF HAWAII

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

RECEIVED
OFFICE OF CONSERVATION AND COASTAL LANDS
2017 DEC 29 P 1:33
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 28, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__ Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
__ Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for **Ala Moana Regional Park and Magic Island Improvements**
LOCATION: Honolulu, Island of Oahu; TMK No. (1) 2-3-037:001, 002, 022, 023, 025
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. Please submit any comments by **January 18, 2018.**

The EISPN can be found on-line at: http://health.hawaii.gov/oeqc/ (Click on the Current Environmental Notice in the middle of the page.)

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: ____________

Print Name: ____________
Date: ____________

cc: Central Files

DAVID Y. IGE
GOVERNOR OF
HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

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

ROBERT K. MASUDA
FIRST DEPUTY

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

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

Date: 1/17/2018
DAR # 5669

MEMORANDUM

TO: Bruce S. Anderson, PhD
DAR Administrator

FROM: Justin Goggins JG, Aquatic Biologist

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for Ala Moana Regional Park and Magic Island Improvements

Request Submitted by: Russell Y. Tsuji, Land Admistrator

Location of Project: Honolulu, Island of Oahu; TMK No. (1) 2-3-037:001, 002, 022, 023, 025

Brief Description of Project:

The City and County, Department of Design and Construction is proposing park and facilities improvements at Ala Moana Regional Park and Magic Island. The new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

Comments:
☐ No Comments ☒ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: [signature] Date: 1/18/18
Bruce S. Anderson, PhD
DAR Administrator

DAR# 5669

Brief Description of Project

The Division of Aquatic Resources (DAR) is in general support of improving the Ala Moana Regional Park and Magic Island. The project is appreciated as it will be a benefit to the local community.

DAR would like to request:
- Emphasis placed on the use of Best Management Practices to contain sediment run-off into the ponds, drainage ditches and ocean.
- Scheduling beach re-nourishment operations to avoid Sea Turtle nesting season
- A detailed outline of sand transport from offshore to the park

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes, amendments or modifications to the current plans, DAR requests the opportunity to review and comment on those changes.

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
JAN - 5 2018
Division of Aquatic Resources
DAR 5669

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 28, 2017

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__Div. of Forestry & Wildlife
X Div. of State Parks
X Commission on Water Resource Management
__Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for **Ala Moana Regional Park and Magic Island Improvements**
LOCATION: Honolulu, Island of Oahu; TMK No. (1) 2-3-037:001, 002, 022, 023, 025
APPLICANT: City and County of Honolulu, Department of Design and Construction

Transmitted for your review and comment is information on the above-referenced project. Please submit any comments by **January 18, 2018.**

The EISPN can be found on-line at: *http://health.hawaii.gov/oeqc/* *(Click on the Current Environmental Notice in the middle of the page.)*

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: Bruce S. Anderson

Print Name: Bruce S. Anderson, PhD, DAR Administrator
Date: 1/18/18

cc: Central Files

BELT COLLINS

May 7, 2018
2015-71-0100/18P-024

Mr. Russell Y. Tsuji
Land Use Administrator
Department of Land and Natural Resources
Commission on Water Resource Management
State of Hawai'i
P.O. Box 119
Honolulu, Hawai'i 96810-0119

Dear Mr. Tsuji:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for reviewing the EISPN and for forwarding the response dated January 19, 2018 from the Commission on Water Resource Management (CWRM). A follow-up email with Lydia Morikawa indicated that the "Comments are attached" box on the memorandum cover sheet from your office was marked in error and CWRM has no comments on this subject property.

Thank you for your response and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

BELT COLLINS

May 7, 2018
2015-71-0100/18P-025

Dr. Bruce S. Anderson, PhD
Administrator
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawai'i
PO Box 621
Honolulu, HI 96813

Dear Dr. Anderson:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for your comments of January 17, 2018. The responses to your comments below follow in the order of topics in your letter.

- **Use Best Management Practices (BMP) to control sediment into ponds, ditches and the ocean:** BMP will be used for sediment control.
- **Avoid sea turtle nesting season for scheduling beach re-nourishment operations**: The Draft Environmental Impact Statement (DEIS) will include operational guidelines to mitigate harm to the existing ecosystem including, but not limited to, sea turtles.
- **Provide a detailed outline of the sand transport plans:** A beach nourishment concept design will be prepared for the DEIS and will evaluate sand recovery methods.

Thank you for your comment and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-023

Mr. Edward R. Underwood
Administrator
Department of Land and Natural Resources
Division of Boating and Ocean Recreation
Post Office Box 621
Honolulu, Hawai'i 96809

Dear Mr. Underwood:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for your review of the EISPN. Your response, dated December 29, 2017, indicated that the Division of Boating and Ocean Recreation has no comment to offer relative to the proposed project.

Thank you for your response and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

BELT COLLINS

May 7, 2018
2015-71-0100/18P-026

Mr. Curt A. Cottrell, Administrator
Department of Land and Natural Resources
Division of State Parks
Post Office Box 621
Honolulu, Hawai'i 96809

Dear Mr. Cottrell:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for your response dated January 2, 2018. Your response indicated that the Division of State Parks has no comment at this time.

We appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

RECEIVED
2018 FEB -7 PM 1:06
BELT COLLINS HAWAII

JADE T. BUTAY
INTERIM DIRECTOR

Deputy Directors
ROY CATALANI
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
STP 18-006
STP 8.2298

January 31, 2018

Ms. Joanne E. Hiramatsu
Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554

Dear Ms. Hiramatsu:

Subject: Ala Moana Regional Park and Magic Island Improvements
Environmental Impact Statement Preparation Notice
Honolulu, Oahu, Hawaii
TMK: (1) 2-3-037:001, 002, 022, 023 and 025

The City is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park and the Magic Island peninsula grounds and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans. Some of the major improvements include sand replenishment, renovations to existing structures, improving pond edges, widening access over the drainage canal along Ala Moana Boulevard, create a wider promenade along Ala Moana Park Drive and reconfiguring the parking.

Our Department of Transportation (DOT) comments on the subject project are as follows:

Airports Division

1. The nearest portion of the site is located approximately 3.75 miles from the planned extension of Runway 26L of the Daniel K. Inouye International Airport. The Applicant and/or Contractors need to be aware of the duties of the state and county agencies to implement the State of Hawaii Office of Planning Technical Assistance Memorandum related to this project and all projects within 5 miles of an airport: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports 08-01-2016.pdf.

If any of the project features attract hazardous wildlife, create glint and glare hazard, or create an aerial obstruction hazard to flight operations, the Applicant/Contractor must coordinate with proper officials and agencies and must implement appropriate mitigation to address the hazards.

2. The project improvements are located within the 55-65 Day-Night Average Night Sound Level noise contours on the 2008 Noise Exposure Map, and the Applicant and future park users should be aware of the proximity of the airport and potential single event noise from aircraft operations.

Highways Division

The Environmental Impact Statement should include an analysis of the project's impact to users of Ala Moana Boulevard including cars, bicyclists, and pedestrians. It should provide detailed information regarding proposed improvements at Piikoi Street and Kamakee Street and identify whether any of the proposed work is within the State highway right-of-way. Please note that a permit from the Department of Transportation, Highways Division, would be required for work within the State highway right-of-way.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

JADE T. BUTAY
Interim Director of Transportation

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-032

Mr. Jade T. Butay
Interim Director of Transportation
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Butay:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN and your response dated January 31, 2018. The responses to your comments below follow in the order of topics in your letter.

Airports Division: All applicable duties of The State of Hawaiʻi Office of Planning Technical Assistance Memorandum that relate to this project will be followed. Appropriate mitigation will be taken for any potential hazards created for air travel. Information concerning the location of the airport in relation to the project will be disseminated to the public as appropriate.

Highways Division: The Draft Environmental Impact Statement (DEIS) will include an analysis of impacts of the project for park users and others on the nearby roadways. All required permits will be obtained if any work is within the State highway right-of-way.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

PAGE IS INTENTIONALLY LEFT BLANK

CITY AND COUNTY OF HONOLULU

PAGE IS INTENTIONALLY LEFT BLANK

BOARD OF WATER SUPPLY

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

January 24, 2018

Ms. Joanne E. Hiramatsu
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554

Dear Ms. Hiramatsu:

Subject: Your Letter Dated December 20, 2017 Requesting Comments on the Environmental Impact Statement Preparation Notice for Ala Moana Regional Park and Magic Island Improvements Project off Ala Moana Boulevard
Tax Map Key: 2-3-037: 001, 002, 022, 023, and 025

Thank you for the opportunity to comment on the proposed regional park improvement project.

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

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

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

Sub-meters are recommended for large diameter irrigation circuits to detect leaks during periods of non-use. The irrigation system should include copper trace wire or marker ball technology to facilitate future leak detection and irrigation pipeline repair.

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

Water for Life . . . Ka Wai Ola

Attached is water use data for the park. The park's highest water use occurred in 2015 and 2016 reaching as high as about 348,000 gallons/day.

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

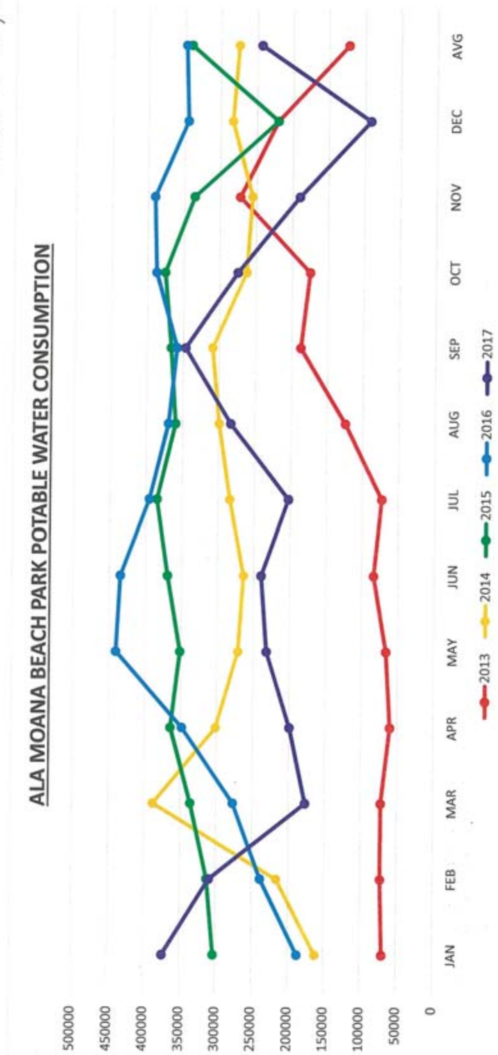
Very truly yours,

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

Attachment

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
	MONTH												
2013	69199	72031	71630	59654	65776	83281	72623	124233	186857	174513	272063	220018	122657
2014	162002	216011	387763	300985	270767	263684	283594	299102	308714	262601	255119	283035	274448
2015	302853	312484	335670	364151	351225	369300	384632	359704	366453	375554	335235	220125	339782
2016	187050	238436	276711	348278	440322	434683	395095	369608	358448	387442	390226	344387	347557
2017	373935	309241	176684	199045	231604	239478	202460	282935	346397	274633	189509	91492	243118

5-YEAR AVG.= 265512 GPD



BELT COLLINS

May 7, 2018
2015-71-0100/18P-016

Ernest Y.W. Lau, P.E.
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96819-4554

Dear Mr. Lau:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN and your comments dated January 24, 2018. Brief responses to your comments bellow follow in the order of topics in your letter.

Existing water system: It is noted that the existing water system is adequate but that the final decision on the availability of water will be confirmed when the building permit is submitted for approval.

Utilization of water: When water is made available, the requirement to pay your Water System Facilities Charges is noted. The Draft Environmental Impact Statement (DEIS) will outline sustainable measures for conservation of water, including the irrigation system. All coordination with related departments, such as the Honolulu Fire Department, will be initiated as applicable.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
925 DILLINGHAM BOULEVARD, SUITE 200 • HONOLULU, HAWAII 96817
PHONE: (808) 768-7762 • FAX: (808) 768-7792
www.honolulu.gov/dcs

RECEIVED
2018 JAN 24 PM 12:08
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

PAMELA A. WITTY-OAKLAND
DIRECTOR

SUSAN L. FERNANDEZ
DEPUTY DIRECTOR

January 22, 2018

Ms. Joanne E. Hiramatsu
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 1-3-37:001, 002, 022, 023, and 025

Thank you for the opportunity to review the request regarding the Environmental Impact Statement Preparation Notice for the Ala Moana Regional Park and Magic Island Improvements project.

Our review of the provided document indicates that the proposed project will have no adverse impacts on any Department of Community Services' activities or projects at this time.

Sincerely,

for
Pamela A. Witty-Oakland
Director

PAW:ta

cc: Ms. Elaine Morisato
Department of Design and Construction

BELT COLLINS

May 7, 2018
2015-71-0100/18P-018

Ms. Pamela A. Witty-Oakland
Director
Department of Community Services
City and County of Honolulu
925 Dillingham Boulevard, Suite 200
Honolulu, Hawaiʻi 96817

Dear Ms. Witty-Oakland:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN and your comment dated January 22, 2018. You indicate that the proposed project has no adverse impacts on the Department of Community Services at this time.

Thank you for your comment and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com
Belt Collins Hawaii is an Equal Opportunity Employer

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

RECEIVED
2018 JAN 26 PM 2:07
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

January 24, 2018

Belt Collins Hawaii LLC
ATTN: Joanne Hiramatsu
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu,

Subject: Environmental Impact Statement Preparation Notice
Ala Moana Regional Park and Magic Island Improvements
TMK: (1)2-3-37:001,002,022,023,025 Oahu, Hawaii

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

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

Sincerely,

Robert J. Kroning
Director

RJK:ms(713728)

BELT COLLINS

May 7, 2018
2015-71-0100/18P-019

Mr. Robert J. Kroning, Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813

Dear Mr. Kroning:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN. Your comment, dated January 24, 2018, indicated that the Department of Design and Construction, has no comments at this time.

Thank you for your response and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,
BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com
Belt Collins Hawaii is an Equal Opportunity Employer

DEPARTMENT OF EMERGENCY MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
PHONE: (808) 723-8960 • FAX: (808) 524-3439

RECEIVED
2018 JAN -8 PM 12: 26
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

MELVIN N. KAKU
DIRECTOR

HIROKAZU TOIYA
DEPUTY DIRECTOR

January 2, 2018

Joanne E. Hiramatsu, Director of Planning
Belt Collins Hawaii, LLC
2153 North King Street, Suite 200
Honolulu, HI 96819

Dear Ms. Hiramatsu:

After reviewing the compact disk on the Environmental Impact Statement Preparation Notice (EISPN) for Ala Moana Beach Park and Magic Island, I have the following areas of concern:

1. Under Section 4 Project Description, subsection 4.3 Proposed Action, my concern is there is no discussion of large scale events such as the Memorial Evening Lantern Festival, the annual July 4th Fireworks event, and the most recently completed special "Return of Hokulea". These unique large scale events take a heavy toll on both man-made and natural/environmental resources which I feel should be considered. What are the short/long term impacts and how/what mitigative measures do we need to implement/plan for to minimize or eliminate the unintended impacts to the environment and ensure the park sustainment.

2. There should be coverage of City/DPR policy regarding a no-fly zone over large gatherings to prevent or control drones or unmanned aerial vehicles (UAS) systems. Believe there needs to be a plan that addresses air space management/envelope over park events and the unintended consequences of these systems on our community and the public's safety.

3. Address potential mitigative measures that should be planned/implemented to address "sea-level rise" and tidal events (aka King Tides) impacts to the Park facilities including the existing/planned facilities, grassed areas, and roadway inundation as these natural occurrences will be happening continually over time.

4. Consider hardening McCoy Pavilion and other covered facilities (i.e. public bathrooms, concessions, etc.) to be able to serve as general shelters for any man-made disaster type incident (aka Ballistic Missile Attack or Active Shooter).

5. Take suggestions proposed in the Honolulu Age-Friendly City's Action Plan in the Outdoor Spaces and Buildings section. There were many "Gaps" identified in our public spaces such as:
   a. Shortage of clean, accessible restrooms
   b. Shortage of amenities such as benches, shaded rest areas, drinking fountains and food concessions
   c. Concerns about crime and vandalism
   d. Spaces are not easily accessible for those with limited mobility
   e. Many outdoor space and buildings are not friendly to those with physical, cognitive, and/or mental disabilities
   f. Lack of awareness among the general public about what constitutes an age-friendly built environment

Appreciate the opportunity to provide feedback on this important improvement project. Should you have any questions, feel free to contact me at 808-723-8960 or at mkaku@honolulu.gov.

Sincerely,

FOR
Melvin N. Kaku
Director

cc: Michele Nekota, Director, Department of Parks & Recreation
Jeanne Ishikawa, Deputy Director, Department of Parks & Recreation

BELT COLLINS

May 7, 2018
2015-71-0100/18P-020

Mr. Melvin N. Kaku
Department of Emergency Management
City and County of Honolulu
650 South King Street
Honolulu, Hawaiʻi 96813

Dear Mr. Kaku:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for letter of January 2, 2018 commenting on the EISPN. The responses to your comments below follow the order of topics in your letter.

1. The Draft Environmental Impact Statement (DEIS) will include discussion of both short and long-term impacts of large scale events and their effect on the man-made environment and natural resources. However, these events are intermittent, occurring several times a year, so impacts are short term to allow the parks to recover between events.

2. The small Unmanned Aerial Systems (UAS) rule (Part 107) of the Federal Aviation Administration (FAA) outlines operating rules and came into effect on August 29, 2016. Congress defines a "model aircraft" as a UAS if it meets the following: capable of sustained flight in the atmosphere; flown within visual line-of-sight of the person operating it; and is flown for hobby or recreational purposes. Section 10-1.2.d.3 of the Revised Ordinance of Honolulu (ROH) states, except in park areas specifically designated for such purposes, it is unlawful for any person to: engage in model airplane flying. The AMRP is governed by the Department of Parks and Recreation; all rules regarding UAS will be governed by established rules described herein.

3. Climate change impacts and sea water rise are of concern with regard to this coastal area. The DEIS will explicitly consider climate change impacts.

4. Hardening of facilities such as McCoy Pavilion and other covered facilities to serve as general shelters will be considered in the DEIS and the design process.

5. The AMRP Master Plan does cover many of the Goals and Recommendations for Outdoor Spaces and Buildings of the Honolulu Age-Friendly City's Action Plan. The DEIS will address creating clean and attractive spaces, ones which are American with Disabilities Act compliant that offer accessible restrooms with enhanced amenities for accessible use by all populations, and which are expected to have reduced criminal activity and vandalism.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com
Belt Collins Hawaii is an Equal Opportunity Employer

HONOLULU EMERGENCY SERVICES DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H-450 • HONOLULU, HAWAII 96819-1814
Phone: (808) 723-7800 • Fax: (808) 723-7836

KIRK CALDWELL
MAYOR

JAMES D. HOWE, JR.
DIRECTOR

IAN T.T. SANTEE
DEPUTY DIRECTOR

RECEIVED
2018 JAN -8 PM 2: 17
BELT COLLINS HAWAII

January 4, 2018

Ms. Joanne E. Hiramatsu
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu:

SUBJECT: Environmental Impact Statement Preparation Notice
Ala Moana Regional Park and Magic Island Improvements

Thank you for the opportunity to comment regarding the Environmental Impact Statement Preparation Notice for Ala Moana Beach Park and Magic Island Improvements.

We have noted the following as areas in need of clarification:

Section 5.13 Public Health, Safety and Service:

Please note that the Honolulu Emergency Services Department (HESD) Charter is as follows:

REVISED CHARTER OF THE CITY & COUNTY OF HONOLULU 1973 (2017 EDITION) Kirk Caldwell, Mayor June 30, 2017

Chapter 6 – Department of Emergency Services Section 6-601. Organization – Powers, Duties and Functions – The director of emergency services shall:

(a) As to medical services:
- (1) Be the primary provider of emergency medical care;
- (2) Develop programs and provide training and educational programs related to emergency medical services and injury prevention;
- (3) Be responsible for medical matters relating to public health and welfare;

- (4) Be responsible for the administration of the city's health services programs and medical evaluations of current and prospective city employees.

(b) As to ocean safety:
- (1) Be the primary responder to emergencies arising on the beach and in the near shore waters;
- (2) Be responsible for ocean safety training, educational, and risk reduction programs relating to ocean safety.

c) Perform such duties as may be required by law. (1992 General Election Charter Amendment Question No. 16; 1998 Reorganization; 2006 General Election Charter Amendment Question No. 10; Reorganization 2007; Reorganization 2012)

Your report noted that the Honolulu Fire Department would normally provide emergency response and rescue relating to water accidents and distress. This is not accurate.

Your report failed to note that HESD will act as the primary medical and ocean rescue responder to all emergencies occurring in Ala Moana Beach Park and Magic Island.

The mention of Kaiser Permanente as an emergency medical facility within a mile of the parks is not accurate.

We noted that the EIS will assess impacts on public services, including police and fire protection, but did not include HESD (EMS or Ocean Safety services) which are primary agencies responsible for Public Health and Safety in the project area.

Section 5.1 Existing Land Use:

This section does not include the current land use within the project area utilized by HESD (Ocean Safety and Lifeguard Services Division) to support the ocean safety operations and training functions of the Department.

Section 5.8 Natural Hazards:

The preparation notes do not address the impacts of tsunami and/or hurricane events.

Ms. Joanne E. Hiramatsu
January 4, 2018
Page 3

Section 5.11 Recreation:

We noted that ocean recreation and safety are concerns in the project area. This is an area that we would request be addressed in the EIS. There are a range of ocean safety and user conflict issues that are of concern:

An increase in the number of people utilizing the ocean waters will lead to a higher risk level for mortality and morbidity.

The ocean bottom structure in the inner park area is the most significant hazard to the public, in particular infants, children, and adults with no or limited swimming ability.

Any changes to the ocean bottom inclination will have an impact on public safety. We believe this issue should be noted as an environmental impact.

If you have any questions, please contact me at 723-7800.

Sincerely,

James D. Howe, Jr.
Director

BELT COLLINS

May 7, 2018
2015-71-0100/18P-036

Mr. James D. Howe, Jr.
Honolulu Emergency Services Department
City and County of Honolulu
3375 Koapaka Street, Suite H-450
Honolulu, HI 96819

Dear Mr. Howe:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for your letter of January 4, 2018. The responses to your comments below follow in the order of topics in your letter.

- **Emergency Response and Ocean Safety:** The Draft Environmental Impact Statement (DEIS) will state that the Honolulu Emergency Services Department (HESD) is the primary medical and ocean responder to all emergencies in Ala Moana Regional Park (AMRP) and Magic Island per Section 6-601 of the Revised Charter of the City and County of Honolulu 1973 (2017 Edition).

- **Kaiser Permanente:** The DEIS will clarify the statement regarding Kaiser Permanente's distance from the AMRP, noting that the Kaiser Honolulu Clinic is within a mile's distance, but its emergency room and hospital facilities are in Moanalua.

- **Impact on Public Services:** The DEIS will include assessment of impacts on public services, and will address impacts on HESD's ocean safety and emergency medical services.

- **Existing Land Use:** The DEIS will include a comprehensive account of existing land use, including the areas used by HESD.

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

- **Natural Hazards:** The impacts of tsunami and hurricane events will be addressed in the DEIS. The document will include the warning systems and zones in place, along with the extent to which AMRP facilities are expected to be affected by such events.

- **Recreation:** As you note, ocean safety is a significant concern with regard to AMRP. On-going work and future plans for sand replenishment are intended to make the shore area and ocean bottom nearby safer and more enjoyable for ocean recreational users. The DEIS will address the question of anticipated changes in the numbers of people enjoying ocean recreation at the Parks.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu`ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

RECEIVED
2018 JAN -8 PM 2:17
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 18-7

January 4, 2018

Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819
Attn: Ms. Joanne E. Hiramatsu

Dear Ms. Hiramatsu

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) Ala Moana Regional Park and Magic Island Improvements

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

We have no comments at this time, as we do not have any facilities or easements on the subject property.

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

Sincerely,

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

BELT COLLINS

May 7, 2018
2015-71-0100/18P-021

Mr. Ross S. Sasamura
Department of Facility Maintenance
City and County of Honolulu
1000 ʻUluʻōhiʻa Street, Suite 215
Kapolei, HI 96707

Dear Mr. Sasamura:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN. Your comments, dated January 4, 2018, indicated that the Department of Facility Maintenance has no comments at this time.

Thank you for your response and we appreciate your participation in the Chapter 343 environmental review process. A copy of the Draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com
Belt Collins Hawaii is an Equal Opportunity Employer

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

RECEIVED
2018 FEB -7 PM 1:06
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

February 5, 2018

Ms. Joanne E. Hiramatsu, Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu:

SUBJECT: Environmental Impact Statement Preparation Notice
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022, 023, and 025

Thank you for the opportunity to review and comment on the subject Draft Environmental Impact Statement Preparation Notice.

The Department of Parks and Recreation's Division of Urban Forestry would like to provide review comments on the Arborist Tree Inventory Plan and requests that a Tree Replacement Beautification Plan be included in the EIS to replace the trees that were removed as a result of the Sand Volleyball and Bath House projects, as well as any future projects that will require tree removals.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(713798)

cc: David Kumasaka-DUF
Terry-Ann Koike-DUF
Brandon Au-DUF
Rosalind Young-DPR District 2

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-034

Ms. Michele K. Nekota, Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Dear Ms. Nekota:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for your reviewing the EISPN and your response dated February 5, 2018. The response to your comment is below.

- **Tree Inventory:** The Ala Moana Regional Park Master Plan addresses horticulture, including trees within the Park. A tree inventory was conducted at the Parks by a licensed arborist. The results of the inventory will be included in the Draft Environmental Impact Statement. The DEIS will assess the extent to which the project replaces trees removed for recent and proposed improvements.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

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

RECEIVED
2018 JAN 26 PM 2:06
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

2017/ELOG-2636(AB)

January 22, 2017

Joanne E. Hiramatsu
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Keys 2-3-037: 001, 002, 022, 023, and 025

Thank you for the opportunity to review the EISPN for the subject project, which includes widening park entrances, walkways, and promenades; rearranging, expanding, and reconfiguring parking lots and parking areas; improvements to the ponds; sand replenishment; playground construction; and a variety of other improvements within the parks and on nearby rights-of-ways. The Draft Environmental Impact Statement (DEIS) should include the following:

1. A discussion on how the proposed project meets the planning principles and guidelines for the Primary Urban Center Development Plan, the Oahu General Plan, and the Ala Moana Neighborhood TOD Plan.

2. An analysis of the possible impact of Sea Level Rise (SLR) on the project. If it is likely that SLR will increase the risk of flooding during the life of the project structures, the DEIS should discuss how the design of the project and proposed operations at the site will address that risk and provide resilience in recovering from flooding.

   The national standard for making such an assessment has been developed by the U.S. Army Corps of Engineers (USACE). The USACE issued an Engineering Regulation 9ER 1100-2-8162) on December 13, 2013, which provides "guidance for incorporating the direct and indirect physical effects of the projected future sea level change across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects." The guidance in the regulation can be used as the basis for assessing the "potential relative sea level change" that might be experienced by projects in shoreline areas, such as this one.

   See www.corpsclimate.us/rccslca.cfm for more details, including use of an online SLR calculator which can be used to produce Oahu specific projections through 2100.

3. A preliminary construction management plan (CMP), traffic demand management plan (TMP), and Traffic Study should be included with the DEIS documents. The Traffic Study should include a robust analysis of compliance with complete streets concepts and alternative transportation access (such as rail, bicycles, pedestrians, and The Bus). The final CMP should be submitted at the time of the issuance of the building permit and the TMP should be submitted at the time of the certificate of occupancy of the buildings.

4. A discussion of compliance with the Land Use Ordinance (LUO). The discussion should specify if a Waiver is required for any proposed developments that exceed the development standards for the P-2 General Preservation Districts, or if any other sections of the LUO need to be waived.

5. A discussion of compliance with Chapter 25, Revised Ordinances of Honolulu (ROH), related to development within the Special Management Area (SMA). An SMA Major Permit is likely required; therefore, to conserve resources and in the interest of efficiency, the DEIS and SMP should include all known and planned improvements for the parks.

6. A discussion of compliance with Chapter 23, ROH, related to shoreline setbacks. Plans and drawings indicating actions near the shoreline should indicate the assumed or certified shoreline, 40-foot setback line, and 55-foot waiver line. If any actions are proposed within the shoreline setback, a Shoreline Setback Variance (SVV) may be required.

7. A discussion of how the project will comply with the new Rules Relating to Water Quality.

Should you have any questions regarding these comments, please contact Alex Beatty of our staff, at 768-8032.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

May 7, 2018
2015-71-0100 / 18P-033

Ms. Kathy K. Sokugawa, Acting Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

Dear Ms. Sokugawa:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN. We received your letter on January 26, 2018. The responses to your comments below follow in the order of topics in your letter.

1. All applicable planning principles and guidelines will be addressed in the Draft Environmental Impact Statement (DEIS).

2. Sea Level Rise and its impacts on the project will be addressed in the DEIS.

3. The DEIS will include a traffic study. Traffic management plans will be developed for review before construction.

4. The DEIS will discuss land use of the Parks and their compliance with the Land Use Ordinance. Any required waivers will be discussed at the time of the DEIS.

5. The DEIS and Special Management Area permit will include all known and planned improvements for the Parks.

6. Required shoreline setbacks will be discussed and noted.

7. All water quality rules and regulations, as they relate to this project, will be discussed in the DEIS.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

716634

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

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP12/17-713631R

January 17, 2018

2018 JAN 24 PM 2:53

Ms. Joanne E. Hiramatsu
Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for Ala Moana Regional Park and Magic Island Improvements

Thank you for the opportunity to provide comments on the EISPN for Ala Moana Regional Park and Magic Island Improvements. In response to your letter dated December 20, 2017 we have the following comments:

1. **Traffic Impact Analysis Report (TIAR).** We have the following comments on the TIAR:

   a. The TIAR should be replaced with a Transportation Impact Assessment (TIA) that analyzes the multi-modal nature of all alternatives, the improvements needed, and recognizes the need for traffic control devices that encourage walking, bicycling, and transit use as the primary access modes for the proposed project. The TIA should identify parking management strategies that will support sustainable mobility. The TIA should identify the locations of all nearby bus stops that residents, employees, and visitors are likely to use.

   b. Provide a map illustrating any nearby Transit Oriented Development (TOD) station area relative to the proposed alternatives, including ¼ mile and ½ mile walkable radii. Include a map of the proposed TOD station access improvements.

   c. Use person trips instead of vehicle trip rates from the Institute of Traffic Engineer's Trip Generation Manual and assign these trips to the transportation system. This will require analysis of crossing treatments using National Cooperative Highway Research Program 562 methodology for pedestrian measures. Any increase in parking shall be justified through trip generation.

   d. In addition to the calculated Level of Service (LOS), the observational LOS should be provided.

   e. Define performance measures for use in the study:
      a. V/C ratio targets that are >1 for 1st and/or 2nd highest peak hours;
      b. Identify where vehicle LOS will not be used;
      c. Pedestrian LOS;
      d. Bicycle Level of Traffic Stress (LTS);
      e. Transit Capacity and Quality of Service.

   f. Define the specific transit, pedestrian, and bicycle improvements necessary where assessment reveals deficient conditions.

   g. The TIA shall analyze the impacts an increase in traffic will have on Makai-bound city streets at all park entrances.

2. **Parking.** We have the following comments related to parking:

   a. **Pay Parking.** All parking for park visitors shall be metered to promote frequent turnover. Provide the number of parking stalls that will be added and the justification.

   b. **Electric Vehicle Parking.** Places of public accommodation with at least 100 parking spaces available for use by the general public shall have at least one parking space exclusively for electric vehicles and equipped with an electric vehicle charging system located anywhere in the parking structure, as per HRS §291-71.

   c. **Bicycle Parking.** Short-term bicycle parking shall be provided whenever new floor area or when a new parking structure is proposed and is also available for public and/or visitor access and shall be located as close as possible to the entrances to the principal uses.

3. **Complete Streets**. The following comments are related to Complete Streets:

   a. The Draft Environmental Impact Statement (DEIS) should contain further discussion of compliance with County and State Complete Streets policies, pursuant to Act 54, Session Laws of Hawaii 2009, HRS §264-20.5 and ROH 12-15. The proposed alternatives and final preferred alternative should describe how they will comply with Complete Streets policies, including specific adherence to the following key Complete Streets principles: 1) safety; 2) Context Sensitive Solutions; 3) accessibility and mobility for all; 4) use and comfort of all users; 5) consistency of design guidelines and standards; 6) energy efficiency; 7) health; and 8) green infrastructure.

   b. Discussion of the existing pedestrian and bike infrastructure for existing and future travel is not sufficient. Specific impacts to transit users, pedestrians and bicyclists, and the corresponding improvements are not addressed in the EISPN. Specify the impacts and the proposed Complete Streets (transit, bicycle and pedestrian) improvements.

   c. Bike Network 2020 requires that a new bike path connection be made on the ewa side of Ala Moana Beach Park that will continue around Kewalo basin. Please identify the ewa-side bike path improvements that will be made within the park.

   d. Figure 3-10 of the Draft Ala Moana TOD Plan (page 57) requires a future bike lane extension of Piikoi through Ala Moana Park. Please identify how this requirement will be fulfilled.

   e. Figure 3-11 of the Draft Ala Moana TOD Plan (page 59) requires intersection improvements and reconfiguration at the intersection of Ala Moana Boulevard and Piikoi Street, and Ala Moana Boulevard and Atkinson Drive. Please identify how this requirement will be fulfilled.

   f. Figure 3-11 of the Draft Ala Moana TOD plan (page 59) requires that elevated pedestrian crossings be implemented at Ala Moana Boulevard and Atkinson Drive, and also at a new Station Mauka-Makai Connection aligned with Kona Iki Street. The Draft TOD

Plan also requires a new Center Stage Mauka-Makai Connection aligned with Keeaumoku Street. Please identify how these pedestrian improvements will be fulfilled.

   g. The Oahu Bike Plan (page 4-2) states that Regional Parks shall have 10 public bicycle racks, each with a minimum capacity of four bicycles per rack. Include a count of current bicycle racks in the park and any needed bicycle rack improvements to meet the standard.

4. **Traffic Management Plan (TMP).** Prepare a TMP which:

   a. Is jointly reviewed and accepted by the Department of Transportation Services (DTS) and the Department of Planning and Permitting (DPP).

   b. Provides a discussion of the traffic impacts that the project may have on any surrounding City roadways, including short-term impacts during construction and long-term impacts after construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

   c. Include a description of how the project will: promote, encourage, and monitor transit use by its residents, and inform employees, residents and visitors.

   d. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to pedestrians and traffic on the local streets and project driveways.

   e. Best practice TMPs provide the City with information by which to monitor construction areas. The City will require cameras where sidewalks are closed to help assess effectiveness of management.

   f. Construction schedules should be coordinated with other nearby properties that have planned developments to ensure minimal impacts on City streets.

5. **Public Transit Service.** Existing transit service is not adequately depicted. Please contact Public Transit Division to ensure that transit routes are accurately depicted on maps in the DEIS, and that the project development does not adversely affect public transit services (bus operations, bus routes, bus stops and para-transit operations); submit project plans to DTS - Public Transit Division (PTD) for review and approval. Contact DTS-PTD at 768-8396, 768-8370, 768-8374 or TheBusStop@honolulu.gov.

6. **Sea Level Rise and Resilience.** Infrastructure improvements located within areas potentially exposed to chronic flooding with sea level rise shall be subject to an in-depth analysis of the potential impacts of sea level rise on elevation, tolerance for risk, and the lifetime of the proposed structure or infrastructure. Any significant improvements within existing footprints should be dependent on established, resilient design guidelines, or otherwise be subject to relocation to a more suitable area.

   The potential for chronic flooding with 3.2 feet of sea level rise (SLR-XA) shall be used as the vulnerability zone for planning purposes. Maps of the project area shall be provided for both the SLR-XA and flooded highways. The applicant shall recommend strategies and designs that increase the flood resiliency for new development or improvements within the SLR-XA that cannot be relocated, or seek opportunities to plan new development or projects well landward of the SLR-XA. See the following to determine vulnerability: http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/

7. **Driveway Design.** All alternatives should have driveways that are designed with the highest pedestrian and bicycle safety measures, have adequate sight distances and supplementary safety measures such as electronic devices at the driveways to warn pedestrians of vehicles moving in and out of driveways, and constructed to current City standards.

8. **Vehicle Ramps.** Any vehicle parking ramps should be designed to accommodate demands so that vehicles will not queue onto public streets and block the roadways.

9. **Loading and Unloading.** All loading and unloading needs, including refuse and service delivery vehicles should be handled on-site, rather than on City roadways. In addition, the project should be designed to accommodate TheHandi-Van para-transit vehicles on-site, which require a minimum 31-foot turning radius, a 10-foot, 6-inch height clearance, and the ability to exit the site without reversing onto public roadways.

10. **Neighborhood Impacts.** The area Neighborhood Board, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.

11. **Street Usage Permit.** A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

12. **Americans with Disabilities Act (ADA) Requirements.** In accordance with the requirements of Ordinance No. 2412, as amended, the proposed sidewalk areas on and adjacent to the property shall meet City and County of Honolulu standards and ADA requirements. Pavement materials shall be chosen to withstand the uplifting and fracturing that may occur from any large trees. Any damage to the existing roadway and sidewalk area caused by the project should be repaired to current City standards as well as meet ADA requirements.

13. **Best Management Practice Controls.** Best Management Practice controls should be included at construction site to prevent trailing of dirt and debris on City roadways.

14. **Disability and Communication Access Board (DCAB).** Project plans (interior and exterior layouts, vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by the DCAB to ensure full compliance with the ADA.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Nicola Szibbo of my staff at 768-8359.

Very truly yours,

Wes Frysztacki
Director

cc: Ms. Elaine Morisato, Department of Design and Construction

BELT COLLINS

May 7, 2018
2015-71-0100/18P-035

Mr. Wes Frysztacki
Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Dear Mr. Frysztacki:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for reviewing the EISPN and your response dated January 17, 2018. The responses to your comments below follow in the order of topics in your letter.

1. **Traffic:** A traffic study will assess baseline traffic conditions in and around the project area. The Draft Environmental Impact Statement (DEIS) will contain an assessment of impacts on traffic as related to trip rates and Level of Service and will identify improvements where needed. A map showing the nearest TOD will be provided in the DEIS

2. **Parking:** Please note that any proposed parking structure is an alternative action in the Ala Moana Regional Park Master Plan, and not the proposed action. Based on community comments metered parking is not being planned. Parking design plans will consider electric vehicle and bicycle parking.

3. **Complete Streets:** The DEIS will examine its compliance with the City and State Complete Streets policies. The DEIS will examine the impacts of proposed actions on sustainable transportation, including bike lanes, bike racks, intersections, or elevated pedestrian crossings. A shared use path will be expanded on the existing ma kai shared-use path.

4. **Traffic Management Plan (TMP):** A TMP will be produced assessing traffic impacts and analyzing for minimal traffic impact.

5. **Public Transit Service:** Thank you for your response regarding the depiction of transit services. The DEIS will ensure that all transit routes are shown accurately and it will ensure that proposed project actions do not adversely affect public transit services.

6. **Sea Level Rise and Resilience:** Impacts of climate change will be addressed in the DEIS.

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

7. **Driveway Design**: All proposed parking reconfiguration will consider designs with the highest level of pedestrian and bicycle safety.

8. **Vehicle Ramps:** No parking ramps are part of the proposed actions.

9. **Loading and Unloading:** Roadway design will take into account location of loading and unloading as well as accommodation for larger vehicles' turning radii and clearance.

10. **Neighborhood Impacts:** All affected groups and organizations will be kept apprised of proposed project details.

11. **Street Usage Permit:** As needed, street usage permits will be obtained from the DTS.

12. **Americans with Disabilities Act (ADA) Requirements:** All proposed actions will comply with ADA requirements.

13. **Best Management Practice (BMP) Control:** BMPs will be observed for all project construction and related activities.

14. **Disability and Communication Access Board (DCAB):** Project plans will be submitted to DCAB to ensure ADA compliance.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

HONOLULU FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

RECEIVED
2018 JAN 24 PM 12: 08
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

January 12, 2018

Ms. Joanne Hiramatsu
Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554

Dear Ms. Hiramatsu:

Subject: Environmental Impact Statement Preparation Notice
Ala Moana Regional Park and Magic Island Improvements
Honolulu, Hawaii
Tax Map Keys: 2-3-037: 001, 002, 022, 023, and 025

In response to your letter dated December 20, 2017, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and requires that the following be complied with:

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

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

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

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

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

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

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

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:bh

BELT COLLINS

May 7, 2018
2015-71-0100/18P-037

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

Dear Mr. Bratakos:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Thank you for reviewing the EISPN and providing your comments dated January 12, 2018. The responses to your comments below follow in the order of topics in your letter.

1. Any new development will meet requirements for distance from fire department access roads.

2. All facilities and buildings will either be within the required distance from a water supply for fire protection or, if in excess of 150 feet, an on-site fire hydrant and mains will be provided.

3. All fire apparatus access roads will meet county requirements for unobstructed width and unobstructed vertical clearance.

4. Once completed, civil drawings will be submitted to the Honolulu Fire Department for review and approval.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the draft Environmental Impact Statement will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

RECEIVED
2018 JAN 25 PM 2:16
BELT COLLINS HAWAII

KIRK CALDWELL
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
JONATHON GREMS
DEPUTY CHIEFS

OUR REFERENCE MT-AL

January 22, 2018

Ms. Joanne E. Hiramatsu
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Ms. Hiramatsu:

This is in response to your letter dated December 20, 2017, requesting comments on an Environmental Impact Statement Preparation Notice for the Ala Moana Regional Park and Magic Island Improvements project.

The Honolulu Police Department (HPD) has reviewed this project and has concerns regarding park signage and the expansion of a facility located in the park.

The park should have visible signage posted at the perimeters, entrances, and interior of the park, which clearly identify the boundaries and park rules and regulations governing Ala Moana Regional Park and Magic Island. Visible signage will assist the HPD with police enforcement in and around the park area.

We would also like to request the possibility of including improvements to the building, which houses HPD and the Department of Ocean Safety, to expand this facility for housing additional All Terrain Vehicles (ATV) and a trailer to transport the ATVs used to patrol the park. This facility can also serve as a command post for large events, such as the Shinnyo-en Latern Festival.

If there are any questions, please call Major Roy Sugimoto of District 1 (Central Honolulu) at 723-3327.

Thank you for the opportunity to review this project.

Sincerely,

MARK TSUYEMURA
Management Analyst VI
Office of the Chief

Serving and Protecting With Aloha

BELT COLLINS

May 7, 2018
2015-71-0100/18P-039

Mr. Mark Tsuyemura, Management Analyst VI
Office of the Chief
Honolulu Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, HI 96813

Dear Mr. Tsuyemura:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for reviewing the EISPN and your response dated January 22, 2018. The responses to your comments below follow in the order of topics in your letter.

- **Park Signage:** Public safety is identified as a concern at the project area. The Draft Environmental Impact Statement (DEIS) will assess impacts on police protection. Visible signage is included with proposed improvements to public safety.
- **Facility expansion:** Thank you for your request to include improvements to the Ocean Safety building. Plans to move the Ocean Safety offices to a more strategic location for emergencies and large events are being considered.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

PAGE IS INTENTIONALLY LEFT BLANK

ORGANIZATIONS

PAGE IS INTENTIONALLY LEFT BLANK

HISTORIC HAWAI'I FOUNDATION

January 22, 2018

Joanne E. Hiramatsu
Belt Collins Hawai'i LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Re: Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Honolulu, Island of Oahu
TMK: 2-3-037:001, 002, 022, 023, 025

Dear Ms. Hiramatsu:

Historic Hawai'i Foundation received notice and request for comments from Belt Collins on behalf of the City & County of Honolulu as it prepares an Environmental Impact Statement (EIS) for the proposed Master Plan for park and facilities improvements of Ala Moana Regional Park. Thank you for the opportunity to comment.

<u>Interests of Historic Hawai'i Foundation</u>
Historic Hawai'i Foundation (HHF) is a statewide organization established in 1974 to encourage the preservation of sites, buildings, structures, objects and districts that are significant to the history of Hawai'i. As an organization that is concerned with the effect of the project on historic properties, HHF confirms our intention to participate in the EIS consultation process in accordance with Hawai´i Revised Statutes (HRS) Chapter 343.

Ala Moana Park was listed on the Hawai'i Register of Historic Places in 1988 as part of the multiple property listing of the "City and County of Honolulu Art Deco Parks and Playgrounds." As a property listed on the historic register, the park is designated as a "significant historic property" under HAR Title 13.

<u>Project Scope:</u> The project is to prepare a master plan for improvements within the boundary of Ala Moana Regional Park, including landscaping, building and structure modifications and alterations, roadway realignment, revisions to parking locations and the creation of a Pi'ikoi Street entrance.

Draft Master Plan proposals were presented for comment in 2015 and 2016. HHF provided comments to the Department of Parks and Recreation on August 8, 2016. On March 28, 2017 we were advised that our comments had been forwarded to the Department of Design and Construction for consideration in preparation of the Master Plan.

<u>Project Area:</u> The Area of Potential Effect (APE) includes the entire Park and Magic Island (Tax Map Keys 2-3-37:001, 002, 022, 023 & 0025). Of the planning area, the historic Ala Moana Park (TMK 2-3-37:001) is the portion listed on the Register of Historic Places. Additional historic properties may be present in the other parcels.

680 Iwilei Road, Suite 690 Honolulu, Hawai'i 96817 Tel (808)523-2900 Fax (808)523-0800
Email preservation@historichawaii.org Web www.historichawaii.org

<u>Proposed Action</u> (Section 4.3 of EISPN): The proposed park and facility improvements in the proposed action to be reviewed in the EIS include:

- Pi'ikoi Street entrance expansion and plaza;
- Widening the promenade along the makai side of Ala Moana Park Drive;
- Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;
- Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;
- Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;
- Keyhole parking lot expansion;
- Elongating Magic Island parking lot;
- Improve the pond edges;
- Improve McCoy Pavilion to include a dining facility;
- Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;
- Sand replenishment and long-term beach nourishment;
- Build a Playground;
- Relocate the Maintenance Yard;
- Drainage canal covering;
- Create a multiuse facility at the Lawn Bowling area;
- Relocate the Ocean Safety's Honolulu Headquarters;
- Improve the entrance at the Kamakee Street entrance.

<u>Identification of Historic Resources:</u>
Any project with potential to affect historic properties must first include identification of the historic resources, evaluation of their significance, evaluation of the proposed project's potential effect on those features, and commitments to avoid, minimize and mitigate any potential adverse effect.. HHF recommends that the Ala Moana Master Plan include a specific description of the historic features and characteristics that contribute to the historic significance of the park as a whole.

EISPN Section 5.9 states that an "architectural survey" will be developed. The survey should be of a quality and contain enough information about each feature to provide an adequate basis for making historic preservation decisions. The survey will need to include:

- Description of character-defining features and contributing elements
- Assessment of historic integrity for the features, including materials, design, workmanship, location, setting, association and feeling

We also recommend that the survey include a discussion about the period of significance, and whether later additions to the park have attained historic significance in their own right, even if designed and built later than 1934 (the significant date listed in the historic register nomination form).

A short list of historic properties should include, but may not be limited to:

- Landscape Features
  - Canal and lagoons
  - Significant trees (including those on the Oʻahu "Exceptional Tree List")
  - Review of Original Plans of 1931 and 1933
- Garden Features
  - Banyan Court, including sculptures
- Site Features
  - Roosevelt Entrance Portals
  - Bridle Path Bridge (and later companion bridges)
  - Lawn Bowling Center including walls, gates and significant materials
  - Central Makai Terrace and pergolas
- Buildings Structures
  - McCoy Pavilion
  - Sports Pavilion including gates and artwork
- Related Properties
  - Boat Harbor
  - Pedestrian and Bridle Path link between Ala Moana Park and Kapiʻolani Park along the Ala Wai (per original master plan)

<u>Determination of Effect:</u>
Once the significant historic properties/features have been identified and evaluated, potential effects of the project need to be determined, along with measures to avoid, minimize and/or mitigate adverse effects to the historic properties.

"Effects" include, but are not limited to, partial or total destruction or alteration of the historic property, detrimental alteration of the property's surrounding environment, and neglect resulting in deterioration or destruction (HAR §13-275-7(b)).

The description of character-defining features and elements of Ala Moana Regional Park will assist with the evaluation of alternatives, as each option can then be compared to a specific benchmark to assess effects.

HHF is particularly concerned about the potential effect on significant historic resources from specific elements in the proposed action, including:

1. McCoy Pavilion Dining Facility
2. Drainage Canal Covering
3. Multiuse Facility at the Lawn Bowling Area
4. Keyhole Parking Lot Expansion
5. Improvements to Pond Edges

<u>Coordination with Federal Permits and NHPA Section 106</u>
The Army Corps of Engineers (ACOE) Permits trigger Section 106 of the National Historic Preservation Act (NHPA). Under the Section 106 procedures, the federal agency needs to coordinate reviews, complete Section 106 agreements and include results in the Final EIS. The EISPN Section 6.1 fails to include Section 106 compliance.

HHF believes that the ACOE needs to complete its Section 106 process and then the final agreement on the treatment of historic properties needs to be integrated into the Master Plan and the EIS.

HHF notes it is necessary to comply with Section 106 <u>*before*</u> final decisions are made in order to avoid foreclosure of options as described in 36 CFR §800.02(c) & 800.16(j). HHF believes that the Master Plan approval sequence may be out of order, as the ACOE is prohibited from taking "an action that effectively precludes the [Advisory Council on Historic Preservation] from providing comments which the agency official can *meaningfully consider* prior to the approval of the undertaking" (emphasis added).

If the EIS finding is issued before that process is complete, it forecloses options. Either the ACOE would not be in compliance with Section 106, or the eventual resolution reached through the Section 106 process could result in an amendment to the EIS.

Historic Hawaiʻi Foundation looks forward to participating in consultation to resolve the potential outstanding issues and adverse effects on the historic Ala Moana Regional Park. We look forward to working with you and your staff on this project.

Very truly yours,

Kiersten Faulkner

Kiersten Faulkner, AICP
Executive Director

BELT COLLINS

May 7, 2018
2015-71-0100 / 18P-038

Ms. Kiersten Faulkner, AICP
Executive Director
Historic Hawaiʻi Foundation
680 Iwilei Road, Suite 690
Honolulu, HI 96817

Dear Ms. Faulkner:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for your reviewing the EISPN and for your letter dated January 22, 2018. The responses to your comments below follow in the order of topics in your letter.

Identification of Historic Resources: The Draft Environmental Impact Statement (DEIS) for this project will identify all historic structures and their historic relationship to the Ala Moana Regional Park. An architectural survey will identify and evaluate historic structures to inform decisions concerning those structures.

Determination of Effect: Effects of this project on identified historic structures will be evaluated in the DEIS.

Section 106 of the National Historic Preservation Act (NHPA): Thank you for your input regarding coordination with Federal Permits and NHPA Section 106. We will evaluate all applicable options and we will coordinate with all appropriate agencies to determine all required rules and regulations.

Thank you for your comments and we appreciate your participation in the Chapter 343 environmental review process. A copy of the DEIS will be sent to you at the time of publication.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

JEH:ajk

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

PAGE IS INTENTIONALLY LEFT BLANK

INDIVIDUAL STAKEHOLDERS AND PARK USERS

PAGE IS INTENTIONALLY LEFT BLANK

Joanne Hiramatsu

From:	Ai Oyama <aioyama@hawaii.edu>
Sent:	Saturday, January 20, 2018 2:26 PM
To:	Joanne Hiramatsu
Cc:	S. Sakai
Subject:	Regarding Ala Moana Park
Follow Up Flag:	Follow up
Flag Status:	Flagged

Dear Joanne Hiramatsu,

I agree with the comments made by Stan Sakai. I'd like you to keep the parallel parking on the makai side of Ala Moana Park Drive. There is enough of an ocean view even with the parked vehicles and eliminating this parking will create many problems for park users, including public safety issues.

I also think there's a nice spacious grassy area where everyone can enjoy picnicking and running around already, so no need to build a playground.

Thank you!
Ai Oyama

Joanne Hiramatsu

From:	Ai Oyama <aioyama@hawaii.edu>
Sent:	Saturday, January 27, 2018 7:23 PM
To:	Joanne Hiramatsu
Cc:	S. Sakai
Subject:	Fwd: EISPN for Ala Moana Park and Magic Island Improvements - Comments on proposed parking

Hello Joanne,

I am sending this email to you to support Stan Sakai's comments below. He points out critical issues about the proposed actions.

Thank you!
Ai Oyama

---------- Forwarded message ----------
From: **S. Sakai** <stansakai154@gmail.com>
Date: Sat, Jan 27, 2018 at 5:46 PM
Subject: EISPN for Ala Moana Park and Magic Island Improvements - Comments on proposed parking
To:

Following is an email I just sent to Joanne (Belt Collins).
Hope she accepts it.

stan

Hi Joanne,

I know the deadline for responding to the EISPN was January 22nd, but when we first talked you mentioned that there might be some flexibility on this date. Having had more time to think through the proposed actions, I now have a better understanding of the important issues so I hope you'll include my comments from this email.

My first criticism is the proposed action "Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones." I am 100% against removing the parallel parking along the makai side of Ala Moana Park Drive and replacing them with loading/unloading zones. Secondly, I also have serious public safety concerns on the implementation of perpendicular or diagonal parking stalls on the mauka side.

The only argument in favor of removing the makai parking is to create an 'open ocean view,' but the list of negatives is considerably longer and includes serious public safety risks.

1. The current ocean views, even with the cars parked along the makai side, are more than adequate. People walking on the promenade, sitting on the low concrete wall that travels along the beach, or sitting on the beach already have 100% 'open ocean views.' People who are picnicking, playing ball sports on the Great Lawn, or playing tennis are not interested in an 'open ocean view.' They're involved in their activities.

2. Creating an 'open ocean view' will essentially create a 'scenic drive' that will encourage more people to drive through the park including tour vans and buses. In recent times, more tour vans and even double decker buses, have been coming into the park. All this extra traffic poses risks for pedestrians, impedes the park traffic, and increases the

frustration of people trying to enjoy the park. The city should seriously consider banning "ALL" tour vans and especially buses from driving through the park as part of a scenic tour because there are no limits on how many businesses can drive through the park. Without some kind of control, in time, potentially all tours could include a drive through the park.

3. Eliminating the makai side parking will increase the risk of an accident because more people will be crossing the street to get to the beach from the mauka side. Many of these will be carrying beach supplies and equipment, including large paddle boards and surfboards. On windy days, it can get really difficult handling these while crossing the street. And, they'll be making the trip twice during their day at the beach, first toward beach and later back to their cars.

4. Drivers sightseeing through the park will be distracted by views of the ocean, beach, and 'beach bodies' rather that looking out for pedestrians crossing from the mauka side. Kids bolting across the street to get to the beach faster and moving cars with inattentive drivers are a bad mix.

5. Like the situation in Laniakea on Oahu's North Shore, the constant flow of people crossing the highway to look at the turtles brings traffic to a crawl. The situation could be worse at Ala Moana because beach goers will be carrying their beach supplies, paddle boards, surfboards, picnic supplies, beach equipment, etc., etc., etc. And, they'll have to do this at least twice, once heading toward the beach and later heading back to their cars.

6. Reversing out of diagonal or perpendicular parking stalling into oncoming traffic is much more dangerous than pulling out from a parallel stall. From a diagonal or perpendicular stall you have to creep out, literally 'praying' that no one is cruising by, especially a driver who's distracted, perhaps by looking at the 'open ocean view.' For trucks with paddle boards or surfboards sticking out of their beds by a few feet, this gets even more risky.

7. Unloading and loading from the backs of cars, vans, and trucks is much more dangerous with perpendicular and diagonal stalls than from parallel ones. With parallel stalls, one just unloads unto the curb. With perpendicular or diagonal stalls, you'll have to stand in the flow of traffic. And, at least for a moment, if you are unloading or loading a paddle board or surfboard the board will extend even further into the flow of traffic.

8. Loading/unloading zones on the makai side is impractical and will create problems for beach users. It's a nice conceptual idea, but uninformed and not well thought out. Here are some scenarios which could play out:

Cars will be lining up waiting to load/unload. This will be worse at those times when most people are packing up and leaving and also on days when people are trying to escape a sudden downpour.

People bring tents and all kinds of things for their day at Ala Moana. Some will take longer to load and unload. Who will police this? Will this frustrate beachgoers enough that some kind of confrontation ensues?

After unloading, someone needs to watch the supplies while the driver leaves to look for parking. On a busy day, the only available parking could be at a far end of the park. This whole process, in reverse, will play out again when the group leaves the park; so much time wasted, so much unnecessary traffic.

From the loading/unloading area, all the supplies will then have to be carried to a beach location. Many will probably setup close to the loading/unloading area rather than haul everything farther away. So, instead of spreading people across the beach,

people will tend to be clustered around the loading/unloading zones.

9. Almost all cars these days are wider than previous models. The one shining feature of parallel parking is that it can accommodate wider vehicles. And, people can unload their supplies from the back of their vehicles without having to walk into traffic, as would be the case with diagonal or perpendicular parking stalls.

Lastly, Ala Moana Park has a long history for generations of residents who have fond memories and still cherish the park. That's why it's still so heavily used. All proposed improvements to the park should not destroy this history and the local park culture. From years of experience, the frequent and long-time park users have a very good understanding of how the park functions, more so than designers and planners, especially those from out of state who don't use the park and don't understand the culture of Ala Moana. As such, the opinions of the people should have a significant and dominant bearing on the proposed actions. They know what they want and they know what works for them.

Stan Sakai

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Oyama:

Thank you for your email dated January 20 and January 27, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN. You state your agreement with Stan Sakai's comments. Responses to those comments are below.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities, such as the playground, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

January 21, 2018

In response to the 17 proposed elements reviewed in the EISPN under the Enhance Alternative, there is unanimous opposition to:

- the taking away of makai parking,
- widening of the promenade along the makai side of Ala Moana Park drive,
- rearranging the parking to open views to the ocean and adding loading and unloading zones,
- one way traffic in any area of the park,
- and vehicle entrance at Piikoi Street.

There are many questions due to the lack of any detail for most of the items, but with the above concerns, there is only consensus.

We ask Belt Collins and the City and County of Honolulu to please listen to the people who use the park. We have been active in giving feedback since the beginning of this project and we are passionate about Ala Moana Beach Park.

Thank you,

Malama Moana

Audrey Lee

Jupiter Kajiwara

Reid Inouye

Robert Stehlik

Bruce Lum

Shar Chun-Lum

Dean Nakamaru

Miles Keone

Namah Grace

Gary Lack

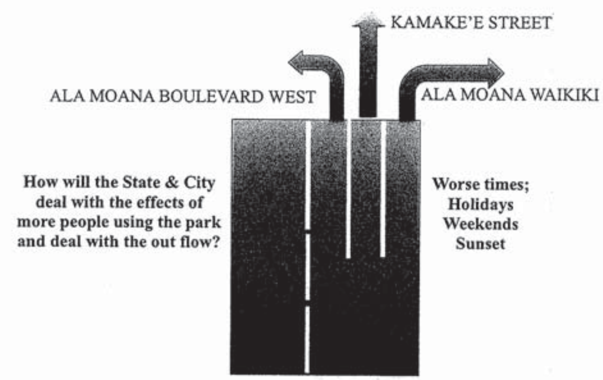
Eugene Lee

Craig Sako

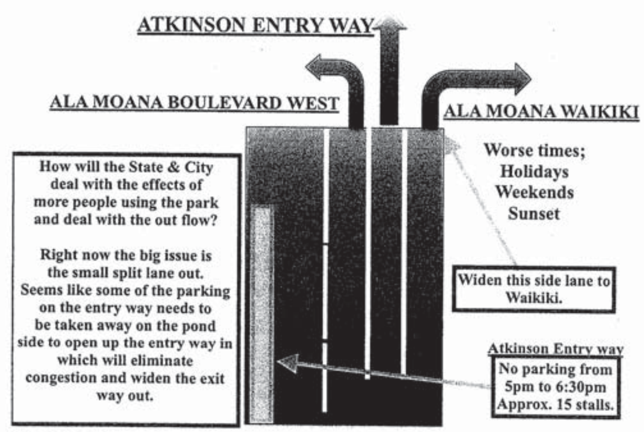
EISPN

A. Entrance Ways

1. KAMAKE"E STREET ENTRY



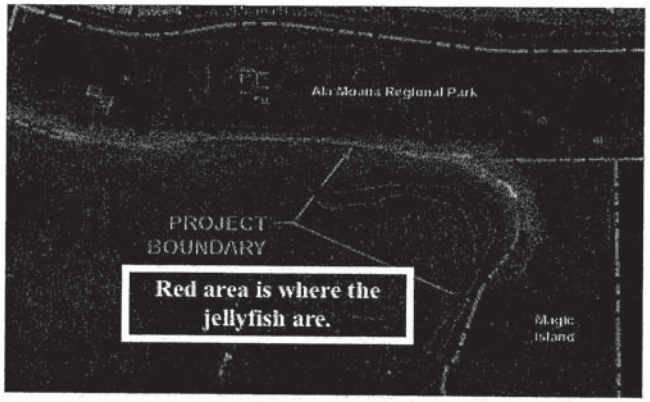
2. ATKINSON ENTRY WAY



B. Water Quality

How will they control water quality when there is a backflow during flooding and Kona winds?

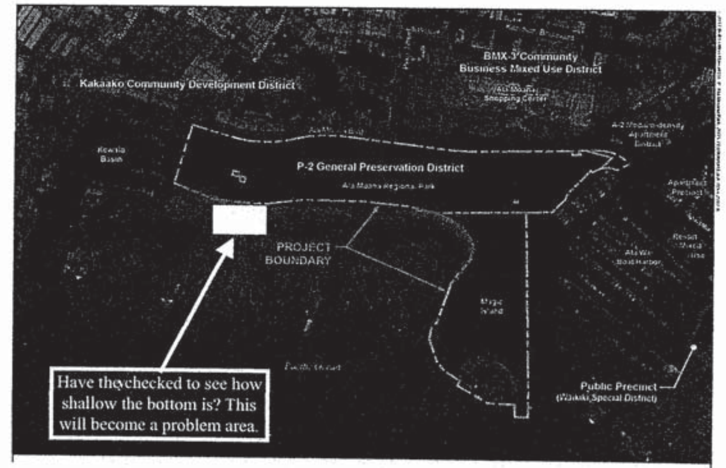
How will they control the invasion of jellyfish and turtle which has grown in population 50-75% over the last 10 years?



The jellyfish population has moved to the deepest part of the park over the last 4 years causing the turtles to feast on the jellyfish in one small area.

C. Sand Replenishment

1. What will they do to replenish sand?
2. What are they doing to undo the sand build-up already existing at the Kewalo end of the park waterway?



D. Adopt A Park (No the builders concern, but a good concern we need to discuss with the mayor and potential future mayor.

Why hasn't the City and County implemented an Adopt A Park Program at Ala Moana Beach Park?

Volunteers to help enforcers the rules and regulations for the park as well as the well being and beautification.

Thank you for sending out the EISPN.
Thank you for accepting public comments.

Ala Moana Park truly is a precious place for many people living here and I'm pleased to see the effort made to listen to the public opinion. I hope the decisions made will benefit those using the park now AND for our children in the future.

Reading through the proposed changes, i feel it is lacking details.
Is there any way you could provide more details?

For example:
1) Piikoi street entrance expansion
QUESTION: Is this entrance for pedestrians or vehicles?

2) Widening of the makai side promenade
QUESTION: Will the widening be on the beach side OR the Ala Moana park drive side?

3) Rearranging parking on the makai side
QUESTION: Will this eliminate all parking on that side?

4) Keyhole expansion
QUESTION: What does that mean? Need details?

5) Will Ala Moana park drive remain 2 ways OR will it become 2 way?

6) Multi Level parking structure
QUESTION: Where will this be located?

There are many good ideas but without details it is difficult to comment.
Please provide more details if possible.

Mahalo,
Dean Nakamaru

Below is what Stan Sakai emailed me.

FEEDBACK FROM BELT COLLINS:

I spoke to Joanne Hiramatsu, Director of Planning for Belt Collins Hawaii, the company which did the EISPN (preparatory note). Here's what Joanne mentioned:

1. The deadline for providing feedback on the EISPN is January 22nd. However, if they get late replies they'll look at them as well, up to a point.

2. There will be one more public meeting on January 29 and most likely at 6 pm at McCoy Pavilion. The meeting hasn't been announced yet, so look out for more details.

3. A preliminary master plan, lead by Biderman Corp, has been completed.

4. Belt Collins sent out of about 600 requests for comments on the EISPN and have received about 20 responses so far.

5. A parking study has been completed and it was concluded that more parking is needed.

6. The promenade will be widened and they'll try to keep as many trees as possible.

7. The parking on the makai side of Ala Moanda Park Drive will be removed but loading/unloading areas will created.

8. Crosswalks will painted. These probably won't be used by most people, but it's one way that the City will protect itself if someone gets injured crossing the street.

9. Traffic through the park will flow in both directions, not in one direction as some have speculated. Some work will be done on the Atkinson exit. But they need to keep some of the historical features.

10. The Piikoi entrance will only be for foot traffic.

1/21/2018 Malama Moana EISPN Sunday January 21 4 pm at Ala Moana Beach Park by Tennis Courts - aelee888@gmail.com - Gmail

Hi Audrey,
Thanks for getting involved in this. I will not be able to make it to the meeting at 4 pm today. One comment I would make is that there is a lot of demand for public surf and SUP board storage racks, so if they could offer that I think it would be a hit with all the apartment dwellers in town.

Aloha,
Robert Stehlik

https://mail.google.com/mail/u/0/#inbox/161072086f54bcd2 1/1

Where is the EIS for the current use of the plan?

PLEASE ADD YOUR COMMENTS (PRO AND/OR CON) UNDER EACH ITEM. The 17 proposed elements reviewed in the EIS under the Enhance Alternative include:

- Pi'ikoi Street entrance expansion and plaza; ?

Vehicle NO

- Widening the promenade along the makai side of Ala Moana Park Drive; No

Segway, bikes, skateboards will be more dangerous

Signage Individual problem

Fewer browsers

- Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

NO

- Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones; Unanimous NO

- Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls; size of stalls

Massive traffic

angled traffic will be worse, but there will be more parking

- Keyhole parking lot expansion;

NO detail, depends on detail

How much green will be left?

- Elongating Magic Island parking lot;

NO ONE WAY!

- Improve the pond edges; ?

back in parking

exhaust from

Air Quality

Who are the people of the People's Park?

• Improve McCoy Pavilion to include a dining facility; ?

• Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access; What do you mean redesign?

• Sand replenishment and long-term beach nourishment;

sand destroys reef and fish food

• Build a Playground;

• Relocate the Maintenance Yard; ?

• Drainage canal covering; cover it up

• Create a multiuse facility at the Lawn Bowling area; ?

• Relocate the Ocean Safety's Honolulu Headquarters; ?

• Improve the entrance at the Kamakee Street entrance. ?

These are my comments. Audrey Lee

January 21, 2018 (Print/sign name)

PLEASE ADD YOUR COMMENTS (PRO AND/OR CON) UNDER EACH ITEM.
The 17 proposed elements reviewed in the EIS under the Enhance Alternative include:

• Pi'ikoi Street entrance expansion and plaza;

DEPENDS ON TRAFFIC IMPACT AND SAFETY

• Widening the promenade along the makai side of Ala Moana Park Drive;

~~DEPENDS~~ DEPENDS ON WHAT IS TAKEN AWAY -

• Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

YES, DEPENDS ON IMPACT TO TRAFFIC FLOW

• Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;

THE ISSUE IS NOT LOADING & UNLOADING BUT PARKING AND ACCESS -

• Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;

TANDEM STALLS FOR TRAFFIC FLOW?

• Keyhole parking lot expansion;

YES, MORE STALLS?

• Elongating Magic Island parking lot;

WHICH DIRECTION

• Improve the pond edges;

YES, HOW ABOUT DRAINAGE?

• Improve McCoy Pavilion to ~~include a dining facility~~;

YES EXCEPT?

IMPROVE ACCESS FOR USE

• Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;

YES -

• Sand replenishment and long-term beach nourishment;

IMPACT ON ENVIRMNT? -

• Build a Playground;

NO - THE BEACH AND OPEN AREAS ARE THE PLAYGROUND -

• Relocate the Maintenance Yard;

CONSOLIDATE AND IMPROVE SPACE FOR CREW

• Drainage canal covering;

CAPACITY ISSUES

• Create a multiuse facility at the Lawn Bowling area;

IMPROVE SPACE FOR USE VS. MAINTENANCE

• Relocate the Ocean Safety's Honolulu Headquarters;

CONSOLIDATE & IMPROVE SPACE FOR CREW -

• Improve the entrance at the Kamakee Street entrance.

YES, DEPENDS ON IMPACT TO SPACE AND TRAFFIC FLOW

These are my comments. [signature] (Print/sign name)

January 21, 2018

PLEASE ADD YOUR COMMENTS (PRO AND/OR CON) UNDER EACH ITEM.
The 17 proposed elements reviewed in the EIS under the Enhance Alternative include:

• Pi'ikoi Street entrance expansion and plaza;

Creating an entrance through the park would take away from the charm of the park.

• Widening the promenade along the makai side of Ala Moana Park Drive;

Bad planning regarding traffic. Having entrance and exit one way will create major problems if emergency occurs.

• Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

• Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;

Against the chances of emergencies from being accomplished with one way traffic

• Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;

The perpendicular parking is ~~...~~ used to attempt to justify the elimination of makai side parking.

• Keyhole parking lot expansion;

• Elongating Magic Island parking lot;

• Improve the pond edges;

• Improve McCoy Pavilion to include a dining facility;

• Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;

• Sand replenishment and long-term beach nourishment;

• Build a Playground;

• Relocate the Maintenance Yard;

• Drainage canal covering;

• Create a multiuse facility at the Lawn Bowling area;

• Relocate the Ocean Safety's Honolulu Headquarters;

• Improve the entrance at the Kamakee Street entrance.

These are my comments. [signature]

January 21, 2018 (Print/sign name)

PLEASE ADD YOUR COMMENTS (PRO AND/OR CON) UNDER EACH ITEM.
The 17 proposed elements reviewed in the EIS under the Enhance Alternative include:

• Pi'ikoi Street entrance expansion and plaza;

NO!

• Widening the promenade along the makai side of Ala Moana Park Drive;

Drawings ?

• Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

Drawings ?

• Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;

Drawings (opposed)

• Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;

Drawings

• Keyhole parking lot expansion;

Is there drawings ?

• Elongating Magic Island parking lot;

Is there drawings ?

• Improve the pond edges;

• Improve McCoy Pavilion to include a dining facility;

• Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;

Just cut A Ramp

• Sand replenishment and long-term beach nourishment;

NO – DREDGE By Kewalo Bay

• Build a Playground;

NO

• Relocate the Maintenance Yard;

Yes

• Drainage canal covering;

• Create a multiuse facility at the Lawn Bowling area;

NO

• Relocate the Ocean Safety's Honolulu Headquarters;

Yes

• Improve the entrance at the Kamakee Street entrance.

Yes

These are my comments. ______________________

January 21, 2018 (Print/sign name)

RED

MAJOR ISSUE: SAFETY FOR PEDESTRIANS.

PLEASE ADD YOUR COMMENTS (PRO AND/OR CON) UNDER EACH ITEM.
The 17 proposed elements reviewed in the EIS under the Enhance Alternative include:

• Pi'ikoi Street entrance expansion and plaza;

only the bridge – may be + keep design same

• Widening the promenade along the makai side of Ala Moana Park Drive;

• Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

• Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;

• Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;

what happens to mature trees!

• Keyhole parking lot expansion;

• Elongating Magic Island parking lot; Preserve green areas.

• Improve the pond edges;

• Improve McCoy Pavilion to include a dining facility;

• Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;

• Sand replenishment and long-term beach nourishment;

• Build a Playground;

• Relocate the Maintenance Yard;

• Drainage canal covering;

• Create a multiuse facility at the Lawn Bowling area;

• Relocate the Ocean Safety's Honolulu Headquarters;

• Improve the entrance at the Kamakee Street entrance.

These are my comments. Namah Grace

January 21, 2018 (Print/sign name)

Slen

PLEASE ADD YOUR COMMENTS (PRO AND/OR CON) UNDER EACH ITEM.
The 17 proposed elements reviewed in the EIS under the Enhance Alternative include:

• Pi'ikoi Street entrance expansion and plaza;

no vehicle entrance to park

• Widening the promenade along the makai side of Ala Moana Park Drive;

Increasing view plane for whom / Widening would encourage more segway traffic Bikers -

• Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

• Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;

Keep Makai parking for the people

• Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;

Harder to open doors with stuff -

Ambiguous, Perpendicular parking increase chances of cars being damaged.

• Keyhole parking lot expansion;

• Elongating Magic Island parking lot;

• Improve the pond edges;

• Improve McCoy Pavilion to include a dining facility;

• Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;

• Sand replenishment and long-term beach nourishment;

• Build a Playground;

• Relocate the Maintenance Yard;

• Drainage canal covering;

• Create a multiuse facility at the Lawn Bowling area;

• Relocate the Ocean Safety's Honolulu Headquarters;

• Improve the entrance at the Kamakee Street entrance.

These are my comments. ________________

January 21, 2018 (Print/sign name)

BELT COLLINS

June 6, 2018
2015-71-0100/18P-044

Ms. Audrey Lee
321 N. Kuakini Street #305
Honolulu, HI 96817

Dear Ms. Lee et al. (Mālama Moana),

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Thank you for your correspondence dated January 21, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN. Responses to the comments are below.

One-Way Traffic and Vehicle Entrance at Piʻikoi Street

Please note that some of the "proposed elements" you are opposing are not considered in the Master Plan. Ala Moana Park Drive will remain as a two-way road and there is no proposal for a vehicle entrance at Piʻikoi Street.

Beach Promenade, Parking Reconfiguration

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Belt Collins Hawaii LLC | 2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
Tel: 808.521.5361 | Fax: 808.538.7819 | www.beltcollins.com | honolulu@bchdesign.com

Park Entrance Ways

As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities, such as speed bumps, and overall traffic efficiency including at the main entrance ways. Results are expected to determine the baseline traffic conditions and evaluate the proposed options of the project. The Draft Environmental Impact Statement (DEIS) appendices will include the results of the traffic study for public review.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will demand additional studies to help determine viable options and permits will be needed for this work.

Water Quality

While the City is concerned about water quality, sampling of the offshore waters is the responsibility of the State of Hawaiʻi Department of Health (DOH). The City follows the lead of DOH when questions of water quality arise.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS, and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Bradley Ebisuya <EbisuyaB001@hawaiiantel.net>
Sent:	Saturday, January 20, 2018 5:14 PM
To:	Joanne Hiramatsu
Subject:	Ala Moana Park Improvements
Follow Up Flag:	Follow up
Flag Status:	Flagged

I am a retiree that utilizes the park daily from 4:00 to 8:00 a.m. I am happy the way the park is but it could use a lot of repair and maintenance. I feel the improvement plan should be cancelled. The proposed improvements will beautify the park but it will be only a temporary solution to the ongoing problem of vandalism, aging, and neglect. Instead, the money for the project should be used for the following and any remaining funds should be kept for ongoing maintenance and repairs:

1) Repair/repaving of the bike path on Magic Island, and the concrete walls/walkways throughout the park.

2) Clean out all the plumbing in the bathrooms. They are constantly getting clogged due to users flushing items that are not degradable.

3) Install locking gates for all bathrooms and they should be locked from 10:00 p.m. to 4:00 p.m. Much of the vandalism occurs during the park closure hours.

4) Replant grass that will grow with little or no sunlight and will not get muddy when it rains. Continue to maintain the grass so that fewer weeds grow.

5) Clean/dredge the ponds and the canal next to Ala Moana Blvd. They're filthy and smelly.

6) Restore the sand on the beach, especially in the area between the lifeguard office and the "high rise" portion of the beach. It was a very wide area and it was popular with beach users. It has eroded to where there is no room for users to enjoy.

7) Hire full-time security with the authority to enforce the rules of the park. Listed below are some of rules that are being abused:

a. No animals allowed in the park. The people walking their dogs have grown the past few years. Although majority of them pick up after their dog, there are a few that does not. Even when they do, the residue smell and attracts flies.

b. No feeding of animals. There are a few groups of people that feed the feral cats in the early morning. The cat population has increased throughout the park, especially on Magic Island. Magic Island really smells awful and feels dirty. Hire someone to trap the feral cats and have them neutered/spayed or turned in to the Human Society for adoption.

c. No smoking. The cigarette butts are thrown on the ground and in the sand.

Thank you.
Bradley Ebisuya

1

Joanne Hiramatsu

From:	Joanne Hiramatsu
Sent:	Wednesday, June 06, 2018 2:30 PM
To:	'EbisuyaB001@hawaiiantel.net'
Subject:	Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Ebisuya,

Thank you for your email dated January 20, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comment on the EISPN regarding the following request:

- Cancel all improvements and focus on repair and maintenance

Additionally, you list the following for repair and maintenance:

- Repair/repave Magic Island bike path and concrete walls/walkways
- Clean bathroom plumbing
- Install locking gates on bathroom, lock from 10 PM to 4 AM
- Replant grass with low-sun requirement variety, and maintain
- Clean/dredge ponds/canals
- Restore beach sand
- Hire full-time security
- Consider enforcing rules: no animals permitted; no feeding animals; no smoking.

The Draft Environmental Impact Statement (DEIS) will explain proposed repair and maintenance of the parks in more detail. Some of that maintenance is already being implemented through increased staffing for maintenance and security. Beach replenishment is part of the Master Plan improvements. It will demand studies and permits in addition to those needed for work on land. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for park improvements; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized.

Your concerns over the park improvements and your proposals will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

1

Joanne Hiramatsu

From:	Brandon Yoza <byoza@hawaii.edu>
Sent:	Thursday, January 11, 2018 4:20 PM
To:	Joanne Hiramatsu
Cc:	'Dean Nakamaru'; 'Tony Ng'; scoleman34@gmail.com
Subject:	RE: Considerations for the EIS at Ala Moana Park
Attachments:	EIS preparation notice.docx
Follow Up Flag:	Flag for follow up
Flag Status:	Flagged

Hi Joanne!

I am not sure if the issue of near shore sand dredging and the impact that it could have on the surf breaks at Ala Moana have been considered. If it hasn't I do feel that it is an important consideration for the EIS.

Please see the attached letter.

Thank you!
Brandon

1

Joanne Hiramatsu
Belt Collins, Hawaii LLC
Director of Planning

Brandon Yoza
Providing individual input for the City and County of Honolulu project; Ala Moana Regional Park and Magic Island Improvements.
Ph. 808 956-6137; email, byoza@hawaii.edu

In specific regard to the EIS preparation notice, a necessary consideration needs inclusion before proceeding with the formal evaluation.

The EIS statement fails to adequately describe how the proposed action under section 4.3, element number 11 - Sand replenishment and long-term beach nourishment, will impact the many surfing spots that are located just outside the Ala Moana beach park reef. Without due consideration, this can have negative impacts on a significant portion of the demographic that recreationally utilize this park.

Coastal engineering projects can have a significant impact on surf breaks (Scarfe *et al.* 2009). Of particular concern for this project are bathymetric changes that could result from dredging, especially for areas near or around the surfing breaks outside of the Ala Moana reef. "Surf is formed as swells move into shallow water near shore: the bottom portion of a swell drags on the sea floor and is slowed when the top portion continues up and forward resulting in a steepening, rising wave." (Oram and Valdverde, 1994). Dredging can change the sea floor profile resulting in potentially unintended results that could damage the surf breaks.

From section 5.6; "Sand replenishment work is proposed for the beach and *will require offshore dredging in the nearby ocean*. Sand replenishment was done recently for two projects at Waikīkī Beach and Kūhiō Beach. *Both projects recovered sand directly offshore or adjacent to the project areas.* A sand source investigation will be done to determine a suitable site to dredge the sand for Ala Moana Beach."

While the act of sand replenishment along the shoreline is likely to have minimal effect on the offshore surf spots*, it is the dredging in areas proximate to the reef or the surfing breaks that have the potential for substantive results upon them.* Similar projects performed at Waikīkī and Kūhiō Beach have different considerations and are not directly comparable to Ala Moana Beach Park.

An objective under the Local Coastal Zone Management program (HRS-205A-2), is the protection of beaches for public use and recreation. While the maintenance of surfing as a recreational activity is potentially covered under this piece of legislation, it would be a travesty to many park users if overlooked. Ala Moana Beach Park and the surf break that are accessible are unique coastal resources and provide an experience there that cannot be found elsewhere on Oahu.

I would like to request that within the EIS, an assessment of improvement activities that might have a lasting impact upon the surf breaks at Ala Moana Beach Park be included.

Thank you.

References

Dean C. 2009. Surfers deal a blow to a beach dredging project. The New York Times. http://www.nytimes.com/2009/03/09/science/earth/09surfers.html

Hawaii Revised Statutes, Chapter 205A coastal zone management https://dlnr.hawaii.gov/occl/files/2013/07/205a.pdf

Oram W., Valverde C. 1994. Legal protection of surf breaks: Putting the brakes on destruction of surf. Stanford Environmental Law Journal. 401-448

Scarfe B.E., Healy T.R., Rennie H.G., Mead S.T. 2009. Sustainable management of surfing breaks: case studies and recommendations. Journal of Coastal Research. 25(3); 684-703

Surfer. 2010. Mundaka Es Muerta, Surfer Magazine. https://www.surfer.com/features/mundaka-gone/

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:31 PM
To: 'byoza@hawaii.edu'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Yoza:

Thank you for your email dated January 11, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comment regarding proximity of the potential dredging sites to the Ala Moana reef for sand replenishment and long-term beach nourishment, and your concern that potential proximity of the dredging site may adversely impact nearby surfing sites.

A beach nourishment study will be conducted with several sand recovery sites being considered. Sand recovery site options will be evaluated for many factors, such as adverse impacts to the surf break, marine life, and other recreational activities associated with the surf break and wave action. Results of those reports will be available for review with the Draft Environmental Impact Statement (DEIS) appendices.

Your concerns will be included in the DEIS and we will notify you when it is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: bdtravbrad@aol.com
Sent: Saturday, January 20, 2018 9:10 PM
To: Joanne Hiramatsu
Subject: Ala Moana Beach Park

Follow Up Flag: Follow up
Flag Status: Flagged

The city should leave the park just the way it is. I currently paddle at least once a week and don't want to see any major change made. The park should be left as the locals want it.....

Brian Furumoto

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:32 PM
To: 'bdtravbrad@aol.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Furumoto,

Thank you for your email dated January 20, 2018 commenting on the EISPN for the Ala Moana Regional Park (AMRP) and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your email, and offer a response to your comment that states "the City should leave the park just the way it is; the park should be left as the locals want it."

The City agrees with the aim of keeping the parks as the "People's Park," but views the option of leaving the parks as they are as unsustainable due to their age and many years of depreciation. The parks receive the most visitors of all the parks in the state and the number of visitors will increase because population growth is inevitable. Proposed improvements are meant to allow park goers to use the vacant areas of the parks and enhance the popular areas so they can sustain more use in the future.

To serve the public, the City is already increasing maintenance of the parks' facilities. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the parks; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Brian Walter <b21walt@yahoo.com>
Sent: Sunday, January 28, 2018 7:17 AM
To: Joanne Hiramatsu
Subject: Ala Moana Park

Good morning Joanne. Last week while surfing at Ala Moana park a friend , Stan Sakai, mentioned the changes taking place and the removal of parking on the makai side of the park. While I agree theirs are certainly changes and upgrades to the park that enhance its appeal. Removing makai side parking is not one I support.

We have a view of beautiful Ala Moana park from our condo building and visit the park upwards of 250 times a year. As a married father of four with our oldest being eight, Parking along the ocean side is very important to us as we need to take multiple trips from the car to the beach with our children and gear. Parking across the street will certain increase the dangers especially with the distracted drivers cruising through the park.

I read the letter Stan Sakai wrote and I equally agree with each of his points. The people who hang out there and walk, bike,skateboard, surf, paddle etc... enjoy the promenade and the beautiful ocean views daily. Why do we want to cater to those driving through just to admire the view for 5 minutes and be gone?

If makai parking Is removed I think it's time to put up flashing lights in the crosswalks making it safer for those crossing and getting the attention of potential distracted drivers.

As big as the park is. It seems like there is so much wasted space. I would personally support a playground or two for the kids to have fun. Multi purpose synthetic turf football fields for children and adult sporting events. A rubberized running track surface, which is a healthier alternative than running on asphalt or cement.

Thank you for your time and I hope you consider the concerns of those who visit the park on a daily basis.

The Walter family

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:33 PM
To: b21walt@yahoo.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Walter:

Thank you for your email dated January 28, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments. You state your agreement with Stan Sakai's comments. Responses to those comments are below.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities, such as the playground, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Bruce Lum <brlum@mac.com>
Sent:	Monday, January 22, 2018 12:27 AM
To:	Joanne Hiramatsu
Subject:	AMRP & MI EISPN comments
Attachments:	EISPN_Bruce Lum comments.pdf
Follow Up Flag:	Follow up
Flag Status:	Flagged

Dear Ms. Hiramatsu,
Attached is a PDF of my comments. Please acknowledge receipt.

Thank you,
Bruce Lum

1

Bruce G.S. Lum
99-546 Iwaiwa Street
Aiea, Hawaii 96701

January 21, 2018

Joanne Hiramatsu
Director of Planning
Belt Collins Hawaii LLC
2153 N. King Street, Suite 200
Honolulu, Hawaii 96819-4554

Re: EISPN for Ala Moana Regional Park and Magic Island Improvements

Dear Ms Hiramatsu,
Please find my comments below regarding the EISPN for the AMRP and MI project. I appreciate this opportunity to weigh-in on this important proposal to improve our beautiful, beloved and heavily used beach park. If you wish to contact me I can be reached at 808-237-9120 or brlum@mac.com. I can be reached at anytime.

The proposed elements provided in the EISPN and commented on by me follows:

Piʻikoi Street entrance expansion and plaza
This is very ambiguous and nebulous due to the lack of EISPN summary or detail. Is a summary or detail available for public reference? Without a summary or detail, I would strongly oppose any action on this element. The project already highlights that AMRP is the heaviest used park on Oahu, so why increase the flow of ambient traffic, in any form, into AMRP and further aggravate Ala Moana Blvd. and park traffic.

What does "plaza" provide, what will it involve and what need will it satisfy?

Atkinson Entrance Exit
Right turn lane going east on Ala Moana Blvd needs to have a longer queue lane to increase free flow against the red signal light to achieve minimal back-up and hold-up.

Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;
Eliminating makai curb side parking without a shake-out/trial period to capture public input and collect "hard data" about actual use is irresponsible. I am totally for a shake-out/trial period prior to AMRP & MI IP action. The project has not provided data to demonstrate that "open ocean views" are deficient. The project hasn't identified why increased "open ocean views" is important and who will it benefit.

Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls;
This is insufficient information and lacks detail as to locations, extent of reconfigurations, total gain in stalls to the total parking spaces, etc. Action on this aspect should not proceed without providing sufficient detail about configurations, placements and benefit justifications. The current curb parking is more traffic efficient. Perpendicular and parallel parking on the mauka side will slow down traffic significantly due to vehicles having to back in or back out of the stalls into the main lane of vehicular flow.

Keyhole parking lot expansion;
I could support this if the total additional spaces gained does not get earmark for new facilities or restaurants. AMRP is a "beach park" and that's its primary function in terms of water/beach-goer activity in its many forms. The keyhole flow pattern is very efficient in its present configuration, because vehicles entering and leaving stalls requires a shorter amount of time in its present configuration.

Elongating Magic Island parking lot;
More explicit detail is needed to provide the public with an accurate idea of the what, why and how this will increase park user value. If no added value, leave it as is. AMRP & MI parking should be park user focused. Parking for tour operations should not be given greater priority or bias.

Improve the pond edges;
Leave the pond edges alone. The pond is unclean and hazardous, so we should not encourage more interaction with the pond than is already going on. The nature and character of the pond actually self-regulates user traffic and it's a good thing. Having inexperienced or unsure users venture too boldly or recklessly would be a bad thing. I'm against any "easy access" improvements around the ponds, because it sends out too welcoming a message that could lead to costly liability suits. I do recommend that signage be placed around the ponds to warn frivolous and inexperienced users of the hazards and dangers.

Improve McCoy Pavilion to include a dining facility;
Absolutely NO! The next thing would be that allowing alcohol will be expected. NO, NO! We don't need another commercial Queens Surf abuse situation. I would support adding a large group kitchen facility for use by public, permitted, large groups to prepare and serve food to accommodate their invited gathering.

The majority of park users prefer to provide their own food when enjoying AMRP, so why does the project believe that a dinning facility would be feasible. The L&L on the Ewa end does very little business. I am at the park nearly every day and often twice a day, so I have witnessed that L&L's minimal business frequently.

Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;
Good idea if doesn't change the current use, look and character of what is presently there. Actually, I question why the project would want to increased disability access would be the right thing to do, but that area has many uneven elevations not cost effective or easy to reconfigure to meet compliance requirements. The restroom in that immediate area would require major ADA upgrading and outlay.

Sand replenishment and long-term beach nourishment;
This makes me very uneasy, because sand management around the State has failed in every instance that humans have tried to hold back or change the ocean's natural propensities. Waikiki is the most nearby example of man's good intentions back firing and failing regularly. Our State presently suffers the gross & bad assumptions, of past decisions to alter the natural ocean hydrology and the continuous migration of sand. At worst our leaders have ignored empirical data that said man is not capable of effectively and efficiently managing ocean hydrology.

Once more, not enough detail was provided for public input to make and informed and reliable recommendation. The extent of how AMRP's shoreline will be modified needs to be clarified to comment on potential impacts. I am very nervous about the irreversible damage that could be done to my shell and aquatic resource gathering areas along these shores. There is a plethora of very valuable and fragile aquatic ecosystems that presently depend on a balanced water temperature, water quality, currents, habitats, etc. Shoreline feature modifications of any kind will negatively disrupt these precious ecosystems.

Modifying the underwater features and character of AMRP's near shore sea bed should be avoided until a definitive understanding of the ecosystems residing there and how to prevent negative disruption to those ecosystems can be achieved... e.g the rocky areas are integral to the life cycles of many organisms the support life cycles of dozens of fish species that inhabit and frequent AMRP's waterways such as fry to adult fish like mullet, aholehole, ballyhoo, halalu, oio, manini, kumu, weke, oama, humuhumuapua'a, kala, nehu, popa'a papio, kahala, moi, moilii, lai, kupipi, uhu, sardines, flying gunards, hinalea lauwili, christmas wrasse, moorish idols, etc., etc., etc. The rocky areas all along AMRP's shoreline provide food, shelter and protection for all these young fishes. Removing or covering of the rocky areas would eliminate nutrients to the seaweed and crustaceans that thrive in and around those rocks and in turn the fishes that feed on them will loose that food source. If "don't use soap" signs at showers are integral to AMRP's protection and conservation of our precious aquatic ecosystems then if should naturally follow that AMRP's conservation protocol should include the food sources that the protected ecosystems depend on too.

Build a Playground;
Sorry, no info provided by the project to help the public know what this addition will include, why it's needed or where it will be located. Info please.

Relocate the Maintenance Yard;
Sorry, no info provided by the project to help the public know why this is propose or where the current yard is or where it will relocate to. info please.

Drainage canal covering;
Why? It's very interesting, teeming with ecosystems that provide positive benefits to other ecosystems around AMRP. It seems that the project views a number of characteristics of AMRP as unsightly and ghastly, but the local culture doesn't see it the same way. We like our park, because it's authentically outdoors and that's what we want from an outdoor park and beach park. To the local culture, the chaos of nature is elegant. Stop trying to redefine what we like.

Create a multi-use facility at the Lawn Bowling area;
Leave that entire area alone. The majority of park users do not desire a world class park at AMRP. It is exactly as we like and want AMRP to be. After decades of refinement most believe that it's perfect but lacking the right amount of love.

Improve the entrance at the Kamakee Street entrance.
Restrict those 20 bicyclist tourist contraptions from using that intersection. They aggravate our already gnarly traffic on Ala Moana Blvd. Tourism is great for Oahu, but common... not every where just to be every where. Restrict those traffic aggravators to Waikiki.

Sincerely,
Bruce G.S. Lum

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:34 PM
To: 'brlum@mac.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Lum:

Thank you for your email dated January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

Piʻikoi Street entrance expansion and plaza, drainage canal covering

The goal is to create a third main entrance for pedestrians that is centrally located and closer to the proposed rail station. This entrance is meant to help with crowd circulation especially during large events and emergencies. Changes to existing structures and walls will be minimal, since this is a pedestrian access, not a vehicular one. A portion of the drainage canal will need to be covered to accomplish this. All such changes will need to be reviewed by the State Historic Preservation Division.

Atkinson entrance/exit

As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional road changes and traffic signal timing. Results are expected to determine the baseline traffic conditions and evaluate the proposed options of the project.

Reconfiguration of parking stalls

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

As for the issues of parking and circulation and as mentioned above– the Draft Environmental Impact Statement (DEIS) will include a parking study and a traffic study, detailed presentations of changes to parking areas, and the expected increase in parking stalls. Please keep in mind that the City does not plan to reconfigure Ala

Moana Park Drive into a one-way road and both vehicular entrances and exits would remain. Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution.

Parking lot expansions

The City is looking at the Keyhole parking area and Magic Island parking lot as possible areas of opportunity to create more parking stalls. The keyhole parking is being reviewed to balance out the number of stall on the ʻEwa side of the park with the Diamond Head side. As for Magic Island parking, it is being reviewed in an elongated configuration to give park users closer access to the picnic spots and the lagoon. This will also help emergency vehicle access in the event of an emergency on Magic Island.

Improvement on the pond edges

Improvements to the pond edges are not meant for people to enter the water. Some people, however, use the ponds for fishing or operating their remote-control boats. Improvements to the ponds could include walkways, overlook decks, and upgraded landscaping. The current conditions around the ponds could be safer and less hazardous with improvements that keep people along the outside. Your suggestion for signage is noted and could be a possible improvement to keep people out of the water.

Improvement of McCoy Pavilion

Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that plan yearly special events. These events include popular festivals such as the Greek Festival and the Scottish Festival.

Redesigning the elevated area for Americans with Disabilities Act (ADA)

Improvements at this location are not meant to change the usage, but to make it more accessible to everyone by complying with the ADA laws.

Sand replenishment and long-term beach nourishment

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will demand additional studies to help determine viable options and permits will be needed for this work.

Building a playground

A site for the playground has been selected behind the Diamond Head concession area, but no immediate plans have been developed.

Relocate Maintenance Yard

The current maintenance yard is located near the Atkinson Street entrance. The City would like to move the maintenance yard to a more central location in the park.

Creating a multi-use facility at the Lawn Bowl area

The Master Plan identifies a multi-use area at or near the lawn bowling area. This concept has not been designed in detail and is viewed as a long-range improvement that may not be implemented immediately. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for added recreational uses; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized.

Improving the Kamakee Street entrance

Proposed improvements for this entrance is mostly related to landscaping and designing it with the art deco theme like the Atkinson entrance.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Channing Ching <channingyh@yahoo.com>
Sent: Saturday, January 27, 2018 11:29 PM
To: Joanne Hiramatsu
Subject: Ala Moana

I'm in agreement with Stan Sakai's comments.

Channing,
AlaMo Surfer

1

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Channing Ching,

Thank you for your email dated January 27, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we are responding to your input. You state your agreement with Stan Sakai's comments. Responses to those comments are below.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities, such as the playground, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Charles Langlas <langlas@hawaii.edu>
Sent: Tuesday, December 26, 2017 8:52 PM
To: Rebecca Choi; Joanne Hiramatsu
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

Aloha Ms Choi and Ms Hiramatsu,
Thank you for the opportunity to comment on the EISPN for Ala Moana & Magic Island Parks. I am happy that you have chosen the Enhance Alternative, rather than the Restore or Evolve Alternatives. That choice aligns with my previous comments. My only disagreement is with the proposal to "elongate" the Magic Island Parking Lot. I feel that any increase in the length of that parking lot will result in unacceptable reduction in the lawn area of Magic Island. I think it would be better to limit the expansion of parking at the parks in order to prevent overcrowding, rather than providing space for cars at the expense of space for people.

Charles Langlas

On Tue, Dec 26, 2017 at 1:24 PM, Rebecca Choi <rchoi@bchdesign.com> wrote:

Environmental Impact Statement Preparation Notice (EISPN)

Ala Moana Regional Park and Magic Island Improvements

Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025

Honolulu, O'ahu, Hawai'i

Aloha Participant,

On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawai'i Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of *The Environmental Notice*. Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:

Mailing Address: Belt Collins Hawaii LLC

2153 North King Street, Suite 200

Honolulu, HI 96819

Attention: Joanne E. Hiramatsu

Email Address: Joanne E. Hiramatsu

jhiramatsu@bchdesign.com

We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu

Director of Planning

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Langlas:

Thank you for your email dated December 26, 2017 commenting on the EISPN for the Ala Moana Regional Park (AMRP) and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following response.

General Support for Enhance Alternative

Your general support for the Enhance Alternative is noted. The goal of the project is developing a sustainable plan for the parks that will do more than maintain, but preserve the resource for many generations. Proposed improvements are meant to allow visitors to use the vacant areas of the parks and enhance the popular areas so they can withstand more use in the future.

Magic Island Parking Lot

The City is looking at several locations as parking opportunities to create additional parking stalls. The goal is to balance the number of stalls by adding more parking on the ʻEwa side of the AMRP and to create access for emergency vehicles. Also the beach on the ʻEwa side of the parking lot will be widened for access to areas closer to the beach. This location by the restrooms and showers is one of the more popular areas for park users. A traffic study and a parking study will be completed for the Draft Environmental Impact Statement (DEIS) and will help assess parking needs and traffic flow through the parks.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the parking; these options will be outlined in more detail in the DEIS. The City will proceed with design after the Environmental Impact Statement (EIS) has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design & Construction

Joanne Hiramatsu

From: Charles Langlas <langlas@hawaii.edu>
Sent: Tuesday, December 26, 2017 8:52 PM
To: Rebecca Choi; Joanne Hiramatsu
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

Aloha Ms Choi and Ms Hiramatsu,
Thank you for the opportunity to comment on the EISPN for Ala Moana & Magic Island Parks. I am happy that you have chosen the Enhance Alternative, rather than the Restore or Evolve Alternatives. That choice aligns with my previous comments. My only disagreement is with the proposal to "elongate" the Magic Island Parking Lot. I feel that any increase in the length of that parking lot will result in unacceptable reduction in the lawn area of Magic Island. I think it would be better to limit the expansion of parking at the parks in order to prevent overcrowding, rather than providing space for cars at the expense of space for people.

Charles Langlas

On Tue, Dec 26, 2017 at 1:24 PM, Rebecca Choi <rchoi@bchdesign.com> wrote:

Environmental Impact Statement Preparation Notice (EISPN)

Ala Moana Regional Park and Magic Island Improvements

Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025

Honolulu, Oʻahu, Hawaiʻi

Aloha Participant,

On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawaiʻi Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of *The Environmental Notice*. Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

1

We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:

Mailing Address: Belt Collins Hawaii LLC

2153 North King Street, Suite 200

Honolulu, HI 96819

Attention: Joanne E. Hiramatsu

Email Address: Joanne E. Hiramatsu

jhiramatsu@bchdesign.com

We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu

Director of Planning

Joanne Hiramatsu

From: Claude Takanishi <cktakanishi@gmail.com>
Sent: Saturday, January 20, 2018 9:52 AM
To: Joanne Hiramatsu
Subject: EISPN for Ala Moana Park and Magic Island Improvements - Comments

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Dear Joanne Hiramatsu,

I agree with the comments made by Stan Sakai and Raymond Madigan which I have copied below. I agree with their comments regarding the widening of the promenade. I am concerned about the possibility of beach erosion affecting the promenade and adversely affecting newly constructed widened promenade.

I strongly agree with Raymond Madigan comment - "Keep it simple." While improvements are good, my perception is that the existing facilities are sufficient. I think current improvement of the maintenance effort is good, and more attention should focus on this area.

Claude K. Takanishi

==

from Raymond Madigan, R.N.

Dear Joanne Hiramatsu,

I agree with the comments made by Stan Sakai which I have copied below. I particularly agree with his comment regarding the widening of the promenade leading to hot feet!

Need more showers!

Keep it simple.

This is the "People's Park", not the the "Tourist's Park".

Forget beer gardens. We don't want any alcohol consumption.

Provide facilities for the families who come to BBQ and get out of their apartments to enjoy the simple natural environment.

Less concrete.

Do we really need restaurants in the park? It's a park not an extension of Waikiki.

Good clean toilets with shady trees.

No unnecessary buildings. Keep it as natural as possible. Plenty of trees, less concrete.

Better off site parking and public transport.

Do not take away green space! It's a precious resource. Don't pave paradise and put up a parking lot!

Raymond Madigan, R.N.

==

from Stan Saiki

FOLLOWING ARE MY COMMENTS THAT I WILL FORWARD TO BELT COLLINS:

1. PROMENADE
a) The grassy areas along the promenade is used by many for setting
up picnics. Is the intention of the new design to eliminate this?
If not, then people will be hauling their picnic and BBQ supplies from their cars parked on the mauka side of Ala Moana Park Drive. This will impede traffic flow and make it more difficult to people to use the park.

b) If you widen the promenade, what will happen to the trees? If you keep the trees than the promenade will essentially be split into two lanes. This will not actually widen the existing promenade.

c) If the trees are to be kept, will widening the promenade injure or shorten the lives of the trees, which are 'historical' features of the park?

d) On hot days, the concrete and asphalt surfaces in the park can easily burn the feet of adults and kids walking bare footed. If you widen the promenade with more concrete, you're adding more of these 'hot' surfaces and there won't be any nearby cooler grass surfaces for people to escape to.

2. PARKING

a) One problem with removing the parking on the makai side of Ala Moana Drive is that many more pedestrians will be crossing the street. This will: (1)impede the flow of traffic and (2)increase the risk of a pedestrian getting hit by a car, more so after dark. The street lighting in the areas where pedestrians are expected to cross the street should be bright enough for drivers to easily see pedestrians.

b) Keep the parking on the makai side of Ala Moana Drive along the raised picnic area. These would provide convenient parking for those picnicking in the raised area and also for those using the Great Lawn. This wouldn't affect the 'open views of the ocean' because the ocean isn't visible from these parking stalls.

c) Keep the parking on the Ewa side of Ala Moana Drive just as
you enter the park. These stalls will provide parking for those using the Ewa end of the park and they do not affect the 'open views of the ocean.'

d) Design the perpendicular and diagonal parking stalls wide enough to
accommodate larger vehicles, which are common at the park, and also to give people enough room to easily unload their vehicles without hitting adjacent ones.

e) Perhaps, create additional parking on the Diamond Head side of McCoy pavilion. These would provide parking for the tennis courts, pavilion, and also for the Great Lawn.

3. BEACH EROSION

a) Efforts should be made to reduce the wave action along the sandy beach shoreline to minimize beach erosion. Otherwise, replenishing the sand might be just ongoing. There used to be large rocks outside of the swim channel. I was told that many of these fell into the channel after one of the hurricanes. Perhaps setting up structures along the reef edge of the channels, like the former rocks, might diminish the wave action at the beach.

b) Efforts should be made to address potential problems that might occur due to sea level rising.

4. INVASIVE PLANTS
The autograph trees in the center of the keyhole parking area are on the list of invasive trees. They and other invasive plants should be identified and removed. There might be some mangrove trees in the Ewa pond that need to evaluated.

http://hawaii-agriculture.com/autograph-trees-are-invading-hawaiis-forests/

http://www.hear.org/misc/pdfs/misc_invasiveplantexamples.pdf

5. PARK TRAFFIC
The park exit at the Atkinson Street side needs to be improved.
The right turn lane from Ala Moana Park Drive onto Ala Moana Blvd is too short. Cars that want to make this turn need to que with cars going straight into Atkinson. To lengthen this right turn lane the historic arch that spans the sidewalk will need to be relocated.

6.BEACH FACILITIES

a) More charcoal fire pits should be provided and these should be visible at dusk and into the early evening when picnickers are cleaning up.

b) A shower/wash station somewhere near the entrance to the Keyhole parking would be a convenient feature. This will give beach-goers a place to rinse off before proceeding to their cars.

c) Especially on windy days, trash from the shoreline is being blown into ocean, sometimes from the trash cans and sometimes from trash strewn in the park and along the beach. This should be addressed.

7. PARK MAINTENANCE COSTS
An assessment of the maintenance costs of any improvements made to the park should be done. Projects that involve significant maintenance costs, especially short-term and ongoing, might not make sense.

8. SIGNAGE

a) Signs describing the rules of the park need to made more obvious. Current signs are too high and too small. The better parks throughout the US have clear signage that helps the public understand the park rules to keep them safe and to protect the park.

b) At the outdoor showers that drain into the sand, clearly visible and readable signs should be posted stating that the use using soaps and shampoos is not allowed.

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Mr. Takanishi,

Thank you for your email dated January 20, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN. You state your agreement with Stan Sakai's and Ray Madigan's comments. Responses to those comments are below.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities, such as the playground, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

RECEIVED

2018 JAN 22 PM 2: 14

BELT COLLINS HAWAII

Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, HI 96819
Attention: Joanne E. Hiramatsu

Rearranging the parking along the Makai side of Ala Moana Park Drive to open views to ocean and Add loading and unloading zones.

I am writing to you to voice my sadness over the
Plan to eliminate the Makai parking at ala moana park.
This change will disrupt 50% of the people who now
Do not have to cross the street to enjoy the beach,
Especially the keiki. Unloading ease of surfboards & SUP ect.
All for a bike lane that bikers already can use the existing street
If they grumble about safty issue, post 5 mile per hr speed sign
Thru out park.
And it Would be less expensive to tax payers if not done.
We are already paying for the rail !
How many bike users versus beach users??
As a park user since the 1950's I strongly oppose this retarded
Change.

Thank you,
Craig Sugihara
Email: cs@tcsurf.com

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:48 PM
To: 'cs@tcsurf.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Sugihara,

Thank you for your email dated January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN, we have reviewed your comments on the EISPN regarding the removal of parking on the makai side of Ala Moana Park Drive.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized, and after the plans are reviewed by the public and agencies. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

1

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Derek Hama <derek.hamasaki@gmail.com>
Sent: Tuesday, January 23, 2018 2:48 PM
To: Joanne Hiramatsu
Subject: Ala Moana Park and Magic Island Improvements

FOLLOWING ARE MY COMMENTS THAT I WILL FORWARD TO BELT COLLINS:

1. PROMENADE
a) The grassy areas along the promenade is used by many for setting up picnics. Is the intention of the new design to eliminate this?
If not, then people will be hauling their picnic and BBQ supplies from their cars parked on the mauka side of Ala Moana Park Drive. This will impede traffic flow and make it more difficult to people to use the park.

b) If you widen the promenade, what will happen to the trees? If you keep the trees than the promenade will essentially be split into two lanes. This will not actually widen the existing promenade.

c) If the trees are to be kept, will widening the promenade injure or shorten the lives of the trees, which are 'historical' features of the park?

d) On hot days, the concrete and asphalt surfaces in the park can easily burn the feet of adults and kids walking bare footed. If you widen the promenade with more concrete, you're adding more of these 'hot' surfaces and there won't be any nearby cooler grass surfaces for people to escape to.

2. PARKING

a) One problem with removing the parking on the makai side of Ala Moana Drive is that many more pedestrians will be crossing the street. This will: (1)impede the flow of traffic and (2)increase the risk of a pedestrian getting hit by a car, more so after dark. The street lighting in the areas where pedestrians are expected to cross the street should be bright enough for drivers to easily see pedestrians.

b) Keep the parking on the makai side of Ala Moana Drive along the raised picnic area. These would provide convenient parking for those picnicking in the raised area and also for those using the Great Lawn. This wouldn't affect the 'open views of the ocean' because the ocean isn't visible from these parking stalls.

c) Keep the parking on the Ewa side of Ala Moana Drive just as you enter the park. These stalls will provide parking for those using the Ewa end of the park and they do not affect the 'open views of the ocean.'

d) Design the perpendicular and diagonal parking stalls wide enough to accommodate larger vehicles, which are common at the park, and also to give people enough room to easily unload their vehicles without hitting adjacent ones.

e) Perhaps, create additional parking on the Diamond Head side of McCoy pavilion. These would provide parking for the tennis courts, pavilion, and also for the Great Lawn.

3. BEACH EROSION

a) Efforts should be made to reduce the wave action along the sandy beach shoreline to minimize beach erosion. Otherwise, replenishing the sand might be just ongoing. There used to be large rocks outside of the swim channel. I was told that many of these fell into the channel after one of the hurricanes. Perhaps setting up structures along the reef edge of the channels, like the former rocks, might diminish the wave action at the beach.

b) Efforts should be made to address potential problems that might occur due to sea level rising.

4. INVASIVE PLANTS
The autograph trees in the center of the keyhole parking area are on the list of invasive trees. They and other invasive plants should be identified and removed. There might be some mangrove trees in the Ewa pond that need to evaluated.

http://hawaii-agriculture.com/autograph-trees-are-invading-hawaiis-forests/

http://www.hear.org/misc/pdfs/misc_invasiveplantexamples.pdf

5. PARK TRAFFIC
The park exit at the Atkinson Street side needs to be improved.
The right turn lane from Ala Moana Park Drive onto Ala Moana Blvd is too short. Cars that want to make this turn need to que with cars going straight into Atkinson. To lengthen this right turn lane the historic arch that spans the sidewalk will need to be relocated.

6.BEACH FACILITIES

a) More charcoal fire pits should be provided and these should be visible at dusk and into the early evening when picnickers are cleaning up.

b) A shower/wash station somewhere near the entrance to the Keyhole parking would be a convenient feature. This will give beach-goers a place to rinse off before proceeding to their cars.

c) Especially on windy days, trash from the shoreline is being blown into ocean, sometimes from the trash cans and sometimes from trash strewn in the park and along the beach. This should be addressed.

7. PARK MAINTENANCE COSTS
An assessment of the maintenance costs of any improvements made to the park should be done. Projects that involve significant maintenance costs, especially short-term and ongoing, might not make sense.

8. SIGNAGE

a) Signs describing the rules of the park need to made more obvious. Current signs are too high and too small. The better parks throughout the US have clear signage that helps the public understand the park rules to keep them safe and to protect the park.

b) At the outdoor showers that drain into the sand, clearly visible and readable signs should be posted stating that the use using soaps and shampoos is not allowed.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:49 PM
To: 'derek.hamasaki@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Hama,

Thank you for your email dated January 23, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will demand additional studies to help determine viable options and permits will be needed for this work.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and

endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Park Traffic

The Atkinson entrance is bordered by the historic Roosevelt Portals the entrance will be studied to see if the ingress and egress at that intersection can be improved.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, so not all projects will be implemented in the near future.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Rebecca Choi

To: Joanne Hiramatsu
Subject: RE: Ala Moana EISPN

From: Diane Fujimura <diyimnida1@gmail.com>
Sent: Thursday, January 18, 2018 12:55 PM
To: Joanne Hiramatsu
Subject: Ala Moana EISPN

Good morning, Ms. Hiramatsu:
Here are my comments, and I also want to ditto the comments already provided by Stan Sakai, and Ray Madigan.
Do not eliminate the parallel parking on the makai side of the drive through the park. To have people have to CROSS the street to gain access to the beach will only create more congestion, and liability.

Exactly how many trees are planned for removal? Where are these trees currently located?

What exactly is planned for the raised area? Leave as is, but make accessible to all patrons.

We don't need a restaurant facility in the park! It's bad enough with L&L with its low quality food. Even high-quality food isn't necessary as a replacement, as people picnic in the park, and bring their own food. Would alcohol be served at the restaurant. That should not happen.

Can we see the parking study? How many parking spaces are gained with perpendicular versus parallel parking?

What's the plans for the 'playground'? We don't need a playground with plastic apparati . . .unsightly and unnecessary. Kids should just runaround, play games, throw balls, etc.....

Keep in mind that this park is a true people's park . . it needs to remain that way, simple, clean, safe, and naturally beautiful.
Mahalo for your time,
Aloha,
Diane Fujimura

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:50 PM
To: 'diyimnida1@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Fujimura,

Thank you for your email dated January 18, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN. You state your agreement with Stan Sakai's and Ray Madigan's comments, and included additional comments of your own. Responses to those comments are below.

Beach Promenade Parking Reconfiguration, Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities, such as the playground, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Richard Fujie <ksph.rmf@gmail.com>
Sent: Tuesday, December 26, 2017 8:30 AM
To: Rebecca Choi; Joanne Hiramatsu
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

This is the most popular beach in Hawaii for residents. More parking is needed...yes we want to control overusage of the park but with the planned improvements and the dispersal of park users to different activities at the park, additional parking will be needed
Specific parking for the McCoy Pavilion. Have specific parking for the use of McCoy Pavilion. Perhaps higher parking fees for short term parking.
This way visitors to functions at the M Pavilion can find parking and will be willing to pay for 1 to 2 hr at a higher rate.

Improve the beach from the Kewalo end of the beach toward the Diamond head side. The beach is rocky and painful to swim and currently unusable to most beach goers. . remove the loose coral and rocks and add sand Tthis will decrease the load on the East end of the park.
Dr Richard Fujie

On Tue, Dec 26, 2017 at 8:19 AM, Rebecca Choi <rchoi@bchdesign.com> wrote:

Environmental Impact Statement Preparation Notice (EISPN)

Ala Moana Regional Park and Magic Island Improvements

Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025

Honolulu, Oʻahu, Hawaiʻi

Aloha Participant,

On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawaiʻi Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of *The Environmental Notice.* Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:

Mailing Address: Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, HI 96819

Attention: Joanne E. Hiramatsu

Email Address: Joanne E. Hiramatsu
jhiramatsu@bchdesign.com

We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu

Director of Planning

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:51 PM
To: ksph.rmf@gmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Dr. Fujie,

Thank you for your email dated December 26, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN and provide the following responses.

Parking

Current plans call for a modest increase in the number of parking stalls, and for more parking near the pavilion. The Draft Environmental Impact Statement (DEIS) will provide more detailed plans along with a traffic and parking study. Your suggestion that parking fees be increased for short-term parking will be considered.

Beach Improvements

The City concurs with the need for beach improvements and have taken action with the sand pushing and removing coral projects. Beach maintenance will continue until a long-term solution for sand replenishment is determined. As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will demand additional studies and permits will be needed for this work.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Gail <percybelle@sbcglobal.net>
Sent: Friday, December 29, 2017 8:55 AM
To: Joanne Hiramatsu
Subject: Ala Moana Park

Aloha kakou,

As a Native Hawaiian and runner/swimmer/surfer who frequently goes to Ala Moana, it is with great hope that the city and state agencies will work to keep this park open to local residents. We need open spaces to move and gather to enjoy access to the ocean. Keeping healthy activities like running, swimming, surfing, paddle boarding, and playing sports is vital to our la hui. If you build more parking spaces please go up. Do not take more land and pave over it. Has there been any thought to work with Ala Moana Center to use their parking for beach users?

Improving the comfort stations should be a huge priority. Keeping the facilities clean and damage free is such a challenge. I have such mixed and conflicted feeling about our homeless population, but it is frustrating that I work so hard and pay taxes on everything to see them desecrate the land and live in areas that I can't afford to live. They should not be able to stay in the parks and take away our ability to use these areas.

I hope all sidewalks will be expanded to accommodate the volume of people who are walking, running, cycling and skate boarding. If the city and state want people out of their vehicles, they need to widen all sidewalks and change the lights to an "all walk" (all cars stop) for pedestrians to cross. Cars will be able to turn freely and not have to wait for pedestrians thus minimizing aggravation and congestion when they have the green light.

Please bring back common sense and practical solutions to challenges we face.

Mahalo,
Gail Murakami
Sent from my iPad

1

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:52 PM
To: 'percybelle@sbcglobal.net'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Murakami,

Thank you for your email dated December 29, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

<u>Land for Parking</u>

Perpendicular parking along Ala Moana Park Drive is proposed and is a standard accepted design for our city parks; it maximizes the use of park space which will yield more stalls.

<u>Comfort Station Improvements, Homeless, Security</u>

The City concurs with the need for improved maintenance, and has increased staffing for better maintenance and cleaner comfort stations. These facilities are currently undergoing major renovations. The City's commitment to improve park security started with hiring more park staff dedicated to these issues. Other security measures were implemented such as installing cameras at all comfort stations and the comfort stations are closed after hours. Furthermore, police patrol units are stationed at the parks overnight. Park staff also supervise security of the parks during the day.

<u>Widen Sidewalks/Pathways</u>

Changes to parking and traffic along Ala Moana Park Drive will be designed to make beach access safe for all, including drivers, bicycle riders, and pedestrians. The City concurs that a wider sidewalk (promenade) would accomplish this, by allowing accessibility for all types of recreation. The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. Your suggestion concerning "all walk" traffic lights will be assessed from that perspective. Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. A traffic study will be conducted to help determine needs for additional traffic calming facilities. Results are expected to determine the baseline traffic conditions and evaluate the proposed options of the project.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized. Your concerns will be included

1

in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Guy KUDO <rubbazori@yahoo.com>
Sent: Thursday, January 18, 2018 2:13 PM
To: Joanne Hiramatsu
Subject: Ala Moana park

Follow Up Flag: Flag for follow up
Flag Status: Flagged

To J. Hiramatsu, I am writing this email to you to express my opinion on the proposed changes for park. I think more bathrooms and more trees are a great idea. I think getting rid of all the commercial endeavors (yoga classes, SUP instruction and rental, exercise classes, Japanese wedding photographers, etc.) would also be a good idea. I also would like to see more matinence and upkeep done.

Other than that, I would like the park to remain as is. It is a beautiful and special place in Honolulu. It has been for the people of Hawaii for as long as I can remember. Sometimes less is more. Aloha, Guy Kudo

Get Yahoo Mail for Mobile

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 2:53 PM
To: rubbazori@yahoo.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Kudo:

Thank you for your email dated January 18, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following response.

Maintenance, Trees, and Comfort Stations

The City and many who have shared their views agree with you on the need for continuing maintenance. The City has already expanded the staff dedicated to upkeep of the park. Work on improvements to the comfort stations has begun and will continue. The City will implement more landscaping improvements within most of the long-term proposed projects. As for the immediate projects, which are listed as the Mayor's 9-Point Community Action Plan, the City planted more trees, and upgraded the irrigation system to be more water efficient and to provide more coverage.

Commercial Use

Your comment that no commercial endeavors be permitted touches on a complex issue. The City permits food sales by a local vendor at two locations. Other "commercial endeavors" include surf schools, wedding photography, and perhaps some exercise and yoga classes. At Kapiʻolani Park, where the initial deed of gift to the City limits commercial activity, the definition of "commercial activities" has been contested for decades. To limit such endeavors at Ala Moana Regional Park will demand both new regulations and enforcement personnel. Revised Ordinances of Honolulu Chapter 10, Article 3 covers the few commercial activities in parks for which the City has established fee schedules.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the Environmental Impact Statement (EIS) has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Design and Construction

Joanne Hiramatsu

From: Helene Philips <hawaiisurferhp@yahoo.com>
Sent: Tuesday, December 26, 2017 2:42 PM
To: Joanne Hiramatsu
Subject: Ala Moana Regional Park

Thank you for sending me the Environmental Impact Statement .
I was at the last planning meeting and was in touch with Chris Dacas regularly. I am aware what things in the project proposals created the most opposition. Was hoping there is some comparison information to see what plans were adapted or rejected after public input was received.
My name is Helene Phillips. I was an Ocean Safety Lifeguard at Ala Moana for 33 years. (retired 6-14) The subject of renovations of the park come up daily.
Any information you can share with me would be greatly appreciated.
Sincerely, Helene Phillips

Joanne Hiramatsu

From: Helene Philips <hawaiisurferhp@yahoo.com>
Sent: Monday, January 22, 2018 4:31 PM
To: Joanne Hiramatsu
Subject: Ala Moana Park

I am writing to comment on the proposed plans for Ala Moana Beach Park.
My main objection is the removal of the Makai parking in the middle of the park.
I'm wondering who it is that needs an ocean view as the beach patrons who come to the park only have to go to the sand or the adjacent walkway to have an unobstructed view of the ocean.
Thank you, Helene Phillips

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:17 PM
To: 'hawaiisurferhp@yahoo.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Philips,

Thank you for your emails dated December 26, 2017 and January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN and provide the following responses.

In your December 26, 2017 email, you requested information regarding what plans were adapted or rejected after public input was received. Please note that the description of facilities in the EISPN is preliminary. The Draft Environmental Impact Statement (DEIS) will have more description of the alternatives considered for the project. The City will proceed with design after the EIS has been finalized and after plans are reviewed by the public and agencies.

In your January 22, 2018 email, you express concern over removing parking on the makai side of Ala Moana Park Drive. The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

1

Joanne Hiramatsu

From: ivan kaisan <seamountain.m115@gmail.com>
Sent: Tuesday, December 26, 2017 2:04 PM
To: Joanne Hiramatsu
Subject: eispn for ala moana regional park

please register my opposition to the proposed action recommended in the enhance project alternative to add a dining activity to mccoy pavilion. i participated in the earlier online public comment outreach by the city for this park. i saw no public interest in adding commercial activity to the park let alone a dining attraction to mccoy. i recommended and here reiterate that the park needs a higher level of maintenance to support the huge increase in nearby residential population. it does not need an additional attraction, commercial or otherwise.

Ivan Kaisan
1525 Pensacola St Apt 302
Honolulu HI 96822

1

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:18 PM
To: seamountain.m115@gmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Kaisan:

Thank you for your email dated December 28, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following response.

McCoy Pavilion Renovations

You believe it is not in the public's interest to add commercial activities/attractions in park, such as dining at McCoy Pavilion. Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that plan yearly special events. These events include popular festivals such as the Greek Festival and Scottish Festival.

Park Maintenance

You have noted that the parks require a higher level of maintenance to support nearby residential growth. The City concurs that the level of maintenance will need to be increased and has prioritized this by hiring more park staff to improve the overall condition. Increased maintenance will need to be coupled with a sustainable plan for the parks due to their age, and is the goal of this project. Proposed improvements are meant to allow visitors to use the vacant areas of the parks and enhance the popular areas so they can withstand more use in the future.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the Environmental Impact Statement (EIS) has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Design and Construction

1

Joanne Hiramatsu

From: james h kaneshiro <jhk41@hotmail.com>
Sent: Thursday, December 28, 2017 9:10 PM
To: Joanne Hiramatsu
Subject: beach sand replenishment

i strongly believe the replenishment should be done by recovering the sand that was washed into the channel between the beach area and the reef. also to lesson the sand runoff when the waves are high or strong, more large rocks should be placed on the reef to break up the waves that causes most of the sand runoff.

thank you very much for allowing my opinion.

james kaneshiro, a long time park user

1

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:18 PM
To: jhk41@hotmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Kaneshiro:

Thank you for your email dated December 28, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your suggestions regarding sand replenishment and beach erosion.

A beach nourishment study will be conducted with several sand recovery sites being considered. Sand recovery site options will be evaluated for many factors, such as adverse impacts to the surf break, marine life, and other recreational activities. Results of those reports will be available for review with the Draft Environmental Impact Statement (DEIS) appendices.

Your suggestions will be included in the DEIS and we will notify you when it is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Design and Construction

1

Joanne Hiramatsu

From: Jan Asuncion <jannerjt@hawaii.rr.com>
Sent: Tuesday, January 09, 2018 11:45 AM
To: Joanne Hiramatsu
Subject: Environmental Impact Statement Preparation Notice (EISPN) Ala Moana Regional Park and Magic Island Improvements

Aloha Ms. Hiramatsu,

Thank you for including me on your email list and allowing feedback from frequent local visitors to Ala Moana Beach Park.

My main concern is the widening of the promenade that may lessen the amount of parking stalls on the Makai side of the road way. I walk/ and run on that promenade and feel it is sufficient.

Thank you for your time,

Jan Asuncion
(808)220-1216

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:21 PM
To: 'jannerjt@hawaii.rr.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Jan Asuncion,

Thank you for your email dated January 9, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we are responding to your comments regarding the promenade widening and reduction of makai side parking stalls.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, we are now evaluating and considering the feasibility of other options for this area. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for parking; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Jay F Henderson
jayhenderson43@gmail.com
Jan 18, 2018 at 20:45 UTC

There are plants growing out of the top of the art deco "gate" to the park at the Diamond Head entrance. They need to be removed before their roots destroy the top of the gate. I'm talking about the only gate, or entryway, that is under a tree. The tree provides shelter for the invasive, destructive plant.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:22 PM
To: jayhenderson43@gmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Henderson:

Thank you for your comments posted January 18, 2018 on the EISPN for the Ala Moana Regional Park (AMRP) and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your concern with damage from plants on top of the Roosevelt Gate at Atkinson Drive.

Please note that the AMRP Master plan proposes restoration of the Roosevelt Gate. Your concern will be included in the Draft Environmental Impact Statement (DEIS). We will contact you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Jeannie Jeffery
jeanniejeffrey@aol.com
Jan 18, 2018 at 03:34 UTC

I personally believe, before Oahu spends another dime on improving any park or public area, we hard working taxpayers should be provided protection on our investment. First of all, PRIORITIZE. Sewage problems, water mains, safe sidewalks and lighting, another entrance/exit for traffic flow and especially, paving! As for beautification? Skip it, save us taxpayers the money. If cameras aren't installed, and park services continue to ignore providing proper maintenance, no security, allowing homeless derilects to trash the area, hoodrats spraypainting sides of buildings etc. well then, forget it. We're so tired of the money wasted on these precious public areas, only to watch them deteriorate at the hands of the lacksadaisy government agencies responsible for their care, and the homeless heathens that don't care.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:23 PM
To: 'jeanniejeffrey@aol.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Jeffrey:

Thank you for your comments posted January 18, 2018 on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following response.

You are seeking prioritization of funding for all City projects. Based on land use laws, open spaces reserved for public use needs to be made available and maintained. The goal of the project is developing a sustainable plan for the parks that will do more than maintain, but preserve the resource for many generations. More money would be spent on maintenance of the parks without a sustainable plan. The City views the option of leaving the parks as they are as unsustainable due to their age and many years of depreciation. The parks receive the most visitors of all the parks in the state and the number of visitors will increase because population growth is inevitable. Proposed improvements are meant to allow park goers to use the vacant areas of the parks and enhance the popular areas so they can withstand more use in the future. Other public agencies have allocated funding to infrastructure needs as you indicated.

You mentioned that improvements may be at risk without security measures. Please note that the project also includes increased security and security personnel for the park. Security cameras were installed at all comfort stations and the comfort stations are closed after hours. Furthermore, police patrol units are stationed at the parks overnight. Additional park staff were hired to help with overall maintenance and security of the parks during the day.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the Environmental Impact Statement (EIS) has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Design and Construction

Joanne Hiramatsu

From: John S. Nishimot <jsn1820@gmail.com>
Sent: Wednesday, January 03, 2018 11:51 PM
To: Joanne Hiramatsu
Subject: AMRP AND MAGIC ISLAND IMPROVEMENTS

You have asked for comments regarding proposed changes and improvements to the AMRP and Magic Island which are intended to be the subject of the EIS which is presently being prepared.

The following are my comments regarding the Proposed Actions listed under section 4.3 of the Project Summary of the EISPN:

As it has been acknowledged that the community's and Park user's preferences are to keep the character of the park the same and to retain its "local character", I believe that some of the proposed actions should not be undertaken altogether or should involve much more limited modifications and/or additions:

1. Piikoi entrance expansion and plaza.

It is unclear what is being proposed to renovate this areas as an entrance and what is being contemplated as a "plaza". However, if it is contemplated that additional changes should not change the local character of the park, minimal addition of concrete walkways and other artificial structures should be the order of the day. That area of the park has never been and continues **not** to be a primary point of entry for park users and to direct substantial resources to "improve" the Piikoi St. area as an entrance would be a waste of money.

2. Widening the promenade on the makai side of the drive.

If the proposed widening contemplates the elimination of all makai road side parking in order to enlarge the present walkway, I oppose such a change. Adding more concrete on the makai side is contrary to the intent of keeping the park's character the same. More concrete and less beach frontage is not maintaining one of the primary park usages. The width of the present sidewalk areas on the makai side of the roadway are sufficient for foot traffick and if anything, modifications can be made to the existing width by removing the present grassy sidewalk area which has very little grass growing anyway and filling in with materials to expand the usable space as a walkway while at the same time preserving the trees that are planted.

It would further be counterproductive to require all parking to only be located on the Mauka side of the drive, especially if the intent is to make traffic only one way. One way traffic would create increased unwanted traffic tie ups and back ups at the exiting side of the drive even on days when the usage of the park is not heavy. We see this already happening when one side of the park is not accessible. One way traffic direction for the park would be a major mistake.

Parking should continue to be available on both sides of the roadway, with continuing two way traffic and improvement of the existing walkway on the makai side but without any widening.

3. Improvement of sandy beach areas

There should be more efforts made in the area of sand replenishment, especially in the middle sections of the park where sand erosion has been heaviest. There is a need for additional efforts toward the removal of rock and coral fragments that presently makes use of the sandy shoreline and shallow swimming areas difficult, if not impossible. Sand replenishment and the removal of rock and coral should be a greater priority than adding more concrete to widen the makai side promenade.

There are certain sections of the swimming channel located directly off the ewa concession structure where there has been a build up of sand within the channel, thereby narrowing the usable space for swimmers and paddle boarders. The built up easand should be removed and placed along those portions of the beach shoreline that require widening.

4. Keyhole Parking Expansion and parking at Magic Island

It is not clear what is specifically contemplated but if the intent is to increase parking capacity for park users, the keyhole area may be suitable for adding additional parking stalls, especially in the large middle grassy area which , based on my observations, is not a frequented picnic area by park users.

If elongating the Magic Island parking lot means taking more of the open grassy areas makai of the existing parking areas to increase parking, it should be done in a manner that will not compromise existing trees and does not extend too far into the present open space. But one thought to keep in mind is that improving and widening the middle sections of the park beach shoreline by rock removal and sand replenishment will direct more usage of the beach space to the middle areas of the park.

5. Lawn Bowling Area

Is the lawn bowling area open for use by the general public? Over the 60+ years that I have been a park user, it was always my impression that the use off the lawn bowling area was restricted and limited to a select few who participated in lawn bowling. Was this a condition for creating the park space many years ago? This space should be used for more general park activities by the general public.

The above are my initial comments regarding the proposed actions for improving the AMRP. I would like to be made aware of more specifics regarding the contemplated changes that are being considered. But again, the basic intent should be to keep the character of the park the same it has been for the last 50 to 60 years and to maintain the local character of the park open for use by the general public.

Sent from my iPad

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:25 PM
To: jsn1820@gmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Nishimot,

Thank you for your email dated January 3, 2018 commenting on the EISPN for the Ala Moana Regional Park (AMRP) and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

Piʻikoi entrance expansion and plaza

The proposed plan for the Piʻikoi entrance expansion is a widened entrance for pedestrians only. Main entrances are currently located at the Diamond Head and ʻEwa ends of the AMRP while the secondary entrances are along Ala Moana Boulevard and by way of narrow bridges over the drainage canal. The goal is to create a third main entrance for pedestrians that is centrally located and closer to the proposed rail station. This entrance is meant to help with crowd circulation especially during large events and emergencies. Additional studies and permits will need to be obtained before this can be done.

Widening the promenade on the makai side of the drive

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Improvements of sandy beach areas

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will demand additional studies to help determine viable options and permits will be needed for this work.

Keyhole parking expansion and parking at Magic Island

The City is reviewing the keyhole parking area and Magic Island's parking lot as some of the areas of opportunity to create additional parking stalls. The goal is to balance the number of stalls by adding more parking on the ʻEwa side of the AMRP. A traffic study and a parking study will be completed for the Draft Environmental Impact Statement (DEIS) and will help assess parking needs and traffic flow through the parks.

Lawn bowling area

The lawn bowling facility is currently open to the public, but has specific hours of operation. The facility was installed when the AMRP was developed in the 1930s. The proposed multi-use facility at or near the lawn bowling area is suggested to increase the variety of sports and recreational games. No detailed plans for this facility have been developed, since this is not proposed as an immediate improvement.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Kimo
jloo@dcca.hawaii.gov
Jan 22, 2018 at 18:48 UTC

Large trees such as the monkeypond, are fine as long as they are not near any street, buildings, or items such as canals, that will require money to repair in the future. Plant some trees/plants that are not so as invasive. Roots.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:27 PM
To: jloo@dcca.hawaii.gov
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Kimo:

Thank you for your comments posted January 22, 2018 on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your recommendations and provide the following responses.

Your recommendations to plant monkeypod trees in areas not near any streets, buildings, and canals; and to plant some trees/plants that have less invasive roots are noted. Several biological studies will be completed for the Draft Environmental Impact Statement (DEIS) that will assess the current environment of the parks' land and surrounding waters. The City will implement landscaping improvements within most of the long-term proposed projects which could be native and practical. As for the immediate projects, which are listed as the Mayor's 9-Point Community Action Plan, the City planted more trees, and upgraded the irrigation system to be more water efficient and to provide more coverage.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the Environmental Impact Statement (EIS) has been finalized. Your recommendations will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: KVIBE . <kvibe@kkv.net>
Sent: Wednesday, December 27, 2017 10:27 AM
To: Joanne Hiramatsu
Subject: Park renovation

Sounds great i would love to see new life be brought into the park as i use it for surfing in the summer time

HOW TO DONATE YOUR BIKE:

*If you have donations or would like to inquire about a bicycle please stop by the shop during hours. We also barter! Contact us to find out what's on our shop wish list!

Follow Us!

1

2

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:28 PM
To: 'kvibe@kkv.net'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear KVIBE:

Thank you for your email dated December 27, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your email.

In your email you state your general support for the project. Your views will be included in the Draft Environmental Impact Statement (DEIS), and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Lance Higa <lwhiga@gmail.com>
Sent: Wednesday, January 10, 2018 4:18 PM
To: Joanne Hiramatsu
Cc: Janyce Higa; Cal; Gary Senaga; Floyd Higa
Subject: Ala Moana Park Improvements

Hi Joanne,

Boy, I give you a lot of credit for hearing out every one's concerns cause everyone I talk to at the beach is very opinionated and passionate about the planned park improvements.
I just want to give you some insight from a Ala Moana surfer for the last 48 years. Although Ala Moana is a long beach, 80% of the surf breaks are located between the tennis courts to Kewalo Basin, thus this stretch of beach and parking stalls are the most heavily used in all of Ala Moana Park, especially during the summer when the south shore swells come to life. The tennis players and tournaments also bring high demands to parking, let alone the festivals that occur at McCoy Pavilion.
My idea for this problem is to create two parking areas:

1. Where the current lifeguard office is located to the area where the large banyan trees are (makai of the lawn bowl), this area is heavily shaded and has always been a undesirable picnic area because grass cannot grow there.
2. The upper circular grass area between the lawn bowling facility and the mauka tennis courts has always been a lightly used and would be better served as a parking lot, especially for the tennis players.

The idea of taking away the parallel parking along the beach and making the roadway one way would be a huge mistake, the whole ambiance of Ala Moana Beach would be lost forever and the traffic created by the one way direction would be a nightmare, the exiting cars in the evenings during the summer is already bad at both exits, having just one exit would create a huge backup and a safety concern for emergency vehicles.
I would like to see a on-site park keeper that would live on the property and manage his own staff, someone who would know all the issues and maintenance problems so any improvements can be maintained and not fall into disrepair like all the other city and state parks.
I suggest having food truck areas instead of the concession stands that have to be maintained, this could give the beach goers eating options and two less buildings to maintain.

A thought to keep in mind... the most important components to any beach park is a nice sandy beach, well kept grass, clean restrooms and parking, everything else is just icing.

Thanks for hearing me

Aloha,
Lance Higa

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:29 PM
To: 'lwhiga@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Higa,

Thank you for your email dated January 10, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

Parking Suggestions and Traffic

The City is reviewing the keyhole parking area and Magic Island parking lot as possible areas of opportunity to create more parking stalls. The keyhole parking is being reviewed to balance out the number of stall on the ʻEwa side of the park with the Diamond Head side. As for Magic Island parking, it is being reviewed in an elongated configuration to give park users closer access to the picnic spots and the lagoon. This will also help emergency vehicle access in the event of an emergency on Magic Island.

As for the issues of parking and circulation – the Draft Environmental Impact Statement (DEIS) will include a parking study and a traffic study, detailed presentations of changes to parking areas, and the expected increase in parking stalls. Please keep in mind that the City does not plan to reconfigure Ala Moana Park Drive into a one-way road and both vehicular entrances and exits would remain. Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution.

Removing Makai Parking

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City needs to address storm water quality in accordance with City's Rules Relating to Water Quality that was effective August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules.

Maintenance Staff

The City has increased staffing at the parks to improve maintenance. Hiring additional park staff was an immediate action from the Mayor's 9-Point Community Action Plan.

Consider Food Trucks Over Concession Stands

Your suggestion to bring in food trucks is noted and considered. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized.

Your comments will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

From: Larry Erwin <larrmo3@gmail.com>
Sent: Tuesday, December 26, 2017 1:56 PM
To: Joanne Hiramatsu
Subject: Honolulu Lawn bowls clubs

Hello
Please explain in more detail ,what exactly is ment by " a multi use facility" at the lawnbowls area??
As you may or may not know, the Honolulu lawn bowls facility is an historic site ,with it's roots of formation during the second world war , begun by Australian airmen/ troops stationed in Hawaii.
It is not only used by many locals ,but importantly it is used by many tourists who visit Oahu regularly from all over the world.
I would be very upset to see the lawn bowls club diminished in any way.
Larry Erwin

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:33 PM
To: larrmo3@gmail.com
Subject: Ala Moana Regional Park

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Erwin,

Thank you for your email dated December 26, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we note your question and concern regarding the lawn bowling facility and provide the following response.

The proposed multi-use facility is suggested to increase the variety of sports and recreational games. No detailed plans for this facility have been developed, since this is not proposed as an immediate improvement. Please note that the description of facilities, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS).

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Leighton & Maude Fujinaka <fujinaka50@gmail.com>
Sent:	Monday, January 01, 2018 6:07 PM
To:	Joanne Hiramatsu
Subject:	pickleball court at Ala Moana Park

As a beginner player of pickle ball, I find the sport very enjoyable for all senior citizens who are looking for an activity to exercise during our golden years. At 70 years of age, pickle ball is a sport that anyone can enjoy and master. It is a fun game to participate and keeps one active. A combination of tennis, ping pong and a mild form of racket ball, it would benefit all people of all ages 6 to 90. If you have not played the game, Monday evening from 6pm to 8pm is available for beginners at the Kailua District Part. Just show up. A paddle will be supplied and the net and court lines will be in place.

If there were pickle ball courts set up with a permanent net and permanent court lines painted (like in Mililani Rec #3) people will be more avid and likely to play the game at Ala Moana Regional Park and Magic Island.

Sincerely,

Leighton and Maude Fujinaka
68 South Kainalu Drive
Kailua, HI 96734
ph#262-0431 (home)
ph#723-8838(work after 1pm)

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. and Mrs. Fujinaka:

Thank you for your email dated January 1, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments. You express interest in installing pickleball courts at the parks.

The Master Plan identifies a multi-use area at or near the lawn bowling area. This concept has not been designed in detail and is viewed as a long-range improvement that may not be implemented immediately. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for added recreational uses; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the Environmental Impact Statement (EIS) has been finalized.

Your comment will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Linda Howe
lindamhowe@gmail.com
Jan 18, 2018 at 15:24 UTC

Please clearly describe/disclose the number and types of mature trees that are being removed and replaced with (?) other types of landscaping? It's particularly obvious to me, especially in the 'promenade' images along the wall/beach side that many trees are being removed -- certainly on the makai side, hard to tell on the mauka side.
I do like the larger broader opening at Piikoi. What will become of the iconic art deco elements which appear to disappear? Will there be 'bath house' improvements? Will there be facilities for city departments/staff serving the public at the park? Will there be more food and beverage opportunities?
Thank you.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:36 PM
To: lindamhowe@gmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Howe:

Thank you for your comments posted January 18, 2018 on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your questions and provide the following responses.

Mature Trees

Several biological studies will be completed for the Draft Environmental Impact Statement (DEIS) that will assess the current environment of the parks' land and surrounding waters. A tree inventory report was also completed for the project. These studies will help with the landscaping plans by adding more trees and removing the unhealthy ones. The City will implement landscaping improvements within most of the long-term proposed projects. As for the immediate projects, which are listed as the Mayor's 9-Point Community Action Plan, the City planted more trees, and upgraded the irrigation system to be more water efficient and to provide more coverage. Details of all studies will be included in the DEIS appendices for public review.

Piʻikoi Street

Your agreement with widening the pedestrian entrance near Piʻikoi Street is noted. The goal is to create a third main entrance for pedestrians that is centrally located and closer to the proposed rail station. This entrance is meant to help with crowd circulation especially during large events and emergencies. Changes to existing structures and walls will be minimal, since this is a pedestrian access, not a vehicular one. All such changes will need to be reviewed by the State Historic Preservation Division (SHPD).

Art Deco Features

The historic art deco features like the Bridle Bridge, Roosevelt Entrance etc.,will remain. There are proposed plans to feature the art deco design at the Kamakee Street entrance as well.

Bathhouse Improvements

The City concurs with the need for improved maintenance, and has increased staffing for better maintenance and cleaner comfort stations. These facilities are currently undergoing major renovations.

Facilities for City Departments / Staff

The City's Ocean Safety headquarters and water safety personnel have space in a facility shared with the Honolulu Police Department. They will remain on site and possible plans could include expansion and relocation of their facility to a more strategic location at the park.

1

Food / Beverage Opportunities

Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that plan yearly special events. These events include popular festivals such as the Greek Festival and Scottish Festival.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the Environmental Impact Statement (EIS)has been finalized. Your recommendations will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Lori McCarney <lori@bikesharehawaii.org>
Sent: Thursday, January 11, 2018 4:15 PM
To: Joanne Hiramatsu
Cc: Rebecca Choi; Leong, Carrie S.; Young, Rosalind J.; Nekota, Michele K
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

Aloha Joanne,

When Biki launched on June 28, it was placed throughout the Park, at locations coordinated with the City and through an ROE. We moved some locations temporarily to accommodate projects underway, and 3 Biki Stops continue to be on Park property. My objective is that Biki Stop locations be considered in the planning so they are of most benefit to Park users and in concert with other elements of Park design—not as an afterthought.

Biki was not in the master plan as they came to being after the plan was created. Biki is not a commercial operation. We are a non-profit working on behalf and in concert with the City to provide bikesharing services to our community.

As mentioned, I am preparing comments in response to your request for comments, but I did want to see if this was the appropriate way to get the subject discussed. I very much appreciate your guidance.

Thank you,

Lori L McCarney
CEO
Bikeshare Hawaii

Lori@bikesharehawaii.org | 808-347-0833 | 914 Ala Moana Blvd, Honolulu, HI 96814
www.GoBiki.org | @gobikihi | Facebook | Instagram | Twitter

On Jan 10, 2018, at 1:25 PM, Joanne Hiramatsu <jhiramatsu@bchdesign.com> wrote:

Lori:

The City is the proposing agency for the Ala Moana Regional Park, so I think this can be one way to discuss Biki Bikes. However, is there any coordination between the City and Biki Bikes on the placement of these bikes? Is there an approval process for these locations? Biki Bikes are currently not in the Master Plan. What we heard from the public is that they don't want the park to be commercialized.

Joanne

Joanne E. Hiramatsu | Senior Associate | Director of Planning
Belt Collins Hawaii LLC
2153 North King Street, Suite 200 | Honolulu, HI 96819-4554 USA
T: 808.521.5361 | Direct: 808.846-3309 | F: 808.538.7819 | www.beltcollins.com

From: Lori McCarney [mailto:lori@bikesharehawaii.org]
Sent: Wednesday, January 10, 2018 12:42 PM
To: Rebecca Choi <rchoi@bchdesign.com>; Joanne Hiramatsu <jhiramatsu@bchdesign.com>
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

Aloha Rebecca and Joanne,

I am preparing comments recommending Biki Stops in Ala Moana Regional Park as they were placed originally. Is this the appropriate vehicle to share this recommendation?

Appreciate your thoughts!

<~WRD000.jpg>

Lori L McCarney
CEO
Bikeshare Hawaii

Lori@bikesharehawaii.org | 808-347-0833 | 914 Ala Moana Blvd, Honolulu, HI 96814
www.GoBiki.org | @gobikihi | Facebook | Instagram | Twitter

On Dec 26, 2017, at 8:19 AM, Rebecca Choi <rchoi@bchdesign.com> wrote:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Aloha Participant,

On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawaiʻi Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of *The Environmental Notice*. Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:

Mailing Address: Belt Collins Hawaii LLC
2153 North King Street, Suite 200

Honolulu, HI 96819

Attention: Joanne E. Hiramatsu

Email Address: Joanne E. Hiramatsu
jhiramatsu@bchdesign.com

We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

Joanne Hiramatsu

From: Lori McCarney <lori@bikesharehawaii.org>
Sent: Friday, January 19, 2018 4:38 PM
To: Joanne Hiramatsu
Cc: Rebecca Choi; Nekota, Michele K; Leong, Carrie S.; Young, Rosalind J.; John Nakauye; Nouchi, Jon; Justine Espiritu
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period
Attachments: Ala Moana_Biki Stops.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Aloha Joanne,

Please accept these comments to the EISPN for Ala Moana Regional Park and Magic Island Improvements.

Recommendation:

Distribute Biki Stops throughout Ala Moana Regional Park and Magic Island for the benefit of Park users for exercise, transportation to and from the Park, and to attract new Park users. The original seven locations that were approved before work began on the Park were optimal to achieve these objectives. Our recommendation is to restore the original number of locations to seven in the Park and Magic Island as part of Park improvements with placement at or near their original locations.

Situation:

Early in the planning process for improvements to the Park, Bikeshare Hawaii attended input meetings to discuss how best to incorporate bikeshare for the benefit of Park users. At that time, bikeshare was not well understood and the actual timing and scale of the bikeshare system was not defined. We are not aware of mention of bikeshare in any planning documents despite our input.

Bikeshare Hawaii launched the bikesharing service, branded Biki, on June 28, 2017 with approximately 100 Biki Stops and 1000 bikes in urban Honolulu. Bikeshare Hawaii, a 501(c)3 non-profit, works in concert and with support from the City and County of Honolulu to provide bikesharing services for the benefit of residents and visitors. As part of Biki's launch and through an ROE granted by the City Parks and Recreation Department (DPR), and specific location review by DPR, we located seven Biki Stops with a capacity of 133 bikes, within Ala Moana Regional Park and Magic Island. (see attached map)

Biki Stop locations reduced from 7 to 4:

- On July 17, we relocated all Biki Stops located on grass to hardscape locations to allow for sprinkler and other landscaping improvements. Instead of broad distribution of Biki Stops to serve most areas of the Park, including Magic Island, some stations were moved to less visible and less convenient locations. The two Biki Stops serving Magic Island were among the most popular in the system. A large Biki Stop at the Atkinson entrance was created to place equipment within the Park, with the number of locations serving the Park and Magic Island reduced from seven to five. Average daily Biki usage (originating or ending at the Park) declined from 262 per day to 191 per day. Declining Biki trips per day is in contrast to Biki daily usage growing consistently since launch.
- On November 27, 2017 the Biki Stop at Concession One was moved out of the Park to accommodate refurbishment of the comfort station located there. It is not clear what impact this has had on Park users who

Joanne Hiramatsu

From:	Lori McCarney <lori@bikesharehawaii.org>
Sent:	Friday, January 19, 2018 4:38 PM
To:	Joanne Hiramatsu
Cc:	Rebecca Choi; Nekota, Michele K; Leong, Carrie S.; Young, Rosalind J.; John Nakauye; Nouchi, Jon; Justine Espiritu
Subject:	Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period
Attachments:	Ala Moana_Biki Stops.pdf
Follow Up Flag:	Follow up
Flag Status:	Flagged

Aloha Joanne,

Please accept these comments to the EISPN for Ala Moana Regional Park and Magic Island Improvements.

Recommendation:

Distribute Biki Stops throughout Ala Moana Regional Park and Magic Island for the benefit of Park users for exercise, transportation to and from the Park, and to attract new Park users. The original seven locations that were approved before work began on the Park were optimal to achieve these objectives. Our recommendation is to restore the original number of locations to seven in the Park and Magic Island as part of Park improvements with placement at or near their original locations.

Situation:

Early in the planning process for improvements to the Park, Bikeshare Hawaii attended input meetings to discuss how best to incorporate bikeshare for the benefit of Park users. At that time, bikeshare was not well understood and the actual timing and scale of the bikeshare system was not defined. We are not aware of mention of bikeshare in any planning documents despite our input.

Bikeshare Hawaii launched the bikesharing service, branded Biki, on June 28, 2017 with approximately 100 Biki Stops and 1000 bikes in urban Honolulu. Bikeshare Hawaii, a 501(c)3 non-profit, works in concert and with support from the City and County of Honolulu to provide bikesharing services for the benefit of residents and visitors. As part of Biki's launch and through an ROE granted by the City Parks and Recreation Department (DPR), and specific location review by DPR, we located seven Biki Stops with a capacity of 133 bikes, within Ala Moana Regional Park and Magic Island. (see attached map)

Biki Stop locations reduced from 7 to 4:

- On July 17, we relocated all Biki Stops located on grass to hardscape locations to allow for sprinkler and other landscaping improvements. Instead of broad distribution of Biki Stops to serve most areas of the Park, including Magic Island, some stations were moved to less visible and less convenient locations. The two Biki Stops serving Magic Island were among the most popular in the system. A large Biki Stop at the Atkinson entrance was created to place equipment within the Park, with the number of locations serving the Park and Magic Island reduced from seven to five. Average daily Biki usage (originating or ending at the Park) declined from 262 per day to 191 per day. Declining Biki trips per day is in contrast to Biki daily usage growing consistently since launch.
- On November 27, 2017 the Biki Stop at Concession One was moved out of the Park to accommodate refurbishment of the comfort station located there. It is not clear what impact this has had on Park users who

had used that location. But it is clear that Biki Stop locational convenience was further negatively impacted for users who use Magic Island and nearby Park facilities.
- The number of Biki Stops in the Park is now only four with a 19% reduced capacity for bikes (108): Atkinson entrance (55), Kamakee entrance (19), Concession 2 (23) and McCoy Pavilion (11). There is no convenient access to Biki for users of Magic Island, Concession One, or other Park destinations on the Diamond Head side of the Park. (see attached map)

Use of Biki at Ala Moana Beach Park:

In the period between June 28 and December 31, 2017 (approximately six months):

- 28,531 Biki trips originated from Biki Stops located at the Park; 23,372 ended at the Park within this same time period.
- On just one day, the 4th of July, 447 Biki trips originated and 470 ended at the Park.

Why People Use Biki:

- System data indicates that nearly 2/3 of Biki trips are made by Oahu residents.
- Member research conducted October 2017 shows the following usage of Biki (some, most or all of the time):
  - For exercise 56%
  - Meet up with friends 66%
  - Just for fun 77%

Who Uses Biki:
(based on October 2017 Member Research)

Age:

- 28% of users are over age 50; 2.52% are over age 65
- 68% of users are between the ages of 25-49

Household Income:

- 17.5% under $50K
- 38% under $75K
- 60% under $100K

We appreciate the opportunity to comment on this EISPN. We would like to have the opportunity to further discuss this subject with the appropriate parties in order to ensure full consideration is given to bikeshare as a mobility, exercise and recreational option for many residents of Honolulu.

Lori L McCarney
CEO
Bikeshare Hawaii
Lori@bikesharehawaii.org | 808-347-0833 | 914 Ala Moana Blvd, Honolulu, HI 96814
www.GoBiki.org | @gobikihi | Facebook | Instagram | Twitter

had used that location. But it is clear that Biki Stop locational convenience was further negatively impacted for users who use Magic Island and nearby Park facilities.

- The number of Biki Stops in the Park is now only four with a 19% reduced capacity for bikes (108): Atkinson entrance (55), Kamakee entrance (19), Concession 2 (23) and McCoy Pavilion (11). There is no convenient access to Biki for users of Magic Island, Concession One, or other Park destinations on the Diamond Head side of the Park. (see attached map)

Use of Biki at Ala Moana Beach Park:

In the period between June 28 and December 31, 2017 (approximately six months):

- 28,531 Biki trips originated from Biki Stops located at the Park; 23,372 ended at the Park within this same time period.
- On just one day, the 4th of July, 447 Biki trips originated and 470 ended at the Park.

Why People Use Biki:

- System data indicates that nearly 2/3 of Biki trips are made by Oahu residents.
- Member research conducted October 2017 shows the following usage of Biki (some, most or all of the time):
    - For exercise 56%
    - Meet up with friends 66%
    - Just for fun 77%

Who Uses Biki:
(based on October 2017 Member Research)

Age:

- 28% of users are over age 50; 2.52% are over age 65
- 68% of users are between the ages of 25-49

Household Income:

- 17.5% under $50K
- 38% under $75K
- 60% under $100K

We appreciate the opportunity to comment on this EISPN. We would like to have the opportunity to further discuss this subject with the appropriate parties in order to ensure full consideration is given to bikeshare as a mobility, exercise and recreational option for many residents of Honolulu.

Lori L McCarney
CEO
Bikeshare Hawaii
Lori@bikesharehawaii.org | 808-347-0833 | 914 Ala Moana Blvd, Honolulu, HI 96814
www.GoBiki.org | @gobikihi | Facebook | Instagram | Twitter

On Dec 26, 2017, at 8:19 AM, Rebecca Choi <rchoi@bchdesign.com> wrote:

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Aloha Participant,

On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawaiʻi Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of *The Environmental Notice*. Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:

Mailing Address:	Belt Collins Hawaii LLC 2153 North King Street, Suite 200 Honolulu, HI 96819 Attention: Joanne E. Hiramatsu
Email Address:	Joanne E. Hiramatsu jhiramatsu@bchdesign.com

We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu
Director of Planning

Food / Beverage Opportunities

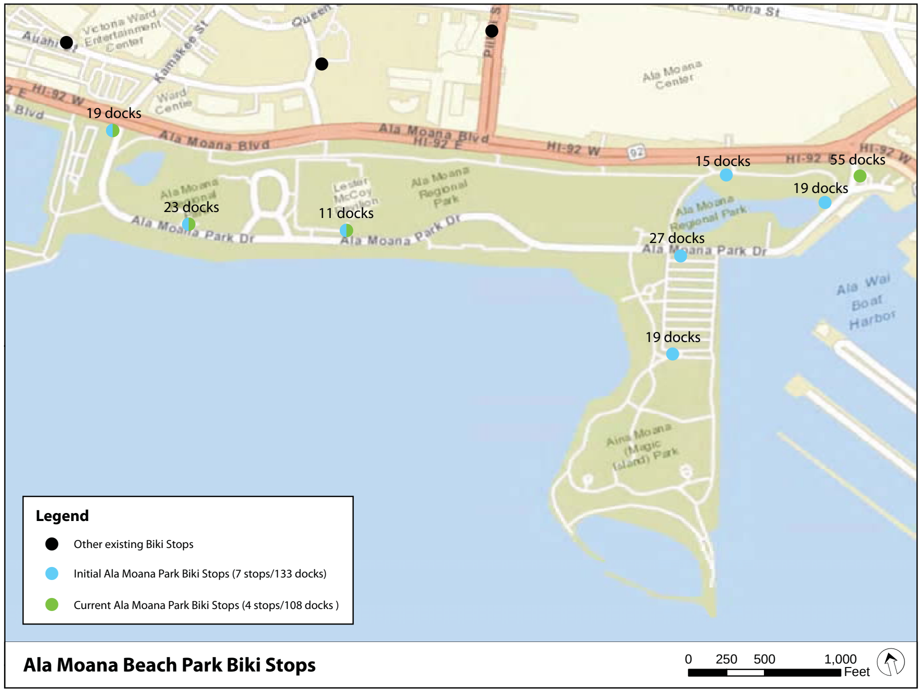
Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that plan yearly special events. These events include popular festivals such as the Greek Festival and Scottish Festival.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the Environmental Impact Statement (EIS)has been finalized. Your recommendations will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

2



Ala Moana Beach Park Biki Stops

Joanne Hiramatsu

From: Michael Arita <mikearita4142@gmail.com>
Sent: Sunday, January 21, 2018 3:06 PM
To: Joanne Hiramatsu
Subject: Ala Moana Regional Park Improvement Project- comments

Follow Up Flag: Follow up
Flag Status: Flagged

Joanne,

Here's my comments to the Improvement plan provided by Belt Collins.
- Although plan provides some description of the Improvements, please provide the conceptual drawings (min plan views) for the alternatives.
- Also need the cost estimates for the alternatives (initial construction & annual maintenance), in order to justify the economic value added.
- Plan notes that the cost will be covered by the CityCapital Improvement Projects Funds, but since the Funds are probably coming from the taxes collected from me, would need to see the value compared to other needy projects.
- Request that the project boundary extend past the noted shoreline for the "rocky" area, since the rocks in the water creates a safety issue. Past efforts to remove rocks had good intentions but have been ineffective.
- Relocating the canoe shelter and enhancing the landing to the Magic Island side would greatly increase safety and reduce the traffic.
- Without the conceptual drawings it's hard to visualize what would be the effects of the parking changes with the perpendicular parking arrangement. But need to at least keep the number parking spaces intact or more.

Thank you
Mike Arita, P.E.

Sent from my iPhone

1

Rebecca Choi

From: Michael Arita <mikearita4142@gmail.com>
Sent: Saturday, January 27, 2018 9:15 AM
To: Rebecca Choi
Subject: Re: Ala Moana Regional Park Improvement Project - comments

Rebecca,

Just saw a rendering of the road & parking. Sidewalk looks nice but I believe it's going to be a nightmare when the outbound lane (Oceanside) will try to cross inbound line to park cars (especially during peak usage) Layout would work if it was just a parking lot, but since cars are traveling both ways, car travel at speeds like a neighborhood street.

During peak use, drivers are very aggressive in getting parking and will cross oncoming cars just to get the parking.

Please let me know if this issue can be addressed in the design.

Thank you

Sent from my iPhone

On Jan 22, 2018, at 7:57 AM, Rebecca Choi <rchoi@bchdesign.com> wrote:

> Dear Mr. Arita,
>
> Thank you for your comment and input on the Environmental Impact Statement Preparation Notice for the Ala Moana Regional Park and Magic Island Improvements. Belt Collins Hawaii LLC and the City's Department of Design and Construction will review your comments and will provide a response after the end of the comment period. We appreciate your time and interest in this project.
>
> Sincerely yours,
>
> BELT COLLINS HAWAII LLC

1

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:38 PM
To: 'mikearita4142@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Arita:

Thank you for your emails dated January 21 and January 27, 2018, commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN.

1. More details will be provided about concept plans in the Draft Environmental Impact Statement (DEIS).
2. Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, so not all projects will be implemented in the near future.
3. Plans for traffic and parking along Ala Moana Park Drive are being considered. If "cars travel at speeds like a neighborhood street," then these can be controlled with speed bumps, signage, and crosswalks. A traffic study will be completed that will inform all plans for changes in parking and traffic flow.
4. As discussed in the EISPN, the project also includes beach nourishment to add more sand to the shoreline, so we are addressing the "rocky" area.
5. Due to space requirements for the Canoe Hālau and outdoor storage of the canoes, the Hālau may not be relocated to Magic Island, but the boat ramp is still planned for renovation with a wider, raised crosswalk at the ramp location.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: Michael Garsva <mwg75@sbcglobal.net>
Sent: Sunday, December 31, 2017 10:49 PM
To: Joanne Hiramatsu
Subject: Re: Ala Moana Park upgrade

I appreciate the attempt to receive and possibly implement input from the public. I Use that park five to 7 times a week. I swim along the buoys regularly and walk and run around the park as well. I really appreciate the improvements so initiated so far. But so much more could be done

1) I believe increasing the width of the walking/jogging path around the entire circumference of the park would be an appropriate action. As it is it is substandard and sorely needed.
2) The water in the park used to be much clearer in years past. I firmly believe that putting oysters in the reef just makai of the main swimming area will bring back the clarity as it has been doing in Pearl Harbor. Some basic seeding of oysters should do the trick over a year or three.
3) The path around the outer lagoon on Magic Island has eroded terribly. It needs to be rebuilt and when that occurs it should be twice the width.
4) The showers should be upgraded to the self-limiting ones such as the Shower-tower from Showertower.com that was installed a few years ago. Occasional maintenance is a must. It doesn't take much to adjust the fixtures on those and it needs to be done from time to time. It would be a significant improvement and reduce water usage significantly.
5) More work needs to be done on eliminating the sticker grass in the park. Once it gets embedded it becomes more difficult to eradicate.
6) We have lost some Plumeria trees and they have not been replaced. They are lovely. Please replace them and add more.

As you have clearly understood, this is the most heavily used park in the state. I hope that you will not only consider but implement these suggestions.

Mahalo,

Michael Garsva
1778 Ala Moana Blvd
Apt 4004
Honolulu, Hawaii
96815

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:44 PM
To: 'mwg75@sbcglobal.net'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Garsva:

Thank you for your email dated December 31, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

Increase Width of Walking / Jogging Paths Around Entire Park

Your agreement with increasing the width of the walking/jogging paths around the entire park is noted. The City has proposed short-term and long-term projects that needs to be more sustainable for the parks and conducive to multiple types of recreation.

Maintenance and Landscaping Recommendations

Your recommendations for maintenance of the showers and ocean water clarity, and landscaping recommendations to remove sticker grass and replace the plumeria trees are also noted. Several biological studies will be completed for the Draft Environmental Impact Statement (DEIS) that will assess the current environment of the parks' land and surrounding waters. The City will implement more landscaping improvements within most of the long-term proposed projects so plumeria trees could be considered. As for the immediate projects, which are listed as the Mayor's 9-Point Community Action Plan, the City planted more trees, and upgraded the irrigation system to be more water efficient and to provide more coverage. The City is working to improve overall maintenance by increasing staffing at the parks.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Michael Tominaga <mineyo306@yahoo.com>
Sent:	Friday, January 19, 2018 2:09 PM
To:	Joanne Hiramatsu
Subject:	My comments on the Ala Moana Beach Park and Magic Island EISPN...
Attachments:	AlaMoanaPlan.pdf
Follow Up Flag:	Flag for follow up
Flag Status:	Flagged

I have included my comments on the EISPN as a separate attachment. Thank you for the opportunity to be involved in the process.

Michael Tominaga

1

ALA MOANA PLAN
COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
Michael P. Tominaga

<u>SUMMARY</u>

The focus of the improvement to Ala Moana Regional Park and Magic Island should be on improving the maintenance and performance of what exists BEFORE attempting to “improve” on what exists. Very little has been stated about the quality of care the current park and island have received over the years. THAT is a testament to what we can expect to happen to the plans for improvements and additions after they are created.

Many of the planned additions don’t seem to take into account the performance and funding of maintenance once they have been created. Where will the money come from to take care of all these additional features? What are the reasons that the current park and island have fallen into such disrepair? Have these reasons been identified and resolved? These should be the focus of improvement before more burden is placed on those that will have to maintain them.

We should all relate to the statement: Show me that you can take care of what you have before thinking you can take care of more.

Lack of adequate parking, while identified as an existing problem, seems to be relegated to an after thought, rather than a ongoing consideration with every other facet of change to the park and island. It should be a high priority and issue addressed with the consideration of any ‘improvement’. Improvements will increase users and users will need someplace to park.

Many of the new additions lack inclusion of justification for their creation. If there is a demand or need and it fits in with the theme of the park and island, it should be considered. Also resources for its maintenance and whether is can sustain itself with the demand that has been identified. Particular attention should be addressed to current features that have exclusive usage.

Resources are scarce and if an improvement is just someone’s idea of a novel addition, it may go the route of Magic Island as a resort. Luckily, it was turned into a green space for park users. Will every addition be as adaptable?

Has the possible need for $200K worth of repairs or $300K/year for 24-hour security been considered when the homeless have been deterred from Kakaako District and Gateway parks and find Ala Moana park convenient.

In conclusion, a majority of the resources should be utilized to bring the existing features to a higher level. Adequate parking on pothole less roadways, widened sandy beaches that address king tides, a pristine channel without sediment from shifting sands, operational showers and comfort stations, grassy areas especially under trees without weeds and dirt spots. These are all things that currently exist in varying, mostly substandard conditions. There is much to bring back to standard rather than ‘improve’ with features that have not been substantiated, justified or dedicated with maintenance resources.

TAKE CARE OF WHAT WE HAVE BEFORE ADDING MORE THINGS TO DEAL WITH.

I have **high lighted** and **underlined** portions of the EISPN with my comments. They follow below for your review and reference. Thank you for this opportunity to participate. I await either your response or action.

4 Project Description

The **City is proposing** to restore, revitalize, enhance, and improve the Ala Moana Regional Park (AMRP) and the Magic Island peninsula (Magic Island)1 grounds and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans.

The initial proposal was full of many commercial entities that appeared to have originated from the present administration. News coverage indicated that there was little public support of these endeavors.

The EIS will evaluate direct impacts associated with the proposed action, as well as indirect and cumulative impacts associated with the project.

4.1 Purpose and Need for the Project

The Parks' resources and amenities have a significant amount of wear and tear from exposure to the coastal environment, a high volume of usage, **unavailability of funding to replace deteriorated infrastructure, and vandalism over the last 80 years**.

Throughout this presentation, nothing has been presented to show that consideration was given to how maintenance of all the new additions will be funded.

Approximately 300- 350 homeless either pass through or stay at the Parks every day. Other issues raised by the community and focus groups were accessibility, night security lighting, ocean safety, sand erosion, canoe ramp steepness, repair of comfort stations, tree health, broken grass, local favorites concessions, **inadequate amount of parking**, lack of loading and unloading zones, and general maintenance and management concerns.

Appears that parking is lower on the priority of issues raised. It is an existing concern and with the increase in users, it should be an ongoing high priority consideration. The number of parking stalls should increase with every item that might increase the number of users to the area.

There was no desire to upscale the Parks with modern motifs and added structures.

This substantiates concern that some of the City proposed commercial entities may not have been totally eliminated despite the lack of public support.

4.2 Background

Structural construction at the AMRP began soon after in the 1930s on the new land with the Sports Pavilion and Banyan Court, a lawn bowling green, the Bridle Path Bridge, and the

Roosevelt Portals. The two ponds and **drainage canal** were dredged around 1932 for both aesthetic and local run-off control purposes. These earlier structures remain today and **most will be considered for preservation or restoration** in the EIS. In 1988, the AMRP received historical recognition as a significant property on the State Register of Historic Places. The main goal for the AMRP during its conception in the 1920s was to have a place with lots of green open space that was accessible to all communities for recreational activities.

The Drainage Canal Covering seems to go beyond "**preservation or restoration**" consideration. (see more in Proposed Action)

The idea for Magic Island was first conceptualized as a major resort area in the late-1950s. Two parts of a three-part plan that included engineering and planning reports were completed in 1961.3 The study goal was to weigh the possibilities for development of the resort area and offshore island through reef reclamation. **The plans for the resort area and island did not develop due to overwhelming public opposition to the proposal.** As a result, Magic Island was added to the AMRP as additional open space.

Hopefully, this time around, we will learn from the past and not go ahead with something that has met with public opposition prior to its creation.

Today, the Parks remain significant to history and the community. They have increased in importance over the years as the population continues to grow and as various forms of recreation evolved. They continue to serve as a host for large venues and events. **There is a need to ensure the Parks' sustainability while meeting the demands on them placed by community.**

Sustainability seems to be an after thought. The only fiscal consideration conveyed in this report seems to be the creation utilizing Capital Improvements funding.

4.3 **Proposed Action**

Are these presented in a priority? Since nothing stated to think otherwise, they portray that additional parking is solely dependent on the inclusion of the new feature.

The proposed elements reviewed in the EIS include:

Pi'ikoi Street entrance expansion and plaza;

Justification/substantiation for its inclusion? Is there a demand from public for non-vehicular entry to the park? How much usage will this feature receive? Will cost of maintaining this addition be considered before decision to create?

Widening the promenade along the makai side of Ala Moana Park Drive;

The effects on parking should be carefully considered and not be a result of what the widening of the promenade dictates.

Widening the promenade along the Ala Wai Small Boat Harbor; with improvements to the existing canoe launch ramp;

Parking must not suffer or decrease due to this feature. This feature should have the result of providing access to more people, increasing the possibility of needing more parking to allow those that commute to enjoy the feature.

Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;

"Rearranging" conveys that the specific 'feature' will dictate the amount of parking that will result. Since it has been stated that parking is an existing issue, it should be highly prioritized when considering any feature.

"…to open views to the ocean…" is a very weak justification for eliminating much needed parking. WHO will benefit from these open views? Has a demand for these open views been determined to exist? Locating on the beach will provide the view for anyone in the immediate vicinity by simply crossing the street.

Configure parking stalls on the mauna side of Ala Moana Park Drive to perpendicular and parallel stalls;

Parking must not suffer or decrease due to this "configuration" who's purpose is to allow the addition of a feature.

Keyhole parking lot expansion;

Unclear what this expansion entails. No clear whether parking will increase or decrease.

Elongating Magic Island parking lot;

"Elongating" doesn't clearly state whether parking will increase or decrease to facilitate the creation of a feature.

Improve the pond edges;

Improve McCoy Pavilion to include a dining facility;

No specific justification for this feature. Other than various annual events, this facility seems a reoccurring location for HPD and HFD functions. How will this new feature be maintained and sustained?

Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Drive for Americans with Disabilities Act access;

Sand replenishment and long-term beach nourishment;
Offshore collection of sand doesn't specify deal with the previously deposited sand that has migrated to the channel between the beach and reef. This migrating sand will continuously fill

the channel and will eventually need to be removed. Has reclamation of the shifted sand from the beach to the channel been considered?

Build a Playground;

Relocate the Maintenance Yard;

No justification or rationale provided to substantiate this feature. Will this involve expansion of the current size? What will become of the current location? How will this new location be maintained regarding funding? Making a new yard is nice but will the funding be available to maintain it?

Drainage canal covering;

While this feature will create more ground for park users, what is the demand for this area? Currently, the closer to the beach portions of the park are more desirable. How will the maintenance of this covered canal be funded? Has thought gone into the maintaining of build up coming downstream from residential/commercial areas?

Create a multiuse facility at the Lawn Bowling area;

Will the exclusive user of this facility be contributing to the cost of this multi-use facility?

Relocate the Ocean Safety's Honolulu Headquarters;

Improve the entrance at the Kamakee Street entrance.

Unclear on details that comprise this 'improvement'. What needs to be improved?

4.4 Alternatives Considered

4.4.2 Enhance Alternative

The enhance alternative includes all proposed improvements in the restore alternative with **some changes to the existing conditions**. This is the preferred alternative that was selected and the projects are identified in Section 4.3.

More details need to be provided for "…some changes to the existing conditions." to ensure that private and personal agendas that have not been accepted by the public are included.

4.4.3 Evolve Alternative

A multi-story parking structure where the outer shell would be designed to camouflage concrete walls

…**, the evolve alternative was not considered further.**
This feature should be considered for inclusion into the Enhance Alternative. Since additional parking is an existing need and will increase with all new features added.

4.5 Timeframe

The Final Environmental Impact Statement (FEIS) is expected to be completed by the end of 2018. Design of the park improvements will then begin. Once all land use, environmental, and construction permits and approvals, as well as financing, are secured, construction can commence.

There is no mention of public input. Many details in this plan are still uncertain.

4.6 Funding Source

The proposed improvements will be paid for by the City's capital improvement project funds.

This does not take into account the cost to maintain all this new features to the park. Consideration of how easy or difficult it will be to secure funding to maintain all these features should be included in the decision to

5.6 Marine Environment

Sand replenishment work is proposed for the beach and will require offshore dredging in the nearby ocean. Sand replenishment was done recently for two projects at Waikīkī Beach and Kūhiō Beach. Both projects recovered sand directly offshore or adjacent to the project areas. **A sand source investigation will be done to determine a suitable site to dredge the sand for Ala Moana Beach. Any sand placed on the shoreline will be tested to ensure that the material is not contaminated.**

Reclamation of the sand that has shifted from the beach to the channel between the beach and reef should be seriously considered. It will address the eventual issue of dealing with shifting sands from multiple replenishment projects with sand from other locations.

5.10 Visual and Aesthetic Resources

Visual resources include scenic vistas, scenic overlooks, unique topography, or visual landmarks having scenic value. Improvements to the Parks' visual and aesthetic resources are not expected to be impacted by the proposed action.

The City also proposes to reconfigure the parking along the Ala Moana Park Drive to improve the view of the ocean.

The "improve the view of the ocean" is a very weak justification to change and possibly decrease the number of parking stalls which is inadequate at the present time. The "view" can be improved by someone simply crossing the drive to be directly on the promenade or beach. Perhaps the improvement of view is for those luxury condos coming up on the Mauka side of Ala Moana Blvd. Let them walk across the street to enjoy the view.

5.11 Recreation

The main recreational amenities at the Parks are the large open spaces and beaches. According to recent public outreach meetings, the highest recreational use of the Parks is water related. The water recreation focus groups suggested better management of suitable areas for calm water activities like paddle boarding and swimming. **The buoyed areas may need updating as safety has been an issue near the reef.**

No details to substantiate the need for "updating". Are use of resources necessary? When infractions of usage are committed, who will handle enforcement?

5.12 Public Health, Safety and Service

The AMRP is currently closed to the public at night between 10 p.m. and 4 a.m. Magic Island and parking lot closes two hours earlier at 8 p.m. Park closure during the night is meant to deter homeless from staying in the Parks, and to prevent crime. **The Honolulu Police Department (HPD) may monitor the Parks during closed hours.** Response from the HPD would come from District 1 (Honolulu) police stations.

Enforcement of rules should not be placed on HPD. Every new law's enforcement is placed on HPD without regard to how it effects their manpower resources. Laws, just for the park already include animals, feeding animals, shopping carts, tents, alcohol, smoking, fireworks, parking, reserving parking stalls, paddlers v. swimmers in the channel… Some thought needs to be given to enforcement costs before laws are created and who will enforce them. Park rangers with citation power, patrolling the park would be able to cite violators or at least summon HPD and substantiate those acts that need to be witnessed.

5.15 Circulation, Traffic, and Parking

A parking study was completed and it was used to substantiated the need for additional parking and propose options for areas where additional parking is possible. A traffic study will assess baseline traffic condition in and around the project area. It will evaluate the parking reconfiguration and lane options and its impact to the current ambient traffic. Results of both studies will be presented in the EIS along with any needed mitigation to avoid or minimize associated impacts.

The already completed parking study should place parking as a priority over ALL NEW additions that will create more user population. Parking should not be secondary to any NEW additions, particularly changes that will decrease the already existing stalls.

Adverse impacts to the circulation and traffic environment resulting from the improvements are not expected to be significant.

Disagree with this assessment. More details are required which define and identify adverse impacts.

5.16 Infrastructure

The majority of the project area is open space that is heavily used for recreational purposes. Infrastructure at the Parks, includes water supply for irrigation and drinking water, wastewater collection system, drainage, electricity, communications, and solid waste collection. Adverse impacts to infrastructure are not anticipated as a result of the proposed action. **The improvements will not significantly increase demand on the existing utilities.**

The existing utilities are already significantly stressed due to lack of adequate maintenance. The improvements, without additional resources to bring the existing utilities to adequate standards AND improved maintenance to keep these utilities in working order will only further burden the park. Whether it is lack of resources or corrective action, the future will be dim if no change in the performance of maintenance or resources to address the customary costs are addressed.

6.2.4 State Functional Plans

These committees hold a forum to discuss the matters within their functional plan that relates to budget, executing actions and implementing a timeframe. The functional plans include: Agriculture, Conservation Lands, Employment, Energy, Health, Higher Education, Historic Preservation, Housing, Recreation, Tourism, Transportation, and Human Services.

The care of the park will fall to the City and County of Honolulu. No listing is included for the C&C Hnl or an entity that appears to handle the resources they will need to maintain the improvements and additions AFTER they are constructed.

6.2.7 Stream Channel Alteration Permit

As outlined in HAR Chapter 13-169-50, no stream channel shall be altered until a SCAP is issued by the commission. In this context, channel alteration means to **"obstruct, diminish, destroy, modify, or relocate a stream channel; to change the direction of flow of water in a stream channel; to place any material or structures in a stream channel; or to remove any material or structures from a stream channel."**

This directly relates to the covering of the stream just makai of Ala Moana Blvd. Many things need to be considered when this water flow is covered up to provide more green space. Resources necessary for the maintenance and to clear it out once upstream sediment and objects flow down and clog the less accessible body of water.

9. Public Outreach

Early consultation on the project has been carried out with various agencies and stakeholder groups as part of the scoping process for the AMRP Master Plan. The first public informational meeting was held on March 10, 2015 to provide opportunities for the community to obtain information on the proposed action and to provide their concerns about changes to the Parks. A second public meeting was held on April 28, 2016 to show the community some of the improvements being considered at the Parks, based on what the development team heard at the first meeting. As a result of these public interactions, substantial input from agencies and the public was obtained. With the information received through this outreach, the distribution of this EISPN, and subsequent

consultations, environmental concerns should be sufficiently identified prior to finalization of the EIS.
Consulted parties, the City's public informational meetings, and the parties to be consulted with distribution of this EISPN are identified in the following section.

There appears to be a pattern. Many undesirable inclusions persist and remain in one form or another with each segment of this process. It appears that the generating force creating each revision continues to attempt and include features that have already be reviewed and rejected. This only slows the process.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 3:57 PM
To: mineyo306@yahoo.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Mr. Tominaga,

Thank you for your email dated January 19, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN and we are providing response on the proposed action.

Pi'ikoi Street entrance expansion and plaza, drainage canal covering

The goal is to create a third main entrance for pedestrians that is centrally located and closer to the proposed rail station. This entrance is meant to help with crowd circulation especially during large events and emergencies. Changes to existing structures and walls will be minimal, since this is a pedestrian access, not a vehicular one. A portion of the drainage canal will need to be covered to accomplish this. All such changes will need to be reviewed by the State Historic Preservation Division.

Reconfiguration of parking stalls

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

As for the issues of parking and circulation - the Draft Environmental Impact Statement (DEIS) will include a parking study and a traffic study, detailed presentations of changes to parking areas, and the expected increase in parking stalls. Please keep in mind that the City does not plan to reconfigure Ala Moana Park Drive into a one-way road and both vehicular entrances and exits would remain. Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure

all drivers, moped riders, and bikers within the park drive with caution. The full results of the studies will be available for public review in the DEIS appendices.

Widen promenade along Ala Wai Small Boat Harbor

Parking would not be affected if the Magic Island parking lot is also elongated in the process. This project is not considered high priority and may be something added in the future.

Parking lot expansions

The City is reviewing the Keyhole parking area and Magic Island parking lot as possible areas of opportunity to create more parking stalls. The keyhole parking is being reviewed to balance out the number of stall on the 'Ewa side of the park with the Diamond Head side. As for Magic Island parking, it is being reviewed in an elongated configuration to give park users closer access to the picnic spots and the lagoon. This will also help emergency vehicle access in the event of an emergency on Magic Island.

Improvement of McCoy Pavilion

Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that plan yearly special events. These events include popular festivals such as the Greek Festival and the Scottish Festival.

Sand replenishment and long-term beach nourishment

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will demand additional studies to help determine viable options and permits will be needed for this work.

Building a playground

A site for the playground has been selected behind the Diamond Head concession area, but no immediate plans have been developed.

Relocate Maintenance Yard

The current maintenance yard is located near the Atkinson Street entrance. The City would like to move the maintenance yard to a more central location in the park.

Creating a multi-use facility at the Lawn Bowl area

The Master Plan identifies a multi-use area at or near the lawn bowling area. This concept has not been designed in detail and is viewed as a long-range improvement that may not be implemented immediately. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for added recreational uses; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized.

Improving the Kamakee Street entrance

Proposed improvements for this entrance is mostly related to landscaping and designing it with the art deco theme like the Atkinson entrance.

Comfort Station Improvements, Security

The City concurs with the need for improved maintenance, and has increased staffing for better maintenance and cleaner comfort stations. These facilities are currently undergoing major renovations. The City's commitment to improve park security started with hiring more park staff dedicated to these issues. Other security measures were implemented such as installing cameras at all comfort stations and the comfort stations are closed after hours. Park staff supervise security of the parks during the day.

Prioritization of Projects and Funding

You are seeking prioritization of funding for the parks' projects. Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, so not all projects will be implemented in the near future. Based on land use laws, open spaces reserved for public use needs to be made available and maintained. The goal of the project is developing a sustainable plan for the parks that will do more than maintain, but preserve the resource for many generations. More money would be spent on maintenance of the parks without a sustainable plan. The City views the option of leaving the parks as they are as unsustainable due to their age and many years of depreciation. The parks receive the most visitors of all the parks in the state and the number of visitors will increase because population growth is inevitable. Proposed improvements are meant to allow visitors to use the vacant areas of the parks and enhance the popular areas so they can withstand more use in the future.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Michael Wong
mustang68@hawaii.rr.com
Dec 29, 2017 at 11:02 UTC

Please don't for the sake of the kamaaina, remove all of the makai parking stalls; we don't want it to be another waikiki. Those stalls is what makes Ala Moana Park so special for 60 years. Please don't pave paradise and put up a parking lot. Pono Ala Moana.

Joanne Hiramatsu

From:	Joanne Hiramatsu
Sent:	Wednesday, June 06, 2018 4:01 PM
To:	'mustang68@hawaii.rr.com'
Subject:	Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Wong,

Thank you for your comments posted December 29, 2018 on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN regarding the removal of parking on the makai side of Ala Moana Park Drive.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized, and after the plans are reviewed by the public and agencies. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

1

Joanne Hiramatsu

From:	msmatson@hawaii.rr.com
Sent:	Tuesday, December 26, 2017 9:50 AM
To:	Joanne Hiramatsu; Rebecca Choi
Subject:	Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

Thank you for this EISPN notification. Please include the O'ahu Island Parks Conservancy on the Special Interest and Stakeholders Groups list at this email address.

Mahalo,
Michelle S. Matson
President, O'ahu Island Parks Conservancy

---- Rebecca Choi <rchoi@bchdesign.com> wrote:
> Environmental Impact Statement Preparation Notice (EISPN) Ala Moana
> Regional Park and Magic Island Improvements Tax Map Key: (1)
> 2-3-37:001, 002, 022,023, 025 Honolulu, O'ahu, Hawai'i
>
> Aloha Participant,
>
>
> On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.
>
> On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawai'i Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of The Environmental Notice. Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:
>
> http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moa
> na-Regional-Park-Improvements.pdf
>
> We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:
>
>
> Mailing Address: Belt Collins Hawaii LLC
> 2153 North King Street, Suite 200
>
> Honolulu, HI 96819
>
>
> Attention: Joanne E. Hiramatsu
>
> Email Address: Joanne E. Hiramatsu
> jhiramatsu@bchdesign.com<mailto:jhiramatsu@bchdesign.com>
>
>

1

> We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com<mailto:jhiramatsu@bchdesign.com>.
>
>
> Sincerely yours,
> BELT COLLINS HAWAII LLC
>
>
>
> Joanne E. Hiramatsu
> Director of Planning
>
>

2

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:02 PM
To: msmatson@hawaii.rr.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Matson:

Thank you for your email dated December 26, 2017 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your request.

You requested to have the Oʻahu Island Park Conservancy be placed on the Special Interest and Stakeholders Groups list as msmatson@hawaii.rr.com. Your request has been noted and your email address has been added. We will contact you when the Draft Environmental Impact Statement (DEIS) is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Mikal Weiss <mweiss@mikalweiss.com>
Sent:	Monday, January 01, 2018 11:58 AM
To:	Joanne Hiramatsu
Subject:	Comment on EISPN

Please consider adding Pickleball Courts! Growing sport all over the Island, as well as nationally, and very few permanent courts. Thanks.

Mikal M. Weiss (808-600-4090)

Joanne Hiramatsu

From:	Joanne Hiramatsu
Sent:	Wednesday, June 06, 2018 4:03 PM
To:	mweiss@mikalweiss.com
Subject:	Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Weiss:

Thank you for your email dated January 1, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your suggestion that the City add pickleball courts.

The Master Plan identifies a multi-use area at or near the lawn bowling area. This concept has not been designed in detail and is viewed as a long-range improvement that may not be implemented immediately. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for added recreational uses; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized.

Your comment will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Nancy Ardito-Ng
nebulousnancy@gmail.com
Jan 23, 2018 at 23:58 UTC

I am not happy with the new proposal for perpendicular parking on the mountain side only. It means that everybody who wants beach access will have to cross the street. People with small children, the elderly,people carrying coolers, surfboards, all the things that people take to the beach,will be forced to cross the street. In what world is that safer, or more convenient? Please don't make this change to our family/people friendly Ala Moana Beach Park.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:09 PM
To: 'nebulousnancy@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Ardito-Ng,

Thank you for your comments posted January 23, 2018 on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN regarding removing parking on the makai side of Ala Moana Park Drive, and perpendicular parking on the mauka side of Ala Moana Park Drive.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Perpendicular parking is a standard accepted design for our city parks; it maximizes the use of park space. Additional speed bumps and signage can be installed on the park road should it be deemed necessary and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: overdafalls <overdafalls@gmail.com>
Sent: Saturday, January 20, 2018 9:06 AM
To: Joanne Hiramatsu
Subject: Ala Moana Park Development

Follow Up Flag: Flag for follow up
Flag Status: Flagged

DO NOT GET RID OF MAKAI PARKING STALKS. DEVELOPERS AND VENTURE OUTSIDERS ALREADY SCREWING OUR WAY OF LIFE IN HAWAII.

Sent from my T-Mobile 4G LTE Device

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:07 PM
To: 'overdafalls@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Overdafalls@gmail.com,

Thank you for your email dated January 20, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we reviewed your comment that states, "do not get rid of makai parking stalls."

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is now evaluating and considering the feasibility of other options for this area. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for parking; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

From: Patti Choy <halamango@gmail.com>
Sent: Thursday, January 18, 2018 2:37 PM
To: Joanne Hiramatsu
Cc: Patti Choy
Subject: Ala Moana Park

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Dear Ms. Hiramatsu,

It is with utter frustration that I write to you about the "improvement" plans for Ala Moana Park and Magic Island.

If the Caldwell administration has good listening skills and puts the desire of longtime Hawaii residents first over the rich cats moving into Kaka'ako, then the park needs to remain as is.

Yes, of course, existing structures need to be renovated, but not expanded, and safety issues need to be resolved such as, continuing to improve bathrooms, lighting, renovate McCoy Pavillion, etc.

Do not touch or reconfigure the existing parking spaces that run parallel to the beach. The access from car to sand when using those parking stalls is a large part of the beauty of the park. Redrawing the parking stalls to pack in more cars will just make the park a madhouse.

Who has complained that the sidewalk (parallel) to the ocean is too narrow?? Probably no one. Leave the walkway as is. Making it wider just adds more concrete to the park which will then generate more heat! People have coexisted on that walkway for decades.

We don't want any beer gardens/alcohol in the park, and no commercial entertainment areas or special playgrounds for rich kids.

Just hear out what the majority of local people said from the beginning of this process and your work will be easy. Follow what we stated. Do not commercialize the park and turn it into a Central Park for rich out of towers.

Caldwell should refocus his energies and instead of working against local people and what they want for the park, go after all the illegal businesses that abuse public land and ocean with the park: land and water yoga classes, SUP classes, scuba diving tours, the bridal industry catering to non-local residents, Segway tours, to name a few.

I am frustrated, along with friends and family, who can't help but think that Caldwell has another agenda for the park and it does not coincide with our wishes.

No matter how long ago the budget was approved for the new beach volleyball courts, we see the building of the courts as a symbol for what is to come for the park: commercialization and building up the park for new residents to Hawaii and not keeping the park as is, for local people!

Enough is enough! Hands off Ala Moana Park!

Patrice Choy
Honolulu, HI

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:08 PM
To: 'halamango@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Choy:

Thank you for your email dated January 18, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN. You express the need for renovation of existing structures, rather than expanding, and resolving of safety issues in the Park.

McCoy Pavilion Renovations and Commercialization

Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that continue to use the dining room for planned special events throughout the year. As stated in Section 4.4.3, Evolve Alternative, of the EISPN, "modernization of the parks would attract more visitors and would not preserve the parks' existing character" so the alternative was not considered further. However, a "No Action" or "leave the parks as is" is also not a viable option due to their age and many years of depreciation (Section 4.4.4, No Action, EISPN). The parks receive the most visitors of all the parks in the state and the number of visitors will increase because population growth is inevitable. Proposed improvements are meant to allow park goers to use other areas of the parks and also enhance popular areas so they can withstand more use in the future.

Playground

A site for the playground has been selected behind the Diamond Head concession area, but no immediate plans have been developed. Playgrounds are common facilities in the City's parks.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Park and Beach Maintenance

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will explain proposed repair and maintenance of the beach and parks in more detail. Some of that maintenance is currently implemented through increased staffing for maintenance and security.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Our Ala Moana Park Website comments during the EISPN comment period

Peter Oleson
peter.oleson@yahoo.com
Jan 19, 2018 at 19:58 UTC

The lawn bowls facility is important to help our senior citizens in particular maintain their fitness through doing sports. In improving Ala Moana Park, as physicians say "first, do no harm." The proposed "multipurpose use" of the lawn bowls facility is a red herring for unspecified and unknown development.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:10 PM
To: peter.oleson@yahoo.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Oleson:

Thank you for your comments posted January 19, 2018 on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments regarding alteration of the lawn bowl facility and proposal of a "multi-purpose use" area at the lawn bowl facility.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized and after plans are reviewed by the public and agencies. No detailed plans have been developed for multi-purpose use.

Your concerns and more detail concerning planned improvements will be included in the DEIS. We will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

1

Our Ala Moana Park Website comments during the EISPN comment period

Ralph Germann
ralph_germann@hotmail.com
Jan 18, 2018 at 18:18 UTC

I swim the length of the beach park from Magic Island to the Kewalo Basin end 5 days a week. Parking in the Magic Island parking area is most important to me as I have a disability. Beach sand as far as low tide 2 foot depth is very important for safe access and egress. Most of the area along the park's beach has sharp rocks and is not safe for swimmers except by the Magic Island life guard station and the McCoy Pavillion life guard station. It is important to be able to exit the water anywhere along the beach and not just at those two points. These are two of the most important improvements I am interested in seeing done at Ala Moana Park. Thank you.

Joanne Hiramatsu

From:	Joanne Hiramatsu
Sent:	Wednesday, June 06, 2018 4:11 PM
To:	ralph_germann@hotmail.com
Subject:	Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Germann,

Thank you for your comments posted January 18, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments regarding your preference to park at Magic Island, and for safe beach entrance/exit along the length of the beach.

Your concerns will be included in the Draft Environmental Impact Statement (DEIS). Sand replenishment and long-term beach nourishment are proposed actions for this project. The City will continue to remove the sharp coral from the beach in the meantime. Additionally, several options are being proposed regarding parking and access, this includes adding more Americans with Disabilities Act stalls and drop off areas.

The City will proceed with design after the EIS has been finalized, and after project plans have been reviewed by the public and agencies. We will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Ray Madigan <ray52madigan@gmail.com>
Sent:	Thursday, January 18, 2018 9:48 AM
To:	Joanne Hiramatsu
Subject:	Comments on the Ala Moana Projec
Follow Up Flag:	Flag for follow up
Flag Status:	Flagged

Dear Joanne Hiramatsu,
I agree with the comments made by Stan Sakai which I have copied below. I particularly agree with his comment regarding the widening of the promenade leading to hot feet!
Need more showers!
Keep it simple. This is the "People's Park", not the the "Tourists Park". Forget beer gardens. We don't want any alcohol consumption. Provide facilities for the families who come to BBQ and get out of their apartments to enjoy the simple natural environment. Less concrete. Do we really need restaurants in the park? It's a park not an extension of Waikiki.
Good clean toilets with shady trees. No unnecessary buildings. Keep it as natural as possible. Plenty of trees, less concrete.
Better off site parking and public transport. Do not take away green space! It's a precious resource. Don't pave paradise and put up a parking lot!

1. PROMENADE
a) The grassy areas along the promenade is used by many for setting up picnics. Is the intention of the new design to eliminate this?
If not, then people will be hauling their picnic and BBQ supplies from their cars parked on the mauka side of Ala Moana Park Drive. This will impede traffic flow and make it more difficult to people to use the park.

b) If you widen the promenade, what will happen to the trees? If you keep the trees than the promenade will essentially be split into two lanes. This will not actually widen the existing promenade.

c) If the trees are to be kept, will widening the promenade injure or shorten the lives of the trees, which are 'historical' features of the park?

d) On hot days, the concrete and asphalt surfaces in the park can easily burn the feet of adults and kids walking bare footed. If you widen the promenade with more concrete, you're adding more of these 'hot' surfaces and there won't be any nearby cooler grass surfaces for people to escape to.

2. PARKING

a) One problem with removing the parking on the makai side of Ala Moana Drive is that many more pedestrians will be crossing the street. This will: (1)impede the flow of traffic and (2)increase the risk of a pedestrian getting hit by a car, more so after dark. The street lighting in the areas where pedestrians are expected to cross the street should be bright enough for drivers to easily see pedestrians.

b) Keep the parking on the makai side of Ala Moana Drive along the raised picnic area. These would provide convenient parking for those picnicking in the raised area and also for those using the Great Lawn. This wouldn't affect the 'open views of the ocean' because the ocean isn't visible from these

parking stalls.

c) Keep the parking on the Ewa side of Ala Moana Drive just as you enter the park. These stalls will provide parking for those using the Ewa end of the park and they do not affect the 'open views of the ocean.'

d) Design the perpendicular and diagonal parking stalls wide enough to accommodate larger vehicles, which are common at the park, and also to give people enough room to easily unload their vehicles without hitting adjacent ones.

e) Perhaps, create additional parking on the Diamond Head side of McCoy pavilion. These would provide parking for the tennis courts, pavilion, and also for the Great Lawn.

3. BEACH EROSION

a) Efforts should be made to reduce the wave action along the sandy beach shoreline to minimize beach erosion. Otherwise, replenishing the sand might be just ongoing. There used to be large rocks outside of the swim channel. I was told that many of these fell into the channel after one of the hurricanes. Perhaps setting up structures along the reef edge of the channels, like the former rocks, might diminish the wave action at the beach.

b) Efforts should be made to address potential problems that might occur due to sea level rising.

4. INVASIVE PLANTS
The autograph trees in the center of the keyhole parking area are on the list of invasive trees. They and other invasive plants should be identified and removed. There might be some mangrove trees in the Ewa pond that need to evaluated.

http://hawaii-agriculture.com/autograph-trees-are-invading-hawaiis-forests/

http://www.hear.org/misc/pdfs/misc_invasiveplantexamples.pdf

5. PARK TRAFFIC
The park exit at the Atkinson Street side needs to be improved.
The right turn lane from Ala Moana Park Drive onto Ala Moana Blvd is too short. Cars that want to make this turn need to que with cars going straight into Atkinson. To lengthen this right turn lane the historic arch that spans the sidewalk will need to be relocated.

6.BEACH FACILITIES

a) More charcoal fire pits should be provided and these should be visible at dusk and into the early evening when picnickers are cleaning up.

b) A shower/wash station somewhere near the entrance to the Keyhole parking would be a convenient feature. This will give beach-goers a place to rinse off before proceeding to their cars.

c) Especially on windy days, trash from the shoreline is being blown into ocean, sometimes from the trash cans and sometimes from trash strewn in the park and along the beach. This should be addressed.

7. PARK MAINTENANCE COSTS
An assessment of the maintenance costs of any improvements made to the park should be done. Projects that involve significant maintenance costs, especially short-term and ongoing, might not make sense.

8. SIGNAGE

a) Signs describing the rules of the park need to made more obvious. Current signs are too high and too small. The better parks throughout the US have clear signage that helps the public understand the park rules to keep them safe and to protect the park.

b) At the outdoor showers that drain into the sand, clearly visible and readable signs should be posted stating that the use using soaps and shampoos is not allowed.

Raymond Madigan, R.N.

Joanne Hiramatsu

From:	Joanne Hiramatsu
Sent:	Wednesday, June 06, 2018 4:12 PM
To:	ray52madigan@gmail.com
Subject:	Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Mr. Madigan,

Thank you for your email dated January 18, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments. You state your agreement with Stan Sakai's comments and included comments of your own. Responses to the comments are below.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities, such as the dining facility, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Rebecca Choi

From: Joanne Hiramatsu
Sent: Monday, January 22, 2018 7:27 AM
To: Rebecca Choi
Subject: FW: Ala Moana Beach Park

From: sen uyeunten [mailto:sen@flex.com]
Sent: Monday, January 22, 2018 12:45 AM
To: Joanne Hiramatsu <jhiramatsu@bchdesign.com>
Subject: Ala Moana Beach Park

Hi Joanne,

Mahalo for taking the time to read all our(my) comments.

Keep the Makai (and Mauka parking too) parking along Ala Moana Park Drive. People enjoy being able to drive up, park, then have a relaxing day along the grass, right next to their car along the beach. There are very few place that allow that in town (Kakaako and Kewalo have no beach/sand, Kapiolani is too far from the road/parking). The parked cars provide a wind block along with a little privacy from the passing traffic, like a wall. The improvement should be to widen the grass area (about 2x the current size) to help keep the walkway free and clear.

The beach/ocean views is nice to have, but not at the loss of the Makai Parking. Loading zones along the Makai side will turn into "parking zones" until the police show up. Then it will be "move the car and return back" until the police show up again. People will park there anyway. More people will be upset at the loss of any Makai Parking, then being happy having a beach/ocean view. Maybe just the visiting tourist will enjoy the beach/ocean views as they drive by.

Traffic and parking are the 2 biggest problems. Need more exits, or a better exit flow getting out of the park. A parking lot and exit(to Ala Moana Blvd) on the "Diamond Head" side of McCoy Pavilion is needed. The exit can be just a "right turn only" lane onto Ala Moana Blvd. The parking lot(and loading/unloading area) should be big enough for events at McCoy Pavilion that will stop the need to block other parking in the park.

Maybe a coral rock "crusher" is needed. There seems to be a good supply of coral rocks that can be made into sand. The current that is pushing" the sand along most of the beach(area in front of the tennis courts) is from the Tradewinds and not really the ocean waves. The Kewalo end of Ala Moana Beach has erosion from the ocean waves. Maybe a small breakwall will help there.

Move the Canoe Hale closer to the launch ramp so there is no need to cross the street. It is dangerous with may of the kids running across the street. Traffic is also a mess when the canoes are crossing the street.

Hope we can make Ala Moana Beach Park a better park for Honolulu's residents.

Mahalo, Sen Uyeunten

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:14 PM
To: 'sen@flex.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Uyeunten,

Thank you for your email dated January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN and provide the following responses.

Removing Parking Along Ala Moana Park Drive and Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Coral Rocks

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Relocate the Canoe Hālau

Due to space requirements for the Canoe Hālau and outdoor storage of the canoes, the Hālau may not be relocated to Magic Island, but the boat ramp is still planned for renovation with a wider, raised crosswalk at the ramp location.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From:	Shar Chun-Lum <sharstocks@yahoo.com>
Sent:	Monday, January 22, 2018 9:59 AM
To:	Joanne Hiramatsu
Subject:	Response to EISPN, Ala Moana Regional Park and Magic Island Improvements
Attachments:	EISPN Save Ala Moana for the people.pdf

Aloha Joanne,

Mahalo for the opportunity to share my views on this EISPN. In the interest of time, I have limited my response to the two most concerning issues.

Sincerely,

Shar Chun-Lum

January 22, 2018

Joanne Hiramatsu, Director of Planning

Jhiramastu@bchdesign.com

Aloha Ms. Hiramastu,

Please halt further recommendation on two of the proposed actions summarized in the EISPN regarding Ala Moana Regional Park and Magic Island Improvements. The two proposals I refer to are: *"Widening the promenade along the makai side of Ala Moana Park Drive"* and *"Rearranging the parking along the makai side of Ala Moana Park Drive to open the views to the ocean and add loading and unloading zones."*

I have been an Ala Moana Park user since the 1950's when my Dad would take my brother, sister and me on Sundays to swim and play in the sand. As parents, my husband and I took our young sons to Ala Moana Beach on weekends. Now that we are retired, we go to the park several times a week.

Being at the beach so often, I see so many individuals, of all socioeconomic status, using the People's Park. Some are workers who park on the makai side looking at the ocean on their lunch break. Some are families who set up their tents on the grass along the makai parking area to enjoy the day. Some families have older, disabled or very young family members who sit or sleep in their cars while the rest enjoy the beach. People like to park on the makai side so they can easily access their cars rather than leave things on the beach. Families with lots of equipment like strollers, beach chairs, coolers, etc. prefer parking on the Makai side since parking on Mauka side can be hazardous as their keiki sometimes dart out into the road in their excitement to get to the beach. Even using the crosswalk can be a challenge.

In its current state, the sidewalk (or "promenade" as you have referred to it) is sufficient for pedestrians and joggers, who look out for each other. Less safe and probably illegal are the bike and Segway riders, as well as skate boarders, who create a hazard for others. Today, I witnessed a person walking his dog (also illegal in the park) while skateboarding down the sidewalk. If the sidewalk is widened as suggested, it will only encourage more dangerous situations, especially as people who are trying to get to the beach with their "stuff" from the mauka side may be hit by those Bike or Segway riders who may even feel encouraged to ride side by side, given the expanse of the "promenade." Should an accident occur between a jogger or pedestrian and such vehicles, the City may face a lawsuit for having willfully created the conditions for accidents to happen. As a person, I am concerned for the safety of other park users. As a taxpayer, I am not happy to see City funds spent wastefully.

By widening the sidewalk to make it a "promenade," it appears the grassy area and trees will be affected. What will the people who sit on the grass on mats or on beach chairs enjoying the shade of the trees while they read the paper, eat lunch, feed their children, wax their surf boards, or just talk story do? Where do the many families and friends who set up tents on the grassy areas on the makai side for a day of fun, with chairs, food and beach equipment go? I doubt that this would be possible or allowed on the "promenade."

"Rearranging the parking along the Makai side of the park to open the views to the ocean and add loading and unloading zones," appears to be doublespeak way of saying, "We are eliminating makai parking to open the view of the ocean, but it's okay because we will add loading and unloading zones." This is illogical. If you are at the beach, you have a view of the ocean, from the sand or in the water. How does this proposed action improve the experience for park users who want to park on the makai side for a multitude of practical reasons? Who is the audience who will enjoy the open view of the ocean? Is this action to enhance the view for the *"New urban residential developments mauka of the parks"* referred to in the second sentence of 4.1 Purpose and Need for the Project versus people at the beach?

My husband and I are 70 and 67 years old. We are lifetime residents and taxpayers of Hawai'i. An important part of maintaining our health is Stand Up paddling. It is important to us to park on the Makai side of the park, nearest the ocean and the showers to wash off our board and ourselves. Carrying the equipment to and from our truck is not easy for people our age. Parking on the Makai side of the beach is a Godsend. And we are not alone in this sentiment.

The last paragraph of 4.1 Purpose and need for the Project acknowledges that *"the community and current part users expressed the preference to keep the park's character the same." "...Remaining true to its local character as "The People's Park,"* requires recognizing what our people do and want at the park. These two plans go against the people's wishes. This afternoon, I approached a group of about 20 people that I didn't know, enjoying the beach with their tent up along the makai parking area, and mentioned that the Mayor was suggesting widening the sidewalk, and taking away some of makai parking and possibly the grassy area they were on. They all looked surprised and incredulous. One young woman spoke for all of their feelings when she said, "No way! It's great the way it is. Why are they trying to fix something that isn't broken?"

My husband and I have attended every public meeting held by the city to express our wishes about the future of the People's Park. We were assured that our participation was vital for making good decisions. After the second meeting, it seemed dubious. And now, as we plan to attend the January 29th meeting, it is even more disheartening that one of the most important issues of parking is still being manipulated for reasons not of or for the people. How disingenuous was it (and a waste of a million taxpayers' dollars) to ask for our opinions when it appears that some actions were already predetermined?

Please take these points to heart and recommend halting: *"Widening the promenade along the makai side of Ala Moana Park Drive"* and *"Rearranging the parking along the makai side of Ala Moana Park Drive to open the views to the ocean and add loading and unloading zones."* Let's encourage our City to focus on more necessary projects.

Sincerely,

Shar Chun-Lum

Sharlene Chun-Lum

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:16 PM
To: sharstocks@yahoo.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Ms. Chun-Lum:

Thank you for your email dated January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments on the EISPN and provide the following response.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Please note that the description of facilities, in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: S. Sakai <stansakai154@gmail.com>
Sent: Saturday, January 27, 2018 5:35 PM
To: Joanne Hiramatsu
Subject: EISPN for Ala Moana Park and Magic Island Improvements - Comments on proposed parking

Hi Joanne,

I know the deadline for responding to the EISPN was January 22nd, but when we first talked you mentioned that there might be some flexibility on this date. Having had more time to think through the proposed actions, I now have a better understanding of the important issues so I hope you'll include my comments from this email.

My first criticism is the proposed action "Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones." I am 100% against removing the parallel parking along the makai side of Ala Moana Park Drive and replacing them with loading/unloading zones. Secondly, I also have serious public safety concerns on the implementation of perpendicular or diagonal parking stalls on the mauka side.

The only argument in favor of removing the makai parking is to create an 'open ocean view,' but the list of negatives is considerably longer and includes serious public safety risks.

1. The current ocean views, even with the cars parked along the makai side, are more than adequate. People walking on the promenade, sitting on the low concrete wall that travels along the beach, or sitting on the beach already have 100% 'open ocean views.' People who are picnicking, playing ball sports on the Great Lawn, or playing tennis are not interested in an 'open ocean view.' They're involved in their activities.

2. Creating an 'open ocean view' will essentially create a 'scenic drive' that will encourage more people to drive through the park including tour vans and buses. In recent times, more tour vans and even double decker buses, have been coming into the park. All this extra traffic poses risks for pedestrians, impedes the park traffic, and increases the frustration of people trying to enjoy the park. The city should seriously consider banning "ALL" tour vans and especially buses from driving through the park as part of a scenic tour because there are no limits on how many businesses can drive through the park. Without some kind of control, in time, potentially all tours could include a drive through the park.

3. Eliminating the makai side parking will increase the risk of an accident because more people will be crossing the street to get to the beach from the mauka side. Many of these will be carrying beach supplies and equipment, including large paddle boards and surfboards. On windy days, it can get really difficult handling these while crossing the street. And, they'll be making the trip twice during their day at the beach, first toward beach and later back to their cars.

4. Drivers sightseeing through the park will be distracted by views of the ocean, beach, and 'beach bodies' rather that looking out for pedestrians crossing from the mauka side. Kids bolting across the street to get to the beach faster and moving cars with inattentive drivers are a bad mix.

5. Like the situation in Laniakea on Oahu's North Shore, the constant flow of people crossing the highway to look at the turtles brings
traffic to a crawl. The situation could be worse at Ala Moana because
beach goers will be carrying their beach supplies, paddle boards, surfboards, picnic supplies, beach equipment, etc., etc., etc. And, they'll have to do this at least twice, once heading toward the beach and later heading back to their cars.

6. Reversing out of diagonal or perpendicular parking stalling into oncoming traffic is much more dangerous than pulling out from a parallel stall. From a diagonal or perpendicular stall you have to creep out, literally 'praying' that no one is

cruising by, especially a driver who's distracted, perhaps by looking at the 'open ocean view.' For trucks with paddle boards or surfboards sticking out of their beds by a few feet, this gets even more risky.

7. Unloading and loading from the backs of cars, vans, and trucks is much more dangerous with perpendicular and diagonal stalls than from parallel ones. With parallel stalls, one just unloads unto the curb.
With perpendicular or diagonal stalls, you'll have to stand in the flow of traffic. And, at least for a moment, if you are unloading or loading a paddle board or surfboard the board will extend even further into the flow of traffic.

8. Loading/unloading zones on the makai side is impractical and will create problems for beach users. It's a nice conceptual idea, but uninformed and not well thought out. Here are some scenarios which could play out:

> Cars will be lining up waiting to load/unload. This will be worse at those times when most people are packing up and leaving and also on days when people are trying to escape a sudden downpour.
>
> People bring tents and all kinds of things for their day at Ala Moana. Some will take longer to load and unload. Who will police this? Will this frustrate beachgoers enough that some kind of confrontation ensues?
>
> After unloading, someone needs to watch the supplies while the driver leaves to look for parking. On a busy day, the only available parking could be at a far end of the park. This whole process, in reverse, will play out again when the group leaves the park; so much time wasted, so much unnecessary traffic.
>
> From the loading/unloading area, all the supplies will then have to be carried to a beach location. Many will probably setup close to the loading/unloading area rather than haul everything farther away. So, instead of spreading people across the beach, people will tend to be clustered around the loading/unloading zones.

9. Almost all cars these days are wider than previous models. The one shining feature of parallel parking is that it can accommodate wider vehicles. And, people can unload their supplies from the back of their vehicles without having to walk into traffic, as would be the case with diagonal or perpendicular parking stalls.

Lastly, Ala Moana Park has a long history for generations of residents who have fond memories and still cherish the park. That's why it's still so heavily used. All proposed improvements to the park should not destroy this history and the local park culture. From years of experience, the frequent and long-time park users have a very good understanding of how the park functions, more so than designers and planners, especially those from out of state who don't use the park and don't understand the culture of Ala Moana. As such, the opinions of the people should have a significant and dominant bearing on the proposed actions. They know what they want and they know what works for them.

Stan Sakai

Joanne Hiramatsu

From:	S. Sakai <stansakai154@gmail.com>
Sent:	Sunday, January 28, 2018 8:16 AM
To:	Joanne Hiramatsu
Subject:	EISPN for Ala Moana Park and Magic Island Improvements - Comments on proposed parking - LAST revision

Hi Joanne,

Sorry for sending another email, but I wanted to clarify section 6 and a bit of section 8. I just see too many problems with diagonal and perpendicular parking stalls for Ala Moana Park Drive so I wanted to make sure that the issues can be clearly visualized and understood.

The text below is the edited version of my previous email.

Stan

Hi Joanne,

I know the deadline for responding to the EISPN was January 22nd, but when we first talked you mentioned that there might be some flexibility on this date. Having had more time to think through the proposed actions, I now have a better understanding of the important issues so I hope you'll include my comments from this email.

My first criticism is the proposed action "Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones." I am 100% against removing the parallel parking along the makai side of Ala Moana Park Drive and replacing them with loading/unloading zones. Secondly, I also have serious public safety concerns on the implementation of perpendicular or diagonal parking stalls on the mauka side.

The only argument in favor of removing the makai parking is to create an 'open ocean view,' but the list of negatives is considerably longer and includes serious public safety risks.

1. The current ocean views, even with the cars parked along the makai side, are more than adequate. People walking on the promenade, sitting on the low concrete wall that travels along the beach, or sitting on the beach already have 100% 'open ocean views.' People who are picnicking, playing ball sports on the Great Lawn, or playing tennis are not interested in an 'open ocean view.' They're involved in their activities.

2. Creating an 'open ocean view' will essentially create a 'scenic drive' that will encourage more people to drive through the park including tour vans and buses. In recent times, more tour vans and even double decker buses, have been coming into the park. All this extra traffic poses risks for pedestrians, impedes the park traffic, and increases the frustration of people trying to enjoy the park. The city should seriously consider banning "ALL" tour vans and especially buses from driving through the park as part of a scenic tour because there are no limits on how many businesses can drive through the park. Without some kind of control, in time, potentially all tours could include a drive through the park.

3. Eliminating the makai side parking will increase the risk of an accident because more people will be crossing the street to get to the beach from the mauka side. Many of these will be carrying beach supplies and equipment, including large paddle boards and surfboards. On windy days, it can get really difficult handling these while crossing the street. And, they'll be making the trip twice during their day at the beach, first toward beach and later back to their cars.

4. Drivers sightseeing through the park will be distracted by views of the ocean, beach, and 'beach bodies' rather that looking out for pedestrians crossing from the mauka side. Kids bolting across the street to get to the beach faster and moving cars with inattentive drivers are a bad mix.

5. Like the situation in Laniakea on Oahu's North Shore, the constant flow of people crossing the highway to look at the turtles brings
traffic to a crawl. The situation could be worse at Ala Moana because
beach goers will be carrying their beach supplies, paddle boards, surfboards, picnic supplies, beach equipment, etc., etc., etc. And, they'll have to do this at least twice, once heading toward the beach and later heading back to their cars.

6. Reversing out of diagonal or perpendicular parking stalling into oncoming traffic is much more dangerous than pulling out from a parallel stall. From a diagonal or perpendicular stall you have to creep out, literally 'praying' that no one is cruising by, especially a driver who's distracted, perhaps by looking at the 'open ocean view.' If there is another car parked next to you that's blocking your view of the oncoming traffic, it gets extremely dangerous. We've all been there trying to pull out of a stall in a parking lot. It's worse pulling out into a major traffic flow. You have to backup 'blind' until at least
1/2 or 3/4 of your vehicle goes past the adjacent car before you can even begin to see the oncoming traffic. At this point, your car will be in the flow of traffic and traffic flow will stop. For trucks with paddle boards or surfboards sticking out of their beds by a few feet, this gets even more risky.

7. Unloading and loading from the backs of cars, vans, and trucks is much more dangerous with perpendicular and diagonal stalls than from parallel ones. With parallel stalls, one just unloads unto the curb.
With perpendicular or diagonal stalls, you'll have to stand in the flow of traffic. And, at least for a moment, if you are unloading or loading a paddle board or surfboard the board will extend even further into the flow of traffic.

8. Loading/unloading zones on the makai side is impractical and will create problems for beach users. It's a nice conceptual idea, but uninformed and not well thought out. A comparable situation might be
the loading/unloading zones at the airports. When they get busy, these
loading/unloading zones become very congested and traffic flow stops.
Here are some scenarios which could play out if there are loading/unloading zones at Ala Moana:

> Cars will be lining up waiting to load/unload. This will be worse at those times when most people are packing up and leaving and also on days when people are trying to escape a sudden downpour.
>
> People bring tents and all kinds of things for their day at Ala Moana. Some will take longer to load and unload. Who will police this? Will this frustrate beachgoers enough that some kind of confrontation ensues?
>
> After unloading, someone needs to watch the supplies while the driver leaves to look for parking. On a busy day, the only available parking could be at a far end of the park. This whole process, in reverse, will play out again when the group leaves the park; so much time wasted, so much unnecessary traffic.
>
> From the loading/unloading area, all the supplies will then have to be carried to a beach location. Many will probably setup close to the loading/unloading area rather than haul everything farther away. So, instead of spreading people across the beach,

people will tend to be clustered around the loading/unloading zones.

9. Almost all cars these days are wider than previous models. The one shining feature of parallel parking is that it can accommodate wider vehicles. And, people can unload their supplies from the back of their vehicles without having to walk into traffic, as would be the case with diagonal or perpendicular parking stalls.

Lastly, Ala Moana Park has a long history for generations of residents who have fond memories and still cherish the park. That's why it's still so heavily used. All proposed improvements to the park should not destroy this history and the local park culture. From years of experience, the frequent and long-time park users have a very good understanding of how the park functions, more so than designers and planners, especially those from out of state who don't use the park and don't understand the culture of Ala Moana. As such, the opinions of the people should have a significant and dominant bearing on the proposed actions. They know what they want and they know what works for them.

Stan Sakai

Joanne Hiramatsu

From: S. Sakai <stansakai154@gmail.com>
Sent: Wednesday, January 17, 2018 12:16 PM
To: Joanne Hiramatsu
Subject: EISPN for Ala Moana Park and Magic Island Improvements

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Hi Joanne,

We spoke over the phone about a week or so ago. I finally have some time formulate my comments. If anything isn't clear, please feel free to contact me.

Stan Sakai

1. PROMENADE
a) The grassy areas along the promenade is used by many for setting up picnics. Is the intention of the new design to eliminate this?
If not, then people will be hauling their picnic and BBQ supplies from their cars parked on the mauka side of Ala Moana Park Drive. This will impede traffic flow and make it more difficult to people to use the park.

b) If you widen the promenade, what will happen to the trees? If you keep the trees than the promenade will essentially be split into two lanes. This will not actually widen the existing promenade.

c) If the trees are to be kept, will widening the promenade injure or shorten the lives of the trees, which are 'historical' features of the park?

d) On hot days, the concrete and asphalt surfaces in the park can easily burn the feet of adults and kids walking bare footed. If you widen the promenade with more concrete, you're adding more of these 'hot' surfaces and there won't be any nearby cooler grass surfaces for people to escape to.

2. PARKING

a) One problem with removing the parking on the makai side of Ala Moana Drive is that many more pedestrians will be crossing the street. This
will: (1)impede the flow of traffic and (2)increase the risk of a pedestrian getting hit by a car, more so after dark. The street lighting in the areas where pedestrians are expected to cross the street should be bright enough for drivers to easily see pedestrians.

b) Keep the parking on the makai side of Ala Moana Drive along the raised picnic area. These would provide convenient parking for those picnicking in the raised area and also for those using the Great Lawn.
This wouldn't affect the 'open views of the ocean' because the ocean isn't visible from these parking stalls.

c) Keep the parking on the Ewa side of Ala Moana Drive just as you enter the park. These stalls will provide parking for those using the Ewa end of the park and they do not affect the 'open views of the ocean.'

d) Design the perpendicular and diagonal parking stalls wide enough to accommodate larger vehicles, which are common at the park, and also to give people enough room to easily unload their vehicles without hitting adjacent ones.

e) Perhaps, create additional parking on the Diamond Head side of McCoy pavilion. These would provide parking for the tennis courts, pavilion, and also for the Great Lawn.

3. BEACH EROSION

a) Efforts should be made to reduce the wave action along the sandy beach shoreline to minimize beach erosion. Otherwise, replenishing the sand might be just ongoing. There used to be large rocks outside of the swim channel. I was told that many of these fell into the channel after one of the hurricanes. Perhaps setting up structures along the reef edge of the channels, like the former rocks, might diminish the wave action at the beach.

b) Efforts should be made to address potential problems that might occur due to sea level rising.

4. INVASIVE PLANTS
The autograph trees in the center of the keyhole parking area are on the list of invasive trees. They and other invasive plants should be identified and removed. There might be some mangrove trees in the Ewa pond that need to evaluated.

http://hawaii-agriculture.com/autograph-trees-are-invading-hawaiis-forests/

http://www.hear.org/misc/pdfs/misc_invasiveplantexamples.pdf

5. PARK TRAFFIC
The park exit at the Atkinson Street side needs to be improved.
The right turn lane from Ala Moana Park Drive onto Ala Moana Blvd is too short. Cars that want to make this turn need to que with cars going straight into Atkinson. To lengthen this right turn lane the historic arch that spans the sidewalk will need to be relocated.

6.BEACH FACILITIES

a) More charcoal fire pits should be provided and these should be visible at dusk and into the early evening when picnickers are cleaning up.

b) A shower/wash station somewhere near the entrance to the Keyhole parking would be a convenient feature. This will give beach-goers a place to rinse off before proceeding to their cars.

c) Especially on windy days, trash from the shoreline is being blown into ocean, sometimes from the trash cans and sometimes from trash strewn in the park and along the beach. This should be addressed.

7. PARK MAINTENANCE COSTS
An assessment of the maintenance costs of any improvements made to the park should be done. Projects that involve significant maintenance costs, especially short-term and ongoing, might not make sense.

8. SIGNAGE

a) Signs describing the rules of the park need to made more obvious.
Current signs are too high and too small. The better parks throughout the US have clear signage that helps the public understand the park rules to keep them safe and to protect the park.

b) At the outdoor showers that drain into the sand, clearly visible and readable signs should be posted stating that the use using soaps and shampoos is not allowed.

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:18 PM
To: stansakai154@gmail.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Sakai,

Thank you for your emails dated January 17, 27, and 28, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses.

Beach Promenade, Parking Reconfiguration, and Park Traffic

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Additional traffic calming facilities such as speed bumps and signage can be installed on the park road, if necessary, and speed tables can be constructed to ensure all drivers, moped riders, and bikers within the park drive with caution. As stated in Section 5.15, Circulation, Traffic, and Parking, of the EISPN, a traffic study will be conducted to help determine needs for additional traffic calming facilities. The study will determine the baseline traffic conditions and evaluate the proposed options of the project.

Beach Erosion

As stated in Section 5.6, Marine Environment, of the EISPN, sand replenishment is proposed, but that work will require additional studies to determine viable options and permits needed for implementation.

Invasive Plants

As stated in Section 5.5, Terrestrial Biological Resources, of the EISPN, a biological survey and tree inventory will be completed for the project area with descriptions of invasive plants, significant trees, and

endangered species. These studies will facilitate the landscaping plans by identifying unhealthy trees that need to be removed and locations for new trees to be planted.

Beach Facilities / Signage

The City concurs with the need for more maintenance. The Draft Environmental Impact Statement (DEIS) will discuss proposed repair and maintenance of the beach and park in more detail. Some of the corrective actions are already being implemented through increased staffing for maintenance and security.

Park Maintenance Costs

Cost estimates for the overall project improvements will be provided in the DEIS. Proposed projects will be prioritized, and not all projects will be implemented in the near future.

Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for the project; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized. Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Rebecca Choi

From: Steve Kalilimoku <stekal2000@gmail.com>
Sent: Sunday, February 04, 2018 7:38 PM
To: Rebecca Choi; Joanne Hiramatsu
Subject: Re: Ala Moana Regional Park and Magic Island Improvements Environmental Impact Statement Preparation Notice - Public Comment Period

Aloha Rebecca,

I looked over the proposal and it is to general in detail for any feedback at this time. When details are available, please forward the details and then I can better respond to your request

Regards,
Steve Kalilimoku

On Tue, Dec 26, 2017 at 3:24 PM, Rebecca Choi <rchoi@bchdesign.com> wrote:

Environmental Impact Statement Preparation Notice (EISPN)

Ala Moana Regional Park and Magic Island Improvements

Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025

Honolulu, Oʻahu, Hawaiʻi

Aloha Participant,

On behalf of the City and County of Honolulu, Department of Design and Construction, we respectfully request your review and comment on the EISPN for the proposed park and facilities improvements at Ala Moana Regional Park and Magic Island. As one of the oldest and most visited parks in the State, the new improvements are intended to restore, revitalize, enhance, and improve the grounds and facilities to extend their longevity.

On December 13, 2017, the EISPN was submitted to the Office of Quality Control (OEQC) under Chapter 343, Hawaiʻi Revised Statutes, requirements. By that submittal, a notice of the EISPN's availability was published in the OEQC's December 23, 2017 issue of *The Environmental Notice*. Publication of that notice initiates a public review period of 30 days. You may review the EISPN document on the OEQC's website:

http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-12-23-OA-EISPN-Ala-Moana-Regional-Park-Improvements.pdf

We would like to receive your comments or input in writing by January 22, 2018 to one of the following addresses below:

Mailing Address: Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, HI 96819
Attention: Joanne E. Hiramatsu

Email Address: Joanne E. Hiramatsu
jhiramatsu@bchdesign.com

We thank you for your time and consideration in participating in this review process. If you have any questions, please contact the undersigned at 521-5361, extension 309, or at jhiramatsu@bchdesign.com.

Sincerely yours,

BELT COLLINS HAWAII LLC

Joanne E. Hiramatsu

Director of Planning

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:19 PM
To: 'stekal2000@gmail.com'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, O'ahu, Hawai'i

Dear Mr. Kalilimoku,

Thank you for your email dated February 4, 2018 regarding the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comment. The DEIS will provide more detail. Please note that the description of facilities in the EISPN is preliminary. The City will proceed with design after plans are reviewed by the public and agencies.

As requested, we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu

From: kkukuisausage@hawaii.rr.com
Sent: Monday, January 22, 2018 7:45 AM
To: Joanne Hiramatsu
Subject: Makai side

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Joanne,
I been frequently going to Ala Moana beach park for 50 some what years. I also now take my child there to swim and I love to surf at the spots that Ala Moana provides.
The idea of taking the Makai parking away for a view of the ocean will create other problems like, cars driving through will be looking at the scenery which will create a traffic jam and be dangerous for pedestrians crossing the street. Besides it will have to be totally enforced like the airport arrival pick up area. Everyone would be stopping to take pictures, unload, and even just to stop by watch the fireworks. Weekend picnickers will be on the grass area and obstruct the view.
There should be more important issues instead of working to improve the view.
We need more tennis courts and a bathroom facility should be close by, we should have more showers, ant infestation should be taking care of, and most important is testing the quality of the ocean and finding out how to eliminate the bacteria problems that's occurring.
Ala Moana has always been the main gathering for the locals. Don't ruin it with all the modern hype.
Mahalo,
Steven Horio

Sent from my iPhone

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:21 PM
To: kkukuisausage@hawaii.rr.com
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Horio,

Thank you for your email dated January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments regarding parking on the makai side of Ala Moana Park Drive.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is now evaluating and considering the feasibility of other options for this area. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for parking; these options will be outlined in more detail in the Draft Environmental Impact Statement (DEIS). The City will proceed with design after the EIS has been finalized.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Additionally, you expressed support for the following Park improvements:

- More tennis courts and nearby bathrooms
- More showers
- Ant extermination
- Focus on water quality and water bacteria problem

The City is currently increasing staffing to improve maintenance in the parks. While the City is concerned about water quality, sampling of the offshore waters is the responsibility of the State of Hawaiʻi Department of Health (DOH). The City follows the lead of DOH when questions of water quality arise.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to submit comments on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

2

Joanne Hiramatsu

From:	Sylvia Hayashi <sylviah@gentryhawaii.com>
Sent:	Tuesday, January 02, 2018 3:05 PM
To:	Joanne Hiramatsu
Subject:	Ala Moana Beach Park

Dear Ms. Hiramatsu,

Thank you for the opportunity to submit feedback re the proposed improvements to Ala Moana Beach Park.

I frequently and consistently visit and utilize Ala Moana Beach Park (since 1969), primarily for the purposes of surfing and walking/running. Ala Moana Beach Park ("the Park") has been my primary spot for physical exercise, as well as a place where I meet friends to relax, enjoy the beach, and socialize.

I appreciate the city's desire to make improvements to the Park. However, I am not optimistic that these improvements will be properly maintained, and over time, will result in money wasted, and those improvements in disrepair. This is currently evident throughout the Park (buckled sidewalks and walking paths, non-functional irrigation, or irrigation that must be turned on manually, compaction where no grass will grow, broken toilets, broken stall doors, broken showers [which park users regularly buy parts for and repair themselves]). To be fair, I have noticed improvements to the bathrooms (more lighting, fewer non-working toilets) in the last 2 years.

Unfortunately, there way more examples of the city (state, too) pouring money into well-intentioned improvements, then failing to maintain them. Whether that maintenance is performed by government employees or contracted thru the private sector doesn't seem to matter – bottom line is that proper maintenance and/or enforcement thereof appears to be minimal, so those improvements deteriorate. Should any improvements be considered, I sincerely hope that more attention is paid to the **proper** maintenance thereof. It is disheartening to see improvements deteriorate when proper maintenance could have not only preserved their appearance and functionality, but more importantly, our monetary investment.

Another of my concerns is with the placement of the promenade. Perhaps I missed something, but it wasn't clear to me as to its location or size/width. I don't think a structure or pathway that obstructs clear access to the beach would necessarily be a positive. I think there needs to be clarification and/or specifics on the promenade issue.

Thank you for your time and consideration.

Very truly yours,
Sylvia Hayashi

Joanne Hiramatsu

From:	Joanne Hiramatsu
Sent:	Wednesday, June 06, 2018 4:22 PM
To:	'sylviah@gentryhawaii.com'
Subject:	Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Ms. Hayashi,

Thank you for your email dated January 2, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction, we have reviewed your comments and provide the following responses below.

The City concurs with the need for more maintenance. As an effort to resolve this issue, the City increased the number of park staff who are responsible for upkeep and maintenance of the facilities.

The Draft Environmental Impact Statement (DEIS) will include detailed plans for the existing beach promenade. The City intends to improve beach access for all and to follow its commitment to the Complete Streets policy. The policy (Ordinance 12-15) was passed as a law in 2012. The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is now evaluating and considering the feasibility of other options for this area. Please note that the description of facilities in the EISPN is preliminary and that several options are being considered for parking; these options will be outlined in more detail in the DEIS. The City will proceed with design after the EIS has been finalized.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Your concerns will be included in the DEIS and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,
BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

Joanne Hiramatsu cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

From: William Kaeo <william.kaeo@wilsonschoolhawaii.org>
Sent: Monday, January 22, 2018 8:34 AM
To: Joanne Hiramatsu
Subject: Ala Moana Beach Park Improvements

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Joanne,

I am writing this letter in regards to the proposed improvements to Ala Moana Beach Park. I strongly feel that the widening of the promenade along the makai side of Ala Moana Park Drive is NOT NEEDED. Keep the parallel parking on the makai side of Ala Moana Park Drive. There is enough of an ocean view even with the parked vehicles and eliminating this parking will create many problems for park users, including public safety issues. A dining facility in McCoy Pavillion is NOT NEEDED. A playground in the park is NOT NEEDED. Please make more showers and cleaner bathrooms. Thank you.

Aloha,

--
William Kaeo
Mayor John H. Wilson Elementary
School Counselor
808-733-4740

Joanne Hiramatsu

From: Joanne Hiramatsu
Sent: Wednesday, June 06, 2018 4:24 PM
To: 'william.kaeo@wilsonschoolhawaii.org'
Subject: Ala Moana Regional Park EIS

Environmental Impact Statement Preparation Notice (EISPN)
Ala Moana Regional Park and Magic Island Improvements
Tax Map Key: (1) 2-3-37:001, 002, 022,023, 025
Honolulu, Oʻahu, Hawaiʻi

Dear Mr. Kaeo,

Thank you for your email dated January 22, 2018 commenting on the EISPN for the Ala Moana Regional Park and Magic Island Improvements. As the consultant for the City and County of Honolulu (City), Department of Design and Construction. The following are responses to your concerns.

The proposed promenade and changes in parking were advanced because of Honolulu's experience with Complete Streets and the efforts to make Honolulu an Age Friendly City, with lessons learned from other cities. The Complete Streets policy (Ordinance 12-15) was passed as a law in 2012. Based on the comments that were received from the EISPN comment period and objections raised by some of the participants at the public meeting, the City is evaluating and considering the feasibility of other options for this area.

Currently, the grassy areas on the promenade are often claimed by families and groups with tents and barbeque grills. Other beachgoers and recreational users find it difficult to pass through these areas. Also, the current use of the promenade grass results in damage to the grass and irrigation lines by tent stakes and picnicking equipment. Finally, the trees are harmed by park users disposing charcoal at the bases; this practice slowly burns the trees and eventually kills them.

The City must comply with new Rules Relating to Water Quality adopted by the Department of Planning and Permitting that went into effect August 16, 2017. The proposed design of the promenade is predicated on compliance with these rules. Adoption of these rules is one of the requirements of the City's National Pollutant Discharge Elimination System Permit No. HI S000002.

Renovation plans for the McCoy Pavilion's kitchen facilities are for the City and other organizations that plan yearly special events. These events include popular festivals such as the Greek Festival and the Scottish Festival.

A site for the playground has been selected behind the Diamond Head concession area, but no immediate plans have been developed.

The City concurs with the need for improved maintenance, and has increased staffing for better maintenance and cleaner comfort stations. These facilities are currently undergoing major renovations.

Your concerns will be included in the Draft Environmental Impact Statement (DEIS) and we will notify you when the DEIS is available for public review. You will be able to comment on the DEIS during a 45-day period after it is published.

Sincerely yours,

BELT COLLINS HAWAII LLC
Joanne E. Hiramatsu
Director of Planning

cc: Ms. Elaine Morisato, City and County of Honolulu, Department of Design and Construction

PAGE IS INTENTIONALLY LEFT BLANK

APPENDIX B

Traffic Evaluation Ala Moana Regional Park

Honolulu, O‘ahu, Hawai‘i June 2018

PAGE IS INTENTIONALLY LEFT BLANK

Draft

TRAFFIC EVALUATION

ALA MOANA REGIONAL PARK

HONOLULU, OAHU, HAWAII

June 2018

Draft

TRAFFIC EVALUATION

ALA MOANA REGIONAL PARK

Honolulu, Oahu, Hawaii

June 2018

Prepared For:
Belt Collins Hawaii LLC
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Prepared By:
WSP USA
American Savings Bank Tower
1001 Bishop Street Suite 2400
Honolulu, HI 96813
(808) 531-7094

WSP Reference Number:

16596A

Draft

TABLE OF CONTENTS

Draft

Appendices

Figures

Tables

Draft

I. INTRODUCTION

Ala Moana Regional Park (AMRP) is an approximately 119-acre public park located on the island of Oahu owned by the City & County of Honolulu (the City). The park is man-made, having been constructed in the 1930s when the area's swampy marshlands were repurposed beginning in the late 1920's. The beach was created in the 1950's. As shown in **Figure 1**, the park is bounded by Kewalo Basin to the west, Ala Moana Boulevard to the north, Ala Wai Boat Harbor to the east, and the Pacific Ocean to the South.

While the beach is AMRP's primary attraction, the park is also used for its recreational amenities, including tennis courts, lawn bowling, pedestrian facilities, and open spaces. AMRP has two vehicular entrances from Ala Moana Boulevard at Kamakee Street and Atkinson Drive, located at the east and west ends of the park, respectively. In addition to these two intersections, pedestrian access at Queen Street and Piikoi Street are utilized by pedestrians and bicycle traffic. Ala Moana Boulevard is serviced by multiple bus routes which connect the park to Waikiki, downtown, and beyond.

Per the Ala Moana Regional Park Environmental Impact Statement Preparation Notice (EISPN), "the City is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park (AMRP) and the Magic Island Peninsula (Magic Island) grounds and facilities as a result of a recent master plan process." Major improvements being considered include "sand replenishment, renovations to existing structures, improving pond edges, widening access over the drainage canal along Ala Moana Boulevard, creating a wider promenade along Ala Moana Park Drive, and reconfiguring the parking." The AMRP Conceptual Plan is shown in **Figure 2**. From a traffic perspective, the expansion of the parking facilities will allow for more park users to access the park facilities.

The purpose of this traffic evaluation is to assess the impact of AMRP's proposed improvements and to identify measures to efficiently handle traffic and pedestrian operations. The Year 2028 was chosen as an analysis year, representing a 10-year horizon. Existing and projected Year 2028 traffic conditions were analyzed at key roadway intersections located within the study area to determine the project's impact.

FIGURE 1

PROJECT LOCATION MAP

Ala Moana Regional Park
June 2018

WSP USA

FIGURE 2

PROPOSED SITE PLAN

Ala Moana Regional Park
June 2018

WSP USA

Draft

II. EXISTING CONDITIONS

A. EXISTING ROADWAY SYSTEM

Ala Moana Boulevard provides regional and sub-regional access to the Ala Moana area. Within the study area, Kamakee Street, Queen Street/Queen Lane, Piikoi Street, and Atkinson Drive provide mauka-makai access. Kamakee Street and Atkinson Drive provide direct access to the park. Additional east-west collector roadways such as Auahi Street and Queen Street provide access within the Ward area.

Ala Moana Boulevard

Ala Moana Boulevard is a principle arterial roadway which is oriented in the east-west direction between downtown and Waikiki. It transitions from Nimitz Highway to Ala Moana Boulevard just west of Bishop Street and continues east into Waikiki, where it terminates at Kalakaua Avenue. In the vicinity of the Victoria-Ward development, Ala Moana Boulevard is configured with 6 lanes (3 in each direction) and a raised median. The posted speed limit is 35 miles per hour (mph). On-street parking in the eastbound direction is allowed between 10 PM and 4 AM in select locations.

Kamakee Street

Kamakee Street is a 4-lane collector road which runs mauka-makai from Kapiolani Boulevard to Ala Moana Boulevard. It intersects Ala Moana Boulevard directly opposite Ala Moana Park Drive and provides mauka-makai mobility in this area of Kakaako. The posted speed limit on Kamakee is 25 mph. On-street parking is allowed on Kamakee Street between Queen Street and Waimanu Street during off-peak time periods.

Atkinson Drive

Atkinson Drive is a 6-lane collector road which runs mauka-makai from Kapiolani Boulevard to Ala Moana Boulevard. It intersects Ala Moana Boulevard directly opposite Ala Moana Park Drive and provides access to the Diamond Head side of Ala Moana Shopping Center as well as the Hawaii Convention Center. The posted speed limit is 30 mph. On-street parking is allowed opposite Kona Street during off-peak time periods.

1. Transit Facilities

Public transportation is provided by TheBus which is managed by Oahu Transit Services (OTS) on behalf of the City Department of Transportation Services (DTS). The following bus routes service Ala Moana Boulevard:

- 42 – Ewa Beach to Waikiki
- 65 – Kaneohe to Ala Moana
- 56 – Kaneohe to Ala Moana
- 20 – Aiea to Diamond Head via the Airport
- 57 – Waimanalo to Ala Moana
- 19 – Hickam Air Force Base to Diamond Head via the Airport
- 57A – Waimanalo to Ala Moana
- 55 – Haleiwa to Ala Moana
- 8 – Ala Moana to Waikiki
- 6 – Pauoa to University of Hawaii at Manoa via Ala Moana
- 88A – Ala Moana/North Shore via Kahekili

Bus stops are located along Ala Moana Boulevard at Kamakee Street, Queen Street, and fronting Ala Moana Shopping Center.

2. Pedestrian and Bike Facilities

Sidewalks are provided along both sides of Ala Moana Boulevard, Kamakee Street, Queen Street, Piikoi Street, and Atkinson Drive. Along the Ala Moana Boulevard corridor, crosswalks are provided across the minor street approaches and across one of the Ala Moana Boulevard approaches. AMRP contains an approximately 2-3 mile shared-use path as well as sidewalks along Ala Moana Park Drive.

Currently, cyclists on Ala Moana Boulevard, Kamakee Street, Queen Street, Piikoi Street, and Atkinson Drive share the travel lanes with vehicles. Within the park, bicyclists can use the shared-use path that circulates the main AMRP and Magic Island areas according to the Hawaii Bicycling League Oahu Bike Map.

3. Public Parking

AMRP provides 934 public parking stalls. 356 of those stalls are parallel parking along Ala Moana Park Drive, 469 are located on Magic Island, 77 are located at McCoy Pavilion, and 32 are located at Canoe Halau.

B. EXISTING INTERSECTION GEOMETRY AND CONTROL

Existing traffic conditions were observed and documented, and operations of study area signalized intersections were analyzed. The existing intersection operational characteristics established base conditions for comparison to future operations with and without the project.

Traffic-related data were collected at the Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive and Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersections. Traffic turning movement volumes, field observations of intersection operations, and general intersection characteristics were noted. Geometric lane configurations, intersection traffic control, and traffic signal phasing and timing data were collected. Intersection geometry inventory included the following:

- Number of lanes and lane widths;
- Crosswalk locations;
- Signalized intersection locations;
- Entrance and driveway locations;
- Posted speed limits.

These data were used as inputs into the intersection analyses. The existing lane configurations are illustrated in **Figure 3**. It should be noted that at the Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection, the mauka-bound Ala Moana Park Drive approach was modified from left/through and right turn lanes to left and through/right lanes. The new lane configuration is reflected in the existing and future analysis.

C. EXISTING TRAFFIC VOLUMES

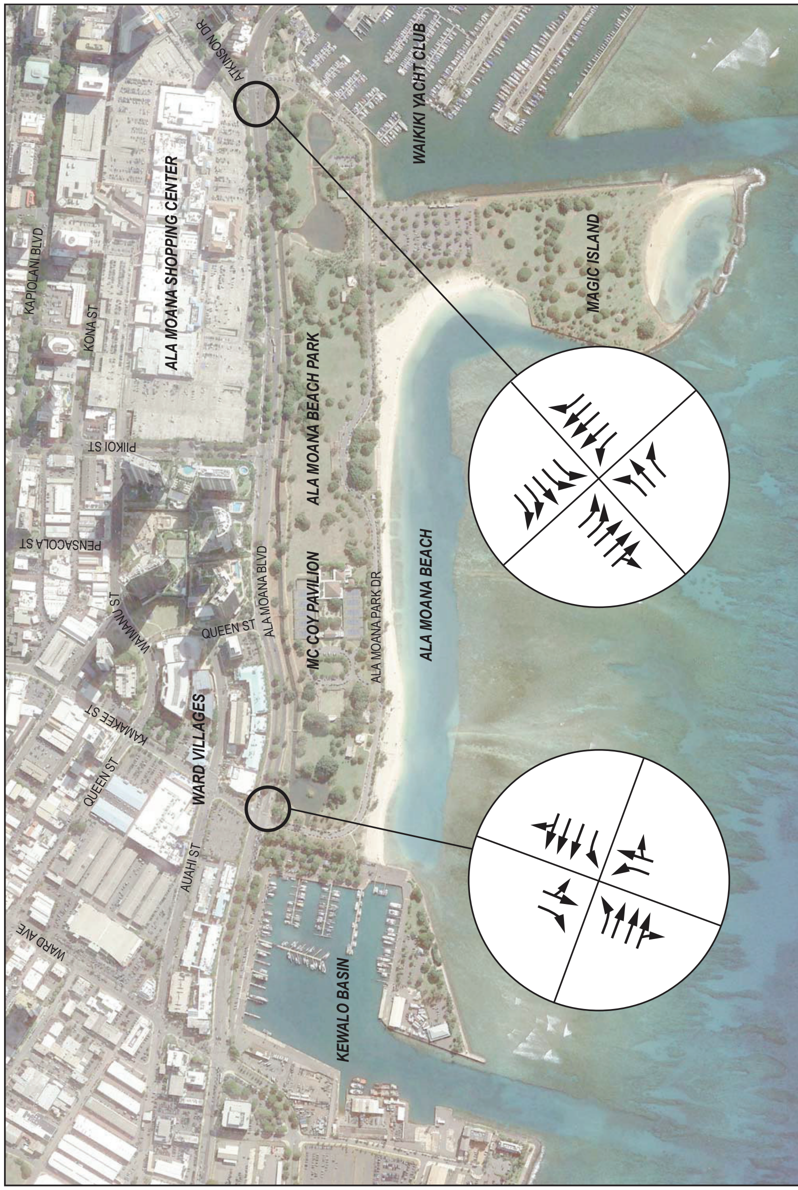
AM, PM, and Saturday mid-day peak period traffic turning movement counts were conducted at these two study area intersections:

- Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive and
- Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive.

Data collection was conducted on the following dates:

- Wednesday, March 15, 2017;
- Thursday, March 16, 2017; and
- Saturday, March 25, 2017.

Traffic volumes obtained from the data collection were compared to historical Hawaii Department of Transportation (HDOT) traffic counts for consistency. Supplemental counts were conducted in April 2018 and compared to the 2017 data. The updated counts were found to be in line with the 2017 counts; therefore, the 2017 counts were assumed to be representative of existing 2018 conditions. Spot pedestrian counts were also conducted in April 2018 to examine pedestrian behavior at park accesses.



EXISTING LANE CONFIGURATIONS

FIGURE 3

WSP USA

Ala Moana Regional Park
June 2018

The AM and PM peak hours were found to occur from 7:15 to 8:15 AM and from 4:15 to 5:15 PM, respectively. The Saturday mid-day peak hour was found to occur from 2:00 PM to 3:00 PM. **Figure 4** shows the existing peak hour traffic volumes for each turning movement at these intersections. Existing traffic count data can be found in **Appendix A.**

D. EXISTING INTERSECTION OPERATIONS

The intersections were analyzed with Synchro 9 using the methodologies for signalized intersections outlined in the *2000 Highway Capacity Manual (HCM)*. Operating conditions at an intersection by approach are expressed as a qualitative measure known as Level of Service (LOS) ranging from A to F. LOS A represents free-flow operations with low delay, while LOS F represents congested conditions with relatively high delay. The overall intersection LOS is a weighted average of the LOS of individual traffic movement groups. **Appendix B** has more detailed definitions of intersection LOS. Field observations were performed at selected intersections to verify the results of the intersection analyses.

Table 1 shows the existing conditions level of service (LOS) for each intersection. The Ala Moana Boulevard intersections are generally characterized by medium to long cycle lengths of 150-170 seconds. This leads to higher delays, particularly for minor street approaches and major street left turns. **Appendix C** contains the Synchro worksheets.

<u>*Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive*</u>

The intersection of Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive is signalized with protected Ala Moana Boulevard left turns. A single phase is provided for the Kamakee Street/Ala Moana Park Drive traffic which includes a pedestrian crossing phase using the crosswalk across the east Ala Moana Boulevard leg of the intersection. The cycle length was 155-165 seconds.

The Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection operates at LOS C overall during the AM, PM, and Saturday mid-day peak hours. Ala Moana Boulevard through movements operate at LOS C or better during all peak periods. Ala Moana Boulevard left turns operate at LOS E. Mauka-bound Ala Moana Park Drive and makai-bound Kamakee Street turning movements operate at LOS D or better. As expected, traffic into and out of the park is lowest during the AM peak and highest during the Saturday mid-day peak. Vehicles were generally observed to clear within one cycle for all movements. The pedestrian phase across Ala Moana Boulevard was observed to be triggered semi-regularly, conflicting with the makai-bound Kamakee Street left turn. Approximately 2/3 of the pedestrians crossing Ala Moana Boulevard were observed to be associated with the park.

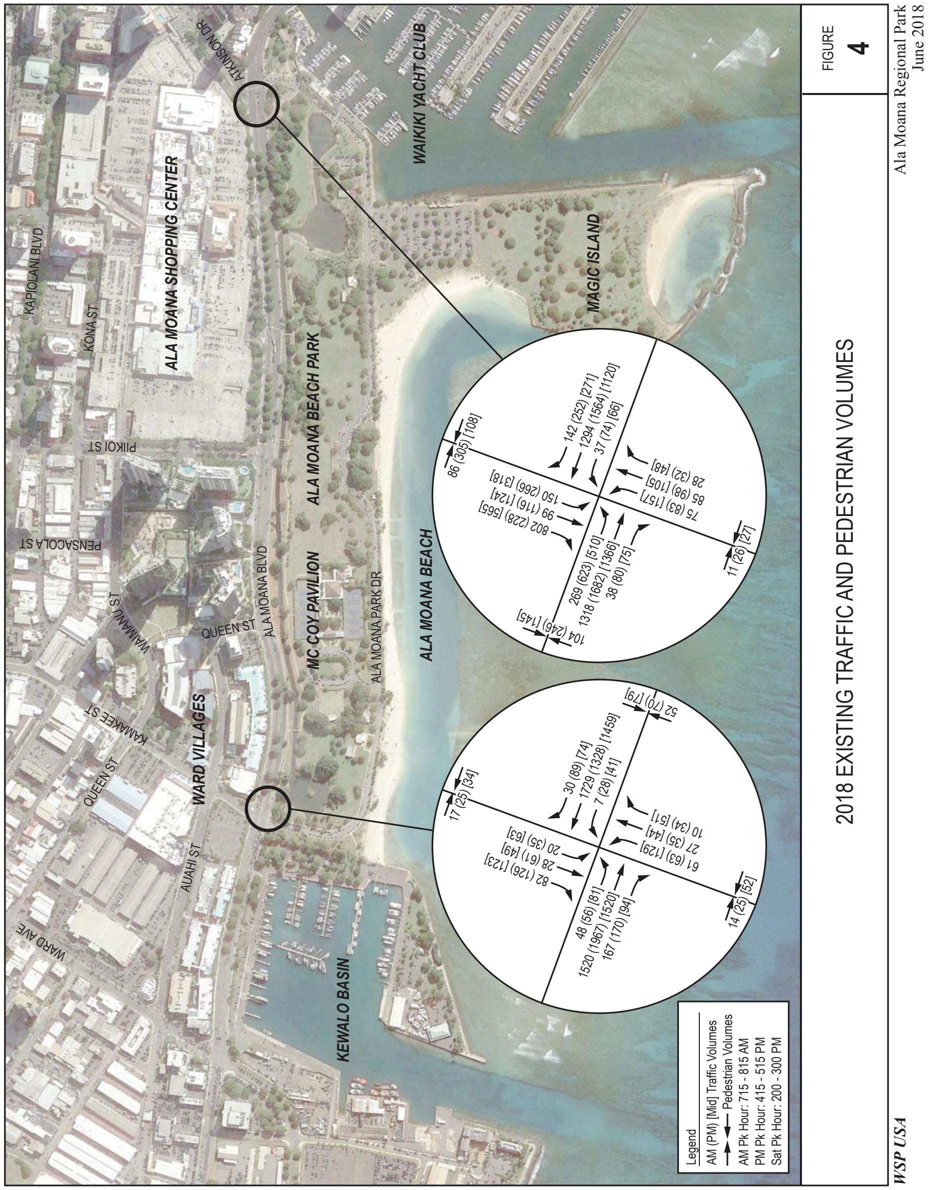


Table 1 Existing Level of Service

HCM 2000	AM		PM		Saturday	
	LOS	Delay	LOS	Delay	LOS	Delay
Ala Moana Blvd/Kamakee Dr/Ala Moana Park Dr	**C**	**22**	**C**	**24**	**C**	**27**
Ala Moana Blvd EB Left	E	71	E	78	E	60
Ala Moana Blvd EB Through-Right	B	18	C	23	C	23
Ala Moana Blvd WB Left	E	67	E	73	E	65
Ala Moana Blvd WB Through-Right	C	23	B	18	C	25
Ala Moana Park Dr NB Left	D	36	D	48	D	42
Ala Moana Park Dr NB Through-Right	C	34	D	45	C	36
Kamakee St SB Left-Through	C	35	D	47	D	38
Kamakee St SB Right	C	34	D	44	C	34
Ala Moana Blvd/Atkinson Dr/Ala Moana Park Dr	**D**	**42**	**D**	**47**	**D**	**45**
Ala Moana Blvd EB Left	E	71	F	97	F	87
Ala Moana Blvd EB Through-Right	C	33	C	29	C	33
Ala Moana Blvd WB Left	E	73	E	72	F	85
Ala Moana Blvd WB Through	D	41	D	44	D	43
Ala Moana Blvd WB Right	C	31	C	31	C	35
Ala Moana Park Dr NB Left	E	70	E	61	E	67
Ala Moana Park Dr NB Left-Through	E	74	E	65	E	67
Ala Moana Park Dr NB Right	E	60	D	55	D	52
Atkinson Dr SB Left	D	43	E	65	D	48
Atkinson Dr SB Through	D	44	E	62	D	46
Atkinson Dr SB Right	D	42	C	34	C	31

NB- northbound, SB-southbound, EB- eastbound, WB- westbound

Delay expressed in seconds per vehicle.

Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive

The intersection of Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive is signalized with protected Ala Moana Boulevard left turns. Split phasing is provided for the Atkinson Drive approaches. The makai-bound Atkinson right turn is given a protected phase with no right turns allowed on red. Pedestrians cross with the makai-bound Atkinson Drive approach phase. The cycle length was 150-170 seconds.

The Ala Moana Boulevard/Atkinson Drive intersection operates at LOS D overall during the AM, PM, and Saturday mid-day peak hours. Ala Moana Boulevard through movements operate at LOS D or better during all peak periods. Ala Moana Boulevard left turns operate at LOS E-F. Mauka-bound Ala Moana Park Drive and makai-bound Kamakee Street turning movements generally operate at LOS D-E. Much of the delay is caused by the Atkinson Drive/Ala Moana Park Drive split phasing. Traffic into and out of the park is lowest during the AM peak and highest during the Saturday mid-day peak. Vehicles were generally observed to clear within one cycle for all movements. The pedestrian phase across Ala Moana Boulevard was observed to be triggered regularly. Approximately 1/4 of the pedestrians crossing Ala Moana Boulevard were associated with the park which is lower than at the Kamakee Street intersection. Pedestrians crossing Ala Moana Boulevard at the Atkinson Drive intersection tend to be associated with Ala Moana Shopping Center and/or Waikiki.

E. EXISTING TRAFFIC OPERATIONS SUMMARY

Overall, the Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection operates at an acceptable LOS during peak hours. The Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersection has a higher delay, which is to be expected as the intersection acts as a gateway to Waikiki. The higher delay is related to high demand for the eastbound left turn movement and the split phasing at the intersection.

III. YEAR 2028 TRAFFIC CONDITIONS

The Year 2028 was used as the basis for future traffic analysis representing a 10-year horizon for the completion of on-site modifications. The No Build scenario represents Year 2028 background conditions without any modifications to the Ala Moana Regional Park.

A. PROJECTED ROADWAY SYSTEM

1. Transit Facilities

In addition to the existing bus transit routes serving the corridor, the City is constructing a 20-mile long rail rapid transit system which will connect East Kapolei to Ala Moana Shopping Center. The project is projected to be completed by 2025. Park users using rail transit would use the Ala Moana Center Station and access AMRP on foot, likely at the Piikoi Street intersection.

2. Future Pedestrian and Bike Facilities

As mentioned earlier, sidewalks are provided along both sides of Ala Moana Boulevard, Kamakee Street, Queen Street, Piikoi Street, and Atkinson Drive with crosswalks provided at each intersection. AMRP contains an approximately 2-3 mile shared-use path as well as sidewalks along Ala Moana Park Drive. The AMRP master plan proposes to improve pedestrian facilities within the park, especially along the beachfront promenade and Magic Island. In addition, per the AMRP Preferred Master Plan, "the enhancement of various AMRP entry points will allow for improved pedestrian and bike access along the length of the park."

According to HDOT's Bike Plan Hawaii and the City's Oahu Bike Plan, the installation of bike lanes on Ala Moana Boulevard between Nimitz Highway and Kalakaua Boulevard are a Priority I proposed project. In addition, bike routes are proposed on Kamakee Street, Queen Street, and Piikoi Street across from AMRP.

B. YEAR 2028 BACKGROUND TRAFFIC

Base Year 2028 traffic volumes were derived using existing Ala Moana Boulevard traffic volumes. Historical HDOT traffic volumes near Atkinson Drive were available for most years between 2009 and 2016 with the nearest counting stations being located on Ala Moana Boulevard on either side of Atkinson Drive. Recent traffic counts show a stagnant or declining average daily traffic, therefore a conservative 0.5% annual growth rate was applied. A summary of the growth rate calculations is included in **Appendix D**. The Ward Villages Transportation Master Plan was used as a reference for future traffic volumes at the Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection.

In addition, the Kamehameha Schools Kaiaulu ‘o Kakaako Master Plan was consulted and used to help generate the 2028 background traffic.

Year 2028 peak hour traffic volumes without project are shown in **Figure 5**.

C. PROJECTED YEAR 2028 INTERSECTION OPERATIONS WITHOUT PROJECT

The intersections were analyzed using Synchro 9. Cycle lengths and signal timing were optimized and adjusted. **Table 2** shows the Year 2028 Without Project level of service (LOS) for each intersection.

Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive

The Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection is projected to operate at LOS C overall during the AM, PM, and Saturday mid-day peak hours. Ala Moana Boulevard through movements are projected to operate at LOS C or better during all peak periods. Ala Moana Boulevard left turns generally are projected to operate at LOS E-F. Mauka-bound Ala Moana Park Drive and makai-bound Kamakee Street turning movements are projected to operate at LOS D-E.

Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive

The Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersection is projected to operate at LOS D overall during the AM and Saturday mid-day peak hours and at LOS E during the PM peak hour. Ala Moana Boulevard through movements are projected to operate at LOS D or better during all peak periods except for the westbound PM peak through. Ala Moana Boulevard left turns are projected to operate at LOS E-F. Mauka-bound Ala Moana Park Drive and makai-bound Kamakee Street turning movements are generally projected to operate at LOS D-F.

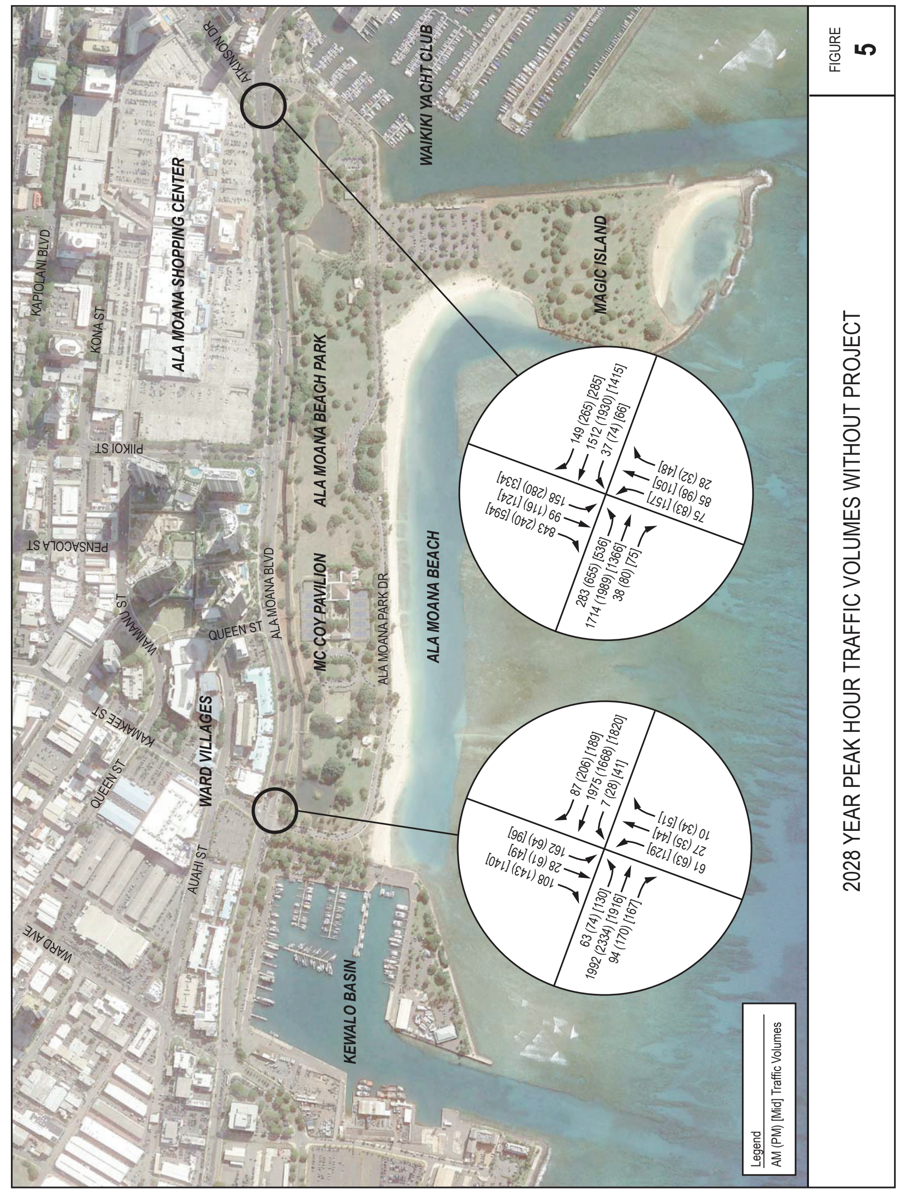


Table 2 Year 2028 Level of Service Without Project

HCM 2000	AM		PM		Saturday	
	LOS	Delay	LOS	Delay	LOS	Delay
Ala Moana Blvd/Kamakee Dr/Ala Moana Park Dr	**C**	**24**	**C**	**27**	**C**	**29**
Ala Moana Blvd EB Left	F	94	F	115	E	74
Ala Moana Blvd EB Through-Right	B	17	C	25	C	23
Ala Moana Blvd WB Left	F	110	F	80	E	78
Ala Moana Blvd WB Through-Right	C	22	B	20	C	26
Ala Moana Park Dr NB Left	E	56	E	55	E	58
Ala Moana Park Dr NB Through-Right	D	48	D	51	D	45
Kamakee St SB Left-Through	E	65	E	58	E	53
Kamakee St SB Right	D	49	D	53	D	44
Ala Moana Blvd/Atkinson Dr/Ala Moana Park Dr	**D**	**46**	**E**	**61**	**D**	**53**
Ala Moana Blvd EB Left	F	80	F	115	F	95
Ala Moana Blvd EB Through-Right	D	37	D	35	D	40
Ala Moana Blvd WB Left	E	79	E	73	F	81
Ala Moana Blvd WB Through	D	43	E	77	D	55
Ala Moana Blvd WB Right	C	30	C	32	D	40
Ala Moana Park Dr NB Left	E	77	E	62	F	83
Ala Moana Park Dr NB Left-Through	F	82	E	65	F	82
Ala Moana Park Dr NB Right	E	66	E	56	E	63
Atkinson Dr SB Left	D	48	E	65	E	56
Atkinson Dr SB Through	D	48	E	61	D	54
Atkinson Dr SB Right	D	51	C	34	D	36

NB- northbound, SB- southbound, EB- eastbound, WB- westbound
Delay expressed in seconds per vehicle.

D. YEAR 2028 WITHOUT PROJECT TRAFFIC OPERATIONS SUMMARY

Overall, the Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection is projected to operate at an acceptable LOS during peak hours. The Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersection is projected to operate at a higher delay due to regional growth with certain individual turning movements operating at LOS E or F.

E. PROJECTED YEAR 2028 INTERSECTION OPERATIONS WITH PROJECT

The Build scenario represents Year 2028 base conditions combined with the proposed AMRP modifications. Overall, drastic changes to AMRP are not being considered. The City is proposing to increase the total number of public parking stalls from 934 to 1088. The bulk of the additional parking stalls will come from converting the McCoy Pavilion keyhole area into a parking lot.

1. Trip Generation

Projected park-related inbound and outbound trips were calculated using parking projections. **Table 3** summarizes the AMRP-generated trips.

Table 3 Trip Generation Summary

	In	Out	Total
AM Peak Hour	45	42	87
PM Peak Hour	78	51	129
Saturday Peak Hour	77	80	157

Trips generated expressed in vehicles per hour

2. Trip Distribution and Assignment

Distribution of new trips associated with the Ala Moana Regional Park were distributed using existing traffic distributions. The total Year 2028 peak hour traffic volumes with project are shown in **Figure 6**, which represent the project-generated traffic combined with projected 2028 background traffic.

The projected 2021 intersection LOS with project are shown in **Table 4**.

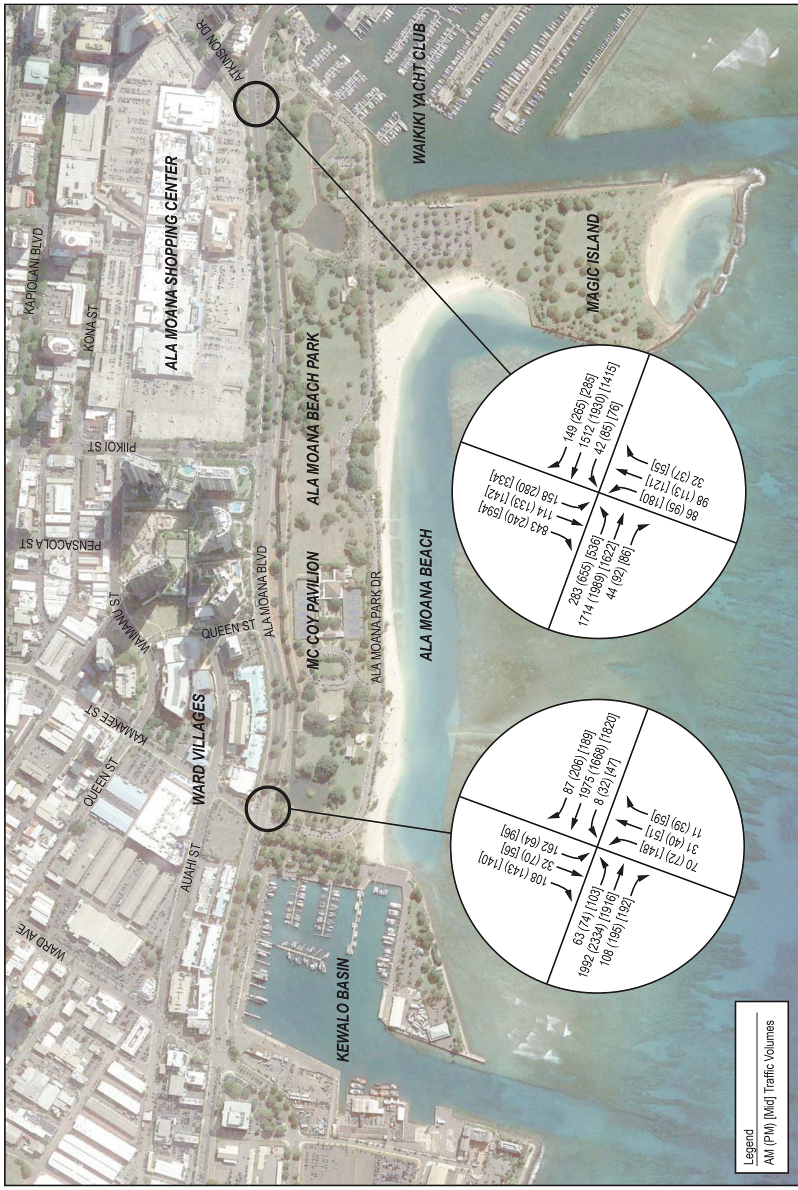


FIGURE 6

2028 YEAR PEAK HOUR TRAFFIC VOLUMES WITH PROJECT

Ala Moana Regional Park
June 2018

WSP USA

Table 4 Year 2028 Level of Service With Project

HCM 2000	AM		PM		Saturday	
	LOS	Delay	LOS	Delay	LOS	Delay
Ala Moana Blvd/Kamakee Dr/Ala Moana Park Dr	**C**	**25**	**C**	**28**	**C**	**30**
Ala Moana Blvd EB Left	F	92	F	117	E	76
Ala Moana Blvd EB Through-Right	B	18	C	26	C	22
Ala Moana Blvd WB Left	F	81	F	82	F	86
Ala Moana Blvd WB Through-Right	C	22	B	20	C	27
Ala Moana Park Dr NB Left	E	58	E	58	E	68
Ala Moana Park Dr NB Through-Right	D	48	D	52	D	47
Kamakee St SB Left-Through	E	65	E	59	E	57
Kamakee St SB Right	D	48	D	53	D	45
Ala Moana Blvd/Atkinson Dr/Ala Moana Park Dr	**D**	**47**	**E**	**62**	**D**	**54**
Ala Moana Blvd EB Left	F	80	F	115	F	95
Ala Moana Blvd EB Through-Right	D	38	D	36	D	41
Ala Moana Blvd WB Left	E	79	E	76	F	86
Ala Moana Blvd WB Through	D	43	E	77	D	55
Ala Moana Blvd WB Right	C	30	C	32	D	40
Ala Moana Park Dr NB Left	E	79	E	63	F	91
Ala Moana Park Dr NB Left-Through	F	88	E	68	F	89
Ala Moana Park Dr NB Right	E	66	E	56	E	63
Atkinson Dr SB Left	D	48	E	65	E	56
Atkinson Dr SB Through	D	49	E	64	D	55
Atkinson Dr SB Right	D	51	C	34	D	36

NB- northbound, SB- southbound, EB- eastbound, WB- westbound
Delay expressed in seconds per vehicle.

Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive

The Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection is projected to operate at LOS C overall during the AM, PM, and Saturday mid-day peak hours. Ala Moana Boulevard through movements are projected to operate at LOS C or better during all peak periods. Ala Moana Boulevard left turns generally are projected to operate at LOS E-F. Mauka-bound Ala Moana Park Drive and makai-bound Kamakee Street turning movements are projected to operate at LOS D-E.

Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive

The Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersection is projected to operate at LOS D overall during the AM and Saturday mid-day peak hours and at LOS E during the PM peak hour. Ala Moana Boulevard through movements are projected to operate at LOS D or better during all peak periods except for the westbound PM peak through. Ala Moana Boulevard left turns are projected to operate at LOS E-F. Mauka-bound Ala Moana Park Drive and makai-bound Kamakee Street turning movements are generally projected to operate at LOS D-F.

F. YEAR 2028 WITH PROJECT TRAFFIC OPERATIONS SUMMARY

The most significant traffic-generating aspects of the AMRP master plan are the increased public parking stall count. This will result in a moderate increase in vehicular traffic compared to existing conditions. Modifications to pedestrian and bike facilities will make the park friendlier to these types of land uses but are not expected to have a significant impact on traffic operations.

As shown in **Tables 2 and 4**, the project is not projected to have a significant impact on the overall delay at the Kamakee Street and Atkinson Drive intersections with Ala Moana Boulevard.

IV. CONCLUSION AND RECOMMENDATIONS

The City is proposing to restore, revitalize, enhance, and improve the AMRP and the Magic Island grounds and facilities. The expansion of the parking facilities will allow for more park users to access the park facilities. Existing and projected Year 2028 traffic conditions were analyzed at key roadway intersections located within the study area.

A. CONCLUSION

Based on the results of the projected 2028 conditions, it was determined that the roadway network can accommodate the project's traffic impacts at the Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive and Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersections.

B. RECOMMENDATIONS

Removal of Makai-bound Left Turn at Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive

With an emphasis on pedestrian and bicycle modes of transportation within the park, it will be important to ensure safe passage for pedestrians into and out of the park. The Ala Moana Boulevard/Kamakee Street/Ala Moana Park Drive intersection has one crosswalk across Ala Moana Boulevard at the east leg of the intersection. Pedestrians using the crosswalk must contend with conflicting makai-bound Kamakee Street left turns. It is recommended that the removal of the left turning movement be examined, with the makai-bound Kamakee Street approach being modified to provide a through lane and a right turn lane. Removing the makai-bound left turning vehicles would improve vehicular access into the park via Kamakee Street. Detoured vehicles would likely use the Ala Moana Boulevard/Queen Street intersection.

A more formal study would need to be conducted, as the Kamakee Street approach is not a part of the AMRP project.

Pedestrian Island at Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive

There are existing crosswalks across 3 legs of the Ala Moana Boulevard/Atkinson Drive/Ala Moana Park Drive intersection. Pedestrians needing to cross multiple approaches are expected to wait at the pedestrian islands located on the Ala Moana Shopping Center and AMRP corners of the intersection. The shopping center pedestrian island is significantly larger than the AMRP island and can comfortably hold far more pedestrians. It is recommended that the AMRP pedestrian island on the southwest corner be expanded as much as possible.

Pedestrian and Bicycle Facilities

Ensure that AMRP pedestrian facilities are compliant with the Americans with Disabilities Act (ADA) guidelines and, where appropriate, increase pedestrian safety by providing traffic calming measures such as raised crosswalks and bulb-outs. Provide secure and convenient bicycle parking throughout AMRP. Coordinate with the State and City on the continued development of State and City bike plans.

Transit Facilities

Coordinate with HDOT, DTS, OTS on public transit services, especially regarding bus stop placement and access.

APPENDICES

Draft

Appendix A Traffic Count Data

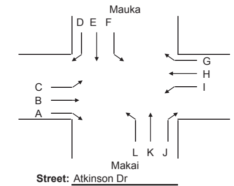
AM COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr

Date: 3/16/2017

By: Nick & David

Weather: Clear



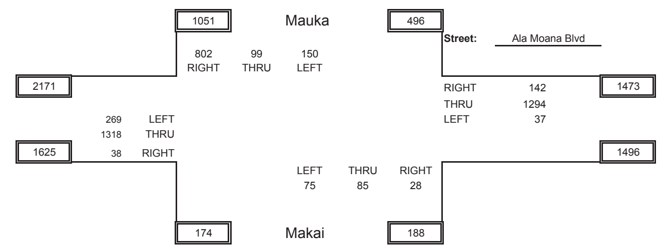
Street: Ala Moana Blvd

Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
6:15 AM - 6:30 AM	7	162	16	86	24	29	10	167	9	0	7	7	524	2997
6:30 AM - 6:45 AM	19	168	26	129	31	38	21	212	4	4	11	10	673	3472
6:45 AM - 7:00 AM	7	231	30	178	29	37	15	256	10	5	10	12	820	3826
7:00 AM - 7:15 AM	10	263	61	200	20	45	18	328	7	6	9	13	980	4146
7:15 AM - 7:30 AM	7	289	55	168	25	33	24	334	15	8	20	21	999	4337
7:30 AM - 7:45 AM	13	317	43	168	27	34	38	326	9	7	24	21	1027	
7:45 AM - 8:00 AM	8	347	76	243	18	45	36	324	3	8	17	15	1140	
8:00 AM - 8:15 AM	10	365	95	223	29	38	44	310	10	5	24	18	1171	
Phf	0.731	0.903	0.708	0.825	0.853	0.833	0.807	0.969	0.617	0.875	0.885	0.893	Peak	Phf
7:15 AM - 8:15 AM	38	1318	269	802	99	150	142	1294	37	28	85	75	4337	0.926

Peak Hour

7:15 AM - 8:15 AM

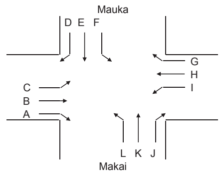


Street: Atkinson Dr

PARSONS
BRINCKERHOFF

AM COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St
Date: 3/16/2017
By: Jodi & Selena
Weather: Clear

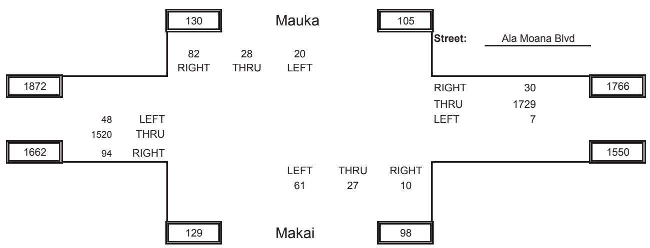


Street: Ala Moana Blvd
Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
6:15 AM - 6:30 AM	23	237	9	12	7	6	1	203	3	1	2	6	510	2645
6:30 AM - 6:45 AM	24	245	16	13	4	4	8	277	1	2	4	7	605	3032
6:45 AM - 7:00 AM	25	294	11	14	8	7	3	311	2	0	1	13	689	3362
7:00 AM - 7:15 AM	29	361	15	18	6	6	8	385	0	2	5	6	841	3580
7:15 AM - 7:30 AM	21	374	13	22	3	9	5	426	0	3	9	12	897	3656
7:30 AM - 7:45 AM	24	391	12	16	9	4	5	451	1	2	7	13	935	
7:45 AM - 8:00 AM	19	372	8	22	6	3	11	439	3	4	4	16	907	
8:00 AM - 8:15 AM	30	383	15	22	10	4	9	413	3	1	7	20	917	
Phf	0.783	0.972	0.800	0.932	0.700	0.556	0.682	0.958	0.583	0.625	0.750	0.763	Peak	Phf
7:15 AM - 8:15 AM	94	1520	48	82	28	20	30	1729	7	10	27	61	3656	0.978

Peak Hour

7:15 AM - 8:15 AM

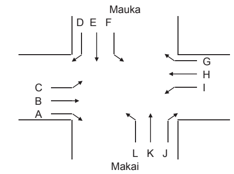


Street: Ala Moana Blvd
Street: Kamakee St

PARSONS
BRINCKERHOFF

PM COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr
Date: 3/15/2017
By: Nick & David
Weather: Clear

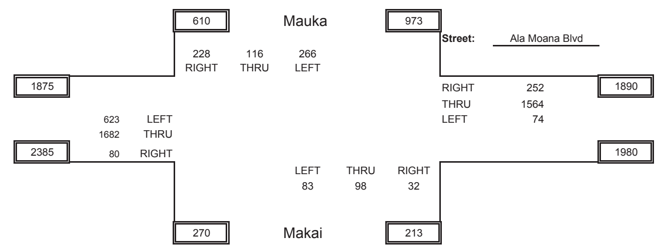


Street: Ala Moana Blvd
Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:15 PM - 3:30 PM	0	0	0	0	0	0	64	302	19	8	56	52	501	3954
3:30 PM - 3:45 PM	30	359	133	55	29	48	95	345	18	26	27	18	1183	4841
3:45 PM - 4:00 PM	11	350	154	34	36	70	67	311	19	16	21	13	1102	4910
4:00 PM - 4:15 PM	15	332	142	44	36	74	53	361	9	19	75	8	1168	5035
4:15 PM - 4:30 PM	15	394	161	54	26	60	66	521	23	13	26	29	1388	5098
4:30 PM - 4:45 PM	20	379	158	64	31	73	69	381	26	9	25	17	1252	4904
4:45 PM - 5:00 PM	17	473	148	54	26	57	62	339	9	6	19	17	1227	4291
5:00 PM - 5:15 PM	28	436	156	56	33	76	55	323	16	4	28	20	1231	
5:15 PM - 5:30 PM	26	362	141	51	36	72	88	323	23	17	36	19	1194	
5:30 PM - 5:45 PM	7	137	35	8	5	14	52	310	6	5	25	35	639	
Phf	0.714	0.889	0.967	0.891	0.879	0.875	0.913	0.750	0.712	0.615	0.875	0.716	Peak	Phf
4:15 PM - 5:15 PM	80	1682	623	228	116	266	252	1564	74	32	98	83	5098	1.018

Peak Hour

4:15 PM - 5:15 PM

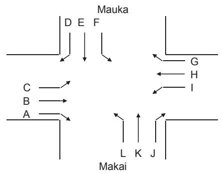


Street: Ala Moana Blvd
Street: Atkinson Dr

PARSONS
BRINCKERHOFF

PM COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St
Date: 3/15/2017
By: Jodi & Selena
Weather: Clear

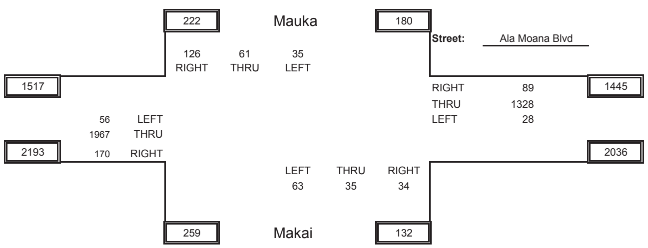


Street: Ala Moana Blvd
Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:15 PM - 3:30 PM	23	444	22	29	13	17	10	330	8	6	8	18	928	3827
3:30 PM - 3:45 PM	46	478	17	34	15	14	18	344	4	6	7	9	992	3964
3:45 PM - 4:00 PM	54	432	7	27	20	16	11	304	2	6	9	21	909	3918
4:00 PM - 4:15 PM	55	515	16	32	20	7	20	297	8	7	5	16	998	4022
4:15 PM - 4:30 PM	56	481	16	33	15	5	34	385	7	12	7	14	1065	3992
4:30 PM - 4:45 PM	30	481	12	28	21	7	17	304	11	8	7	20	946	3909
4:45 PM - 5:00 PM	38	520	14	27	13	11	20	329	5	9	13	14	1013	3951
5:00 PM - 5:15 PM	46	485	14	38	12	12	18	310	5	5	8	15	968	
5:15 PM - 5:30 PM	35	502	12	36	20	14	18	300	6	7	12	20	982	
5:30 PM - 5:45 PM	43	510	8	30	13	7	15	317	10	10	6	19	988	
Phf	0.759	0.946	0.875	0.829	0.726	0.729	0.654	0.862	0.636	0.708	0.673	0.788	Peak	Phf
4:15 PM - 5:15 PM	170	1967	56	126	61	35	89	1328	28	34	35	63	3992	0.985

Peak Hour

4:15 PM - 5:15 PM

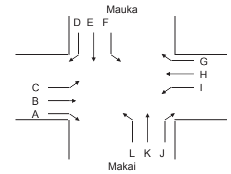


Street: Ala Moana Blvd
Street: Kamakee St

PARSONS
BRINCKERHOFF

Saturday COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr
Date: 3/25/2017
By: Nick & David
Weather: Clear

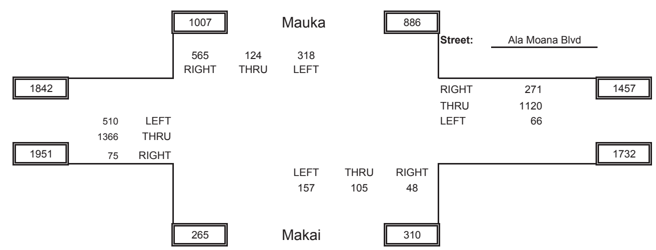


Street: Ala Moana Blvd
Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
12:00 PM - 12:15 PM	31	260	117	135	39	55	33	287	16	11	22	33	1039	4117
12:15 PM - 12:30 PM	26	296	111	180	22	48	44	282	7	10	26	41	1093	4102
12:30 PM - 12:45 PM	22	265	110	152	34	45	32	297	9	6	35	39	1046	4017
12:45 PM - 1:00 PM	26	260	96	130	40	55	35	239	10	8	17	23	939	4043
1:00 PM - 1:15 PM	13	259	109	147	37	61	44	256	14	27	31	26	1024	4125
1:15 PM - 1:30 PM	24	274	119	119	28	53	55	256	17	16	18	29	1008	4263
1:30 PM - 1:45 PM	17	277	99	149	22	61	48	314	14	10	28	33	1072	4424
1:45 PM - 2:00 PM	19	249	104	153	36	86	56	263	8	12	18	17	1021	4566
2:00 PM - 2:15 PM	14	327	138	147	26	76	80	271	11	11	29	32	1162	4725
2:15 PM - 2:30 PM	19	340	124	141	39	84	64	275	20	7	25	31	1169	
2:30 PM - 2:45 PM	20	373	138	134	27	81	63	287	12	20	16	43	1214	
2:45 PM - 3:00 PM	22	326	110	143	32	77	64	287	23	10	35	51	1180	
Phf	0.852	0.916	0.924	0.961	0.795	0.946	0.847	0.976	0.717	0.600	0.750	0.770	Peak	Phf
1:00 PM - 2:00 PM	75	1366	510	565	124	318	271	1120	66	48	105	157	4725	0.973

Peak Hour

1:00 PM - 2:00 PM



Street: Ala Moana Blvd
Street: Atkinson Dr

PARSONS
BRINCKERHOFF

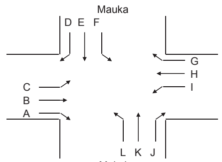
Saturday COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St

Date: 3/25/2017

By: Sal & Selena

Weather: Clear



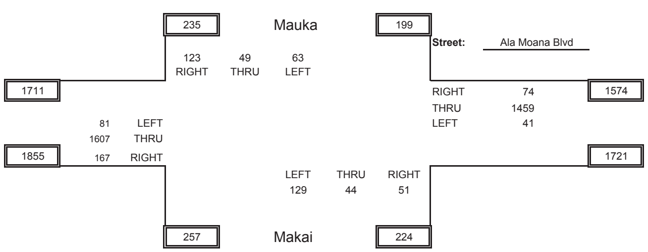
Street: Ala Moana Blvd

Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
12:00 PM - 12:15 PM	37	410	29	31	14	17	15	386	9	19	9	23	999	3763
12:15 PM - 12:30 PM	52	389	13	28	11	8	17	336	6	13	12	30	915	3666
12:30 PM - 12:45 PM	59	369	21	32	12	13	18	382	13	6	6	24	955	3672
12:45 PM - 1:00 PM	56	357	27	41	13	17	20	316	11	4	12	20	894	3634
1:00 PM - 1:15 PM	44	354	18	31	10	14	19	353	9	14	8	28	902	3706
1:15 PM - 1:30 PM	34	412	20	25	8	11	19	340	7	10	12	23	921	3807
1:30 PM - 1:45 PM	37	364	17	41	13	14	14	355	11	11	10	30	917	3851
1:45 PM - 2:00 PM	55	396	20	35	7	11	27	368	7	7	7	26	966	3886
2:00 PM - 2:15 PM	40	463	21	31	13	19	20	329	9	12	9	37	1003	3888
2:15 PM - 2:30 PM	41	376	19	26	11	18	21	397	5	15	6	30	965	
2:30 PM - 2:45 PM	45	392	22	35	11	11	15	356	12	10	13	30	952	
2:45 PM - 3:00 PM	41	376	19	31	14	15	18	377	15	14	16	32	968	
Phf	0.928	0.868	0.920	0.879	0.875	0.829	0.881	0.919	0.683	0.850	0.688	0.872	Peak	Phf
2:00 PM - 3:00 PM	167	1607	81	123	49	63	74	1459	41	51	44	129	3888	0.969

Peak Hour

2:00 PM - 3:00 PM



Street: Kamakee St

PARSONS
BRINCKERHOFF

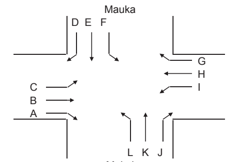
PM COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr.

Date: 4/26/2018

By: David

Weather: Sunny



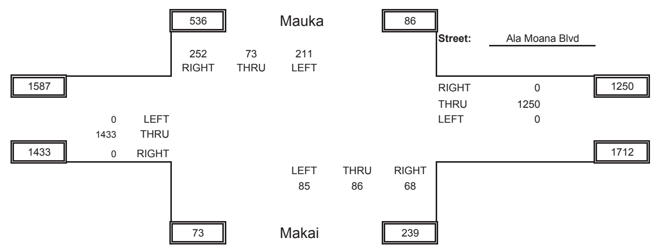
Street: Ala Moana Blvd

Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	917
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1807
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2751
4:15 PM - 4:30 PM	0	353	0	76	14	46	0	353	0	24	26	25	917	3458
4:30 PM - 4:45 PM	0	374	0	56	27	62	0	311	0	19	23	18	890	2541
4:45 PM - 5:00 PM	0	424	0	61	14	52	0	338	0	15	19	21	944	1651
5:00 PM - 5:15 PM	0	282	0	59	18	51	0	248	0	10	18	21	707	
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
Phf	#DIV/0!	0.845	#DIV/0!	0.829	0.676	0.851	#DIV/0!	0.885	#DIV/0!	0.708	0.827	0.850	Peak	Phf
4:15 PM - 5:15 PM	0	1433	0	252	73	211	0	1250	0	68	86	85	3458	0.916

Peak Hour

4:15 PM - 5:15 PM

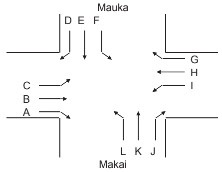


Street: Atkinson Dr

PARSONS
BRINCKERHOFF

PM COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St
Date: 4/26/2018
By: Phil
Weather: Sunny



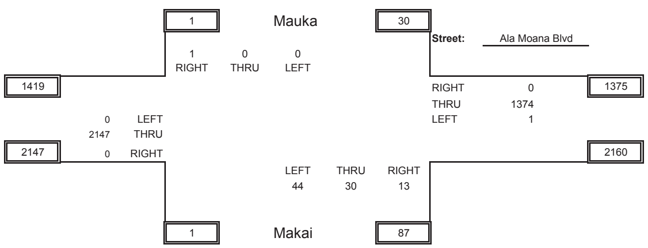
Street: Ala Moana Blvd

Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	916
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1832
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2749
4:15 PM - 4:30 PM	0	514	0	0	0	0	0	383	0	6	4	9	916	3610
4:30 PM - 4:45 PM	0	557	0	1	0	0	0	332	1	4	9	12	916	2694
4:45 PM - 5:00 PM	0	539	0	0	0	0	0	361	0	0	8	9	917	1778
5:00 PM - 5:15 PM	0	537	0	0	0	0	0	298	0	3	9	14	861	
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
Phf	#DIV/0!	0.964	#DIV/0!	0.250	#DIV/0!	#DIV/0!	#DIV/0!	0.897	0.250	0.542	0.833	0.786	Peak	Phf
4:15 PM - 5:15 PM	0	2147	0	1	0	0	0	1374	1	13	30	44	3610	0.984

Peak Hour

4:15 PM - 5:15 PM

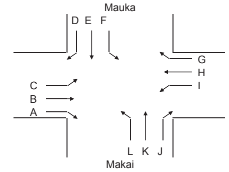


Street: Kamakee St

PARSONS
BRINCKERHOFF

AM COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr
Date: 3/16/2017
By: Nick & David
Weather: Clear



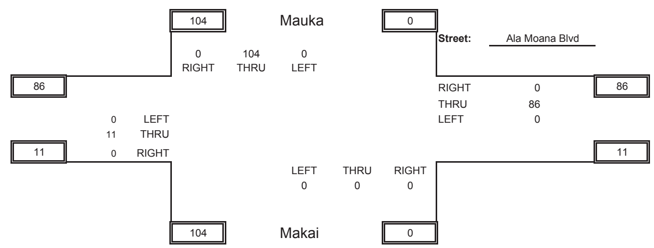
Street: Ala Moana Blvd

Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
6:15 AM - 6:30 AM	0	1	0	0	16	0	0	9	0	0	0	0	26	112
6:30 AM - 6:45 AM	0	0	0	0	10	0	0	0	0	0	0	0	10	144
6:45 AM - 7:00 AM	0	4	0	0	28	0	0	0	0	0	0	0	32	190
7:00 AM - 7:15 AM	0	3	0	0	24	0	0	17	0	0	0	0	44	211
7:15 AM - 7:30 AM	0	6	0	0	34	0	0	18	0	0	0	0	58	201
7:30 AM - 7:45 AM	0	4	0	0	22	0	0	30	0	0	0	0	56	
7:45 AM - 8:00 AM	0	0	0	0	35	0	0	18	0	0	0	0	53	
8:00 AM - 8:15 AM	0	1	0	0	13	0	0	20	0	0	0	0	34	
Phf	#DIV/0!	0.458	#DIV/0!	#DIV/0!	0.743	#DIV/0!	#DIV/0!	0.717	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:15 AM - 8:15 AM	0	11	0	0	104	0	0	86	0	0	0	0	201	0.866

Peak Hour

7:15 AM - 8:15 AM

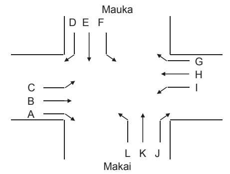


Street: Atkinson Dr

PARSONS
BRINCKERHOFF

AM COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St
Date: 3/16/2017
By: Jodi & Selena
Weather: Clear



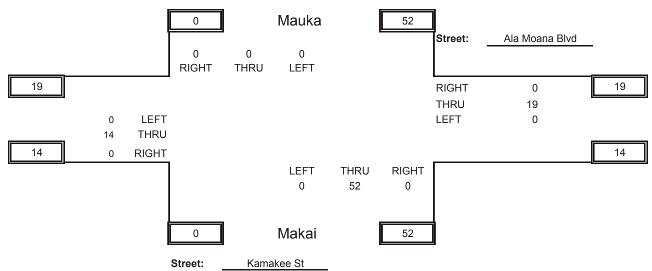
Street: Ala Moana Blvd

Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
6:15 AM - 6:30 AM	0	4	0	0	0	0	0	4	0	0	37	0	45	133
6:30 AM - 6:45 AM	0	5	0	0	0	0	0	9	0	0	25	0	39	122
6:45 AM - 7:00 AM	0	6	0	0	0	0	0	4	0	0	25	0	35	105
7:00 AM - 7:15 AM	0	3	0	0	0	0	0	3	0	0	8	0	14	82
7:15 AM - 7:30 AM	0	4	0	0	0	0	0	8	0	0	22	0	34	85
7:30 AM - 7:45 AM	0	3	0	0	0	0	0	8	0	0	11	0	22	
7:45 AM - 8:00 AM	0	5	0	0	0	0	0	1	0	0	6	0	12	
8:00 AM - 8:15 AM	0	2	0	0	0	0	0	2	0	0	13	0	17	
Phf	#DIV/0!	0.700	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.594	#DIV/0!	#DIV/0!	0.591	#DIV/0!	Peak	Phf
7:15 AM - 8:15 AM	0	14	0	0	0	0	0	19	0	0	52	0	85	0.966

Peak Hour

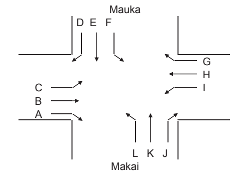
7:15 AM - 8:15 AM



PARSONS
BRINCKERHOFF

PM COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr
Date: 3/15/2017
By: Nick & David
Weather: Clear



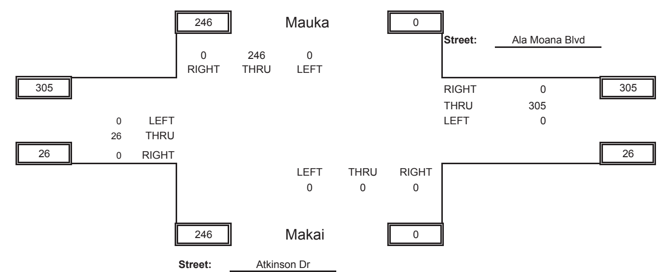
Street: Ala Moana Blvd

Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	58	0	0	0	0	58	509
3:30 PM - 3:45 PM	0	31	0	0	58	0	0	78	0	0	0	0	167	624
3:45 PM - 4:00 PM	0	10	0	0	81	0	0	58	0	0	0	0	149	626
4:00 PM - 4:15 PM	0	30	0	0	55	0	0	50	0	0	0	0	135	572
4:15 PM - 4:30 PM	0	20	0	0	71	0	0	82	0	0	0	0	173	577
4:30 PM - 4:45 PM	0	2	0	0	78	0	0	89	0	0	0	0	169	562
4:45 PM - 5:00 PM	0	0	0	0	54	0	0	41	0	0	0	0	95	492
5:00 PM - 5:15 PM	0	4	0	0	43	0	0	93	0	0	0	0	140	
5:15 PM - 5:30 PM	0	12	0	0	54	0	0	92	0	0	0	0	158	
5:30 PM - 5:45 PM	0	0	0	0	10	0	0	89	0	0	0	0	99	
Phf	#DIV/0!	0.325	#DIV/0!	#DIV/0!	0.788	#DIV/0!	#DIV/0!	0.820	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
4:15 PM - 5:15 PM	0	26	0	0	246	0	0	305	0	0	0	0	577	0.854

Peak Hour

4:15 PM - 5:15 PM



PARSONS
BRINCKERHOFF

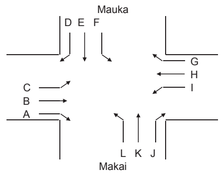
PM COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St

Date: 3/15/2017

By: Jodi & Selena

Weather: Clear



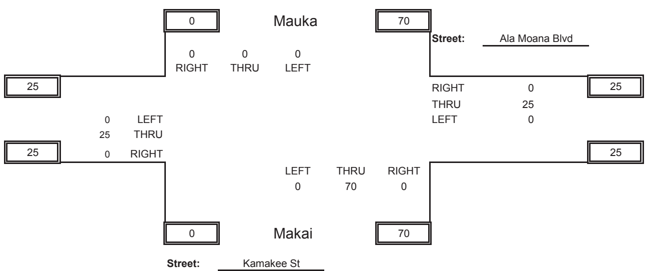
Street: Ala Moana Blvd

Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:15 PM - 3:30 PM	0	2	0	0	0	0	0	1	0	0	12	0	15	105
3:30 PM - 3:45 PM	0	10	0	0	0	0	0	9	0	0	19	0	38	101
3:45 PM - 4:00 PM	0	6	0	0	0	0	0	8	0	0	24	0	38	100
4:00 PM - 4:15 PM	0	2	0	0	0	0	0	0	0	0	12	0	14	100
4:15 PM - 4:30 PM	0	4	0	0	0	0	0	4	0	0	3	0	11	120
4:30 PM - 4:45 PM	0	9	0	0	0	0	0	12	0	0	16	0	37	139
4:45 PM - 5:00 PM	0	5	0	0	0	0	0	2	0	0	31	0	38	142
5:00 PM - 5:15 PM	0	7	0	0	0	0	0	7	0	0	20	0	34	
5:15 PM - 5:30 PM	0	3	0	0	0	0	0	4	0	0	23	0	30	
5:30 PM - 5:45 PM	0	8	0	0	0	0	0	15	0	0	17	0	40	
Phf	#DIV/0!	0.694	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.521	#DIV/0!	#DIV/0!	0.565	#DIV/0!	Peak	Phf
4:15 PM - 5:15 PM	0	25	0	0	0	0	0	25	0	0	70	0	120	0.789

Peak Hour

4:15 PM - 5:15 PM



PARSONS
BRINCKERHOFF

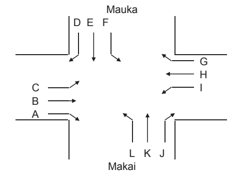
Saturday COUNT SHEET

Intersection: Ala Moana Blvd & Atkinson Dr

Date: 3/15/2017

By: Nick & David

Weather: Clear



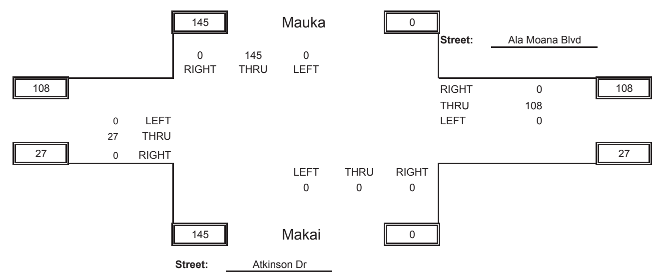
Street: Ala Moana Blvd

Street: Atkinson Dr

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
12:00 PM - 12:15 PM	0	9	0	0	23	0	0	49	0	0	0	0	81	445
12:15 PM - 12:30 PM	0	24	0	0	56	0	0	52	0	0	0	0	132	437
12:30 PM - 12:45 PM	0	10	0	0	44	0	0	63	0	0	0	0	117	420
12:45 PM - 1:00 PM	0	7	0	0	30	0	0	78	0	0	0	0	115	370
1:00 PM - 1:15 PM	0	9	0	0	33	0	0	31	0	0	0	0	73	369
1:15 PM - 1:30 PM	0	21	0	0	50	0	0	44	0	0	0	0	115	366
1:30 PM - 1:45 PM	0	0	0	0	31	0	0	36	0	0	0	0	67	348
1:45 PM - 2:00 PM	0	6	0	0	55	0	0	53	0	0	0	0	114	331
2:00 PM - 2:15 PM	0	5	0	0	31	0	0	34	0	0	0	0	70	280
2:15 PM - 2:30 PM	0	11	0	0	49	0	0	37	0	0	0	0	97	
2:30 PM - 2:45 PM	0	7	0	0	13	0	0	30	0	0	0	0	50	
2:45 PM - 3:00 PM	0	4	0	0	52	0	0	7	0	0	0	0	63	
Phf	#DIV/0!	0.614	#DIV/0!	#DIV/0!	0.697	#DIV/0!	#DIV/0!	0.730	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
1:00 PM - 2:00 PM	0	27	0	0	145	0	0	108	0	0	0	0	280	0.722

Peak Hour

1:00 PM - 2:00 PM



PARSONS
BRINCKERHOFF

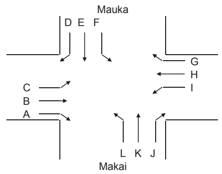
Saturday COUNT SHEET

Intersection: Ala Moana Blvd & Kamakee St

Date: 3/25/2017

By: Sal & Selena

Weather: Clear



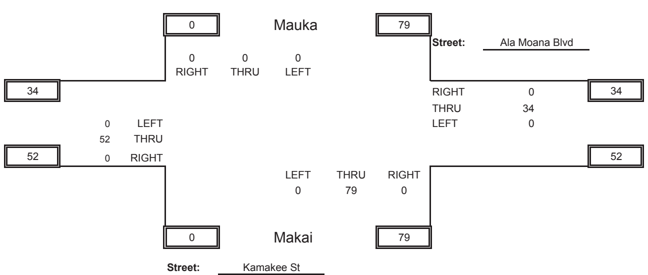
Street: Ala Moana Blvd

Street: Kamakee St

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
12:00 PM - 12:15 PM	0	7	0	0	0	0	0	7	0	0	18	0	32	133
12:15 PM - 12:30 PM	0	6	0	0	0	0	0	4	0	0	17	0	27	124
12:30 PM - 12:45 PM	0	10	0	0	0	0	0	13	0	0	25	0	48	121
12:45 PM - 1:00 PM	0	3	0	0	0	0	0	10	0	0	13	0	26	125
1:00 PM - 1:15 PM	0	5	0	0	0	0	0	10	0	0	8	0	23	136
1:15 PM - 1:30 PM	0	7	0	0	0	0	0	5	0	0	12	0	24	147
1:30 PM - 1:45 PM	0	7	0	0	0	0	0	24	0	0	21	0	52	156
1:45 PM - 2:00 PM	0	10	0	0	0	0	0	12	0	0	15	0	37	163
2:00 PM - 2:15 PM	0	8	0	0	0	0	0	13	0	0	13	0	34	165
2:15 PM - 2:30 PM	0	10	0	0	0	0	0	9	0	0	14	0	33	
2:30 PM - 2:45 PM	0	25	0	0	0	0	0	4	0	0	30	0	59	
2:45 PM - 3:00 PM	0	9	0	0	0	0	0	8	0	0	22	0	39	
Phf	#DIV/0!	0.520	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.654	#DIV/0!	#DIV/0!	0.658	#DIV/0!	Peak	Phf
2:00 PM - 3:00 PM	0	52	0	0	0	0	0	34	0	0	79	0	165	0.699

Peak Hour

2:00 PM - 3:00 PM

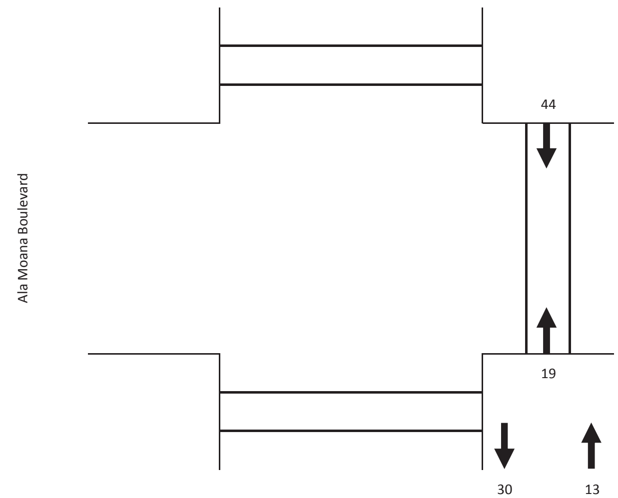


PARSONS
BRINCKERHOFF

Thursday, 4/26/18

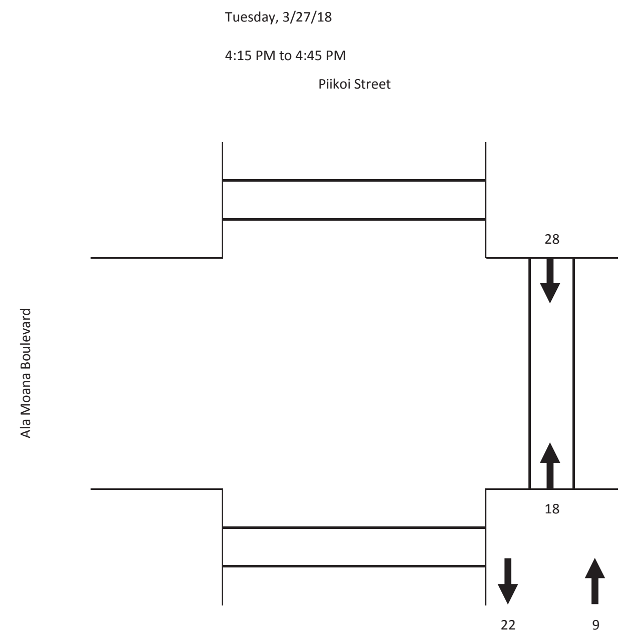
4:15 PM to 5:15 PM

Kamakee Street



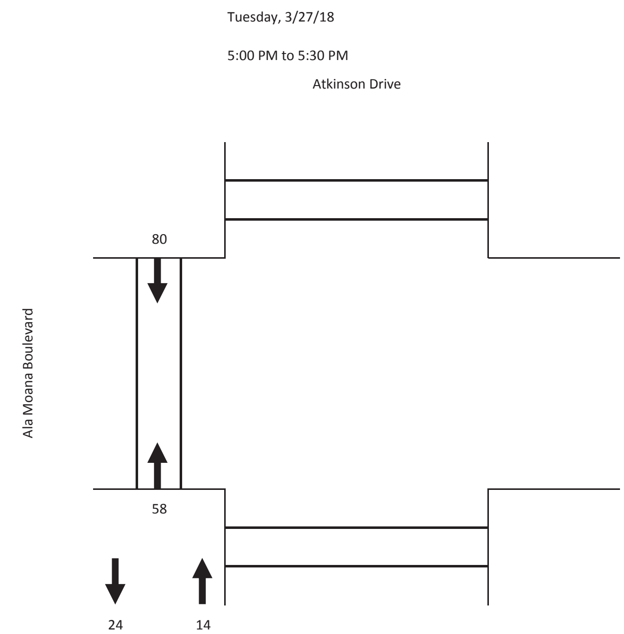
30 of 44 makai-bound crossers entered the park.

13 of 19 mauka-bound crossers came from the park.



22 of 28 makai-bound crossers entered the park.

9 of 18 mauka-bound crossers came from the park.



24 of 80 makai-bound crossers entered the park.

14 of 58 mauka-bound crossers came from the park.

Appendix B Levels of Service Definitions

The *Highway Capacity Manual* defines six Levels of Service (LOS), labeled A through F, from best to worst conditions. Levels of Service for signalized and unsignalized intersections are defined in terms of average user delays. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

For unsignalized intersections, the *Highway Capacity Manual* evaluates gaps in the major street traffic flow and calculates available gaps for left-turns across oncoming traffic and for the left and right-turns onto the major roadway from the minor street.

LEVEL-OF-SERVICE A: Little or no delay.

LEVEL-OF-SERVICE B: Short traffic delays.

LEVEL-OF-SERVICE C: Average traffic delays.

LEVEL-OF-SERVICE D: Long traffic delays.

LEVEL-OF-SERVICE E: Very long traffic delays.

LEVEL-OF-SERVICE F: Demand volume exceeds capacity, resulting in extreme delays with queuing that may cause severe congestion and affect other movements at the intersection.

Appendix C Intersection Capacity Analysis Worksheets

HCM Signalized Intersection Capacity Analysis
3: Atkinson Drive & Ala Moana Boulevard

Existing AM
05/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	1318	38	37	1294	142	75	85	28	150	99	812
Future Volume (vph)	269	1318	38	37	1294	142	75	85	28	150	99	812
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5064		1770	5085	1583	1681	1763	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5064		1770	5085	1583	1681	1763	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	292	1433	41	40	1407	154	82	92	30	163	108	883
RTOR Reduction (vph)	0	2	0	0	0	63	0	0	27	0	0	0
Lane Group Flow (vph)	292	1472	0	40	1407	91	74	100	3	163	108	883
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	17.6	67.3		7.5	57.2	57.2	16.1	16.1	16.1	39.5	39.5	61.1
Effective Green, g (s)	17.6	67.3		7.5	57.2	57.2	16.1	16.1	16.1	39.5	39.5	61.1
Actuated g/C Ratio	0.12	0.45		0.05	0.38	0.38	0.11	0.11	0.11	0.26	0.26	0.41
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	401	2266		88	1933	602	179	188	169	901	489	1132
v/s Ratio Prot	0.09	0.29		0.02	c0.28		0.04	c0.06		0.05	0.06	c0.32
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.73	0.65		0.45	0.73	0.15	0.41	0.53	0.02	0.18	0.22	0.78
Uniform Delay, d1	64.1	32.4		69.5	39.9	30.6	62.7	63.6	60.1	42.9	43.4	38.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.5	0.7		3.7	1.4	0.1	6.9	10.4	0.2	0.1	0.2	3.5
Delay (s)	70.6	33.0		73.2	41.3	30.8	69.6	74.0	60.3	43.0	43.6	42.4
Level of Service	E	C		E	D	C	E	E	E	D	D	D
Approach Delay (s)		39.2			41.1			70.4			42.6	
Approach LOS		D			D			E			D	

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)	150.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

Synchro 9 Report
Page 1

HCM Signalized Intersection Capacity Analysis
3: Atkinson Drive & Ala Moana Boulevard

Existing PM
05/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	623	1682	80	74	1564	252	83	98	32	266	116	228
Future Volume (vph)	623	1682	80	74	1564	252	83	98	32	266	116	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5051		1770	5085	1583	1681	1763	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5051		1770	5085	1583	1681	1763	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	677	1828	87	80	1700	274	90	107	35	289	126	248
RTOR Reduction (vph)	0	2	0	0	0	77	0	0	30	0	0	0
Lane Group Flow (vph)	677	1913	0	80	1700	197	81	116	5	289	126	248
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	29.0	76.5		11.5	59.0	59.0	21.0	21.0	21.0	19.3	19.3	52.3
Effective Green, g (s)	29.0	76.5		11.5	59.0	59.0	21.0	21.0	21.0	19.3	19.3	52.3
Actuated g/C Ratio	0.20	0.52		0.08	0.40	0.40	0.14	0.14	0.14	0.13	0.13	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	671	2605		137	2023	629	238	249	224	446	242	982
v/s Ratio Prot	c0.20	0.38		0.05	c0.33		0.05	c0.07		c0.08	0.07	0.09
v/s Ratio Perm						0.12			0.00			
v/c Ratio	1.01	0.73		0.58	0.84	0.31	0.34	0.47	0.02	0.65	0.52	0.25
Uniform Delay, d1	59.7	28.0		66.1	40.4	30.7	57.4	58.5	54.8	61.3	60.2	34.1
Progression Factor	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	37.0	1.1		6.2	3.3	0.3	3.9	6.1	0.2	3.2	2.0	0.1
Delay (s)	96.6	29.1		72.3	43.7	31.0	61.3	64.6	55.0	64.5	62.2	34.2
Level of Service	F	C		E	D	C	E	E	D	E	E	C
Approach Delay (s)		46.7			43.1			62.0			52.7	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	148.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

Synchro 9 Report
Page 1

HCM Signalized Intersection Capacity Analysis

3: Atkinson Drive & Ala Moana Boulevard

Existing Saturday

05/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	510	1366	75	66	1120	271	157	105	48	318	124	565
Future Volume (vph)	510	1366	75	66	1120	271	157	105	48	318	124	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5045		1770	5085	1583	1681	1751	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5045		1770	5085	1583	1681	1751	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	554	1485	82	72	1217	295	171	114	52	346	135	614
RTOR Reduction (vph)	0	4	0	0	0	148	0	0	45	0	0	0
Lane Group Flow (vph)	554	1563	0	72	1217	147	140	145	7	346	135	614
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	23.2	61.2		8.0	46.0	46.0	19.2	19.2	19.2	30.6	30.6	57.8
Effective Green, g (s)	23.2	61.2		8.0	46.0	46.0	19.2	19.2	19.2	30.6	30.6	57.8
Actuated g/C Ratio	0.17	0.44		0.06	0.33	0.33	0.14	0.14	0.14	0.22	0.22	0.42
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	572	2221		101	1682	523	232	241	218	755	410	1158
v/s Ratio Prot	c0.16	c0.31		0.04	0.24		c0.08	0.08		0.10	0.07	c0.22
v/s Ratio Perm						0.09			0.00			
v/c Ratio	0.97	0.70		0.71	0.72	0.28	0.60	0.60	0.03	0.46	0.33	0.53
Uniform Delay, d1	57.5	31.5		64.4	40.9	34.3	56.3	56.3	51.9	47.0	45.6	30.4
Progression Factor	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	29.4	1.0		21.1	1.6	0.3	11.1	10.6	0.3	0.4	0.5	0.5
Delay (s)	87.0	32.6		85.4	42.5	34.6	67.4	67.0	52.1	47.5	46.0	30.9
Level of Service	F	C		F	D	C	E	E	D	D	D	C
Approach Delay (s)		46.8			43.0			64.9			38.0	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

HCM Signalized Intersection Capacity Analysis

2: Kamakee Drive & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	48	1520	94	1	1729	30	61	27	10	20	28	82
Future Volume (vph)	48	1520	94	1	1729	30	61	27	10	20	28	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5041		1770	5072		1770	1786			1824	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.72	1.00			0.90	1.00
Satd. Flow (perm)	1770	5041		1770	5072		1347	1786			1679	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	1652	102	1	1879	33	66	29	11	22	30	89
RTOR Reduction (vph)	0	5	0	0	1	0	0	8	0	0	0	64
Lane Group Flow (vph)	52	1749	0	1	1911	0	66	32	0	0	52	25
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	6.5	75.9		1.0	70.4		37.1	37.1			37.1	37.1
Effective Green, g (s)	6.5	75.9		1.0	70.4		37.1	37.1			37.1	37.1
Actuated g/C Ratio	0.05	0.58		0.01	0.54		0.29	0.29			0.29	0.29
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	88	2943		13	2746		384	509			479	451
v/s Ratio Prot	c0.03	c0.35		0.00	c0.38			0.02				
v/s Ratio Perm							c0.05				0.03	0.02
v/c Ratio	0.59	0.59		0.08	0.70		0.17	0.06			0.11	0.06
Uniform Delay, d1	60.4	17.2		64.0	21.9		34.9	33.8			34.3	33.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	10.2	0.3		2.5	0.8		1.0	0.2			0.5	0.2
Delay (s)	70.6	17.6		66.6	22.7		35.9	34.0			34.7	34.0
Level of Service	E	B		E	C		D	C			C	C
Approach Delay (s)		19.1			22.7			35.2			34.2	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

HCM Signalized Intersection Capacity Analysis
2: Kamakee Drive & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	56	1967	170	28	1328	89	63	35	34	35	61	126
Future Volume (vph)	56	1967	170	28	1328	89	63	35	34	35	61	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5025		1770	5037		1770	1725			1829	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00			0.88	1.00
Satd. Flow (perm)	1770	5025		1770	5037		1181	1725			1639	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	2138	185	30	1443	97	68	38	37	38	66	137
RTOR Reduction (vph)	0	6	0	0	4	0	0	20	0	0	0	104
Lane Group Flow (vph)	61	2317	0	30	1536	0	68	55	0	0	104	33
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	90.9		6.7	88.9		36.7	36.7			36.7	36.7
Effective Green, g (s)	8.7	90.9		6.7	88.9		36.7	36.7			36.7	36.7
Actuated g/C Ratio	0.06	0.60		0.04	0.59		0.24	0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	102	3039		78	2979		288	421			400	386
v/s Ratio Prot	c0.03	c0.46		0.02	0.30			0.03				
v/s Ratio Perm							0.06				c0.06	0.02
v/c Ratio	0.60	0.76		0.38	0.52		0.24	0.13			0.26	0.09
Uniform Delay, d1	69.1	21.8		69.8	18.0		45.6	44.3			45.8	43.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.1	1.2		3.1	0.2		1.9	0.6			1.6	0.4
Delay (s)	78.2	23.0		72.9	18.2		47.5	45.0			47.4	44.3
Level of Service	E	C		E	B		D	D			D	D
Approach Delay (s)		24.4			19.2			46.2			45.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Kamakee Drive & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	81	1607	167	41	1459	74	129	44	51	63	49	123
Future Volume (vph)	81	1607	167	41	1459	74	129	44	51	63	49	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	5013		1770	5049		1770	1714			1812	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00			0.79	1.00
Satd. Flow (perm)	1770	5013		1770	5049		1173	1714			1481	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	1747	182	45	1586	80	140	48	55	68	53	134
RTOR Reduction (vph)	0	9	0	0	4	0	0	25	0	0	0	96
Lane Group Flow (vph)	88	1920	0	45	1662	0	140	78	0	0	121	38
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	11.8	70.4		6.4	65.0		36.8	36.8			36.8	36.8
Effective Green, g (s)	11.8	70.4		6.4	65.0		36.8	36.8			36.8	36.8
Actuated g/C Ratio	0.09	0.54		0.05	0.50		0.28	0.28			0.28	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	161	2723		87	2532		333	486			420	449
v/s Ratio Prot	c0.05	c0.38		0.03	0.33			0.05				
v/s Ratio Perm							c0.12				0.08	0.02
v/c Ratio	0.55	0.71		0.52	0.66		0.42	0.16			0.29	0.08
Uniform Delay, d1	56.3	21.9		60.1	24.0		37.7	34.8			36.2	34.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.8	0.8		5.1	0.6		3.9	0.7			1.7	0.4
Delay (s)	60.1	22.8		65.2	24.6		41.6	35.5			37.9	34.4
Level of Service	E	C		E	C		D	D			D	C
Approach Delay (s)		24.4			25.7			39.0			36.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	129.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2028 AM
3: Atkinson Drive & Ala Moana Boulevard — 05/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	1714	38	37	1512	149	75	85	28	158	99	843
Future Volume (vph)	283	1714	38	37	1512	149	75	85	28	158	99	843
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5069		1770	5085	1583	1681	1763	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5069		1770	5085	1583	1681	1763	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	308	1863	41	40	1643	162	82	92	30	172	108	916
RTOR Reduction (vph)	0	1	0	0	0	54	0	0	27	0	0	0
Lane Group Flow (vph)	308	1903	0	40	1643	108	74	100	3	172	108	916
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	18.2	76.6		7.8	66.2	66.2	16.0	16.0	16.0	40.7	40.7	62.9
Effective Green, g (s)	18.2	76.6		7.8	66.2	66.2	16.0	16.0	16.0	40.7	40.7	62.9
Actuated g/C Ratio	0.11	0.48		0.05	0.41	0.41	0.10	0.10	0.10	0.25	0.25	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	387	2410		85	2089	650	166	175	157	867	470	1088
v/s Ratio Prot	0.09	c0.38		0.02	0.32		0.04	c0.06		0.05	0.06	c0.33
v/s Ratio Perm						0.07			0.00			
v/c Ratio	0.80	0.79		0.47	0.79	0.17	0.45	0.57	0.02	0.20	0.23	0.84
Uniform Delay, d1	69.6	35.5		74.6	41.3	30.0	68.4	69.3	65.5	47.4	47.8	44.6
Progression Factor	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	10.8	1.8		4.1	2.0	0.1	8.4	12.9	0.2	0.1	0.3	6.0
Delay (s)	80.4	37.3		78.7	43.3	30.1	76.8	82.1	65.7	47.5	48.0	50.6
Level of Service	F	D		E	D	C	E	F	E	D	D	D
Approach Delay (s)		43.3			42.9			77.8			49.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	161.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline — Synchro 9 Report Page 1

HCM Signalized Intersection Capacity Analysis — 2028 PM
3: Atkinson Drive & Ala Moana Boulevard — 05/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	655	1989	80	74	1930	265	83	98	32	280	116	240
Future Volume (vph)	655	1989	80	74	1930	265	83	98	32	280	116	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5056		1770	5085	1583	1681	1763	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5056		1770	5085	1583	1681	1763	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	712	2162	87	80	2098	288	90	107	35	304	126	261
RTOR Reduction (vph)	0	2	0	0	0	66	0	0	30	0	0	0
Lane Group Flow (vph)	712	2247	0	80	2098	222	81	116	5	304	126	261
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	29.0	76.6		11.5	59.1	59.1	21.0	21.0	21.0	20.2	20.2	53.2
Effective Green, g (s)	29.0	76.6		11.5	59.1	59.1	21.0	21.0	21.0	20.2	20.2	53.2
Actuated g/C Ratio	0.19	0.51		0.08	0.40	0.40	0.14	0.14	0.14	0.14	0.14	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	666	2594		136	2012	626	236	247	222	464	252	993
v/s Ratio Prot	c0.21	0.44		0.05	c0.41		0.05	c0.07		c0.09	0.07	0.09
v/s Ratio Perm						0.14			0.00			
v/c Ratio	1.07	0.87		0.59	1.04	0.35	0.34	0.47	0.02	0.66	0.50	0.26
Uniform Delay, d1	60.2	31.9		66.6	45.1	31.7	57.9	59.0	55.3	61.2	59.9	34.1
Progression Factor	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	54.8	3.3		6.4	32.3	0.3	3.9	6.3	0.2	3.3	1.6	0.1
Delay (s)	115.0	35.2		73.0	77.4	32.0	61.9	65.3	55.5	64.6	61.4	34.3
Level of Service	F	D		E	E	C	E	E	E	E	E	C
Approach Delay (s)		54.4			71.9			62.6			52.5	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	61.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	149.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline — Synchro 9 Report Page 1

HCM Signalized Intersection Capacity Analysis
3: Atkinson Drive & Ala Moana Boulevard

2028 Saturday
05/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	536	1622	75	66	1415	285	157	105	48	334	124	594
Future Volume (vph)	536	1622	75	66	1415	285	157	105	48	334	124	594
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5051		1770	5085	1583	1681	1751	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5051		1770	5085	1583	1681	1751	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	583	1763	82	72	1538	310	171	114	52	363	135	646
RTOR Reduction (vph)	0	3	0	0	0	105	0	0	45	0	0	0
Lane Group Flow (vph)	583	1842	0	72	1538	205	140	145	7	363	135	646
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	29.1	75.3		11.5	57.7	57.7	21.0	21.0	21.0	37.0	37.0	70.1
Effective Green, g (s)	29.1	75.3		11.5	57.7	57.7	21.0	21.0	21.0	37.0	37.0	70.1
Actuated g/C Ratio	0.18	0.46		0.07	0.35	0.35	0.13	0.13	0.13	0.22	0.22	0.43
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	606	2307		123	1780	554	214	223	201	770	418	1185
v/s Ratio Prot	c0.17	0.36		0.04	c0.30		c0.08	0.08		0.11	0.07	c0.23
v/s Ratio Perm						0.13			0.00			
v/c Ratio	0.96	0.80		0.59	0.86	0.37	0.65	0.65	0.03	0.47	0.32	0.55
Uniform Delay, d1	67.3	38.3		74.3	49.9	40.0	68.4	68.4	63.0	55.4	53.4	35.4
Progression Factor	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	27.2	2.0		6.9	4.6	0.4	14.6	13.8	0.3	0.5	0.5	0.5
Delay (s)	94.5	40.3		81.3	54.5	40.4	83.0	82.2	63.3	55.9	53.9	35.9
Level of Service	F	D		F	D	D	F	F	E	E	D	D
Approach Delay (s)		53.3			53.3			79.6			44.4	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	164.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

HCM Signalized Intersection Capacity Analysis
2: Kamakee Street & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	63	1992	94	7	1975	87	61	27	10	162	28	108
Future Volume (vph)	63	1992	94	7	1975	87	61	27	10	162	28	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5051		1770	5053		1770	1786			1786	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.43	1.00			0.73	1.00
Satd. Flow (perm)	1770	5051		1770	5053		795	1786			1358	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	2165	102	8	2147	95	66	29	11	176	30	117
RTOR Reduction (vph)	0	3	0	0	3	0	0	8	0	0	0	74
Lane Group Flow (vph)	68	2264	0	8	2239	0	66	32	0	0	206	43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	103.7		1.4	96.4		36.3	36.3			36.3	36.3
Effective Green, g (s)	8.7	103.7		1.4	96.4		36.3	36.3			36.3	36.3
Actuated g/C Ratio	0.06	0.66		0.01	0.61		0.23	0.23			0.23	0.23
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	97	3327		15	3094		183	411			313	365
v/s Ratio Prot	c0.04	c0.45		0.00	c0.44			0.02				
v/s Ratio Perm							0.08				c0.15	0.03
v/c Ratio	0.70	0.68		0.53	0.72		0.36	0.08			0.66	0.12
Uniform Delay, d1	73.1	16.6		77.7	21.2		50.8	47.4			54.9	47.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	20.4	0.6		31.9	0.9		5.4	0.4			10.4	0.7
Delay (s)	93.5	17.2		109.6	22.1		56.3	47.8			65.3	48.6
Level of Service	F	B		F	C		E	D			E	D
Approach Delay (s)		19.4			22.4			53.1			59.2	
Approach LOS		B			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	157.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

HCM Signalized Intersection Capacity Analysis
2: Kamakee Street & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	74	2334	170	28	1668	206	63	35	34	64	61	143
Future Volume (vph)	74	2334	170	28	1668	206	63	35	34	64	61	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	5033		1770	5001		1770	1725			1816	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00			0.81	1.00
Satd. Flow (perm)	1770	5033		1770	5001		1030	1725			1510	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	2537	185	30	1813	224	68	38	37	70	66	155
RTOR Reduction (vph)	0	5	0	0	9	0	0	21	0	0	0	83
Lane Group Flow (vph)	80	2717	0	30	2028	0	68	54	0	0	136	72
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	9.0	103.7		6.5	101.2		36.1	36.1			36.1	36.1
Effective Green, g (s)	9.0	103.7		6.5	101.2		36.1	36.1			36.1	36.1
Actuated g/C Ratio	0.06	0.64		0.04	0.62		0.22	0.22			0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	98	3215		70	3118		229	383			335	352
v/s Ratio Prot	c0.05	c0.54		0.02	0.41			0.03				
v/s Ratio Perm							0.07				c0.09	0.05
v/c Ratio	0.82	0.85		0.43	0.65		0.30	0.14			0.41	0.20
Uniform Delay, d1	75.8	23.0		76.1	19.3		52.5	50.7			53.9	51.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	38.7	2.2		4.2	0.5		3.3	0.8			3.6	1.3
Delay (s)	114.5	25.2		80.3	19.8		55.8	51.4			57.6	52.7
Level of Service	F	C		F	B		E	D			E	D
Approach Delay (s)		27.8			20.7			53.5			55.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	162.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

Synchro 9 Report
Page 1

HCM Signalized Intersection Capacity Analysis
2: Kamakee Street & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	103	1916	167	41	1820	74	129	44	51	96	49	140
Future Volume (vph)	103	1916	167	41	1820	74	129	44	51	96	49	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	5024		1770	5056		1770	1714			1803	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00			0.69	1.00
Satd. Flow (perm)	1770	5024		1770	5056		1002	1714			1286	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	2083	182	45	1978	80	140	48	55	104	53	152
RTOR Reduction (vph)	0	7	0	0	3	0	0	26	0	0	0	107
Lane Group Flow (vph)	112	2258	0	45	2055	0	140	77	0	0	157	45
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	14.1	88.5		6.6	81.0		36.4	36.4			36.4	36.4
Effective Green, g (s)	14.1	88.5		6.6	81.0		36.4	36.4			36.4	36.4
Actuated g/C Ratio	0.10	0.60		0.04	0.55		0.25	0.25			0.25	0.25
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	169	3014		79	2776		247	422			317	390
v/s Ratio Prot	c0.06	c0.45		0.03	0.41			0.04				
v/s Ratio Perm							c0.14				0.12	0.03
v/c Ratio	0.66	0.75		0.57	0.74		0.57	0.18			0.50	0.12
Uniform Delay, d1	64.4	21.4		69.1	25.3		48.6	43.8			47.7	43.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.4	1.1		9.1	1.1		9.1	0.9			5.4	0.6
Delay (s)	73.8	22.5		78.2	26.4		57.8	44.7			53.1	43.7
Level of Service	E	C		E	C		E	D			D	D
Approach Delay (s)		24.9			27.5			52.2			48.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	147.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

Synchro 9 Report
Page 1

HCM Signalized Intersection Capacity Analysis
3: Atkinson Drive & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	1714	44	42	1512	149	86	98	32	158	114	843
Future Volume (vph)	283	1714	44	42	1512	149	86	98	32	158	114	843
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5066		1770	5085	1583	1681	1763	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5066		1770	5085	1583	1681	1763	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	308	1863	48	46	1643	162	93	107	35	172	124	916
RTOR Reduction (vph)	0	2	0	0	0	54	0	0	32	0	0	0
Lane Group Flow (vph)	308	1909	0	46	1643	108	84	116	3	172	124	916
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	18.2	76.2		8.2	66.2	66.2	16.0	16.0	16.0	40.7	40.7	62.9
Effective Green, g (s)	18.2	76.2		8.2	66.2	66.2	16.0	16.0	16.0	40.7	40.7	62.9
Actuated g/C Ratio	0.11	0.47		0.05	0.41	0.41	0.10	0.10	0.10	0.25	0.25	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	387	2396		90	2089	650	166	175	157	867	470	1088
v/s Ratio Prot	0.09	c0.38		0.03	0.32		0.05	c0.07		0.05	0.07	c0.33
v/s Ratio Perm						0.07			0.00			
v/c Ratio	0.80	0.80		0.51	0.79	0.17	0.51	0.66	0.02	0.20	0.26	0.84
Uniform Delay, d1	69.6	35.9		74.5	41.3	30.0	68.8	69.9	65.5	47.4	48.2	44.6
Progression Factor	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	10.8	1.9		4.8	2.0	0.1	10.6	18.1	0.3	0.1	0.3	6.0
Delay (s)	80.4	37.8		79.3	43.3	30.1	79.4	88.0	65.7	47.5	48.5	50.6
Level of Service	F	D		E	D	C	E	F	E	D	D	D
Approach Delay (s)		43.7			43.1			81.6			50.0	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	161.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Atkinson Drive & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	655	1989	92	85	1930	265	95	113	37	280	133	240
Future Volume (vph)	655	1989	92	85	1930	265	95	113	37	280	133	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5052		1770	5085	1583	1681	1763	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5052		1770	5085	1583	1681	1763	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	712	2162	100	92	2098	288	103	123	40	304	145	261
RTOR Reduction (vph)	0	2	0	0	0	66	0	0	34	0	0	0
Lane Group Flow (vph)	712	2260	0	92	2098	222	93	133	6	304	145	261
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	29.0	76.1		12.0	59.1	59.1	21.0	21.0	21.0	20.2	20.2	53.2
Effective Green, g (s)	29.0	76.1		12.0	59.1	59.1	21.0	21.0	21.0	20.2	20.2	53.2
Actuated g/C Ratio	0.19	0.51		0.08	0.40	0.40	0.14	0.14	0.14	0.14	0.14	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	666	2575		142	2012	626	236	247	222	464	252	993
v/s Ratio Prot	c0.21	0.45		0.05	c0.41		0.06	c0.08		c0.09	0.08	0.09
v/s Ratio Perm						0.14			0.00			
v/c Ratio	1.07	0.88		0.65	1.04	0.35	0.39	0.54	0.03	0.66	0.58	0.26
Uniform Delay, d1	60.2	32.5		66.6	45.1	31.7	58.4	59.6	55.3	61.2	60.5	34.1
Progression Factor	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	54.8	3.7		9.8	32.3	0.3	4.9	8.2	0.2	3.3	3.2	0.1
Delay (s)	115.0	36.2		76.4	77.4	32.0	63.2	67.8	55.5	64.6	63.7	34.3
Level of Service	F	D		E	E	C	E	E	E	E	E	C
Approach Delay (s)		55.0			72.0			64.4			53.2	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	61.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	149.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Atkinson Drive & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	536	1622	86	76	1415	285	180	121	55	334	142	594
Future Volume (vph)	536	1622	86	76	1415	285	180	121	55	334	142	594
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5047		1770	5085	1583	1681	1751	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5047		1770	5085	1583	1681	1751	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	583	1763	93	83	1538	310	196	132	60	363	154	646
RTOR Reduction (vph)	0	3	0	0	0	105	0	0	52	0	0	0
Lane Group Flow (vph)	583	1853	0	83	1538	205	161	167	8	363	154	646
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7
Permitted Phases						8			2			
Actuated Green, G (s)	29.1	74.9		11.9	57.7	57.7	21.0	21.0	21.0	37.0	37.0	70.1
Effective Green, g (s)	29.1	74.9		11.9	57.7	57.7	21.0	21.0	21.0	37.0	37.0	70.1
Actuated g/C Ratio	0.18	0.45		0.07	0.35	0.35	0.13	0.13	0.13	0.22	0.22	0.43
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	606	2293		127	1780	554	214	223	201	770	418	1185
v/s Ratio Prot	c0.17	0.37		0.05	c0.30		c0.10	0.10		0.11	0.08	c0.23
v/s Ratio Perm						0.13			0.00			
v/c Ratio	0.96	0.81		0.65	0.86	0.37	0.75	0.75	0.04	0.47	0.37	0.55
Uniform Delay, d1	67.3	38.8		74.4	49.9	40.0	69.4	69.4	63.0	55.4	54.0	35.4
Progression Factor	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	27.2	2.2		11.5	4.6	0.4	21.4	20.4	0.4	0.5	0.6	0.5
Delay (s)	94.5	40.9		85.9	54.5	40.4	90.8	89.7	63.4	55.9	54.6	35.9
Level of Service	F	D		F	D	D	F	F	E	E	D	D
Approach Delay (s)		53.7			53.6			86.1			44.6	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	164.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Kamakee Street & Ala Moana Boulevard

06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	63	1992	108	8	1975	87	70	31	11	162	32	108
Future Volume (vph)	63	1992	108	8	1975	87	70	31	11	162	32	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5046		1770	5053		1770	1790			1788	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.42	1.00			0.73	1.00
Satd. Flow (perm)	1770	5046		1770	5053		783	1790			1359	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	2165	117	9	2147	95	76	34	12	176	35	117
RTOR Reduction (vph)	0	4	0	0	3	0	0	8	0	0	0	74
Lane Group Flow (vph)	68	2278	0	9	2239	0	76	38	0	0	211	43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	101.3		2.7	95.3		36.3	36.3			36.3	36.3
Effective Green, g (s)	8.7	101.3		2.7	95.3		36.3	36.3			36.3	36.3
Actuated g/C Ratio	0.06	0.65		0.02	0.61		0.23	0.23			0.23	0.23
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	98	3270		30	3080		181	415			315	367
v/s Ratio Prot	c0.04	c0.45		0.01	c0.44			0.02				
v/s Ratio Perm							0.10				c0.16	0.03
v/c Ratio	0.69	0.70		0.30	0.73		0.42	0.09			0.67	0.12
Uniform Delay, d1	72.5	17.6		75.9	21.4		51.0	47.1			54.6	47.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	19.2	0.7		5.6	0.9		7.0	0.4			10.8	0.7
Delay (s)	91.6	18.3		81.4	22.3		58.1	47.5			65.4	48.0
Level of Service	F	B		F	C		E	D			E	D
Approach Delay (s)		20.4			22.5			54.1			59.2	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	156.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Kamakee Street & Ala Moana Boulevard 06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	74	2334	195	32	1668	206	72	40	39	64	70	143
Future Volume (vph)	74	2334	195	32	1668	206	72	40	39	64	70	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5026		1770	5001		1770	1725			1819	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.53	1.00			0.81	1.00
Satd. Flow (perm)	1770	5026		1770	5001		990	1725			1513	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	2537	212	35	1813	224	78	43	42	70	76	155
RTOR Reduction (vph)	0	6	0	0	9	0	0	21	0	0	0	83
Lane Group Flow (vph)	80	2743	0	35	2028	0	78	64	0	0	146	72
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	9.0	104.1		6.7	101.8		36.0	36.0			36.0	36.0
Effective Green, g (s)	9.0	104.1		6.7	101.8		36.0	36.0			36.0	36.0
Actuated g/C Ratio	0.06	0.64		0.04	0.63		0.22	0.22			0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	97	3213		72	3127		218	381			334	350
v/s Ratio Prot	c0.05	c0.55		0.02	0.41			0.04				
v/s Ratio Perm							0.08				c0.10	0.05
v/c Ratio	0.82	0.85		0.49	0.65		0.36	0.17			0.44	0.20
Uniform Delay, d1	76.1	23.3		76.4	19.2		53.6	51.3			54.7	51.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	40.9	2.4		5.1	0.5		4.5	1.0			4.1	1.3
Delay (s)	117.1	25.7		81.5	19.7		58.2	52.2			58.8	53.0
Level of Service	F	C		F	B		E	D			E	D
Approach Delay (s)		28.3			20.7			55.1			55.8	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	162.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

03/21/2017 Baseline

Synchro 9 Report
Page 1

HCM Signalized Intersection Capacity Analysis
2: Kamakee Street & Ala Moana Boulevard 06/21/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	103	1916	192	47	1820	189	149	51	59	96	56	140
Future Volume (vph)	103	1916	192	47	1820	189	149	51	59	96	56	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	5016		1770	5014		1770	1712			1806	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00			0.66	1.00
Satd. Flow (perm)	1770	5016		1770	5014		965	1712			1232	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	2083	209	51	1978	205	162	55	64	104	61	152
RTOR Reduction (vph)	0	8	0	0	8	0	0	27	0	0	0	108
Lane Group Flow (vph)	112	2284	0	51	2175	0	162	92	0	0	165	44
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	14.2	90.7		6.8	83.3		36.2	36.2			36.2	36.2
Effective Green, g (s)	14.2	90.7		6.8	83.3		36.2	36.2			36.2	36.2
Actuated g/C Ratio	0.09	0.61		0.05	0.56		0.24	0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	167	3039		80	2790		233	413			297	382
v/s Ratio Prot	c0.06	c0.46		0.03	c0.43			0.05				
v/s Ratio Perm							c0.17				0.13	0.03
v/c Ratio	0.67	0.75		0.64	0.78		0.70	0.22			0.56	0.12
Uniform Delay, d1	65.5	21.3		70.2	26.0		51.7	45.5			49.7	44.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	10.1	1.1		15.5	1.4		15.8	1.3			7.3	0.6
Delay (s)	75.6	22.4		85.7	27.4		67.5	46.7			57.0	44.9
Level of Service	E	C		F	C		E	D			E	D
Approach Delay (s)		24.9			28.8			58.7			51.2	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	149.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

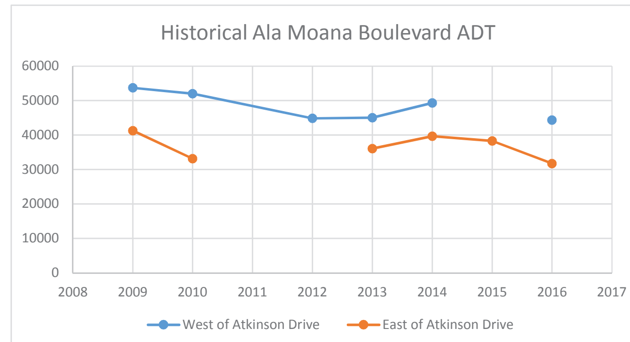
03/21/2017 Baseline

Synchro 9 Report
Page 1

Draft

Appendix D Growth Rate Analysis

	West of Atl	East of Atkinson Drive	W of Atkinson		E of Atkinson	
2009	53708	41294.5	54433	52983	41349	41240
2010	52018.5	33134.5	51769	52268	33994	32275
2012	44845.5		44229	45462		
2013	45026	36075	44668	45384	38388	33762
2014	49321	39654	48609	50033	39226	40082
2015		38271			38134	38408
2016	44331.5	31750.5	44791	43872	31749	31752



PAGE IS INTENTIONALLY LEFT BLANK

APPENDIX C

Ala Moana Regional Park
Parking Occupancy Study

PAGE IS INTENTIONALLY LEFT BLANK

FEHR & PEERS

August 24, 2017

Mr. Rodrigo Rodarte
Project Analyst
Biederman Redevelopment Ventures
441 N. Beverly Dr., Suite 205
Beverly Hills, CA 90210

Subject: **Ala Moana Regional Park – Parking Occupancy Study** **SD17-0244**

Dear Mr. Rodarte:

Fehr & Peers has completed a parking occupancy study of Ala Moana Regional Park in the City and County of Honolulu on the island of O`ahu, Hawaii. We completed this study on behalf of Biederman Redevelopment Ventures for the City & County to provide input to the Ala Moana Regional Park Master Plan. The Master Plan will identify potential options for redeveloping the park, and an integral element of this plan is understanding the demand for vehicle parking. The scope of this study included conducting parking occupancy counts, documenting the range of demand on select days of the week, and identifying potential strategies to address and manage existing and future demand. This report documents our study approach and findings.

STUDY CONTEXT AND BACKGROUND

Ala Moana Regional Park (also known as Ala Moana Beach Park) is a 100-acre park located between Downtown Honolulu and the Waikiki resort area on the southern edge of O`ahu. The Park is a primary destination for numerous residents, especially those living in the primary urban center of Honolulu, but it is also used by employees from the surrounding area and island visitors. In addition to the numerous natural amenities, the Park includes several different recreation facilities that make it attractive to both the casual user, as well as attendees of organized events. The Park is operated and maintained by the City & County of Honolulu Department of Parks and Recreation (DPR) including both the distribution of operating permits for organized events and upkeep of all facilities and public areas.

Given its convenient location, natural beauty, facilities, and access to the ocean, the Park has become an attraction that generates a substantial demand for vehicle parking depending on the weather, scheduled events, time of day, day of week, etc. As shown on **Figure 1**, vehicle access is provided via a two-lane circulatory roadway designated as Ala Moana Park Drive that connects and is generally parallel to Ala Moana Boulevard. The primary connections of Ala Moana Park Drive are at signalized intersections opposite Kamakee Street at the west end, and opposite Atkinson Drive at the east end.

Figure 1
Ala Moana Beach Park
Project Location

On-street spaces are delineated on Ala Moana Park Drive, which also provides access to four off-street public parking lots with different capacities within the Park. These lots include the McCoy Pavilion Lot, the Beach Lot, the Canoe Hale Lot, and the Harbor Lot. A fifth lot is located along Ala Moana Park Drive adjacent to the marina slips, but it is private, gate-controlled and not part of this study.

Like many attractions that are in demand, anecdotes vary as to the availability of parking, demand patterns, and the ability of drivers to find parking in close proximity to their ultimate destination within the Park. With a length of approximately one-mile and a width that generally varies between 0.15 to 0.45 miles between ala Moana Boulevard and the water's edge, the Park is large enough that some users complain when spaces are not available within a reasonable walking distance. While this distance can vary from person to person, a typical distance of 0.25 miles or roughly 1,300 feet is considered the desired maximum.

PARKING OCCUPANCY COUNTS

To provide actual demand data to identify current parking utilization, vehicle occupancy counts were conducted over the course of one weekday and two weekend days. The purpose of these counts is to quantify the parking demand by hour to determine demand across the entire park, as well as within specific areas.

As noted above, parking demand at the Park can vary depending on the number and size of scheduled events, as well as weather and surf conditions and time of year. The general intent for any parking study is to conduct counts during higher demand times, but not the highest or peak conditions, since those typically do not occur with regular frequency. Conclusions of studies based on absolute peak conditions typically result in over-building of facilities to accommodate projected demand and an inefficient use of infrastructure and support staff. A more typical industry approach is to use demand that represents the 85th or 90th percentile, provided that the selected level occurs with some regular frequency over the course of the year. The understanding is that some larger-scale events will require additional parking in other areas, but that the provided supply will generally be sufficient for most days.

Selection of Survey Days

Fehr & Peers coordinated with DPR staff to identify potential days with higher than normal attendance levels based on projected event schedules. Data from May 2016 through April 2017 was reviewed and event sizes were generally categorized by 250-attendee increments between 0 and 1000 or more. Most events

included attendance levels of less than 500 persons and the majority of those events included less than 250 people. Some key findings from the review of event data included the following:

- Approximately 70% of weekdays did not have a scheduled event requiring a permit through DPR.
- Of the weekdays with events, over two-thirds of those had events with fewer than 250 persons total.
- Roughly 85% of weekend days had some event scheduled.
- Weekend events had higher numbers of attendees, with 40% of all events including 250 total persons or less, and roughly 25% of events with a total attendance of between 250 and 500 people.
- Nearly ¼ of all weekend events had a total attendance of more than 1,000 persons but over the course of a year, this represents less than 8% of all days or slightly more than two days per month.

In addition to the review of scheduled event data, other aspects of the Park as an attraction were considered. Several desirable surf breaks are accessible from the Park, and these generate parking demand, especially during the summer when the surf is typically better on the south shore of the island than at the North Shore breaks. In addition, summer months also include typically the highest number of monthly visitors to O`ahu (usually in July per the latest visitor data published at http://files.hawaii.gov/dbedt/visitor/visitor-research/2015-annual-visitor.pdf), as well as local students on summer vacation.

Based on the review of event data, seasonal variations, and the project schedule, one weekday (Thursday July 13th) and two consecutive weekend days (Saturday July 15th and Sunday July 16th) were selected as the days for the parking occupancy surveys. The combined potential event attendance was expected to be 270 persons on Thursday, and increasing to 950 and 575 people on Saturday and Sunday, respectively, if all events occurred as anticipated.

Survey Scope

The Master Plan for the Park will recommend redevelopment options across the property and may change the location of the most desired parking spaces. As such, it was determined that locational surveys would be conducted independently for each of the individual parking lots, and for various sections of on-street spaces on Ala Moana Park Drive (within the Park) and Ala Moana Boulevard (fronting the Park). Ala Moana Park Drive within the Park was subdivided into three sections as follows:

- Park West On-Street Parking: from the Kamakee Street intersection to the crosswalk immediately east of the McCoy Pavilion lot eastern driveway
- Park Central On-Street Parking: from the McCoy Pavilion crosswalk to the western entrance of the Beach Lot
- Park East On-Street Parking: from the Beach Lot western entrance to the Atkinson Drive intersection

On Ala Moana Boulevard, parking is permitted in the outside lane but only on weekdays late at night (between 10pm and 4am) and on weekends. The section where parking is permitted extends from diamond head of Kamakee Street to the diamond head driveway serving Ala Moana Shopping Center. These sections were included in the survey on Saturday and Sunday only.

In addition to locational variations, parking demand fluctuates over the course of the day. To address this issue and to identify the peak times of parking demand, surveys were conducted between 8am and 6pm on each of the weekday and weekend days. During each hour, the number of vehicles parked in each off-street lot space and in the on-street spaces was counted. In all off-street lots except for the relatively small Harbor Lot, some of the parking spaces are designated for vehicles displaying a blue disability parking placard. Occupancy of these spaces was tallied separately since access to them is restricted, but it is also important to understand if the existing supply of disabled spaces is adequately serving demand.

The available parking supply within each lot and on-street segment is shown in **Table 1**. The total number of spaces is also presented in this table and shows that the aggregate supply of standard and disabled parking is 929 spaces and 23 spaces, respectively. This total excludes the 64 on-street spaces on Ala Moana Boulevard (assuming 22 feet per space) since they are only available on weekends (and weekday late nights), and that available supply is also included in **Table 1**.

Table 1
Ala Moana Regional Park – Vehicle Parking Supply

Parking Lot/Street Segment	Standard Space Supply	Disabled Space Supply
Ala Moana Park Drive		
Park West	119	0
Park Central	173	0
Park East	82	0
Off-Street Lots		
McCoy Pavilion Lot	76	4
Beach Lot	453	17
Canoe Hale Lot	19	2
Harbor Lot	7	0
Total	***929***	***23***
Ala Moana Boulevard (Weekends Only)		
Kamakee St to Piikoi St	34	0
Piikoi St to DH Ala Moana SCtr Dwy	30	0

Source: Fehr & Peers – Vendor Survey (July 2017)

Knowing that the overall parking demand could exceed the existing available supply at some locations at certain times of day, survey personnel were also tasked with counting the number of vehicles parking illegally, as well as those waiting for spaces to become available. These additional counts help to identify the total parking demand regardless of space availability, as well as the actual locational demand.

Also noted during the survey was the presence of bus, limousines, and large passenger vans that often stage at various locations throughout the park. Along the Diamond Head (i.e., eastern) edge of the Beach Lot, for example, the curb is painted yellow allowing for loading activities, and striping on the pavement indicates parking for larger vehicles. The presence of these vehicles in all parking lots and in on-street spaces was noted during the survey.

PARKING OCCUPANCY SURVEY RESULTS

The results of all of the July parking occupancy surveys are graphically depicted on **Figure 2**. This figure shows the proportion of occupied spaces by hour for each of the survey days (Thursday, Saturday and Sunday) by lot or on-street segment. The percentage within each circle represents the vehicle occupancy divided by the capacity of that facility. The set of occupancy data for each surveyed facility is color-coded to the respective lot or segment. For occupancies shown as greater than 100%, the number of illegally parked and waiting vehicles was added to the occupancy count.

All percentages on **Figure 2** that exceed 90% are shown in yellow. This signifies that the effective capacity of the lot or street segment has been exceeded. When a parking area's occupancy reaches 85 to 95% of the total capacity, depending on the user group, the area becomes effectively full. When parking lot occupancy exceeds effective capacity, users become frustrated as it becomes increasingly difficult to find an available parking space. Users will begin to either park illegally in the lot or leave the lot altogether and search for parking elsewhere. Given the current mix of user groups (residents familiar with the Park, and some visitors who may not be), the effective maximum desirable occupancy percentage for parking within the Park is assumed to be 90%. This 10% "cushion" of spaces is used to provide for reasonable search times for available parking, as well as to need to look in several distinct areas for parking.

In addition to the data for each lot or segment, the peak parking demand for the overall park as a whole is also noted by a square around the corresponding peak hour (i.e., 6pm on Thursday, 5pm on Saturday, and 2pm on Sunday. **Figure 3** illustrates the total parking demand across the Park for each day, and includes both the actual and effective capacities of the total Park supply.

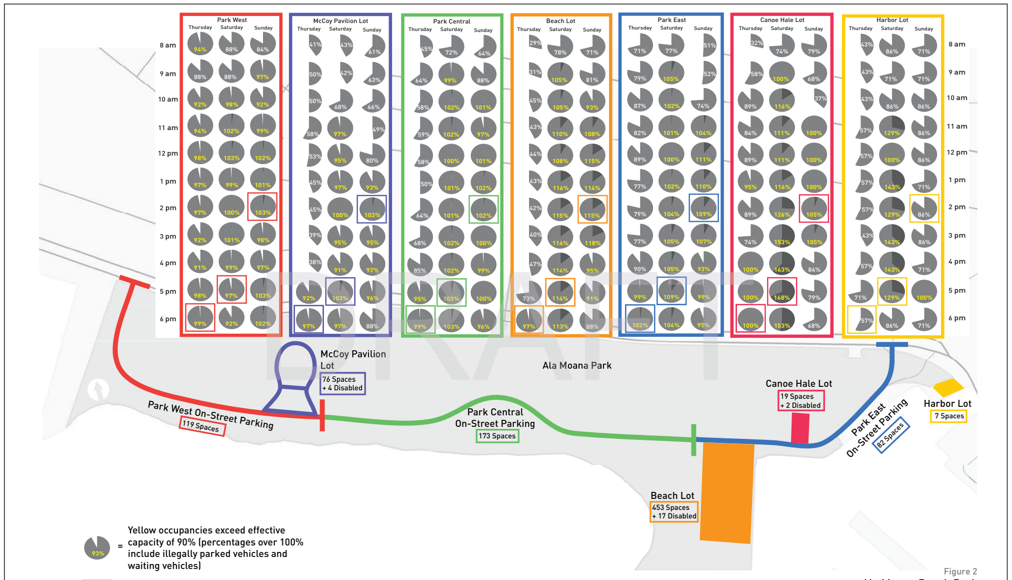
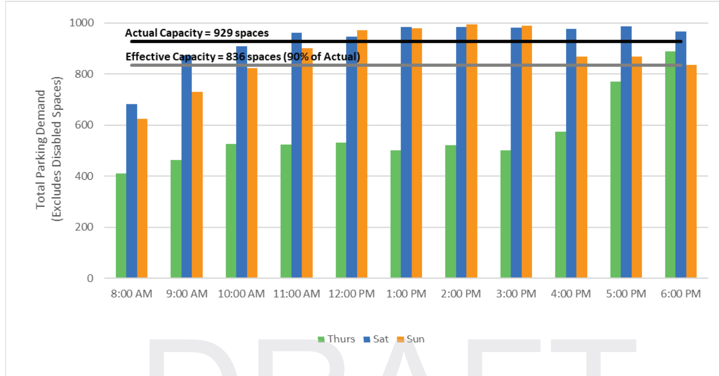


Figure 2
Ala Moana Beach Park
2017 Parking Occupancy Survey
Thursday (July 13), Saturday (July 15), Sunday (July 16)

Figure 3
Total Parking Demand by Day at Ala Moana Regional Park



The raw data for this figure and all of the analyses in this report is included in the tables attached as an appendix. A review of the findings for each day, as well as for the park as a whole, are presented below.

Thursday Parking Demand

The highest demand area for parking on Thursday was the western segment of Ala Moana Park Drive, which experienced an occupancy rate of 91% to 99% for all but one hour of the survey period. The occupancy in most of the other lots and segments ranged from 40% to 70% full between 8am and 3pm, except for the Canoe Hale Lot, which approached 90% to 95% occupancy for five of the midday hours. It was only towards the end of the day at around 4pm or 5pm did occupancy in almost all of the lots and segments approach 90% or more. Interestingly, the small seven-space Harbor Lot was generally 60% full or less for almost the entire day.

The only lot or segment where demand exceeded the actual capacity was the Park East segment, where the occupancy was measured at 102% at 6pm where three vehicles were illegally parked.

Between 8am and 4pm on Thursday, the total parking demand for the entire park ranged from 44% to 62% with 411 to 574 spaces occupied. At 5pm, the occupancy increased to 770 spaces or 83% of capacity, and then to 889 spaces or 96% occupancy by 6pm. At this time, parking at the Park was effectively full.

For disabled parking spaces specifically, demand was 100% for several hours at the end of the survey period in both the McCoy Pavilion Lot and the Canoe Hale Lot (2 spaces). During the rest of the day, some spaces were available.

Upon consultation with DPR staff after the occupancy surveys were completed, it was determined that both of the permitted events originally scheduled for Thursday did not take place. Thus, the Thursday data is based solely on the recreation and visitor demand generated by the Park amenities and not by any large organized group.

Saturday Parking Demand

The parking demand on Saturday began to exceed 90% of the available supply in all but two of the lots (McCoy Pavilion and Harbor Lot) and on all street segments by 10am. In fact, the Park Central segment and the Beach Lot (with the two largest individual supplies), as well as the Park East segment and Canoe Hale Lot, were all at or over capacity by 9am. By 11am, demand in all of the surveyed facilities were at or over capacity.

All of the lots and segments experienced demand that exceeded capacity, but the two locations with the highest absolute volume of illegally parked vehicles was the Beach Lot with 50 to 60 vehicles every hour between 1pm and 6pm, and the Canoe Hale Lot with 10 to 13 vehicles every hour between 3pm and 6pm.

On a total demand basis, the total number of parked vehicles at 8am was 683 vehicles or 70% of capacity and increased to 910 vehicles or 91% by 10am. From 11am through 6pm, total Park demand ranged from 947 to 988 vehicles or 102% to 106% of actual capacity. The absolute peak technically occurred at 5pm, but the difference in total demand amongst the highest four surveyed hours was a negligible six vehicles.

Not surprisingly, the demand for disabled parking spaces on Saturday reflected the higher overall demand compared to Thursday. On Saturday, the Beach Lot disabled spaces were fully occupied for all but two hours: 8am and 10am with three spaces and one space available, respectively. Overall, disabled parking space occupancy was over 90% for five of the 11 survey hours on Saturday.

During the Saturday parking surveys, no vehicles were observed parking in the diamond head-bound curb lane on Ala Moana Boulevard where parking is permitted on weekends. Either drivers are misunderstanding the signage along the applicable blocks, or Park users deem those spaces too far from their ultimate destination within the Park (possibly the beach).

Similar to the Thursday survey, DPR staff indicated that all of the Saturday events requiring permits did not take place as originally scheduled. Where up to 950 persons were originally expected at a variety of

organized events, this additional demand never materialized. Thus, the Saturday parking demand data is based solely on the recreation and visitor demand generated by the Park attractions and not by any large organized group.

Sunday Parking Demand

In general, Sunday parking demand mirrored Saturday demand through the core hours of the day. Most of the lots and segments were at or over capacity by or before 11am except for the McCoy Pavilion Lot and the Harbor Lot. This trend continued until around 4pm, when the demand tapered more as compared to Saturday, but at 6pm all of the street sections were still above their effective capacity (i.e., greater than 95% occupied). The largest lots began to open up at 6pm but were still just below their effective capacity.

The peak demand for the entire park occurred between 12pm and 3pm, where the measured occupancy was 105% to 107%. The shoulders of the peak period occurred between 10am and 12pm, and between 4pm and 6pm, but occupancy during these times was at or in excess of 90%.

Overall demand in disabled spaces peaked in the middle of the day ranging from an overall occupancy of 87% to 96% between 11am and 3pm. In particular, the Beach Lot disabled spaces were fully occupied during that period, but spaces were generally available in all lots outside those core hours.

Similar to the Saturday observations, no vehicles were observed parking on Ala Moana Boulevard immediately mauka of the Park property on Sunday during the occupancy survey. Instead of waiting for an available space or parking illegally, up to 64 vehicles could have utilized these spaces.

Although not expected at all, DPR staff indicated that all of the scheduled Sunday events requiring a permit did not take place as originally scheduled. This was a similar occurrence during the Thursday and Saturday occupancy surveys, and as a result, the Sunday parking demand data in this report is based solely on the recreation and visitor demand generated by the Park attractions.

OVERALL CONCLUSIONS REGARDING DEMAND

The occupancy data clearly shows that parking demand on Thursday can be generally accommodated by the existing supply at the Park. The exceptions are the 5pm hour when the demand is approaching the effective capacity of the Park (90% of the supply), and the 6pm hour when the demand is between the effective and actual parking capacity. This peak in demand is attributed to people that drive to the Park to enjoy the amenities and attractions after work. The number of disabled spaces appears to be adequate to serve weekday demand based on the Thursday survey. To provide a supply that would accommodate the peak Thursday demand at the effective capacity of 90%, a total of 58 spaces would have to be added. The spaces on Ala Moana Boulevard are not an option since they are unavailable during the peak Park hour on Thursday.

On Saturdays and Sundays, the overall parking demand exceeds the total parking supply at the Park primarily from 11am to 5pm, with Saturdays including an additional three hours (9am, 10am and 6pm) where the demand exceeds the available capacity. The area with the highest demands includes the on-street spaces in the western section of Ala Moana Park Drive on both Thursday and the weekend days, although the on-street demand is high all weekend long. The Beach Lot is also highly desirable on the weekends and was over-capacity by 9am on Saturday.

It is interesting to note that while all of the parking supplies within the Park were highly desired on the weekend, no one took advantage of the spaces on Ala Moana Boulevard. These available on-street spaces could have accommodated nearly all of the illegally parked vehicles in the Beach Lot during the peak hours on Saturday. However, the overall demand would still have far exceeded the effective parking capacity within the Park had those spaces been utilized.

Even without *any* increase in activity and subsequent parking demand caused the Master Plan, the City and County would have to consider providing additional parking and/or implementing management strategies to ensure that demand can be accommodated within the effective capacity of the available supply. To provide a supply that would accommodate the peak Saturday and Sunday demand at the effective capacity of 90%, a total of 113 new spaces would have to be added to the Park. This assumes that all 64 of the spaces on Ala Moana Boulevard were fully utilized before the new supply was added.

As noted in each of the daily summaries, none of the surveyed days included any scheduled events that can generate a substantial on-site population and parking demand, in addition to the demand generated by the Park's natural amenities. If the surveyed days are representative of typical summer activity for at least June, July and part of August (when schools begin classes), then weekend days with *any* scheduled events would likely result in more hours with a deficient parking supply and potentially vehicles parking in adjacent areas (such as Ala Moana Shopping Center).

POTENTIAL PARKING MANAGEMENT STRATEGIES

Managing parking is one of the most challenging aspects of transportation planning in terms of balancing: 1) the need to provide adequate supplies within reasonable access to the subject attraction with 2) the infrastructure economics/environmental considerations, and 3) public expectations. The expectations of drivers includes not only perceived convenience, but relatively low costs, and anticipated "free" access to certain attractions (e.g., the beach). When parking in an area has been "free" or has not included any

operational restrictions (e.g., time limits), some drivers resist the implementation of parking management strategies simply based on a change in the status quo. However, as areas urbanize and demand approaches or exceeds capacity, parking operators are forced to increase the supply or implement policies and actions to better manage demand and create opportunities for drivers to park at all times of day.

In the case of Ala Moana Regional Park, a series of strategies can be considered to increase the number of available spaces during the day, increase the available supply, and/or reduce the overall demand. These options are included in **Table 2** and each strategy includes a general description, the expected benefit, potential application for the Park, and relative cost and time implications for implementation. Cost is generalized as low, medium and high cost items illustrated by one, two or three dollar signs. Similarly, implementation timing is estimated as Immediate (within one year), Mid-Term (likely one to two years), and Long-Term (more than two years).

The simplest method to free up spaces during peak demand times is the implementation of time limits and enforcement to ensure compliance. This will provide more opportunities for Park patrons arriving during the peak times to find available spaces, and not require that they arrive by 9am or 10am to find a space. For the highest demand areas, a portion of the spaces could be designated with shorter time limits (2 hour and 4 hour limits) to make spaces available in all areas of the Park.

DRAFT

Another relatively inexpensive solution is to install signage at both entrances and exits identifying that parking is available on Ala Moana Boulevard on weekends. Use of these 64 spaces would provide a substantive increase in the supply with little investment.

Reducing demand through the encouragement of other mode use and taxis/transportation network companies (TNCs) such as Uber and Lyft is an ideal way to increase space availability. However, these approaches are typically the most effective when there is some cost associated with parking in the desired location (i.e., when it is less expensive to ride one's bike or take an Uber).

Charging for parking is typically the most effective strategy to manage demand but also has the most implications for public comment and potential opposition. Another challenge is that there is not another free public parking supply that can reasonably serve as an option for drivers if parking charges were implemented. While Ala Moana Shopping Center is in close proximity, those spaces are designated for private use and cannot be counted on to supplement the Park supply.

Limited opportunities are available to increase the existing parking supply within the Park and using the existing infrastructure. The most effective strategy for re-striping would be to convert Ala Moana Park Drive to one-way operation (either ewa-bound or diamond head-bound) and stripe it with 60-degree diagonal parking on along the makai curb and parallel parking on the mauka curb. Within the existing 40-foot curb to curb width, this would include 18 feet for the diagonal spaces, 8 feet for the parallel spaces, and a 14-foot travel lane. While this could increase the parking supply by roughly 200 spaces along the entire length of the street, the conversion would have other implications including: 1) changes to intersection operations on Ala Moana Boulevard at Kamakee Street and at Atkinson Drive depending on the direction of travel, as well as reduced circulation options to and through the Park. Additional studies would be needed to ascertain the functional feasibility of this option.

Please let us know if you have any questions regarding the contents of this study. We appreciate the opportunity to assist you.

Sincerely,

FEHR & PEERS

Sohrab Rashid
Principal

Attachment

Table 2

Potential Parking Management Strategies for Ala Moana Regional Park

Strategy	Description	Benefit	Potential Application	Cost[1]	Timing[2]
Time Limits and Restrictions	Indicate time limits on spaces via signage using a mix of short-term and and long-term limits. Typical limits for a park use include 2-hr, 4-hr, and 8-hr blocks but can be modified as appropriate.	Encourages turnover of spaces to provide short-term parking for visitors in some areas and provides opportunities for vehicles arriving during peak conditions.	Designate a portion of the spaces within the Park with typical limit ranges. Can be combined with parking charges and/or assignment of location if desired.	$	Immediate
Enforcement	Usually involves writing and issuing parking citation relating to violation of codes, laws, regulations, and validation programs. Is typically performed by a non-peace officer. If a jurisdiction is about to more stringently enforce time limits, sufficent notice should be provided to those who might be ticketed.	Encourages compliance with legal parking spaces, time limits, parking charges, permit requirements, etc.	Enforcement could currently be used to reduce illegal parking in the lots and on Ala Moana Park Drive, and would also need to be conducted in conjunction with one or more of the time limit or parking charge options to make them effective.	$	Immediate
Encourage Use of Non-Auto Modes	Enhance bus transit stops with amenities; provide: direct and attractive connections between stops and ultimate destination, secure and convenient bicycle parking, and enhanced walking environments to high-capacity transit stations..	Reduces overall parking demand by making non-auto modes more attractive and convenient	Install bike lockers and /or shaded racks, make sure all transit stops include all amenities including shelters and comfortable seating, provide discount at Park concessions for transit tickets and passes.	$ to $$	Immediate to Mid-Term
Wayfinding and Space Availability Signage	Install informational signs indicating larger parking supplies and all available on- and off-street supplies. In addition, install electronic reader boards indicating space availability within larger lots.	Ability for drivers to find spaces more efficiently resulting in reduced re-circulation and driver frustration.	Install: 1) information signs at the Park entrances indicating that location of additional on-street parking is available on Ala Moana Boulevard on weekends only, and 2) a reader board at the entrance to the Beach and McCoy Pavilion Lots indicating the number of available spaces.	$$	Mid-Term
Restripe to Increase Capacity	Re-stripe roadway sections with angled or perpendicular parking, if right-of-way and traffic conditions allow.	Increased supply plus a traffic calming effect and improved pedestrian environment by maintaining a buffer between pedestrians and moving vehicles.	Within the existing curb-to-curb width, the only effective way to increase the on-street supply is to convert Ala Moana Park Drive to one-way operation and install angled parking on one side and maintain parallel parking on the other.	$$	Mid-Term
Assignment of Parking Location	Assigns particular parking users to specific locations to increase the efficiency with which spaces are used.	Concentrates more frequent parking activities, manages the perceived convenience of some spaces (i.e., on-street) and can reduce recirculation.	Implement shorter time limits on some higher demand street sections (Park West) and allow longer term parking in the larger lots. Would be used in conjunction with time limits.	$	Immediate

Table 2

Potential Parking Management Strategies for Ala Moana Regional Park

Strategy	Description	Benefit	Potential Application	Cost	Timing
Charge for Parking	Collecting parking charges can be accomplished by traditional parking meters, centralized parking machines, debit card systems, phone apps, etc. All systems can be programmed to implement different parking charges by day of the week depending upon demand, differentiate between short- and long-term use, time of day, and the location of particular spaces.	Encourages drivers to use parking efficiently, by directing long-term parking to less convenient spaces and gaining the most productivity from the most attractive spaces. Also, helps to reduce auto use and increase use of transit, walking and biking. Generates revenue for maintenance and re-investment in Park.	Install pay stations along Park street sections and in all lots. Initially, charges may only be required on weekends during peak periods with electronic signs at entrances indicating whether charges are in effect.	$$ to $$$	Mid-Term to Long-Term
Curbside Management	Designate the use of the most convenient curb locations for taxis and Transportation Network Companies (TNCs) such as Uber and Lyft	Reduces parking demand while still providing convenient access for users	Identify/construct key passenger loading areas in the Park with signing/striping and enforce appropriate use	$ to $$	Immediate to Mid-Term

Notes: 1 Dollar signs indicate relative cost of improvement strategies from least ($) to most ($$$)expensive.
2 Timing is generally described as follows: Immediate (w/in 1 year), Mid-Term (w/in 2 to 3 years), and Long-Term (greater than 3 years).
Source: Fehr & Peers, 2017.

APPENDIX D-1

HRS Chapter 6E-8 Letter of Determination

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

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

ROBERT K. MASUDA
FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

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

June 18, 2018

IN REPLY REFER TO:
LOG: 2018.01374
DOC: 1806KN03
Architecture, Archaeology

Robert J. Kroning, Director
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813
via: rkroning@honolulu.gov

Dear Mr. Kroning:

RE: **Historic Preservation Review**
Ala Moana Regional Park Master Plan
1201 Ala Moana Blvd. Honolulu, HI 96814
Waikīkī Ahupua'a, Kona District, Island of O'ahu
TMK: (1) 2-3-037:001

Thank you for the opportunity to comment on this request from the Department of Design and Construction (DDC) for Hawai'i Revised Statutes (HRS) Chapter 6E-8 review. The State Historic Preservation Division (SHPD) received this submittal on June 5, 2018. The submittal included the SHPD 6E Submittal Form, information per §13-275, HAR, the permit set, and photographs. The proposed scope of work includes repairing damaged canal walls, improving access along Ala Moana Boulevard and the edge conditions of the Japanese and Hawaiian ponds, reconfiguring the McCoy Pavilion "keyhole" parking area, and providing maintenance repair to the Bridle Bridge and Roosevelt Portals.

Ala Moana Regional Park is listed on the Hawai'i Register of Historic Places as part of the thematic multiple property nomination for the City & County of Honolulu's Art Deco Parks. The park was evaluated as eligible under Criteria A and C, under the areas of Recreation and Architecture and the period of significance is 1934.

Per §13-275-7, HAR, the project will affect one or more significant historic properties, the effects will potentially be harmful, and therefore SHPD **concurs** with DDC's **"Effect, with proposed mitigation commitments"** effect determination. Per §13-275-8, HAR, DDC's proposed mitigation commitments are acceptable.

Per 36 CFR 800.16(y), this project will require a Federal permit, license or approval and therefore is considered an undertaking. DDC acknowledges that this project shall comply with Section 106 of the National Historic Preservation Act, and SHPD looks forward to future consultation and receiving the appropriate documentation per 36 CFR 800.11.

Please contact Susan Lebo, Archaeology Branch Chief, at (808) 692- 8019, or at Susan.A.Lebo@hawaii.gov, for questions regarding archaeological resources, or Kaiwi Yoon, Architecture Branch Chief at (808) 692-8032, or at Kaiwi.N.Yoon@hawaii.gov for questions regarding architectural resources this letter.

Mahalo,

Alan Downer

Alan Downer, PhD.
Deputy State Historic Preservation Officer
Administrator, State Historic Preservation Division

cc: emorisato@honolulu.gov

APPENDIX D-2

Draft Literature Review and Field Inspection with Cultural Section for the Ala Moana Regional Park Master Plan
Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu
TMKs: [1] 2-3-037:001, 022, 023 and 025

Draft

Literature Review and Field Inspection with Cultural Section for the Ala Moana Regional Park Master Plan Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu TMKs: [1] 2-3-037:001, 022, 023 and 025

Prepared for
Belt Collins Hawaii LLC

Prepared by
Constance R. O'Hare, B.A.,
David W. Shideler, M.A.,
and
Hallett H. Hammatt

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: WAIKIKI 160)

January 2017

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1860 Main St.
Wailuku, Hawai‘i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Literature Review and Field Inspection with Cultural Section for the Ala Moana Regional Park Master Plan, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKs: [1] 2-3-037:001, 022, 023 and 025 (O'Hare et al. 2017)
Date	January 2017
Project Number (s)	Cultural Surveys Hawai‘i Inc. (CSH) Job Code: WAIKIKI 160
Investigation Permit Number	CSH presently operates under Hawai‘i State Historic Preservation Division (SHPD) permit number 16-26, issued per Hawai‘i Administrative Rules (HAR) §13-282.
Project Location	The project area is bounded by Ala Moana Boulevard to the north, *mauka* (inland) side, the ocean on the south, *makai* (seaward) side, Kewalo Basin to the west, and Ala Wai Yacht Harbor to the east. The project area also includes Magic Island, a peninsula off the southeastern corner of the park. The project area is depicted on the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Land Jurisdiction	City and County of Honolulu
Agencies	SHPD
Project Description	The project area consists of the 75.209-acre Ala Moana Regional Park and the 42.669-acre peninsula called Magic Island for a total area of 117.878 acres. Various improvements are planned for the park by the City and County of Honolulu, after community input. These improvements could include construction of and/or improvements to existing pathways, lawn areas, new bathroom stalls on Magic Island, and new limits to parking (Garcia 2015).
Project Acreage	117.878 acres (47.70 hectares)
Historic Preservation Regulatory Context	The proposed project is subject to Hawai‘i State environmental and historic preservation review legislation (Hawai‘i Revised Statutes [HRS] §343 and HRS§6E-8/ HAR §13-275, respectively).
Historic Properties Potentially Affected	Ala Moana Regional Park was nominated to the National Register of Historic Places (NRHP) in 1988, and listed on the Hawai‘i Register of Historic Places (HRHP) in 1988, as State Inventory of Historic Places (SIHP) # 50-8-14-1388, one of the Art Deco Parks Thematic Group. A NRHP nomination for Ala Moana Regional Park, was prepared in 1988 (present Appendix A).

Field Results and Recommendation	A field check of the project area was conducted by Constance R. O'Hare, B.A., and photographs were taken of all major structures. Pre-Contact burials, historic burials, subsurface cultural layers, and historic trash layers have been recorded near Ala Moana Boulevard and may extend into the northern section of the park immediately adjacent to Ala Moana Boulevard in some areas but this is by no means certain. In addition, scattered human skeletal remains and pre-Contact artifacts might be found in a secondary context in the sand mined from northern and western O‘ahu beaches and trucked to the park to be used to create Ala Moana Beach. Possibly subsurface remnants of the Anti-Motor-Torpedo Boat (AMTB) Battery at Ala Moana Regional Park and related army temporary shacks for housing and bomb shelters built in 1944 and destroyed in 1946 may be present in a specific area. Possibly subsurface remnants of Ulu Mau Village (a recreation of a Hawaiian village) dating from 1948 into the early 1960s may be present. There are several original, unmodified structures/features in the park that are older than 50 years and consultation with the SHPD architecture branch is recommended if proposed improvements include modifications to these features.

Table of Contents

Cultural Surveys Hawai'i Job Code: WAIKIKI 160

TMKs: [1] 2-3-037:001, 022, 023 and 025

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Belt Collins Hawaii, LLC, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological literature review and field inspection (LRFI) with a cultural section for the Ala Moana Regional Park Master Plan project, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKs: [1] 2-3-037:001, 022, 033, and 025. Various improvements are planned for the park by the City and County of Honolulu, after community input. These improvements could include construction and or improvements to existing pathways, lawn areas, new bathroom stalls on Magic Island, and new limits to parking (Garcia 2015).

Ala Moana Regional Park is a 75.209-acre City and County of Honolulu public park located on the shoreline, bounded by Ala Moana Boulevard to the north, *mauka* (inland) side, the ocean on the south, *makai* (seaward) side, Kewalo Basin to the west, and Ala Wai Yacht Harbor to the east. The project area (117.878 acres or 47.70 ha) includes the 75.209-acre peninsula on the southeastern side of the park known as Magic Island. Ala Moana Park Drive runs through the park parallel to the shoreline. The project area is depicted on the 1998 Honolulu U.S. Geological Survey (USGS) map (Figure 1), tax map plat (TMK: [1] 2-3-037) (Figure 2), a 2013 aerial photograph (Figure 3), and a park layout map (Figure 4). Ala Moana Regional Park was nominated to the National Register of Historic Places (NRHP) in 1988 (Appendix A). The park was listed on the Hawai‘i State Register of Historic Places (HRHP) as part of the City and County of Honolulu's Art Deco Parks Thematic Group and as State Inventory of Historic Places (SIHP) # 50-80-14-1388 in 1988. Several extant structures in the park date to the 1930s, and are thus older than 50 years.

1.2 Scope of Work

The scope of work for this archaeological literature review and field inspection includes the following:

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

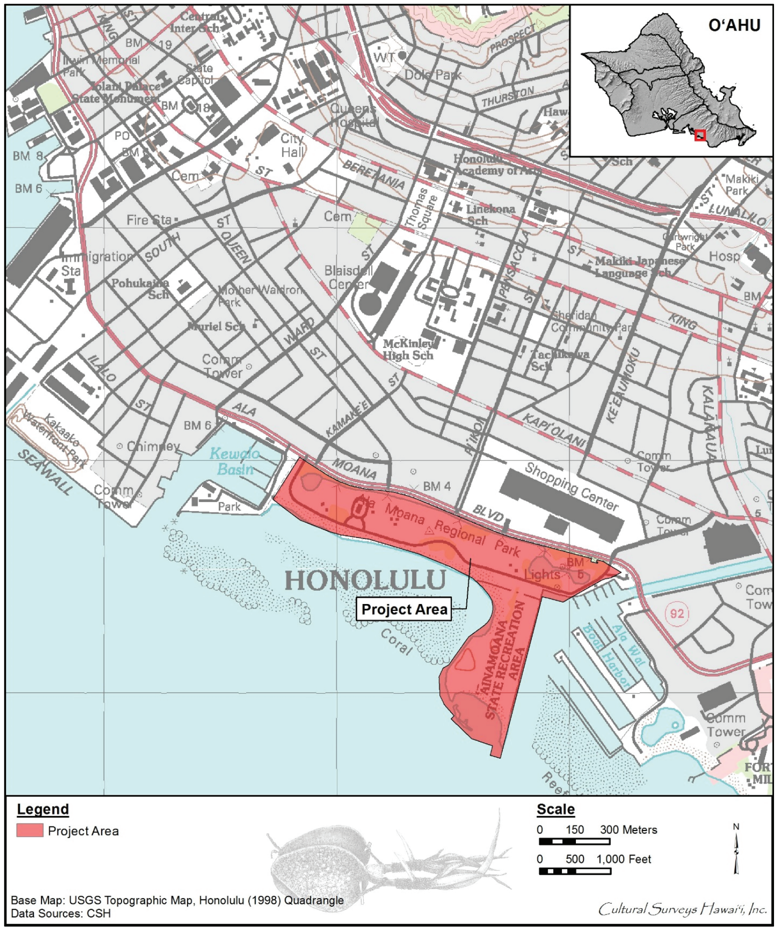


Figure 1. Portion of 1998 Honolulu USGS 7.5-minute series topographic quadrangle, showing the location of the project area

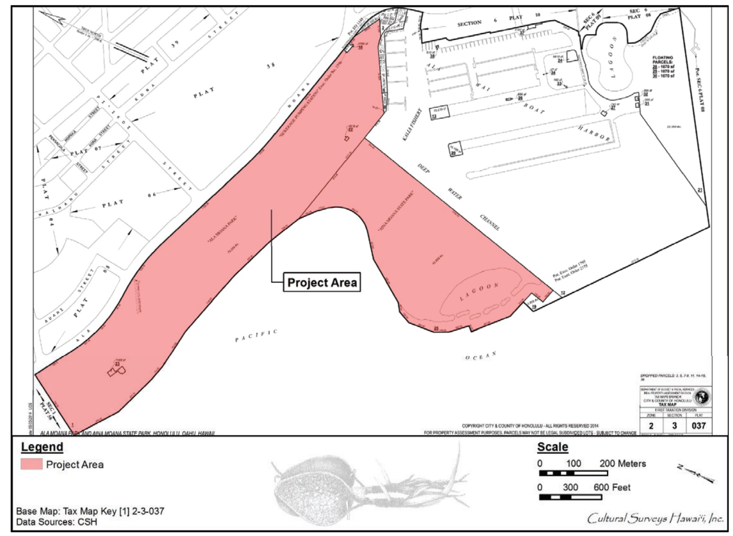


Figure 2. Tax Map Key (TMK) [1] 2-3-037, showing the location of the project area (Hawai‘i TMK Service 2013)

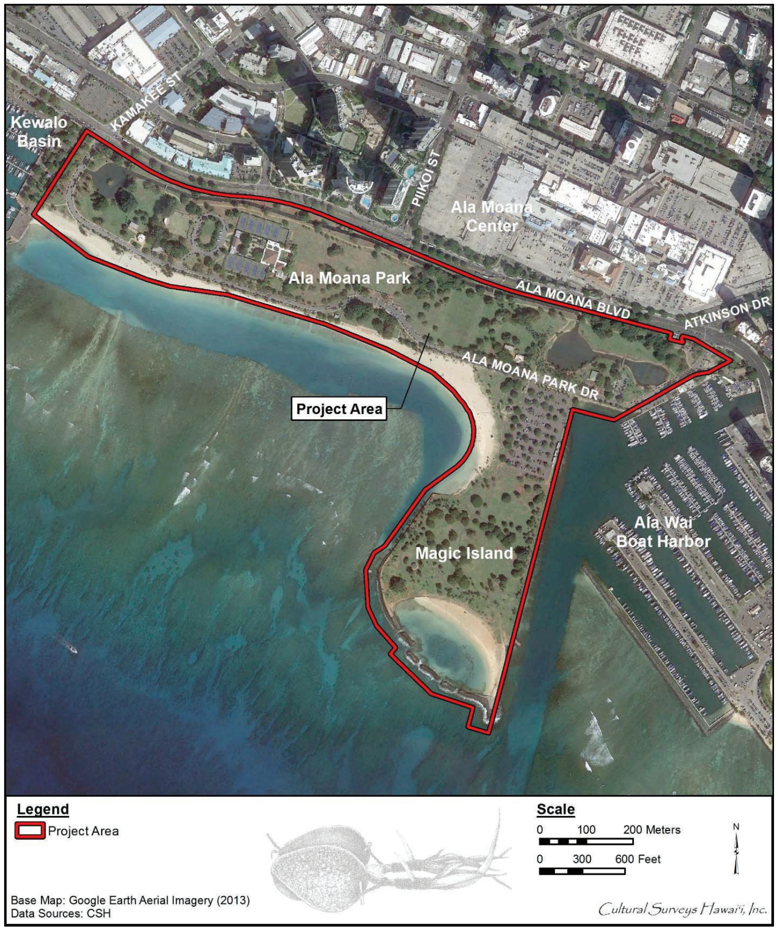


Figure 3. Aerial image (Google Earth 2013), showing the project area

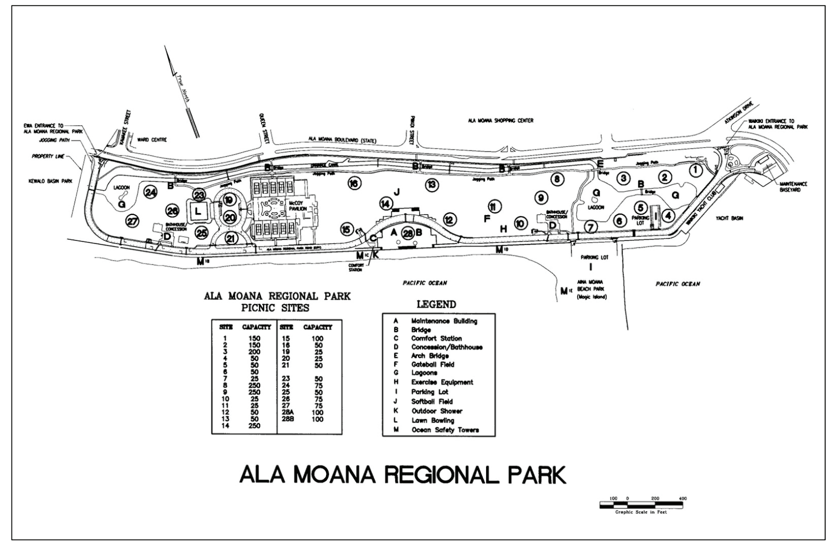


Figure 4. Plan of Ala Moana Regional Park (courtesy of client)

1.3 Document Purpose

The proposed project is subject to Hawai'i State environmental and historic preservation review legislation (Hawai'i Revised Statutes [HRS] §343 and HRS§6E-8/Hawai'i Administrative Rules [HAR] §13-275, respectively). This literature review and field inspection provides a comprehensive overview document that will synthesize the work previously performed in and near this project area. This study includes analysis of the previous work, available information, and limited site inspections, as well as recommendations for future development contingencies.

This archaeological study provides an overview of existing archaeological conditions to facilitate planning and budgeting considerations, and to convey any possible archaeological constraints to proposed development(s) or improvements. Although the primary purpose of this investigation is planning, the investigation and its associated report can be used by project proponents to consult with the State Historic Preservation Division (SHPD) regarding the need for an archaeological inventory survey and/or mitigation work within the project area.

This literature review and field inspection is not intended to meet the requirements of an archaeological inventory survey per the rules and regulations of the SHPD (HAR §13-276). The level of work of this study is regarded as sufficient to address potential archaeological site types and locations and allow for future work recommendations. This literature review and field inspection report details methods, findings, and results.

1.4 Environmental Setting

1.4.1 Natural Environment

The project area is located on former reef land off O'ahu's south shore that was dredged and filled to create the park in the late 1920s and early 1930s (Figure 5). The park is fairly level with elevations ranging from 5.1 to 5.6 feet (ft) above mean sea level. The park stratigraphy is described as follows:

> The site is underlain by a layer of silty topsoil less than a foot thick beneath which is a loose to semi compact sand fill extending to an average depth of about five feet. The fill was placed as part of the reclamation effort to create Ala Moana Park. Immediately beneath the fill is a rather uniform deposit of chiefly loose to very loose, gravelly coralline sand identified as lagoonal sediments to the maximum depth explored, approximately 21.5 feet. Ground water levels were measured at an average depth of about five feet, reflecting mean sea level. [Weidig Geoanalysts in Arthur Kimbal Thompson Architect, AIA 2004:16]
>
> The remainder of the . . . site is underlain by fill, placed to extend the old shoreline, overlying pelagic coral reefs and lagoonal deposits. . . . Below the fill horizon, lies a rather uniform soil profile consisting of saturated, mostly loose to very loose, well graded fine to coarse coralline gravelly sand. These soils are lagoonal deposits, found to contain abundant fragments of finer coral and shells broken by storm surges. [Arthur Kimbal Thompson Architect, AIA 2004:16–17]

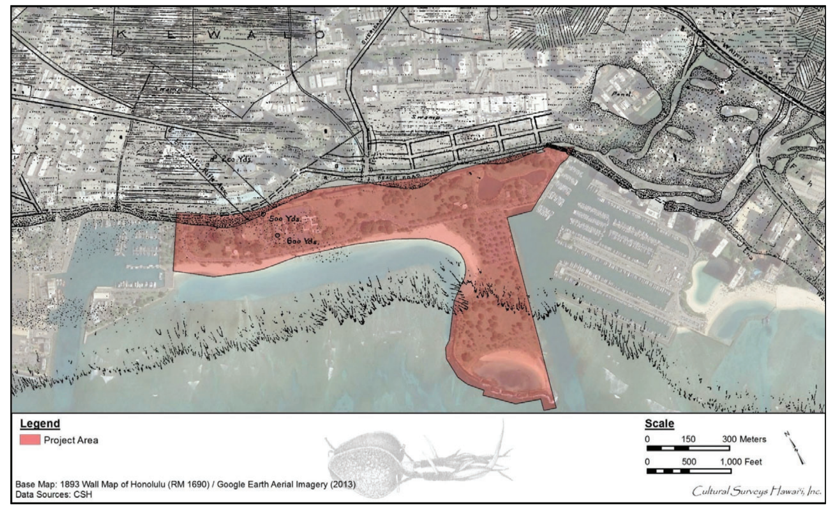


Figure 5. Figure comparing the shoreline of 1893 and the present shoreline in the vicinity of the project area (1893 Wall map of Honolulu overlain on a 2013 aerial photograph); note majority of project area is *makai* of "Beach Road" (Ala Moana Boulevard) in the former shallow reef area that was submerged at high tide

In this area of the Honolulu District, rainfall averages less than 30 inches per year (Armstrong 1983:62). Northeasterly trade winds prevail throughout the year, although their frequency varies from more than 90% during the summer months to 50% in January. The average annual wind velocity is approximately 10 miles per hour (Wilson Okamoto & Associates 1998:1–2). Vegetation within the project area is limited to a variety of landscaped plants and ornamental trees such as banyans (*Ficus* sp.), coconuts (*Cocos nucifera*), *hala* (*Pandanus* sp.), monkeypod (*Samanea saman*), and *kamani* (*Calophyllum inophyllum*). Green turtles (*Chelonia mydas*) and Hawaiian monk seals (*Monachus schauinslandi*) are occasionally noted on the beach (Arthur Kimbal Thompson Architect, AIA 2004:22).

The USDA Soil Survey classifies the project area’s soils as “Fill land, mixed” (FL) (Figure 6):

> This land type occurs mostly near Pearl Harbor and in Honolulu, adjacent to the ocean. It consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. [Foote et al. 1972:31]

The fill lands were created from 1931 to 1934, mainly from offshore dredged material plus a foot of top soil. Although the soil map also shows an area of “Beaches” (BS), this sand is not local but was trucked in from other areas (mainly the north shore of O‘ahu) to expand and replenish the swimming beach area of the park.

1.4.2 Built Environment

The project area is comprised of the Ala Moana Regional Park, a landscaped area with a beach, open green areas, sports areas, Magic Island, and structures on the *makai* side of Ala Moana Boulevard. Shopping centers, including the large Ala Moana Center, and condominiums line the *mauka* side of Ala Moana Boulevard.

As Robert Weyeneth notes in his study *Ala Moana: The People’s Park*:

> . . . Ala Moana Beach Park is entirely a manmade development. Its trees and shrubs are landscaping effects, arranged by the human hand, that have matured fifty years now [in 1987]. The park’s oceanfront swimming hole has been carved from the fringing coral reef. The beach is the creation of hydraulic engineers, who at periodic intervals replenish the sand with imports from elsewhere on the island of Oahu. Even the site itself is a human invention, a tidal area filled by excavating the offshore reef. The passage of five decades [in 1987] has turned the park into a setting of incomparable natural beauty, but Ala Moana is what a geographer would call a “cultural” landscape. It is the product of engineering expertise and landscape design. [Weyeneth 1987:1]

Part of the purpose of the present study was to examine this claim particularly with regard to whether there might be a thin strip of land on the inland (Ala Moana Boulevard) side of the park that might have buried, natural sediments (a former natural coastline) above the water table. Reviewing the history of the land filling that created the park, and the subsequent substantial widening on the seaward side of the ancient “Beach Road” that evolved from a pre-Contact foot path into Ala Moana Boulevard (see in particular a 1935 aerial photograph in Figure 31) supports Weyeneth’s conclusion that “Ala Moana Beach Park is entirely a manmade development.” No natural sediments above the water table are believed to be present.

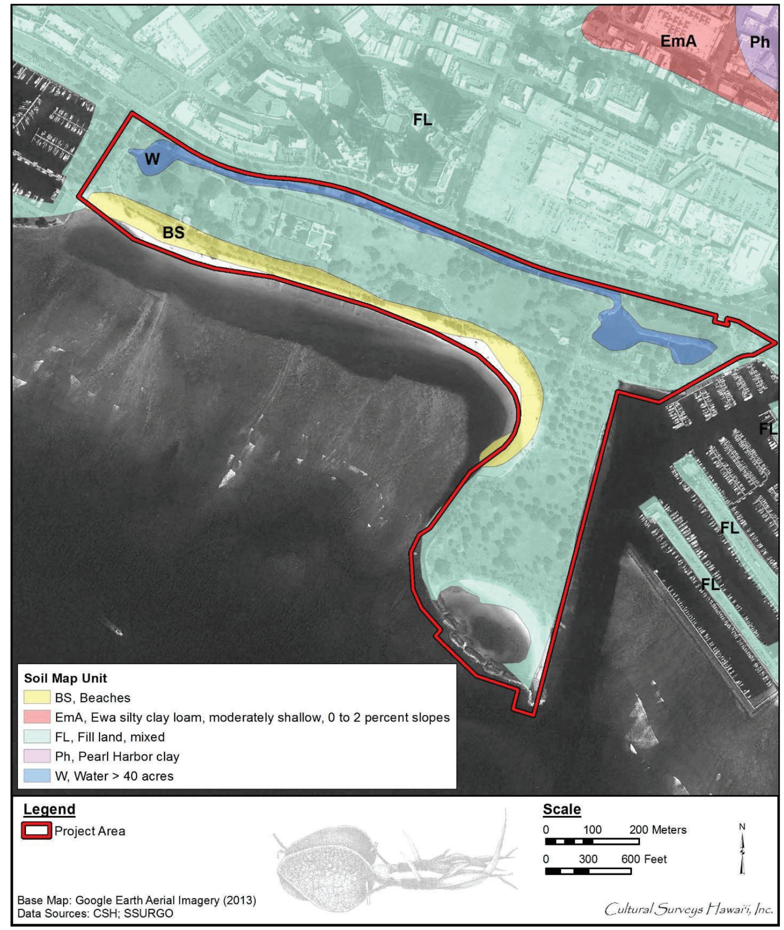


Figure 6. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating sediment types within and surrounding the project area (USDA Soils Survey Geographic Database [SSURGO] 2001)

Section 2 Traditional Background

Central Honolulu consists of the *ahupua‘a* (large land division) of Nu‘uanu, Pauoa, Makiki, Mānoa, and Pālolo, from west to east. At one time these *ahupua‘a* probably extended from the Ko‘olau mountain range down to the sea, as is typical of *ahupua‘a* on other parts of O‘ahu. Due to the importance of Honolulu Harbor to the west and the *ali‘i* (high chiefs) residences on the Waikīkī shore, these lands were "cut off" in the late pre-Contact or early post-Contact period, and the coastal areas of Nu‘uanu, Pauoa, and Makiki became Honolulu Ahupua‘a, while the coastal areas of Mānoa and Pālolo became Waikīkī Ahupua‘a. Many individual *‘ili* (small land divisions) within Honolulu and Waikīkī, however, still had some association with their original *ahupua‘a*. Some *‘ili lele*, or "jump lands," were still part of an *ahupua‘a*, although possibly no longer contiguous with the rest of the *ahupua‘a*. Additionally, they could be *‘ili kūpono*, shortened to *‘ili kū*, which were independent from their original *ahupua‘a* (Lucas 1995:40–41).

The project area is located offshore of portions of Kukuluāe‘o and Kewalo, two *‘ili* of Honolulu, and Kālia, an *‘ili* of Waikīkī. Sheridan and Pi‘ikoi streets generally follow the ancient boundary line dividing Honolulu to the west from Waikīkī to the east, as shown on maps of Honolulu from 1884 and 1891 (see Figure 10 and Figure 11). On the west side of Pi‘ikoi Street is a small section of the *‘ili* of Kewalo, an *‘ili kū* of Pauoa, then further west is Kukuluāe‘o, an *‘ili kū* of Makiki. Today, Pi‘ikoi Street also marks the eastern boundary of a modern land section called the Kaka‘ako Development District, which includes several *‘ili* stretching from Punchbowl Street to Pi‘ikoi Street, and some of the lands of Kukuluāe‘o and Kewalo. In the following report sections, the traditional background of Kukuluāe‘o, Kewalo, and Kālia will be presented.

The following sections present *wahi pana* (legendary places) and *‘ōlelo* (stories) of Kukuluāe‘o, Kewalo, two *‘ili* of Honolulu and Kālia. The Hawaiian term *wahi pana*, also referred to as a place name (literally "a storied place"), "physically and poetically describes an area while revealing its historical or legendary significance" (Landgraf 1994:v). *Wahi pana* can refer to natural geographic locations such as streams, peaks, rock formations, ridges, and offshore islands and reefs, or they can refer to Hawaiian divisions such as *ahupua‘a* and *‘ili*, and man-made structures such as fishponds. *‘Ōlelo* are traditional stories and *‘ōlelo no‘eau* are proverbs, wise sayings, or poetical sayings. *Wahi pana* and *‘ōlelo* tangibly link the *kama‘āina* (residents) of Hawai‘i to their past.

2.1 Kukuluāe‘o and Kewalo ‘Ili

Kukuluāe‘o, an *‘ili kū* of Makiki, which translates literally as the "Hawaiian stilt (bird)," means "to walk on stilts" (Pukui et al. 1974:23). This area with its marshes, saltpans, and small fishponds (Kekahuna 1958:4), was an ideal environment for the Hawaiian stilt (Griffin et al. 1987:36).

Kewalo literally means "the calling (as an echo)" (Pukui et al. 1974:109). This large *‘ili kū* of Pauoa extended from an area on the west side of Makiki above Punchbowl Crater down to a narrow beach section west of Pi‘ikoi Street. At one time, various sports such as surfing were held at this beach (Kekahuna 1958:4).

Kamakau (1991:24–25) recorded a traditional *wānana* (prophecy) that mentions the chief Huanuikalala‘ila‘i of Pu‘ukea Heiau:

[Ka makaua ua kahi o ‘Ewa]	[The increasing ‘first rain’ of ‘Ewa]
Ua puni ka i‘a o Mokumoa,	Overcomes the fish of Mokumoa,
Ua kau i‘a ka nene;	Washes up fish to the nene plants;
Ua ha‘a kalo ha‘a nu;	Lays low the taro as it patters down;
Ha‘a ka i‘a o Kewalo,	Lays low the fish of Kewalo,
Ha‘a na ‘ualu o Pahua,	Lays low the sweet potatoes of Pahua,
Ha‘a ka mahiki i Pu‘ukea,	Lays low the mahiki grass at Pu‘ukea,
Ha‘a ka unuunu i Pele ‘ula,	Lays low the growing things at Pele‘ula
Ha‘a Makaaho i ke ala.	Lays low Makaaho [Makāho] in its path
E Kū e, ma ke kaha ka ua, e Kū,	O Kū, the rain goes along the edge [of the island], O Kū
[I ‘ai na ka i‘a o Maunalua]	[‘Eating’ the fish of Maunalua] . . . .

The chant mentions the *mahiki* grass of Pu‘ukea. *Mahiki* is a tufted rush found near the seashore. The term *mahiki* connotes several historical and contemporary meanings. With serious family discord, a *kupuna* (elder) can continue with lines of inquiry of *ho‘oponopono* (family conference in which relationships are set right) to "peel off" layers of deeper feelings (Pukui et al. 1972:228). In a deeper Hawaiian past, skilled *kahuna* (priests, experts) formerly exorcised malicious spirits from the afflicted in an exorcist ritual with the aid of *mahiki* (shrimp or a grass called *‘aki‘aki)* (Pukui and Elbert 1986:219). The use of this grass in a ritual may explain its association with a ceremonial *heiau* (temple, shrine). Alternatively, the Kewalo and Kukuluāe‘o coast were good habitats for *mahiki* and, therefore, they may have been favored places for healers to collect this type of grass.

The chief Huanuikalala‘ila‘i governed Pu‘ukea Heiau, located in the land section of Kukuluāe‘o (Kamakau 1991:24). Pu‘ukea literally means the "white hill" (Pukui et al. 1974:199). It is also the name of a small land division within the *‘ili* of Kukuluāe‘o that is mentioned in at least two Land Commission cases, LCA 1502 (not awarded) and LCA 1504. LCA 1504 is located near the junction of Halekauwila and Cooke streets. It is common for a *heiau* to have the same name as the *‘ili* in which it is located, so it is possible Pu‘ukea Heiau was also near the junction of Halekauwila and Cooke streets. The majority of the house sites in the mid-nineteenth century in Kukuluāe‘o were located near Halekauwila and Queen streets, *mauka* of the low-lying coastal marshlands on higher, dry ground. It is possible the *heiau* platform, or at least the area it was built on, was one of the few elevated locations in the flat, low-lying marshland that surrounded it. The name of Pu‘u Kea Heiau might be attributed to this elevated natural feature of the landscape.

2.2 Kālia ‘Ili

The marshland of Waikīkī was watered from streams in the Makiki, Mānoa, and Pālolo valleys, and from springs in Mānoa such as Punahou and Kānewai. The name Waikīkī, which means "water spurting from many sources" (Pukui et al. 1974:223), was well adapted to the character of the swampy land of ancient Waikīkī, where water from the upland valleys of Mānoa and Pālolo would gush forth from underground. Before construction of the Ala Wai Canal, the Mānoa and Pālolo streams did not merge until deep within Waikīkī. As they entered the flat Waikīkī Plain, the names of the streams changed; the Mānoa became the Kālia and the Pālolo became the Pāhoa. They joined near Hamohamo (now an area *mauka* [inland] of the Kapahulu Library) and then divided into three new streams, the Kuekaunahi, ‘Āpuakēhau, and Pi‘inaio. The Kuekaunahi once emptied into the sea at Hamohamo (near the intersection of ‘Ōhua and Kalākaua avenues). The ‘Āpuakēhau, also referred to on some maps as the Muliwai o Kawehewehe, or “the stream that opens the way” (Kanahele 1995:7), emptied into the ocean at Helumoa, between the Royal Hawaiian and Moana hotels. The Pi‘inaio entered the sea in a wide delta at Kālia. The land between these three streams was called Waikolu, meaning “three waters” (Kanahele 1995:7–8).

Pi‘inaio Stream extends through the center of Kālia ‘Ili. The meaning of Pi‘inaio is uncertain but it could be an allusion to going inland (*pi‘i*) to the location of a *naio* tree (bastard sandalwood; *Myoporum sandwicense*), near a stream crossing. The name of the area, “Kālia,” translated as “waited for” (Pukui et al. 1974:77), provides a sense of “waiting,” “loitering,” or “hesitating.” While the nuance is uncertain, the mouth of the Pi‘inaio Stream would be a logical place for travelers to stop. Others believe the place was named after the native tree *kālia (Elaeocarpus bifudus*) (Clark 2011:437), which the Hawaiians used as thatching rods for their house roofs (Thrum 1891:95).

Kālia had rich fishing grounds and reefs, beaches, and tide pools for collecting mollusks, crabs, and seaweed, and a swampy area well suited for salt pans, as shown on a 1909 map of Waikīkī (see Figure 13). It was famous for one type of edible *limu* (seaweed) called *limu ‘ele‘ele* (*Enteromorpha prolifera*), or black seaweed. *Limu ‘ele‘ele* was common along coastlines with freshwater intrusions, such as the Pi‘inaio Stream or at inland fishponds (Abbott 1984:17). The offshore waters of Kālia were also used for surfing; many of these areas no longer exist, as dredging and land filling have destroyed the ancient breaks.

2.2.1 *‘Ōlelo* of Kālia

There are several *‘ōlelo* (poetical sayings) referring to Kālia, its lands, and resources. Mary Kawena Pukui (1983) collected several in her book, *‘Ōlelo No‘eau. Hawaiian Proverbs & Poetical Sayings.* In addition, John Clark (2011) has recently collected and translated sayings from old Hawaiian language newspapers, which are printed in his book *Hawaiian Surfing*. Several sayings reference the sea, the surf, the wind, or the rain of Kālia.

> *E ho-i, E ho-i e Kilopu ka wai hale i* ***Kalia****. He wai na ka ua Naulu mai luna.*
>
> Return, return, o Kili‘opu, the fresh waters that fill **Kalia**. These are the waters of the Nāulu rains from the uplands. [*Ka Nupepa Kuokoa*, 23 April 1864:2; Clark 2011:438]
>
> *E Kalia i ke kai nehe i ka pu-eone, ame wai limu nii o Piinaio.*
>
> Oh, Kalia in the gentle rustling of the waves on the sand dunes and the plentiful fresh water seaweed of Pi‘inaio stream. [*Ka Nupepa Kuokoa,* 9 April 1925:5; Clark 2011:438]

Ke kai wawalo leo le‘a o ***Kālia***	The pleasing, echoing sea of Kālia

[Pukui 1983:186]

Ke haaheo ae la i ke kai o ***Kalia***	We are proud of the sea of **Kalia**

[*Ka Nupepa Kuokoa,* 22 March 1862:3; Clark 2011:437]

E hoi ka nanai i Ulukou la,	Beauty rests in Ulukou.
I ka nalu hoi muku i Kapuna la,	In the waves that break at Kapuni.

Punihei ho au ia la la la,	I am taken by him,
I ka leo o ke kai leo nui la.	By the great voice of the sea,
Ke wa mai la i ***Kalia*** *la.*	It makes a thundering noise at **Kalia**

[*Ka Hoku o ka Pakipika,* 12 April 1862:4; Clark 2011:438]

There is one reference to the salt collection at Kālia:

Kāhunahuna pa‘akai o Kālia.	Fine-grained salt of Kālia.

> A derogatory expression for the dried, viscid material in the corners of the eyes of an unwashed face. Kālia was a place for gathering salt, although any place name might be used. [Pukui 1983:144]

Many other sayings refer to the abundant fishing resources of Kālia.

Ho‘i i ***Kālia*** *i ka ‘ai ‘alamihi*.	Gone to **Kālia** to eat *‘alamihi* crabs.

Kālia was a place where *‘alamihi* crabs were once plentiful, leading to a play on the word *‘ala-mihi* (path of repentance), indicating someone who is in a repentant mood (Pukui 1983:110).

Ka i‘a pīkoi kānaka o ***Kālia****;*	The fish caught by the men of **Kālia**;
He kānaka ka pīkoi, he kānaka ka pōhaku.	men are the floaters, men are the sinkers

[Pukui 1983:150]

Kālia was also known for a certain type of fishing technique used to catch schools of mullet. When a school of mullet appeared, a bag net was set and the men swam out in a row. They surrounded the fish, slapped the water and kicked their feet, thus driving the frightened fish into the opening of their bag net. The fishermen of Kālia became known as human fishnets (Pukui 1983:150). This particular type of net was used because the water off Kālia was very shallow (Pukui 1983:74).

Kuu hoa o ka i-a lauahi lima o ***Kalia***	My companion who holds the fishnet at **Kalia**

[*Ka Nupepa Kuokoa*, 12 April 1862:4; Clark 2011:438]

He kai hopuni ko ***Kalia****.*	A sea for surround [nets] is at **Kalia**

[*Ka Nupepa Kuokoa*, 19 January 1867:1; Clark 2011:438]

In a song for the O‘ahu chief, Kuali‘i, the net fishermen of Kālia are also mentioned.

He kai heenalu ko Kahaloa,	The sea for surf-riding is at Kahaloa,
He kai hului ko ***Kalia****,*	The sea for casting the [bag] net is at **Kalia**,
He kai hele kohana ko Mamala,	A sea for going naked is at Mamala,
He kai au ko Kapueone,	A sea for swimming is at Kapuuone,
He kai kaha-nalu ko Makaiwa,	A sea for surf-riding sideways is at Makaiwa,
He kai ka anea ko Keehi,	A sea for kicking up mullet is at Keehi,
He kai elemihi ko Leleiwi,	The sea for small crabs is at Leleiwi,
He Kai awalau ko Puuloa, . . .	The sea of many harbors is at Puuloa . . .

[Fornander 1917:4(2):378–379]

The mullet were caught on their annual migration from their home in Pearl Harbor as they traveled around the island of O‘ahu:

> . . . starting from Puuloa and going windward, passing successively Kumumanu, Kalihi, Kou, **Kalia**, Waikiki, Kaalawai and so on, around to the Koolau side, ending at Laie, and then return by the same course to their starting point. [Keliipio 1900:112]

Kālia was one of eight important fisheries along the Waikīkī coast. The fishing grounds from the reef to the shore were so rich they were *kapu* (restricted) to anyone but the king and his representatives during certain seasons (Maly and Maly 2003:244).

> Kalia is one of eight fishing grounds (also called fisheries) on the shoreline of Waikīkī. From east to west they are: Ka‘alāwai, Kuilei, Kea‘ua‘u, Kaluāhole, Kapua, Kāneloa, Hamohamo, and **Kalia.** [*Honolulu Advertiser*, 11 March 1923:12; map of the fisheries of O‘ahu in Clark 2011:438]
>
> *Penei kana, ‘E hoomaka ana ke kapu ma ka muliwai o Piinaio, a hiki i ke kai o* ***Kalia***. *Aole loa kekahi e lawaia malaila.’*
>
> This is what he said, ‘The restriction will commence at the stream of Pi’inaio to the sea at **Kālia**. No one is allowed to fish there.’ [*Ka Hoku o ka Pakipika,* 10 April 1862:4; Clark 2011:438]

2.2.2 The Snatching Wind in Kālia

Kālia is mentioned in a story about a woman who left her husband and children on Kīpahulu, Maui and followed a man from O‘ahu. Her husband missed her and went to see a *kahuna* (priest) who was skilled in *hana aloha* sorcery. The *kahuna* told the man to find a container with a lid and to speak into it of his love for his wife. The *kahuna* then uttered an incantation into the container, closed it, and threw it into the sea. The wife was fishing one morning at Kālia, O‘ahu, and saw the container. She opened the lid, and was possessed by a great longing to return to her husband. She walked until she found a canoe to take her home. This story led to the saying:

> *Ka makani kā‘ili aloha o Kīpahulu.* The love-snatching wind of Kīpahulu.
> [Pukui 1983:158]

2.2.3 The Goddess Hi‘iaka and Kālia

Honolulu was once called Kou, named for the most beautiful woman on O‘ahu. Kou composed a *mele* (chant) to her husband ‘Ouha, which includes some of the place names of coastal Honolulu and Waikīkī.

> *Kū ka nalu kai a ke Ko‘olau*
> *Pūhā ka nalu i kai mā‘oki‘oki*
> *Pī kai pua lana awa*
> *A ku‘u kāne aloha, ‘o ‘Ouha*
> . . .
> *Pā pae (papa pae) a kāua*
> *I ka‘u aloha lā, ua hala*
> *Ka hōkū papa nemonemo ō*
> *Aloha ka makani lihi kao o* ***Kālia***
> *Ke kali nei au ‘o kō ho‘i mai*
> . . .

> *‘O ka lā a pō iho*
> *Hui aku i Kou nā maka.* [Ho‘oulumāhiehie 2008a:296–297]
>
> Translation:
>
> The surf rises, stirred up by the Ko‘olau wind
> Waves burst in the hue-streaked sea
> Sprinkling the flowers drifting in the harbor
> Of my beloved husband, ‘Ouha
> . . .
> On the waves our boards have mounted
> To my love who has gone
> The star of that smooth strata, oh
> Beloved is the shoreline breeze at **Kālia**
> I await your return
> . . .
> Wait all day until night
> Friends shall meet in Kou [Ho‘oulumāhiehie 2008b:277]

The chant ends with the phrase, “Friends shall meet in Kou [Honolulu].” In her journey around the island of O‘ahu with her traveling companions Lohi‘au and Wahine-‘oma‘o, the goddess Hi‘iaka stopped at Pu‘uloa (Pearl Harbor) and met some people who were about to travel to Honolulu for the festival of a great chiefess. Hi‘iaka decided to attend the festival and departed on a canoe, bidding her friends at Pu‘uloa that “Kou is where we will meet again,” thus echoing a saying first pronounced by the chiefess Kou.

2.3 The Ala Moana or Beach Road

As will be expanded upon below, the vast majority of Ala Moana Regional Park is reclaimed or dredged land. Of particular note for the present project is the traditional Hawaiian trail that ran along the coast which began in pre-Contact times as a foot path, developed into a horse path, then into a cart path popularly known as “Beach Road” and ultimately into Ala Moana Boulevard.

John Papa ‘Ī‘ī provided a written account of the Waikīkī path of his experience ca. 1810 from which Gerald Ober produced a reconstructed figure (Figure 7).

> A trail led out of the town at the south side of the coconut grove of Honuakaha and went on to Kalia. From Kalia it ran eastward along the borders of the fish ponds and met the trail from lower Waikiki . . .
>
> The trail from Kawaiahao which led to lower Waikiki went along Kaananiau, into the coconut grove at Pawaa, the coconut grove of Kuakuaka, then down to Piinaio; along the upper side of Kahanaumaikai’s coconut grove, along the border of Kaihikapu pond, into Kawehewehe; then through the center of Helumoa of Puaaliilii, down to the mouth of the Apuakehau stream. [‘Ī‘ī 1959:92]

It is unclear from ‘Ī‘ī’s account whether the trail was immediately coastal in the project vicinity but this is how it is shown on early maps.

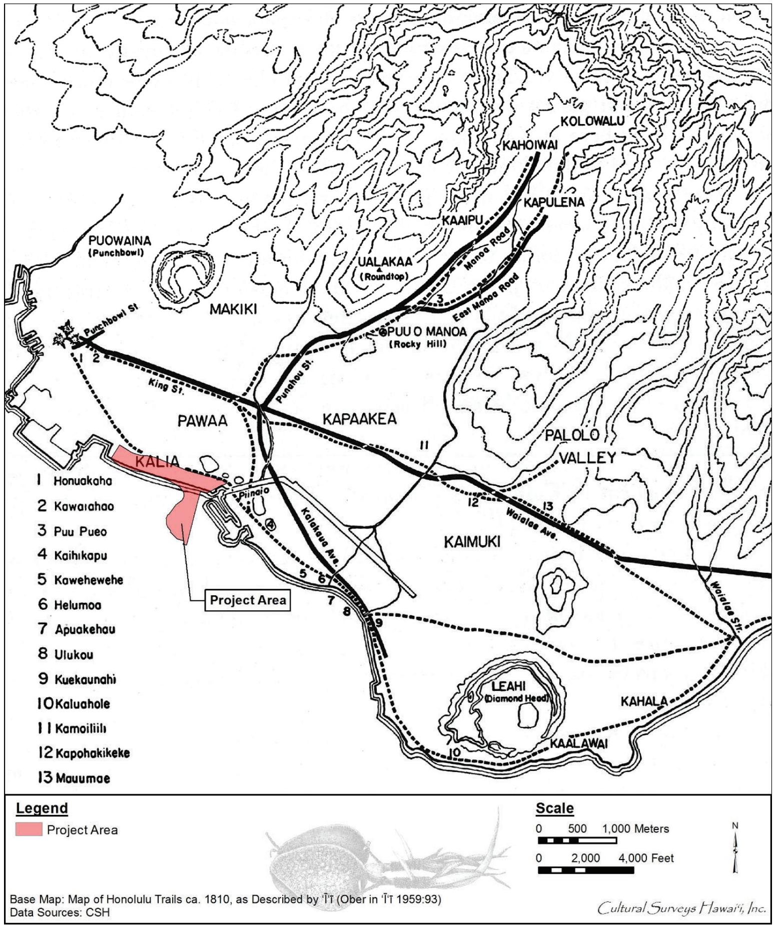


Figure 7. Reconstructed map of Honolulu trails (Ober in ‘Ī‘ī 1959:93) ca. 1810 depicting the coastal trail from Honuakaha (downtown) through coastal Kālia (showing the project area)

Section 3 Historic Background

3.1 Early 1800s

Waikīkī is actually the name of a large *ahupua‘a* encompassing lands stretching from Honolulu to Maunalua Bay. By the time of the arrival of Europeans during the late eighteenth century, the area today known as Waikīkī had long been a center of population and chiefly residence. The high chief Mā‘ilikūkāhi first established Waikīkī as the government center of O‘ahu ca.1450. The area remained the central residence of the rulers of the island until Kamehameha I moved his court to Honolulu in 1809.

Chiefly residences, however, were only one element of the landscape that characterized Waikīkī up through pre-Contact times. Beginning in the fifteenth century, a vast system of irrigated taro fields was constructed, extending across the littoral plain from Waikīkī to lower Mānoa and Pālolo valleys. This field system, attributed to the chief Kalamakua, took advantage of streams descending from Makiki, Mānoa, and Pālolo valleys, and provided ample fresh water for the Hawaiians living in the *ahupua‘a*. Water was also available from springs in nearby Mō‘ili‘ili and Punahou. Closer to the Waikīkī shoreline, coconut groves and fishponds dotted the landscape.

In 1831, the Prussian botanist Dr. F.J.F. Meyen described this part of O‘ahu:

> Our way took us through the plain along the beach which was only sparsely covered with grass. Not until we came to the village of Waititi, where running and standing water is in abundance, did we see the taro fields and precious coconut plantations which stretch almost right up to the ocean shore. Under the scant shadow of these trees stand the quaint huts of the Indians. [Pultz 1981:52]

Samuel Kamakau in 1865 wrote,

> Cultivating was a great occupation of the chiefs, and the land of Waikīkī was made productive through cultivation—from the inland side to the coconut grove beside the sea. The chiefs constructed many ponds and stocked them with fish, and they made irrigation ditches about the land that led into the fishponds and the taro pond fields. . . .
>
> Kalamakua-a-Kaipūhōlua was a good chief. He was noted for cultivating, and it was he who constructed the large pond fields Ke‘okea, Kūalulua, Kalāmanamana, and the other *lo‘i* [irrigated taro fields] in Waikīkī. [*Ka Nupepa Kuokoa*, 19 August 1865, translation from Kamakau 1991:45]

A sizeable population developed amidst this fertile coastal landscape. Captain George Vancouver (1798), arriving at “Whyteete” in 1792, captured something of this profusion in his journals:

> On the shores, the villages appeared numerous, large, and in good repair; and the surrounding country pleasingly interspersed with deep, though not extensive valleys; which, with the plains near the sea-side, presented a high degree of cultivation and fertility.

[We] found the plain in a high state of cultivation, mostly under immediate crops of taro; and abounding with a variety of wild fowl, chiefly of the duck kind . . . The sides of the hills, which were at some distance, seemed rocky and barren; the intermediate vallies, which were all inhabited, produced some large trees, and made a pleasing appearance. The plain, however, if we may judge from the labour bestowed on their cultivation, seemed to afford the principal proportion of the different vegetable productions on which the inhabitants depend for their subsistence. [Vancouver 1798:161–164]

An 1817 map of Oʻahu's south shore, drawn by Otto von Kotzebue of the Russian Ship *Rurick* (Figure 8), depicts the Kakaʻako/Waikīkī landscape in the first decades following Western Contact. This map shows a concentration of house sites and agricultural fields along the Nuʻuanu Stream in Honolulu. Houses and agricultural fields are also depicted in the three-stream area (Waikolu) of Waiatité (Waikīkī) and along the coastline. Taro *loʻi* (rectangular areas depicting irrigated fields) are concentrated around the streams descending from the Nuʻuanu and Mānoa valleys. The areas of habitation (indicated on the map by the trapezoids) probably reflect the post-Contact shift of Hawaiians to the area around Honolulu Harbor, the only sheltered landing on Oʻahu and the center of increasing trade with visiting foreign vessels.

During the early nineteenth century, the traditional Hawaiian role of Waikīkī as a center of chiefly and agricultural activities on southeastern Oʻahu was changing. The *ahupuaʻa* of Honolulu became the center for trade, with visiting foreign vessels drawing increasing numbers of Hawaiians away from their traditional environments. The shift in preeminence is illustrated by the fact that Kamehameha moved his residence from Waikīkī to Honolulu. These changes were evident in 1828, when Levi Chamberlain visited Waikīkī:

Our path led us along the borders of extensive plats of marshy ground, having raised banks on one or more sides, and which were once filled with water, and replenished abundantly with esculent fish; but now overgrown with tall rushes waving in the wind. The land all around for several miles has the appearance of having once been under cultivation. I entered into conversation with the natives respecting this present neglected state. They ascribed it to the decrease of population. [Chamberlain 1957:26]

The growing attraction of Honolulu (where, by the 1820s, the population was estimated at 6,000 to 7,000) and the introduction of European diseases were the primary factors behind the depopulation of Waikīkī. Despite the decrease in population, the *ahupuaʻa* continued to sustain Hawaiians well into the nineteenth century. LCA records from the 1840s indicate awardees continued to maintain fishponds and irrigated and dryland agricultural plots, though on a greatly reduced scale.

Ala Moana Regional Park lies seaward of what formerly was an extensive area of low marshy ground as is clearly depicted on an 1884 Bishop map (Figure 10). It appears that a narrow sand bar upon which a coastal path was developed was all that separated the marsh from the coast. Thus it is perhaps no surprise that the natural shoreline of Ala Moana Regional Park was more mudflat than reef as suggested by one of our first photographs of the vicinity (Figure 9). Early maps (see Figure 14) refer to the former shallows that would become Ala Moana Regional Park as "Mud and Coral Flats Covered at High Tide."

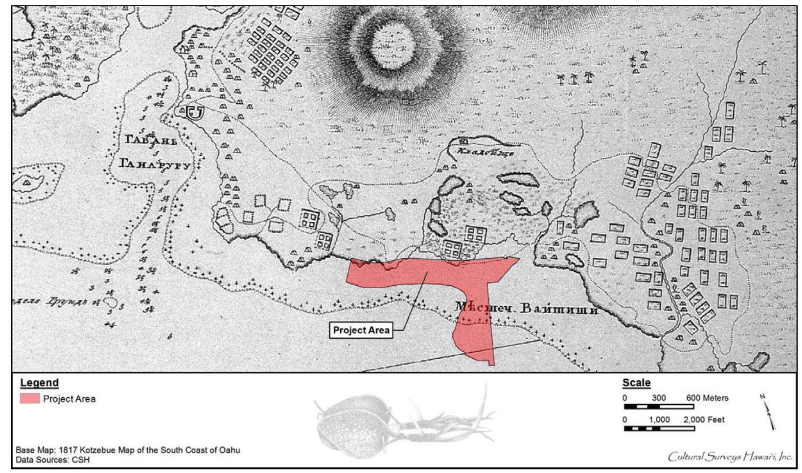


Figure 8. 1817 Kotzebue map of the south coast of Oʻahu by Otto von Kotzebue of the Russian ship *Rurick*, showing the project area and depicting the taro fields (rectangles), fishponds (ovals, squares), salt pans (squares with interior squares), and habitations (house icons) of Oʻahu's south shore; habitation and agricultural land in Honolulu (left side of figure) and in Waikīkī (right); note fishponds to the north and east and salt pans *mauka* of the current project area (center) (map reprinted in Fitzpatrick 1986:48–49)

Figure 9. 1880 photograph of the Kaka'ako shoreline west of areas later dredged for Kewalo Basin and filled for Fort Armstrong (near the peninsula in the background) (Hawai'i State Archives 1880)

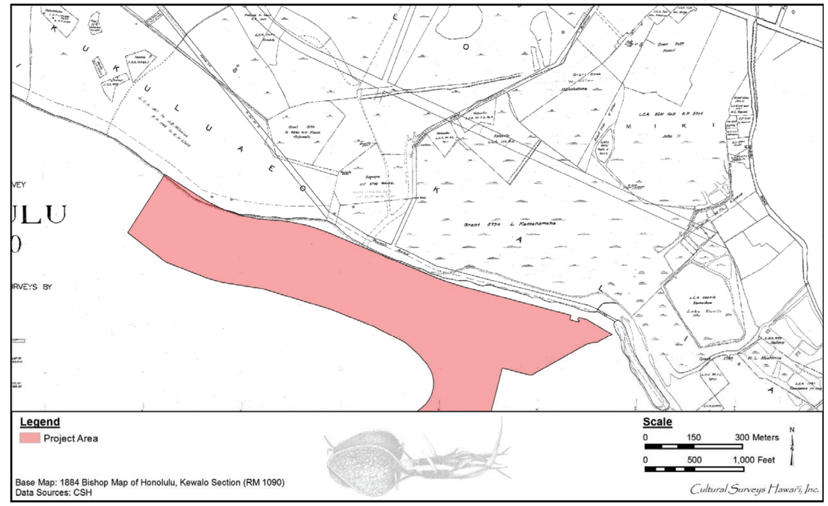


Figure 10. 1884 Bishop map of Honolulu, Kewalo Section by Sereno Bishop showing the project area, coastal *'ili* of Kewalo and Kukuluāe'o (Makiki and Pauoa Ahupua'a) to the west and the *'ili* of Kālia in Waikīkī Ahupua'a to the east; note Pi'inaio Stream empties into the ocean at the east end of the project area (bottom right corner of map)

3.2 Mid-1800s and 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, the Hawaiian government, and the *ali‘i* received their land titles. The common people (*maka‘āinana*) received their *kuleana* awards (individual land parcels) beginning in 1850. The records for the Land Commission Awards (LCA) generated during the Māhele provide the first specific documentation of life in the Kewalo area as it had evolved up until the mid-nineteenth century.

The project area is *makai* of the lands of Kukuluāe‘o, Kewalo, and Kālia (Figure 11). The *‘ili* of Kukuluāe‘o (LCA 387) was awarded to the American Board of Commissioners for Foreign Missions (see Figure 10 where LCA 387 is annotated as “to AB Mission”). Initially this land was associated with Punahou School in Makiki and Mānoa Valley, as Chief Boki gave the Punahou lands to Hiram Bingham, pastor of Kawaiaha‘o Church in 1829 (DeLeon 1978:3), as stated in the LCA testimony: “The boundaries of that part which lies on the sea shore we cannot define so definitely, but presume there will be no difficulty in determining them as it is commonly known as pertaining to Punahou. This part embraces fishing grounds, coral flats & salt beds” (LCA 387). In the Māhele, however, this sea land became “detached” from the Mānoa award and was instead given to the pastor of the Kawaiaha‘o Church. The award also included the Kukuluāe‘o Fishery on the low reef flats offshore (Figure 13). A portion of the Kukuluāe‘o Fishery would later be dredged and filled to create Kewalo Basin and the west portion of the Ala Moana Regional Park (Figure 12 through Figure 14). A 1901 map (see Figure 12) has an early reference to the Beach Road as “Ala Moana” (“Ocean Road,” but we cannot rule out that this was a later annotation). The 1909 map (see Figure 13) calls it “Moana Road” and it does appear that by 1911 (see Figure 14) it was firmly known as “Ala Moana.”

The *‘ili* of Kewalo (LCA 10605) was awarded to Kamake‘e Pi‘ikoi, wife of Jonah Pi‘ikoi. The husband and wife shared the award (Kame‘eleihiwa 1992:269). Kewalo was a large 270.84-acre land section extending from Kawaiaha‘o Church to Sheridan Street and had a small access to the shoreline between the boundaries of Kukuluāe‘o and Kālia.

Kālia was an *‘ili kū* of Waikīkī Ahupua‘a. Soehren (2015) notes, “Kalia resembles an *ahupua‘a* extending across Waikīkī from Makiki in the west to Kapahulu in the east, fragmented by many intervening *‘ili* and *kuleana*.” The *‘ili* of Kālia was first awarded to Victoria Kamāmalu, who eventually returned it to the government. It then became fort land set aside for soldiers manning the fort positions on O‘ahu to plant crops for their own subsistence. The plan proved impractical and many of these lands were later awarded to other *ali‘i* or commoners, or assigned as Government or Crown Lands. The area also included the rich offshore Kālia fishery, on the low reef flats, as shown on the 1909 map of the O‘ahu Fisheries (see Figure 13). This fishery area would later be dredged and filled to form the east end of the Ala Moana Regional Park and part of Magic Island.

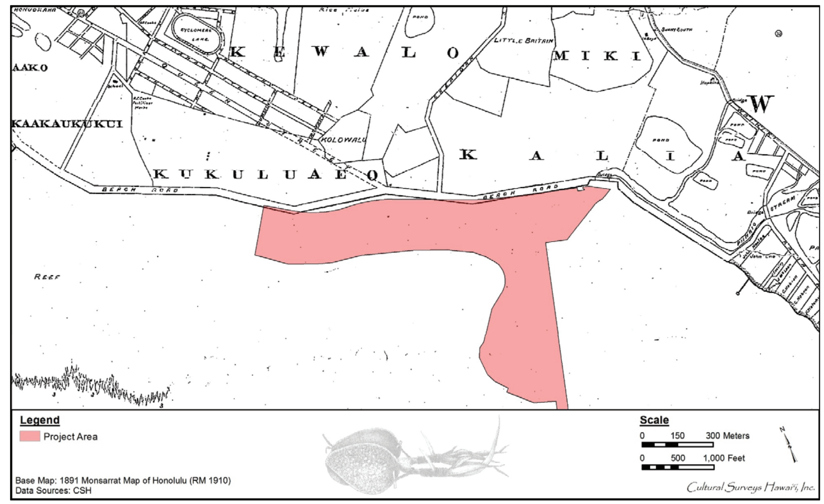


Figure 11. 1891 Monsarrat map of Honolulu showing the project area, depicting Sheridan/Pi‘ikoi Street as the dividing line between the coastal *‘ili* of Kewalo and Kukuluāe‘o to the west and the *‘ili* of Kālia in Waikīkī Ahupua‘a to the east

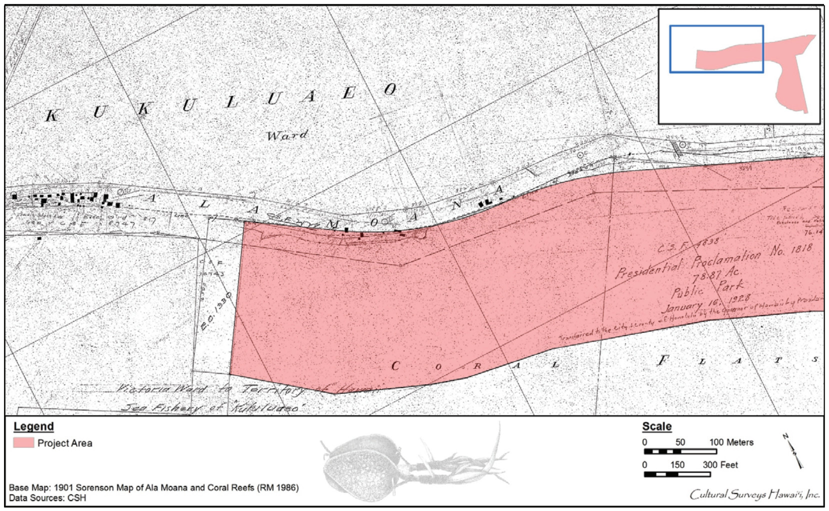


Figure 12 1901 Sorenson map of Ala Moana and Coral Reefs showing the west portion of the project area in the "Sea Fishery of Kukuluaeo"

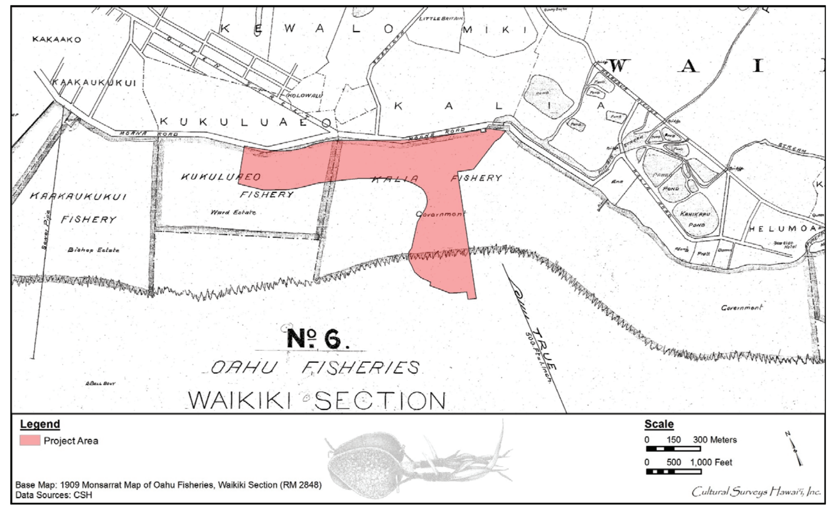


Figure 13. 1909 Monsarrat map of Oahu Fisheries, Waikiki Section showing the project area within the offshore fisheries of Kukuluāe'o and Kālia, showing project area mainly within the shallow reef area of the fisheries

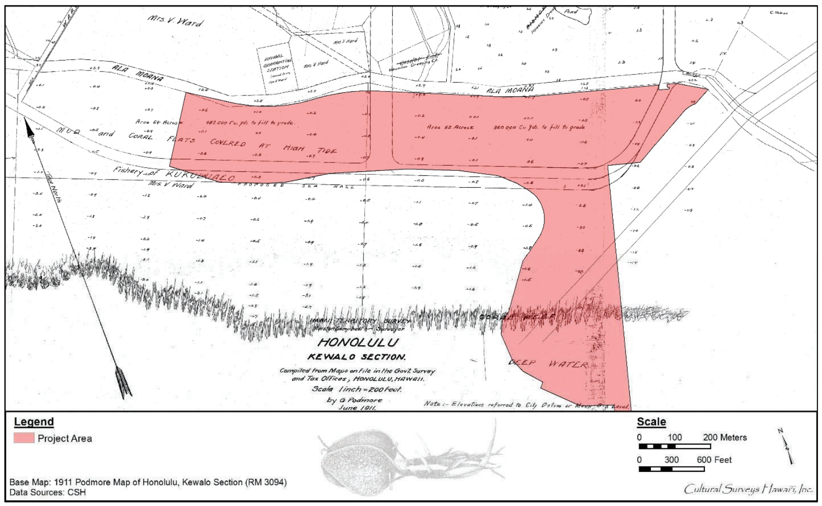


Figure 14. 1911 Podmore map of Honolulu, Kewalo Section, showing the project area and the original depths of the coral reef *makai* of Ala Moana Boulevard; note "Fishery of Kukuluaeo"

3.3 Late 1800s

The shallow, well-protected reefs of Waikīkī and the availability of the riparian resources of the Pi'inaio estuary and the inland dune ponds made the Kālia vicinity particularly desirable for Polynesian settlement. John Papa 'Ī'ī (1959:49) relates an account from the early 1800s of a catch at a Kālia fishpond "so large that a great heap of fish lay spoiling upon the bank of the pond." The waste was not noted with approval.

This abundance of fishponds not only provided a bounty of food for chiefly redistribution, but also would have required significant maintenance. While the abundance of fishponds suggests a large pre-Contact population, the demographics of pre-Contact Waikīkī remain uncertain (see Kanahele 1995:32–33). The missionary census of 1831/1832 lists a relatively large population for "Waikiki" of 2,571 (Schmitt 1973:19). This appears, however, to include all land between Honolulu and Waimānalo (including for example Mānoa and Pālolo), so the population of Waikīkī and Kālia remains uncertain.

The 1817 Kotzebue map of O'ahu indicates there were several ponds north and east of the current project area (see Figure 8). In a list of fishponds on the island in 1903, there were ten fishponds in Kālia still in use, three of which did not have known names. Most of the ponds were leased and maintained by Chinese workers and most were controlled by just two merchant firms in Honolulu (Cobb 1905:748). The number of fishponds in the vicinity suggests cultural deposits in the vicinity may be particularly rich.

Much of the land in Kewalo, Kukuluāe'o, and Kālia was used to produce salt. Salt pans are shown in Kaka'ako and in Kālia on the 1817 Kotzebue map (represented by boxes with rectangles). The Hawaiians used *pa'akai* (salt) to flavor food, to preserve fish by salting, for medicines, and for ceremonial purposes. Malo discusses the traditional Hawaiian method of salt production and salt pans:

> *O ka paakai kekahi mea e pono ai, he mea e ono ai, ka ia, a me ke koekoe o ka paina ana, he mea hana ia ka paakai, ma kekahi aina, aole i hana a ma kekahi aina, o ke kai makai, e kii aku no ka wahine, a lawe mai ma ke poi, a ke kai hooholo ia mai kekahi ma kauwahi mai.*
>
> *E waiho kela kai ma kekahi poho paha, he ekaha paha, he kahe ka paha, a liu malaila, alaila lawe ana kauwahi e, a paakai iho la no ia, o ka papa laau ka mea kui poi.* [Malo 2006:73]
>
> Pa'akai [salt] is another beneficial item. It is used to make fish delicious and tasteless foods edible. Pa'akai is made at a particular place, [but] it [salt] is not actually made from this spot, rather it [salt water] came from the sea. A woman went to get some when the sea crashed [upon the rocks] and she ran back [the salt water] to this particular spot.
>
> That salt water [kai] is placed in, perhaps, a depression [*poho*] or a 'Bird's nest' [ēkeha] or rock basin [kāheka] and allowed to evaporate [*liu*]. Then it is taken to another spot and is formed into pa'akai. Wooden boards [*papa lā'au*] are used to pound poi [mashed cooked *kalo* corms] on. [Malo 2006:95]

In 1903, Nathaniel Emerson translated David Malo's articles on early Hawaiian life. In his publication, the translations are not literal, but include information that Emerson added to clarify the accounts. In Emerson's translation:

> Salt was one of the necessities and was a condiment used with fish and meat, also as a relish with fresh food. Salt was manufactured in certain places. The women brought sea-water in calabashes, or conducted it in ditches to natural holes, hollows and shallow ponds [*kekaha*] on the sea-coast, where it soon became strong brine from evaporation. Thence it was transferred to another hollow or shallow vat, where crystallization into salt was completed. [Malo 1951:123]

In the years following the arrival of Captain Cook in the Islands in 1778, most visitors were British and American fur traders stopping in Hawai‘i on their way to China. One reason for their visit was to stock up on food and water. Another concern was to buy or trade for salt, which was used to cure the seal and mammal pelts collected from the Northwest Coast. During Kotzebue's visit in 1816 and 1817, he noted that "Salt and sandalwood were the chief items of export" (Thrum 1904:50).

> The journals of none mention the object of call other than for refreshments, though one, some 3 years later, records the scarcity and high price of salt at the several points touched at, with which to serve them in the curing of furs obtained on the coast. In all probability salt was the first article of export trade of the islands and an object, if not the object, of these pioneer fur traders' call. [Thrum 1904:45]

Samuel Kamakau noted that in the early to mid-nineteenth century, "The king [Kamehameha III] and Isaac of Pu‘uloa [Pearl Harbor] are getting rich by running the salt water into patches and trading salt with other islands" (Kamakau 1992:409). In an article on Hawaiian salt, Thomas Thrum (1923:112–117) discussed the large salt works at Pu‘uloa, on the western loch of Pearl Harbor, and at Alia Pa‘akai (Salt Lake in Moanalua). The salt collected at these places was sent to Russian settlements in the Pacific Northwest, where it was used to pack salmon (Kurlansky 2002:406). Thrum also mentions a salt works in Kaka‘ako:

> Honolulu had another salt-making section in early days, known as the Kakaako salt works, the property of Kamehameha IV, but leased to and conducted by E.O. Hall, and subsequently E.O. Hall and Son, until comparatively recent years. This enterprise was carried on very much after the ancient method of earth saltpans as described by Cook and Ellis. [Thrum 1923:116]

The export of salt declined in the late nineteenth century. Thrum (1923:116) states that the apex of the trade was in 1870. By 1883, he noted that "pulu [a soft, glossy, yellow wool used for pillows and mattresses], salt and oil have disappeared entirely" from the list of yearly exports (Thrum 1883:68). By 1916, only one salt works, the Honolulu Salt Company, was in operation. The owner of the company, E.O. Hall & Son, had salt works in Pu‘uloa, Kalihi, and Waikīkī on the island of O‘ahu, and a salt works on the island of Hawai‘i (*Engineering and Mining Journal* 1916:595). Salt continued to be manufactured for local use; the Kaka‘ako Salt Works appears on maps as late as 1891, and a page in Victoria Ward's ledger for 1883 notes a yearly income of $651.50 received from her "Salt Lands" in Kukuluāe‘o (Hustace 2000:50).

A traditional saying, *Kāhunahuna pa‘akao o Kālia*, "the fine-grained salt of Kālia" (Pukui 1983:144) indicates Kālia, along with Kaka‘ako, was a traditional area for salt collection by Native Hawaiians. Historic maps also indicate large-scale salt production took place in the project area in the early twentieth century.

E.O. Hall & Son, a Honolulu merchant, had a large salt works at Kaka‘ako, west of the project area. The company was officially used as a salt vendor as early as 1892 (*Daily Bulletin*, 7 January 1892:3). In 1902, the auctioneer Jas. F. Morgan advertised (*Hawaiian Star,* 10 July 1902:8) that he would be selling the "cottages, sheds, lean-tos, store and warehouses" at the Kaka‘ako Salt Works of E.O. Hall & Son. Soon after this date, in 1903 and 1904 (*Hawaiian Gazette*, 23 May 1903:8; *Hawaiian Star*, 31 August 1904:6), E.O. Hall began to advertise salt from their new "Kalia Salt Works." This seems to indicate the merchant closed down the facilities at Kaka‘ako (or sold them) in 1902 and moved to the newly constructed works at Kālia in 1903/1904. There are references of the Kalia Salt Works until at least 1909 (*Overland Monthly* 1909:xii); however, at some point, E.O. Hall consolidated all of their salt works into the Honolulu Salt Company, which operated until at least 1916. A volume of the 1916 *Engineering & Mining Journal* indicated,

> Most of the salt produced in the islands is the output of the Honolulu Salt company, whose product is confined to coarse salt and manufactured entirely by natural evaporation, no vacuum pans, kettles or grainers being used. The company operates salt beds at Puuloa, Kalihi and Waikiki, on the island of Oahu, and at Mahukona, on the west coast of the island of Hawaii. [*Engineering and Mining Journal* 1916:594]

The Kalia Salt Works is probably the "Waikiki" salt works in the reference. These works probably closed between 1927 and 1932. Extensive areas of "salt pans" are depicted in some detail inland of the project area on a 1921 map (Figure 16).

3.4 The Vicinity of Ala Moana Regional Park in the Early Twentieth Century

The area inland of Ala Moana Regional Park was some of the last land of central urban Honolulu to be developed. A 1919 map (Figure 15) depicts substantial development in Kaka‘ako to the west, filling in seaward from King Street to the north, and in Waikīkī to the east but with the area inland of the future Ala Moana Regional Park as very sparsely settled—which is understood as due to the low-lying marshy ground. An animal quarantine station (first shown on the 1911 map, Figure 14) is a large fenced rectangular compound north of the west portion of the project area and a few houses are arrayed on the *mauka* side of the Beach Road *mauka* of the central portion of the project area.

The low-lying nature of the area *mauka* of what would become Ala Moana Regional Park is well illustrated in a 1921 Land Court Application map (see Figure 16).This map calls out "Pond" seventeen times along with two areas of "Salt Pans."

A small area of land on the *makai* side of Ala Moana Boulevard was used as a city dump for trash. Before incinerators were built in Kaka‘ako and Kewalo in the 1930s and 1940s (such as Kewalo Incinerator No. 1), combustible trash collected by the city refuse division was burned in open areas near the coast from Kewalo Basin to the Ala Wai Canal (Young 2005), as shown on a 1921 photograph (Figure 17).

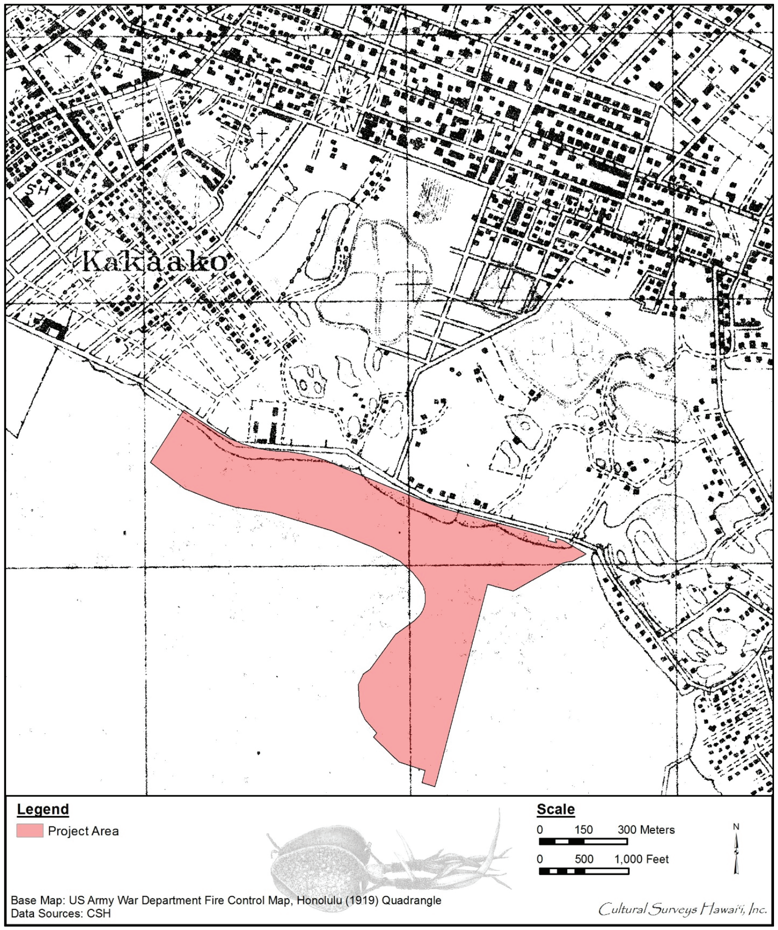


Figure 15. 1919 U.S. Army War Department Fire Control, Honolulu Quadrangle, depicting the location of the project area before the construction of the Ala Moana Regional Park

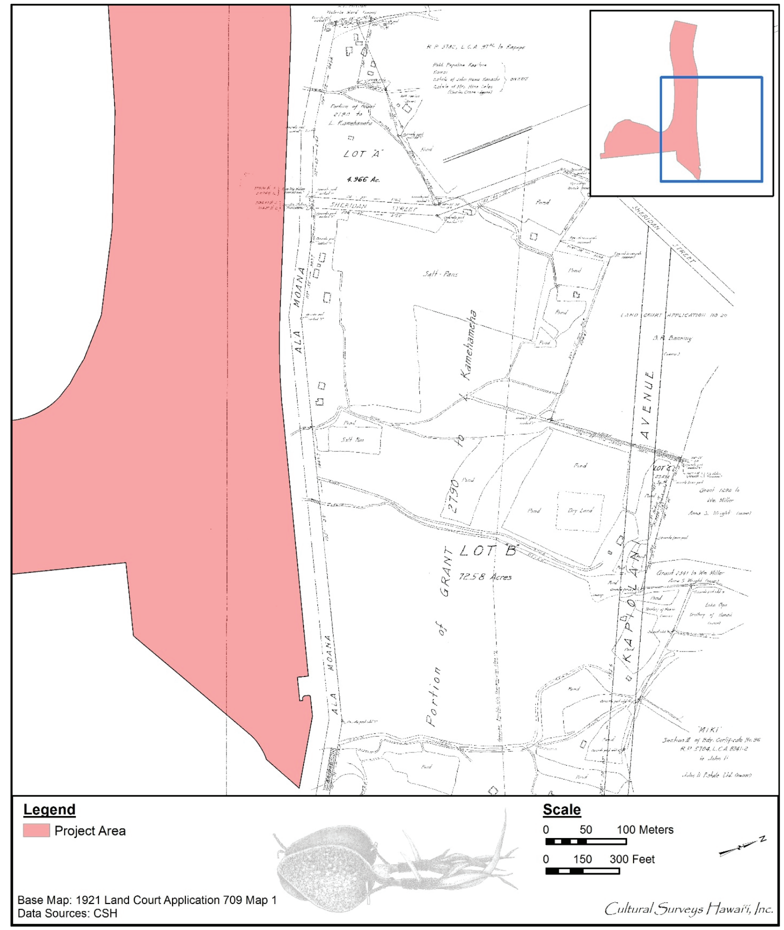


Figure 16. 1921 Land Court Application 709 Map 1 showing the project area (Hawai'i Land Survey Division 1921)

Figure 17. Open-air burning of trash in area between Kewalo Basin and Ala Moana Regional Park, 1921 photograph (Hill 1921, reprinted in Scott 1968:578)

3.4.1 The Ala Wai Canal and the Waikīkī Reclamation Project

The land surface of modern Honolulu and Waikīkī is the result of a decades-long dredging and fill project that included the creation of the Ala Wai Canal. In Nakamura's (1979) *The Story of Waikīkī and the Reclamation Project*, he writes that this land "reclamation program, planned in 1906, changed the ecology of Waikīkī from a once viable and important agriculture and aquaculture center . . . destroyed by profit-seeking capitalist entrepreneurs . . . under the subterfuge of 'drainage' and 'sanitation'" (Nakamura 1979:113). Many of the original property owners lost their land or suffered serious damage to their property as a result of the reclamation activities and/or costly expense for the mandatory filling in of their properties.

Dredging for the Ala Wai Canal began in 1921 and was completed seven years later. The final result was a "canal three miles long, with an average depth of twenty-five feet and a breadth of two hundred fifty feet" (*Honolulu Advertiser*, 17 October 1928). Nakamura (1979:85) writes that the government of the Territory of Hawaii solicited bids in 1920 for the dredge and fill project planned for the environs of Waikīkī. The plan was to create hundreds of acres of urban land at the expense of wetland agriculture and aquaculture in the area. The advertisement soliciting bids for the project put forward by Lyman H. Bigelow masked the significance of the project by stating it was "for Dredging a Drainage Canal and Filling and Reclaiming Certain Unsanitary Lands at Waikīkī" (Nakamura 1979:85). Territorial laws were passed requiring property owners to pay for the filling in of their lands, which apparently was going to be done whether they wanted it or not. A lien would be fixed against their property and if all payment was not made on time, land would

be foreclosed. Nakamura points out that the cost was so high for some property owners that the bank lien could extend into a 15-year mortgage (Nakamura 1979:89).

Once land that the Territory of Hawaii government wanted filled in (for state buildings) was filled, any further dredged materials became the property of the dredging company—the Hawaiian Dredging Company—and they could sell the materials to the property owners who in turn,were forced to buy the product. Walter F. Dillingham, of the Hawaiian Dredging Company, died in 1963. *Time* magazine, in their article about him and his involvement in the project, stated that "Walter Dillingham used the muck dragged up from the sea to fill in low, marshy areas around Honolulu, over the years created 5,000 acres of solid ground that now holds a full third of the city's population" (Nakamura 1979:112). The Ala Wai Canal is listed as SIHP # 50-8-14-9757.

3.4.2 Ala Moana Regional Park

Ala Moana Regional Park is a 75.209-acre public park stretching along the modern shoreline from the Kewalo Basin in Honolulu to the west end of the Ala Wai Canal in Waikīkī. It is built almost entirely on fill land, land that was formerly a shallow reef off the Kaka‘ako District. This original shoreline and reef area can be seen in an 1880 photograph of the Kaka‘ako shore (see Figure 9). The peninsula in the background of this photo would later be expanded and filled to create the Fort Armstrong area, adjacent to the west side of Kewalo Basin, which was also created by dredging the reef. The history of the development of the park has been presented in Robert Weyeneth's (1987) book *Ala Moana: The People's Park*, and this book is the main source for the historical information in this section, unless otherwise noted.

Ala Moana Regional Park was one of the many public works projects carried out in the 1930s during the Great Depression. The idea for the park first originated in the 1920s. The park was especially backed by the Outdoor Circle, a club organized in 1911 by the wives of prominent Honolulu businessmen who organized to beautify and clean the city (Watts 1993:50). This group wielded a large influence and was instrumental in municipal planning. They were the main organization that led the push to ban large roadside advertising signs in Hawai‘i in 1927 (Watts 1993:154). The club envisioned Ala Moana as a park that could be used by all of the people of Hawai'i.

The U.S. Federal government assumed the title to the site in 1897 with annexation of the new territory and began to use the site as a dump and open air burning area in ca. 1900. They transferred the original 78.87-acre lot to the Territory of Hawaii as Presidential Proclamation No. 1818 in 1927, as shown on a 1927 map (see Figure 20). There were two provisions for the transfer of the land. The first was that the territorial government dredge a channel through the reef to allow boats to travel from the Ala Wai Canal on the east to Kewalo Basin on the west, and the second was to fill a portion of the submerged reef to construct a public park. The dredging of the channel was completed in 1928 by the Hawaiian Dredging Company, managed by Walter Francis Dillingham. Walter Dillingham's wife, Louise Dillingham was a member of the Outdoor Circle and one of the park's main proponents. She was also a member of the Honolulu Park Board from the 1930s until her death in 1964.

The dredging plans (including the depths of the original reef) are shown in a 1911 map of Honolulu (see Figure 14). The initial dredged areas for Kewalo Basin, the boat channel in front of the park, and a dredged channel that extended from the west end of the Ala Wai Canal to this boat channel and a second channel across the reef to the sea can be seen in a 1934 map (see Figure 27).

A 1923 map (Figure 18) shows a “Proposed Park” that would be developed into Ala Moana Regional Park. Almost everything depicted on this map is “proposed” including a “proposed public park” on the *mauka* side of the (proposed) Ala Wai Canal, a “Proposed Channel” from the proposed Ala Wai Canal extending into what is now Magic Island, and a vast grid of dashed-in proposed streets. Some of the proposed streets between Kapi‘olani Boulevard and Ala Moana would be cancelled by the construction of the (not yet proposed) Ala Moana Shopping Center. Kewalo Basin is newly created (but does not yet have its present configuration).

A 1925 map (Figure 19) shows the original shoreline in some detail with named three-letter survey points. This surveyed map gives us confidence that very little, if any, of Ala Moana Regional Park is actually built on naturally occurring dryland. This 1925 map offers an explanation for how the proposed park land was anticipated to be created as five areas seaward of Ala Moana Road are called out as “dump” or “city dump” along the “mud shore.” The configuration of “dumps” certainly suggests they are being expanded south onto the shallow shoal.

A 1927 map (Figure 20) does indeed show substantial movement seaward of the “Edge of Dump.” This map explicitly shows a surveyed perimeter of what would become Ala Moana Regional Park (Magic Island being a much later addition) as a result of the reclamation project in the “Tide Lands.” This 1927 map specifies Presidential Proclamation No. 1818 dedicating an area of 78.87 acres for the park.

A 1927 aerial photograph (Figure 21) shows the original shoreline and reef edge of the project area. This photograph shows expanding and coalescing dumps on the shallow reef. The plume of smoke over the largest dump almost certainly relates to the pattern of open-air burning of trash depicted in Figure 17. Weyeneth (1987:5) reports a tradition of local wags pointing out the plumes of smoke to gullible ship-board visitors “as Honolulu's active downtown volcano.”

The Ala Moana Regional Park area was deeded by the federal government to the Territory of Hawaii on 25 October 1927 and then from the territory to the City and County of Honolulu on 16 January 1928 (Weyeneth 1987:5).

It may be noted that the only dredging shown in 1927 is off the mouth of the new Ala Wai Canal which takes a right angle turn southeast toward Diamond Head. The Hawaiian Dredging Company, Ltd. received the contract to dredge the channel and fill the future park site; the work was completed in October 1930 (Weyeneth 1987:5).

A 1931 photograph as viewed from the west (Figure 22) shows a radically different situation from the aerial photograph of four years earlier in that the substrate of Ala Moana Regional Park has just been created as a field of bright white crushed coral. There is a dark patch in the center of this bright field of crushed coral *makai* of Ala Moana Boulevard in the central portion of the park understood to be the large area of “dumps” shown in the 1927 aerial. Evidently the burned dumped material was high enough there was no need for further fill or there was a wish not to interfere with on-going dump activities.

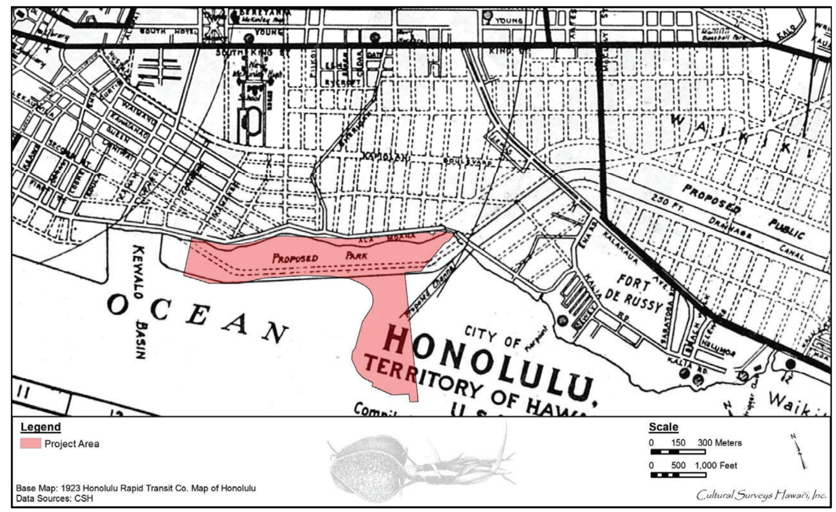


Figure 18. 1923 Honolulu Rapid Transit Company map of Honolulu showing the project area

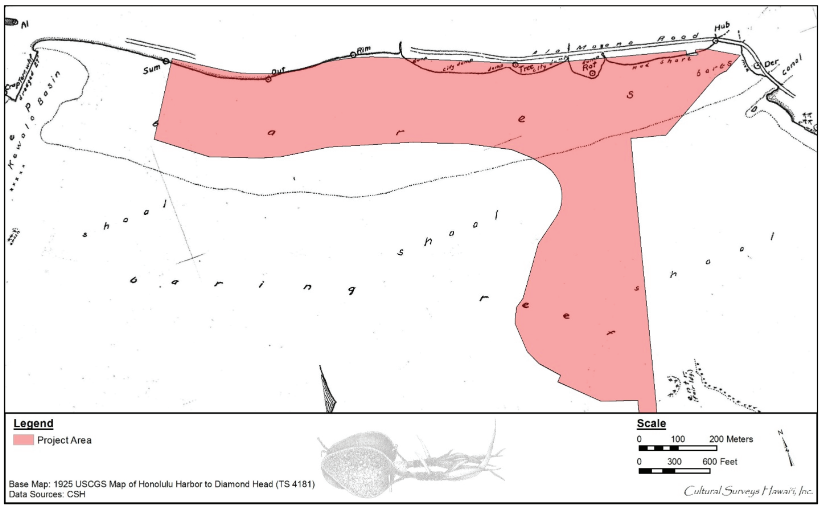


Figure 19. 1925 U.S. Coast and Geodetic Survey map of Honolulu Harbor to Diamond Head (portion) showing the project area; note areas labeled "dump" or "city dump" on the *makai* "mud shore" side of Ala Moana Boulevard

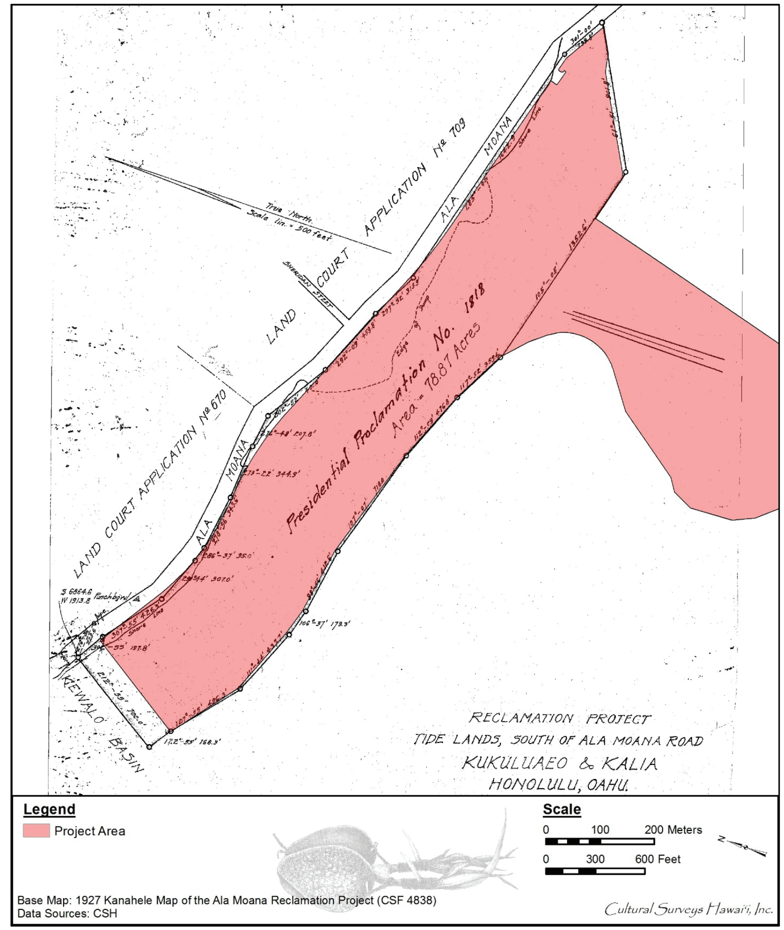


Figure 20. 1927 Kanahele map of the Ala Moana Reclamation Project showing the project area land transfer for the Ala Moana Regional Park from the federal government to the City and County of Honolulu (Hawai'i Land Survey Division 1927)

Figure 21. 1927 Kakaako/Waikiki Coast Aerial Photograph (UH SOEST 2012a) showing the project area and showing the Ala Moana Regional Park area after the construction of the Ala Wai Canal but before construction of the park; note the initial dredging for Kewalo Basin can be seen on the left side of the photograph

Figure 22. 1931 photograph of the Honolulu to Waikīkī Coast; the dredged boat channel and the recent fill for the Ala Moana Regional Park can be clearly seen (Hawai'i State Archives 1931)

In July 1931, the Honolulu Park Board approved the designs for the park, originally called Moana Park, by two Hawai‘i landscape architects, Catherine Jones Richards and Robert Oliver Thompson, later Mr. and Mrs. Robert O. Thompson (Weyeneth 1987:9).

> As landscape architects, Richards and Thompson proposed a design for the park layout that included six tennis courts, three baseball fields, volley ball courts, a children's wading pool, a playground, picnic spots with outdoor grills, a bridle path linking Ala Moana and Kapiolani parks, a small boat harbor designed as a public alternative to private yacht clubs, and clubhouses for local rowing clubs. The central architectural feature was to be an oceanfront recreational complex combining a dance pavilion, restaurant, and bath house, bordered on the mauka (mountain) side by a large sunken pool with fountain and allees (parallel rows) of banyan trees. Instead of a beach, Richards and Thompson proposed a shaded shoreline promenade. [Weyeneth 1987:10]

Plans for the park included a Hawaiian Village, a Japanese teahouse, and Chinese pagodas.

A clearer view of the emerging park land is provided in an oblique aerial photograph as viewed from the east in 1932 (Figure 23). The developing park roughly followed the configuration of the original 1932 landscape plan by Richards and Thompson (Figure 24). The 1932 aerial photograph (see Figure 23) shows the completion of the lagoon features, interior pathways, and seawall at the edge of the filled park land. This photograph also shows the small amount of land in the center, inland section of the park that was originally dry land (dark area of park near Ala Moana Boulevard), rather than former reef land filled with dredged spoils (white areas).

By 1932, the lagoons had been dredged, the central recreational area had been paved, and 600 coconut palms and 100 banyan trees, donated by the public, had been planted, as shown on a ca. 1935 photograph of the park (see Figure 31).

A 1933 map (Figure 25) depicts a grid of planned roads (shown as dotted lines) *mauka* of Ala Moana Boulevard. Many of these streets were never built, as the Hawaiian Dredging Company began to fill and level the land. The Ala Moana Regional Park fill land is shown but there are no structures within the park. On this map, Kewalo Basin has been dredged adjacent to the new fill land for Fort Armstrong and the western end of the Ala Wai Canal ends at the open ocean at the east end of the park. The blue dotted line off the coast indicates the edge of dredged areas for Kewalo Basin and the boat channel in front of the park.

The newly dredged fill from the Ala Wai Canal and from the reef just seaward of the emerging Ala Moana Regional Park was used not only to create the Ala Moana Regional Park but also to fill low-lying areas inland. One focus of the inland fill efforts was the low-lying area on the northwest side of the new Ala Wai Canal extending inland from the east corner of the new Ala Moana Regional Park. This area had been an extensive area of shallow ponds and marsh (see Figure 15). This inland extension of fill efforts is evident in the extension of bright white coral fill extending inland from the Diamond Head end of the park on the 1931 aerial photograph (see Figure 22). The Ala Wai Inn (Figure 26) was a very well-known restaurant and bar built on the northwest side of the Ala Wai Canal about midway between Ala Moana Boulevard and Kalākaua Avenue (see Figure 36 for specific location). The caption of a 1933 photo of the Ala Wai Inn by the Department of Parks and Public Grounds, City of County of Honolulu dated 9 August 1933 (see

Figure 23. 1932 photograph of former reef area filled with dredged material to create Ala Moana Regional Park (Hawai‘i State Archives 1932)

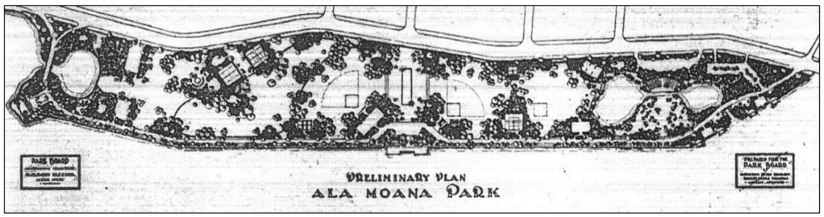


Figure 24. Original landscape plan by Richards and Thompson, 1932 (from Weyeneth 1987:55); the shoreline is bound by a promenade not a beach

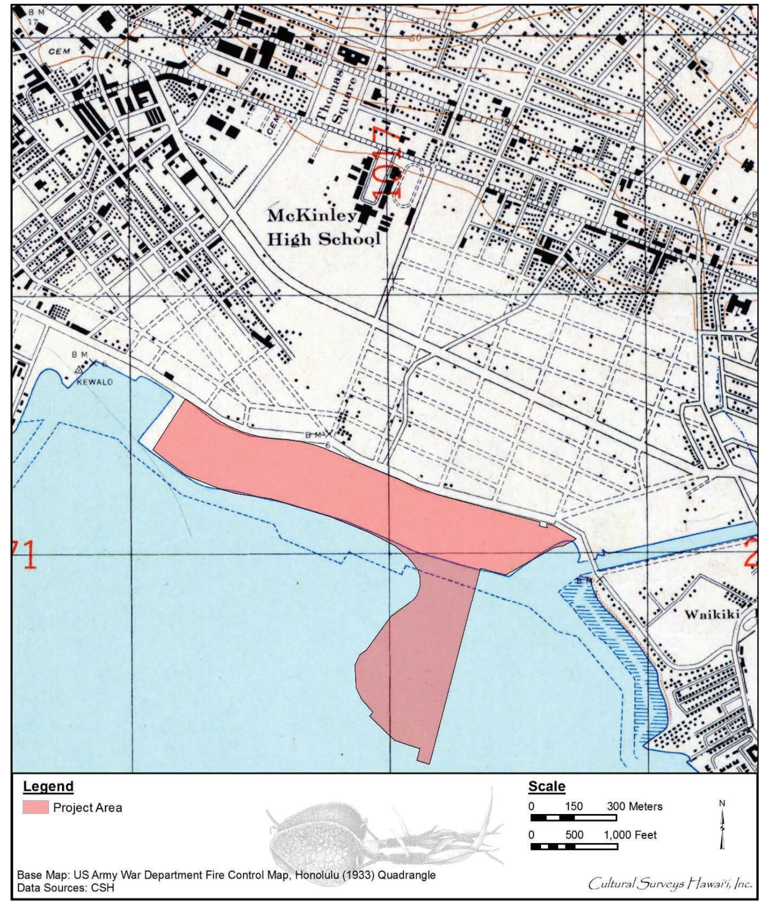


Figure 25. 1933 U.S. Army War Department Fire Control map of O‘ahu, Honolulu quadrangle, showing the project area; Ala Moana Regional Park has been constructed on fill land and the boat channel offshore has been dredged, but the park has not yet landscaped; note streets have been planned on the *mauka* side of Ala Moana Boulevard, as denoted by the dashed lines, but the majority were never built

Figure 26. 1933 photograph of the Ala Wai Canal and the Ala Wai Inn (on right); this land section between Ala Moana Boulevard and Kalākaua Avenue on the northwest side of the Ala Wai Canal adjacent to the northeast end of the Ala Moana Regional Park was first proposed as a promenade area connected to the park (Hawai'i State Archives 1933)

Figure 26) seems incongruous to us in suggesting the Ala Wai Inn was part of "Ala Moana Park." The Ala Wai Inn is 300 m northeast of the northeast corner of Ala Moana Regional Park as we know it today. Part of the early vision for the park was that it would be "a link between Ala Moana and Kapiolani Park" (Weyeneth 1987:11), with the park continuing inland of Ala Moana Boulevard, southeast of Atkinson Boulevard as a promenade on the northwest side of the Ala Wai Canal extending on up past the Ala Wai Inn to Kalākaua Avenue. Presumably the difficulties of creating pedestrian access across Ala Moana Boulevard (and the value of the land) led to Ala Moana Regional Park remaining isolated *makai* of Ala Moana Boulevard.

A 1934 Wright, Harvey and Wright map of Honolulu (Figure 27) helps us visualize the plan where a strip of land along the northwest side of the Ala Wai Canal would connect the Ala Moana Park to a proposed park extending along the *mauka* side of the Ala Wai Canal toward Diamond Head. This 1934 map also shows a concept involving shallows *makai* of Ala Moana Regional Park separating the park from the dredged channel with seven short groins or piers extending perpendicular out from the shore connecting the park to the deeper water of the dredged channel.

In 1933, Lester McCoy (the "virtual founder of Honolulu's modern park system"; Weyeneth 1987:11) hired Henry Sims Bent to complete working drawings for the new park.

> It is Bent's work that today gives Ala Moana Park its unique character, exemplified in the whimsical canal bridge (completed in 1934), the portals at the Waikiki entrance (named for President Franklin Delano Roosevelt after he dedicated them in 1934), the sports pavilion and banyan garden (completed in 1937), and the lawn bowling green (completed in 1939).
>
> In addition to his work at Ala Moana, Bent designed the layout and structures of a number of smaller parks in Honolulu, including Mother Waldron Playground, Kawananakoa Playground, the Lanikila Park comfort station, Kalihi-Waena Playground, Haleiwa Beach Park, the wall at Hauula Beach Park, Ala Wai Clubhouse, the park service center near Kapiolani Park, and a design for the Kalakaua Recreational Center. Many of his park designs combined the angular zig-zag motifs associated with the Art Deco style with the curved surfaces typical of Streamline Moderne. [Weyeneth 1987:14]

It is largely due to the vision of landscape architects Richards and Thompson and architect Bent that Ala Moana "park stands as the crowning achievement of the golden age of Honolulu park building during the 1930s" (Weyeneth 1987:14). Ala Moana Regional Park was placed on the HRHP on 9 June 1988 as part of a City & County of Honolulu Art Deco Parks Thematic Group designated SIHP # 50-80-14-1388 and a NRHP Nomination for Ala Moana Regional Park was prepared in 1988 listing the period of significance as 1934.

Henry Sims Bent's first design was an equestrian bridge with the appearance from the side of two half-circles screening the single arch (Figure 28). It was meant to be part of a horse bridle path that connected to the Ala Wai promenade (Natonal Park Service 5-6).This was quickly followed by the Roosevelt portals that were formally dedicated in 1934 during a visit by President Roosevelt to Honolulu. (Weyeneth 1987:17) (Figure 29). The scalloped art deco walls at the portals that allow for planting space within their concave recesses (Figure 30) are understood to date from the same year (1934).

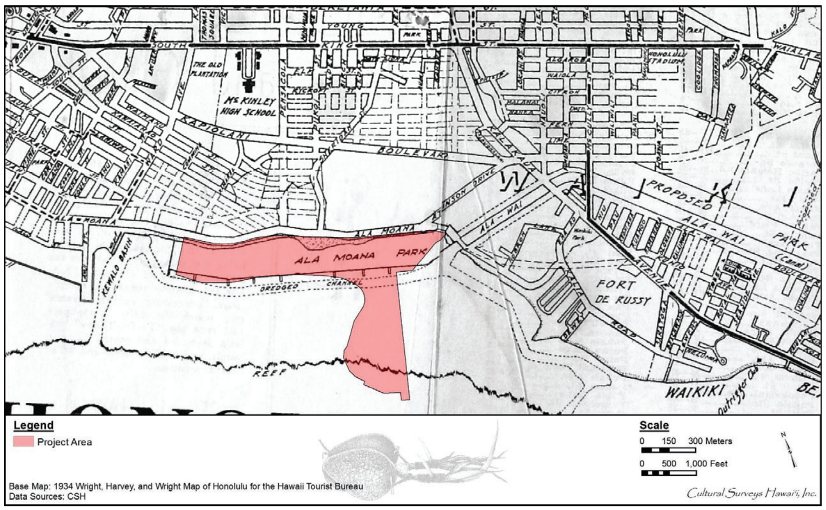


Figure 27. 1934 Wright, Harvey and Wright map of Honolulu for the Hawaii Tourist Bureau, showing the project area and dredged channels for the Kewalo Basin, the Ala Moana boat channel, and a separate channel from the Ala Wai Canal across the reef to the ocean (left to right)

Figure 28. Art Deco style Ala Moana Equestrian Bridge understood as completed in 1934 (Hawai'i State Archives n.d.)

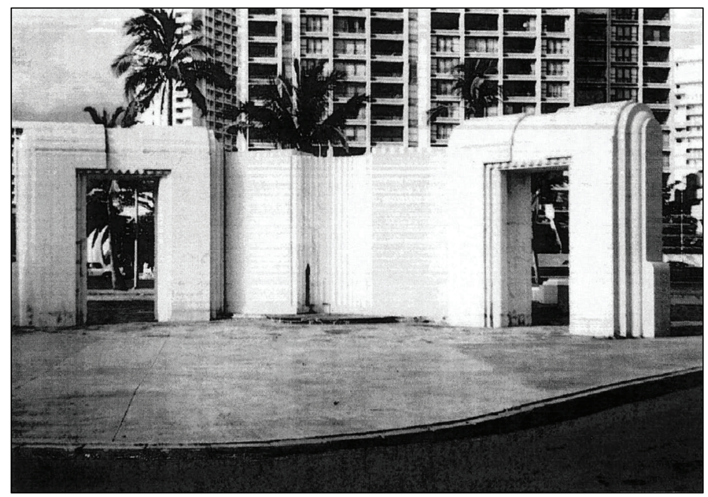


Figure 29. Roosevelt Portal understood as completed in 1934 (in Weyeneth 1987)

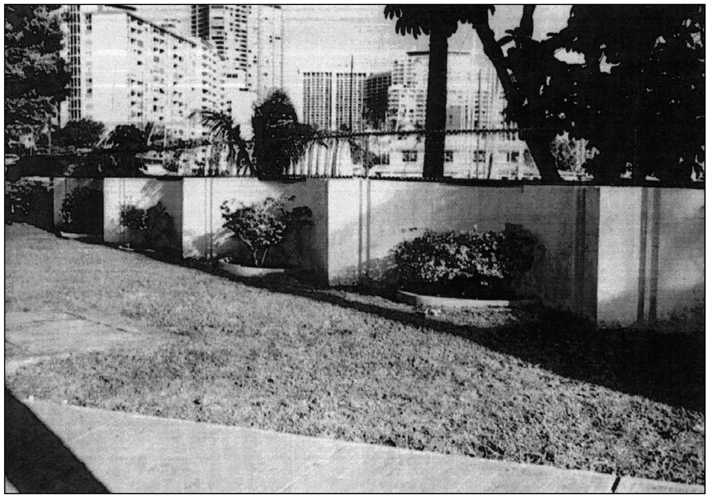


Figure 30. Scalloped Art Deco walls at portals (in Weyeneth 1987)

A 1935 aerial photograph (Figure 31) stands in quite sharp contrast to the 1932 aerial photograph (see Figure 23). What in 1932 was a white plain of compacted crushed dredged coral is now extensively landscaped with expanses of grass and many trees. The photographs from 1935 (Figure 32) show how the landscaping of Ala Moana Regional Park was quickly accomplished through the stockpiling and spreading of topsoil on new dredged coral rubble fill land. Other 1935 photographs (Figure 33) show the ongoing construction of the Banyan Tree Court in the central portion of the park and completed walkways and water features in the central McCoy Pavilion area.

The funds for the labor, at times as large as 800-900 workers, to complete the park came from the Federal Employment Relief Administration (FERA) and the Civil Works Administration (CWA). The land was filled with approximately 5 ft of sand and coral rubble dredged from the ocean in front of the park or with sand trucked in from north O‘ahu beaches, and placed on the coral reef with about a 1-ft thick layer of topsoil (Arthur Kimbal Thompson Architect, AIA 2004:16–17). The sand, coral rubble, and top soil can be seen in two 1935 photographs (see Figure 32).

Of note in the 1935 aerial photograph is the wide swath on the *makai* side of Ala Moana Boulevard between the two-lane road and the *mauka* park wall that would be used to triple the width of Ala Moana Boulevard seaward. This 1935 aerial photograph is of import in reconstructing the relationship of the Ala Moana Regional Park lands to the original land surface. From the earliest maps, the Beach Road that became Moana Road that became Ala Moana Boulevard is shown as

Figure 31. Ca. 1935 photograph of landscaped Ala Moana Regional Park (Hawai‘i State Archives 1935a); note the wide swath on the *makai* side of Ala Moana Boulevard between the two-lane road and the *mauka* park wall that would be used to triple the width of Ala Moana Boulevard on the seaward side

Figure 32. 1935 photographs showing dredged material and topsoil stockpiled and spread on new fill land of Ala Moana Regional Park (Hawai‘i State Archives 1935b)

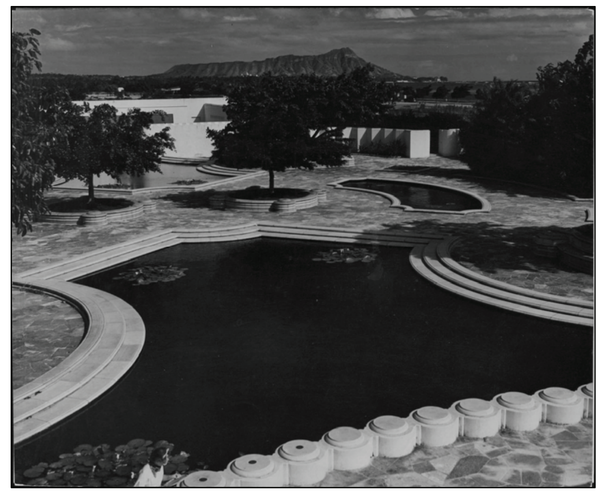


Figure 33. 1935 photographs of Banyan Tree Court: aerial showing construction (top) and completed walkways and water features (bottom) (Hawai‘i State Archives 1935c)

pretty much flush on the *makai* edge of dry land (for relatively detailed maps see Figure 19 and Figure 20). This depiction of Ala Moana Boulevard width expansion quite significantly seaward after 1935 is an element of proof that Ala Moana Regional Park is built entirely on fill.

Weyeneth (1987:17) explains that the sports pavilion and banyan court were officially completed in 1937, although much of the sports pavilion had been finished somewhat earlier, by 1935 (see Figure 33). The pavilion itself was designed to be a recreation center, offering rooms for crafts and games and, across the courtyard, locker facilities for men and women. The two notable wall-sized murals depicting the Hawaiian *makahiki* (sports festival) and which depict Hawaiian sports such as *ulu maika* (game stones) rolling, *hōlua* (sled) sliding, spear throwing, canoeing, surfing, hula dancing, and wrestling were completed by artist Robert Lee Eskridge (Figure 34).

Many of the structures and walls (see Figure 33 and Figure 34) incorporate the angular, scalloped, and curved lines of the Art Deco style. The enclosed Banyan Tree Court, with its reflecting pools and stone planters, was designed to represent a “Pacific” style based partly on a picture of a Balinese garden. The artist, Marguerite Blasingame, later added low-relief sculptures of Hawaiian figures to the courtyard walls.

The many rock walls in the park were made of boulder concrete construction, where concrete is poured into wood molds filled with broken-up coral and lava rocks. This type of construction, chosen during the Depression era for its low expense, necessitated the making of rather massive wall sections. In some sections of the park, the coral/rock is exposed and in other areas the walls have been smoothed by the addition of stucco (Figure 35).

In 1935, the park board planned to acquire land on the *mauka* side of Ala Moana Boulevard so that a continuous parkway and promenade would connect Ala Moana Regional Park and Kapi‘olani Park, as shown on the 1936 park plan map (Figure 36). The early development of the western end of this parkway is shown in a 1933 photo, with wooden struts against the Ala Wai Canal next to a worker’s tent and the old Ala Wai Inn building. The Ala Wai Inn, a Japanese tea house, was a favorite haunt of pre-World War II naval officers. It became notorious in the 1930s as the opening location for the Massie Affair. In 1931, a naval wife, Thalia Massie, walked away from a party at the Ala Wai Inn to John Ena Road in Waikīkī. She claimed that five Hawaiian local boys kidnapped her off the road and raped her, which later led to the retaliatory “honor killing” of one of the boys (Daws 1968:319–327). Most recent books have discounted the kidnaping and rape and supported the innocence of the five accused boys (e.g., Stannard 2006). Some accounts mistakenly claimed that Massie said she was taken by the boys to Ala Moana Park (Riccio 2003) and that the park was built to erase this association, but this claim has been easily discounted as the park was planned long before this incident. Eventually this parkway area along the Ala Wai Canal was developed, with the current Hawaiian Convention Center built generally on the site of the old Ala Wai Inn, shown in a 1933 photograph (see Figure 26).

A 1936 map of the Ala Moana Regional Park Development shows the landscaping and structural plans developed by Sims and approved by McCoy (see Figure 36). The 1936 Ala Moana Regional Park development plan (see Figure 36) differs from the present configuration of the park in a number of ways. Virtually the entire perimeter of the park was developed differently from what was earlier envisioned; from the configuration of Kewalo Basin to the configuration of streets in the Ala Moana area, to the configuration of the Ala Wai Yacht Harbor, to the configuration of dredged channels seaward. The southeast and northwest ends of Ala Moana Regional Park were subsequently developed as depicted but the central focal area of the park was not developed

Figure 34. Ala Moana Regional Park Sports Pavilion completed ca. 1935-1937; exterior view (upper) (in Weyeneth 1987), with murals of Hawaiian games (lower) (Hawai‘i State Archives n.d.)

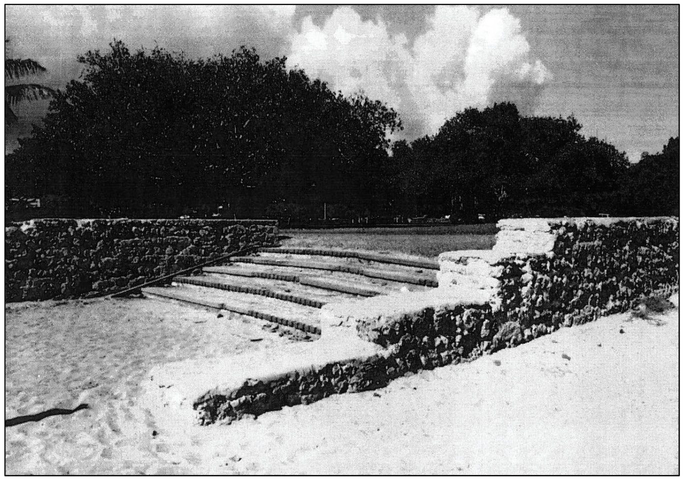


Figure 35. Boulder walls in the park, bare (upper) and stuccoed (lower) (photographs by Robert R. Weyeneth in Weyeneth 1987)

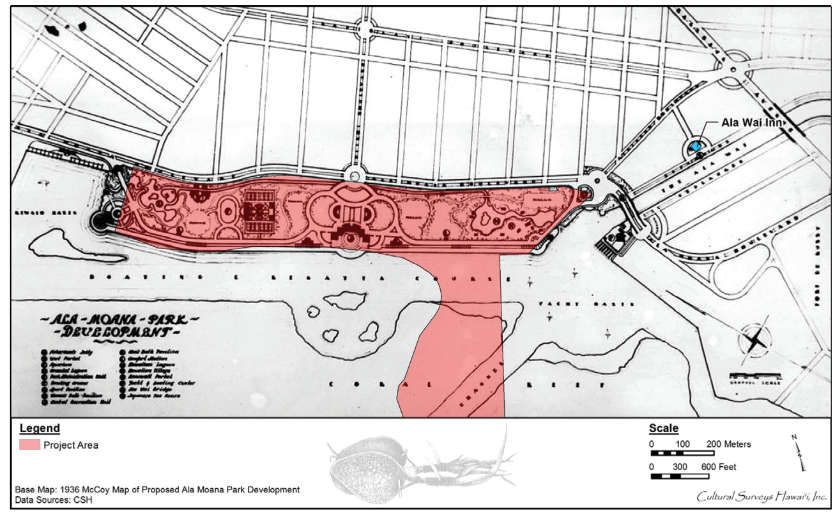


Figure 36. 1936 McCoy map of proposed Ala Moana Park Development showing the project area and landscaping and structural plans for Ala Moana Park; note location of the Ala Wai Inn (Japanese Tea House)

according to this plan. A 1943 Army War Department terrain map (Figure 37) similarly depicts Kewalo Basin, the streets in the Ala Moana area, and the Ala Wai Yacht Harbor differently from what would be developed. The central configuration of Ala Moana Regional Park is shown differently from the 1936 plan and also differently from what is present today.

In 1941, at the start of World War II, the park was taken over by the military and barbed wire was used to fence off the park from the public (Allen 1999:392). Temporary shacks for housing, bomb shelters, and a gun battery were built in the park. AMTB Battery Ala Moana had four 90 mm dual-purpose guns on a M1 mobile mount. These guns were used by the coast artillery as anti-aircraft and anti-motor-torpedo boat (AMTB) defenses (Williford and McGovern 2003:44). The general location of this battery is shown in Figure 38 and a typical AMTB battery (at Fort Monroe, Virginia) is shown in Figure 39 (Fort Wiki 2015). The battery was constructed in 1944 and destroyed in 1946 (Mason Architects, Inc. 2004: A-15).

In 1945, the army wished to keep half of the park for an Army Air Force rest and recuperation center, but the request was rejected by the city board. The temporary structures were taken down, the gun battery was destroyed, and wire fences were dismantled after the war, the damaged lawns and landscaping plants were resown, and the park was slowly restored.

In 1945, the Territorial Department of Public Works planned to build an airport off the reef of Waikīkī. The proposed location was on the reef off Ala Moana Regional Park. The reef would be dredged and filled for a 3,000-ft runway, hanger, and other structures. The airport would be used for small private airplanes while the new John Rodgers International Airport would take the larger private and commercial planes. The project was included in the Planning Board meetings, but was never taken up by the Legislature (State of Hawai‘i Department of Transportation, Airports Division 2015). A plan view of the proposed airport is shown in Figure 40 and Figure 41. These plans show for the first time an approximation of the configuration of Kewalo Basin and the Ala Wai Yacht Harbor. In these renditions a bridge was proposed at the west end of Ala Moana Regional Park across the channel that was dredged ca. 1931 (see Figure 22 and Figure 23). That portion of the dredged channel was apparently still present in 1953 (Figure 43 and Figure 44) but appears to have been filled by 1955 (Figure 46) and certainly by 1959 when the southwest corner of Ala Moana Regional Park looked much as it does today (Figure 47).

During the early decades of the park, a “Hawaiian Village” was constructed by the Diamond Head lagoon (Figure 42).Weyeneth (1987:27) relates that the “Hawaiian Village” of Ulu Mau was constructed in Ala Moana Regional Park in 1948, and park brochures in the 1950s advertised its “authentic grass huts” as must-see sights “for island visitors.” Ulu Mau would be renovated in 1960 but later moved to He‘eia Kea ca. 1963 for a while before it closed.

3.5 The Vicinity of Ala Moana Regional Park in the Late Twentieth Century

While the full integration of the Ala Moana Regional Park with the Ala Wai Promenade was never quite actualized, one aspect—the construction of “fishermen’s stands”—was common to recreation in both the Ala Wai and Ala Moana Regional Park areas. These fishing stands (Figure 45) were often constructed out in the shallows with a creative collection of wood scraps and were used primarily by fishermen attempting to catch mullet with bamboo poles.

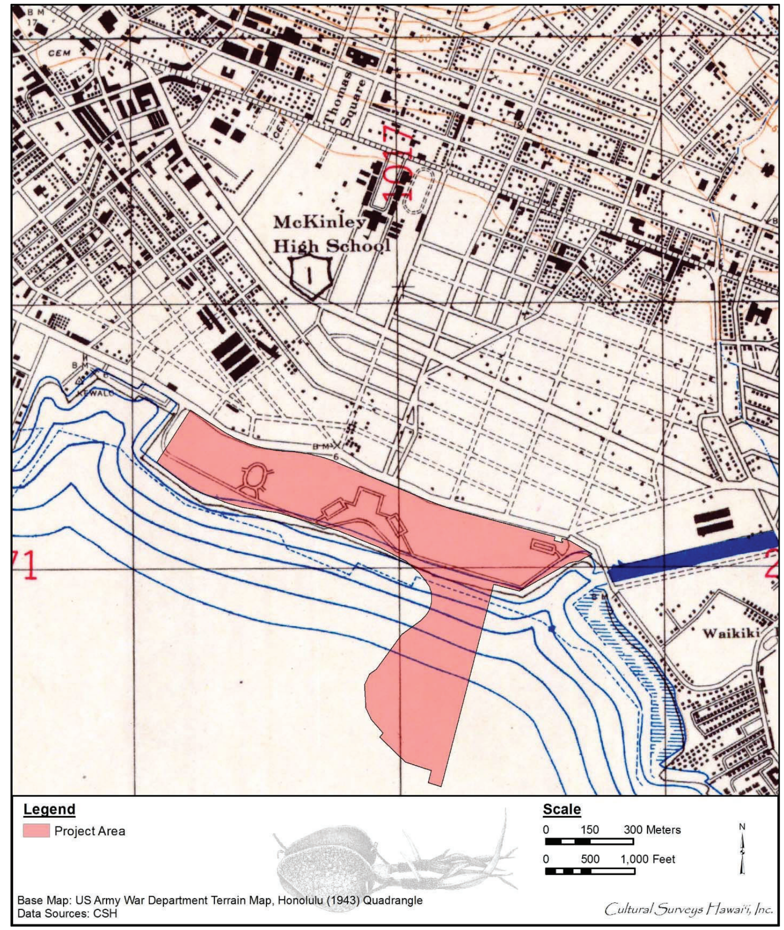


Figure 37. 1943 U.S. Army War Department terrain map of O‘ahu, Honolulu quadrangle, showing the project area; Ala Moana Regional Park has been constructed and landscaped

Figure 38. Former location of Battery AMTB (Anti-Motor-Torpedo Boat) at Ala Moana Regional Park, built in 1944 and destroyed in 1946 (Fort Wiki 2015)

Figure 39. Typical AMTB Battery with 90 mm gun (Fort Monroe, Virgina) (photograph from Fort Wiki 2015)

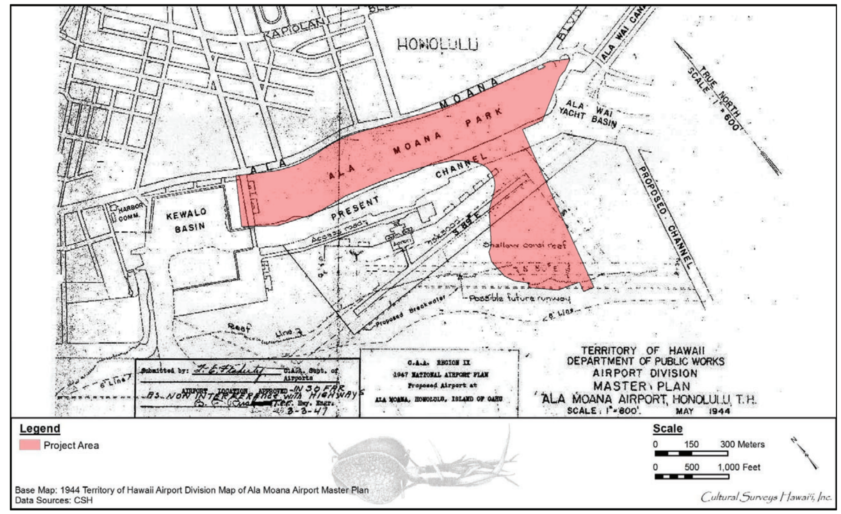


Figure 40. 1944 Territory of Hawaii Airport Division map of Ala Moana Airport Master Plan showing the project area

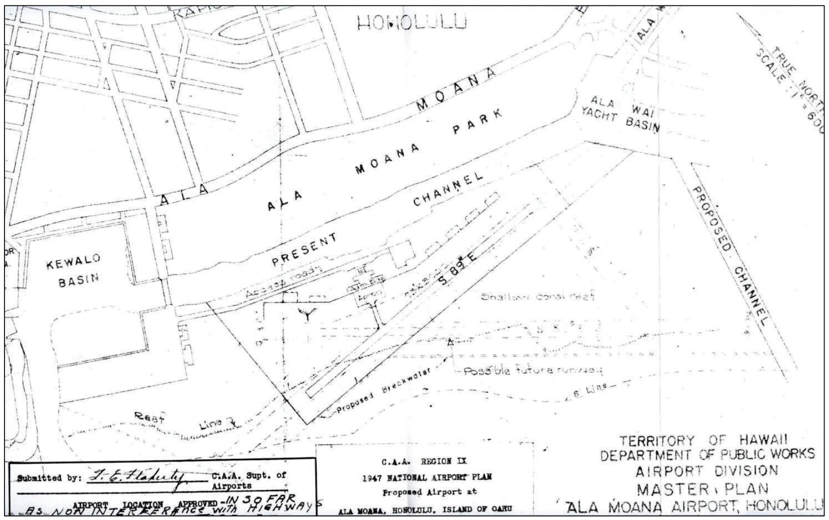


Figure 41. 1947 map of Territory of Hawaii's plans for the Ala Moana Airport for private planes off Ala Moana Park (State of Hawaii Department of Transportation, Airports Division 2015)

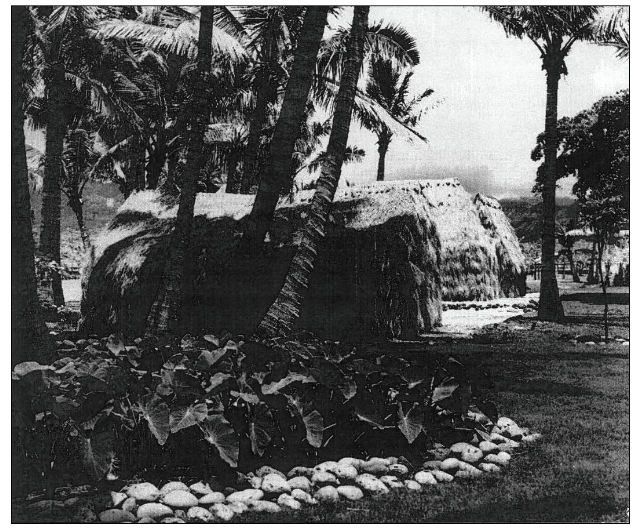


Figure 42. Hale Mau, Hawaiian Village at the East (Hawaiian) Lagoon (1950 photograph by Municipal Reference and Records Center, Honolulu in Weyeneth 1987)

Figure 43. 1952 aerial photograph of Ala Moana Regional Park (UH SOEST 2012b) with narrow beach area and boat channel still open from Kewalo Basin (left) to Ala Moana Yacht Harbor

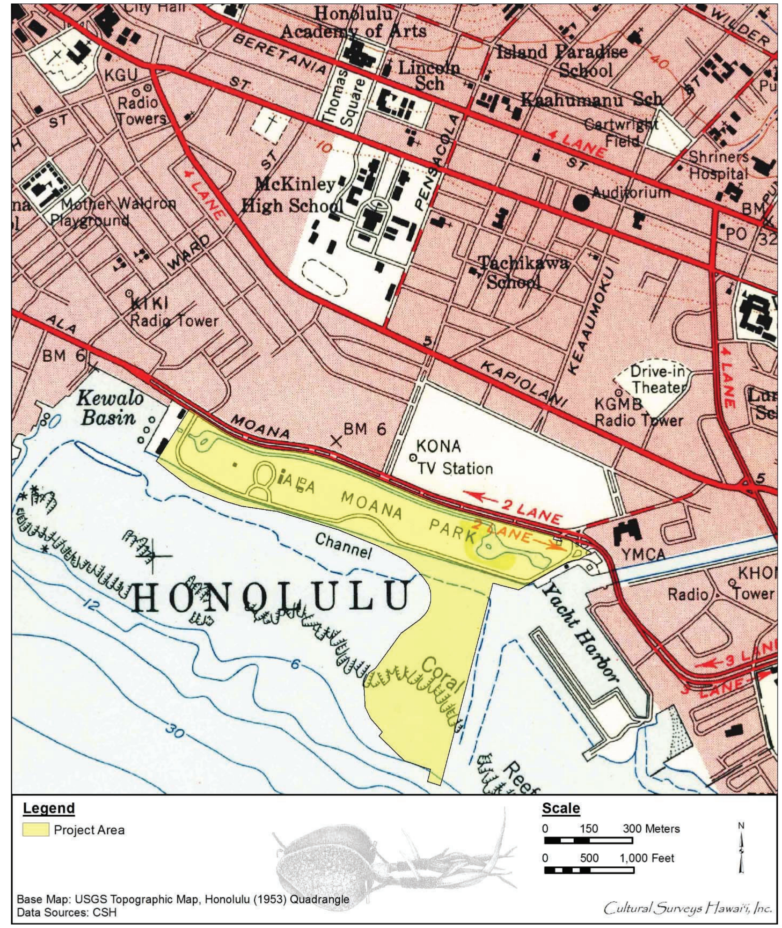


Figure 44. Portion of 1953 Honolulu USGS 7.5-minute topographic quadrangle, showing the project area; the boat channel still connects the Kewalo Basin to the Ala Wai Yacht Harbor

Figure 45. 1954 photograph of fishermen's stands off seawall before construction of new and expanded beach area (photograph by Department of Parks and Recreation, City and County of Honolulu in Weyeneth 1987)

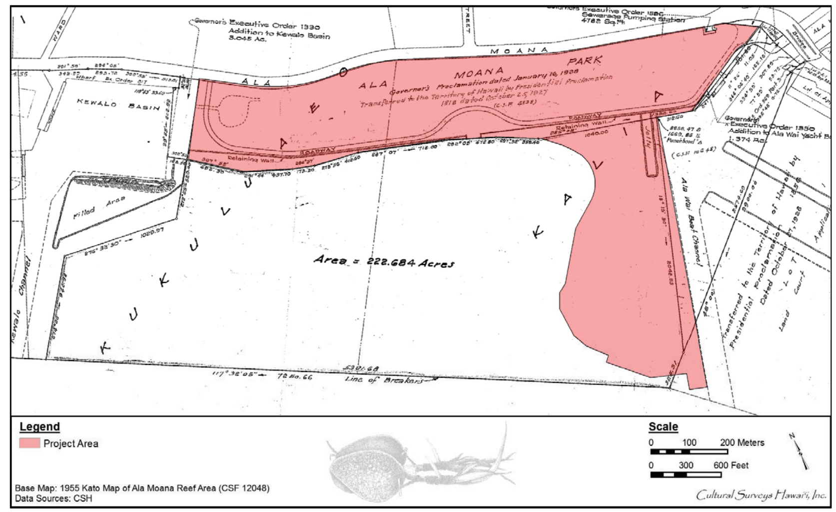


Figure 46. 1955 Kato map of Ala Moana reef area showing the project area

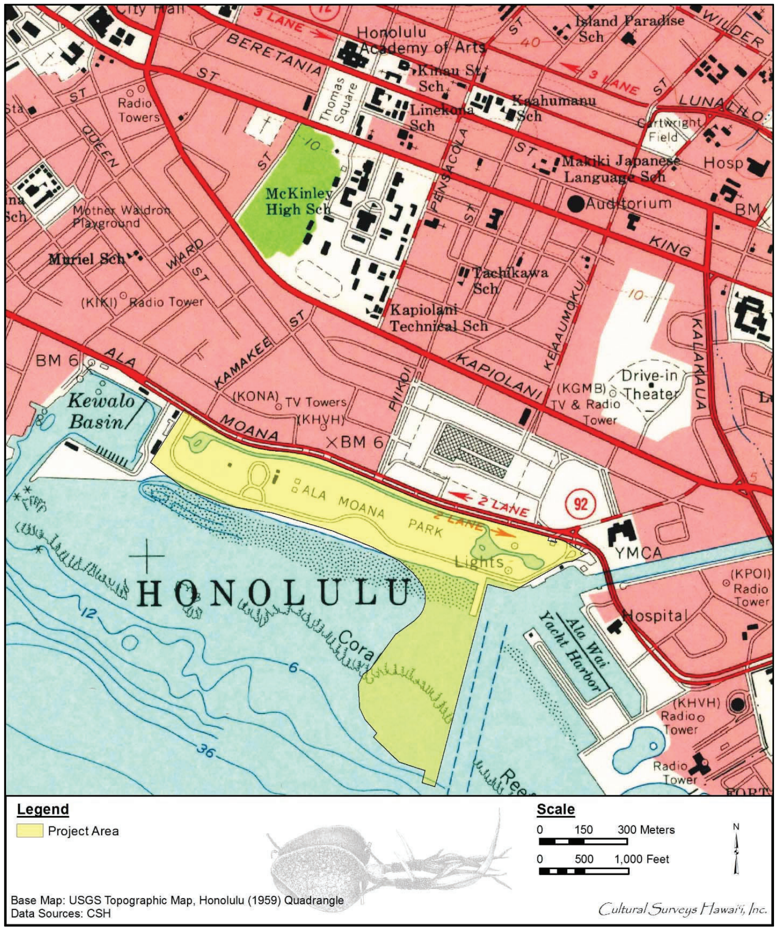


Figure 47. Portion of 1959 Honolulu USGS 7.5-minute topographic quadrangle, showing the project area; the boat channel has been dredged, access to Kewalo Basin has been blocked, and access to the Ala Wai Canal and Yacht Harbor have been partially blocked

The 1953 USGS map (see Figure 44) shows the planned area of the Ala Moana Center as a solid block. One new structure is a radio tower labeled “KONA.” The KONA-TV station (now KHON-TV, an affiliate of NBC) broadcast its first hour of television in 1952. The studio was located on Kō‘ula Street (west of the project area in Kaka‘ako); the transmitter was in the Ala Moana area and the executive offices were in downtown Honolulu. All of these facilities were moved to a new location on Auahi Street in Kaka‘ako in the mid-1950s (Stone 1983:243). The Ala Moana Yacht Basin has been created by dredging, and Ala Moana Boulevard is now a two-lane road. On a 1959 USGS map (see Figure 47), the boat channel connecting the Ala Wai Yacht Harbor to Kewalo Basin has been eliminated by expanding the beach area for Ala Moana Regional Park and by blocking the entrances to the harbor. The west end of Ala Wai Canal now is an open channel to the sea.

After the war several changes were made to the park. In 1947, the name of the park changed from Moana to Ala Moana Park. The Hawaiian Village, called Ulu Mau, consisting of a collection of grass huts near the Hawaiian Lagoon, was added in 1948 (see Figure 42), the Oriental Lagoon was remodeled in 1950, and a children’s center was added in 1954.

The most important change, however, was the construction of the beach and swimming area at the shoreline of the park. Before this time, swimming was discouraged as two sewers emptied into this area and the ocean was blocked off by a seawall with a narrow beach. Fishermen built wood fishing stands offshore (see Figure 45) and boats used the water channel on the *mauka* side of the park to move from the west end of the Ala Wai Canal where boats were moored to Kewalo Basin and the ocean. This boat channel became obsolete in 1951 when a channel was dredged directly from the Ala Wai Yacht Club across the reef to the ocean. The Territory built a jetty in 1952 that existed until 1959 (see Figure 46 through Figure 48) that kept the polluted waters of the Ala Wai Canal from entering the boating channel, and then filled a portion of the channel in 1954-1955 to create a platform for a beach. The open channel to Kewalo Basin shown in a 1952 aerial photograph (see Figure 43) had been filled in by 1955 (see Figure 46). To create a swimming area, the reef area was dredged 400 ft from the new shoreline. Sand was shipped in from Keawa‘ula Beach in Wai‘anae to create the beach (Clark 1977:62). This sand had to be replenished several times, first in 1976, when sand from a fossil beach ridge at Mokulē‘ia was trucked to Ala Moana. Dressing rooms and showers were added to each side of the McCoy Pavilion in 1959-1961. Two aerial photographs from 1952 and 1959 show the evolution of the beach and dredged areas during this period (compare Figure 43 and Figure 48).

The boom in tourism led to new schemes for resort development of the Ala Moana area. In 1955, there was a suggestion to move the park to a man-made off-shore island and develop the former park into an area of hotels, shops, and theaters. A 1961 plan called for the creation of two new peninsulas, one at the west Kewalo Harbor end and one at the Ala Wai Canal east end, with an island between the two peninsulas called “Magic Island” (Figure 49). In the end only one peninsula, a 36-acre acre filled reef section at the east end of the park, now called “Magic Island,” was created, built between 1962 and 1964 (Figure 50 and Figure 52 through Figure 56). Public demand in 1970 changed the peninsular use from resort development to public recreation.

Development of the Ala Moana Center land, *mauka* of the current project area, on the north side of Ala Moana Boulevard, was also moving forward in this same timeframe. The land was put up for sale as early as 1884 by the Bishop Estate, which had classified the 50-acre lot as

Figure 48. 1959 aerial photograph of Ala Moana Regional Park, with wide beach and swimming area; swimming area blocked from access to Kewalo Basin (left) by peninsula of fill land and from Ala Moana Yacht Harbor (right) by a jetty (UH SOEST 2012c)

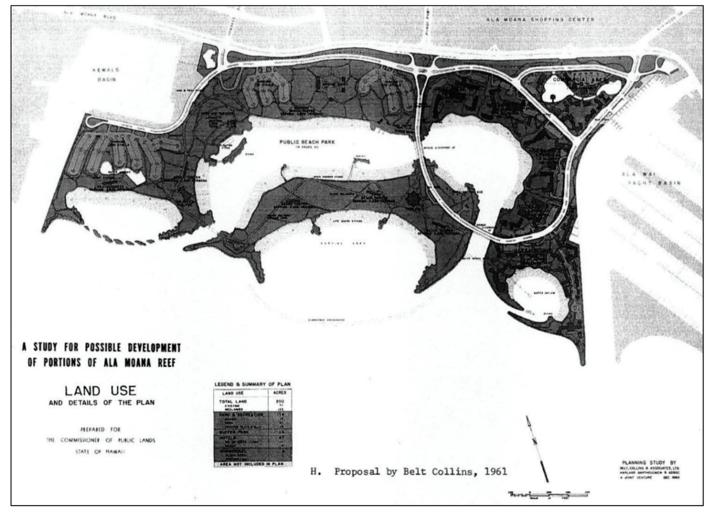


Figure 49. 1961 plans for construction of offshore island for the Ala Moana Regional Park and two peninsulas for resort development in *The Comprehensive Plan, Ala Moana Reef* (Belt Collins and Associates, Harland Bartholomew & Associates 1961) (map from Weyeneth 1987)

Figure 50. 1963 aerial photograph of the Ala Moana Regional Park with initial construction of the Magic Island peninsula (on right) (UH SOEST 2012d)

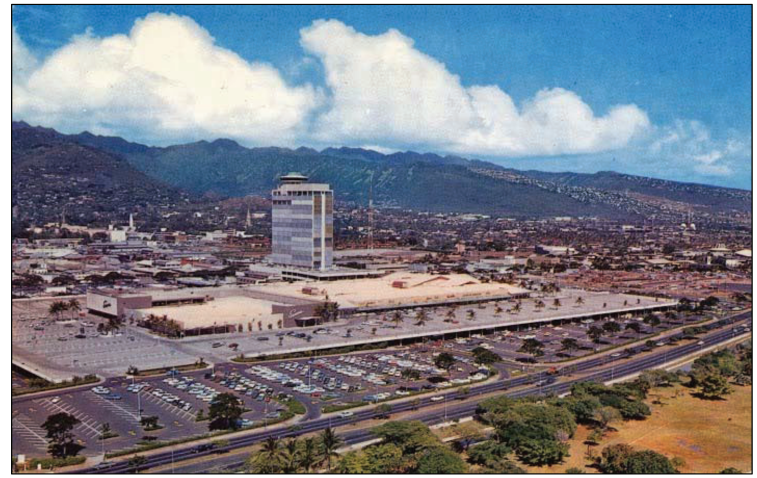


Figure 51. 1966 photograph of the Ala Moana Shopping Center; note Ala Moana Regional Park across from Ala Moana Boulevard on *makai* (lower) side (postcard, unknown photographer)

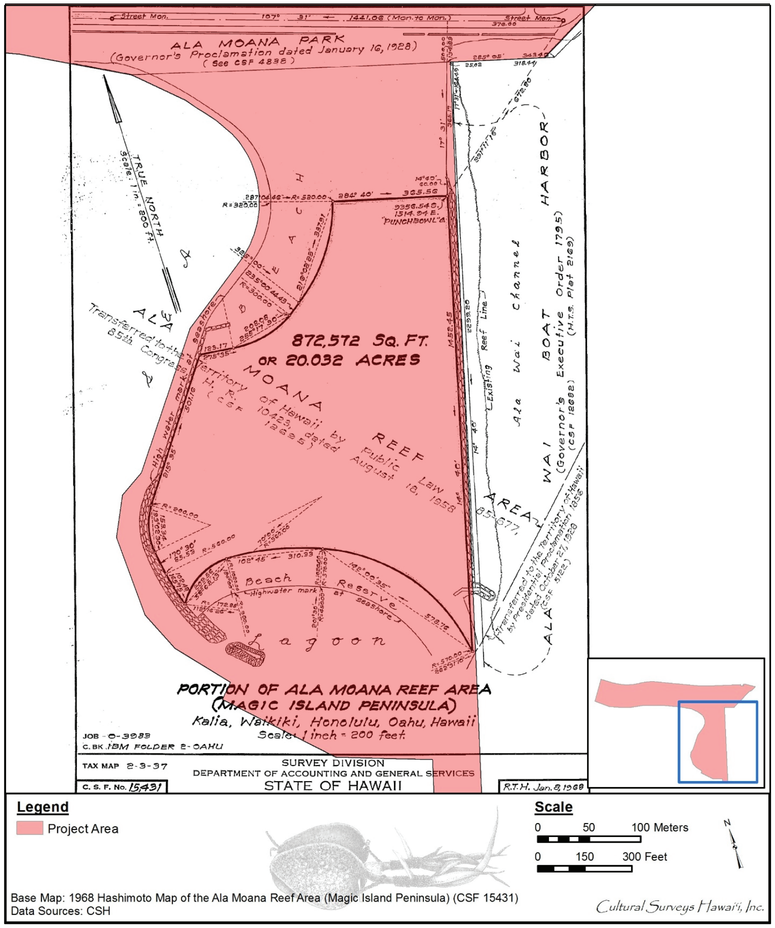


Figure 52. 1968 Hashimoto map of the Ala Moana reef area (Magic Island Peninsula) showing the Magic Island portion of the project area

Figure 53. 1968 aerial photograph of the Ala Moana Regional Park with completed construction of the Magic Island peninsula (on right) (UH SOEST 2012e)

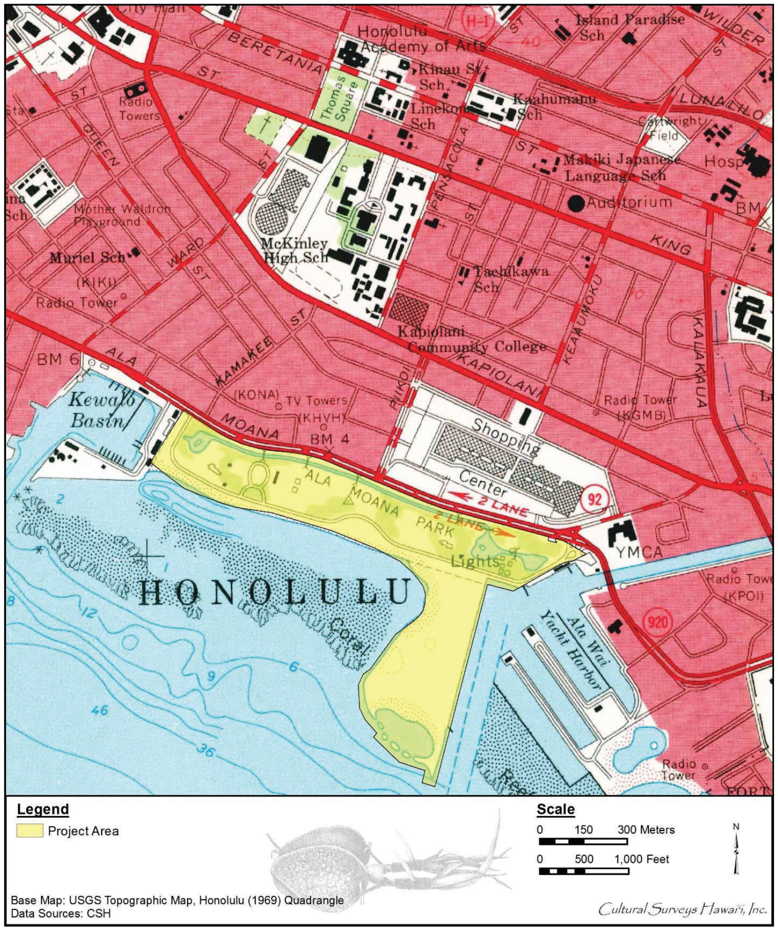


Figure 54. Portion of 1969 Honolulu USGS 7.5-minute topographic quadrangle, showing the project area; the construction of the Magic Island peninsula now completely blocks the Ala Moana Beach area from the Ala Wai Canal and boat harbor

Figure 55. 1970 Kakaako/Waikiki Coast Aerial Photograph (UH SOEST) showing the project area

Figure 56. Magic Island, ca. 2008 (public domain photograph from Wikipedia.com

unproductive land. They finally found a buyer in 1912, Walter F. Dillingham, head of the Hawaiian Dredging Company. Dillingham purchased the land for $25,000 in order to fill it with the coral left over from his many dredging projects.

The company's first project was the dredging of the main channels for Honolulu Harbor and Pearl Harbor. In the 1920s, the company won the bid for construction of the Ala Wai Canal as the company had the only type of large dredge necessary for the project. Besides dredging the streams in Waikīkī to form the canal, the company also dredged offshore to obtain crushed coral to fill the ponds and wetlands around the new canal. As a bonus, Dillingham could sell dredged material to private landowners who, as part of the Waikiki Reclamation project, had to fill in their low-lying areas.

In their bid for the contract, Hawaiian Dredging stated that they proposed to "furnish and pay for all of the labor, material, tools and equipment required for the dredging of a Canal, transporting and depositing the dredged or other filling materials upon certain lands, and constructing bridges, dykes, drainage ditches, etc." The company removed 140,000 cubic yards of dredged material and placed the majority of the crushed coral on the contractor's property in District No. 1, an area bounded by Sheridan Street, Kapahulu Road, King Street, Wai‘alae Road, and the ocean (Hawaii Department of Public Works 1920).

By 1931, Hawaiian Dredging had already begun to fill in their Kālia lands with coral fill. By 1947, the Ala Moana Center area was filled with crushed coral and the western portion of the lot was used for equipment and lumber storage, as in many portions of coastal Kaka‘ako.

Walter's son Lowell Dillingham initiated the Ala Moana Shopping Center project in 1948. Phase I of the shopping center construction project began in 1957. A 1959 map (see Figure 47) and 1959 aerial photograph (see Figure 48) show the shopping center nearing initial completion.

Sears, at the ‘Ewa side, and Shirokiya's, on the Diamond Head side, were two of the original tenants of the mall, which had its grand opening on 13 August 1959 (Dashefsky 2009). In 1957, the mall had 87 stores and 4,000 parking spaces within a two-story complex. In 1966, Phase II construction was completed with the addition of 1.35 million sq ft, making it the largest shopping mall in the United States, with 155 stores and 7,800 parking spaces (Figure 51). New wings and levels were added in 1966, 1987, 1999, and 2008; today there are over 290 shops and restaurants on four levels (Gomes 2012; White and Kraus 2007).

The banyan court at Ala Moana Regional Park was altered in the 1970s, when Hazel McCoy donated a large sum to the park to build a new pavilion named for her husband, Lester McCoy. To construct the McCoy Pavilion, which contained assembly rooms and offices, a few of the original locker room structures and wall sections had to be demolished to provide room on the east side of the courtyard. The pavilion was completed in 1975 (Figure 57).

In the end, the park included large open areas, water and fountain features, a sports pavilion with an enclosed banyan garden, a lawn bowling green, an Art Deco style bridge crossing the Ala Wai Canal, a boat harbor, tennis courts, dressing rooms and showers, and extensive landscaping. In 1998, Ala Moana Regional Park was listed on the HRHP as one of Honolulu's Art Deco Parks Thematic Group (see Appendix A).

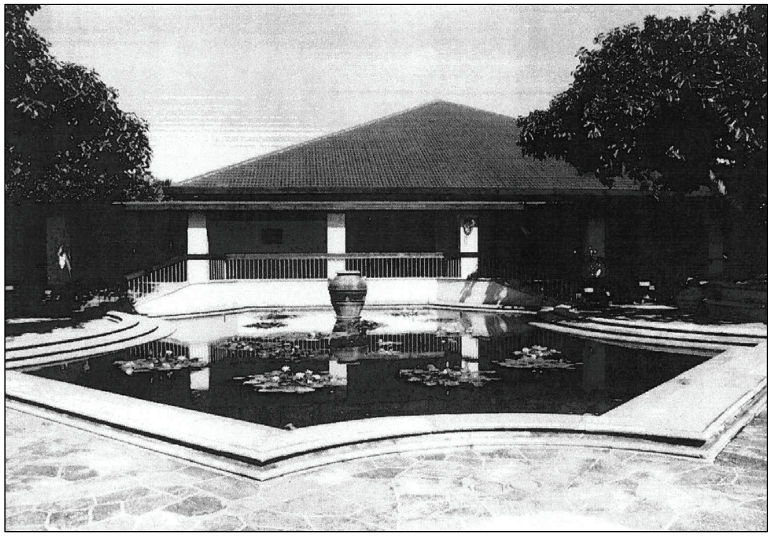


Figure 57. McCoy Pavilion, 1975 (in Weyeneth 1987)

Section 4 Previous Archaeological Research

4.1 Previous Archaeological Research in Ala Moana Regional Park

In 2003, archaeologists from Pacific Legacy (Ah Sam and Cleghorn 2003) conducted an archaeological assessment of a portion of Ala Moana Regional Park proposed for a canoe *hālau* (canoe shed). Their study emphasized the artificial nature of the park, which was created in the 1920s and 1930s by dredging the ocean in front of the former shoreline (around the Ala Moana Boulevard alignment), and filling the land *makai* of the boulevard to create a park, now 76 acres in size. A review of historic documents and maps and a visual inspection led them to conclude there was no evidence suggesting the possibility of cultural or historic features in the park (Ah Sam and Cleghorn 2003:2). Thus this section of previous archaeological work will focus on areas surrounding the park on areas once *mauka* of the reef on dry land. Previous archaeological study areas near Ala Moana Regional Park are shown on Figure 58, the locations of previously identified archaeological sites are shown on Figure 59; the archaeological studies and their results, including site numbers, are summarized in Table 1 and previously identified historic properties in the vicinity are summarized in Table 2. A more detailed discussion of each archaeological study follows.

4.2 Previous Archaeological Research in Coastal Kaka'ako and Kālia

4.2.1 Smith 1989

In 1989, construction workers discovered four bone fragments in a property located on the southeast corner of Kapi'olani Boulevard and Pi'ikoi Street (TMK: [1] 2-3-039:019). The find was reported to Marc Smith (1989), State Parks archaeologist. Smith examined the bones and determined only one was human (SIHP # 50-80-14-4243); the remaining fragments were pig bones. The human bone was a right tibia shaft fragment. A 3 August 1989 memorandum to the "Historic Sites File" stated that "On 2 August 1989, Alan Yoshimoto, project supervisor for Nordic Construction . . . called our office to report 'some bones' found at a construction site at 1341 Kapiolani Boulevard." A memorandum addressed to Dr. Ross Cordy (SHPD) dated 10 April 1991, mentioned a formal report for SHPD files with skeletal remains data collection forms appended. The bone was temporarily taken to the Honolulu SHPD office and the site was designated SIHP # -4243.

4.2.2 Athens et al. 1994

During the 1994 excavation of a trench for an underground telephone line near the northeast corner of Pi'ikoi Street and Kapi'olani Boulevard, the remains of a single individual were inadvertently discovered and later disinterred (SIHP # -4847) (Athens et al. 1994). Osteological analysis revealed the skeletal remains were of a 12 to 15-year-old female. Radiocarbon analysis of a sample of bone collagen yielded a death date between AD 1295 and AD 1473, supporting the osteological determination of Hawaiian/Polynesian ancestry. The remains were found within a brackish water marsh environment (based on malacological findings) at a shallow depth of 50-80 cm below surface. A lack of burial goods and the presence of the remains within an unusual wetlands context strongly suggested the location of the remains did not reflect an intentional burial. Osteological analysis revealed a severe bone infection of the right pubis as the probable cause of

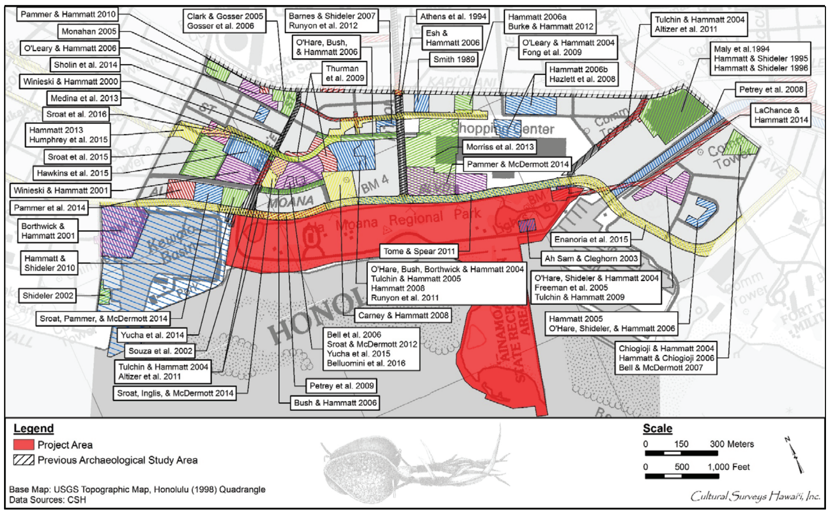


Figure 58. Previous archaeological studies in the vicinity of the current project area

Table 1. Summary of previous archaeological studies and their results

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Smith 1989	State Parks response to inadvertent discovery of human remains	1341 Kapi‘olani Ave	SIHP # -4243 (isolated long bone) found in a disturbed context
Athens et al. 1994	Investigation of inadvertently discovered human remains	Pi‘ikoi St and Kapi‘olani Blvd intersection	Identified SIHP # -4847, an inadvertently discovered scattered human burial dating to ca. 1450s
Maly et al. 1994	Archaeological and historical assessment	Convention Center, TMK [1] 2-3-035, 036	Historic research indicated project adjacent to Kūwili Pond
Hammatt and Shideler 1995, 1996	Subsurface inventory and data recovery	Convention Center, TMK [1] 2-3-035:001	Ten backhoe trenches and seven cores excavated; additional testing near former location of Kūwili Pond, but sediments believed to have been from pond found to be imported fill
Winieski and Hammatt 2000	Archaeological monitoring	Kaka‘ako Improvement District 4, Kamake‘e St	SIHP # -5598 (two adjacent coffin burials); old A horizon noted in some trenches
Borthwick and Hammatt 2001	Archaeological monitoring	Kaka‘ako Improvement District 6	Documented various fill layers over natural tidal flats, consistent with project area location within historic fill land seaward of previous coastline
Winieski and Hammatt 2001	Archaeological monitoring	Victoria Ward Theater, TMK: [1] 2-3-002:001	No pre-Contact materials, historic cultural materials, or human burials encountered
Shideler 2002	Historic American Buildings Survey	Incinerator Number One	Documentation of Incinerator Number One
Souza et al. 2002	Archaeological monitoring	Kaka‘ako Improvement District 7, Kamake‘e St	Three disturbed, pre-Contact burials recorded (SIHP #s -6376, -6377, -6378; location of -6378 unknown); old A horizon in seven of ten profiles

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Ah Sam and Cleghorn 2003	Archaeological assessment	Proposed Canoe Hālau, Ala Moana Regional Park, TMK: [1] 2-3-037	No archaeological or historic features identified
Chiojioji and Hammatt 2004	Archaeological literature review and field check	89,000 square foot parcel, TMKs: [1] 2-6-013:001, 003, 004, 007, 008, 009, 011, and 012	From archival research and field check, concluded there had been little subsurface disturbance within this area
O’Hare, Bush, Borthwick, and Hammatt 2004	Archaeological inventory survey	Ko‘olani Condominium, TMKs: [1] 2-3-004:073, 2-3-005:027; 2-3-006:014; 2-3-007:002	Original wetland surface of Kewalo (SIHP # -6636), three historic trash pits (SIHP # -6639), and a historic fill layer (SIHP # -6641) reported
O’Hare, Shideler, and Hammatt 2004	Archaeological assessment	Kapiolani Akahi project, TMKs: [1] 2-6-011:001, 002, 004, 032, 037, 040	Archival research indicated project area might contain evidence of wetlands, a fishpond, and historic fill layers with artifacts
Tulchin and Hammatt 2004	Literature review and field inspection	Kapi‘olani area, bounded by Ala Moana Regional Park, Ward Ave, Kalākaua Ave, and King St, TMKs:[1] 2-3-004, 005, 007, 009, 010, 013, 014, 017, 018, 022, 035, 036, and 038	No archaeological or historic features identified
O’Leary and Hammatt 2004	Archaeological monitoring	Kapi‘olani Blvd from Kalākaua Ave to Kamake‘e St, TMK: [1] 2-3-003	No cultural material observed
Clark and Gosser 2005	Subsurface archaeological inventory survey	TMKs: [1] 2-3-003:075, 085, and 086	SIHP # -6636 designates a subsurface remnant of a small pond present in northern portions of project area

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Freeman et al. 2005	Archaeological inventory survey and cultural impact evaluation	4-acres bounded by Ala Wai and Ala Moana Blvds, Hobron Lane, Lipe‘epe‘e St, TMKs: [1] 2-6-011:001, 002, 004, 032, 037, and 040	Identified four sites: disturbed and incomplete human remains (SIHP # -6700), an in situ coffin burial with grave goods (SIHP # -6701), a culturally enriched A horizon (SIHP # -6702), and remnants of a fishpond (SIHP # -6703; location outside area shown on figures)
Hammatt 2005	Literature review and field inspection	Kaio‘o Dr Development, TMKs. [1] 2-6-012:various	Recommended archaeological survey for project area as historic maps indicated area was once a wetland with fishponds
Monahan 2005	Archaeological Assessment	Three parcels on corner of Waimanu St. and Ward Ave, TMKs: [1] 2-3-003:073, 096	Nine backhoe trenches excavated on one parcel; no cultural deposits observed
Tulchin and Hammatt 2005	Addendum to an archaeological inventory survey	Ko‘olani Condominium, TMKs: [1] 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002	Eight backhoe test trenches excavated; SIHP # -6636, original wetland surface of Kewalo area; SIHP # -6641, historic garbage layer
Bell et al. 2006	Archaeological inventory survey	Victoria Ward Village Shops, TMKs: [1] 2-3-5:013–017, 022, 023	Eleven burials (SIHP #s -6854 and -6855) found during AIS and additional 50+ burials found during monitoring; historic privy/activity area (SIHP #s -6854 and -6855) and fishpond sediments (Kolowalu Pond, SIHP # -6856) recorded
Bush and Hammatt 2006	Archaeological monitoring	Hokua Tower, Ala Moana Blvd, TMKs: [1] 2-03-004:073; 2-03-005:027; 2-03-006:014; 2-03-007:002	No burials or cultural deposits observed; old A horizon found at eastern end of Auahi St

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Esh and Hammatt 2006	Archaeological monitoring	Pi‘ikoi St from Ala Moana Blvd to Matlock St, TMKs: [1] 2-3-006, 007, 010, 011, 012, 014, 015, 035, 038; 2-4-003, 004, 011, 012	No cultural material observed
Gosser et al. 2006	Archaeological monitoring	Kapi‘olani Blvd and Kamake‘e St corner, TMKs: [1] 2-3-003:075, 085, 086	No cultural material observed
Hammatt 2006a	Archaeological literature review and field inspection	1391 Kapi‘olani Blvd, TMK: [1] 2-3-039:011	No surface historic properties identified
Hammatt 2006b	Archaeological inventory survey	6-acres bounded by Kapi‘olani Blvd, Keaumoku St, Ala Moana Blvd, and Pi‘ikoi St, TMKs: [1] 2-3-038:001, 2-3-040:005, 007, 009, 011, 014, 016, 018	Thirty test trenches excavated; SIHP # -6847, a small, subsurface feature (wooden box with chopsticks, brushes, a bead, animal bones) dating to late nineteenth/early twentieth century
Hammatt and Chiogioji 2006	Literature review and field inspection	Waikīkī Allure Condo Development	Potential for subsurface archaeological resources in project area, including pre- and post-Contact habitation and burial deposits
O’Hare, Bush and Hammatt 2006	Archaeological monitoring	Kaka‘ako Improvement District 10, TMKs: [1] 2-3-004–007	Cluster of 28 historic burials (SIHP # -6658), two isolated disturbed burials (SIHP # -6659), and a historic trash dump (SIHP # -6660); weak A horizon; some fishpond sediments observed
O’Hare, Shideler, and Hammatt 2006	Archaeological inventory survey	Kaio‘o Dr Development, TMKs. [1] 2-6-012:varioius	Twenty backhoe trenches excavated on lots; SIHP # -6848, a pre-Contact fire pit, recorded and radiocarbon dated to AD 1470-1660

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
O’Leary and Hammatt 2006	Archaeological inventory survey	Moana Vista, Kapi‘olani Blvd, TMKs: [1] 2-3-003:072, 088, 102	Twenty-four test trenches excavated; extensive prior subsurface disturbance noted; no historic properties observed; small area of sand layers noted
Barnes and Shideler 2007	Literature review and field inspection	1235 Kona St/1226 Waimanu St, TMKs: [1] 2-3-007:026 and 049	No surface historic properties identified
Bell and McDermott 2007	Archaeological inventory survey	Block bounded by Ala Wai Blvd, Kalākaua Ave, Ena Rd, Hobron Lane, and Līpe‘epe‘e St	Documented three historic properties: SIHP #s -6873 and -6875, consisting of isolated traditional Hawaiian burials; and SIHP # -6874, subsurface cultural layer of pre-Contact and post-Contact origin
Carney and Hammatt 2008	Archaeological monitoring	Hokua Tower project, Ala Moana Blvd, TMKs: [1] 2-3-005:001, 002, 003 (por.), 024, 026, 027	Isolated human mandible fragment and a historic trash pit (SIHP # -6765) observed
Hammatt 2008	Archaeological monitoring	Ko‘olani Condominium, Waimanu St, TMKs: [1] 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002	Two isolated burials (SIHP #s -6910 and -6912) and a cluster of 16 coffin burials (SIHP # -6911) found
Hazlett et al. 2008	Archaeological monitoring	Ala Moana Center expansion project, TMKs: [1] 2-3-38:001, 2-3-040:005, 007, 009, 011, 014, 016, 018	No cultural material observed; monitoring results within current project area (Kona St Block) indicate fill sediments to below water table; document research indicated Ala Moana Center Phase II project completed in 1960s completely removed prior natural sediments to below water table and replaced them with fill
Petrey et al. 2008	Archaeological monitoring	Ala Wai to Magic Island, TMKs: [1] 2-3-034, 036, 037; 2-6-017, 018; 2-7-036	No cultural material observed

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Fong et al. 2009	Archaeological monitoring	Kapi‘olani Blvd from Kalākaua to Ward Ave, Kamake‘e St from Kapi‘olani Blvd to Auahi St and Atkinson Dr from Kapi‘olani to Ala Moana Blvd	No cultural material observed
Petrey et al. 2009	Archaeological monitoring	Nitmitz Hwy and Ala Moana Blvd, TMKs: [1] 2-1-014 and 027	No cultural deposits identified
Thurman et al. 2009	Archaeological inventory survey	Queen St Parks	Identified one previously documented historic fishpond remnant (SIHP # -6856)
Tulchin and Hammatt 2009	Archaeological monitoring	4-acre area bounded by Ala Wai Blvd, Hobron Lane, Lipe‘epe‘e St, and Ala Moana Blvd, TMKs: [1] 2-6-011:001, 037	Identified additional fragments of previously identified disturbed human burial (SIHP # -6700), as well as second set of human remains (SIHP # -7057)
Hammatt and Shideler 2010	Cultural anthropology and archaeology summary	Kewalo Basin, TMK: [1] 2-1-058	Concluded no pre-twentieth century in situ deposits present within majority of project area
Pammer and Hammatt 2010	Archaeological assessment	0.26-acre Moana Vista project, Kapi‘olani Blvd, TMK: [1] 2-3-003:084	Four test trenches excavated; no cultural material observed
Altizer et al. 2011	Archaeological monitoring	Kapi‘olani Area Revised Sewer System, TMKs: [1] 2-3-004, 005, 007, 009, 010, 013, 014, 017, 018, 022, 035, 036, 038, and 041	One site documented: previously identified SIHP # -6636, a wetland deposit with signs of historic modification for rice cultivation

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Runyon et al. 2011	Archaeological inventory survey	Ko‘olani Phase II project, TMK:[1] 2-3-006:017	Five sites documented: two previously identified sites: an historic trash layer and a wetland sediment (SIHP #s -6641 and -6636); three newly identified sites: a buried pre-Contact and post-Contact cultural layer (SIHP # -7115), an alluvial layer (SIHP # -7116), and a concentration of 27 post-Contact burials (SIHP # -7117)
Tome and Spear 2011	Archaeological monitoring	Ala Moana, TMKs: [1] 2-3-006 and 038	No cultural materials or subsurface features identified
Burke and Hammatt 2012	Archaeological inventory survey	1391 Kapi‘olani Blvd parcel	Identified SIHP # -7193, a historic trash layer
Runyon et al. 2012	Archaeological inventory survey	Corner of Pi‘ikoi St and Kona St, TMKs: [1] 2-3-007:026 and 049	Identified Kewalo wetland sediments (SIHP # -6636) in all 13 test excavations
Sroat and McDermott 2012	Supplemental archaeological inventory survey	Ward Village, TMKs: [1] 2-3-005:013–017, 022, and 023	Further documented SIHP # -6855, subsurface cultural layer/activity area comprised of traditional Hawaiian cultural layer that included numerous pit features and six previously identified human burials
Hammatt 2013	Archaeological inventory survey	Numerous locations between Middle St and Ala Moana Center	Identified Kewalo wetland land surface (SIHP # -6636), Kolowalu Fishpond (SIHP # -6856), a pre- to post-Contact cultural layer containing an isolated human bone fragment (SIHP # -7429), and subsurface privy remnant (SIHP # -7430)
Medina et al. 2013	Archaeological monitoring	Intersection of Kamake‘e St and Queen St, TMKs: [1] 2-3-002 001; 2-3-003:087, 103; 2-3-004:080 (por.)	Identified multiple fill layers and truncated sand A horizon
Morriss et al. 2013	Archaeological inventory survey	Ala Moana Center, TMK: [1] 2-3-038:001 (por.)	Identified potential salt pan signatures in nine trenches and further documented SIHP # -6636 (Kewalo wetland sediments)

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
LaChance and Hammatt 2014	Archaeological monitoring	Sewer line along Ala Wai Park adjacent to Ala Wai Canal	No cultural deposits identified
Pammer and McDermott 2014	Archaeological inventory survey	Park Lane, TMK: [1] 2-3-038:001 (por.)	Eight backhoe trenches excavated; two historic properties identified, SIHP # - 6636, pre-Contact to early twentieth century natural wetland deposit and SIHP # -7596, a subsurface trash deposit with historic artifacts
Pammer et al. 2014	Archaeological inventory survey	Ward Neighborhood Block B East (Ward Village Gateway)	Identified five historic properties in 38 test excavations: 1) SIHP # -7655, subsurface salt pan remnants; 2) SIHP # -7656, human skeletal remains; 3) SIHP # -7658, historic buried surfaces; 4) SIHP # -7659, historic water channel; and 5) SIHP # -7660, historic fill layer
Sholin et al. 2014	Archaeological inventory survey	Ola Ka 'Ilima Artspace Loft, Waimanu St	Six test trenches excavated; scattered historic artifacts found in fill layers
Sroat, Inglis, and McDermott 2014	Archaeological inventory survey	Ward Neighborhood Block K	Identified portions of two historic properties in 35 test excavations: 1) SIHP # -6855, subsurface cultural deposits; and 2) SIHP # -7422, burned trash layer; majority of project area contained modern developed land surface, fill layers, and hydraulic (dredged) fill overlying remnant buried A horizon or organic-rich peat material, Jaucas sand, and gleyed marine sandy clay
Sroat, Pammer, and McDermott 2014	Archaeological inventory survey	Ward Neighborhood Block C West (Ward Village Gateway)	Identified two historic properties in 36 test excavations: 1) SIHP # -7655, subsurface salt pan remnants; and 2) SIHP # -7658, historic buried surfaces
Yucha et al. 2014	Archaeological inventory survey	Ward Neighborhood Block C	Identified burned trash layer (SIHP # -7422); majority of project area contained sand or peat A horizon and Jaucas sand beneath reclamation fill layers; no cultural material or features observed

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Enanoria et al. 2015	Archaeological monitoring	Ala Moana Blvd/ Nimitz Hwy Resurfacing and Lighting project	Identified three historic properties, only one near project area, SIHP # -7435, four sets of human skeletal remains within sand deposits near Ala Moana Blvd and Queen St
Hawkins et al. 2015	Archaeological inventory survey	Ward Neighborhood Block M	Identified two historic properties in 68 test excavations: 1) SIHP # -7429, subsurface cultural deposits consisting of two discrete cultural deposits and associated features; and 2) SIHP # -7686, twentieth century commercial infrastructure remnants
Humphrey et al. 2015	Supplemental archaeological inventory survey	HRTP (City Center)	Fifteen test excavations identified additional components of SIHP # -7429, including three pit features and human burial
Sroat et al. 2015	Archaeological inventory survey	Ward Neighborhood Block I	Eighty-eight test excavations identified two historic properties: SIHP # -7429, subsurface cultural deposits and associated features including burial sites; and SIHP # -7655, subsurface salt pan remnants; pedestrian inspection documented SIHP # -7659, concretized water channel (*'auwai*)
Yucha et al. 2015	Archaeological monitoring	Ward Village Shops Project Kaka'ako, TMKs: [1] 2-3-005:013 through 017, 022, and 023.	Four significant historic properties were identified. Three were originally identified during the AIS for this project (Bell et al. 2006) and one was originally identified by Yucha et al. (2014) during an AIS for a Block C project area and was reassessed for the current study by Sroat et al. (2014): 1) SIHP # -6854 is a subsurface cultural layer/activity area, 2) SIHP # -6855 is a buried cultural layer indicating a former traditional Hawaiian activity area, 3) SIHP # -6856 is comprised of buried fishpond remnants (Kolowalu Fishpond) 4) SIHP # -7422 is a post-Contact subsurface cultural deposit (burned trash layer) associated with open-air burning practices.

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Belluomini, et al. 2016	Archaeological monitoring	Ward Village Shops project, Kaka‘ako, TMKs: [1] 2-3-005:013 through 017, 022, and 023	Monitoring conducted from March 2006 through December 2008; four historic properties discussed, three originally identified during the initial (Bell et al. 2006) AIS for the project and one initially identified during another AIS (Yucha et al. 2014); SIHP # -6854, subsurface cultural layer/activity area remnant; SIHP # -6855, an activity area remnant comprised of a subsurface cultural layer that included numerous pit features and six human burial finds; SIHP # -6856, buried fishpond remnants (Kolowalu Fishpond); SIHP # -7422, a post-Contact subsurface cultural deposit (burnt trash layer)
Sroat et al. 2016	Archaeological inventory survey	Block N East project, Kaka‘ako, TMKs: [1] 2-3-002:001 (por.), 067, 086, 087	Two historic properties documented: SIHP # -7429 consists of pre- and post-Contact cultural deposits with associated features, including human burials; SIHP # -7686 consists of subsurface historic infrastructure remnants

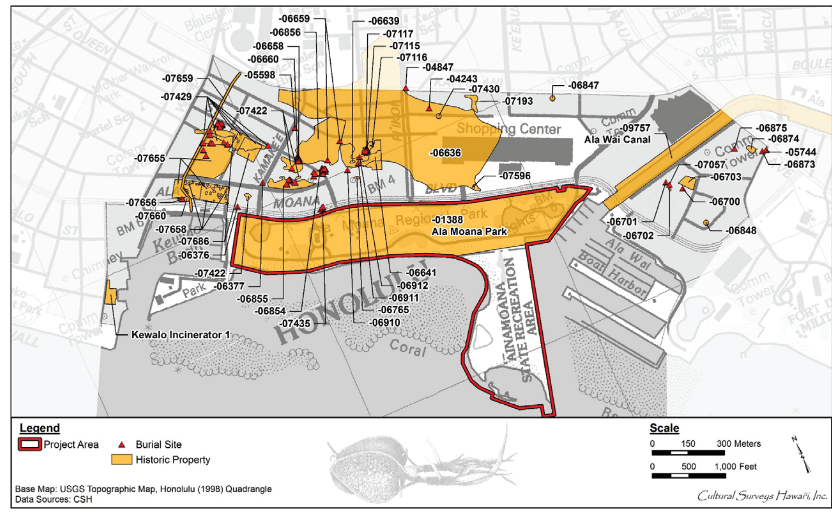


Figure 59. Previously designated archaeological sites in the vicinity of the project area

Table 2. Previously identified historic properties in the vicinity of the project area

SIHP # 50-80-14-	Description of Site	Source
1388	Ala Moana Park	HRHP
4243	Human bone	Smith 1989
4847	Scattered human burial dating to ca. 1450s	Athens et al. 1994
5598	Two adjacent coffin burials	Winieski and Hammatt 2000
5744 (2)	Human burials	Perzinski
6376	Human burial (1)	Souza et al. 2002
6377	Human burial (1)	Souza et al. 2002
6636	Subsurface wetland sediments	O'Hare, Bush, Borthwick, and Hammatt 2004, Clark and Gosser 2005, Runyon et al. 2012, Hammatt 2013
6639	Historic trash pit	O'Hare, Bush, Borthwick, and Hammatt 2004
6641	Historic trash pit	O'Hare, Bush, Borthwick, and Hammatt 2004
6658	Human burials	O'Hare, Bush, Borthwick, and Hammatt 2004
6659	Human burials	O'Hare, Bush, Borthwick, and Hammatt 2004
6660	Historic trash pit	O'Hare, Bush and Hammatt 2006
6700	Human burial (1)	Freeman et al. 2005
6701	Human burial (1)	Freeman et al. 2005
6702	Subsurface cultural deposit	Freeman et al. 2005
6703	Buried fishpond sediments	Freeman et al. 2005
6765	Historic trash layer	Carney and Hammatt 2008
6847	Wood-lined subsurface feature	Hammatt 2013
6848	Subsurface cultural deposit	O'Hare, Shideler, and Hammatt 2006
6854	Subsurface cultural deposit and human burials (5)	Bell et al. 2006, Belluomini 2016
6855	Subsurface cultural deposit and human burials (7)	Bell et al. 2006, Yucha et al. 2015, Belluomini 2016
6856	Kolowalu Fishpond	Thurman et al. 2009, Belluomini 2016
6873	Human burial (1)	Bell and McDermott 2007
6874	Subsurface cultural layer	Bell and McDermott 2007
6875	Human burial (1)	Bell and McDermott 2007
6910	Human burial (1)	Hammatt 2008
6911	Cluster of 16 coffin burials	Hammatt 2008
6912	Human burial (1)	Hammatt 2008

SIHP # 50-80-14-	Description of Site	Source
7057	Human skeletal remains	Tulchin and Hammatt 2009
7115	Subsurface cultural deposit	Runyon et al. 2011
7116	Pond sediment	Runyon et al. 2011
7117	Burial cluster	Runyon et al. 2011
7193	Historic trash pit	Burke and Hammatt 2012
7422	Subsurface burnt trash deposit	Sroat et al. 2014, Yucha et al. 2015, Belluomini 2016
7429	Subsurface cultural deposit and a human burial	Hammatt 2013, Hawkins et al. 2015, Humphrey et al. 2015, Sroat et al. 2015, Sroat et al. 2016
7430	Subsurface privy remnant	Hammatt 2013
7435 A-D	Human skeletal remains	Enanoria et al. 2015
7596	Subsurface trash deposit	Pammer and McDermott 2014
7655	Salt pan sediments and human burials	Sroat et al. 2015
7656	Human burial (1)	Pammer et al. 2014
7658	Subsurface infrastructure remnants	Sroat et al. 2014
7659	Ward ditch	Pammer et al. 2014, Sroat et al. 2015
7660	Historic trash deposit	Pammer et al. 2014
7686	Commercial infrastructure remnants	Hawkins et al. 2015, Sroat et al. 2016
9757	Ala Wai Canal	NRHP, Maly et al. 1994
No SIHP # assigned	Kewalo Incinerator 1	National Park Service

death. The individual may have passed away at the very spot of interment and remained undiscovered. Alternatively, the individual may have been interred in an elevated sand berm. Several burials in Kaka'ako have been found in similar sand berms located around fishponds.

4.2.3 Maly et al. 1994

The firm Paul H. Rosendahl, Inc. (PHRI) (Maly et al. 1994) conducted an archaeological and historical assessment study for the proposed Convention Center, on the *makai* side of the Ala Wai Canal adjacent to the east end of the current project area. Historic research indicated the project area was adjacent to the large Kūwili Fishpond. For this reason, the authors recommended subsurface testing to report subsurface remains and to look for the pond walls.

4.2.4 Hammatt and Shideler 1995, 1996

In 1995, CSH (Hammatt and Shideler 1995) conducted subsurface testing at a site proposed for the Waikīkī Convention Center (now called the Hawai'i Convention Center). The crew excavated ten backhoe trenches and seven cores. Most of the excavations had fill material down to within a few centimeters of the original coral reef, an indication that this former wetland area had been extensively filled during the 1920s and 1930s Waikīkī Reclamation Project. Four radiocarbon dates were recovered, and the oldest sediment, from just above the coral reef, wielded a date of AD 985-1920. The pollen analysis of samples from older deposits indicated a dominance of *Pritchardia* palms, which virtually disappeared before the arrival of the Polynesians to the Islands. Additional testing was conducted (Hammatt and Shideler 1996) near one of the trenches located in a former fishpond (Loko Kūwili Pond) in 1994. Results of the data recovery research showed the Stratum III sediments believed to have been related to Kūwili Fishpond were in fact imported fill.

4.2.5 Winieski and Hammatt 2000

In 2000, archaeological monitoring for the Kaka'ako Improvement District (ID) 4 project was conducted by CSH (Winieski and Hammatt 2000). The project documented two isolated historic coffin burials (SIHP # -5598) on Kamake'e Street, between Kawaiaha'o and Waimanu streets. The two adjacent burials were within an undisturbed beach sand deposit, directly underlying an A horizon, which itself was beneath approximately 50 cm of construction fill and pavement. Well-defined burial pits were present, as well as staining from the deteriorated coffin wood. Apart from the coffins, no associated artifacts were discovered during disinterment. During a nearby excavation on Waimanu Street, approximately 2 m west of Kamake'e Street, a horse or mule skeleton was discovered within an undisturbed sand layer, approximately 1 m below the surface. No other materials were observed during the Kaka'ako ID 4 project, apart from several modern bottles and bottle fragments discovered within fill materials. One "Star Soda Works" bottle was dated to ca. 1900.

4.2.6 Borthwick and Hammatt 2001

Between 1999 and 2001, CSH conducted archaeological monitoring for the Kaka'ako Improvement District 6 project, located adjacent to Kewalo Basin and *makai* of the Ward Avenue and Ala Moana Boulevard intersection (Borthwick and Hammatt 2001). The project included an extension of Ward Avenue *makai* of Ala Moana Boulevard, connecting with 'Āhui Street, as well as improvements to drainage, water, sewer, and utility systems, the construction of a parking lot,

and landscaping. Consistent with the project area's location within infilled coastal waters *makai* of the previous shoreline, the documented stratigraphy consisted of various fill deposits over natural tidal flats characterized by gleyed sandy clay to loamy clay. No historic properties were observed.

4.2.7 Winieski and Hammatt 2001

In 2000, CSH performed archaeological monitoring for Victoria Ward Ltd. at the site of the Ward Village Phase II (Ward Theaters) construction project in Kaka'ako (Winieski and Hammatt 2001). No pre-Contact materials, historic cultural materials, or human burials were encountered. Stratigraphic profiles within the project area revealed fill materials placed over a pre-existing marsh surface. In the northwest corner of the project area, an old A horizon, naturally deposited pond sediments, and calcareous sand were observed. Similarly, an old A horizon and naturally deposited calcareous sand were observed in the southwest corner of the project area.

4.2.8 Souza et al. 2002

In 2000, CSH completed a monitoring program for the Kaka'ako ID-7 construction project, encountering three human burials severely disturbed by excavation activities (Souza et al. 2002). The ages and ancestries of the individuals could not be identified; however, the lack of grave goods may indicate they were pre-Contact or early post-Contact. Burial 1 (SIHP # -6376), a single cranium, was inadvertently discovered by construction personnel in the back dirt pile at the base yard. Burial 2 (SIHP # -6377), an adult individual, was encountered by a CSH archaeologist during backhoe excavations for a box drain. The burial was within an undisturbed beach sand deposit. Burial 3 (SIHP # -6378), consisting of a femur and several rib fragments, was also recovered in the base yard.

4.2.9 Chiogioji and Hammatt 2004

In 2004, CSH (Chiogioji and Hammatt 2004) prepared an archaeological literature review and field inspection for the 2.3-acre former Wave nightclub, later used for the Waikīkī Allure condominium development, at the corner of Kalākaua Boulevard and 'Ena Road in Waikīkī. Background research indicated the study area, from traditional Hawaiian times to the modern era, comprised a drier portion of Waikīkī, at least partially elevated above the region's fishponds and wetland agricultural fields. An inventory survey with subsurface testing was recommended.

4.2.10 O'Hare, Bush, Borthwick, and Hammatt 2004

In 2003, CSH conducted the Phase I portion of the archaeological inventory survey for the Ko'olani Condominium project in the Kewalo area (O'Hare, Bush, Borthwick, and Hammatt 2004). A total of 13 trenches were excavated. Two previously unrecorded historic properties were newly identified, SIHP #s -6639 and -6641, both historic trash pits dated to the early twentieth century. In addition, one previously recorded historic property, the original wetland surface of Kewalo (SIHP # -6636), was documented.

4.2.11 O'Hare, Shideler, and Hammatt 2004

In 2004, an assessment consisting of archival research and a field inspection was conducted by CSH (O'Hare, Shideler, and Hammatt 2004) at the proposed Kapiolani Akahi project site on Hobron Lane in Waikīkī. From these two sources, a predictive model was generated. Historic maps indicated the project area once had a fishpond and an *‘auwai* (water ditch), and possibly taro *lo‘i* (irrigated patches). Historic artifacts within fill layers were also anticipated.

4.2.12 O’Leary and Hammatt 2004

Between August and October 2004, CSH conducted archaeological monitoring along Kapi‘olani Boulevard for sewer line repairs (O’Leary and Hammatt 2004). A total of five 0.6-m deep trenches were excavated. The stratigraphy of these trenches consisted of fill materials associated with the original placement of the sewer pipes. No cultural materials were observed.

4.2.13 Tulchin and Hammatt 2004

In 2004, CSH completed a literature review and field inspection for the Kapi‘olani Area Revised Sewer System project (Tulchin and Hammatt 2004). No subsurface testing was conducted as part of the archaeological assessment. No archaeological or historical features were observed within the project area.

4.2.14 Clark and Gosser 2005

Pacific Consulting Services (Clark and Gosser 2005) carried out subsurface testing for a storage facility on the southwest corner of Kapi‘olani Boulevard and Kamake‘e Street, documenting SIHP # -6636, a subsurface remnant of a small pond.

4.2.15 Freeman et al. 2005

In 2004, CSH completed an archaeological inventory survey and cultural impact evaluation for the Ala Wai Gateway project site (Freeman et al. 2005). Twenty-two backhoe trenches were excavated within the project area. Four sites were identified during excavation: disturbed and incomplete human remains (SIHP # -6700), an in situ coffin burial with grave goods (SIHP # -6701), a culturally enriched A horizon (SIHP # -6702), and the remnants of a fishpond (SIHP # -6703). The buried A horizon was only observed in one trench (Trench 11). It contained cultural material, including marine shell midden, fishbone, charcoal, historic glass, and a large mammal bone. Radiocarbon analysis on charcoal samples collected from the A horizon indicate the cultural layer accumulated in the late pre-Contact or early historic period.

4.2.16 Hammatt 2005

In 2005, CSH conducted archival research and a brief field inspection of a proposed condominium development on Kaio‘o Drive in Waikīkī. Archival research, including historic maps, indicated that before the construction of the Ala Wai Canal and the filling in of Waikīkī’s marshes and fishponds, the project area comprised dry land and portions of ponds. Based on this report’s findings and the cultural sensitivity of the entire Waikīkī area, CSH recommended an archaeological inventory survey with a substantial subsurface testing component for the project area.

4.2.17 Monahan 2005

A crew from Scientific Consultant Services, Inc. (SCS) completed a report on an archaeological assessment of three parcels at the corner of Waimanu Street and Ward Avenue in 2005 (Monahan 2005). Nine backhoe trenches were excavated through hard, severely impacted, fill layers. No cultural layers or burials were recorded.

4.2.18 Tulchin and Hammatt 2005

In 2005, CSH conducted Phase II of the archaeological inventory survey for the Ko‘olani Condominium project (Tulchin and Hammatt 2005). Two historic properties previously recorded by O’Hare et al. (2004) were identified, SIHP #s -6636 (an original wetland surface of Kewalo) and -6641 (a historic trash fill layer).

4.2.19 Bell et al. 2006

In 2006, CSH completed an archaeological inventory survey for the Victoria Ward Village Shops project (Bell et al. 2006). A total of 86 trenches were excavated within the project area. Three historic properties were identified: 1) SIHP # -6854, a subsurface cultural layer/activity area that contained an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A horizon (containing both historic and prehistoric cultural material), and five previously identified human burials; 2) SIHP # -6855, a subsurface cultural layer/activity area comprised of a traditional Hawaiian cultural layer that included numerous pit features and six previously identified human burials; and 3) SIHP # -6856, a historic fishpond that is part of Land Commission Grant 3194, “Kolowalu,” awarded to Kalae and Kaaua. Subsequent archaeological monitoring associated with the project documented approximately 50 additional pre-Contact or early post-Contact burials associated with SIHP #s -6854 and -6855 (see Thurman et al. 2009). All burials were found in Jaucas sand deposits. Of historic interest in the monitoring results are the frequent discoveries of late nineteenth century ammunition and animal burials. The Ward Village Shops project area correlates to areas shown on historic maps as a rifle range (1893) and an animal quarantine station (1911), which likely explains these findings.

4.2.20 Bush and Hammatt 2006

Between 2003 and 2005, CSH conducted archaeological monitoring along Auahi Street for the Hokua Tower project (Bush and Hammatt 2006). Excavations took place using a backhoe with a 3-ft-wide bucket, as well as by hand shoveling. Excavations included 350 m of electrical line trenching and two associated manholes. No archaeological finds were encountered during monitoring.

4.2.21 Esh and Hammatt 2006

In 2004, CSH conducted archaeological monitoring for the Rehabilitation of Streets, Unit 5 B project on Pi‘ikoi Street between Ala Moana Boulevard and Matlock Street (Esh and Hammatt 2006). Construction activities in the area primarily consisted of the resurfacing of Pi‘ikoi Street. This activity did not extend deeper than 30 cm below base course, and it did not require archaeological monitoring. Construction activity requiring monitoring was limited to excavation at the intersection of Pi‘ikoi and Young streets for traffic signal improvements. No cultural materials were encountered.

4.2.22 Gosser et al. 2006

In 2006, archaeological monitoring was performed for a 1.84-acre parcel at the west corner of Kapi‘olani Boulevard and Kamake‘e Street (Gosser et al. 2006). Remnants of an unnamed fishpond that had been previously identified (SIHP # -6636) were discovered (Clark and Gosser 2005); however, no cultural materials were observed during monitoring.

4.2.23 Hammatt 2006a

In 2006, CSH completed an archaeological literature review and field inspection of a 1.43-acre area proposed for development of a residential condominium (Hammatt 2006a). No surface historic properties were observed within the project area.

4.2.24 Hammatt 2006b

In late 2005 and early 2006, CSH conducted an archaeological inventory survey of the Ala Moana Expansion project (Hammatt 2006). The investigation's 30 backhoe trenches revealed no Jaucas sand deposits within the project area. The natural land surface, prior to historic/modern fill episodes, was either a sandy clay or a highly organically enriched peaty layer. This natural surface was largely removed by prior construction-related disturbances within portions of the project area. One historic property (SIHP # -6847) was identified. It consisted of a wooden box placed in a pit cut into the former land surface. The box contained a mix of historic artifacts including, among other things, printed material, wooden chopsticks, pig bone, and a horse brush. It was tentatively dated to the late nineteenth or early twentieth century.

4.2.25 Hammatt and Chiogioji 2006

In 2006, CSH prepared an archaeological literature review and field inspection for the 2.3-acre Waikīkī Allure condominium development at the corner of Kalākaua Boulevard and 'Ena Road in Waikīkī, an update for a previous literature report (see Chiogioji and Hammatt 2004). Background research indicated the study area, from traditional Hawaiian times to the modern era, comprised a drier portion of Waikīkī, at least partially elevated above the region's fishponds and wetland agricultural fields. Fieldwork included only a brief pedestrian inspection of the project area. No surface archaeological resources or historic buildings or structures were noted. Based on background research, the authors indicated a potential for subsurface archaeological resources in the project area, including pre- and post-Contact habitation and burial deposits.

4.2.26 O'Hare, Bush, and Hammatt 2006

In 2006, CSH completed archaeological monitoring for the Queen Street Extension project, part of the Kaka'ako Improvement District 10 (O'Hare et al. 2006). During monitoring of the construction, 30 human burials were found and disinterred. Analysis of their distribution and associated grave goods indicates 28 of the burials (SIHP # -6658) constituted a cemetery, possibly used between the 1840s and the 1880s. The cemetery was located on an elevated sandbar that formed the margin of Kolowalu Pond (SIHP # -6856). Two burials (SIHP # -6659) were isolated finds and were not related to the main cemetery cluster. Historic trash pits (SIHP # -6660) that intruded into the eastern edge of the cemetery were also discovered during monitoring. The human remains and associated grave goods were reburied on site in a specially constructed vault complex.

4.2.27 O'Hare, Shideler, and Hammatt 2006

In 2005, CSH excavated 20 backhoe trenches for the Kaio'o Drive Condominium project on in Waikīkī. Based on nineteenth and early twentieth century maps and photographs, two ponds once existed in the project area, surrounded by higher ground. In the eastern portion of the project area, six trenches had a layer of organic clay loam that formed at the bottom of a still-water environment. When the location of ponds on a 1927 map is overlain on a modern map of the project area, five of the six trenches fell within the eastern pond and three of the trenches in the western half of the

project area fell within or near the predicted location of the second pond. SIHP # 6848 was a fire pit within a buried A horizon found in one trench. Radiocarbon determination of charcoal and rocks from this fire pit date to AD 1470-1660. Additional testing took place to clear a 10 m by 4 m area near this fire pit to determine its extent. No other cultural material was noted near the fire pit.

4.2.28 O'Leary and Hammatt 2006

In 2005, CSH conducted an archaeological inventory survey for the Moana Vista Condominiums project (O'Leary and Hammatt 2006). The project included the excavation of 24 backhoe trenches. The project area was divided into three stratigraphic groups (A–C). Group A contained fill over a disturbed organic A horizon containing coarse gray marine sand. Group B contained fill over Jaucas sand. Group C contained fill over an intact organic A horizon and coarse gray marine sand, similar to Group A. No historic properties were designated.

4.2.29 Barnes and Shideler 2007

In 2007, CSH completed a literature review and field inspection for the 1235 Kona Street/1226 Waimanu Street Reserved Housing project (Barnes and Shideler 2007). No surface historic properties were identified within the project area.

4.2.30 Bell and McDermott 2007

In 2006, CSH conducted an AIS for the Allure Waikīkī Development project between Ala Wai Boulevard, Kalākaua Avenue, and 'Ena Road. After a pedestrian inspection was conducted and 35 backhoe assisted trenches were excavated, three historic properties were documented: SIHP #s -6873 and -6875, consisting of isolated traditional Hawaiian burials found in sand deposits, and SIHP # -6874, a subsurface cultural layer of pre- and post-Contact origin.

4.2.31 Carney and Hammatt 2008

From 2003 to 2005, CSH conducted archaeological monitoring for the Hokua Tower project (Carney and Hammatt 2008). One historic property was documented (SIHP # -6765) consisting of an historic trash layer containing rusted metal, broken glass, and various bottles dating to the mid-1900s. In addition, a human mandible fragment was found in a displaced secondary context. It was thought that the mandible may have been exposed by coring activities (over 200 cores were drilled); however, the exact origin of the find was unknown.

4.2.32 Hammatt 2008

In 2008, CSH completed archaeological monitoring for the Ko'olani Condominium project (Hammatt 2008). Three new historic properties were identified, SIHP # -6910, a single pre-Contact burial; SIHP # -6911, a cluster of 16 historic coffin burials believed to comprise a discrete cemetery; and SIHP # -6912, a single burial. The burials were associated with Jaucas sand deposits buried beneath historic and modern fill. Additionally, various historic trash deposits were observed throughout the project area but were not assessed as significant.

4.2.33 Hazlett et al. 2008

In 2008, CSH performed archaeological monitoring for the 6-acre Ala Moana Expansion project (Hazlett et al. 2008), within the same project area as an earlier archaeological inventory survey (Hammatt 2006b). Hazlett et al. (2008) reported that no cultural materials were observed. Additionally, the monitoring results confirmed the prior inventory survey's observation (Hammatt

2006) that the natural sediments were largely removed to below the water table in areas and replaced by various fill sediments.

4.2.34 Petrey et al. 2008

Between 2006 and 2007, CSH performed archaeological monitoring from Ala Wai to Magic Island for the City and County of Honolulu's Emergency Sewer Bypass project (Petrey et al. 2008). No cultural deposits were identified during monitoring. The investigation concluded the project area's subsurface deposits were disturbed by imported fill materials.

4.2.35 Fong et al. 2009

In 2009, CSH completed archaeological monitoring of construction associated with upgrading existing drainage, water, and sewer systems. The project area included Kapi'olani Boulevard from Kalākaua Avenue to Ward Avenue, Kamake'e Street from Kapi'olani Boulevard to Auahi Street, and Atkinson Drive from Kapi'olani Boulevard to Ala Moana Boulevard (Fong et al. 2009). No historic properties were observed. The stratigraphy consisted primarily of imported fill material associated with the installation of utilities and road construction. In some instances, pockets of naturally deposited sediment (Jaucas sand and wetland clays) were observed beneath fill deposits.

4.2.36 Petrey et al. 2009

In 2007, CSH completed archaeological monitoring for the Nimitz Highway/Ala Moana Boulevard resurfacing project (Petrey et al. 2009). Project excavations were generally to depths of only 0.6 m below surface, with a maximum depth of 1.0-1.25 cmbs, and exposed various layers of fill. No historic properties were identified.

4.2.37 Thurman et al. 2009

In 2009, CSH completed an archaeological inventory survey for the Queen Street Parks project. Fieldwork involved the excavation of 29 backhoe trenches. One previously identified historic property was recorded, SIHP # -6856, remnants of a historic fishpond, originally identified by Bell et al. (2006). Documented stratigraphy consisted of varying layers of fill, overlying various naturally deposited sediments atop the coral shelf. The fill consisted of imported terrigenous sediment, incinerator material containing burnt historic refuse, crushed coral, and hydraulic pump dredge sediment. Natural sediments consisted primarily of backshore marsh or pond sediments associated with SIHP # -6856 (Kolowalu fishpond). Naturally deposited Jaucas sand deposits were also observed.

4.2.38 Tulchin and Hammatt 2009

Between 2005 and 2008, CSH completed archaeological monitoring for the Ala Wai Watermark project (Tulchin and Hammatt 2009). Monitoring identified additional skeletal fragments associated with a previously identified disturbed human burial (SIHP # -6700), as well as a second set of human remains (SIHP # -7057). Observed stratigraphy consisted of various fill deposits overlying natural marine sands and clays indicative of a marshland environment. In general, the observed naturally deposited sediments had been previously disturbed.

4.2.39 Hammatt and Shideler 2010

In 2010, CSH completed a summary report on the cultural anthropology and archaeology of the Kewalo Basin area to document potential cultural resources (Hammatt and Shideler 2010). The

study concluded that no pre-twentieth century in situ deposits are located within the majority of the project area. Potential early twentieth century in situ deposits may be located in the extreme inland portion of the project area. No human burials are expected in the project area with the possible exception of the vicinity of the seaward curb of the Ala Moana/Nimitz alignment.

4.2.40 Pammer and Hammatt 2010

In 2010, CSH conducted an archaeological assessment for a 0.26-acre parcel for the Moana Vista project (Pammer and Hammatt 2010). Four trenches were excavated, but no cultural materials were observed. The study found layers of imported fill over an organic A horizon. The organic A horizon consisted of brown clay loam (peat) containing compressed roots.

4.2.41 Altizer et al. 2011

From 2008 to 2009, CSH conducted archaeological monitoring for the Kapi'olani Area Revised Sewer System project (Altizer et al. 2011). The project comprised multiple sewer line segments located throughout Kaka'ako, Kewalo, and Kālia. The study documented two layers of former wetland sediments, identified as SIHP # -6636. The portion of SIHP # -6636 observed during monitoring was located in an easement off Pensacola Street, between Ho'olai and Kamaile streets, and extended between two low-rise apartment buildings. The location of SIHP # -6636 was consistent with the 1884 Bishop Waikiki Survey map (RM 1090) and the 1897 Monsarrat map (RM 1910), both of which show a pond present in the vicinity of the Kapi'olani Area Revised Sewer System project area. The pond is not named on either map, but is present within former rice fields. The sediments encountered during project-related sewer line excavation are described as a black clay loam, potentially related to rice cultivation. Abundant quantities of freshwater snail shells may indicate the former wetland deposits were modified for rice cultivation.

4.2.42 Runyon et al. 2011

Between 2009 and 2010, CSH conducted an archaeological inventory survey for the 1.73-acre Ko'olani Phase II project in Kaka'ako (Runyon et al. 2011). A total of 29 test trenches were excavated. Five historic properties were identified, two of which had been previously identified. SIHP # -6636 consists of portions of the former wetland surface of the Kewalo area. SIHP # -6641 is an historic burnt trash layer that was used as fill material to raise the original ground surface. Diagnostic artifacts provided a date range between the 1880s and 1940s. SIHP # -7115 is a subsurface culturally enriched sandy A horizon (cultural layer) containing multiple pit features, and pre- and post-Contact artifacts. Traditional Hawaiian artifacts included two basalt adzes. The historic artifacts dated to the early twentieth century. SIHP # -7116 is a subsurface low-energy alluvial layer characterized as pond sediment. Remnants of the site were found in four trenches whose location corresponds with a pond depicted on historic maps. SIHP # -7116 is a concentration of 27 human burials, 20 of which were found in wooden coffins. The burials were found in sand deposits below historic and modern fill layers. The presence of a glass bottle dated to between 1879 and 1907 suggests the burials were interred before ca. 1900. The SHPD determined the burials were of Native Hawaiian ancestry.

4.2.43 Tome and Spear 2011

In 2011, Scientific Consultant Services, Inc. conducted archaeological monitoring for the Ala Moana Sewer Reconstruction project (Tome and Spear 2011). No cultural materials or subsurface features were identified. In general, the observed stratigraphy consisted of multiple fill deposits overlying natural sediments (i.e., sand and silty sand).

4.2.44 Burke and Hammatt 2012

In 2011, CSH conducted an AIS of a 1.43-acre parcel located at 1391 Kapi‘olani Boulevard. A layer of historic trash, designated as SIHP # -7193, was noted throughout the northern and eastern portions of the project area (Burke and Hammatt 2012). The trash layer corresponds to land reclamation activities during the early to mid-twentieth century, similar to deposits noted in the surrounding area. Artifacts collected range in date from the 1930s to the 1950s.

4.2.45 Runyon et al. 2012

In 2012, CSH completed an archaeological inventory survey for the Senior Residence at Pi‘ikoi at the corner of Pi‘ikoi and Kona streets (Runyon et al. 2012). Subsurface Kewalo wetland sediments (SIHP # -6636) were observed in all 13 test excavations within the project area. In general, the wetland deposits consisted of very dark brown silty clay loam containing abundant decomposing organic materials (peat), snail shells, rootlets, and charcoal flecking. These sediments were found overlying gleyed sandy clay sediments over the coral shelf. Historic documentation suggests the site was capped with imported fill during early twentieth century land reclamation fill events. The site has been previously documented in nearby areas in Kaka‘ako (O’Hare et al. 2003; O’Hare et al. 2004; Tulchin and Hammatt 2005; and Runyon et al. 2011).

A sediment sample collected from SIHP # -6636 was analyzed by Dr. Carl Christensen, professional malacologist. The analysis also noted the snail species represented in the samples were “little changed from those present there and in similar environments in pre-Contact times” (Christensen 2011:9). Of three snail species commonly found in these wetland environments (*T. porrecta*, *M. tuberculata*, and *T. granifera*), one species (*T. porrecta*) found within SIHP # -6636 is now virtually extinct.

4.2.46 Sroat and McDermott 2012

In 2012, CSH completed a supplemental archaeological inventory survey for the Ward Village Shops Phase 2 project (Sroat and McDermott 2012). Five test units were excavated within or adjacent to the extrapolated location of SIHP # -6855. The stratigraphy observed with the five test excavations substantiated the previously extrapolated boundaries of SIHP # -6855, including the sub-boundaries demarcating concentrated areas of traditional Hawaiian deposits.

4.2.47 Hammatt 2013

Between November 2011 and February 2013, CSH conducted an archaeological inventory survey for the Honolulu High-Capacity Transit Corridor project (HHCTCP)—City Center (Section 4), which extended from Kalihi Stream in the west to Ala Moana Center in the east. Two hundred-fifty test excavations were documented. A total of 19 historic properties were identified along the length of the project corridor; however, only one historic property was documented within the vicinity of the current project area (SIHP # -7429).

Hammatt (2013) performed AIS testing within numerous locations between Middle Street and Ala Moana Center. Testing revealed multiple sites, three of which were identified near the current project area—SIHP # -6636 (former wetland land surface), SIHP # -6856 (Kolowalu Fishpond), and SIHP # -7430 (subsurface privy remnant). These wetland sediments represent the natural

wetland surface of the Kewalo area. Wetland sediments were identified within 25 AIS test excavations in the East Kaka‘ako and Kālia Geographic Zones for the Honolulu High Capacity Transit Corridor project (T-186 through T-193, T-195, T-196, T-198 through T-200, T-202, T-202A, T-203, T-205, T-207, T-208, T-210 through T-212, T-214, T-219, and T-220). In general, the wetland sediments were documented as variations of brown and gray silty clays, sandy clays, clay loams, and, similar to the current AIS, black silt loam peat layers.

4.2.48 Medina et al. 2013

In 2010, CSH conducted archaeological monitoring for utility relocations, traffic signal installations, and road widening at the intersection of Kamake‘e and Queen streets. Four profiles were drawn for excavated utility trenches at the junction of Queen and Kamake‘e streets, all on the western side. In general, stratigraphy within the project area consisted of various fill materials overlying a remnant or truncated sand A horizon, Jaucas sand, and the coral shelf. On average, the A horizon and lower sand layers began at 50–65 cmbs, and the coral shelf began at 75–120 cmbs. No historic properties were encountered.

4.2.49 Morriss et al. 2013

In 2012, CSH conducted an archaeological inventory survey for the Ala Moana Center ‘Ewa Mall Expansion project (Morriss et al. 2013). The 15.7-acre project included the excavation of 26 test trenches within the western portion of Ala Moana Center. One previously identified site, SIHP # -6636 (Kewalo wetland sediments), was documented. Possible salt pan signatures were observed in nine trenches (Trenches 3, 6, 8, 9, 13, 16, 18, 19, and 23) characterized by greenish-gray clays overlying natural wetland sediment. Seven samples of clay associated with potential salt pans and of natural wetland sediments were analyzed by the Paleo Research Institute for pollen, phytolith, and resistivity. Five samples were analyzed for pollen and phytoliths to determine their correlation with the nearby wetland surface. Resistivity testing was completed on six samples to identify differences between potential salt pan lining clay, marsh, and hydraulic fill deposits. The results of the resistivity testing on the potential salt pan lining clay sediments were suggestive but inconclusive. It was determined that additional testing of the deposits was necessary as well as a more comparative analysis of potential salt pan lining clay and wetland deposit datasets would need to be undertaken.

4.2.50 LaChance et al. 2014

In 2011 and 2012, a crew from CSH (LaChance et al. 2014) monitored the installation of a sewer force main from Ala Wai Park along and across Ala Wai Boulevard to Ala Moana Regional Park. Ground disturbance related to this project included excavation of four access shafts used in microtunneling techniques applied to excavation of the new 72-inch sewer tunnel. As a result of construction techniques applied to this project, such as microtunneling and the use of sheet piles for shoring, documentation of monitoring efforts was often limited to photographic recordation of events and written descriptions. No cultural deposits or human burials were identified during this project’s monitoring program. The project area’s subsurface deposits appear to have been disturbed by past land use, which likely included extensive earthmoving activity and importation of fill sediments into the project area.

4.2.51 Pammer and McDermott 2014

In 2014, CSH conducted an archaeological inventory survey of the Park Lane Ala Moana project, located at the southeastern corner of the Ala Moana Center, across Ala Moana Boulevard from the present project area. A total of eight backhoe trenches were excavated. Two historic properties were identified, SIHP # - 6636 , a pre-Contact to early twentieth century natural wetland deposit with culturally modified components, likely associated with agriculture, aquaculture, and possible salt production. It has been previously documented in different portions of the Kewalo area. SIHP # -7596 is a subsurface trash deposit, likely originating from open air burning common in the Kewalo coastal areas. The collected artifacts dated to the turn of the nineteenth century, with diagnostic date ranges of 1890–1902. Although the observed bottles and ceramics did not appear to have been burned or melted, they were collected from within a layer of blackened sediments containing charred wood in addition to the historic artifacts.

4.2.52 Pammer et al. 2014

Between 14 April and 9 June 2014, CSH conducted archaeological inventory surveys of Block B East (Pammer et al. 2014), part of the proposed Ward Village Gateway project. A total of 38 test excavations were completed within Block B East. Five historic properties were identified within the Blocks B East and C West (Ward Village Gateway) project areas. SIHP # -7658 represents the structures of previous twentieth century development land surface consisting of asphalt, concrete, coral and tar pavement, and oil-rolled surfaces. SIHP # -7655 is the remnants of historic salt pans. SIHP # -7656 consisted of a single human cranial fragment encountered within disturbed sand along the *makai* boundary of the project area. SIHP # -7659 consisted of the concretized and rerouted Ward Estate *'auwai* (water channel). SIHP # -7660 consisted of an historic trash fill deposit located within an abandoned storm drain box along the *makai* boundary of the project area. The historic trash included bottles, ceramic, metal fragments, and boat trash likely related to the nearby fishing and tuna cannery industry.

4.2.53 Sroat, Inglis, and McDermott 2014

Between 14 January and 13 December 2013, CSH conducted an archaeological inventory survey of the Block K project area within the Ward Neighborhood Master Plan (Sroat, Inglis, and McDermott 2014). The Block K project area is located along the southeast side of Kamake'e Street between Queen and Auahi streets. Thirty-five test excavations were documented within the project area. The stratigraphic sequence within the Block K project area was relatively consistent. It consisted of the modern developed land surface, numerous and variable layers of fill, and hydraulic (dredged) fill overlying natural layers, including a remnant buried A horizon or organic-rich peat material, Jaucas sand, gleyed marine sandy clay, and the coral shelf. Portions of two previously identified historic properties were recorded within the Block K project area: 1) a portion of SIHP # -6855, consisting of 24 subsurface cultural deposits; and 2) a portion of SIHP # -7422, a cultural deposit consisting of a burned trash layer. A sample of 61 artifacts from SIHP # -7422 dated generally to between 1870 and the mid-twentieth century and two artifacts post-date 1930 and 1935, suggesting the deposit likely dates to sometime after 1935.

4.2.54 Sroat, Pammer, and McDermott 2014

Between 14 April and 9 June 2014, CSH conducted archaeological inventory Block C West (Sroat, Pammer, and McDermott 2014), part of the proposed Ward Village Gateway project. A

total of 36 test excavations were completed within Block C West. Five historic properties, SIHP # -7658, -7655, -7656, -7659, and -7660 were identified (see Pammer et al. 2014, above, for site descriptions).

4.2.55 Sholin et al. 2014

In 2014, archaeologists from T.S. Dye & Colleagues (Sholin et al. 2014) completed an archaeological inventory survey into the proposed Ola Ka ~Ilima Artspace Lofts project on a 0.6-acre lot, currently used as a parking lot, at 1025 Waimanu Street in Kaka'ako. The crew monitored the excavation of several construction boreholes and excavated six archaeological test trenches. The stratigraphy of the trenches consisted of asphalt and fill materials over a thin deposit of clay and basalt marine sand. Historic artifacts and faunal bone were collected from the fill layers and were dated to ca. 1880-1960.

4.2.56 Yucha et al. 2014

Between December 2012 and January 2013, CSH conducted an archaeological inventory survey of the Ward Neighborhood Block C project, located within a parking lot at the intersection of Ala Moana Boulevard and Kamake'e Street (Yucha et al. 2014). Forty-one test excavations were distributed across the project area. Only one historic property was identified, a burned trash layer located near the corner of Kamake'e and Auahi streets (SIHP # -7422). Stratigraphy within the project area was largely consistent. A deposit of hydraulic fill material associated with the reclamation infilling of Kaka'ako during the 1913 to 1930 period was found within the north, west, and south portions of the project area. Beneath the fill layers, a coarse sand A horizon was documented within 25 test excavations throughout the project area, while a peat A horizon was found within three excavations within the northern portion of the project area. A majority of the project area (35 test excavations) contained Jaucas sand. No cultural material or features were observed within the test excavations or within screened sediment samples.

4.2.57 Hawkins et al. 2015

Between 13 January and 1 June 2014, CSH conducted an archaeological inventory survey of the Block M project area within the Ward Neighborhood Master Plan project (Hawkins et al. 2015). The Block M project area is located at the western corner of the intersection of Queen and Kamake'e streets, and is bound to the southwest by Ward Theaters and to the northwest by the Ward Industrial Center. Sixty-eight test excavations were documented. Portions of two historic properties were identified within the Block M project area: 1) a portion of previously identified SIHP # -7429, consisting of two layered cultural deposits and associated features; and 2) SIHP # -7686, consisting of twentieth century commercial infrastructure remnants.

4.2.58 Humphrey et al. 2015

A 2014 supplemental AIS of the HHCTCP (now termed Honolulu Rail Transit Project –HRTP) City Center project area, from the location of the Kaka'ako Station to just east of Kamake'e Street, further identified SIHP # -7429 within two cultural deposits (Humphrey et al. 2015). The cultural deposits consist of an in situ loamy sand A horizon and an overlying historic fill deposit comprised of redeposited local sediments. These two cultural deposits are designated Component 1 (culturally enriched historic fill) and Component 2 (culturally enriched natural A horizon). Four additional features of SIHP # -7429 were identified, including a fire pit feature within Component 2 and a flexed human burial within the underlying natural Jaucas sand. Stratigraphy consisted of interspersed sand and wetland deposits.

4.2.59 Sroat et al. 2015

Between 17 March and 2 August 2014, CSH conducted an archaeological inventory survey for the Ward Neighborhood Block I project (Sroat et al. 2015). The AIS consisted of 88 test excavations within a parcel. Three historic properties were identified, including SIHP # -7429, pre-Contact to early post-Contact subsurface cultural deposits including human burial sites, SIHP # -7655, subsurface historic salt pan remnants, and SIHP # -7659, a historic subsurface concrete water channel (*‘auwai*) associated with the Ward Estate.

4.2.60 Enanoria et al. 2015

Between 2011 and 2014, CSH conducted archaeological monitoring for the Ala Moana Boulevard/Nimitz Highway Resurfacing and Highway Lighting Replacement project, which extended from Fort Street to Kalākaua Avenue (Enanoria et al. 2015). The project area was divided into five sections. Three sites were identified, but only SIHP # -7435 is near the current project area. Near the intersection of Ala Moana Boulevard and Queen Street, four sets of human remains, including three in situ or partially in situ burials and one previously disturbed individual, were encountered during utility trenching with sand deposits (SIHP # -7435).

4.2.61 Yucha (J.) et al. 2015

From July 2010 through August 2011, CSH conducted archaeological monitoring for the Ward Village Shops Project bounded by Kamake‘e Street to the west, Queen Street to the north, Auahi Street to the south, and Queen Lane to the east in Kaka‘ako (TMKs: [1] 2-3-005:013 through 017, 022, and 023) (Yucha et al. 2015).

Four significant historic properties were located within the project area. Three were originally identified during the archaeological inventory survey for this project (Bell et al. 2006) and one was originally identified by Yucha et al. (2014) during an archaeological inventory survey of Block C and reassessed for the current study by Sroat et al. (2014):

1) SIHP # -6854 is a subsurface cultural layer/activity area, which contained an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A horizon (containing both historic and traditional cultural material), and 28 previously identified human burials. No evidence of SIHP # -6854 was identified during the current archaeological monitoring effort.
2) SIHP # -6855 is a buried cultural layer indicating a former traditional Hawaiian activity area, which contained numerous pit features and human burials. The layer also contains historic cultural material and has extensive previous disturbance from modern activities.
3) SIHP # -6856 is comprised of buried fishpond remnants (Kolowalu Fishpond), part of Land Commission Grant 3194, “Kolowalu,” awarded to Kalae and Kaaua. No evidence of SIHP # -6856 was identified during the current archaeological monitoring effort.
4) SIHP # -7422 is a post-Contact subsurface cultural deposit (burned trash layer) associated with open-air burning practices.

4.2.62 Belluomini et al. 2016

The Belluomini et al. 2016 archaeological monitoring report documents monitoring conducted from March 2006 through December 2008 in a project area bounded by Kamake‘e Street to the west, Queen Street to the north, Auahi Street to the south, and Queen Lane to the east in Kaka‘ako.

Four significant historic properties are located in the project area. Three were originally identified during the initial archaeological inventory survey for the project (Bell et al. 2006) and one was initially identified during an archaeological inventory survey (Yucha et al. 2014) of the Howard Hughes Corporation Block C East project and reassessed for the current study during the Howard Hughes Corporation Block K archaeological inventory survey (Sroat et al. 2014):

1) SIHP # -6854 is a subsurface cultural layer/activity area remnant, which contained an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A horizon (containing both historic and prehistoric cultural material), and five human burial finds.
2) SIHP # -6855 is an activity area remnant comprised of a subsurface cultural layer that included numerous pit features and six human burial finds. There are two distinct portions to this cultural layer separated by areas of disturbance and/or a slightly culturally enriched buried A horizon that contains both traditional Hawaiian and historic cultural material.
3) SIHP # -6856 is buried fishpond remnants (Kolowalu Fishpond), part of Land Commission Grant 3194, “Kolowalu,” awarded to Kalae and Kaaua.
4) SIHP # -7422 is a post-Contact subsurface cultural deposit (burnt trash layer), which was most likely associated with open-air burning.

4.2.63 Sroat et al. 2016

Sroat et al. 2016 reported on an archaeological inventory survey for the Block N East project area located within the Ward Industrial Center, along the *makai* side of Queen Street between Ward Avenue and Kamake‘e Street. In Kaka‘ako, (TMKs: [1] 2-3-002:001 [por.], 067, 086, 087). Two historic properties were documented within the Block N East project area:

1. SIHP # -7429 consists of pre- and post-Contact cultural deposits with associated features, including human burials. SIHP # -7429 was previously documented by Hammatt (2013), Hawkins et al. (2015), Humphrey et al. (2015), and Sroat et al. (2015) within adjacent project areas. Within Block N East, SIHP # -7429 consists of culturally enriched natural sand deposits, including an associated human burial ground, and culturally enriched fill deposits utilized as historic living surfaces.
2. SIHP # -7686 consists of subsurface historic infrastructure remnants. SIHP # -7686 was previously identified by Hawkins et al. (2015) within the adjacent Block M project area as consisting of warehouse building remnants and asphalt road surfaces associated with twentieth century commercial development. Within Block N East, SIHP # -7686 consists of buried asphalt and oil-rolled surfaces.

4.3 Summary of Previous Archaeological Research

Several in situ pre-Contact burials and cultural layers have been found in sand deposits in the Kaka‘ako/Kālia coastal area. Cultural layers associated with habitations, agricultural fields, fishponds, salt ponds, and wetlands have also been recorded near the coast. Historic salt works remains, coffin burials, and trash associated with late nineteenth-early twentieth century open-air burning are also commonly identified historic properties. Five burials have been recorded along the northern boundary of the park, one in situ burial, SIHP # -6376, on Kamake‘e Street near the northeastern corner of the park (Souza et al. 2002), and four possibly in situ burials, SIHP # -7435, at the termination of Queen Street near the north, central area of the park (Enanoria et al. 2015).

Other sites near the project area include SIHP # -6636, a wetland surface (Altizer et al. 2011; Clark and Gosser 2005; O’Hare, Bush, Borthwick, and Hammatt 2004; Tulchin and Hammatt 2005, etc.), SIHP # -7422, a burned historic trash layer (Sroat, Inglis, and McDermott 2014), and SIHP # -7596, another subsurface historic trash deposit (Pammer and McDermott 2014). In areas of the park near Ala Moana Boulevard, it is possible some pre-Contact burials and cultural layers may still be present, and it is very likely historic trash deposits remain in areas of the park where the old open-air burning grounds extended past the Old Beach Road (now Ala Moana Boulevard) into the present area of Ala Moana Regional Park.

Section 5 Results of Field Check

David W. Shideler, M.A., under the general supervision of Dr. Hallett H. Hammatt, conducted a field check of the Ala Moana Regional Park on 29 December 2016. The archaeologist walked the entire perimeter and took photographs of representative buildings and landscape areas (Figure 60 through Figure 69). The field check photographs begin at the northeastern corner of the park near the Roosevelt Portal, then follow along the east boundary of the park next to the Ala Wai Yacht Harbor, along the coast to the southwest corner of the park at Kewalo Basin, along the west end of the park, and along the Ala Moana Boulevard side east to the starting point. A sidewalk and a drainage canal parallels Ala Moana Boulevard for most of its length, and the drainage canal is spanned by several bridges, including the arched Equestrian Bridge. Building letter designations correspond to the plan view map in the Introduction section of this report (see Figure 4).

Figure 60. Roosevelt Portal, northeast corner of the park, view to northeast

Figure 61. East (Hawaiian) Lagoon, note top soil fill over dredged coral rubble and sand

Figure 62. Southeastern corner of park, East Lagoon beyond coconut trees, Equestrian Bridge in background, view to north

Figure 63. Building D concession stand (east) (not on original 1936 plan), view to northwest

Figure 64. Beach from southwest corner of park, Magic Island and Diamond Head in the background, view to east

Figure 65. Ocean from beach, note color differences between dredged swimming area, former low reef, and deep ocean, view southwest

Figure 66. McCoy Pavilion complex (includes Sports Pavilion and remnant of Banyan Court), view to northeast

Figure 67. West (Oriental) Lagoon, at west end of park, view to southwest

Figure 68. Sidewalk and drainage canal parallel to Ala Moana Boulevard, view to west

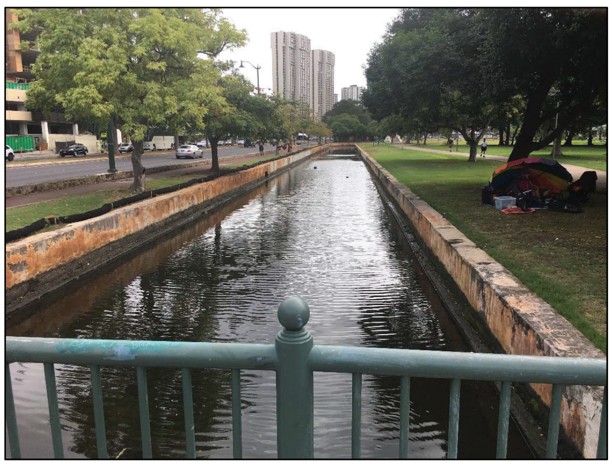


Figure 69. Drainage canal with stucco boulder wall parallel to Ala Moana Boulevard, view to east

Section 6 Cultural Impact Evaluation

The preceding discussion documents in detail the filling operations that created the land that became today’s Ala Moana Regional Park. Plans to fill these shallows were developed at least as early as 1911 (see Figure 14) with highly developed plans by 1927 (see Figure 20). Most of the fill activity is understood to have taken place in 1930/1931 (see Figure 22, Figure 23, and Figure 25) although toping the marine fill with terrestrial top soil extended at least as late as 1935 (see Figure 32).

6.1 Traditional Hawaiian Use of the Project Area

The shallows of present Ala Moana Regional Park were probably utilized by Native Hawaiians for close to a millennium for traditional Hawaiian patterns of marine exploitation. The western third of the present Ala Moana Regional Park footprint was within the Kukuluaeo Fishery and the eastern portion was within the Kālia Fishery (see Figure 13) The specificity of the boundaries of the fisheries suggest these were desirable coveted lands for fishing and gathering of marine resources.

It seems likely access to off-shore fishing grounds would have been preferentially to the west at the natural deep channel that was later developed as Kewalo Basin and at the mouth of Pi‘inaio Stream to the east. Thus fishing within the former shallows that became Ala Moana Regional Park likely would have focused more on mollusks, crabs, and seaweed, particularly *‘alamihi* (*Metopograpsus messor*) crabs and the edible *limu* called *limu ‘ele‘ele* (*Enteromorpha prolifera*), or black seaweed for which the shallows of Kālia were famous (see Section 2.2 above). The shallows of Kālia were also famous for the netting of fish with a special fishing technique used to catch schools of mullet. When a school of mullet appeared, a bag net was set and the men swam out in a row. They surrounded the fish, slapped the water and kicked their feet, thus driving the frightened fish into the opening of their bag net. The fishermen of Kālia became known as human fishnets (Pukui 1983:150). This particular type of net was used because the water off Kālia was very shallow (Pukui 1983:74).

6.1.1 Trail

Early maps such as Kotzebue’s map of 1817 (see Figure 8) supports our general understanding that pre-Contact and early post-Contact Hawaiian coastal population densities were significantly higher just to the west (Kou and Honolulu) and the east (Waikīkī east of Pi‘inaio Stream).

6.2 Hawaiian Use of the Project Area Post 1930s Land Creation

The present lands of Ala Moana Regional Park only came into being with the completion of topping the marine fill with terrestrial top soil that was on-going at least as late as 1935. Access to traditional resources that have been planted as part of Ala Moana Regional Park landscaping (such as to *Pandanus* trees for *lauhala* leaves) presumably would be available to Native Hawaiian practitioners within standard park rules.

The case of Ulu Mau village merits further consideration. From the beginning the landscape design was to feature a showcase for Hawaiian culture. “The eastern lagoon was to provide a setting for a "Hawaiian village" for municipal pageants (Weyeneth 1987:10). “On the drawing boards in 1936 were plans for …a ‘village’ of grass huts "harking back to the atmosphere of old

Hawaii," (Weyeneth 1987:27). Weyeneth (1987:30, 49) relates that Ulu Mau opened in 1948 and was renovated in 1960.

While perhaps few remember the opening in 1948 the “re-opening” in 1960 is better remembered.

> In 1960, Herman and Malia Solomon created Ulu Mau Village, grass shacks and all, at the Diamond Head end of Ala Moana Park as a way to revive the Hawaiian culture, offering demonstrations of tapa-weaving, poi pounding and other crafts. [Watanabe 2009]

George Kanahele (1979:3) mentions Ulu Mau Village with its emphasis on culture as one of the few bright spots between the 1930s and 1969 leading up to the Hawaiian Renaissance. The village later moved to He‘eia Kea ca. 1963 for a while before it closed. As one online review notes: “Ulu Mau Village is often fondly recounted from the memories of those who remember the 1950’s-1960’s era in Hawai‘i” and “Everyone who knew of Ulu Mau Village seemed to love it” (Kealoha 2012). It might be wished that the dignified presentation of Hawaiian arts led by Aunty Maria Malia Blanchard Solomon, “cultural village co-founder, *kapa* maker and ambassador of good will and aloha” (Blakeman 2005) could be resurrected at Ala Moana Regional Park.

Section 7 Summary and Recommendations

Original buildings such as the Sports Pavilion, the Ala Moana Equestrian Bridge, the Roosevelt Portals, and the Lawn Bowling Green were completed between 1934 and 1939. Many of the park walls were also built in the early 1930s. In the 1970s, the pavilion/courtyard complex was altered with the construction of the McCoy Pavilion, and now the entire complex is known by this name. There are now no visible surface remains of the Ulu Mau Village near the East (Hawaiian) Lagoon, built in 1948, or any World War II structures, including the gun emplacement near the beach (see Figure 39). Several other structures such as the West (Oriental) Lagoon have been altered and many comfort stations have been added. There are still original and unaltered features in the park that are older than 50 years old, and are thus historic properties. Ala Moana Regional Park was listed on the Hawai‘i Register of Historic Places as SIHP # 50-80-14-1388 (part of the County of Honolulu’s Art Deco Parks Thematic Group) and nominated to the National Register of Historic Places in 1988. An architectural review of the age, condition and integrity of the current structures in the park is needed before alteration (if any) during the proposed improvements to the park.

Summarizing the history of the development of the park, Weyeneth (1987:4) concluded that “the site has no known pre-contact or archaeological significance.” This present study largely supports Weyeneth’s conclusion that there are no pre-fill in-situ sediments or archaeological resources above the water table at Ala Moana Regional Park. There are, however, some caveats about archaeological significance.

It must be noted that sand for the park was trucked in from beaches on the north and western shores of O‘ahu and burials and pre-Contact cultural layers have been recorded from the sources of the sand, Keawa‘ula Beach in the Wai‘anae District (summarized in Gaskell and Desilets 2007:7), and Mokulē‘ia Beach in the Waialua District (summarized in Monahan et al. 2007). Thus, it is possible human skeletal remains and pre-Contact artifacts may be found in a secondary context in the sand fill substratum of the park.

In the later nineteenth and early twentieth century, the former shoreline of Kaka‘ako was used for open-air incineration of historic trash, especially on the mud shores that extended past the old Beach Road, and thus within the present park (see Figure 19, Figure 21, and Figure 23). Remnants of dumps and their contents extend back at least as far as 1925 (see Figure 19) and Weyeneth (1987:5) may well be correct that “the city had been using a portion of the area as a garbage and refuse dump since the turn of the century.” Numerous fill layers with bottles, ceramics, and other trash have been recorded from this open-air burning area during previous archaeological projects (see Section 4 of this report), and it is probable some subsurface historic trash layers are still present along the northern boundary of the park.

There was a Battery AMTB (Anti-Motor-Torpedo Boat) at Ala Moana Regional Park, built in 1944 and destroyed in 1946. Remnants of this World War II installation are possible within Ala Moana Regional Park and potentially would constitute a historic property.

It might be wished that the dignified presentation of Hawaiian arts at Ala Moana Regional Park’s Ulu Mau Village led by Aunty Maria Malia Blanchard Solomon, “cultural village co-founder, *kapa* maker and ambassador of good will and aloha” (Blakeman 2005) could be resurrected at Ala Moana Regional Park.

Section 8 References Cited

Abbott, Isabella Aiona
1984 *Limu: An Ethnobotanical Study of Some Seaweeds.* Pacific Tropical Botanical Garden, Lawa‘i, Kaua‘i.

Ah Sam, Jessica A. and Paul L. Cleghorn
2003 *Archaeological Assessment for Ala Moana Beach Park, Makiki, Honolulu, O‘ahu* (TMK: 2-3-37). Pacific Legacy, Inc., Kailua, Hawai‘i.

Allen, Gwenfread
1999 *Hawaii's War Years: 1941-1945.* Pacific Mongraph, Kailua, Hawai‘i.

Altizer, Kendy, Douglas F. Borthwick, and Hallatt H. Hammatt
2011 *Archaeological Monitoring Report for the Kapi‘olani Area Revised Sewer System, Honolulu Ahupua‘a, Kona District, Island of O‘ahu TMK: (1) 2-3-04, 05, 07, 09, 10, 13, 14, 17, 18, 22, 35, 36, 38, and 41.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

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

Arthur Kimbal Thompson Architect, AIA
2004 *Ala Moana Regional Park Canoe Halau Final Environmental Assessment.* Arthur Kimbal Thompson Architect, AIA, Honolulu.

Athens, Stephen J., Conrad Erkelens, Jerome V. Ward, Robert H. Cowie, and Michael Pietrusewsky
1994 *The Archaeological Investigation of Inadvertently Discovered Human Remains at the Piikoi and Kapiolani Intersection, Kewalo, Waikiki, O‘ahu, Hawai‘i.* International Archaeological Research Institute, Inc., Honolulu.

Barnes, Shawn and David W. Shideler
2007 *Field Check and Literature Review for the Proposed 1235 Kona Street/1226 Waimanu Street Reserved Housing Project Kaka‘ako, Kona District, O‘ahu Island TMK: [1] 2-3-007:026 & 049.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Bell, Mathew and Matthew M. McDermott
2007 *Archaeological Inventory Survey Report for the Allure Waikīkī Development, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu TMK [1] 2-6-13: 1, 3, 4, 7, 8, 9, 11 and 12.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Bell, Matt, Matt McDermott, and Owen O'Leary
2006 *Archaeological Inventory Survey Report for the Victoria Ward Village Shops Project, Waikiki Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK: (1) 2-3-5: 013–017, 022, and 023.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Belluomini, Scott A., Josephine Yucha, Trevor M. Yucha, and Matthew McDermott
2016 *Archaeological Monitoring Report for the Ward Village Shops Project for Monitoring Conducted from March 2006 through December 2008 Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKs: [1] 2-3-005:013 through 017, 022, and 023* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Belt Collins & Associates and Harland Bartholomew & Associates
1961 *The Comprehensive Plan, Ala Moana Reef, Honolulu, Hawaii*. Belt Collins & Associates and Harland Bartholomew & Associates, Honolulu.

Bishop, S.E.
1884 Honolulu, Kewalo Section. Map by S.E. Bishop, Registered Map 1090. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Blakeman, Karen
2005 "Aunty Malia" helped revive Hawaiian culture [obituary]. *Honolulu Advertiser*, 20 May 2005 http://the.honoluluadvertiser.com/article/2005/May/20/ln/ln49p.html (accessed 20 May 2015).

Borthwick, Douglas F. and Hallett H. Hammatt
2001 *An Archaeological Monitoring Report for Kaka‘ako Improvement District 6 Honolulu, Hawai‘i (TMK 2-1-58, 2-3, 2-3-01 thru 05).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Burke, Kelly and Hallett H. Hammatt
2012 *Archaeological Inventory Survey Report for the 1391 Kapi‘olani Boulevard Parcel, Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu TMK: [1] 2-3-039:011.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Bush, Anthony and Hallett H. Hammatt
2006 *Archaeological Monitoring Report for Hawaiian Electric Company Trenching for Hokua Tower Project on Ala Moana Boulevard, Kaka‘ako/Kewalo District, Waikīkī Ahupua‘a, Island of O‘ahu TMK: (1) 2-03-004:073; 2-03-005:027; 2-03-006:014; 2-03-007:002.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Carney, Mary and Hallett H. Hammatt
2008 *An Archaeological Monitoring Report for the Hokua Tower Project Parcel on Ala Moana Boulevard, Kaka‘ako/Kewalo District, Waikiki Ahupua‘a, Island of O‘ahu TMK: (1) 2-03-005: 001, 002, 003, por. 024, 026, and 027.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Chamberlain, Levi
1957 Tour Around O‘ahu: 1828. In *Sixty-Fifth Annual Report of the Hawaiian Historical Society for the Year 1956*. Hawaiian Historical Society, Honolulu.

Chiogioji, Rodney and Hallett H. Hammatt
2004 *Archaeological Literature Review and Field Check for an Approximately 89,000-sq. ft. Project Area, Waikīkī Ahupua‘a, Kona District, O‘ahu (TMK:2-6-13:1,3,4,7,8,9,11 and 12).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Christensen, Carl C.
2011 *Analysis of Nonmarine Mollusks from Excavation at SIHP # 50-80-14-6636, Kewalo, O‘ahu, Hawaii.* Bernice Pauahi Bishop Museum, Honolulu.

Clark, John R.K.
1977 *The Beaches of O‘ahu*. University of Hawaii Press, Honolulu.
2011 *Hawaiian Surfing: Traditions from the Past.* University of Hawai‘i Press, Honolulu.

Clark, Stephen D. and Dennis Gosser
2005 *Final Report: A Subsurface Archaeological Inventory Survey of TMK 2-3-003:075, 085, and 086. Waikīkī Ahupua‘a, Kona District, O‘ahu, Hawai‘i.* Pacific Consulting Services, Inc., Honolulu.

Cobb, John N.
1905 The Commercial Fisheries of the Hawaiian Islands. In *Bulletin of the United States Fish Commission, Vol. XXII, for 1903, Part II*. Bulletin III. Government Printing Office, Washington, D.C.

Daily Bulletin
1892 Board of Health, Quarantine of Coming Asiaties Decided On 7 January:3, eVols (online). University of Hawai‘i at Mānoa Library, Honolulu.

Dashefsky, Howard
2009 *Ala Moana Center turns the big 5-0.* Hawaii News Now website. Electronic document, http://www.hawaiinewsnow.com/story/10894818/ala-moana-center-turns-the-big-5-0?redirected=true (accessed 2 June 2013).

Daws, Gavan
1968 *Shoal of Time. A History of the Hawaiian Islands*. University of Hawaii Press, Honolulu.

DeLeon, David
1978 *A Short History of Manoa Valley from 1800 to Present.* University of Hawai‘i at Mānoa, Hamilton Library, Honolulu.

Enanoria, Brittany, Frederick LaChance, Ellena de Leeuw, Pūlama Lima, Douglas Borthwick, and Hallett H. Hammatt
2015 *Archaeological Monitoring Report for the Ala Moana Boulevard/Nimitz Highway Resurfacing & Highway Lighting Replacement Project, Honolulu Ahupua‘a, Honolulu District, O‘ahu Island, TMK: (1) 2-1-014, 2-1-027, 2-3 & 2-6 (Nimitz Hwy. and Ala Moana Blvd.)*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Engineering and Mining Journal
1916 Salt Production in the Hawaiian Islands. *Engineering and Mining Journal,* 1 April 1916:594.

Esh, Kelly and Hallett H. Hammatt
2006 *Archaeological Monitoring Report for the Rehabilitation of Streets Unit 5B Project, Pi‘ikoi Street from Ala Moana Blvd. To Matlock Street, Kewalo ‘Ili, Waikīkī Ahupua‘a, Kona District, O‘ahu Island (TMK: 2-3-06, 07, 10, 11, 12, 14, 15, 35 and 38 and 2-4-03, 04, 1 and 12).* Cultural Surveys Hawai‘i, Inc. Kailua, Hawai‘i.

Fitzpatrick, Gary L.
1986 *The Early Mapping of Hawai‘i.* Editions Limited, Honolulu.

Fong, Jeffrey W.K., Douglas F. Borthwick, and Hallett H. Hammatt
2009 *Archaeological Monitoring Report for Rehabilitation of Streets: Unit 9, Phase 1 Kapi‘olani Boulevard from Kalākaua Avenue to Ward Avenue, Kamake‘e Street from Kapi‘olani Boulevard to Auahi Street and Atkinson Drive from Kapi‘olani Boulevard to Ala Moana Boulevard (TMK: [1] 2-1-044, 049, [1] 2-3-001-005, 007, 008, 010, 015, 016, 021, 022, 032, 034-036, 038–041).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

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

Fornander, Abraham
1917 History of Kualii. *Fornander Collection of Hawaiian Antiquities and Folklore*. Vol. IV, Part II. T.G. Thrum, editor. Bishop Museum Press, Honolulu.

Fort Wiki
2015 *Hawaiian AMTB Batteries*. Electronic map at http://fortwiki.com/ Hawaiian_AMTB_Batteries (accessed 23 March 2015).

Freeman, Sallee D.M., Matt McDermott, Constance R. O'Hare, and Hallett H. Hammatt
2005 *Archaeological Inventory Survey and Cultural Impact Evaluation for the Ala Wai Gateway Project Site, Kālia, Waikīkī, O‘ahu TMK: [1] 2-6-011:001, 002, 004, 032, 037 and 040.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Garcia, Nestor
2015 *City highlights Ala Moana Beach Park changes ahead of master plan.* KHON 2 internet site, posted 19 March 2015 at http://khon2.com/2015/03/19/city-highlights-ala-moana-beach-park-changes-ahead-of-master-plan/.

Gaskell, Dana and Michael Desilets
2007 *Archaeological Assessment of Fiber Optic Cable Corridor, Keawa‘ula Beach, Ka‘ena Point State Park, Keawa‘ula Ahupua‘a, Wai‘anae District, O‘ahu, Hawai‘i.* Garcia and Associates, Kailua, Hawai‘i.

Gomes, Andrew
2012 Can Ala Moana Get Any Bigger? *Honolulu Advertiser*, 30 June 2006. Original article updated 16 May 2012. Electronic document, http:// the.honoluluadvertiser.com/article/2006/Jun/30/ln/FP606300357.html (accessed 16 May 2012).

Google Earth
2013 Aerial photographs of Hawai‘i. Google Inc., Mountain View, California. Available at www.google.com/earth.html (accessed 12 May 2012).

Gosser, Dennis C., Richard C. Nees, and Stephen D. Clark
2006 *Archaeological Monitoring Report of TMK: 2-3-003:075, 085, and 086. Waikīkī Ahupua‘a, Kona District, O‘ahu, Hawai‘i.* Pacific Consulting Services, Inc., Honolulu.

Griffin, P. Bion, D.T.P. Keene, and Joseph Kennedy

1987 *Kaka‘ako: Prediction of Sub-Surface Archaeological Resources, Kaka‘ako Community Development District, Archaeological Reconnaissance Survey.* University of Hawai‘i at Mānoa, Honolulu.

Hammatt, Hallett H.

2005 *Archaeological Literature Review and Field Inspection of the Proposed Kaioo Drive Multi-Family Development in Waikīkī, Kona District, Island of O‘ahu, TMK: (1) 2-6-012: 37, 38, 39, 40, 41, 42, 43, 44, 55, 56, 57 & 58.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006a *Archaeological Literature Review and Field Inspection of the 1391 Kapi‘olani Boulevard Parcel, Waikīkī Ahupua‘a, Kona District, O‘ahu TMK (1) 2-3-39:11.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006b *Archaeological Inventory Survey for the Ala Moana Center Expansion Project Waikīkī Ahupua‘a, Kona District, O‘ahu Island TMK: [1] 2-3-38:001 and 2-3-40:005, 007, 009, 011, 014, 016, & 018.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2008 *Archaeological Monitoring Report for the Ko‘olani Project on Waimanu Street, Kaka‘ako/Kewalo, Waikīkī Ahupua'a, Kona District, Island Of O‘ahu TMK: 2-3-04:73, 2-3-05:27, 2-3-06:14 and 2-3-07:2.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2013 *Draft Archaeological Inventory Survey for the Honolulu High-Capacity Transit Corridor Project, for the City Center (Section 4), Kalihi, Kapālama, Honolulu and Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu TMK: (1) 1-2, 1-5, 1-7, 2-1, 2-3 (Various Plats and Parcels).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H. and Rodney Chiogioji

2006 *Archaeological Literature Review and Field Inspection for a 2.3-acre Project Area, Waikīkī Ahupua‘a, Kona District, O‘ahu (TMK: 2-6-13: 1, 3, 4, 7, 8, 9, 11, and 12).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H. and David W. Shideler

1995 *Archaeological Sub-surface Inventory Survey at the Hawai‘i Convention Center Site, Waikiki, Kona District, O‘ahu.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

1996 *Archaeological Data Recovery at the Hawai‘i Convention Center Site, Waik§k§, Kona District, O‘ahu (TMK 2-3-35:001).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2010 *Kewalo Basin Repairs Project Archaeological Literature Review and Field Inspection Report Kaka‘ako Ahupua‘a, Honolulu (Kona District), O‘ahu TMK: [1] 2-1-058.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hashimoto

1968 Map of Ala Moana reef area. CSF (Copy Survey Furnished) 15431. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Hawaii Department of Public Works

1920 Bid Submitted by Walter F. Dillingham, December 23, 1920 for a Proposal for Dredging a Drainage Canal . . . Certain Unsanitary Lands at Waikiki. In *The Story of Waikiki and the "Reclamation Project,"* by Barry Nakamura, 1979, Appendix B. Master's thesis, History Department, University of Hawai‘i at Mānoa, Honolulu.

Hawai‘i Land Survey Division

1921 Hawaii Land Court Application 709 Map 1. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

1927 Map, Reclamation Project, Tide Lands, South of Ala Moana Road, Kukuluaeo & Kalia, Honolulu, Oahu. CSF (Copy Survey Furnished) 4838. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Hawai‘i State Archives

1880 Photograph of Kaka‘ako coastline. SP-204120. Hawai‘i State Archives, Honolulu.

1931 Aerial photograph of Ala Moana Park area. Hawai‘i State Archives, Honolulu.

1932 Aerial photograph of Ala Moana Park area. PP-65-8-010. Hawai‘i State Archives, Honolulu.

1933 Photograph of Ala Wai Inn and Ala Wai Canal. PP-65-6-005. Hawai‘i State Archives, Honolulu.

1935a Aerial photograph of Ala Moana Park. PP-65-6-017. Hawai‘i State Archives, Honolulu.

1935b Photographs of soil and sand fill, Ala Moana Park. PP-65-6-004 and PP-65-7-012. Hawai‘i State Archives, Honolulu.

1935c Photograph of Banyan Court aerial and close-up PP-65-7-027 and PP-65-6-029. Hawai‘i State Archives, Honolulu.

n.d. Photograph of Sports Pavilion. PP-65-6-027. Hawai‘i State Archives, Honolulu.

n.d. Photograph of Ala Moana Park Equestrian Bridge PP-65-6-001. Hawai‘i State Archives, Honolulu.

Hawai‘i TMK Service

2013 Tax Map Key [1] 2-3-037. Hawai‘i TMK Service, Honolulu.

Hawaiian Gazette

1903 Advertisement for the Kalia Salt Works of E.O. Hall & Company, Ltd. *Hawaiian Gazette*, 23 May:6.

Hawaiian Star

1902 Auction Announcement for the Kakaako Salt Works of E.O Hall & Son. *Hawaiian Star*, 10 July:8.

1904 Article. *Hawaiian Star*, 31 August:6.

Hawkins, Megan T., Ena Sroat, and Matt McDermott
2015 *Archaeological Inventory Survey Report for the Block M Project, Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu, TMK: [1] 2-3-002:001 (portion)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hazlett, Alex, Lleliena Loynaz, and Matt McDermott
2008 *Final Archaeological Monitoring Report for the approximately 6-acre Ala Moana Center Expansion Project, Waikiki Ahupua'a, Honolulu District, O'ahu Island TMK [1] 2-3-38: 001 and [1] 2-3-40: 005, 007, 009, 011, 014, 016, & 018.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hill, Norman
1921 Photograph of Open Burning in the Kaka'ako Area. In *The Saga of the Sandwich Islands,* by Edward B. Scott, 1968, p. 578. Sierra-Tahoe Publishing Company, Crystal Bay, Lake Tahoe, Nevada.

Honolulu Advertiser
1923 Article on the Kalia fisheries. *Honolulu Advertiser*, 11 March:12.
1928 Article on Kewalo Basin Dredging. *Honolulu Advertiser*, 17 October:2.

Honolulu Rapid Transit Map Company
1923 Map of Honolulu. Available online, http://magis.manoa.hawaii.edu/gis/georeferenced/index.html. Archived at the University of Hawai'i-Mānoa, Hamilton Library, Honolulu.

Ho'oulumāhiehie
2008a *The Epic Tale of Hi'iakaikapoliopele*. As Told by Ho'oulumāhiehie. M. Puakea Nogelmeier, translator. Awaiaulu Press, Honolulu.
2008b *Ka Mo'olelo o Hi'iakaikapoliopele*. Original Hawaiian text taken from series of articles in Ka Na'i Aupuni 1905–1906. Awaiaulu Press, Honolulu.

Humphrey, Lisa, Kelly Burke, Jessica Leger, Michelle Pammer, Matt McDermott, Ena Sroat, and Matt McDermott
2015 *Supplemental Archaeological Inventory Survey Report for the City Center (Section 4) of the Honolulu Rapid Transit Project, Kalihi, Kapālama, Honolulu, and Waikīkī Ahupua'a, Honolulu (Kona) District, O'ahu Addressing Changes from the Vicinity of Ward Avenue and Halekauwila Street to the Vicinity of Queen and Kamake'e Streets TMK: [1] 2-3:002, 003, and 004 (Various Parcels).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hustace, Frank W., III
2000 *Victoria Ward and Her Family: Memories of Old Plantation.* Victoria Ward, Ltd., Honolulu.

Ī'ī, John Papa
1959 *Fragments of Hawaiian History as Recorded by John Papa 'I'i.* Bishop Museum Press, Honolulu.

Ka Hoku o ka Pakipika
1862 Article on Kālia. *Ka Hoku o ka Pakipika,* 10 April:4.

Ka Nupepa Kuokoa
1862 Article on Kālia. *Ka Nupepa Kuokoa,* 22 March:3.
1862 Article on the fishermen of Kālia. *Ka Nupepa Kuokoa,* 12 April:4.
1864 Article on Kālia. *Ka Nupepa Kuokoa,* 23 April:2.
1865 Article by Kamakau. *Ka Nupepa Kuokoa,* 19 August.
1867 Article on the fishermen of Kālia. *Ka Nupepa Kuokoa,* 19 January:1.
1925 Article on Kālia. *Ka Nupepa Kuokoa,* 9 April:5.

Kamakau, Samuel Mānaiakalani
1991 *Tales and Traditions of the People of Old: Nā Mo'olelo a ka Po'e Kahiko.* Bishop Museum Press, Honolulu.
1992 *Ruling Chiefs of Hawaii*. Kamehameha Schools Press, Honolulu.

Kame'eleihiwa, Lilikala
1992 *Native Land and Foreign Desires. Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.

Kanahele, George S.
1979 *The Hawaiian Renaissance.* May 1979, Polynesian Voyaging Society. Electronic document, http://kapalama.ksbe.edu/archives/pvsa/primary%202/79%20kanahele/kanahele.htm (accessed 20 May 2015).
1995 *Waikīkī: 100 B.C. to 1900 A.D.: An Untold Story.* Queen Emma Foundation, Honolulu.

Kato, Susumo
1955 Map of Ala Moana reef area (CSF 12048). Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Kealoha, Kamahana
2012 *Ulu Mau Village.* Electronic document, http://nohawaii.weebly.com/ho699omana699o/no-ulu-mau-village (accessed20 May 2015).

Kekahuna, Henry E.P.
1958 *Hawaiian Place Names of O'ahu*. Box M-445, Item # 81. Hawai'i State Archives, Honolulu.

Keliipio, L.D.
1900 Hawaiian Fish Stories and Superstitions. M.K. Nakuina, translator. In *Hawaiian Annual and Almanac for 1901*. Thos. G. Thrum, Honolulu.

Kido, K.
2014 Ala Moana Park. HALS No. HI-21. Written Historical and Descriptive Data. Historci American Landscpaes Survey (HALS). National Park Service, U.S. Dept. Interior, Washington, D.C. Online at http://lcweb2.loc.gov/master/pnp/habshaer/hi/hi1000/hi1008/data/hi1008data.pdf.

Kotzebue, Otto von
1817 South O'ahu. Map by Otto von Kotzebue. In *The Early Mapping of Hawai'i* by Gary L. Fitzpatrick, 1986. Editions Limited, Honolulu.

Kurlansky, Mark
2002 *Salt: A World History*. Walker Publishing Company, New York.

LaChance, Frederick and Hallett H. Hammatt
2014 *Archaeological Monitoring Report for the Beachwalk to Ala Moana Park Sewer Project, Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu (TMKs: [1] 2-3-034: 033, 2-3-037: 001 and 002, 2-6, and 2-7-036 [various parcels])*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Landgraf, Anne Kapulani
1994 *Nā Wahi Pana ‘o Ko‘olau Poko*. University of Hawai‘i Press, Honolulu.

Lucas, Paul F. Nahoa
1995 *Dictionary of Hawaiian Legal Land-Terms*. Paul F. Nahoa Lucas, compiler and editor. Native Hawaiian Legal Corporation, Honolulu.

Malo, David
1951 *Hawaiian Antiquities.* Nathaniel B. Emerson, translator (1898). Bishop Museum Special Publication 2. Second edition. Bishop Museum Press, Honolulu.

2006 *Ka Mo‘olelo Hawai‘i. Hawaiian Traditions*. Malcolm Nāea Chun, translator. First People’s Productions, Honolulu.

Maly, Kepa and Onaona Maly
2003 *Ka Hana Lawai‘a A Me Nā Ko‘a O Na Kai ‘Ewalu: A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands*. Kumu Pono Associates, Hilo, Hawai‘i.

Maly, Kepā, Leta J. Franklin, and Paul H. Rosendahl
1994 *Archaeological and Historical Assessment Study Convention Center Project Area, Land of Waikīkī, Kona District, Island of O‘ahu (TMK: 2-3-35- and 3-4-36:018, 024, 025).* Paul H. Rosendahl, PhD., Inc., Hilo, Hawai‘i.

Mason Architects, Inc.
2004 *Historic Context Report and Historic Preservation for World War II Defensive Accessory Facilities. Building Types Assessment: Splinterproof Shelters and Gun Emplacements.* Mason Architects, Inc., Honolulu.

McCoy
1936 Map of proposed Ala Moana Park Development.

Medina, Leandra, Ian A. Masterson, and Hallett H. Hammatt
2013 *Draft Archaeological Monitoring Report for the Queen and Kamake‘e, Traffic Signal Project, Kaka‘ako, Honolulu District, O‘ahu Island (TMK: [1] 2-3-002: 001; 2-3-003: 087, 103, and 2-3-004:080 por.).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Monahan, Christopher M.
2005 *An Archaeological Assessment Report of Three Parcels Measuring Approximately 1.35 Acres in Waikiki Ahupua‘a, ‘Ili of Kewalo, Kona (Honolulu) District, Island of O‘ahu, Hawai‘i [TMK: (1) 2-3-003: 73 and 96]*. Scientific Consultant Services, Inc., Honolulu.

Monahan, Christopher M., James R. Moore, and Joseph Kennedy
2007 *An Archaeological Assessment Report for a Property Located at TMK: (1) 6-8-011: 50 in Mokule‘ia 1st Ahupua‘a, Waialua District, Island of Oahu.* Archaeologcal Consultants of the Pacific Inc., Hale‘iwa, Hawai‘i.

Monsarrat, M.D.
1897 Map of Honolulu, Hawaiian Islands. Registered Map 1910. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

1909 Map of Oahu fisheries, Waikiki section. Registered Map 2848. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Morriss, Veronica, Nifae Hunkin, and Matt McDermott
2013 *Archaeological Inventory Survey for the Ala Moana Center ‘Ewa Mall Expansion Project, Kālia, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK: (1)-2-3-038:001 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Nakamura, Barry
1979 The Story of Waikiki and the Reclamation Project. Master’s thesis. University of Hawai‘i at Mānoa, Honolulu.

O’Hare, Constance R., Tony Bush, Douglas Borthwick, and Hallett Hammatt
2004 *Archaeological Inventory Survey for the Ko‘olani Condominium Project, Honolulu Ahupua‘a, Kona District, Island of O‘ahu, (TMK: [1] 2-3-004:73: 2-3-005:27; 2-3-006:14; 2-3-007:2).* Cultural Surveys Hawai‘i, Inc. Kailua, Hawai‘i.

O’Hare, Constance R., Anthony Bush, and Hallett H. Hammatt
2006 *Archaeological Monitoring Report Kaka‘ako Community Improvement District 10, Honolulu Ahupua‘a, Kona District, O‘ahu (TMK: [1] 2-3-004, 005, 006, and 007).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

O’Hare, Constance R., David Shideler, and Hallett H. Hammatt
2004 *Archaeological Assessment for the Kapiolani Akahi Project Site, Kālia, Waikīkī, O‘ahu, TMK: ([1] 2-6-011:001, 002, 004, 032, 037, 040).* Cultural Surveys Hawai‘i, Inc. Kailua, Hawai‘i.

2006 *Archaeological Inventory Survey for the 116-unit Kaio‘o Multifamily Condominium Project, Waikiki Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK (1) 2-6-012:037-044, 055-058.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

O’Leary, Owen and Hallett H. Hammatt
2004 *Archaeological Monitoring Report for the Emergency Phase Rehabilitation of Streets: Unit 9 Phase I Kapi‘olani Boulevard form Kalākaua Avenue to Kamake‘e Street, Honolulu Ahupua‘a, Kona District, O‘ahu (TMK: [1] 2-3-003).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006 *Archaeological Inventory Survey for the Moana Vista Project Area on Kapi‘olani Boulevard, Honolulu Ahupua‘a, Kona District, O‘ahu Island (TMK: [1] 2-3-003:072, 088, 102).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Overland Monthly
1909 E.O. Hall & Son, Ltd. [advertisement]. *Overland Monthly,* July-December, Vol. 54:xii.

Pammer, Michelle F. and Hallett H. Hammatt
2010 *Archaeological Assessment for an Approximately 0.26-Acre Moana Vista Project Area on Kapi‘olani Boulevard, Kaka‘ako Ahupua‘a, Kona District, O‘ahu Island (TMK: [1] 2-3-003:084).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pammer, Michelle F. and Matt McDermott
2014 *Archaeological Inventory Survey for the Park Lane Ala Moana Project, Kālia, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu TMK: [1] 2-3-038:001 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pammer, Michelle F., Ena Sroat, and Matt M. McDermott
2014 *Archaeological Inventory Survey Report for the Block B East Project, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK: [1] 2-3-001:005 (por.).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Petrey, Whitney, Alexander Hazlett, Douglas F. Borthwick, and Hallett H. Hammatt
2008 *Archaeological Monitoring Report for the City and County of Honolulu’s Emergency Sewer Bypass Project, Ala Wai to Magic Island, Waikīkī Ahupua‘a, Kona District, Island of O‘ahu TMK: [1] 2-3-034, -036, 037; 2-6-017, -018; 2-7-036.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2009 *Archaeological Monitoring Report for the Nimitz Highway and Ala Moana Boulevard Resurfacing Project Honolulu Ahupua‘a, Kona District, O‘ahu Island TMK: (1) 2-1-014 and 027.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Podmore, G.
1911 Map of Honolulu, Kewalo Section. Registered Map 3094. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Pukui, Mary Kawena
1983 *‘Ōlelo No‘eau: Hawaiian Proverbs & Poetical Sayings*. Bishop Museum Special Publication No. 71. Bishop Museum Press, Honolulu.

Pukui, Mary K. and Samuel H. Elbert
1986 *Hawaiian Dictionary.* Second edition. University of Hawaii Press, Honolulu.

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

Pukui, Mary K., E.W. Haertig, and Catherine A. Lee
1972 *Nānā I Ke Kumu (Look to the Source)*. Vol. II. Hui Hānai, Honolulu.

Pultz, Mary Anne (editor)
1981 *A Botanists Visit to Oahu in 1831: Being the Journal of Dr. F.J.F. Meyen’s Travels and Observations about the Island of Oahu.* Press Pacifica, Ltd., Kailua, Hawai‘i.

Riccio, Charles A., Jr.
2003 *Something Terrible has Happened.* Colorado State Patrol Academy. Judge Riccio's Legal Articles. Available online at http://web.archive.org/web/20061012215829/http://www.csp.state.co.us/academy/aclegal.htm.

Runyon, Rosanna, Douglas Borthwick, and Hallett H. Hammatt
2012 *Archaeological Inventory Survey Report for the Senior Residence at Pi'ikoi Kaka'ako, Waikīkī Ahupua'a, Kona District, O'ahu Island (TMK: [1] 2-3-007:026 & 049).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Runyon, Rosanna, Douglas Thurman, Constance O'Hare, Douglas Borthwick, and Hallett H. Hammatt
2011 *Archaeological Inventory Survey Report for the Ko'olani Phase II Project, Kaka'ako, Waikīkī Ahupua'a, Honolulu (Kona) District, Island of O'ahu (TMK: [1] 2-3-006:017).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Schmitt, Robert C.
1973 The Missionary Censuses of Hawaii. *Pacific Anthropological Records* 20. Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu.

Scott, Edward B.
1968 *The Saga of the Sandwich Islands*. Fourth edition. Sierra-Tahoe Publishing Company, Crystal Bay, Lake Tahoe, Nevada.

Shideler, Barbara
2002 *Incinerator Number One (Old Kewalo Incinerator). HAER No. HI-64.* Historic American Buildings Survey (HAER). Pacific Great Bain System Support Office, National Park Service, Oakland, California. Mason Architects, Inc., Honolulu.

Sholin, Carl E., Nathan J. DiVito, and Thomas S. Dye
2014 *Archaeological Inventory Survey for the Propsed Ola Ka 'Ilima Artspace Lofts Project, Land of Honolulu, Kona District, O'ahu Island, TMK: (1) 2-3-003:040.* T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

Smith, Marc
1989 *Human Bone at 1341 Kapiolani Avenue, Honolulu, O'ahu (TMK: [1] 2-3-039:19).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Soehren, Lloyd
2015 *A Catalog of Hawaiian Place Names. Compiled for the Records of the Boundary Commission and The Board Commissioners to Quiet Land Titles of the Kingdom of Hawaii.* Collected and annotated by Lloyd J. Soehren. Online at the Ulukau website, http://ulukau.org/cgi-bin/hpn?l=en (accessed 20 March 2015).

Sorenson
1901 Map of Ala Moana and Coarl Reefs. Registered Map 1986. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Souza, Kehaulani E., Mary Perzinski, and Hallett H. Hammatt
2002 *An Archaeological Monitoring Report for the Kaka'ako Improvement District 7 Project (TMK: [1] 2-1-58, 2-3-01 thru -05).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Sroat, Ena, Kelly L. Burke, Megan T. Hawkins, and Matthew McDermott
2016 *Archaeological Inventory Survey Report for the Block N East Project, Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu TMKs: [1] 2-3-002:001 (por.), 067, 086, 087.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Sroat, Ena and Matt McDermott
2012 *Supplemental Archaeological Inventory Survey Report for the Ward Village Shops Phase 2 Project, Waikīkī Ahupua'a, Honolulu (Kona) District, O'ahu Island (TMK: [1] 2-3-005:013-017, 022 & 023).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Sroat, Ena, Doug Inglis, and Matt McDermott
2014 *Archaeological Inventory Survey Report for the Ward Block K Project Area, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu Island, TMK: [1] 2-3-005:019, 013 (por.), 017 (por.), and 022 (por.).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Sroat, Ena, Michelle F. Pammer, and Matt M. McDermott
2014 *Archaeological Inventory Survey Report for the Block C West Project, Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu, TMK: [1] 2-3-001:005 (por.).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Sroat, Ena, Megan Hawkins, Kelly Burke, Michelle Pammer, Constance O'Hare, and Matt McDermott
2015 *Archaeological Inventory Survey Report for the Block I Project, Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu, TMK: [1] 2-3-002:001 (por.).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Stannard, David E.
2006 *Honor Killing: Race, Rape and Clarence Darrow's Spectacular Last Case*. Penguin Books, London.

State of Hawaii Department of Transportation, Airports Division
2015 *Hawaii Aviation. An Archive of Historic Photos and Facts.* Electronic documents at http://hawaii.gov/hawaiiaviation (accessed 1 May 2015).

Stone, Scott C.S.
1983 *Honolulu: Heart of Hawai'i*. Continental Heritage Press, Inc., Tulsa, Oklahoma.

Territory of Hawaii
1944 Airport Division Map of Ala Moana Airport Master Plan. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Thrum, Thomas
1883 Retrospect of the Year 1883. *Hawaiian Almanac and Annual for 1884*. Thomas G. Thrum, Honolulu.

1891 Indigenous Hawaiian Woods. *Hawaiian Almanac and Annual for 1892*. Thomas G. Thrum, Honolulu.

1904 The Sandalwood Trade of Early Hawaii, As Told by the Pioneer Traders, Voyagers and Others. *Hawaiian Almanac and Annual for 1905*. Thomas G. Thrum, Honolulu.

1923 Hawaiian Salt Making. *Hawaiian Almanac and Annual for 1924*. Thomas G. Thrum, Honolulu.

Thurman, Douglas, Kendy Altizer, Constance R. O'Hare, David W. Shideler, and Hallett H. Hammatt

2009 *Archaeological Inventory Survey Report for the Queen Street Parks, Kaka‘ako, Honolulu District, O‘ahu Island.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Tome, Guerin and Robert L. Spear

2011 *Archaeological Monitoring Report for the Ala Moana Sewer Reconstruction Project in Waikīki Ahupua‘a, Honolulu District, Island of O‘ahu, Hawai‘i [TMK: (1) 2-3-006 and (1) 2-3-038]*. Scientific Consultant Services Inc., Honolulu.

Tulchin, Todd and Hallett H. Hammatt

2004 *Literature Review and Field Check for the Kapi‘olani Area Revised Sewer System, Honolulu Ahupua‘a, Kona District, Island of O‘ahu (TMK: 2-3-04, 05, 07, 09, 10, 13, 14, 17, 18, 22, 35, 36, & 38).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2005 *Addendum to an Archaeological Inventory Survey for the Ko‘olani Condominium Project, Honolulu Ahupua‘a, Kona District, Island of O‘ahu. (Portions of TMKs 2-3-04:73, 2-3-05:27, 2-3-06:14, 2-3-07:2).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2009 *Archaeological Monitoring Report for the Ala Wai Watermark Project, Waikīkī Ahupua‘a, Honolulu District, O‘ahu TMK: [1] 2-6-011: 001 & 037.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

UH SOEST

1970 UH SOEST Kakaako/Waikiki coast aerial photograph. University of Hawai‘i at Mānoa School of Ocean and Earth Science and Technology–Coastal Geology Group. Online at http://soest.hawaii.edu/coastal/webftp/Oahu/mosaics/

2012a Oahu Ortho-rectified Historical Shoreline Mosaic for 1927. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012b Oahu Ortho-rectified Historical Shoreline Mosaic for 1952. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012c Oahu Ortho-rectified Historical Shoreline Mosaic for 1959. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012d Oahu Ortho-rectified Historical Shoreline Mosaic for 1963. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012e Oahu Ortho-rectified Historical Shoreline Mosaic for 1968. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

U.S. Army War Department

1919 U.S. Army War Department Fire Control Map of O‘ahu, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

1933 U.S. Army War Department Fire Control Map of O‘ahu, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

1943 U.S. Army War Department Terrain Map of O‘ahu, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

U.S. Coast and Geodetic Survey

1925 Oahu Island–South Shore, Honolulu Harbor Entrance to Diamond Head, TS 4181. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/coasts/erosion/oahu/tsheet.php (accessed 10 May 2012).

USDA (U.S. Department of Agriculture)

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

USGS (U.S. Geological Survey)

1953 Honolulu USGS 7.5-Minute Topographic Quadrangle. USGS Information Services, Denver, Colorado.

1959 Honolulu USGS 7.5-Minute Topographic Quadrangle. USGS Information Services, Denver, Colorado.

1969 Honolulu USGS 7.5-Minute Topographic Quadrangle. USGS Information Services, Denver, Colorado.

1998 Honolulu USGS 7.5-Minute Topographic Quadrangle. USGS Information Services, Denver, Colorado.

Vancouver, George

1798 *A Voyage of Discovery to the North Pacific Ocean, and Round the World . . . Performed in the Years 1790-1795.* Robinson and Edwards, London.

Wall, W.A.

1893 Map of Honoluu and Vicinity. Registered Map 1690. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Watanabe, June

2009 *It's surprising how much memory is built around things unnoticed at the time.* Electronic document, http://archives.starbulletin.com/content/20090819 _memories_built_on_things_unnoticed_at_the_time (accessed 20 May 2015).

Watts, Margit Misangyi
1993 *High Tea at Halekulani. Feminist Theory and American Clubwomen*. Carlson Publishing, Brooklyn, New York.

Weyeneth, Robert
1987 *Ala Moana: The People’s Park.* Department of Parks and Recreation, Honolulu. Includes unpaginated photographic section with photographs by Ann K. Yoklavitch, Department of Parks and Recreation, City and County of Honolulu, Municipal Reference and Records Center, Honolulu, and Robert R. Weyeneth.

White, Kai and Jim Kraus
2007 *Images of America: Waikīkī*. Arcadia Publishing, Chicago.

Wikipedia.com
2008 Photograph of Magic Island. Public domain photograph at Wikipedia.com.

Williford, G. and T. McGovern
2003 *Defenses of Pearl Harbor and Oahu 1907-50.* Osprey Publishing, Oxford, England.

Wilson Okamoto & Associates, Inc.
1998 *Final Environmental Impact Statement for the Block J Redevelopment Project Honolulu, O‘ahu, Hawai‘i.* Wilson Okamoto & Associates, Honolulu.

Winieski, John P. and Hallett H. Hammatt
2000 *An Archaeological Monitoring Report for Kaka‘ako Improvement District 4 Honolulu, Hawai‘i (TMK: [1] 2-3-02 thru 05).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2001 *Archaeological Monitoring Report for Ward Village Phase II, (Ward Theaters), Kaka‘ako, Honolulu, O‘ahu, Hawai‘i (TMK: [1] 2-3-02:1).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

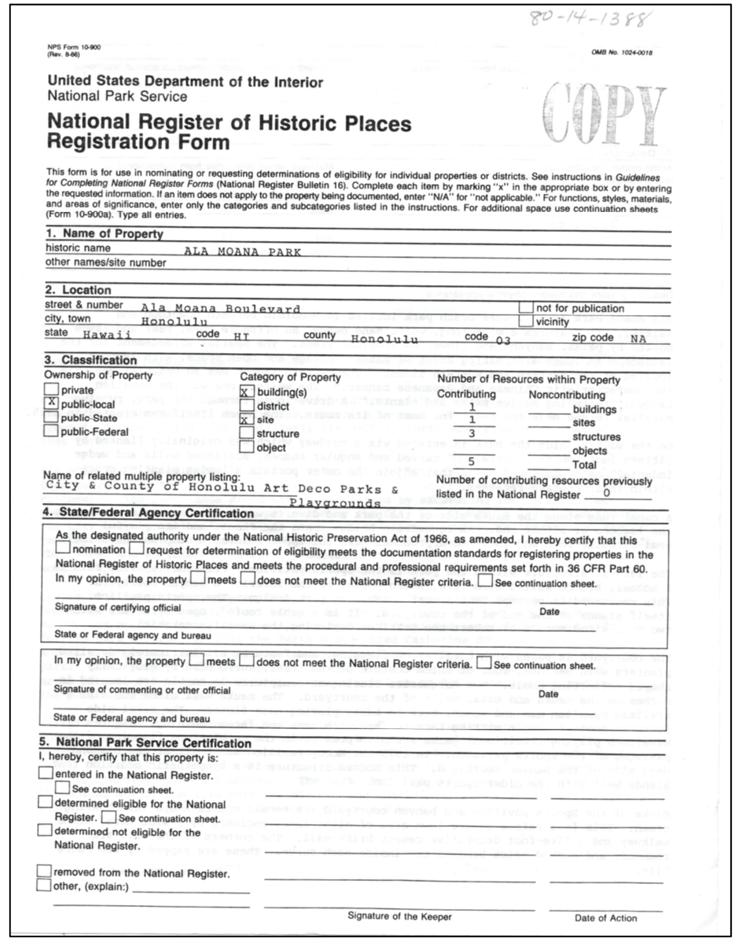
Wright, Harvey, and Wright
1934 Map. Island of Oahu, Territory of Hawaii. Hawaii Tourist Bureau, Honolulu.

Young, Robert
2005 *Garbage in Paradise: A History of Honolulu’s Refuse Division*. City and County of Honolulu’s Department of Environmental Services, Division of Refuse Collection and Disposal, Honolulu.

Yucha, Josephine, Scott A. Belluomini, and Matthew McDermott
2015 *Archaeological Monitoring Report for the Ward Village Shops Project for Monitoring Conducted from July 2010 through August 2011, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu TMKs: [1] 2-3-005:013 through 017, 022, and 023.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Yucha, Trevor M., Josephine M. Yucha, and Matt McDermott
2014 *Archaeological Inventory Survey Report for the Ward Block C Project Area, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK: [1] 2-3-001:001 and 004.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Appendix A NRHP Nomination Form



80-14-1388

NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

COPY

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property
historic name ALA MOANA PARK
other names/site number

2. Location
street & number Ala Moana Boulevard ☐ not for publication
city, town Honolulu ☐ vicinity
state Hawaii code HI county Honolulu code 03 zip code NA

3. Classification

Ownership of Property
☐ private
☒ public-local
☐ public-State
☐ public-Federal

Category of Property
☒ building(s)
☐ district
☒ site
☐ structure
☐ object

Number of Resources within Property

Contributing	Noncontributing	
1		buildings
1		sites
3		structures
		objects
5		Total

Name of related multiple property listing:
City & County of Honolulu Art Deco Parks & Playgrounds

Number of contributing resources previously listed in the National Register 0

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ☐ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official Date

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official Date

State or Federal agency and bureau

5. National Park Service Certification
I, hereby, certify that this property is:
☐ entered in the National Register.
☐ See continuation sheet.
☐ determined eligible for the National Register. ☐ See continuation sheet.
☐ determined not eligible for the National Register.

☐ removed from the National Register.
☐ other, (explain:)

Signature of the Keeper Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)	Current Functions (enter categories from instructions)
Recreation & Culture	Recreation & Culture

7. Description

Architectural Classification (enter categories from instructions)

Modern Movement

Art deco

Materials (enter categories from instructions)

foundation NA
walls NA
roof NA
other NA

Describe present and historic physical appearance.

Ala Moana Park is a 76 acre beach park located in Honolulu between downtown and Waikiki. It features a mile-long, white sand beach, an offshore coral reef and lawns dotted by palms, banyans and flowering tropical trees. The spatial arrangement for the landscape includes alternating areas of massed foliage and open space, with lagoons located at the eastern and western sides. The eastern lagoon was an Oriental one, "in the characteristic Chinese and Japanese manner." The western one was the Hawaiian Lagoon, "featuring native palms and plants." A drive loops through the park, running parallel to and near the beach for most of its route. The beach itself was created in 1955.

On the Waikiki side the park is entered via a roadway which was originally flanked by fifteen foot concrete portals of curved and angular shapes, scalloped walls and wedge indentations. Scalloped walls that adjoin the outer portals allowing planting space within their concave recesses.

A canal runs along the mauka side of the park and diverts water from mountain streams to the lagoons at either end. An equestrian bridge spans the canal, and its playful semi-circular form and inclined approaches give the appearance of a hump-backed animal.

The largest structure within the park is the sports pavilion. From the exterior this is a modest, stucco walled structure, which houses on the interior a banyan courtyard. This courtyard is perhaps Bent's most noteworthy park design. The sports pavilion, itself stands at one end of the courtyard. It is a gable roofed, open structure with two wall-sized murals by Robert Lee Eskridge depicting the Hawaiian makahiki.

The courtyard is paved with coral stone flagging, and features six intricately detailed planters with benches, four of which contain banyan trees, surrounded by exotically shaped reflecting pools. Two Marguerite Blasingame sculptures in marble are located in niches on the mauka and makai walls of the courtyard. The mauka wall niche contains a stylized Hawaiian man and woman, back-to-back, playing nose flutes. The makai side features another couple sitting face to face with arms and faces touching. Figures of Hawaiians playing traditional games are also present in the coral stone flagging of the passages of the sports pavilion. In 1975 the McCoy Pavilion was built at the Diamond Head side of the banyan courtyard. This modern structure is a sympathetic addition that blends well with the older sports pavilion.

Mauka of the Sports pavilion and banyan courtyard are tennis courts and a lawn bowling green. This is a raised square lawn area of eight lanes enclosed by a wide coral stone walkway and a five-foot decorative cement brick wall. The corners of the wall are rounded, and curved brick benches are inside each curve. These are capped by red Padre tile.

☐ See continuation sheet

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
☐ nationally ☐ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)	Period of Significance	Significant Dates
Recreation	1934	1934
Architecture		

Cultural Affiliation NA

Significant Person NA

Architect/Builder Harry Sims Bent

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Ala Moana Park is significant for its associations with the development of parks in Honolulu during the 1930s as discussed under the context section of the multiple property documentation form. Similarly its architectural significance is covered in that form.

Ala Moana Park is entirely a man-made development. Its oceanfront bathing area has been carved from the fringing coral reef. Its beach the creation of hydraulic engineers. The park lands are a tidal area filled by excavating the offshore reef. The land on which it stands was purchased by the City and County in 1928, even though the city had been using the site as a garbage and refuse dump since the turn of the century. The idea of a park on the present site of Ala Moana Park can be traced to the 1920s, and an interest in civic beautification among socially prominent Honolulu women, especially those involved in the Outdoor Circle.

Louise Dillingham, who was president of the Outdoor Circle from 1929 to 1931 and a member of the city's Shade Tree Commission, the predecessor of the Honolulu Park Board, was an outspoken proponent of the park and fashioned some of the initial ideas for the park's form. In 1931 the Parks Board hired Catherine Jones Richards and Robert O. Thompson, major landscape architects of the period in Honolulu, to plan the park. Their proposal for the spatial arrangement of two lagoons and alternating areas of massed foliage and wide open spaces continue to delineate the contours of the park's design today.

Harry Sims Bent was responsible for the design of such structures as the Waikiki entrance portals (completed 1934), the canal bridge (completed 1934), a lawn bowling green (completed 1939) and the sports pavilion with its banyen courtyard (completed 1937). In addition federal relief labor constructed a small boat harbor, tennis courts, dressing rooms and showers. The park stands as the crowning achievement of the golden age of Honolulu park-building during the 1930s. It is an attractive and functional urban space created in Depression-era Hawaii.

☐ See continuation sheet

9. Major Bibliographical References

Robert Weyeneth. "Ala Moana: The People's Park" (Honolulu, 1987)

☐ See continuation sheet

Previous documentation on file (NPS):
☐ preliminary determination of individual listing (36 CFR 67) has been requested
☐ previously listed in the National Register
☐ previously determined eligible by the National Register
☐ designated a National Historic Landmark
☐ recorded by Historic American Buildings Survey #
☐ recorded by Historic American Engineering Record #

Primary location of additional data:
X State historic preservation office
☐ Other State agency
☐ Federal agency
☐ Local government
☐ University
☐ Other
Specify repository:

10. Geographical Data

Acreage of property 76 Acres

UTM References
A Zone Easting Northing
B Zone Easting Northing
C
D

☐ See continuation sheet

Verbal Boundary Description

This nomination includes all the property owned by the City & County of Honolulu in 1988 as described by Tax Map Key 2-3-37:1.

☐ See continuation sheet

Boundary Justification

This is the historic boundary of the park.

☐ See continuation sheet

11. Form Prepared By

name/title Don Hibbard,
organization State Historic Preservation Office date 4/20/88
street & number 1151 Punchbowl Street, Room 310 telephone 548-6408
city or town Honolulu state Hawaii zip code 96813

APPENDIX D-3

Draft Cultural Impact Assessment for the Ala Moana Regional Park Master Plan Project, Waikīkī and Honolulu Ahupuaʻa, Honolulu District, Oʻahu, TMKs: (1)2-3-037:001, 022, 023, 025

PAGE IS INTENTIONALLY LEFT BLANK

Cultural Impact Assessment for the Ala Moana Regional Park Master Plan Project, Waikīkī and Honolulu Ahupua‘a, Honolulu District, O‘ahu TMKs: [1] 2-3-037:001, 022, 023, and 025

Prepared for
Belt Collins Hawaii LLC

Prepared by
Kellen Tanaka, B.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: WAIKIKI 265)

January 2019

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1860 Main St.
Wailuku, Hawai‘i 96793
Ph.: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Cultural Impact Assessment (CIA) for the Ala Moana Regional Park and Magic Island Master Plan Project, Waikīkī and Honolulu Ahupua‘a, Honolulu District, O‘ahu, TMKs: [1] 2-3-037:001, 002, 022, 023, and 025 (Tanaka and Hammatt 2019)
Date	January 2019
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: WAIKIKI 265
Agencies	State of Hawai‘i, Department of Health, Office of Environmental Quality Control (DOH/OEQC)
Land Jurisdiction	City and County of Honolulu
Project Proponent	City and County of Honolulu
Project Location	The project area is bounded by Ala Moana Boulevard to the north, *mauka* (inland) side, the ocean on the south, *makai* (seaward) side, Kewalo Basin to the west, and Ala Wai Yacht Harbor to the east. The project area also includes Magic Island, a peninsula off the southeastern corner of the park. The project area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The City and County of Honolulu is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park (AMRP) and Magic Island and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans. The project area receives the most usage of any park in the state and is also one of the oldest. Many park users visit daily or several times during the week. The city wishes to extend the park's longevity as a gradual increase in visits is forecasted for the foreseeable future. A Draft Environmental Impact Statement (DEIS) is being prepared which will evaluate direct impacts associated with the proposed action, as well as indirect and cumulative impacts associated with the project. The proposed elements reviewed in the DEIS include the following: • Pi‘ikoi Street and Queen Street pedestrian entrance expansion; • Widening the shared-use path along the *makai* side of Ala Moana Park Drive; • Widening the shared-use path along the Ala Wai Small Boat Harbor; • Improvements to the existing canoe launch ramp and crossing; • Rearranging the parking along the *makai* side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones; • Configure parking stalls on the *mauka* side of Ala Moana Park Drive to perpendicular and parallel stalls;

	• Keyhole parking lot expansion; • Elongating Magic Island parking lot; • Improve the pond edges; • Renovate McCoy Pavilion to include a dining facility; • Redesign the elevated area in the middle of the park on the *makai* side of Ala Moana Park Drive for Americans with Disabilities Act access; • Sand replenishment and long-term beach nourishment; • Build a playground; • Relocate the maintenance yard; • Drainage canal wall repair; • Repair the Bridal Bridge; • Add a dog park near Kewalo Basin; • Create a multi-use facility at the lawn bowling area; • Relocate the Ocean Safety's Honolulu Headquarters; • Repair Roosevelt Portals at Atkinson Street entrance and improve the entrance at the Kamakee Street.
Project Acreage	119.017 acres (76.348-acre Ala Moana Regional Park and 42.669-acre Magic Island)
Document Purpose	This CIA was prepared to comply with the State of Hawai‘i's environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the proposed project's potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project's potential impacts to cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control's *Guidelines for Assessing Cultural Impacts*) which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance Criterion e, pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that "have an important value to the native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity" (HAR §13-275-6 and §13-284-6). The document will likely also support the project's historic preservation review under HRS §6E and HAR §13-

	275 and §13-284. The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS §6E-8 and HAR §13-284.
Results of Background Research	Background research for this study yielded the following results, presented in approximate chronological order: 1. The project area is located offshore of portions of the *‘ili* of Kālia in the *ahupua‘a* of Waikīkī, and the *‘ili* of Kukuluāe‘o and Kewalo in the *ahupua‘a* of Honolulu. Kālia, meaning "waited for," is a name of the coastal area where the Pi‘inaio Stream once emptied into the ocean adjacent to the proposed project area. 2. The *‘ili* of Kukuluāe and Kewalo are located in the modern land section called the Kaka‘ako Development District. The original location and extent of the area called Kaka‘ako is ambiguous. In mid-nineteenth century documents and maps, Kaka‘ako was a small *‘ili* within the *ahupua‘a* of Honolulu. The modern urban Kaka‘ako district is comprised of the *‘ili* of Kaka‘ako, Ka‘ākaukukui, Kukuluāe‘o, and the *makai* portion of Kewalo, as well as portions of *‘ili* called Kawaiaha‘o, Honuakaha, Ka‘ala‘a, ‘Āpua, ‘Auwaiolimu, Pualoalo, Pu‘unui, and Kolowalu. 3. Large portions of Waikīkī were once part of a wide marshland. The name Waikīkī translates as "water spurting from many sources," and reveals the character of the intact watershed system of Waikīkī prior to European Contact, where water from the valleys of Mānoa and Pālolo gushed forth from underground. 4. Translations of the name Kaka‘ako are provided by Pukui and Elbert (1986:110) who translate the word *kākā‘āko* as "dull, slow," and Thrum (1922:639) who translated the word as "prepare the thatching," as *kākā* means "to chop, beat, or thresh" and *ako* means "thatch." 5. The Waikīkī area was full of aquatic resources including numerous fishponds that dotted the shoreline of the *ahupua‘a*. Kālia is associated with a traditional fishing technique used to catch schools of mullet. The fishermen of Kālia became known as human fishnets. 6. Kaka‘ako is located between two of the most intensely populated and cultivated areas in southeastern O‘ahu during the pre-Contact period: Waikīkī and Honolulu (also known as Kou). Pre-Contact Hawaiians used the lagoonal/estuary environment of the Honolulu plain to construct fishponds. The undeveloped natural condition of the project area consisted of low-lying marshes, tidal flats, and reef areas used to collect marine resources.

	7. John Papa ʻĪʻī (1959) discussed early nineteenth century trails in the Honolulu/Waikīkī area that traversed the region which was characterized by ponds, marshlands, and *loʻi* (irrigated terrace). He suggested that the trail, especially as it neared the coastline at Kālia, must have run on a sand berm raised above surrounding wetlands and coral flats. Historic trails on the south side of Oʻahu included a trail that ran along the coastal area of Waikīkī most likely where the present Kalākaua Avenue is located. A trail traversed the Kakaʻako area, ultimately connecting Waikīkī to Honolulu. ʻĪʻī (1959:89) described the middle trail (close to the current alignment of Queen Street) extending from Kālia to Kukuluāeʻo as passing "along the graves of those who died in the smallpox epidemic of 1853," and into the center of the coconut grove of Honuakaha. 8. A majority of the land in Kewalo and Kukuluāeʻo was used to produce salt. Hawaiians used *paʻakai* (salt) to flavor food, to preserve fish, to use for ceremonial purposes, and for medicinal purposes. Kakaʻako Salt Works continued to manufacture salt for local use as late as 1891, while other economic endeavors in Kakaʻako – such as infrastructure development, reclamation, and coastal dredging – began to shape the twentieth century landscape. 9. A number of reclamation projects involved the dredging of offshore areas to deepen and create boat harbors and using the dredged material to fill in the former swampy land. During the 1920s, Waikīkī's landscape would be transformed when the construction of the Ala Wai Drainage Canal—begun in 1921 and completed in 1928—resulted in the draining and filling in of the remaining fishponds and irrigated fields of Waikīkī. The construction of the canal was one of the many efforts to help urbanize Waikīkī. 10. The Kewalo Basin Harbor was formerly shallow reef that enclosed a deep section of water. The harbor was dredged in the mid-1880s. In 1919, the Hawaiʻi Government appropriated $130,000 to improve the small harbor of Kewalo for the aim of a harbor extension that was to serve fishing fleets and to relieve Honolulu Harbor. The harbor was completed in 1926. In 1941, the basin was dredged and expanded to its current 55 acres. In 1955, dredged material was placed along the *makai* side to form an 8-acre land section. 11. Construction of Ala Moana Regional Park began in the 1920s following a series of land reclamation projects beginning with the dredging of the nearby channel leading to Kewalo Basin and sand from offsite beaches being brought in to fill in the swampy marshlands. Structural construction on the newly filled land

	began in the 1930's with the construction of the Sports Pavilion and Banyan Court, the Bridle Path Bridge, the Roosevelt Portals, and a lawn bowling green. Around 1932, the Hawaiian and Japanese Ponds, and a drainage canal, were dredged for both aesthetic and local run-off control purposes. Following World War II, about 55,000 cubic yards of sand were brought in from the west side of the island to create the beach. Another post WWII addition to AMRP was the 47-acrea Magic Island Peninsula which was first conceptualized in the late-1950s.
Results of Community Consultation	CSH attempted to contact 114 Native Hawaiian Organizations (NHOs), agencies, and community members. Of the six people that responded, two *kamaʻāina* (Native-born) and/or *kūpuna* (elders) provided written testimony and two participated in formal interviews for more in-depth contributions to the CIA. Below is a list of individuals who shared their *manaʻo* and *ʻike* about the project area: 1. Shad Kane, member of the Kapolei Hawaiian Civic Club, Chair of the Oʻahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Aliʻi Ai Moku of the Kapuāiwa Chapter of the Royal Order of Kamehameha Ekahi, and ʻEwa Moku Representative on the State Aha Moku Advisory Committee 2. Mr. Kaleo Patterson, cultural and lineal descendant of Honolulu and President of Pacific Justice and Reconciliation Center (PJRC) and the Native Hawaiian Church 3. Mr. Bruce Lum, *kamaʻāina, lawaiʻa* (fisherman), and gatherer of *pūpū o Niʻihau* (Niʻihau shells) 4. Hinaleimoana Wong-Kalu, *kamaʻāina* and Chair of the Oʻahu Island Burial Council (OIBC)
Impacts and Recommendations	Based on information gathered from the community consultation, participants voiced and framed their concerns in a cultural context. 1. The community discussed the sensitivity of coastal areas of Waikīkī and Honolulu, and the possibility of encountering *iwi kūpuna* (ancestral remains) during ground disturbance. Mr. Kane stated that in ancient times, burials would have been "along the shoreline in sand" in the region that stretched between Kou (modern-day Kewalo) and Waikīkī (modern-day Ala Wai Canal). Mr. Kane expressed a concern about the sensitivity of coastal areas, including AMRP and Ala Moana Beach Road, noting there is a "possibility that *ʻiwi* will be found depending how invasive the proposed project will be." He emphasized the sensitivity of areas within and near roadways. The sensitivity of these areas is evident by the location of SIHP # -7435, consisting of four sets of human remains, near the intersection of Ala

	Moana Boulevard and Queen Street. Mr. Kane recommended that minimal ground disturbance occur within sensitive areas. Mr. Kane stated that the possibility of discovering burials in the area of the Pi'ikoi Street and Queen Street pedestrian expansion is highly unlikely since most burials have been disturbed by previous construction. He also noted that Magic Island was constructed of fill material, and thus it is highly unlikely that burials will be encountered during construction activities in that area. Ms. Hinaleimoana Wong-Kalu noted that burials have been recorded *mauka* of the project area, however, burials are not expected within the project area as it was formerly coral reefs and mudflats and is now entirely fill land. 2. Five burials have been recorded along the northern boundary of the park, one *in situ* (situated in the original place or position) burial, SIHP # -6376, on Kamake'e Street approximately 65 m from the northeastern corner of the park (Souza et al. 2002), and four possibly *in situ* burials, SIHP # -7435, at the termination of Queen Street approximately 30 m from the north, central area of the park (Enanoria et al. 2015). Other recorded historic properties within or near the project area include SIHP # -1388, Ala Moana Regional Park; and SIHP # -7596, a subsurface trash deposit with historic trash artifacts approximately 50 m from the mauka boundary of the park (Pammer and McDermott 2014). In the event that *iwi kūpuna* are identified, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40. In addition, in the event of an inadvertent discovery of human remains, the completion of a burial treatment plan, in compliance with HAR §13-300 and HRS §6E-43, is recommended. 3. Ms. Wong-Kalu recommends that the project proponents present the details of the project to the OIBC. 4. The community expressed a concern regarding "awareness and protection of known historic sites." Mr. Kaleo Patterson recommended that any new discoveries encountered during construction, including *iwi kūpuna*, must be treated appropriately. 5. In the event that *iwi kūpuna* and/or cultural finds are encountered during construction, project proponents must consult with cultural and lineal descendants of the area to develop a reinterment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance. 6. Mr. Lum expressed a concern about the proposed sand replenishment and long-term beach nourishment of AMRP and Magic Island, highlighting the potential adverse impact it will have on the existing ecosystem and traditional gathering

	practices. Mr. Lum believes that not enough detail was provided to the public regarding the extent of modifications to AMRP's shoreline. He emphasized that valuable and fragile aquatic ecosystems will be negatively impacted by any modifications to the shoreline. Additional studies should be conducted to confirm that sand replenishment activities will not have an adverse impact on the existing ecosystem, and by extension, ongoing gathering practices. 7. Mr. Lum is also concerned that construction activities associated with the widening of the Makai Shared-Use Path will result in runoff into the ocean. Based on his research, Mr. Lum noted that a refuse dump once stretched across an area from Kewalo Basin to the Ala Wai Boulevard area. Historic maps have indicated that a city dump for trash was previously located in a small area immediately *makai* of Ala Moana Boulevard. Previous oral history research also indicates that a refuse dump was located within the present AMRP boundaries. Although, Mr. Lum is not aware of the exact location of the refuse dump, he believes ground disturbance will uncover trash and other refuse which has been previously buried. Should there be runoff, pollutants will be carried into the ocean. He also believes the proposed widening of the Magic Island (Ala Wai Boat Harbor) Shared-Use Path will impact fishermen who access the seawall along the eastern side of the Magic Island peninsula for subsistence and recreational purposes. The current master plan should account for all current users, including fishermen, and provide appropriate mitigation measures to ensure no adverse impacts to any and all users of the Magic Island (Ala Wai Boat Harbor) Shared-Use Path. 8. Ms. Wong-Kalu recommended that the City and County of Honolulu remove areas of stagnant water throughout the park. She also recommended that the history of AMRP be included within the master plan, and that the City should begin to utilize traditional names when identifying specific *wahi pana* (storied places) or landmarks within AMRP. In addition to generating awareness of *wahi pana*, Mr. Patterson recommended that the "utilization of indigenous coastal plants and landscaping, and preservation of unique cultural and environmental elements" be incorporated into the master plan.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Belt Collins Hawaii, LLC, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared a cultural impact assessment (CIA) for the Ala Moana Regional Park Master Plan project, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMKs: [1] 2-3-037:001, 022, 023, and 025. Ala Moana Regional Park is a 76.348-acre City and County of Honolulu public park located on the shoreline, bounded by Ala Moana Boulevard to the north, *mauka* (inland) side, the ocean on the south, *makai* (seaward) side, Kewalo Basin to the west, and Ala Wai Yacht Harbor to the east. The project area (119.017 acres or 48.164 ha) includes the 42.669-acre peninsula on the southeastern side of the park known as Magic Island. Ala Moana Park Drive runs through the park parallel to the shoreline. The project area is depicted on a portion of the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), tax map plat (TMK: [1] 2-3-037) (Figure 2), a 2013 aerial photograph (Figure 3), and a park layout map (Figure 4). Ala Moana Regional Park was nominated to the National Register of Historic Places (NRHP) in 1988 (Appendix A). The park was listed on the Hawai‘i State Register of Historic Places (HRHP) as part of the City and County of Honolulu's Art Deco Parks Thematic Group and as State Inventory of Historic Places (SIHP) # 50-80-14-1388 in 1988. Several extant structures in the park date to the 1930s and are thus older than 50 years.

The City and County of Honolulu is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park and Magic Island and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans. The project area receives the most usage of any park in the state and is also one of the oldest. Many park users visit daily or several times during the week. The city wishes to extend the park's longevity as a gradual increase in visitors is forecasted for the foreseeable future. A Draft Environmental Impact Statement (DEIS) is being prepared which will evaluate direct impacts associated with the proposed action, as well as indirect and cumulative impacts associated with the project. The proposed elements reviewed in the DEIS include the following:

- Pi‘ikoi Street and Queen Street pedestrian entrance expansion;
- Widening the shared-use path along the *makai* side of Ala Moana Park Drive;
- Widening the shared-use path along the Ala Wai Small Boat Harbor;
- Improvements to the existing canoe launch ramp and crossing;
- Rearranging the parking along the *makai* side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;
- Configure parking stalls on the *mauka* side of Ala Moana Park Drive to perpendicular and parallel stalls;
- Keyhole parking lot expansion;
- Elongating Magic Island parking lot;
- Improve the pond edges;

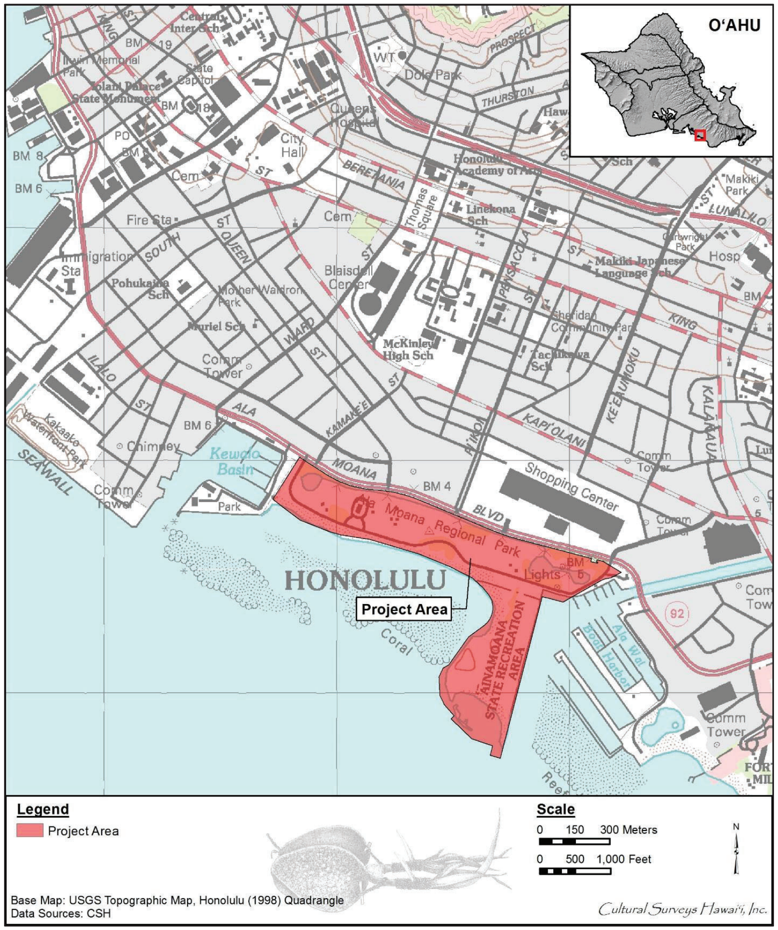


Figure 1. Portion of 1998 Honolulu USGS 7.5-minute series topographic quadrangle, showing the location of the project area

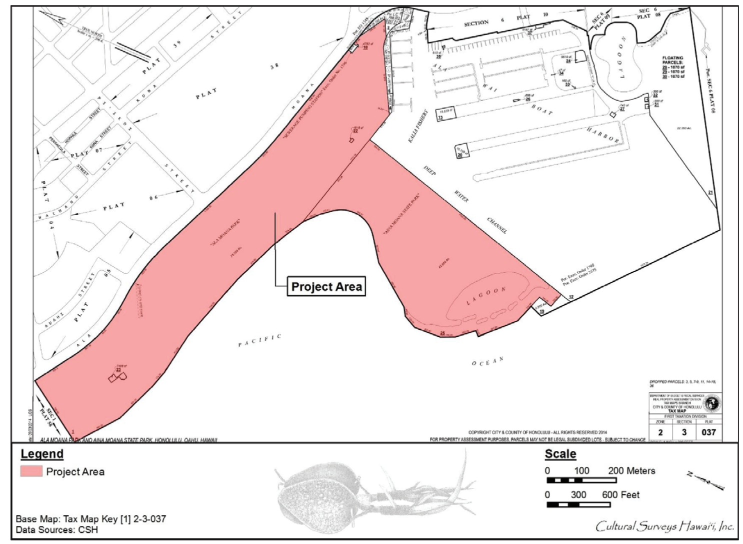


Figure 2. Tax Map Key (TMK) [1] 2-3-037, showing the location of the project area (Hawai‘i TMK Service 2013)

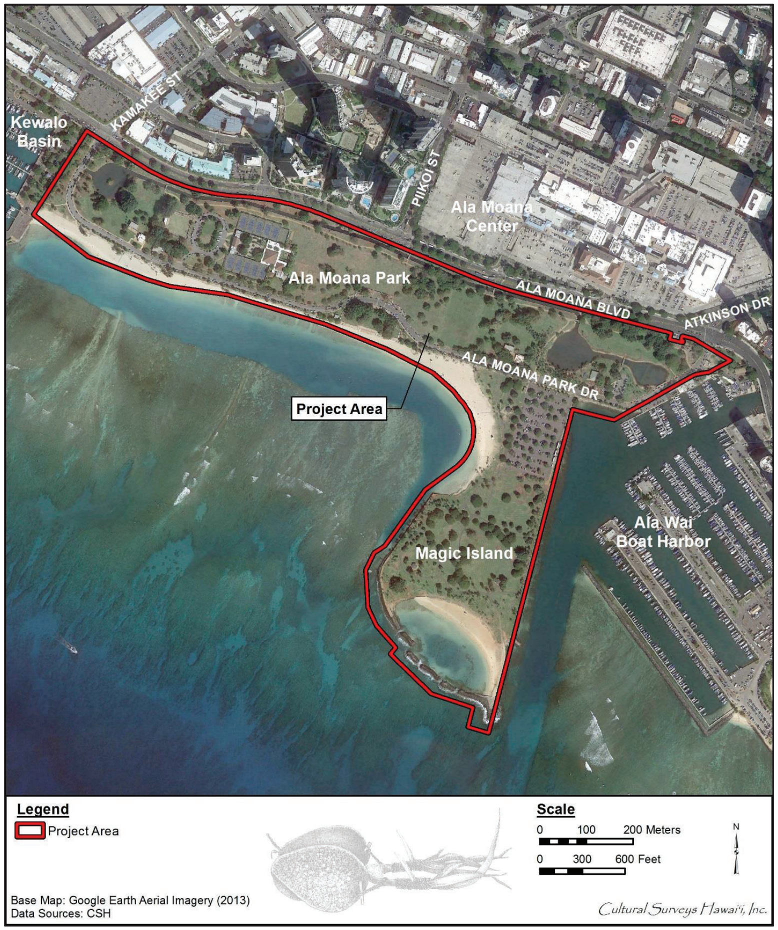


Figure 3. Aerial image (Google Earth 2013), showing the project area

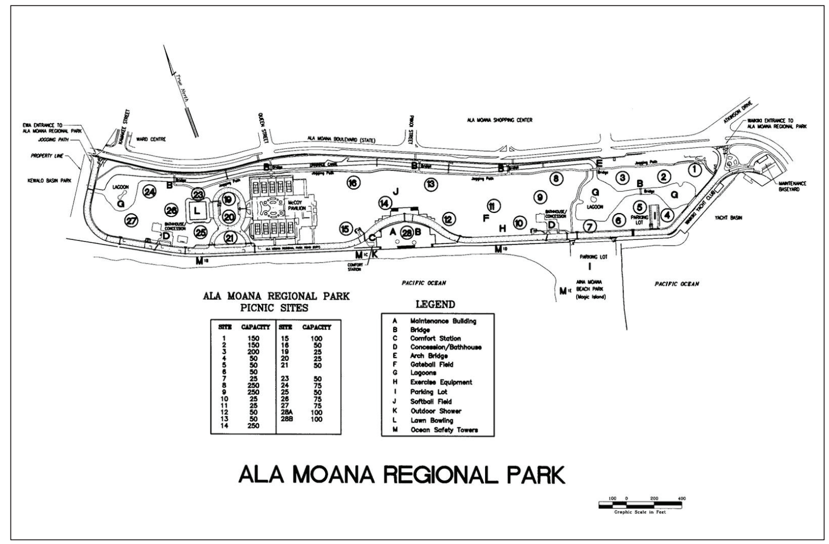


Figure 4. Plan of Ala Moana Regional Park (courtesy of client)

• Renovate McCoy Pavilion to include a dining facility;

• Redesign the elevated area in the middle of the park on the *makai* side of Ala Moana Park Drive for Americans with Disabilities Act access;

• Sand replenishment and long-term beach nourishment;

• Build a playground;

• Relocate the maintenance yard;

• Drainage canal wall repair;

• Repair the Bridal Bridge;

• Add a dog park near Kewalo Basin;

• Create a multi-use facility at the lawn bowling area;

• Relocate the Ocean Safety’s Honolulu Headquarters;

• Repair Roosevelt Portals at Atkinson Street entrance and improve the entrance at the Kamakee Street.

1.2 Document Purpose

Due to the scale of the project and potentially significant environmental impacts that could result, an environmental impact statement (EIS) is required as opposed to an environmental assessment / Finding of No Significant Impact. This CIA was prepared to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the proposed project’s potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts to cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control’s *Guidelines for Assessing Cultural Impacts*) which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance Criterion e, pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that

> . . . have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity. [HAR §13-275-6 and §13-284-6]

The document is intended to support the project’s environmental review and will likely also support the project’s historic preservation review under HRS §6E and HAR §13-275 and §13-284.

1.3 Scope of Work

The scope of work for this cultural component includes the following:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with the specific purpose of identifying

traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.

2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

The environmental setting draws from previous environmental and historical surveys conducted throughout the Hawaiian archipelago (Foote et al. 1972; Giambelluca 1986; Nakuina 1992; WRCC 2010) as well as cultural sources and may be thought of as being divided into two sections. The natural environment begins with a discussion of geologic history and the 1972 soil surveys conducted by the Foote et al. research team, and then shifts to a description of prevailing winds, precipitation, streams, and coastal/marine environment found within and in proximity to the project area. Throughout these subsections, an effort is made to ground scientific knowledge within traditional cultural frameworks or knowledge systems. That is, understandings of the Waikīkī environment have also been informed by various traditional sources, including *mo‘olelo* (stories), *mele* (songs), or *oli* (chant). As pointed out by anthropologist Laura Nader and reiterated by Dr. Kathleen Kawelu, “science is not free of culture; rather, it is full of it” (Kawelu 2015:6; Nader 1996: xiii). The second setting section concludes with a description of the built environment, emphasizing a transitional change into modernity.

1.4.1 Natural Environment

The project area forms a small portion of O‘ahu’s modern southeastern coastline and is located on former reef land off O‘ahu’s south shore that was dredged and filled to create the park in the late 1920s and early 1930s (Figure 5). The Honolulu leeward coastal plain is stratified with late-Pleistocene coral reef substrate overlaid with calcareous marine beach sand, terrigenous sediments, and/or stream-fed alluvial deposits (Armstrong 1973:36). Terrigenous sediments are formed and deposited on land, or are materials derived from land mixed with purely marine material. The modern Honolulu District shoreline configuration is primarily the result of three factors: the rising sea level following the end of the Pleistocene (Stearns 1978); the 1.5-2.0 m highstand of the sea during the mid- to late Holocene; and pre- and post-Contact human landscape modification. The plain of Waikīkī is flat and generally less than 4.5 m (15 feet [ft]) above sea level. The Ala Moana Regional Park also is fairly level, with elevations ranging from 5.1 to 5.6 ft above mean sea level. The park stratigraphy is described as follows:

> The site is underlain by a layer of silty topsoil less than a foot thick beneath which is a loose to semi compact sand fill extending to an average depth of about five feet. The fill was placed as part of the reclamation effort to create Ala Moana Park. Immediately beneath the fill is a rather uniform deposit of chiefly loose to very

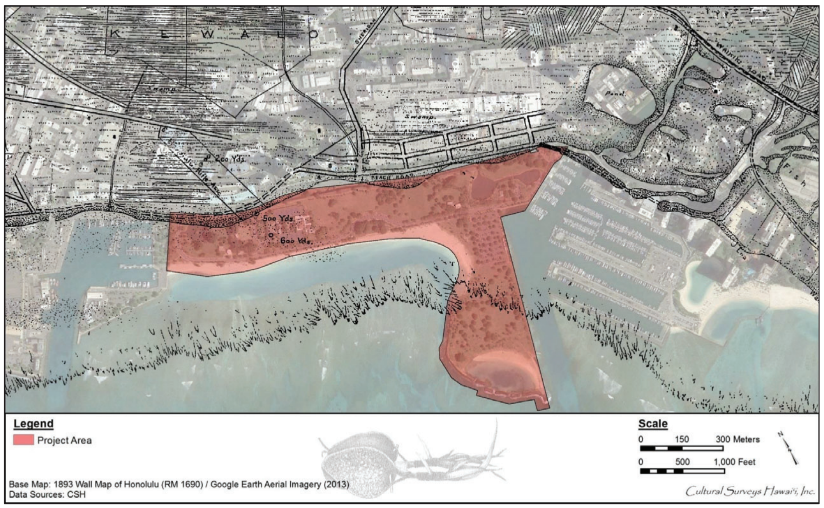


Figure 5. Figure comparing the shoreline of 1893 and the present shoreline in the vicinity of the project area (1893 Wall map of Honolulu overlain on a 2013 aerial photograph); note majority of project area is *makai* of “Beach Road” (Ala Moana Boulevard) in the former shallow reef area that was submerged at high tide

> loose, gravelly coralline sand identified as lagoonal sediments to the maximum depth explored, approximately 21.5 feet. Ground water levels were measured at an average depth of about five feet, reflecting mean sea level. [Weidig Geoanalysts in Arthur Kimbal Thompson Architect, AIA 2004:16]
>
> The remainder of the . . . site is underlain by fill, placed to extend the old shoreline, overlying pelagic coral reefs and lagoonal deposits. . . Below the fill horizon, lies a rather uniform soil profile consisting of saturated, mostly loose to very loose, well graded fine to coarse coralline gravelly sand. These soils are lagoonal deposits, found to contain abundant fragments of finer coral and shells broken by storm surges. [Arthur Kimbal Thompson Architect, AIA 2004:16–17]

1.4.2 *Ka Lepo* (Soils)

The USDA Soil Survey classifies the project area’s soils as “Fill land, mixed” (FL) (Figure 6):

> This land type occurs mostly near Pearl Harbor and in Honolulu, adjacent to the ocean. It consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. [Foote et al. 1972:31]

The fill lands were created from 1931 to 1934, mainly from offshore dredged material plus a foot of top soil. Although the soil map also shows an area of “Beaches” (BS), this sand is not local but was trucked in from other areas (mainly the north shore of O‘ahu) to expand and replenish the swimming beach area of the park.

1.4.3 *Ka Makani* (Winds)

Northeasterly trade winds prevail throughout the year, although their frequency varies from 80 to 95% of the time during the summer months, when high-pressure systems tend to be located north and east of Hawai‘i. During the winter months, the high pressure systems are located farther to the south, decreasing the occurrence of the trade winds to about 50 to 80% of the time (WRCC 2010).

Ancient Hawaiians recognized different weather characteristics and named each of the predominant winds using an expressive term descriptive of the wind’s direction and velocity. Two winds found in the vicinity of the project area are the ‘Ōlauniu of Kahaloa (an area of Waikīkī) and the Kūkalahale of Honolulu (Nakuina 1990:50–51). Additionally, the Ulumano wind of Kāne‘ohe is known to be “for Kaholoakeāhole,” an area located just west of the current project area (Nakuina 1992:51) (Figure 7).

In the *Wind Gourd of La‘amaomao*, the names of the winds of O‘ahu are listed in a chant concerning a powerful gourd called the wind gourd of La‘amaomao. When the gourd was opened, a specific wind could be called to fill the sails of a canoe and take the person in the desired direction. In a particular verse, the chanter calls out the ‘Ōlauniu wind of Kahaloa (Nakuina 1990:140):

> The wind of Le‘ahi turns here and there,
>
> ‘Ōlauniu is of Kahaloa,
>
> Wai‘ōma‘o is of Palolo,

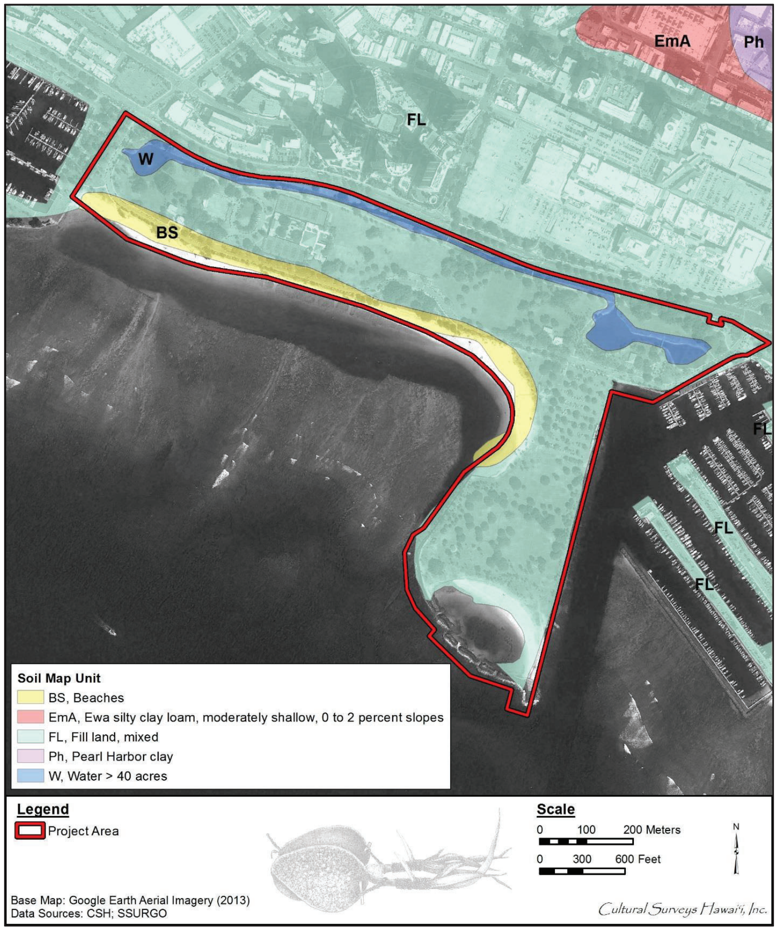


Figure 6. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating sediment types within and surrounding the project area (USDA SSURGO 2001)

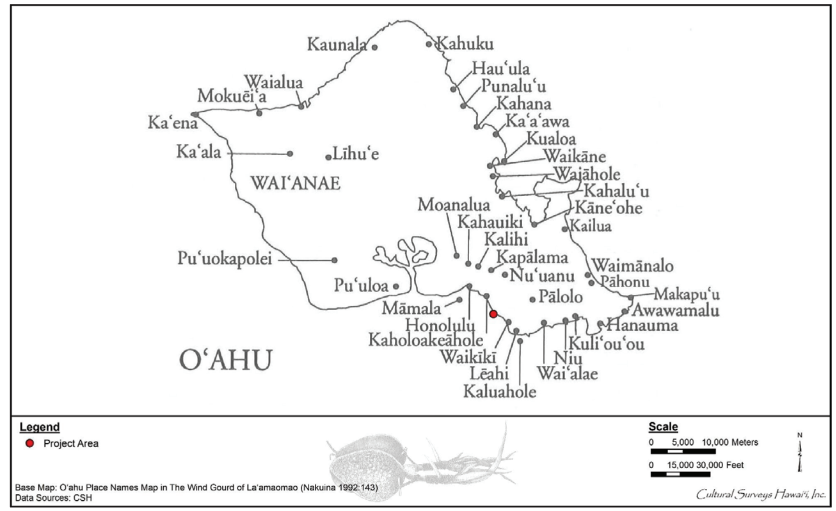


Figure 7. O'ahu place names as depicted in *The Wind Gourd of La'amaomao* (Nakuina 1992:143); note the areas of Māmala, Honolulu, Kaholoakeāhole, and Waikīkī surrounding the project area

Kuehu-Iepo is of Kahua

[Nakuina 1990:50]

'Ōlauniu is literally translated as "coconut-leaf piercing," although it is also noted to have "promiscuous" conotations (Pukui and Elbert 1986:20). The Kahaloa mentioned above refers to the beach area between the Royal Hawaiian Hotel and the Halekūlani Hotel (Alameida 1997). While the 'Ōlauniu wind of Kahaloa is prominently noted in Nakuina's *Wind Gourd of La'amaomao*, an additional reference to a Waikīkī wind is located within *The Epic Tale of Hi'iakaikapoliopele*. A breeze at Kālia, the *'ili* or land section located in the western section of Waikīkī, is described as follows:

10. On the waves our boards have mounted

To my love who has gone

The star of that smooth strata, oh

Beloved is the shoreline breeze at Kālia

I await your return

[Ho'oulumahiehie 2008:277]

Further west, in Honolulu, the prominent wind for the area is known as Kūkalahale. Kūkalahale is also the name of a rain specific to Honolulu. In *The Wind Gourd of La'amaomao*, Pāka'a chants the names of winds belonging to and surrounding Honolulu Ahupua'a. In these stanzas, the 'Ōlauniu is invoked again, however, in this instance it is identified as a wind of Kapālama. Honolulu's Māmala Bay is also mentioned alongside its associated wind, the 'Ao'aoa (see Figure 7):

He Kukalahale ko Honolulu,

He Ao-a-oa ko Mamala,

He Olauniu ko Kapalama,

Translation:

Kukalahale is of Honolulu,

'Ao'aoa is of Māmala,

'Ōlauniu is of Kapālama,

[Nakuina 1904:56–57;1992:50]

1.4.4 *Ka Ua* (Rains)

Precipitation is a major component of the water cycle accountable for depositing fresh water on local flora. Pre-Contact *kānaka 'ōiwi* (Native Hawaiians) recognized two distinct annual seasons. The first, known as *kau* (period of time, especially summer) lasts typically from May to October and is a season marked by a high-sun period corresponding to warmer temperatures and steady trade winds. The second season, *ho'oilo* (winter, rainy season) continues through the end of the year from November to April and is a much cooler period when trade winds are less frequent, and widespread storms and rainfall become more common (Giambelluca et al. 1986:17). Typically, the maximum rainfall occurs in January and the minimum in June (Giambelluca et al. 1986:17).

Annual rainfall in the project area varies between 25 and 125 inches, higher volumes occur in the rainy season between November and April. The mean rainfall in the project area is 600 mm (23.625 inches) (Giambelluca et al. 1986:138). In the Honolulu District, rainfall averages less than 30 inches per year (Armstrong 1983:62). The Kūkalahale rain is a rain associated with Honolulu and the larger Kona district of O'ahu. *Kū kala hale* means "standing under the eaves of the house" or "striking the house gables" while *Kūkala hale* means "announcing to the homes" (Akana and Gonzalez 2015:127).

Kūkalahale is mentioned in the legend of Hi'iakaikapoliopele:

Ai ia wā i uhau a'e ai 'o Hi'iaka i kēia kau, 'oiai nō ka ua Kūkalahale o Honolulu nei e ho'okawewe ana i ka lau lā'au a me nā hākala ho'i o nā hale pili o ia mau lā aloha o ka nohona o ko kākou mau kūpuna.

Translation:

Then Hi'iaka offered up this chant, while the Kūkalahale rain of Honolulu pattered upon the leaves of the trees and the thatched roofs of those beloved days of our ancestors.

[Akana and Gonzales 2015:127]

Another section of the same legend notes the Kūkalahale rain:

I ia wā i ha'alei aku ai 'o Kauakahiapaoa i kāna kilu . . . 'He mau wahi hua mele paoa loa kā ho'i ka'u i oli a'e nei. E'eha ana ho'i au i ke kaikamahine o ka ua Kūkalahale.'

I kēlā wā, lālau ihola 'o Pele'ula i kāna ipu, a oli a'ela noō ho'i.

. . . .

Eia au ē, ka ua Kūkalahale

A pā!

Translation:

At that point, Kauakahiapaoa tossed his kilu . . . 'Those were certainly unlucky lines I just chanted. I shall be wounded by the girl of the Kūkalahale rains.'

Whereupon Pele'ula reached for her gourd maker and chanted.

. . . .

Here am I, the Kūkalahale rain

Let it strike!

[Akana and Gonzalez 2015:127]

This rain was also mentioned in a *mele kanikau* (dirge) for Joseph Nāwahīokalani'ōpu'u:

Nākolo, nakulu, pa'apa'a'ina kaupoku o Kākuhihewa ē

Hewa ka i'a a 'Umiamaka i ka lili a ka ua Kūkalahale

Translation:

The roofs of Kākuhihewa are roaring, rumbling, and crackling

The fish of ‘Umiamaka was wronged by the jealousy of the Kūkalahale rain

[Akana and Gonzalez 2015:127]

The description of the Kūkalahale rain, as a rain that strikes upon thatched roofs, may also relate to a translation of Kaka‘ako by Thrum (1922:639). According to Thrum, Kaka‘ako means “prepare the thatching.” This translation may have to do with the abundance of tall *pili* (*Heteropogon contortus*; a grass for thatching;) once found in the Kaka‘ako area. Traditionally, the Kaka‘ako area was once a small *‘ili* (small land division), described as the “land on the ‘Ewa side of Ke-walo to Ku-lolo-ia Stream, where the Honolulu Ironworks and Fort Armstrong are now” (Kekahuna 1958:4). Due to the growth of the settlements of Honolulu and Waikīkī in the late pre-Contact (pre-1778) period and early post-Contact periods, the seaward sections of many *ahupua‘a* (land division usually extending from the uplands to the sea, larger than an *‘ili*) were cut off from the sea. The government later subdivided sections of Honolulu and Waikīkī into neighborhoods or districts, including Kaka‘ako, which the Hawaii Community Development Authority (HCDA) named the Kaka‘ako Community Development District. The current project area may also be thought of as within the Kaka‘ako Community Development District, an area *makai* of King Street from South Street to Kalākaua Avenue/Ala Wai Boulevard.

Although rain tends to skirt around Waikīkī today, largely due to thermodynamics and the rising of heat from numerous concrete surfaces, there exist rains traditionally known to be specific to Waikīkī. These are the Makahuna rain and the Wa‘ahila rain, respectively.

The Makahuna rain, a rain of both Pālolo and Waikīkī at large, is mentioned in a chant by the goddess Hi‘iaka during her travels across the islands (Akana and Gonzalez 2015:169; Ho‘oulumahiehie 2008:291). While calling out to the *mo‘o* (lizard-like creature or water spirit) Pāhoa, Hi‘iaka pronounces:

1. *‘O ‘oe ia, e Pāhoa*

Wahine noho ua Makahuna o Pālolo

Ho‘olono mai ana ‘o ka leo

Leo ualo a kama hele.

It is you, O Pāhoa

Woman who dwells in the Makahuna rain of Pālolo

Listening to the voice

The beckoning call of the traveler

[Akana and Gonzalez 2015:169]

The rain of Makahuna is mentioned on a second occasion in a *mele* (song) by Hi‘iaka; in this *mele*, she remarks on hearing the clamor of people in the house she has just left in Waikīkī:

2. *Ku‘u kane i ka makani Hauālia*

‘O ka Makahuna i Hāwāwā ē

Wā ihola, ke wā wale maila nō

Ka ua hilahila moe awakea

My husband of the Hauālia wind

The Makahuna rain at Hāwāwā

Boisterous, making an uproar

The shy rain that settles down at midday

[Akana and Gonzalez 2015:169-170; Ho‘oulumāhiehie 2008:291]

Another rain associated with Waikīkī is the Wa‘ahila (also Wa‘ahia) rain. The rain of Wa‘ahila is mentioned in a *mele* by Hi‘iaka; in this *mele* she remarks on leaving a house filled with noisy people playing the game of *kilu* in Waikīkī (Akana and Gonzalez 2015:280):

27. *Ku‘u kāne i ka ua noe*

Noe hāli‘i a ka Wa‘ahila

Ho‘ohila ka mana‘o, wehi i ka lau

Lau a ke aloha e pi‘i ana i ka liko

Wā ihola, ke wā wale maila nō

Translation:

My husband of the misty rains

Blanketing fall of the Wa‘ahila showers

Abashed, yet adorned by the outpour

An outpouring of love, rising to brightness

Boisterous, an uproar

[Akana and Gonzalez 2015:280; Ho‘oulumāhiehie 2008:291]

The following *kanikau*, written for the *ali‘i ‘ai moku* (chief of an island) Kahahana, recalls the soothing nature of the Wa‘ahila (identified as Wa‘ahia in this instance) rain (Kamakau 1991a:92):

He pua ka lani, he pua laha ‘ole nei no nā moku

He kamaha‘o ka lani na O‘ahu

I walea ka lani i Kona, i ka lulu

I ka pohu wale o ka ua Wa‘ahia

Ke hāli‘i maila i ke pili

The chief is a flower, a rare blossom of the islands

Magnificent is the chief of O‘ahu

The chief relaxes at Kona in the calm

In the soothing serenity of the Wa‘ahia rain

Covering the pili grass

[Akana and Gonzales 2015:271–272]

This next *kanikau* was written for Ka‘ahumanu, the favored wife of Kamehameha I:

‘O ka wahine ‘alo ua Wa‘ahila o Kona

Nihi makani ‘alo ua Kūkalahale

Noho ānea kula wela lā o Pahua

Wahine holo ua Hā‘ao Nu‘uanu ē, ia

The woman who resists the Wa‘ahila rain of Kona

Creeping softly like the wind, resisting the Kūkalahale rain

A bleak existence along the hot plains of Pahua

Woman traveling in Nu‘uanu's Hā‘ao rain

[Akana and Gonzales 2015:273]

1.4.5 *Nā Kahawai* (Streams)

The name Waikīkī translates as "water spurting from many sources," and reveals the character of the intact watershed system of Waikīkī prior to European Contact, where water from the valleys of Mānoa, Pālolo, and Makiki gushed forth. The western edge of Waikīkī, which includes the current project area, is primarily fed by streams originating from Pu‘u ‘Ohi‘a (Tantalus) and Makiki Valley:

> The headwaters of the area flow into three tributaries: Maunalaha, Moleka and Kānealolo, all of which join Kanahā Stream, today near the intersection of Wilder and Punahou streets. The Kanahā turns into Makiki Stream as it moves through Makiki and Pawa‘a and finally to Kālia, the western district of Waikīkī, where it empties into the sea. [Kanahele 1995:5]

The streams mentioned above cut their path *makai*, through the *ahupua‘a* of Waikīkī, well into the early twentieth century, until they were subsequently rerouted and confined as lined channels, having both their natural banks and streambeds removed, during the construction of the Ala Wai Canal (Timbal and Maciolek 1978:11).

In the 1930s, after the completion of the Ala Wai Canal, the course of lower Mānoa Stream was pushed to the east (the course of the Pālolo Stream was also pushed to the west) to form an artificial Mānoa/Pālolo Channel that now empties into the Ala Wai Canal (Oceanit 2004:7). The Mānoa Stream is a confluence of multiple headwaters originating from upper Mānoa Valley. The Mānoa sub-basin watershed covers 6,150 acres and includes 12 miles of streams. There are six named tributary streams in the upper valley that merge at an elevation of 400 ft into the main Mānoa Stream: ‘Aihualama, Waihī, Lua‘alaea, Nāniu‘apo, Wa‘aloa, and Waiakeakua. Halfway down the center of the valley, the Sugar Loaf eruption has pushed the streambed to the extreme east of the

valley. Pi‘inaio is a name used for the central portion of Mānoa Stream and the name of the coastal area where the Pi‘inaio Stream emptied into the ocean. The exact meaning of Pi‘inaio is unknown, but *pi‘ina* means "climb or ascend" (Pukui and Elbert 1986:327). The stream's mouth was on the western end of the Waikīkī coast, where the Ala Moana Shopping Center is now located, west of Duke Kahanamoku Beach and Lagoon. Immediately west of Duke Kahanamoku Beach and Lagoon is the Ala Wai Boat Harbor. The Ala Wai Canal empties into the Ala Wai Boat Harbor, which forms the eastern boundary of Magic Island.

In neighboring Kālia, streams fed a large marshy plain that allowed for the development of fishponds such as Kaihikapu (or Ka‘ihikapu), Kaipuni, and Paweo (or Pāweo). Prior to the formalization of these fishponds, which would have required extensive social organization and management, it is likely that the area immediately inland of the current project area was part of a vast natural wetland habitat for shorebirds, fish, and other estuary resources.

1.4.6 *Ke Kai ame ka Moana* (Seashore and Ocean)

The last century has seen the area of Waikīkī Kai, including the seashore and extending to the offshore areas, extensively altered. According to a report produced by Robert L. Wiegel evaluating the coastal area of Waikīkī, most of the Waikīkī shore (between Kewalo Basin and the Elks Club near Diamond Head) at the beginning of the twentieth century was "a narrow, thin ribbon of carbonate sand lying between wetlands, mudflats, duck ponds, fishponds, and a gently sloping fringing reef a few thousand feet wide" (Wiegel 2008:3). He further elaborates that the subsurface geology of the Waikīkī "coastal plain is a complicated mix of horizons/lenses of lagoonal deposits, marsh deposits, sand and coralline debris, coral ledges, alluvium, cemented sand, cinder, clinker, tuff, and basalt" (Wiegel 2008:6 citing data in Ferrall 1976 and Noda 1994). The continual transformation of the Waikīkī coastline into areas of "intensively used urban beach" (Wiegel 2008:3) has resulted in its current conditions. The current Ala Moana Beach, facing southwest toward "the bight of Mamala Bay" (Wiegel 2008:3), is a result of dredging and in-filling episodes occurring between 1931 and 1934.

Traditionally, however, the seashore and ocean were vitally important for resource extraction in the early days of settlement. Fishermen along the coast maintained a respected status within traditional Hawaiian society; Kanahele asserts that "early Hawaiians regarded fishing as the oldest, and hence the most prestigious of professions" (Kanahele 1995:17).

For those engaged in this profession, knowledge of the seas, particularly fishing grounds, was especially important. This knowledge was passed down from one generation to another. As D. Kanewanui notes, "our fishing grounds were sought by the ancestors with great patience, and those spots were revealed to their children, which is how that knowledge was passed down" (Kahā‘ulelio 2006:xv). The names of the seas of southeastern O‘ahu are listed in a chant for the high chief, Kūali‘i, paramount chief of the Hawaiian Islands from 1720 to 1740 (Cordy 2002:19). The chant also identifies the cultural resources known to be available within a specific sea. From the eastern end of Waikīkī to the western boundary of the Kona district, the seas were as follows:

A sea for surf swimming is Kahaloa [in Waikīkī]
A sea for net fishing is Kalia [in Waikīkī]
A sea for going naked is Mamala [mouth of Honolulu Harbor]
A sea for swimming is Kapuuone [in Kapālama/Kalihi]
A sea for surf-swimming sideways is Makaiwa [in Kapālama/Kalihi]

A sea for catching ‘anae [mullet] is Keehi [in Moanalua]
A sea for crabs is Leleiwi [in Moanalua]
[Fornander 1880:390]

Immediately west of the current project area, pre-Contact *kānaka ‘ōiwi* used the lagoonal/estuary environment of the Honolulu plain to construct fishponds. Fishpond walls served as sediment anchors for the accumulation of detrital reef sediments. Henry Kekahuna, a Hawaiian scholar and cartographer, describes Kaka‘ako saying, "There were formerly scattered dunes of white sand there" (Kekahuna 1958:4). The nearby Kaka‘ako reef and shoreline of the mid-nineteenth century was well regarded for *limu* (seaweed), *wana* (sea urchin), squid, and fish harvesting. Many Japanese from the Kaka‘ako area would use these waters to pick *ogo* (*Gracilaria*). *Ogo* is the Japanese name for this particular type of seaweed, however, it may also be identified by its Hawaiian, *limu manauea*. It should be noted that *limu* varied "greatly as to locality, season, and regional nomenclature" (Krauss 1993:16).

Kekahuna (1958) adds that many Gilbert Islanders made a living catching octopus and fishing in Kaka‘ako. The reef also offered good surf but the 1948 construction of the Kewalo seawall and landfill drastically altered the shoreline when the reef was infilled. By the late nineteenth century, low-lying areas were infilled and developed, permanently changing the area into its present, fully urbanized, character.

1.4.7 Built Environment

The project area is comprised of the Ala Moana Regional Park, a landscaped area with a beach, open green areas, sports areas, Magic Island, and structures on the *makai* side of Ala Moana Boulevard. Shopping centers, including the large Ala Moana Center, and condominiums line the *mauka* side of Ala Moana Boulevard.

As Robert Weyeneth notes in his study, *Ala Moana: The People's Park*:

> . . . Ala Moana Beach Park is entirely a manmade development. Its trees and shrubs are landscaping effects, arranged by the human hand, that have matured fifty years now [in 1987]. The park's oceanfront swimming hole has been carved from the fringing coral reef. The beach is the creation of hydraulic engineers, who at periodic intervals replenish the sand with imports from elsewhere on the island of Oahu. Even the site itself is a human invention, a tidal area filled by excavating the offshore reef. The passage of five decades [in 1987] has turned the park into a setting of incomparable natural beauty, but Ala Moana is what a geographer would call a "cultural" landscape. It is the product of engineering expertise and landscape design. [Weyeneth 1987:1]

The peninsula of Magic Island (‘Āina Moana), adjacent to the Ala Wai Canal and Boat Harbor,

> . . . was constructed of fill placed on 30 acres of the reef flat, and completed in 1964 (Belt 1963; Nance and Hirota 1974). Most of the fill came from the coral dredged from a future boat slip outboard of the Ala Wai Yacht Harbor. Two small beaches were made with sand brought from another part of Oahu and from Molokai. . . Detached breakwaters were constructed to protect the 'outer beach.' [Wiegel 2008:24]

No natural sediments above the water table are believed to be present within the current project area.

Section 2 Methods

2.1 Archival Research

Research centers on Hawaiian activities including *ka‘ao* (legends), *wahi pana* (storied places), *‘ōlelo no‘eau* (proverbs), *oli* (chants), *mele* (songs), traditional *mo‘olelo* (stories), traditional subsistence and gathering methods, ritual and ceremonial practices, and more. Background research focuses on land transformation, development, and population changes beginning with the early post-Contact era to the present day.

Cultural documents, primary and secondary cultural and historical sources, historic maps, and photographs were reviewed for information pertaining to the study area. Research was primarily conducted at the CSH library. Other archives and libraries including the Hawai‘i State Archives, the Bishop Museum Archives, the University of Hawai‘i at Mānoa's Hamilton Library, Ulukau, The Hawaiian Electronic Library (Ulukau 2014), the State Historic Preservation Division (SHPD) Library, the State of Hawai‘i Land Survey Division, the Hawaiian Historical Society, and the Hawaiian Mission Houses Historic Site and Archives are also repositories where CSH cultural researchers gather information. Information on Land Commission Awards (LCAs) were accessed via Waihona ‘Aina Corporation's Māhele database (Waihona ‘Aina 2000), the Office of Hawaiian Affairs (OHA) Papakilo Database (Office of Hawaiian Affairs 2015), and the Ava Konohiki Ancestral Visions of ‘Āina website (Ava Konohiki 2015).

2.2 Community Consultation

2.2.1 Scoping for Participants

We begin our consultation efforts with utilizing our previous contact list to facilitate the interview process. We then review an in-house database of *kūpuna* (elders), *kama‘āina* (native born), cultural practitioners, lineal and cultural descendants, Native Hawaiian organizations (NHOs; includes Hawaiian Civic Clubs and those listed on the Department of Interior's NHO list), and community groups. The current project area also remains significant for various other ethnic groups of the State and is utilized for events such as the Greek Festival of Hawai‘i, the Hawaiian Scottish Festival & Highland Games, the Hawaii Dragon Boat Festival, and the annual Lantern Floating Hawai‘i ceremony (see Section 4.5). Organizations and community groups associated with these events were also contacted as part of the study. CSH also contacted agencies such as SHPD, OHA, and the appropriate Island Burial Council where the proposed project is located for their response on the project and to identify lineal and cultural descendants, individuals and/or NHO with cultural expertise and/or knowledge of the study area. CSH remains open to referrals and new contacts.

2.2.2 "Talk Story" Sessions

Prior to the interview, CSH cultural researchers explain the role of a CIA, how the consent process works, the project purpose, the intent of the study, and how their *‘ike* (knowledge) and *mana‘o* (thought, opinion) will be used in the report. The interviewee is given an Authorization and Release Form to read and sign.

"Talk Story" sessions range from the formal (e.g., sit down and *kūkākūkā* [consultation, discussion] in participants choice of place over set interview questions) to the informal (e.g., hiking to cultural sites near the study area and asking questions based on findings during the field outing). In some cases, interviews are recorded and transcribed later.

CSH also conducts group interviews, which range in size. Group interviews usually begin with set, formal questions. As the group interview progresses, questions are based on interviewee’s answers. Group interviews are always transcribed and notes are taken. Recorded interviews assist the cultural researcher in 1) conveying accurate information for interview summaries, 2) reducing misinterpretation, and 3) missing details to *mo‘olelo*.

CSH seeks *kōkua* (assistance) and guidance on identifying past and current traditional cultural practices of the study area. Those aspects include general history of the *ahupua‘a*; past and present land use of the study area; knowledge of cultural sites (for example, *wahi pana*, archaeological sites, and burials); knowledge of traditional gathering practices (past and present) within the study area; cultural associations (*ka‘ao* and *mo‘olelo*); referrals; and any other concerns the community might have related to cultural practices, resources, and/or beliefs within or in the vicinity of the study area.

Per the OEQC guidelines, the CIA should also address “. . . the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained,” as well as “a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs“ (Environmental Council, State of Hawai‘i 1997). It should be noted that due to the long land use history of the Waikīkī and Honolulu areas, including several land reclamation events, there may be conflicting information in regard to the location of the original shoreline.

2.2.3 Completion of Interview

After an interview, CSH cultural researchers transcribe and create an interview summary based on information provided by the interviewee. Cultural researchers give a copy of the transcription and interview summary to the interviewee for review and ask to make any necessary edits. Once the interviewee has made those edits, we incorporate their *‘ike* and *mana‘o* into the report. When the draft report is submitted to the client, cultural researchers then prepare a finalized packet of the participant’s transcription, interview summary, and any photos that were taken during the interview. We also include a thank you card and honoraria. This is for the interviewee’s records.

It is important to CSH cultural researchers to cultivate and maintain community relationships. The CIA report may be completed, but CSH researchers continuously keep in touch with the community and interviewees throughout the year—such as checking in to say hello via email or by phone, volunteering with past interviewees on community service projects, and sending holiday cards to them and their *‘ohana* (family). CSH researchers feel this is an important component to building relationships and being part of an *‘ohana* and community.

“*I ulu no ka lālā i ke kumu*—the branches grow because of the trunk,” an *‘ōlelo no‘eau* (#1261) shared by Mary Kawena Pukui with the simple explanation: “Without our ancestors we would not be here” (Pukui 1983:137). As cultural researchers, we often lose our *kūpuna* but we did not lose their wisdom and words. We routinely check obituaries and gather information from other informants if we have lost our *kūpuna*. CSH makes it a point to reach out to the *‘ohana* of our fallen *kūpuna* and pay our respects including sending all past transcriptions, interview summaries, and photos for families to have on file for genealogical and historical reference.

Section 3 *Ka‘ao* and *Mo‘olelo* (Legends and Stories)

Hawaiian storytellers of old were greatly honored; they were a major source of entertainment and their stories contained teachings while interweaving elements of Hawaiian lifestyles, genealogy, history, relationships, arts, and the natural environment (Pukui and Green 1995:IX). According to Pukui and Green (1995), storytelling is better heard rather than read for much becomes lost in the transfer from the spoken to the written word and *ka‘ao* (legends) are often full of *kaona* or double meanings.

Ka‘ao are defined by Pukui and Elbert as a “legend, tale […], romance, [and/or], fiction” (1986:108). *Ka‘ao* may be thought of as oral literature or legends, often fictional or mythic in origin, and have been “consciously composed to tickle the fancy rather than to inform the mind as to supposed events” (Beckwith 1970:1). Conversely, Pukui and Elbert define *mo‘olelo* as a “story, tale, myth, history, [and/or] tradition” (Pukui and Elbert 1986:254). The *mo‘olelo* are generally traditional stories about the gods, historic figures or stories which cover historic events and locate the events with known places. *Mo‘olelo* are often intimately connected to a tangible place or space (*wahi pana)* (see Section 3.2 *Wahi Pana*).

In differentiating *ka‘ao* and *mo‘olelo* it may be useful to think of *ka‘ao* as expressly delving into the *wao akua* (realm of the gods), discussing the exploits of *akua* (gods) in a primordial time. *Mo‘olelo* on the other hand, reference a host of characters from *ali‘i* (royalty), to *akua* (gods) and *kupua* (supernatural beings), to finally *maka‘āinana* (commoners) and discuss their varied and complex interactions within the *wao kānaka* (realm of man). Beckwith elaborates, “In reality, the distinction between *ka‘ao* as fiction and *mo‘olelo* as fact cannot be pressed too closely. It is rather in the intention than in the fact” (Beckwith 1970:1). Thus, a so-called *mo‘olelo*, which may be enlivened by fantastic adventures of *kupua*, “nevertheless corresponds with the Hawaiian view of the relation between nature and man” (Beckwith 1970:1).

Both *ka‘ao* and *mo‘olelo* provide important insight into a specific geographical area, adding to a rich fabric of traditional knowledge. The preservation and passing on of these stories through oration remains a highly valued tradition. Additionally, oral traditions associated with the study area communicate the intrinsic value and meaning of a place, specifically its meaning to both *kama‘āina* as well as others who also value that place.

The project area is located offshore from portions of Kukuluāe‘o and Kewalo, two *‘ili* of Honolulu, and Kālia, an *‘ili* of Waikīkī. Sheridan and Pi‘ikoi streets generally follow the ancient boundary line dividing Honolulu to the west from Waikīkī to the east, as shown on maps of Honolulu from 1884 and 1891 (see Figure 12 and Figure 14). On the west side of Pi‘ikoi Street is a small section of the *‘ili* of Kewalo, an *‘ili kū* of Pauoa, then further west is Kukuluāe‘o, an *‘ili kū* of Makiki. Today, Pi‘ikoi Street also marks the eastern boundary of a modern land section called the Kaka‘ako Development District, which includes several *‘ili* stretching from Punchbowl Street to Pi‘ikoi Street, and some of the lands of Kukuluāe‘o and Kewalo. In the following report sections, *ka‘ao* and *mo‘olelo* of both Waikīkī and Honolulu will be presented.

The following sections seek to present traditional accounts of ancient Hawaiians living in the vicinity of the study area. They tell of times before the first Hawaiian to an age of mythical characters whose epic adventures inadvertently lead to the Hawaiian race of *ali‘i* (chief) and *maka‘āinana* (commoner) alike. The *ka‘ao* in and around the study area shared below are some of the oldest Hawaiian stories that have survived and still speak to the characteristics and environment of the area and its people.

3.1 *Ka‘ao* and *Mo‘olelo* of Waikīkī

The marshland of Waikīkī was watered from streams in the Makiki, Mānoa, and Pālolo valleys, and from springs in Mānoa such as Punahou and Kānewai. The name Waikīkī, which means “water spurting from many sources” (Pukui et al. 1974:223), was well adapted to the character of the swampy land of ancient Waikīkī, where water from the upland valleys of Mānoa and Pālolo would gush forth from underground. Before construction of the Ala Wai Canal, the Mānoa and Pālolo streams did not merge until deep within Waikīkī. As they entered the flat Waikīkī Plain, the names of the streams changed; the Mānoa became the Kālia and the Pālolo became the Pāhoa. They joined near Hamohamo (now an area *mauka* [inland] of the Kapahulu Library) and then divided into three new streams, the Kuekaunahi, ‘Āpuakēhau, and Pi‘inaio. The Kuekaunahi once emptied into the sea at Hamohamo (near the intersection of ‘Ōhua and Kalākaua avenues). The ‘Āpuakēhau, also referred to on some maps as the Muliwai o Kawehewehe, or “the stream that opens the way” (Kanahele 1995:7), emptied into the ocean at Helumoa, between the Royal Hawaiian and Moana hotels. The Pi‘inaio entered the sea in a wide delta at Kālia. The land between these three streams was called Waikolu, meaning “three waters” (Kanahele 1995:7–8).

Pi‘inaio Stream extends through the center of Kālia ‘Ili. The meaning of Pi‘inaio is uncertain but it could be an allusion to going inland (*pi‘i*) to the location of a *naio* tree (bastard sandalwood; *Myoporum sandwicense*), near a stream crossing. The name of the area, “Kālia,” translated as “waited for” (Pukui et al. 1974:77), provides a sense of “waiting,” “loitering,” or “hesitating.” While the nuance is uncertain, the mouth of the Pi‘inaio Stream would be a logical place for travelers to stop. Others believe the place was named after the native tree *kālia (Elaeocarpus bifudus*) (Clark 2011:437), which the Hawaiians used as thatching rods for their house roofs (Thrum 1891:95).

3.1.1 Kalamakua and His Romantic Meeting with Keleanuinoho‘ana‘api‘api (“Great Kelea who flutters”)

The area of Kālia marked the end point of the Kalehuawehe surfing course, a surfing course that extended from the “surfing *heiau* [temple, shrine]” of Papa‘ena‘ena, at the foot of Lē‘ahi (Diamond Head) to Kawewehi (the deep, dark surf) at Kālia (Kanahele 1995:56). Although most every level of society surfed, including women and children, *ali‘i* were the true masters of the sport. The best surfer among Waikīkī’s chiefs was Kalamakua (Kanahele 1995:57). “He came from a long ancestry of champion surfers whose knowledge, skill, and *mana* were handed down and passed on from generation to generation” (Kanahele 1995:57). His love affair with Keleanuinoho‘ana‘api‘api (Great Kelea who flutters) reaffirms the central role that surfing played in the history of Waikīkī (Kanahele 1995:57):

> One day this beautiful chiefess with ‘clear skin and sparkling eyes,’ who then resided in Wahiawā (in Central O‘ahu), was visiting Waikīkī with a few of her ladies-in-waiting. She entered the coconut grove and beach of Kawehewehe […] which was located just east of the Halekūlani Hotel. Here is where the sick came to bathe and to be healed. They would wear *limu-kala* (seaweed) leis and leave them

> in the water as a request to the gods for forgiveness of past wrongs which was the cause of much illness.
>
> The residents welcomed Keleanuinoho‘ana‘api‘api and offered her coconuts to eat. She remarked that Waikīkī was ‘the most pleasant place we have seen,’ to which her hosts replied, ‘This is a place for enjoyment. Over there is the *kou* grove of Kahaloa where one may view the surfing of the chiefs and of the *ali‘i nui* Kalamakua.’ Kahaloa, or ‘Long Place,’ was also a beach area located today between the Royal Hawaiian and Halekūlani hotels and noted for its fragrant *līpoa* seaweed. When she asked if she could borrow a surfboard, the Waikīkīans were surprised because they thought people from Wahiawā were only adept at ‘slicing *mo‘okilau* ferns and *pōpolo* stalk,’ not at surfing. They did not know that their visitor was originally from Maui where she surfed with all the chiefs. She was too beautiful to refuse and someone gave her a board.
>
> Before she entered the water, she ‘rubbed off the red dirt of ‘Ewa from her feet so as to look fresh,’ and then paddled off like an expert, moving easily and noiselessly without the least heeling over. Instead of starting at the first break where *kama‘āina* (native born or old-time resident) surfers congregated, she went beyond and waited for a large wave. She let the first, second and third waves pass, and rode the fourth all the way to shore. The chiefs and commoners were so impressed with her skill and grace that they immediately joined in loud cheers of admiration.
>
> Meanwhile, Kalamakua, who was working in his taro fields nearby asked his men who was causing the commotion. They replied that the people were amazed at the performance of a female surfer. A skilled surfer himself, Kalamakua rushed to the edge of the beach to see for himself. He recognized Kelea at once as the chiefess from Maui famed for her surfing prowess.
>
> When she reached shore, he took hold of her board and asked, ‘Are you Kelea?’ ‘Yes,’ she answered. As she stood up, in naked splendor, he removed his feathered shoulder cape and wrapped it around her. Then he guided her to a *kapu* place and made her his *ali‘i wahine mō‘ī*, or queen. [Kanahele 1995:56–58]

3.1.2 The Shark God Ka‘ehu

In his book *Waikīkī: 100 B.C. to 1900 A.D. An Untold Story*, author George Kanahele discusses a particular legend concerning a man-eating shark in the waters off Waikīkī. In this *mo‘olelo* “the little yellow shark Ka‘ehu of Pearl Harbor who was endowed with magical power by his ancestor Kamohoali‘i, the shark god and brother of Pele” (Kanahele 1995:58) devises a plan to destroy the man-eating shark who threatens the people of Waikīkī:

> One day Ka‘ehu called his shark friends to accompany him to Puna. On the way they stopped at Waikīkī where they met Pehu, a man-eating shark from Maui, who was swimming back and forth at Kalehuawehe in wait for an unsuspecting surfer.
>
> Ka‘ehu asked what Pehu was doing there and he replied, ‘I‘m catching a crab for my breakfast.’ ‘We‘ll help you catch your crab,’ Ka‘ehu said, and told him to go near the coral reef while he and his friends would drive them shoreward, allowing

Pehu to catch this crab easily. He was pleased with the plan and swam close to the reef where he hid himself in its shadows.

Then Ka‘ehu told his friends, ‘We must kill this man-eater because he is destroying our people. Let’s try to push him into the shallow water.’

Soon two surfers appeared and when Pehu leaped to catch one, Ka‘ehu and his friends pushed the surfer aside and hurled Pehu over the reef into a deep hole in the coral. The more he thrashed about to escape, the more trapped he became.

When the surfers saw what had happened, they were not as afraid of Pehu and moved to the hole to kill him. As they cut into his body they discovered the remains of their own people. Out of respect, they delivered them to Pele‘ula (an area with many healing heiau located in Kou, now downtown Honolulu) and burned the remains. Ka‘ehu had many more adventures that had a similar objective, the punishment of other man-eaters from the great sea. [Kanahele 1995:58–59]

3.2 *Ka‘ao* and *Mo‘olelo* of Honolulu

Pukui et al. (1974:49–50) literally translates Honolulu as “protected bay,” which refers to the protection of Honolulu Harbor. Older names for the harbor are Kou and Māmala. According to Westervelt, Honolulu is a name made by the union of the two words “*Hono*” and “*lulu*.” Westervelt explains as follows:

Some say it means ‘Sheltered Hollow.’ The old Hawaiians say that ‘Hono’ means ‘abundance’ and ‘lulu’ means ‘calm,’ or ‘peace,’ or ‘abundance of peace.’ The navigator who gave the definition ‘Fair Haven’ was out of the way, inasmuch as the name does not belong to a harbor, but to a district having ‘abundant calm,’ or ‘a pleasant slope of restful land.’ ‘Honolulu’ was probably a name given to a very rich district of farm land near what is now known as the junction of Liliha and School Streets, because its chief was Honolulu, one of the high chiefs of the time of Kakuhihewa, according to the legends. [Westervelt 1915:14]

3.2.1 The Legend of Kapo‘i Kukaeunahiokapueo

In one legend, Kewalo (located immediately west of the current project area) is a marsh near the beach, where tall *pili* grass grew. A man named Kapo‘i went to this area to get thatching for his house. While there, he found seven eggs of a *pueo* (Hawaiian short-eared owl; *Asio fammeus sandwichensis*) and took them home to cook for his supper. An owl perched on the fence surrounding his house and cried out “O Kapoi, give me my eggs!” After several such pleas, Kapo‘i eventually returned the eggs. In return, the owl became his *‘aumakua* (deified ancestor) and instructed him to build a *heiau* named Mānoa. Kapo‘i built the *heiau*, placed some bananas on the altar as a sacrifice, and set the *kapu* days for its dedication. The king of O‘ahu, Kākuhihewa, who was building his own *heiau*, had made a law that if any man among his people erected a *heiau* and set the *kapu* before him, that man should die. Kapo‘i was seized and taken to the *heiau* of Kūpalaha at Waikīkī. Kapo‘i’s *‘aumakua* asked for aid from the king of the owls at Pu‘u Pueo in Mānoa, who gathered all of the owls of the islands. They flew to Kūpalaha and battled the king’s men, who finally surrendered: “The owls scratched at the eyes and noses of the men and befouled them with excrement” (Kamakau 1991:23). From this time, Hawaiians considered the owl a powerful

akua (god, divine). Because of this battle, the Hawaiians named the area Kukaeunahiokapueo, which means, “the confused noise of owls rising in masses” (Thrum 1998:200–202; Westervelt 1963:135–137).

3.2.2 Kū‘ula

Both Waikīkī and Kaka‘ako are mentioned in Thrum’s version of the legend of Kū‘ula, the god presiding over the fish, and his son ‘Ai‘ai. ‘Ai‘ai was the first to teach Hawaiians how to make various fishing lines and nets, the first to set up a *ko‘a kū‘ula*, a rock shrine on which the fishermen placed their first catch as an offering to Kū‘ula, and the first to set up *ko‘a i‘a*, fishing stations where certain fish were known to gather. Leaving his birthplace in Maui, ‘Ai‘ai traveled around the islands, establishing *ko‘a kū‘ula* and *ko‘a ia*. On O‘ahu, he landed first at Makapu‘u in Ko‘olaupoko, and then traveled clockwise around the island:

Aiai came to Kalia [Waikīkī] and so on to Kakaako. Here he was befriended by a man named Apua, with whom he remained several days, observing and listening to the murmurs of the chief named Kou. This chief was a skillful haiku [bonito] fisherman, his grounds being outside of Mamala until you came to Moanalua. There was none so skilled as he, and generous withal, giving akus to the people throughout the district. [Thrum 1998:242]

In Fornander’s “Legend of ‘Ai‘ai,” ‘Ai‘ai is identified as the son of Kū‘ua and Hina. The family was believed to have originally resided in Niolapa, an *‘ili* of Nu‘uanu around Wyllie Street. The couple had a pearl fishhook named Kahu‘oi. The fishhook was kept at Kaumakapili by the bird Kamanuwai. When Kū‘ula went to fish at Māmala (Honolulu Bay), the lure was so enticing that the *aku* (Skipjack tuna; *Katsuwonus pelamis*) would jump into his canoe which would fill to feed both his family and Kamanuwai. One day the king of Honolulu, Kipapalaulu, saw the amazing behavior of the fish and stole Kahu‘oi, the fishhook:

This act not only deprived Ku‘ula of his favorite hook, but the bird also hungered from loss of its food. Through this seizure of the pearl hook by Kipapalaulu the bird went without any food, it would fly on its roosting place and go to sleep. It was because the bird, Kamanuwai, closed its eyes from hunger was the reason why the place where it lived was called Kaumakapili, and the place is so called to this day. [Fornander 1917:4(3):556]

3.3 Wahi Pana (Legendary or Storied Places)

Wahi pana are legendary or storied places of an area. These legendary or storied places may include a variety of natural or human-made structures. Oftentimes dating to the pre-Contact period, most *wahi pana* are in some way connected to a particular *mo‘olelo*, however, a *wahi pana* may exist without a connection to any particular story. Davianna McGregor outlines the types of natural and human-made structures that may constitute *wahi pana*:

Natural places have mana, and are sacred because of the presence of the gods, the akua, and the ancestral guardian spirits, the ‘aumakua. Human-made structures for the Hawaiian religion and family religious practices are also sacred. These structures and places include temples, and shrines, or heiau, for war, peace, agriculture, fishing, healing, and the like; pu‘uhonua, places of refuge and

> sanctuaries for healing and rebirth; agricultural sites and sites of food production such as the lo‘i pond fields and terraces slopes, ‘auwai irrigation ditches, and the fishponds; and special function sites such as trails, salt pans, holua slides, quarries, petroglyphs, gaming sites, and canoe landings. [McGregor 1996:22]

As McGregor makes clear, *wahi pana* can refer to natural geographic locations such as streams, peaks, rock formations, ridges, offshore islands and reefs, or they can refer to Hawaiian land divisions such as *ahupua‘a* or *‘ili*, and man-made structures such as fishponds. In this way, the *wahi pana* of Waikīkī and Honolulu tangibly link *kama‘āina* to their past. It is common for places and landscape features to have multiple names, some of which may only be known to certain *‘ohana* or even certain individuals within an *‘ohana*, and many have been lost, forgotten or kept secret through time. Place names also convey *kaona* (hidden meanings) and *huna* (secret) information that may even have political or subversive undertones.

Before the introduction of writing to the Hawaiian Islands, cultural information was exclusively preserved and perpetuated orally. Hawaiians gave names to literally everything in their environment, including individual garden plots and *‘auwai* (water courses), house sites, intangible phenomena such as meteorological and atmospheric effects, *pōhaku* (rock, stone), *pūnāwai* (freshwater springs), and many others. According to Landgraf (1994), Hawaiian *wahi pana* “physically and poetically describes an area while revealing its historical or legendary significance” (Landgraf 1994:v). A *wahi pana* leaves an imprint on the landscape even if its tangible properties no longer exist, as the *mana* (divine power) of previous people and events associated with this space continues to manifest itself.

3.3.1 *Wahi Pana* of Waikīkī

3.3.1.1 Kālia ‘Ili

Kālia had rich fishing grounds and reefs, beaches, and tide pools for collecting mollusks, crabs, and seaweed, and a swampy area well suited for salt pans, as shown on a 1909 map of Waikīkī (Figure 8). It was famous for one type of edible *limu* (seaweed) called *limu ‘ele‘ele* (*Enteromorpha prolifera*), or black seaweed. *Limu ‘ele‘ele* was common along coastlines with freshwater intrusions, such as the Pi‘inaio Stream or at inland fishponds (Abbott 1984:17). It should be noted that *limu*, as a food source, was primarily used as a condiment or relish. The offshore waters of Kālia were also used for surfing; many of these areas no longer exist, as dredging and land filling have destroyed the ancient breaks.

There are several *‘ōlelo no‘eau* (poetical sayings) referring to Kālia, its lands, and resources. Mary Kawena Pukui (1983) collected several in her book, *‘Ōlelo No‘eau. Hawaiian Proverbs & Poetical Sayings* (see Section 3.4 *‘Ōlelo No‘eau*). In addition, John Clark (2011) has recently collected and translated sayings from old Hawaiian language newspapers, which are printed in his book *Hawaiian Surfing*. Several sayings reference the sea, the surf, the wind, or the rain of Kālia.

> *E ho-i, E ho-i e Kilopu ka wai hale i* ***Kalia****. He wai na ka ua Naulu mai luna.*
>
> Return, return, o Kili‘opu, the fresh waters that fill **Kalia**. These are the waters of the Nāulu rains from the uplands. [*Ka Nupepa Kuokoa*, 23 April 1864:2; Clark 2011:438]
>
> .

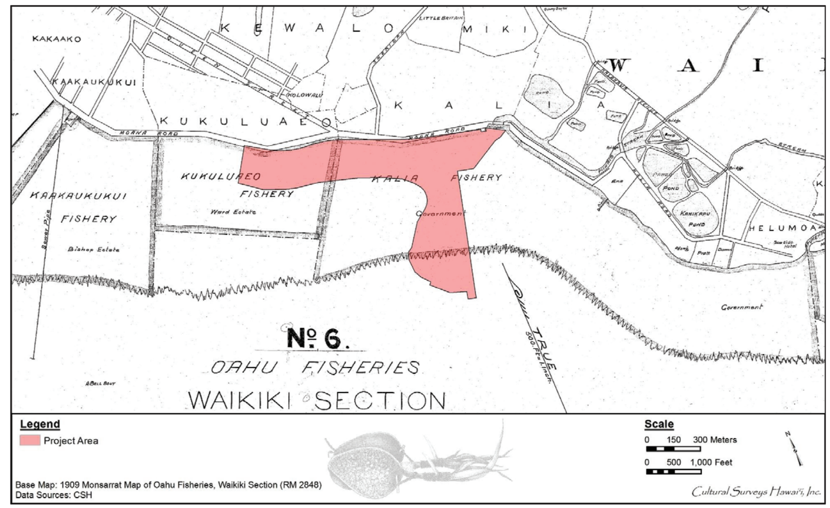


Figure 8. 1909 Monsarrat map of Oahu Fisheries, Waikiki Section showing the project area within the offshore fisheries of Kukuluāe‘o and Kālia, showing project area mainly within the shallow reef area of the fisheries

E Kalia i ke kai nehe i ka pu-eone, ame wai limu nii o Piinaio

Oh, Kalia in the gentle rustling of the waves on the sand dunes and the plentiful fresh water seaweed of Pi‘inaio stream. [*Ka Nupepa Kuokoa,* 9 April 1925:5; Clark 2011:438]

Ke haaheo ae la i ke kai o ***Kalia*** We are proud of the sea of **Kalia**
[*Ka Nupepa Kuokoa,* 22 March 1862:3; Clark 2011:437]

E hoi ka nanai i Ulukou la,	Beauty rests in Ulukou.
I ka nalu hoi muku i Kapuna la,	In the waves that break at Kapuni.
Punihei ho au ia la la la,	I am taken by him,
I ka leo o ke kai leo nui la.	By the great voice of the sea,
Ke wa mai la i ***Kalia*** *la.*	It makes a thundering noise at **Kalia**

[*Ka Hoku o ka Pakipika,* 12 April 1862:4; Clark 2011:438]

Kālia was also known for a certain type of fishing technique used to catch schools of mullet. When a school of mullet appeared, a bag net was set and the men swam out in a row. They surrounded the fish, slapped the water and kicked their feet, thus driving the frightened fish into the opening of their bag net. The fishermen of Kālia became known as human fishnets (Pukui 1983:150). This particular type of net was used because the water off Kālia was very shallow (Pukui 1983:74).

Kuu hoa o ka i-a lauahi lima o ***Kalia*** My companion who holds the fishnet at **Kalia**
[*Ka Nupepa Kuokoa*, 12 April 1862:4; Clark 2011:438]

He kai hopuni ko ***Kalia****.* A sea for surround [nets] is at **Kalia**
[*Ka Nupepa Kuokoa*, 19 January 1867:1; Clark 2011:438]

The mullet were caught on their annual migration from their home in Pearl Harbor as they traveled around the island of O‘ahu:

. . . starting from Puuloa and going windward, passing successively Kumumanu, Kalihi, Kou, **Kalia**, Waikiki, Kaalawai and so on, around to the Koolau side, ending at Laie, and then return by the same course to their starting point. [Keliipio 1900:112]

Kālia was one of eight important fisheries along the Waikīkī coast. The fishing grounds from the reef to the shore were so rich they were *kapu* (restricted) to anyone but the king and his representatives during certain seasons (Maly and Maly 2003:244).

Kalia is one of eight fishing grounds (also called fisheries) on the shoreline of Waikīkī. From east to west they are: Ka‘alāwai, Kuilei, Kea‘ua‘u, Kaluāhole, Kapua, Kāneloa, Hamohamo, and **Kalia.** [*Honolulu Advertiser*, 11 March 1923:12; map of the fisheries of O‘ahu in Clark 2011:438]

Penei kana, ‘E hoomaka ana ke kapu ma ka muliwai o Piinaio, a hiki i ke kai o ***Kalia****. Aole loa kekahi e lawaia malaila.’*

This is what he said, ‘The restriction will commence at the stream of Pi’inaio to the sea at **Kālia**. No one is allowed to fish there.’ [*Ka Hoku o ka Pakipika,* 10 April 1862:4; Clark 2011:438]

Kālia is also mentioned in a story about a woman who left her husband and children on Kīpahulu, Maui and followed a man from O‘ahu. Her husband missed her and went to see a *kahuna* (priest) who was skilled in *hana aloha* sorcery. The *kahuna* told the man to find a container with a lid and to speak into it of his love for his wife. The *kahuna* then uttered an incantation into the container, closed it, and threw it into the sea. The wife was fishing one morning at Kālia, O‘ahu, and saw the container. She opened the lid and was possessed by a great longing to return to her husband. She walked until she found a canoe to take her home. This story led to the saying:

Ka makani kā‘ili aloha o Kīpahulu. The love-snatching wind of Kīpahulu.

[Pukui 1983:158]

3.3.1.2 Healing Waters of Kawehewehe

The healing waters of Kawehewehe, comprising the nearshore waters between Kālia and Helumoa, is said to be located near the present-day Halekulani Hotel. Kawehewehe takes its meaning from the root word, *wehe*, which can be translated as “to remove” (Pukui et al. 1974:383). Thus, as the name implies, Kawehewehe was a traditional place where people went to be cured of all types of physical and spiritual illnesses. Two healing areas share the name Kawehewehe, one being a healing pond and the other a beach. Kawehewehe pond was located in the vicinity of Saratoga Road. As a treatment for illness and defilement, the sick were brought here to bathe in the healing waters of the ocean. As part of the healing ritual, the ill might wear a *lei* (garland) made from the *limu kala* (*Sargassum* species), a seaweed that had both ceremonial and food uses (Abbott 1992:116), and leave it in the water as a request that his sins be forgiven; hence the origin of the name *kala* (“the removal,” Pukui et al. 1974:99). By ducking under the water, the ill person releases the *lei* from around his neck, letting the *lei* float out to sea. Upon turning around to return to shore, the custom is to never look back, symbolizing the *‘oki* (to sever or end) and putting an end to the illness; as well as forgiveness (*kala*) and the leaving of anything negative behind. It is uncertain if the tradition of Kawehewehe as a healing place originated hundreds of years ago in Hawaiian history or whether it began after the introduction of foreign diseases and epidemics that decimated thousands of Hawaiians.

3.3.1.3 Waikīkī Trail and Beach Road

As will be expanded upon in later sections, the vast majority of Ala Moana Regional Park is reclaimed or dredged land. Of particular note for the present project is the traditional Hawaiian trail that ran along the coast which began in pre-Contact times as a foot path, developed into a horse path, then into a cart path popularly known as “Beach Road” and ultimately into Ala Moana Boulevard.

John Papa ‘Ī‘ī provided a written account of the Waikīkī path of his experience ca. 1810 from which Gerald Ober produced a reconstructed figure (Figure 9).

A trail led out of the town at the south side of the coconut grove of Honuakaha and went on to Kalia. From Kalia it ran eastward along the borders of the fish ponds and met the trail from lower Waikiki . . .

The trail from Kawaiahao which led to lower Waikiki went along Kaananiau, into the coconut grove at Pawaa, the coconut grove of Kuakuaka, then down to Piinaio;

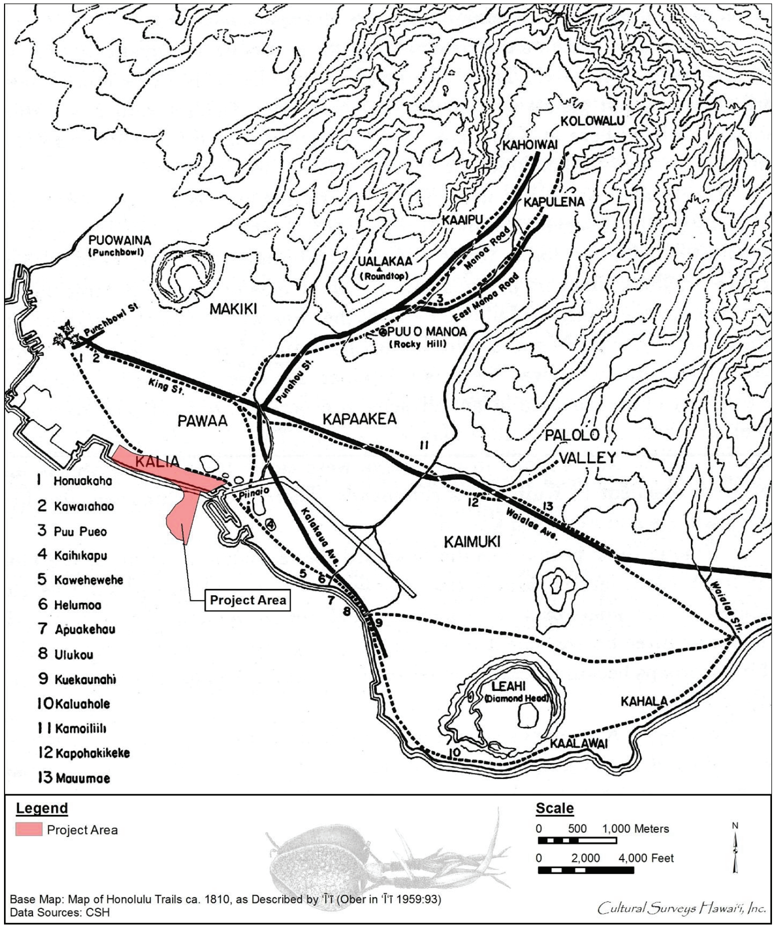


Figure 9. Map depicting project area in red and trails from Punchbowl Street to Waialae as described by ‘Ī‘ī (1959:93)

> along the upper side of Kahanaumaikai’s coconut grove, along the border of Kaihikapu pond, into Kawehewehe; then through the center of Helumoa of Puaaliilii, down to the mouth of the Apuakehau stream. [‘Ī‘ī 1959:92]

It is unclear from ‘Ī‘ī’s account whether the trail was immediately coastal in the project vicinity but this is how it is shown on early maps.

3.3.1.4 *Heiau*

Thomas G. Thrum reports that eight *heiau* were once located in Waikīkī, consisting of Papa‘ena‘ena Heiau, Kapua Heiau, Kūpalaha Heiau, Helumoa Heiau, Makahuna Heiau, Kamauakapu Heiau, Pahu-a-Maui Heiau, and Kulanihakoi Heiau (Thrum 1905:44–45). Samuel Kamakau notes another *heiau* of Waikīkī called Halekumukaaha Heiau (Kamakau n.d. in McAllister 1933:78), and early historic maps by C.J. Lyons (Registered Maps [RM] 726 and 727) indicate the location of another *heiau* called Ōpūnahā Heiau. Several of the *heiau* were of *po‘okanaka* (sacrificial) classification and used ceremoniously for human sacrifices (Stokes 1991:24). These *heiau*, however, did not exist within or in close proximity to the current project area.

3.3.2 *Wahi Pana* of Honolulu

Central Honolulu consists of the *ahupua‘a* of Nu‘uanu, Pauoa, Makiki, Mānoa, and Pālolo, from west to east. At one time these *ahupua‘a* probably extended from the Ko‘olau mountain range down to the sea, as is typical of *ahupua‘a* on other parts of O‘ahu. The Kaka‘ako coast fronted a narrow channel leading to Māmala, the entrance, and to the harbor, called Kuloloia. Due to the importance of Kuloloia (Honolulu Harbor) to the west and the *ali‘i* (high chiefs) residences on the Waikīkī shore, these lands were “cut off” in the late pre-Contact or early post-Contact period, and the coastal areas of Nu‘uanu, Pauoa, and Makiki became Honolulu Ahupua‘a, while the coastal areas of Mānoa and Pālolo became Waikīkī Ahupua‘a. Many individual *‘ili* within Honolulu and Waikīkī, however, still had some association with their original *ahupua‘a*. Some *‘ili lele*, or “jump lands,” were still part of an *ahupua‘a*, although possibly no longer contiguous with the rest of the *ahupua‘a*. Additionally, they could be *‘ili kūpono*, shortened to *‘ili kū*, which were independent from their original *ahupua‘a* (Lucas 1995:40–41). The following sections present *wahi pana* and associated *mo‘olelo* for Kukuluāe‘o and Kewalo, two *‘ili* of Honolulu.

3.3.2.1 Kukuluāe‘o and Kewalo ‘Ili

Kukuluāe‘o, an *‘ili kū* of Makiki, which translates literally as the “Hawaiian stilt (bird),” means “to walk on stilts” (Pukui et al. 1974:23). This area with its marshes, saltpans, and small fishponds (Kekahuna 1958:4), was an ideal environment for the Hawaiian stilt (Griffin et al. 1987:36).

Kewalo literally means “the calling (as an echo)” (Pukui et al. 1974:109). This large *‘ili kū* of Pauoa extended from an area on the west side of Makiki above Punchbowl Crater down to a narrow beach section west of Pi‘ikoi Street. According to Pukui et al. (1974:109), *kauwā* intended for sacrifice were drowned there. Furthermore, Sterling and Summers (1978:291) adds that, “Human sacrifices were drowned in Kewalo, then brought to the heiau of Kane-laau. . .”. At one time, there was a sand beach at Kewalo, where various sports, such as surfing took place (Kekahuna 1958). The *‘ōlelo no‘eau*, “*Ka wai huahua‘i o Kewalo*,” which translates as “The bubbling water of Kewalo” (Pukui 1983:178), suggests that Kewalo once contained a freshwater spring. A *mo‘olelo* of Kawaiaha‘o also mentions two springs in Kewalo— Kawaiaha‘o (The Waters of Ha‘o) and Kewalo Spring (Pukui 1988:87–89).

3.3.2.2 Ka‘ākaukukui

Ka‘ākaukukui, now a filled-in reef, means "the right (or north) light," and it may refer to a maritime navigational landmark. According to Kekahuna (1958:4), Ka‘ākaukukui was a beautiful sand beach and reef that formerly extended a quarter mile along Ala Moana Regional Park to Kewalo Basin. Various translations of Ka‘ākaukukui include "radiating place for lamp" (Thrum 1922:635) and "to the right of the lighthouse" (Gessler 1937:187). This would have been an accurate description of the area at that time as Ka‘ākaukukui was east, or "to the right" of the Honolulu Lighthouse in the harbor. This is probably a historic, not an ancient, interpretation as the Honolulu Lighthouse was not built until 1869 (Dean 1991:7). Ka‘ākaukukui was a *lele* (a detached part or lot of land belonging to one *‘ili* and located in another) with one parcel on the coast and two other, non-contiguous parcels inland. Ka‘ākaukukui was adjacent on the *mauka* side to several other small *‘ili* and *lele* lands, including portions of Pu‘unui and Pualoalo (Thrum 1922:667).

3.3.2.1 Pākākā Heiau

Pākākā was the name of a canoe landing and later a wharf built off the point in 1827. The name literally means "to skim, as stones over the water" (Pukui et al. 1974:175). Thrum (1906) generated several lists and surveys of *heiau* and noted that Peter Corney, a visitor to the island in 1819, saw several *heiau* along the Honolulu shore:

> There are several morais [*heiau*], or churches in the village, and at new moon the priests, chiefs and hikanees (aikane) [friends] enter them with offerings of hogs, plantains, and cocoanuts, which they set before the wooden images. The place is fenced in, and have [*sic*] pieces of white flags flying on the fences. [Corney 1896:101]

Westervelt (1915:21) identifies Pākākā Heiau as once being the main royal temple in Honolulu and the headquarters for priests, with the nearby wharf a possible part of the complex. The walls of the *heiau* were decorated with sacrificial heads of men. Westervelt relates that Pākākā was built before the time of Kākuhihewa, and was later owned by Kīna‘u, the mother of Kamehameha V. In the *mo‘olelo*, "The God of Pakaka Temple," the creation of Pākākā Heiau is told. On Maui the god Ku-hoo-nee-nuu was cut from a tree and Waihua Heiau was built for this god.

> The mana, or divine power, of this god was very great, and it was a noted god from Hawaii to Kauai . . . The king who was living on the island Oahu heard about this tree, and sent servants to the island Maui to find out whether or no the reports were true. If true they should bring that god to Oahu. They found the god and told the chief that the king wanted to establish it at Kou [ancient Honolulu], and would build a temple for it there. The chief readily gave up his god and it was carried over to its new home. So the temple, or heiau, was built at Kou and the god Ku-hoo-nee-nuu placed in it. This temple was Pakaka, the most noted temple on the island Oahu, while its god, the log of the tree from a foreign land, became the god of the chiefs of Oahu. [Westervelt 1915:28]

In 1816, a fort named Kekuanohu was constructed in this area, roughly *mauka* of Pākākā Heiau; the adjacent street was called Fort Street. Liloliho, Kamehameha II, built a palace complex in this

area in 1821, possibly on the former Pākākā Heiau platform. Klieger (1997:15–16) has suggested the Pākākā Palace complex may have lasted until around 1826, when a new royal compound was built for Kamehameha III within the town of Honolulu, near the modern junction of Alakea and Beretania streets.

Kekuanohu Fort was demolished in 1857 and the stones from the wall were used to create a seawall (Pukui et al. 1974:30), which was then filled to create a new land, called the Esplanade or ‘Āinahau, *hau* tree (beach hibiscus; *Hibiscus tiliaceus*) land (Pukui et al. 1974:7).

3.3.2.2 Pu‘ukea Heiau

The chief Huanuikalala‘ila‘i governed Pu‘ukea Heiau in the land section of Kukuluāe‘o, according to Kamakau (1991:24). Pu‘ukea literally means "white hill" (Pukui et al. 1974:199) and is also the name of a small land division within the *‘ili* of Kukuluāe‘o that is mentioned in at least two Land Commission cases, LCA 1502 (not awarded) and LCA 1504. LCA 1504 is located near the junction of Halekauwila Street and Cooke Street. It is common for a *heiau* to have the same name as the *‘ili* in which it is located, so it is possible that Pu‘ukea Heiau was also near the junction of Halekauwila and Cooke streets. The majority of the house sites in the mid-nineteenth century in Kukuluāe‘o were located near Halekauwila Street and Queen Street, *mauka* of the low-lying coastal swamplands on higher, dry ground. It is possible the *heiau* platform was built on one of the few elevated locations in the flat, low-lying swamp that surrounded it, and thus gained the name Pu‘u kea, or "white hill."

Kamakau (1991) recorded a traditional *wānana* (prophecy) that mentions the chief Huanuikalala‘ila‘i of Pu‘ukea Heiau:

[Ka makaua ua kahi o ‘Ewa]	[The increasing ‘first rain’ of ‘Ewa]
Ua puni ka i‘a o Mokumoa,	Overcomes the fish of Mokumoa,
Ua kau i‘a ka nene;	Washes up fish to the nene plants;
Ua ha‘a kalo ha‘a nu;	Lays low the taro as it patters down;
Ha‘a ka i‘a o Kewalo,	Lays low the fish of Kewalo,
Ha‘a na ‘ualu o Pahua,	Lays low the sweet potatoes of Pahua,
Ha‘a ka mahiki i Pu‘ukea,	Lays low the mahiki grass at Pu‘ukea,
Ha‘a ka unuunu i Pele‘ula,	Lays low the growing things at Pele‘ula
Ha‘a Makaaho i ke ala.	Lays low Makaaho [Makāho] in its path
E Kū e, ma ke kaha ka ua, e Kū,	O Kū, the rain goes along the edge [of the island], O Kū
[I ‘ai na ka i‘a o Maunalua] . . .	[‘Eating’ the fish of Maunalua] . . .

[Kamakau 1991:24–25]

The chant also mentions the *mahiki* grass (seashore rush grass; *Sprorbolus virginicus*) of Pu‘ukea, a tufted rush found near the seashore. The term *mahiki* connotes several historical and contemporary meanings. With serious family discord, a *kupuna* (grandparent, ancestor) can continue with lines of inquiry of *ho‘oponopono* (family conference in which relationships are set right) to “peel off” layers of deeper feelings (Pukui et al. 1972:228). In a deeper Hawaiian past, skilled *kāhuna* (priests) formely exorcised malicious spirits from the afflicted in an exorcist ritual with the aid of *mahiki* (Pukui and Elbert 1986:219). The use of this grass in a ritual may explain its association with a ceremonial *heiau*, or it may simply be that the Kukuluāe‘o coast was a good habitat and thus a favored place for healers to collect this type of grass.

3.3.2.3 Kawaiaha‘o Spring

Two springs in Kewalo are mentioned in the *mo‘olelo* of “The Waters of Ha‘o (Kawaiaha‘o),” which describes two children of the chief Ha‘o who ran away from their cruel stepmother. They stayed for a time with the caretakers of Kewalo Spring, which may have been located close to the trail that connected Waikīkī and Honolulu. The children then left when they heard that the female chief had sent men to look for them. The two children followed the moonlit trail across the plain toward Kou (Honolulu), but finally collapsed from weariness and thirst. In a dream, the boy’s mother told him to pull up a plant close to his feet. When he did, he found a spring under the plant, which was called the Water of Ha‘o, or Kawaiaha‘o. This spring is located at the western end of the trail, near Kawaiaha‘o Church in Kaka‘ako (Pukui 1988:87–89).

3.3.2.4 Kawailumalumai, Fishpond of Kewalo

The Kewalo area once had a famous pond used to drown members of the *kauwā* (outcaste, slave) class or *kapu* (taboo) breakers in a sacrificial ritual known as *Kānāwai Kaihehe‘e* (Kamakau 1991:6) or *Ke-kai-he‘ehe‘e*, which translates as “sea sliding along,” suggesting the victims were slid under the sea (Westervelt 1963:16). Kewalo is described thus:

> A fishpond and surrounding land on the plains below King Street, and beyond Koula. It contains a spring rather famous in the times previous to the conversion to Christianity, as the place where victims designed for the Heiau of Kanelaau on Punchbowl slopes, was first drowned. The priest holding the victim’s head under water would say to her or him on any signs of struggling, ‘*Moe malie i ke kai o ko haku*.’ ‘Lie still in the waters of your superiors.’ From this it was called Kawailumalumai, ‘Drowning waters.’ [Sterling and Summers 1978:292]

3.3.2.5 Kaimuhaikanaka Pond

There was also a fish/salt pond called Kaimuhaikanaka, or Umukanaka (Griffin et al. 1987:39), “the oven of human sacrifice,” located in Kaka‘ako (in the general area now covered with One Waterfront Plaza). The name suggests this might also have been an area for human sacrifice. Kekahuna (1958) says of Kaimuhaikanaka that “It was a place of training for lua, or deadly hand-to-hand grappling, mokomoko, or boxing, and other forms of combat” (Kekahuna 1958:6).

3.4 *‘Ōlelo No‘eau*

Hawaiian knowledge was shared by way of oral histories. Indeed, one’s *leo* (voice) is oftentimes presented as *ho‘okupu* (“a tribute or gift” given to convey appreciation, to strengthen bonds, and to show honor and respect); the high valuation of the spoken word underscores the importance of the oral tradition (in this case, Hawaiian sayings or expressions), and its ability to impart traditional Hawaiian “aesthetic, historic, and educational values” (Pukui 1983:vii). Thus, in many ways these expressions may be understood as inspiring growth within reader or between speaker and listener:

> They reveal with each new reading ever deeper layers of meaning, giving understanding not only of Hawai‘i and its people but of all humanity. Since the sayings carry the immediacy of the spoken word, considered to be the highest form of cultural expression in old Hawai‘i, they bring us closer to the everyday thoughts and lives of the Hawaiians who created them. Taken together, the sayings offer a basis for an understanding of the essence and origins of traditional Hawaiian values. The sayings may be categorized, in Western terms, as proverbs, aphorisms, didactic adages, jokes, riddles, epithets, lines from chants, etc., and they present a variety of literary techniques such as metaphor, analogy, allegory, personification, irony, pun, and repetition. It is worth noting, however, that the sayings were spoken, and that their meanings and purposes should not be assessed by the Western concepts of literary types and techniques. [Pukui 1983:vii]

Simply, *‘ōlelo no‘eau* may be understood as proverbs. The Webster dictionary notes it as “a phrase which is often repeated; especially, a sentence which briefly and forcibly expresses some practical truth, or the result of experience and observation.” It is a pithy or short form of folk wisdom. Pukui equates proverbs as a treasury of Hawaiian expressions (Pukui 1995:xii). Oftentimes within these Hawaiian expressions or proverbs are references to places. This section draws from the collection of author and historian Mary Kawena Pukui and her knowledge of Hawaiian proverbs describing *‘āina* (land), chiefs, plants, and places:

3.4.1 *‘Olelo No‘eau* Concerning Waikīkī

3.4.1.1 *‘Ōlelo No‘eau* #285

> *E ho‘i ka u‘i o Mānoa, ua ahiahi.*
>
> Let the youth of Mānoa go home, for it is evening.
>
> Refers to the youth of Mānoa who used to ride the surf at Kalehuawehe in Waikīkī. The surfboards were shred among several people who would take turns using them. Those who finished first often suggested going home early, even though it might not be evening, to avoid carrying the boards to the *hālau* [long house] where they were stored. Later the expression was used for anyone who went off to avoid work. [Pukui 1983:35–36]

3.4.1.2 *‘Ōlelo No‘eau* #1321

> *Kāhunahuna pa‘akai o Kālia*
>
> Fine-grained salt of Kālia.

A derogatory expression for the dried, viscid matter in the corners of the eyes of an unwashed face. Kālia was a place for gathering salt, although any place name might be used. [Pukui 1983:144]

3.4.1.3 *'Ōlelo No'eau* #1378

The following *'ōlelo no'eau* describes the fishing techniques found in the Kālia area on O'ahu Island.

Ka i'a pīkoi kānaka o Kālia; he kānaka ka pīkoi, he kānaka ka pōhuku.

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

In ancient days, when a school of mullet appeared at Kālia, O'ahu, a bag net was set and the men swan out in a row and surrounded the fish. Then the men would slap the water together and kick their feet, driving the frightened fish into the opening of their bag net. Thus the fishermen of Kālia became known as human fishnets. [Pukui 1983:151]

3.4.1.4 *'Ōlelo No'eau* #1493

Ka nalu ha'i o Kalehuawehe.

The rolling surf of Kalehuawehe.

Ka-Lehua-wehe (take-off-the-*lehua*) was Waikiīkī's most famous surf. It was so named when a legendary hero took off his *lei* of *lehua* [the flower of the *'ōhi'a* tree] blossoms and gave it to the wife of the ruling chief, with whom he was surfing. [Pukui 1983:161–162]

3.4.1.5 *'Ōlelo No'eau* #1734

The following *'ōlelo no'eau* describes the pleasant ocean reverberations characteristic of shallow reef shorelines.

Ke kai wawalo leo le'a o Kālia.

The pleasing, echoing sea of Kālia.

Refers to the sea of Kālia, Honolulu, now known as Ala Moana. [Pukui 1983:186]

3.4.1.6 *'Ōlelo No'eau* #2255

Na līpoa 'ala o Kawehewehe.

The fragrant līpoa of Kawehewehe.

The līpoa seaweed of Waikīkī, especially at Kawehewehe, was so fragrant that one could smell it while standing on the shore. Often mentions in songs about Waikīkī [Pukui 1983:246]

3.4.2 *'Olelo No'eau* Concerning Honolulu

3.4.2.1 *'Olelo No'eau* # 1652

Ka wai huahua'i o Kewalo.

The bubbling water of Kewalo.

Kewalo once had a large spring where many went for cool, refreshing water. [Pukui 1983:178]

3.4.2.2 *'Ōlelo No'eau* #656

He kai hele kohana ko Māmala.

A sea for going naked is at Māmala.

The entrance to Honolulu Harbor was known as Māmala. In time of war the people took off their clothes and traveled along the reef to avoid meeting the enemy on land. [Pukui 1983:74]

3.4.2.3 *'Ōlelo No'eau* #1510

Ka nuku o Māmala.

The mouth of Māmala.

The entrance to Honolulu Harbor, named for a shark goddess who once lived in the vicinity. [Pukui 1983:163]

3.4.2.4 *'Ōlelo No'eau* #1718

Ke kai 'au umauma o Māmala.

The sea of Māmala, where one swims at the surface.

Māmala is the entrance to Honolulu Harbor.[Pukui 1983:185]

3.4.2.5 *'Ōlelo No'eau* #2202

Na 'ale kuehu o Māmala.

The billows of Māmala with wind-blown sprays.

Māmala is the entrance to Honolulu Harbor. [Pukui 1983:241]

3.4.2.6 *'Ōlelo No'eau* #1370

Ka i'a maunu lima o Kuloloia.

The hand-baited fish of Kuloloia.

Small eels (*pūhi 'ōilo*) that were caught by placing bait on the open palm of one hand with the fingers held wide apart. When the eels came up to take the bait, the fingers were clenched into a tight fist, grabbing the eels tightly by the heads. [Pukui 1983:149]

3.4.2.7 *'Ōlelo No'eau* #407

There are also several *'ōlelo no'eau* concerning the attributes of the coastal area of Kou (Honolulu).

Hāhā pō'ele ka pāpa'i o Kou.

The crabs of Kou are groped for in the dark.

Applied to one who goes groping in the dark. The chiefs held kōnane [an ancient game resembling checkers] and other games at the shore of Kou (now central Honolulu), and people came from everywhere to watch. Very often they remained until it was too dark to see and had to grope for their companions. [Pukui 1983:50–51]

3.4.2.8 *'Ōlelo No'eau* #1128

Hui aku na maka i Kou.

The faces will meet in Kou.

We will all meet there. Kou (now central Honolulu) was the place where the chiefs played games, and people came from everywhere to watch. [Pukui 1983:120]

3.4.2.9 *'Ōlelo No'eau* #1685

Ke awa la'i lulu o Kou.

The peaceful harbor of Kou.

Honolulu Harbor. [Pukui 1983:182]

3.5 *Oli* (Chants)

Oli, according to Mary Kawena Pukui (Pukui 1995:xvi–xvii) are often grouped according to content. Chants often were imbued with *mana* (spiritual power); such *mana* was made manifest through the use of themes and *kaona* (hidden meanings). According to Pukui, chants for the gods (prayers) came first, and chants for the *ali'i*, "the descendants of the gods," came second in significance. Chants "concerning the activities of the earth peopled by common humans," were last in this hierarchy (Pukui 1995:xvi–xvii). Emerson conversely states:

> In its most familiar form the Hawaiians–many of whom [were lyrical masters]–used the oli not only for the songful expression of joy and affection, but as the vehicle of humorous or sarcastic narrative in the entertainment of their comrades. The dividing line, then, between the oli and those other weightier forms of the mele, the inoa, the kanikau (threnody), the pule, and that unnamed variety of mele in which the poet dealt with historic or mythologic subjects, is to be found almost wholly in the mood of the singer. [Emerson 1965:254]

While *oli* may vary thematically, subject to the perspective of the *ho'opa'a* (chanter), it was undoubtedly a valued art form used to preserve oral histories, genealogies, and traditions, to recall special places and events, and to offer prayers to *akua* (gods) and *'aumākua* (family gods) alike. Perhaps most importantly, as Alameida (1993:26) writes, "chants . . . created a mystic beauty . . . confirming the special feeling for the environment among Hawaiians: their *one hānau* (birthplace), their *kula iwi* (land of their ancestors)."

3.5.1 *Oli* Concerning Waikīkī

3.5.1.1 Chant of Papa'ena'ena

In Waikīkī when the waves were running, the *kāhuna* (priests who were in charge of all rites pertaining to surfing) signaled to the people by flying a kite. An ancient chant tells of Papa'ena'ena (the start of the surfing course which ended at Kālia):

There at Kalahuewehe is the big surf created by Papa'ena'ena.
Arise, of ye surf of Kalahuewehe, arise!
The *kahuna* of Papa'ena'ena flies his moon kite
To proclaim the suitability of the sea for surfing.
The eager lookout on yonder highland
Anxiously scans the skies for this signal,
And relays the good news by runners;
Farmers, woodsmen, bird catchers all,
Leave their tasks and fetching their surf boards
Hurry to the beach at Waikīkī.
Soon the sea is filled with natives
Sporting in the billowy surf;
Trick riding, zigging and zagging, amidst the foam
Shouting words of defiance against the angry surf'
To topple the rider if it can . . .
[Kanahele 1995:56–57]

3.5.2 *Oli* Concerning Honolulu

3.5.2.1 The Chief Huanuikalala'ila'i in Kewalo

Kewalo was the birthplace of Huanuikalala'ila'i, a chief famous for his love of cultivation at Kewalo and his care for the people (Kamakau 1991:24). An *oli*, recounted by Kamakau, captures the significance of Kewalo:

'O Hua-a-Kamapau ke 'li'i
O Honolulu o Waikīkī
I hanau no la i kahua la i Kewalo,
'O Kālia la kahua
O Makiki la ke ēwe,
I Kānelā'au i Kahehuna ke piko,
I Kalo i Pauoa ka 'a'a;

I uka i Kaho‘iwai i

Kanaloaho‘okau . . .

Translation:

Hua-a-Kamapau the chief

Of Honolulu, of Waikīkī

Was born at Kewalo,

Kālia was the place [the site]

At Makiki the placenta,

At Kānelā‘au at Kahehuna the navel cord,

At Kalo at Pauoa the caul;

Upland at Kaho‘iwai, at

Kanaloaho‘okau. . .

[Kamakau 1991:24]

3.5.2.2 The Epic Tale of Hi‘iakaikapoliopele

The Epic Tale of Hi‘iakaikapoliopele takes the reader on a literary adventure throughout the Hawaiian Islands. The saga begins with the fire goddess, Pele, in pursuit of her dream lover. Hi‘iakaikapoliopele, Pele’s younger sister, is tasked with bringing back the handsome *ali‘i* of Kaua‘i, Lohi‘au.

Hi‘iakaikapoliopele, her *aikāne* (close companion) Wahine‘ōma‘o, and Lohi‘au board a canoe at Pu‘uloa (now known as Pearl Harbor) and plan to sail to Waikīkī. At Pu‘uloa, Hi‘iaka meets a party who were planning on traveling to the house of the chiefess Pele‘ula in Waikīkī. Hi‘iaka recites the following chant, telling the party that despite the fact that she would be traveling by boat and they would be walking, they would meet again in Kou:

‘O Kou ka papa	Kou is the coral flat
‘O Ka‘ākaukukui ka loko	Ka‘ākaukukui is the pool
‘O ka ‘alamihi a‘e nō	Some ‘alamihi [a black crab], indeed
‘O ka lā a pō iho	Wait all day until night
Hui aku i Kou nā maka.	Friends shall meet in Kou.

[Ho‘oulumāhiehie 2008a:277; Ho‘oulumāhiehie 2008b:297]

The party continues to sail toward Waikīkī where they reach the outside area of Kou. Hi‘iaka turns, looks toward the uplands of Nu‘uanu and sees Hāpu‘u and Kala‘ihauola. Hi‘iaka says to them, “I might have forgotten you two, Hāpu‘u and Kala‘ihauola. I do not want you to say I did not acknowledge you, so here are the chanted regards from the traveler.” She then offers the following *kānaenae* (chanted supplicating prayer):

E Hapuu laua me Kalaihauola e

E na wahine no noho Koolau

E no nonoho ana i ke Alanui

Kanaenae au a ka mea hele i‘ai‘a.

[*Ka Na‘i Aupuni*, Vol. II, No. 10, 13 June 1906]

Translation:

O Hāpu‘u and Kala‘ihauola

O women who dwell on the Ko‘olau range

Residing upon the pathway

I offer this chant for those who pass that way.

[Ho‘oulumāhiehie 2008a:278]

3.6 *Mele* (Songs)

A number of late nineteenth, twentieth, and twenty-first century *mele* concern or mention Waikīkī and/or Honolulu (Kona) Moku. These particular *mele* may also be classified as *mele wahi pana* (songs for legendary or historic places). *Mele wahi pana* such as those presented here may or may not be accompanied by *hula* (dance) or *hula wahi pana* (dance for legendary or historic places). As the Hula Preservation Society notes,

> Hula Wahi Pana comprise a large class of dances that honor places of such emotional, spiritual, historical, or cultural significance that chants were composed for them. Only the composers of the chants could know the deepest meanings, as they would be reflections of their feelings and experiences . . . Since the subjects of Wahi Pana compositions are extremely varied, their implementation through hula are as well. Coupled with the differences from one hula style and tradition to the next, Hula Wahi Pana can be exceptionally diverse. They can be done sitting or standing, with limited body movement or wide free movement; with or without the use of implements or instruments; with the dancers themselves chanting and/or playing an implement or being accompanied by the *ho‘opa‘a* [drummer and *hula* chanter (memorizer)]. Beyond the particular hula tradition, what ultimately determines the manner in which a Hula Wahi Pana is performed are the specific place involved, why it is significant, the story being shared about it, and its importance in the composer’s view. [Hula Preservation Society 2014]

3.6.1 *Mele* Concerning Waikīkī

3.6.1.1 O‘ahu

O‘ahu is a traditional *mele* describing O‘ahu as the land of love; it highlights the areas of Mānoa, Waikīkī, Nu‘uanu, and Makiki. Raiatea Helm recently rerecorded this *mele* on her 2016 album *He Leo Huali*:

Mānoa he u‘i nō i ka‘u ‘ike	Mānoa is indeed a beauty for my sight
I ka pi‘o mai a ke ānuenue	At the arching of the rainbow

Waikīkī i ke kai malamalama	Waikīkī in the glimmering sea
He wai ho'oheno a ka pu'uwai	Cherished waters of my heart
Nu'uanu i ka makani lawe mālie	Nu'uanu in the caressing wind
I ke 'ala o nēia pua o ka 'awapuhi	In the fragrance of this blossom of ginger
Makiki ka home o nā manu	Makiki, the home of the birds when they soar into the sky
Ha'ina 'ia mai ana ka puana	Tell the refrain
He u'i ke ea mai i ka lani	A beauty, a breath in the heavens,
O'ahu ka 'āina o ke aloha	O'ahu, the land of love

3.6.1.2 Waikīkī Hula

Waikīkī Hula is a traditional *mele.* This song "was written for Pualeilani, the Waikīkī home of Prince Jonah Kuhio Kalanianaole. It was given to Helen Ayat by her mother, a lady-in-waiting to Princess Kahanu, wife of Prince Kuhio (Huapala n.d.):

He aloha 'ia no a'o Waikīkī, eā	Beloved is Waikīkī
Ka nehe o ke kai hāwanawana	The rustling of the whispering sea
Pa iho ka makani lawe mālie, eā	The wind blows carrying softly
Ke 'ala onaona o ka līpoa	The sweet fragrance of seaweed
Kaulana kou inoa i nā malihini, eā	Your name is famous to visitors,
Ka'apuni kou nani puni ka honua	All your beauty known around the world
Huli aku nānā ia Kaimana Hila, eā	Turn and look at Diamond Head
'Ike i ka nani a'o Honolulu	See the beauty of Honolulu
Ha'ina 'ia mai ana ka puana, eā	The story is told
He aloha 'ia no a'o Waikīkī	Beloved is Waikīkī

3.6.1.3 Waikiki

In 1938, Andrew Kealoha Cummings, "a homesick local boy," composed this famous song while touring in Michigan (Bolante and Keany 2007). The song, originally performed by Cummings, has been described by George Kanahele as a "rare instance of a near perfect fit of song and singer" (Bolante and Keany 2007):

There's a feeling deep in my heart
Stabbing at me just like a dart
It's a feeling heavenly
I see memories out of the past
Memories that always will last

Of the days that used to be
(Of a place beside the sea)
Waikiki
At night when the shadows are falling
I hear the rolling surf calling
Calling and calling to me
Waikiki
Tis for you that my heart is yearning
My thoughts are always returning
Out there to you across the sea
Chorus: Your tropic nights and your wonderful charms
Are ever in my memory
And I recall when I held in my arms
An angel sweet and heavenly
Waikiki
My whole life is empty without you
I miss that magic about you
Magic beside the sea
Magic of Waikiki

3.6.2 *Mele* Concerning Honolulu

3.6.2.1 Henehene Kou 'Aka (For You And I)

This *mele* was composed in the 1920s in connection to Kamehameha students riding street cars from the first Kamaehameha campus to Kaka'ako.

Henehene kou 'aka
Kou le'ale'a paha
He mea ma'a mau ia
For you and I
Ka'a uila mākēneki
Hō'onioni kou kino
He mea ma'a mau ia
For you and I
I Kaka'ako mākou

‘Ai ana i ka pipi stew
He mea ma‘a mau ia
For you and I
I Waikīkī mākou
‘Au ana i ke kai
He mea ma‘a mau ia
For you and I
I Kapahulu mākou
‘Ai ana i ka līpoa
He mea ma‘a mau ia
For you and I
Ha‘ina mai ka puana
Kou le‘ale‘a paha
He mea ma‘a mau ia
For you and I

Translation:

Your laughter is so contagious
It's fun to be with you
Always a good time
For you and I
The streetcar wheels turn
Vibrating your body
Always a good time
For you and I
To Kaka‘ako we go
Eating beef stew
Always a good time
For you and I
To Waikīkī we go
Swimming in the sea
Always a good time
For you and I

To Kapahulu we go
Eating seaweed
Always a good time
For you and I
Tell the refrain
It's fun to be with you
Always a good time
For you and I
[Hupala n.d.]

3.6.2.2 He Aloha Nō ‘o Honolulu

The following *mele* retraces the sea routes of the famed ship Maunaloa. These routes included Honolulu to Maui and onward to the west coast of Hawai‘i. This *mele* also describes the feel of the landscape with a different rain and wind for each place.

He aloha nō ‘o Honolulu i ka ua Kūkalahale
Ka nuku a‘o Māmala ‘ae a‘e nei ma hope
Kau mai ana ma mua ka malu ‘ula a‘o Lele
Kukui ‘a‘ā mau, pio ‘ole i ke Kaua‘ula

‘Au aku i ke kai loa oni mai ana ‘o ‘Upolu
Ho‘okomo iā Mahukona i ka makani ‘Āpa‘apa‘a
E wiki ‘oe ‘apa nei eia a‘e ‘o Kawaihae
Ho‘ohaehae Nāulu, i ka makani ku‘ehu ‘ale

‘O ka hao a ka Mūmuku poho pono nā pe‘a heke
‘O ka heke nō nā Kona i ke kai mā‘oki‘oki
Ki‘ina ke koi‘i koi i ka piko o Hualālai
A la‘i wale ke kaunu ‘a‘ole pahuna hala

Hale ‘ole nō kāua i ke kole maka onaona
E haupā ‘oe a kena i ka piko ‘oe a lihaliha
Hāli‘ali‘a mai ana kou aloha kākia iwi
Ho‘okomo iā Honu‘apo i ke kai kauha‘a

Ha‘alele ka Maunaloa i ka pohu la‘i a‘o Kona
Ho‘okomo iā Ho‘okena i ka pewa a‘o ka manini

Ha‘ina mai ka puana ‘o ka heke nō nā Kona
No Kona ke kai malino kaulana i ka lehulehu
Translation:
Dearly loved is Honolulu in the Kūkalahale rain
The entrance of Māmala Bay fares on behind
Up ahead is the breadfruit shade of Lele
The ever-blazing torch unextinguished by the Kaua‘ula wind

Faring out to the deep sea of ‘Upolu Point appears
Entering Mahukona in the ‘Āpa‘apa‘a wind
Make haste, slowpoke, for hers is Kawaihae
Where the Nāulu showes stir up wave gustling winds

The buffering of the Mūmuku wind fills out the topsails
The Kona districts are foremost with their sea-patterned hues
The rush sweeps to the summit of Hualālai
And love is contended, no thrust is missed

We make no error with the tender-eyed kole fish
You eat heartily, right to the rich oily belly
I‘m reminded of your love holding me fast
Coming in to Honu‘apo in the restless sea
The *Maunaloa* departs the quiet tranquility of Kona
Porting into Ho‘okena in her bay like a manini tail
The story is told that the Kona districts are the finest
For Kona are the clam seas, famous among all people.
[Wilcox et al. 2003:50–51]

3.6.2.3 Māmala

In the song *Nā ka Pueo*, the *Pueo-kahi* was a ship named for a place near Hāna, Maui, which had been named for a *pueo kupua* (owl demigod). Honolulu Harbor was called Māmala; note the play on words with *mālama* (to care for), to protect:

Nā ka Pueo-kahi ke aloha	Love from the *Pueo-kahi*,
Nēnē ‘au kai o Maui.	The Maui goose that sails the sea.
Ma ka ‘ilikai a‘o Māmala.	Over the sea at Māmala.

Mālama ‘ia iho ke aloha	Keep your love
I kuleana na‘u e hiki aku ai	And I have the right to come.
Ha‘ina ‘ia mai ka puana	Tell the refrain:
Nā ka Pueo-kahi ke aloha	Love from the *Pueo-kahi*.

[Elbert and Mahoe 1970:81–82]

Section 4 Historical Background

The current project area belongs to both the *ahupua‘a* of Waikīkī and Honolulu. Waikīkī Ahupua‘a at one time spanned the area from Kou (an older name for Honolulu) in the west to Maunalua in the east. Like other *ahupua‘a* of southeastern O‘ahu, Waikīkī Ahupua‘a also traditionally extended from the Ko‘olau mountain range on the *mauka* side all the way to the shoreline on the *makai* side (Kanahele 1995:5).

During the growth of the Honolulu and Waikīkī settlements in the late pre-Contact (pre-1778) and early post-Contact periods, the seaward sections of southeastern O‘ahu *ahupua‘a*—Waikīkī Ahupua‘a included—became effectively “cut off” from the sea along what would become the east-west King Street/Wai‘alae Avenue alignment. The boundaries of Waikīkī Ahupua‘a shrank to Kalākaua Avenue in the west, Diamond Head in the east, and the sea coast to the south. Much of the available traditional and historical background literature from the late pre-Contact through early post-Contact era refers to this more limited *ahupua‘a* of Waikīkī.

4.1 Pre-Contact to Early Post-Contact Period

By the time of the arrival of westerners in the Hawaiian Islands during the late eighteenth century, Waikīkī had long been a center of population and political power on O‘ahu. Chiefly residences, however, were only one element of a complex of features that characterized Waikīkī during pre-Contact (before 1778). Beginning in the fifteenth century, a vast system of irrigated taro fields was constructed, extending across the littoral plain from Waikīkī to lower Mānoa and Pālolo valleys. This field system—an impressive engineering design traditionally attributed to the chief Kalamakua—took advantage of streams descending from Makiki, Mānoa, and Pālolo valleys that also provided ample fresh water for the Hawaiians living in the *ahupua‘a*. Water was also available from springs in nearby Mō‘ili‘ili and Punahou. Closer to the Waikīkī shoreline, coconut groves and fishponds dotted the landscape. A sizeable population developed amidst this Hawaiian-engineered abundance. Captain George Vancouver (1798), arriving at “Whyteete” in 1792, captured something of this profusion in his journals:

> On shores, the villages appeared numerous, large, and in good repair; and the surrounding country pleasingly interspersed with deep, though not extensive valleys; which, with the plains near the sea-side, presented a high degree of cultivation and fertility.
>
> [Our] guides led us to the northward through the village, to an exceedingly well-made causeway, about twelve feet broad, with a ditch on each side.
>
> This opened our view to a spacious plain, which, in the immediate vicinity of the village, had the appearance of the open common fields in England; but, on advancing, the major part appeared to be divided into fields of irregular shape and figure, which were separated from each other by low stone walls, and were in a very high state of cultivation. These several portions of land were planted with the eddo or taro root, in different stages of inundation; none being perfectly dry, and some from three to six or seven inches under water. The causeway led us near a mile from the beach, at the end of which was the water we were in quest of. It was a rivulet five or six feet wide, and about two or three feet deep, well banked up, and

> nearly motionless; some small rills only, finding a passage through the dams that checked the sluggish stream, by which a constant supply was afforded to the taro plantations.
>
> [We] found the plain in a high state of cultivation, mostly under immediate crops of taro; and abounding with a variety of wild fowl, chiefly of the duck kind . . . The sides of the hills, which were at some distance, seemed rocky and barren; the intermediate vallies, which were all inhabited, produced some large trees, and made a pleasing appearance. The plain, however, if we may judge from the labour bestowed on their cultivation, seemed to afford the principal proportion of the different vegetable productions on which the inhabitants depend for their subsistence. [Vancouver 1798:161–164]

Further details of the exuberant life that must have characterized Hawaiian use of the lands including the *ahupua‘a* of Waikīkī are given by Archibald Menzies (1920), a naturalist accompanying Vancouver’s expedition:

> The verge of the shore was planted with a large grove of cocoanut palms, affording a delightful shade to the scattered habitations of the natives. Some of those near the beach were raised a few feet from the ground upon a kind of stage, so as to admit the surf to wash underneath them. We pursued a pleasing path back to the plantation, which was nearly level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes and the cloth plant. These, in many cases, were divided by little banks on which grew the sugar cane and a species of Draecena [ti or *kī*] without the aid of much cultivation, and the whole was watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to be able to supply the most distant fields at pleasure, and the soil seemed to repay the labour and industry of these people by the luxuriancy of its productions. Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with water fowl of various kinds such as ducks, coots, water hens, bitterns, plovers and curlews. [Menzies 1920:23–24]

An 1817 map of O‘ahu’s south shore, drawn by Otto von Kotzebue of the Russian Ship *Rurick* (Figure 10), depicts the Kaka‘ako/Waikīkī landscape in the first decades following Western Contact. This map shows a concentration of house sites and agricultural fields along the Nu‘uanu Stream in Honolulu. Houses and agricultural fields are also depicted in the three-stream area (Waikolu) of Waiatité (Waikīkī) and along the coastline. Taro *lo‘i* (rectangular areas depicting irrigated fields) are concentrated around the streams descending from the Nu‘uanu and Mānoa valleys. The areas of habitation (indicated on the map by the trapezoids) probably reflect the post-Contact shift of Hawaiians to the area around Honolulu Harbor, the only sheltered landing on O‘ahu and the center of increasing trade with visiting foreign vessels.

The traditional Hawaiian focus on Waikīkī as a center of chiefly and agricultural activities on southeastern O‘ahu was soon to change—disrupted by the same Western Contact that produced the first documentation (including the records cited above) of that traditional life. The *ahupua‘a*

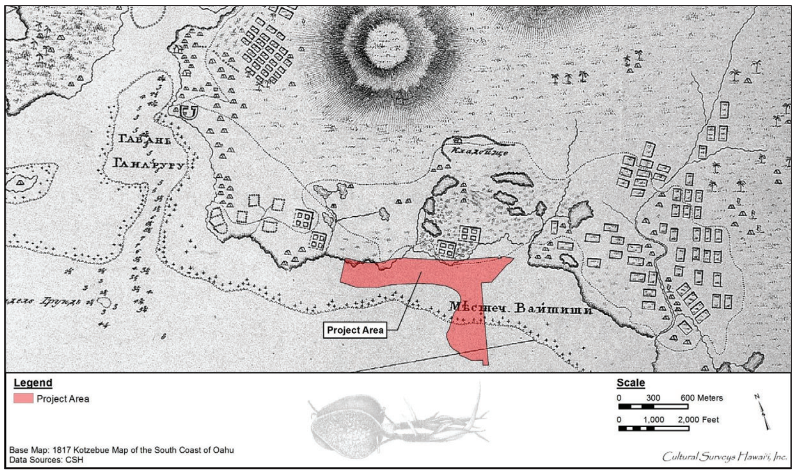


Figure 10. 1817 Kotzebue map of the south coast of O‘ahu by Otto von Kotzebue of the Russian ship *Rurick*, showing the project area and depicting the taro fields (rectangles), fishponds (ovals, squares), salt pans (squares with interior squares), and habitations (house icons) of O‘ahu’s south shore; habitation and agricultural land in Honolulu (left side of figure) and in Waikīkī (right); note fishponds to the north and east and salt pans *mauka* of the current project area (center) (map reprinted in Fitzpatrick 1986:48–49)

of Honolulu—with the only sheltered harbor on O‘ahu—became the center for trade with visiting foreign vessels, drawing increasing numbers of Hawaiians away from their traditional environments. Kamehameha himself moved his residence from Waikīkī to the coast near Honolulu harbor, likely in order to maintain his control of the lucrative trade in sandalwood that had developed.

4.1.1 Agriculture and Aquaculture

Traditionally, “religious beliefs and practices pervaded daily life,” influencing the ways land, plants, and animals were used, the types of foods people could eat, and “the time and methods for planting” (Abott 1992:15).For spiritual and dietary reasons, *kalo* (taro) was a sacred staple in the Hawaiian diet. According to Hawaiian mythology, man was born from the taro plant. According to the *Kumulipo* (“origin, genesis”), Hāloa, “he of the long breath,” is the second son of Wākea (Father Sky) and Papa (Mother Earth). Wākea and Papa’s first born, Hāloa-naka was born premature and died shortly after his birth (Kanahele 1995:17). After burying Hāloa-naka, a *kalo* plant sprouted at his grave. Shortly after, a second son (Hāloa) was born. A human child, Hāloa symbolizes *kalo* and man. *Kalo* is a metaphor for life, Kanahele explains as follows:

> In the mythologies of many cultures, plants have been used to symbolize human spiritual growth. Hawaiians made taro a metaphor for life because, like the taro plant, it needs to be rooted in good soil and to be constantly nourished with the waters of Kāne. As the stalk grows taller with its leaves reaching toward the light of the sun, symbolized by Wākea, so Hawaiians grow aspiring to be closer to their heavenly spirit. Just as every young shoot can become a full-grown plant, so can they become gods as descendants of Hāloa. As every plant must die, however, they too must die. And from the remains a new plant lives again. In this continuity of life, both plant and man repeat the mystery of the unending cycle. [Kanahele 1995:18]

The Waikīkī marshland was an ideal place for *kalo* cultivation, providing an abundance of water and sunlight (Figure 11). *Kalo* grown in sunnier conditions matured noticeably faster, thus Waikīkī was established as a key area for cultivation (Kanahele 1995:22). *‘Uala* (sweet potato; *Ipomoea batatas*) and the prized *ipu* (gourd) were also abundant in the lower Waikīkī marshlands (Kanahele 1995:35).

In his master’s thesis discussing Waikīkī and the reclamation of the Waikīkī marshalnds, Barry Seichi Nakamura determined that wealth and power succeeded in driving people away from Waikīkī.

> To the uninitiated, it would probably come as a surprise to learn that Waikiki, as recently as the 1920’s, was one of the important areas of Hawai‘i for the cultivation of agriculture and aquaculture. As early as in the 15th century, the Native Hawaiian people engineered and developed at Waikiki extensive taro pondfields and fishponds and an irrigation system which decentralized the water resources of the mountain streams which flowed into the Waikiki hinterland. [Nakamura 1979:v–vi]

The settlers of Waikīkī had to travel *mauka* to the foothills of Mānoa and the valley of Pālolo to gather grasses, vines, and other fauna. *Pili* (*Heteropogon contortus*) grass could be found in the

Figure 11. Aerial photograph of Waikīkī with overlay of areas historically known to be *lo‘i kalo* (green), streams (blue), and fishponds (teal) (Google Earth 2012; image courtesy of Mr. Peter Young 2013)

drier areas of Mānoa as well as in Kapahulu and Kaimukī (Kanahele 1995:24). *Pili* grass was used primarily to thatch homes. Along the Waikīkī stream banks, *hau* (beach hibiscus; *Hibiscus tiliaceus*) flourished. The *hau* tree’s wood proved excellent for outrigger canoe frames and kite supports; the bark was used for ropes, nets, and *kapa* (cloth); while the flowers were used for medicine (Kanahele 1995:25). *Kukui* (candlenut; *Aleurites moluccana*) trees could be found mid-way in Mānoa Valley (Kanahele 1995:26). The kernels were used to make *‘inamona* (relish) and the oily nut could also be used for stone lamps. The flowers, leaves, branches, and bark were used for medicinal purposes, curing a range of ailments from sore throats to bouts of constipation (Kanahele 1995:26). *‘Ōhia ‘ai* (mountain apple; *Eugenia malaccensis*) could also be found mid-way in the *ahupua‘a*, toward Mānoa Valley (Kanahele 1995:26).

Fishponds were one of the most important traditional resources for the Hawaiian community in Waikīkī. Historic maps and images depict the locations of numerous *loko i‘a* (fishponds) in Waikīkī and historic documents describe “several hundred” and “innumerable” artificial freshwater fishponds extending a mile inland from the shore (Bloxam 1925:35–36 in McAllister 1933:76). Two studies by the U.S. Commission of Fish and Fisheries (Bowers 1902:429; Cobb 1902 in McAllister 1933:76) listed extant fishponds in Kālia in 1901, including Ka‘ihikapu (“the taboo sacredness”), Kūwili (“stand swirling”), Kaipuni (1 and 2), Paweo (1 and 2), Kapu‘uiki, Kapaakea, Maalahia, Opu, and Opukaala, as well as several fishponds with undocumented names. In addition, historic maps provide the locations of several other fishponds: Kaohai, Oo, Halemauuola, Moo, Kuilei (“lei stringing”), and Kaheana.

The fame of Kālia’s fishponds is attested to in a *mo‘olelo* recounted by John Papa ‘Ī‘ī (in Wyban 1992) that deals with prohibitions against wasting food:

> Once Kinopu gave a tribute of fish to Kamehameha’s son Kinau, at Moehonua’s fishpond in Kalia. While Kinau and his wife Kahukuhaakoi (Wahine-pio) were going to Waikiki from Honolulu, the sea came into the pond and fishes of every kind entered the sluice gate. Kinopu ordered the keepers of the pond to lower fish nets and the result was a catch so large that a great heap of fish lay spoiling upon the bank of a pond.
>
> The news of the huge catch reached Kamehameha, who was then with Kalanimoku, war leader and officer of the king’s guard. The king said nothing at the time, but sat with bowed head and downcast eyes, apparently disapproving of such reckless waste. [Wyban 1992:87]

Kaka‘ako (the modern district) is between two traditional centers of population, Kou (Honolulu) and Waikīkī. In Waikīkī, a system of irrigated taro *lo‘i* fed by streams descending from Makiki, Mānoa, and Pālolo valleys blanketed the plain, and networks of fishponds dotted the shoreline. Similarly, Kou—the area of downtown Honolulu surrounding the harbor—possessed shoreward fishponds and irrigated fields watered by perennial streams descending from Nu‘uanu and Pauoa valleys. Reverend Hiram Bingham, arriving in Honolulu-Kou in 1820, described a still predominantly Native Hawaiian environment—still a “village”—on the brink of western-induced transformations:

> We can anchor in the roadstead abreast of Honolulu village, on the south side of the island, about 17 miles from the eastern extremity. . . . Passing through the irregular village of some thousands of inhabitants, whose grass thatched habitations

were mostly small and mean, while some were more spacious, we walked about a mile northwardly to the opening of the valley of Pauoa, then turning southeasterly, ascending to the top of Punchbowl Hill, an extinguished crater, whose base bounds the northeast part of the village or town. . . . Below us, on the south and west, spread the plain of Honolulu, having its fishponds and salt making pools along the seashore, the village and fort between us and the harbor, and the valley stretching a few miles north into the interior, which presented its scattered habitations and numerous beds of kalo in its various stages of growth, with its large green leaves, beautifully embossed on the silvery water, in which it flourishes. [Bingham 1847:92–93]

The Kaka‘ako district would have been in Bingham's view as he stood atop "Punchbowl Hill" looking toward Waikīkī to the south. It would have comprised part of the area he describes as the "plain of Honolulu" with its "fishponds and salt making pools along the seashore."

4.1.2 Human Sacrifices in Waikīkī

Hawaiian authors in the nineteenth and twentieth centuries have emphasized that victims for sacrifice were "criminals," "wrongdoers," or "individuals who had broken tabu, or rendered themselves obnoxious to the chiefs" (Kanahele 1986:116). Another major category of human sacrifice victims was the *kauwā*. Pukui and Elbert (1986:128) translate *kauwā* as "Untouchable, outcast, pariah: a caste which lived apart and was drawn on for sacrificial victims." An account of sacrificial drowning of *kauwā* at Waikīkī appeared in the Hawaiian language newspaper *Ka Loea Kālai‘āina*:

*A penei na‘e i kauwā loa [*sic. "loa‘a"*] ai. Aia a mana‘o ke Ali‘i Nui (Mō‘ī) e ‘au‘au kai i Waikīkī. Eia ka nīnau a ke Ali‘i Nui i ke ali‘i ma lalo iho ona, 'Pehea āu mau wahi lepo kanu o Pu‘u Ku‘ua? 'A‘ole paha he mau wahi pōhuli?'*

Eia ka pane a ke ali‘i ma lalo iho ona, 'He Pōhuli nō.' 'O ke kauoha ia akula nō ia e ki‘i.

'Oiai ko kāne me ka wahine e nanea ana me nā keiki, a hiki 'ana ke ki‘i i mau keiki. 'O ke kū a‘ela nō ia o ka makuakāne a lawe 'ana i kāna mau keiki a hiki i Waikīkī.

Aia ho‘i a hiki i ka wā a ke Ali‘i e hele ai i ka 'au‘au kai, a laila, hoouna 'ia mai ke kahu e ki‘i mai i ua keiki a lawe aku ia ma kahi pāpa‘u o ke kai, ma kahi a ke Ali‘i nui e hele kū 'ana, a laila kau nā lima o ka Mō‘ī i luna o kahi keiki a me kahi keiki, ma nā 'ā‘ī o nā keiki a pa‘a ai.

'O ka hua 'ōlelo ma ka waha o ke Ali‘i nui e 'ōlelo ai, ''A‘ole pau ku‘u loa! 'A‘ole pau ku‘u loa!' 'Oiai 'o ia e 'au ana me ka pa‘a nō o nā lima i nā keiki a hiki i ka umauma ke kai o ke ali‘i.

Ua lana a‘ela nā keiki i luna o ka 'ilikai, aia ke alo i lalo. Eia ho‘i ka 'ōlelo a ka makuakāne ma kula aku nei, 'Moe mālie i ke kai o ko Haku,' a pēlā aku.

'O ke kai o Waikīkī ke kai i 'ōlelo 'ia he kai lumaluma‘i kanaka o ka lua, aia i Kualoa.

<u>Translation</u>:

When the ruling chief wished to go to Waikīkī for sea bathing he asked the chief just below him in rank, 'How are my planting places at Pu‘u Ku‘ua, [a place in the Wai‘anae Range famous as a kauwā residence and place of mixed caste], have they not produced young suckers?' The chief next to him answered, 'There are some suckers,' and sent someone for them. When the men, women and children least expected it, the messenger came to get some of the children. The father stood up and took his sons to Waikīkī.

Then, when the ruling chief went sea bathing, he sent an attendant to get the boys and take them to a shallow place where the ruling chief would come. Then the ruler placed a hand on each of the boys, holding them by the necks. The words he uttered were, 'My height has not been reached! My height has not been reached!' He advanced and held onto the boys until the sea was up to his chest. The boys floated on the water face down. The father on shore called out, 'Lie still in the sea of your Lord,' and so on.

The Sea of Waikīkī is said to have been used to kill men in and the other place is Kualoa. [*Ka Loea Kālai‘āina* newspaper, 8 July 1899, translation in Sterling and Summers 1978:33]

No specific location at Waikīkī is indicated as the sacrificial site. Numerous accounts of human sacrifice (or near sacrifice) at Waikīkī have a mythopoeic quality for which the historical basis is uncertain.

4.1.3 Ancient Battles at Waikīkī

The following section is a summary of ancient battles associated with Waikīkī according to Kamakau.

4.1.3.1 Kahekili's Invasion of O‘ahu, ca. 1783

In 1867, Kamakau wrote the following account of the invasion of the island of O‘ahu by the Maui ruling chief, Kahekili:

I ka pae 'ana o Kahekili a me nā 'au wa‘a kaua o nā li‘i o Maui, ma Waikīkī, e noho ana nō ka Mō‘ī Kahahana ma Kawānanakoa, ma Nu‘uanu, ma uka o Honolulu. I ka lohe 'ana o Kahahana, ua hiki mai 'o Kahekili me nā 'au wa‘a i lako i nā mea kaua. Ua piha ho‘i mai Ka‘alāwai a hiki i Kawehewehe ka pa‘a i nā wa‘a kaua o Kahekili mai Maui, Moloka‘i a me Lāna‘i mai, no laila, maka‘u honua 'ē wale ihola nō 'o Kahahana, a ho‘ākoakoa a‘ela i kona po‘e ali‘i a me nā koa . . . 'ewalu ko lākou nui i hele i ke kaua. Ua komo loa kēia po‘e 'ewalu i loko o 'Āpuakēhau, i laila kahi i kaua ai me ke koa launa 'ole, a ua ho‘opuni 'ia mai lākou a puni e nā koa o Maui, a laila, wāhi a‘ela kēia po‘e 'ewalu i loko o ka puoko o ke kaua , a nahā a‘ela ka po‘e i ho‘opuni ai iā lākou nei. I ko lākou luli 'ana a‘e na‘e e ho‘i mai, ua piha loa 'o mua i nā koa, 'a‘ohe wahi ka‘awale o Kawehewehe, e hiolo ana nā pololū e like me nā paka ua, akā, 'a‘ohe na‘e he wahi mea a pō‘ino 'o kēia po‘e 'ahi kananā, akā, 'o kēlā po‘e koa o Maui ua pau i ka make. I ka hiki 'ana i kuāuna o Punalu‘u, e iho mai ai i Luahinewai, e hiki mai ai i nā niu a Kuakuaaka . . . 'Ekolu ho‘ouka kaua 'ana o nā 'ao‘ao 'elua, a ua make like nō.

I ka malama o Ianuari 1, o ka A. D. 1783, ua ʻākoakoa nā aliʻi a me nā pūkaua, nā pūʻali a me nā koa o Kahekili, a māhele ʻia ihola ʻelua poʻe kaua. Mahele 1. ʻO Kahekili ka pūkaua. Mahele 2. ʻO Hūʻeu ka pūkaua. ʻO kā Hūʻeu poʻe kaua, ma uka o Kānelāau a me Kapapakolea, ma uka o Pūowaina. ʻO ka mahele mua, ma luna o Hekili a hiki i Kahēhuna a me ʻAuwaiolimu. ʻO Kaheiki ke kahua kaua.

Ma kēia hoʻouka kaua ʻana, ua lilo ka wai o ke kahawai o Kaheiki i koko, no ke āhau lālā kukui o ka heana i ka wai, no ka mea ua kūmano ʻia ke kahawai i ke kino o nā kānaka i make i ke kaua. ʻO ke kaua ma luna iho o ka haiau ʻo Kaheiki ke kaua i heʻe ai, no ka mea, ua piʻi aʻela kekahi kaua ma ke kualapa pili o Pauoa, a iho ma Kapena, a uluāoʻa aʻela ka hoʻouka ʻana o ke kaua . . . Lilo ihola ke aupuni o Oʻahu a me Molokaʻi. [Kamakau, *Ka Nūpepa Kūʻokoʻa,* March, 30, 1867]

Translation:

Kahahana, [ruling chief of Oʻahu] who was then living at Kawānanakoa in Nuʻuanu, back of Honolulu, was filled with consternation when he heard that Kahekili had come with a fleet of war canoes that reached from Kaʻalāwai to Kawehewehe, and he rallied his warriors about him [but] eight of the warriors . . . went to ʻĀpuakēhau and fought against the whole host, and when they found themselves surrounded by the Maui warriors they broke through the front lines, only to find their way of retreat bristling with more warriors and no way to turn in all of Kawehewehe. Spears fell upon them like rain, but it was they who slew the warriors of Maui. At the border of Punaluʻu, on the way down to Luahinewai and the coconut grove of Kuakuaaka [there was fighting] . . . Three times both sides attacked, and three times both were defeated.

In January 1783, a decisive battle was fought with Kaheiki as the battlefield. Kahekili's forces were divided into two companies, one under Hūʻeu's leadership stationed at Kānelāʻau and Kapapakōlea back of Pūowaina and the other under his own command stationed from above Hekili to Kahēhuna and ʻAuwaiolimu.

In this battle the waters of the stream of Kaheiki ran red with blood from the heaps of broken corpses . . . on the ridge facing Pauoa and from thence down to Kapena another attack was made against the defense stationed back of the heiau of Kaheiki . . . thus Oʻahu and Molokai were taken. [Kamakau 1992:135–137]

A reconstruction of Kamakau's account of Kahekili's attack suggests battle casualties in Waikīkī.

4.1.3.2 Account of the Invasion of Kamehameha, ca. 1795

In 1867, Samuel M. Kamakau wrote the following account of the invasion of the island of Oʻahu by the ruling chief, Kamehameha:

Holo akula hoʻi ka ʻau waʻa kaua o Kamehameha a pae i Waikīkī, a ua pani ʻia mai Waiʻalae a Waikīkī e nā ʻau waʻa kaua o Kamehameha.

ʻO Kalanikūpule hoʻi a me kona mau aliʻi, e noho ana lākou ma Nuʻuanu, Kanoneakapueo, Kahapaʻakai, Luakaha, Kawānakoa, Kaukahōkū, Kapaeli,

Kaumuohena a me Pūʻiwa no kahua kaua. [Kamakau, *Ka Nūpepa Kūʻokoʻa*, 8 June 1867]

Translation:

Kamehameha's fleet landed at Waikīkī where it covered the beaches from Waiʻalae to Waikīkī. Kalanikūpule and his chiefs were stationed at strategic points in Nuʻuanu at Kanoneakapueo, Kahapaʻakai, Luakaha, Kawananakoa, Kaukahoku, Kapaʻeli, Kaumuʻohena a me Puʻiwa, where the fighting began. [Kamakau 1992:172]

This account emphasizes that the main fighting started in the uplands, however, fighting at Waikīkī cannot be definitively ruled out.

4.1.4 Missionaries

In the 1820s protestant missionaries arrived in Hawaiʻi with hopes of starting a Christian mission in Honolulu. Granted permission by Liholiho, Kamehameha II, to open their missions, by the end of 1820 there were numerous missions located throughout the Hawaiian Islands with about one hundred students. Missionaries quickly learned the Hawaiian language and sought to create a written form in order to distribute Christian materials. In 1822 the mission press produced the first document printed in the Hawaiian Islands (Kuykendall and Day 1961:44-45).

Hawaiians quickly learned the written form of their own language and by 1861 the Hawaiian-language newspaper *Ka Hoku o ka Pakipika* (The Star of the Pacific) was published. *Ka Hoku o ka Pakipika* asserted the *Kānaka Maoli* (native Hawaiian/born) identity, mastered the technology of the predominantly white missionaries, and displayed skills of traditional storytelling and contemporary writing (Silva 2004:55, 73). With the advent of the printing press, many *moʻolelo* and accounts of the Hawaiian Islands were put into print.

Of the English language sources, the missionaries were very detailed in their descriptions of life in Hawaiʻi and Waikīkī. By 1828, the missionary Levi Chamberlain (1957:26), describing a journey into Waikīkī, noted,

> Our path led us along the borders of extensive plats of marshy ground, having raised banks on one or more sides, and which were once filled with water, and replenished abundantly with esculent fish; but now overgrown with tall rushes waving in the wind. The land all around for several miles has the appearance of having once been under cultivation. I entered into conversation with the natives respecting this present neglected state. They ascribed it to the decrease of population. [Chamberlain 1957:26]

The environs of the missionary enclave and Kawaiahaʻo Church were indeed "forsaken" and "desolate looking" in the 1820s when the missionaries first settled there. This is confirmed in the memoirs of the American missionary C.S. Stewart. Arriving on Maui after living at the mission, he declared Lahaina to be "like the delights of an Eden" after "four weeks residence on the dreary plain of Honoruru" (Stewart 1970:177). It is likely that these descriptions of the Honolulu plain also include—at least for western sensibilities—the Kewalo and Kukuluāeʻo regions.

4.1.5 Disease and Decrease of Population

The depopulation of Waikīkī was not simply a result of the attractions of Honolulu (where, by the 1820s, the population was estimated at 6,000 to 7,000) but also of the European and Asian diseases that had devastating effects upon the Hawaiian population. In 1812, when Kamehameha moved his court from Waikīkī to Kona, on Hawai‘i Island, for the last and final time, Waikīkī had suffered a population loss of approximately 1,000. In 1804 the *ka ma‘i ‘ōku‘u* epidemic was estimated to have reduced the population of O‘ahu (35,000 to 40,000 at the time) to between 5,000 and 22,000. *‘Ōku‘u* (to squat on the haunches, crouch, sit hunched up, Pukui and Elbert 1986:282) was perhaps used to describe this sickness (*ma‘i*, Pukui and Elbert 1986:221) because “it was dysenteric, and people were squatting (*‘ōku‘u*) much at stool” (Pukui and Elbert 1986:282). Due to the close contact Waikīkī residents had with soldiers, it is very likely these diseases would have had devastating consequences on the population of Waikīkī:

> The tragedy of the disappearance of the Hawaiians in Waikīkī and elsewhere was that little could be done to stop the dying. Traditional medicine had failed. Not the healing gods, prayers, herbs, ‘wizard stones,’ the clear waters of Kumalae or Kawehewehe—none of these offered a cure. Foreign physicians in Hawai‘i were also unable to stop the dying. In fact, one of their main treatments was still bloodletting done with leeches and lancets. [Kanahele 1995:113]

John Papa ‘Ī‘ī, in discussing the trails of Honolulu, also makes a passing reference to the small pox epidemic that swept through the island of O‘ahu in 1853:

> The trail from Kalia led to Kukuluaeo, then along the graves of those who died in the smallpox epidemic of 1853, and into the center of the coconut grove of Honuakaha. On the upper side of the trail was the place of Kinau, the father of Kekauonohi. His houses were made kapu after his death, and no one was permitted to pass in front of them. [‘Ī‘ī 1959:89]

4.2 Mid- to Late 1800s and the Māhele

The depopulation of Waikīkī, however, was not total and the *ahupua‘a* continued to sustain Hawaiians living traditionally into the mid-nineteenth century. Many of these families continued to carry out traditional aquacultural and agricultural practices. Land Commission Award records associated with the Māhele document the continued maintenance of fishponds and irrigated and dryland agricultural plots, though on a greatly reduced scale than had been possible previously with adequate manpower.

Ala Moana Regional Park lies seaward of what formerly was an extensive area of low marshy ground as is clearly depicted on an 1884 Bishop map (Figure 12). It appears a narrow sand bar upon which a coastal path was developed was all that separated the marsh from the coast. Thus, it is perhaps no surprise that the natural shoreline of Ala Moana Regional Park was more mudflat than reef as suggested by one of our first photographs of the vicinity (Figure 13). Early maps (see Figure 16) refer to the former shallows that would become Ala Moana Regional Park as “Mud and Coral Flats Covered at High Tide.”

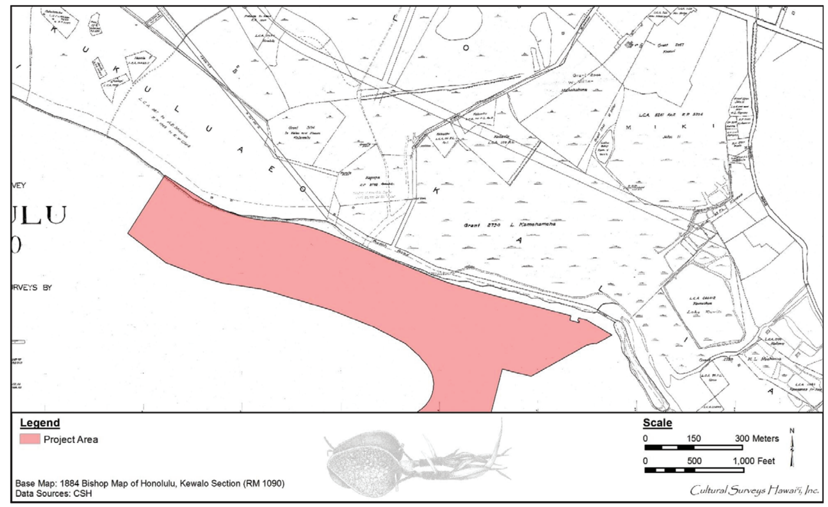


Figure 12. 1884 Bishop map of Honolulu, Kewalo Section by Sereno Bishop showing the project area, coastal *‘ili* of Kewalo and Kukuluāe‘o (Makiki and Pauoa Ahupua‘a) to the west and the *‘ili* of Kālia in Waikīkī Ahupua‘a to the east; note Pi‘inaio Stream empties into the ocean at the east end of the project area (bottom right corner of map)

Figure 13. 1880 photograph of the Kaka'ako shoreline west of areas later dredged for Kewalo Basin and filled for Fort Armstrong (near the peninsula in the background) (Hawai'i State Archives 1880)

4.2.1 The Māhele and Kuleana Awards

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—that introduced private property into Hawaiian society. On 27 January 1848, the Crown and the *ali'i* began to receive their land titles as Konohiki (land manager) awards. For *konohiki* lands, a claim first had to be approved by the Land Commissioners. Upon confirmation of the claim, a certificate was awarded to the claimant. This certificate was called a Land Commission Award (LCA), which confirmed the claim of an individual for a parcel. The awardee could then obtain from the Minister of the Interior a Royal Patent (RP), which indicated the government's interest in the land had been settled by the payment of a commutation fee. Commutation means "an exchange, or replacement." The commutation fee was usually set at a maximum of one-third of the value of the unimproved land. The fee could be settled by the exchange of cash but was usually settled by the return of one-third of the lands (or cumulative value of the lands) originally awarded to the claimant (Chinen 1958:13).

On 19 October 1849, the Hawaiian Privy Council adopted resolutions to protect the rights of native tenants, the *maka'āinana*, or the "common" people. The Kuleana Act of 1850 confirmed these rights. Under this act, the claimant was required to produce two witnesses who knew the claimant and the boundaries of the land, knew that the claimant had lived on the land for a minimum of two years, and knew that no one had challenged the claim. The land also had to be surveyed. Native tenants or naturalized foreigners who could prove occupancy on the parcels before 1845 could be awarded lands they occupied or that they cultivated as *kuleana* (land holding of a tenant or *hoa'āina* residing in the *ahupua'a*) awards. No commutation fee was necessary to apply for a Royal Patent for a *kuleana* award, as the commutation fee had presumably already been paid by the *ali'i* / *konohiki* who had been awarded the entire *ahupua'a*, or *'ili* in which the native tenant claimed his own small parcels (Chinen 1958:29–30).

It is through records for Land Commission Awards generated during the Māhele that the first specific documentation of life in Hawai'i as it had evolved up to the mid-nineteenth century comes to light. Although many Hawaiians did not submit or follow through on claims, or simply were not granted the claims for their lands, the distribution of LCAs can provide insight into patterns of residence and agriculture; many of these patterns probably had existed for centuries past. Examination of the patterns of *kuleana* (commoner) LCA parcels in the vicinity of the project area can provide insight into the likely intensity and nature of Hawaiian activity in the area.

The project area is *makai* of the lands of Kukuluāe'o, Kewalo, and Kālia (Figure 14). The *'ili* of Kukuluāe'o (LCA 387) was awarded to the American Board of Commissioners for Foreign Missions (see Figure 12 where LCA 387 is annotated as "to AB Mission"). Initially this land was associated with Punahou School in Makiki and Mānoa Valley, as Chief Boki gave the Punahou lands to Hiram Bingham, pastor of Kawaiaha'o Church in 1829 (DeLeon 1978:3), as stated in the LCA testimony: "The boundaries of that part which lies on the sea shore we cannot define so definitely, but presume there will be no difficulty in determining them as it is commonly known as pertaining to Punahou. This part embraces fishing grounds, coral flats & salt beds" (LCA 387). In the Māhele, however, this sea land became "detached" from the Mānoa award and was instead given to the pastor of the Kawaiaha'o Church. The award also included the Kukuluāe'o Fishery on the low reef flats offshore (see Figure 8). A portion of the Kukuluāe'o Fishery would later be dredged and filled to create Kewalo Basin and the west portion of the Ala Moana Regional Park

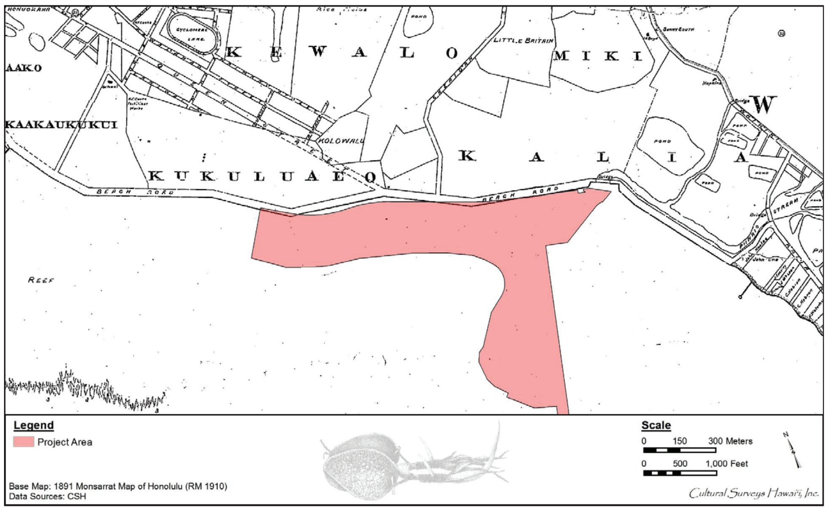


Figure 14. 1891 Monsarrat map of Honolulu showing the project area, depicting Sheridan/Pi'ikoi Street as the dividing line between the coastal *'ili* of Kewalo and Kukuluāe'o to the west and the *'ili* of Kālia in Waikīkī Ahupua'a to the east

(Figure 8, Figure 15, and Figure 16). A 1901 map (see Figure 15) has an early reference to the Beach Road as "Ala Moana" ("Ocean Road," but we cannot rule out that this was a later annotation). The 1909 map (see Figure 8) calls it "Moana Road" and it does appear that by 1911 (see Figure 16) it was firmly known as "Ala Moana." The *'ili* of Kewalo (LCA 10605) was awarded to Kamake'e Pi'ikoi, wife of Jonah Pi'ikoi. The husband and wife shared the award (Kame'eleihiwa 1992:269). Kewalo was a large 270.84-acre land section extending from Kawaiaha'o Church to Sheridan Street and had a small access to the shoreline between the boundaries of Kukuluāe'o and Kālia.

Kālia was an *'ili kū* of Waikīkī Ahupua'a. Soehren (2015) notes, "Kalia resembles an *ahupua'a* extending across Waikīkī from Makiki in the west to Kapahulu in the east, fragmented by many intervening *'ili* and *kuleana*." The *'ili* of Kālia was first awarded to Victoria Kamāmalu, who eventually returned it to the government. It then became fort land set aside for soldiers manning Government or Crown Lands. The area also included the rich offshore Kālia fishery, on the low reef flats, as shown on the 1909 map of the O'ahu Fisheries (see Figure 8). This fishery area would later be dredged and filled to form the east end of the Ala Moana Regional Park and part of Magic Island.

4.2.2 Rice Cultivation

By the end of the nineteenth century, most of the fishponds that had previously proliferated had been neglected and allowed to deteriorate. The remaining taro fields were planted in rice to supply the growing numbers of immigrant laborers imported from China and Japan, and for shipment to the west coast of the United States (Coulter and Chun 1937). As the sugar industry throughout the Hawaiian Kingdom expanded in the second half of the nineteenth century, the need for increased numbers of field laborers prompted passage of contract labor laws. In 1852, the first Chinese contract laborers arrived in the Islands. Contracts were for five years and pay was $3 a month plus room and board. Upon completion of their contracts, a number of the immigrants remained in the Islands, many becoming merchants or rice farmers. As was happening in other locales in the 1880s, groups of Chinese began leasing and buying (from the Hawaiians of Waikīkī) former taro lands for conversion to rice farming. The taro lands' availability throughout the Islands in the late 1800s reflected the declining demand for taro as the Native Hawaiian population diminished (Coulter and Chun 1937).

The Hawaiian Islands were well positioned for rice cultivation. A market for rice in California had developed as increasing numbers of Chinese laborers immigrated there since the mid-nineteenth century. Similarly, as Chinese immigration to the Islands also accelerated, a domestic market opened.

> The primary market for both husked rice and paddy raised in all parts of the Hawaiian Islands was in Honolulu. The number of Chinese in the islands created a large home demand.
>
> In 1880 the home market was made more secure by an increase in the duty on rice imported into Hawai'i to 1½ cents on paddy and 2½ cents on hulled rice. It resulted in further checking the importation of foreign rice and giving an immense impetus to the home product. [Coulter and Chun 1937:130]

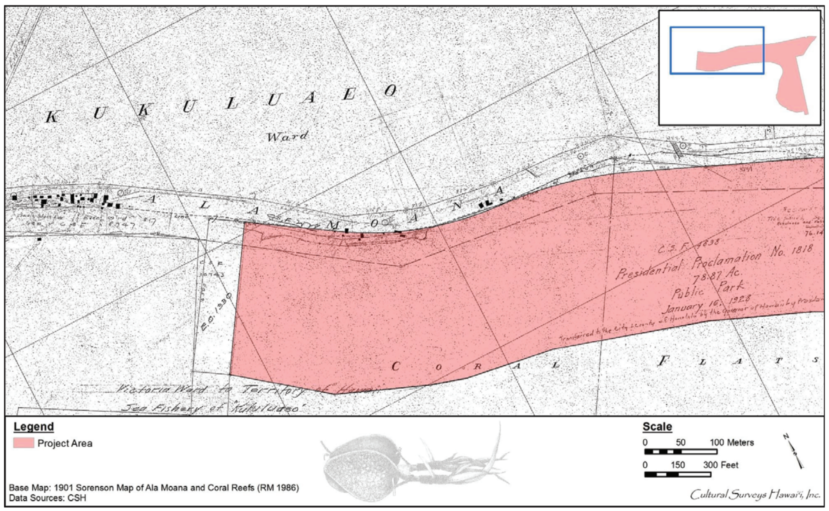


Figure 15. 1901 Sorenson map of Ala Moana and Coral Reefs showing the west portion of the project area in the "Sea Fishery of Kukuluaeo"

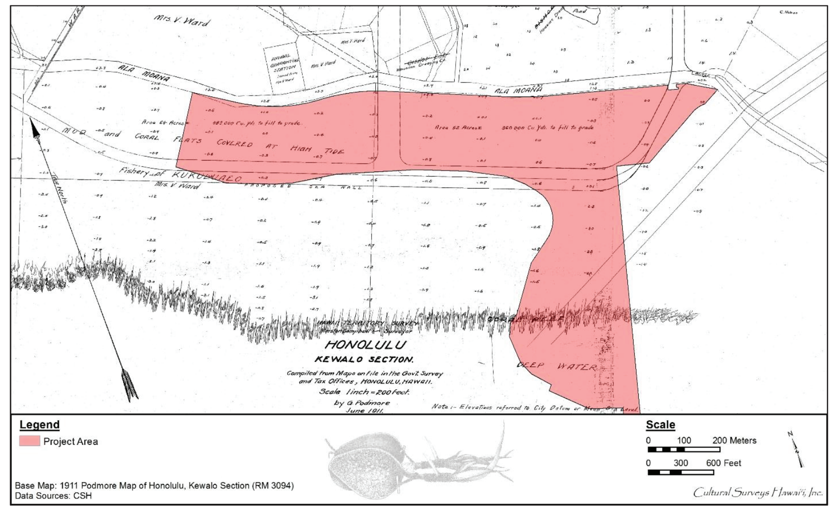


Figure 16. 1911 Podmore map of Honolulu, Kewalo Section, showing the project area and the original depths of the coral reef *makai* of Ala Moana Boulevard; note "Fishery of Kukuluaeo"

By 1892, Waikīkī had 542 acres planted in rice, representing almost 12% of the total 4,659 acres planted in rice on O'ahu. Most of the former taro *lo'i* converted to rice fields were *mauka* of the present Ala Wai Boulevard, understood to be Waikīkī Waena.

4.2.3 Banana Cultivation

Bananas were likely first brought to the Hawaiian Islands by Polynesians. They fared well on long distance journeys, both in root form and ripened, likely due to their hardy corm-like bulb and its leathery peel (Pope 1926:8). By the time Captain Cook and his men made contact with Hawaiians in 1778, many different varieties of bananas were already being cultivated locally (Pope 1926:2). Multinational strains of bananas were introduced to Hawai'i as early as the 1850s. Today, multinational strains of the fruit are so popularly grown in the Hawaiian Islands that only about 20 of the estimated 70 early Hawaiian varieties remain and these are often limited to remote valleys (Wagner et al. 1990:1465).

The Chinese banana, also known as the Dwarf or Cavendish banana, was introduced in 1855 and quickly became the most popular tropical fruit to be grown on a commercial scale because of its sweet taste, rapid growth, and resistance to insects like fruit flies (Higgins 1904:16). In addition to being the most widespread commercially grown banana in the Hawaiian Islands, the Chinese banana yields crops within one year of being planted at sea level, giving farmers the extra incentive to grow in lowlands. Banana farms flourished in areas like Waikīkī, which had been cultivated for centuries with taro *lo'i,* and later on with rice. Von Tempski (1940) provides a first-hand observation of the marshy landscape and the banana fields of Waikīkī ca.1910:

> After driving through the business section of town we began passing lovely homes set back in gracious gardens. Gradually the houses became farther apart, and finally the road started across a marshy tract of ground paralleled by a solitary street-car track. On either side of the dike were vivid green rice paddies and taro patches. Thin-legged Chinamen in coolie hats were wading around, tending the crops. Each paddy was surrounded by raised ground planted with stocky banana trees bending under huge bunches of fruit. Shanties on high poles showed here and there and imposing fleets of ducks paddled through the reed ponds quacking, shaking their tails and up-ending to dive for minnows and frogs. [von Tempski 1940:8–586]

The banana plant is notoriously thirsty; it is estimated that for every one pound of fruit yielded from a banana plant, it takes over 600 pounds of water to grow (Pope 1926:14). Therefore, irrigation and drainage systems had to be implemented as rows "laid out in ditches 1½ to 2 feet deep with high ridges between . . . The ditches are made by running a plow several times through each row, after which the loosened soil is thrown to the sides" (Pope 1926:13). Banana fields required very "deep and thorough" plowing, and after between 4-8 years of cultivation it was required that the field be replowed to maintain its productivity (Pope 1926:13, 19). This process would obliterate the previous year's rows, suggesting the natural land surface had undergone extensive and repeated restructuring.

Due to its extensive irrigation, banana farming and duck ponds reportedly went hand in hand, one helping to sustain the other. A 1901 article titled "Chinese Duck Ranch" in *Paradise of the Pacific* (cited in Feeser 2006) describes the duck ponds:

> . . . it is typical of countless such enterprises across O'ahu . . . the duck rancher carefully monitors every stage of his birds' growth and guards his flock from predators such as mongoose. He also states that the rancher gets two uses from his irrigation ditches, which he freshens regularly: he employs them not only for ponds, but also for growing bananas. [Feeser 2006:30]

4.2.4 Salt

As noted in LCA documents, much of the land in the modern-day area known as Kaka'ako and in Kewalo was used to produce *pa'akai* (salt). The Hawaiians used salt for a variety of purposes: to flavor food, to preserve fish and other meat, for medicines, and for ceremonial purposes. David Malo described the traditional method:

> *O ka paakai kekahi mea e pono ai, he mea e ono ai, ka ia, a me ke koekoe o ka paina ana, he mea hana ia ka paakai, ma kekahi aina, aole i hana a ma kekahi aina, o ke kai makai, e kii aku no ka wahine, a lawe mai ma ke poi, a ke kai hooholo ia mai kekahi ma kauwahi mai.*
>
> *E waiho kela kai ma kekahi poho paha, he ekaha paha, he kahe ka paha, a liu malaila, alaila lawe ana kauwahi e, a paakai iho la no ia, o ka papa laau ka mea kui poi.* [Malo 2006:73]
>
> Translation
>
> Pa'akai [salt] is another beneficial item. It is used to make fish delicious and tasteless foods edible. Pa'akai is made at a particular place, [but] it [salt] is not actually made from this spot, rather it [salt water] came from the sea. A woman went to get some when the sea crashed [upon the rocks] and she ran back [the salt water] to this particular spot.
>
> That salt water (kai) is placed in, perhaps, a depression (poho) or a 'Bird's nest' (ēkeha) or rock basin (kāheka) and allowed to evaporate (liu). Then it is taken to another spot and is formed into pa'akai. Wooden boards (papa lā'au) are used to pound poi (mashed cooked kalo corms) on. [Malo 2006:95]

In 1903, Nathaniel Emerson translated David Malo's articles on early Hawaiian life. In his publication, the translations are not literal, but include information that Emerson added to clarify the accounts. In Emerson's translation:

> Salt was one of the necessities and was a condiment used with fish and meat, also as a relish with fresh food. Salt was manufactured in certain places. The women brought sea water in calabashes, or conducted it in ditches to natural holes, hollows and shallow ponds (*kekaha*) on the sea coast, where it soon became strong brine from evaporation. Thence it was transferred to another hollow or shallow vat, where crystallization into salt was completed. [Malo 1951:123]

Captain James Cook was the first to document the more complicated method of making salt in prepared "saltpans."

> Amongst their arts, we must not forget that of making salt, with which we were amply supplied, during our stay at these islands, and which was perfectly good of

> its kind. Their saltpans are made of earth, lined with clay; being generally six or eight feet square, and about eight inches deep. They are raised upon a bank of stones near the high-water mark, from whence the salt water is conducted to the foot of them, in small trenches, out of which they are filled, and the sun quickly performs the necessary process of evaporation. . . Besides the quantity we used in salting pork, we filled all our empty casks, amounting to sixteen puncheons, in the Resolution only. [Cook 1784:151]

In the years immediately following the discovery of the islands by Captain Cook in 1778, most visitors were British and American fur traders who stopped at Hawai‘i on their way to China. One reason for their visit was to stock up on food and water, but the main concern was to buy or trade for salt, which was used to cure the seal and mammal pelts collected from the Northwest Coast. During Kotzebue's visit in 1816 and 1817, he noted that "Salt and sandalwood were the chief items of export" (in Thrum 1905:50):

> The journals of none mention the object of call other than for refreshments, though one, 3 some years later, records the scarcity and high price of salt at the several points touched at, with which to serve them in the curing of furs obtained on the coast. In all probability salt was the first article of export trade of the islands and an object, if not the object, of these pioneer furtraders' call. [Thrum 1905:46]

The missionary William Ellis, on a tour of the Hawaiian Islands in 1822 and 1823, also noted these salt pans and recorded the final step of crystallization.

> The natives of this district (Kawaihae) manufacture large quantities of salt, by evaporating the sea water. We saw a number of their pans, in the disposition of which they display great ingenuity. They have generally one large pond near the sea, into which the water flows by a channel cut through the rocks, or is carried thither by the natives in large calabashes. After remaining there for some time, it is conducted into a number of smaller pans about six or eight inches in depth, which are made with great care, and frequently lined with large evergreen leaves, in order to prevent absorption. Along the narrow banks or partitions between the different pans, we saw a number of large evergreen leaves placed. They were tied up at each end, so as to resemble a narrow dish, and filled with sea water, in which the crystals of salt were abundant. [Ellis 1827:403-404]

Samuel Kamakau noted that in the early to mid-nineteenth century, "The king [Kamehameha III] and Isaac of Pu‘uloa [Pearl Harbor] are getting rich by running the salt water into patches and trading salt with other islands" (Kamakau 1992:409). In an article on Hawaiian salt, Thomas Thrum (1923b:112–117) discussed the large salt works at Pu‘uloa, on the western loch of Pearl Harbor, and at Alia Pa‘akai (Salt Lake in Moanalua). The salt collected at these places was sent to Russian settlements in the Pacific Northwest, where it was used to pack salmon (Kurlansky 2002:406). Thrum also mentions a salt works in Kaka‘ako:

> Honolulu had another salt-making section in early days, known as the Kakaako salt works, the property of Kamehameha IV, but leased to and conducted by E.O. Hall, and subsequently E.O. Hall and Son, until comparatively recent years. This enterprise was carried on very much after the ancient method of earth saltpans as described by Cook and Ellis. [Thrum 1923b:116]

The export of salt declined in the late nineteenth century. Thrum (1923:116) states that the apex of the trade was in 1870. By 1883, he noted that "pulu [a soft, glossy, yellow wool used for pillows and mattresses], salt and oil have disappeared entirely" from the list of yearly exports (Thrum 1883:68). By 1916, only one salt works, the Honolulu Salt Company, was in operation. The owner of the company, E.O. Hall & Son, had salt works in Pu‘uloa, Kalihi, and Waikīkī on the island of O‘ahu, and a salt works on the island of Hawai‘i (*Engineering and Mining Journal* 1916:595). Salt continued to be manufactured for local use; the Kaka‘ako Salt Works appears on maps as late as 1891, and a page in Victoria Ward's ledger for 1883 notes a yearly income of $651.50 received from her "Salt Lands" in Kukuluāe‘o (Hustace 2000:50).

By 1901, government agencies reported that most of the fishponds and salt pans *makai* of the Ward "Old Plantation" area were abandoned. In that year, the Hawai‘i Legislature proposed to build a ditch to drain away the "foul and filthy water that overflows that district at the present time."

> The district makai of King St. and the Catholic Cemetery, Ewa of Mrs. Ward's (the Old Plantation), *mauka* of Clayton St., and Waikiki of the land from King St., leading to the Hoomananaauao Church, consists of six large abandoned fish ponds and a large number of smaller ones, all in filthy condition, fed by springs and flowing into Peck's ditches. Just makai of these ponds, at the end of Clayton street, next to Mr. Ward's, is Peck's place. An artesian well flushing the wash houses flows into two foul ditches, thence to the big pond which is Waikiki of what used to be Cyclomere and next to Mrs. Ward's line [ditch] extending down to Waimanu St. The rear portion of Mrs. Ward's property down to Waimanu St. used to be fish ponds all connecting to the sea by a ditch which is fed by an artesian well. These ponds, with the exception of three, are abandoned. [Hawaii Legislature 1901:185]

A traditional saying, *Kāhunahuna pa‘akao o Kālia*, "the fine-grained salt of Kālia" (Pukui 1983:144) indicates Kālia, along with Kaka‘ako, was a traditional area for salt collection by Native Hawaiians. Historic maps also indicate large-scale salt production took place in the project area in the early twentieth century.

E.O. Hall & Son, a Honolulu merchant, had a large salt works at Kaka‘ako, west of the project area. The company was officially used as a salt vendor as early as 1892 (*Daily Bulletin*, 7 January 1892:3). In 1902, the auctioneer Jas. F. Morgan advertised (*Hawaiian Star,* 10 July 1902:8) that he would be selling the "cottages, sheds, lean-tos, store and warehouses" at the Kaka‘ako Salt Works of E.O. Hall & Son. Soon after this date, in 1903 and 1904 (*Hawaiian Gazette*, 23 May 1903:8; *Hawaiian Star*, 31 August 1904:6), E.O. Hall began to advertise salt from their new "Kalia Salt Works." This seems to indicate the merchant closed down the facilities at Kaka‘ako (or sold them) in 1902 and moved to the newly constructed works at Kālia in 1903/1904. There are references of the Kalia Salt Works until at least 1909 (*Overland Monthly* 1909:xii); however, at some point, E.O. Hall consolidated all of their salt works into the Honolulu Salt Company, which operated until at least 1916. A volume of the 1916 *Engineering & Mining Journal* indicated,

> Most of the salt produced in the islands is the output of the Honolulu Salt company, whose product is confined to coarse salt and manufactured entirely by natural evaporation, no vacuum pans, kettles or grainers being used. The company operates salt beds at Puuloa, Kalihi and Waikiki, on the island of Oahu, and at Mahukona,

on the west coast of the island of Hawaii. [*Engineering and Mining Journal* 1916:594]

The Kalia Salt Works is probably the "Waikiki" salt works in the reference. These works probably closed between 1927 and 1932. Extensive areas of "salt pans" are depicted in some detail inland of the project area on a 1921 map (Figure 17).

4.3 The Vicinity of Ala Moana Regional Park in the Early Twentieth Century

The area inland of Ala Moana Regional Park was some of the last land of central urban Honolulu to be developed. A 1919 map (Figure 18) depicts substantial development in Kaka'ako to the west, filling in seaward from King Street to the north, and in Waikīkī to the east but with the area inland of the future Ala Moana Regional Park as very sparsely settled—which is understood as due to the low-lying marshy ground. An animal quarantine station (first shown on the 1911 map, Figure 16) is a large fenced rectangular compound north of the west portion of the project area and a few houses are arrayed on the *mauka* side of the Beach Road *mauka* of the central portion of the project area.

The low-lying nature of the area *mauka* of what would become Ala Moana Regional Park is well illustrated in a 1921 Land Court Application map (see Figure 17). This map calls out "Pond" seventeen times along with two areas of "Salt Pans."

A small area of land on the *makai* side of Ala Moana Boulevard was used as a city dump for trash. Before incinerators were built in Kaka'ako and Kewalo in the 1930s and 1940s (such as Kewalo Incinerator No. 1), combustible trash collected by the city refuse division was burned in open areas near the coast from Kewalo Basin to the Ala Wai Canal (Young 2005), as shown on a 1921 photograph (Figure 19).

4.3.1 The Ala Wai Canal and the Waikīkī Reclamation Project

The land surface of modern Honolulu and Waikīkī is the result of a decades-long dredging and fill project that included the creation of the Ala Wai Canal. In Nakamura's (1979) *The Story of Waikīkī and the Reclamation Project*, he writes that this land "reclamation program, planned in 1906, changed the ecology of Waikīkī from a once viable and important agriculture and aquaculture center . . . destroyed by profit-seeking capitalist entrepreneurs . . . under the subterfuge of 'drainage' and 'sanitation'" (Nakamura 1979:113). Many of the original property owners lost their land or suffered serious damage to their property as a result of the reclamation activities and/or costly expense for the mandatory filling in of their properties.

Dredging for the Ala Wai Canal began in 1921 and was completed seven years later. The final result was a "canal three miles long, with an average depth of twenty-five feet and a breadth of two hundred fifty feet" (*Honolulu Advertiser*, 17 October 1928). Nakamura (1979:85) writes that the government of the Territory of Hawaii solicited bids in 1920 for the dredge and fill project planned for the environs of Waikīkī. The plan was to create hundreds of acres of urban land at the expense of wetland agriculture and aquaculture in the area. The advertisement soliciting bids for the project put forward by Lyman H. Bigelow masked the significance of the project by stating it was "for Dredging a Drainage Canal and Filling and Reclaiming Certain Unsanitary Lands at Waikīkī" (Nakamura 1979:85). The Territorial legislature passed laws requiring property owners

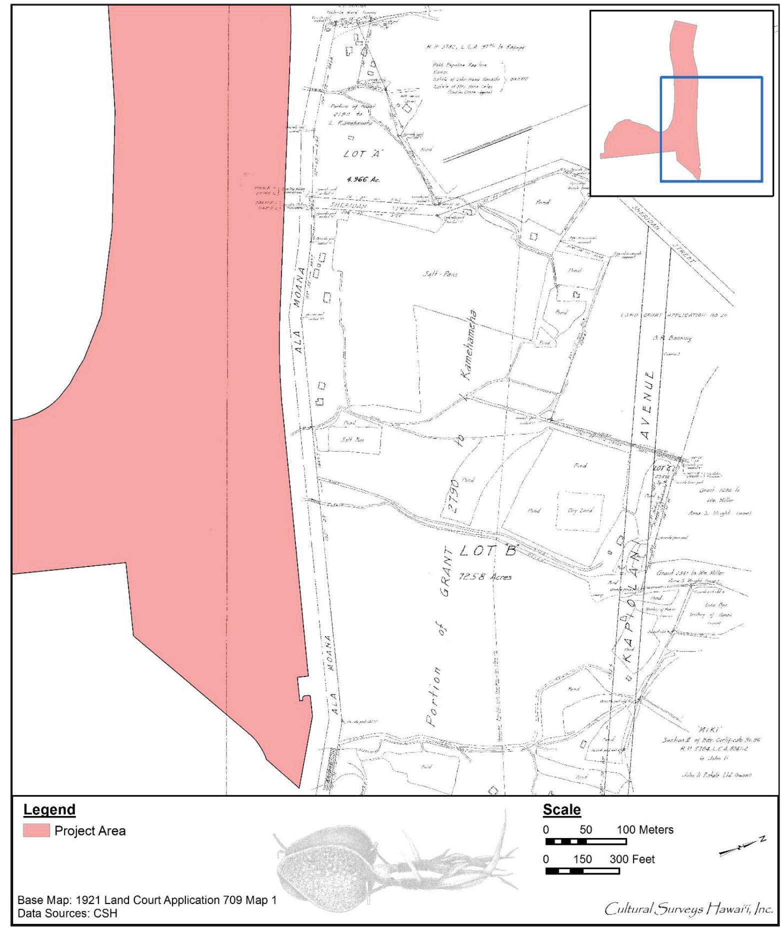


Figure 17. 1921 Land Court Application 709 Map 1 showing the project area (Hawai'i Land Survey Division 1921)

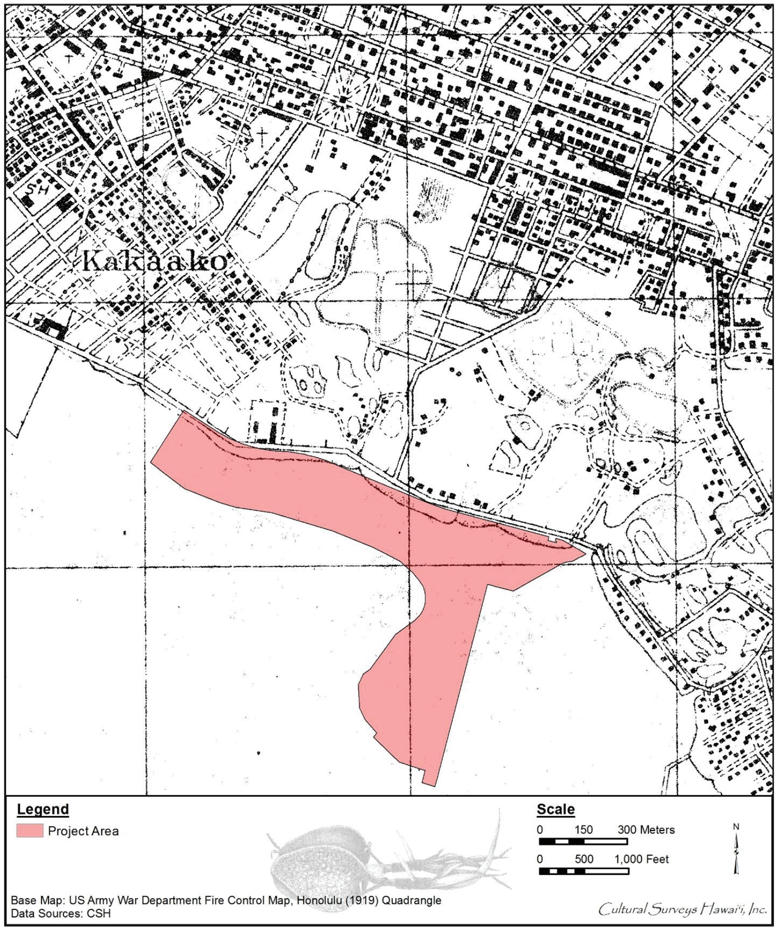


Figure 18. 1919 U.S. Army War Department fire control map, Honolulu Quadrangle, depicting the location of the project area before the construction of the Ala Moana Regional Park

Figure 19. Open-air burning of trash in area between Kewalo Basin and Ala Moana Regional Park, 1921 photograph (Hill 1921, reprinted in Scott 1968:578)

to pay for the filling in of their lands, which apparently was going to be done whether they wanted it or not. A lien would be fixed against their property and if all payment was not made on time, land would be foreclosed. Nakamura points out that the cost was so high for some property owners that the bank lien could extend into a 15-year mortgage (Nakamura 1979:89).

Once land that the Territory of Hawaii government wanted filled in (for state buildings) was filled, any further dredged materials became the property of the dredging company—the Hawaiian Dredging Company—and they could sell the materials to the property owners who in turn,were forced to buy the product. Walter F. Dillingham, of the Hawaiian Dredging Company, died in 1963. *Time* magazine, in their article about him and his involvement in the project, stated that "Walter Dillingham used the muck dragged up from the sea to fill in low, marshy areas around Honolulu, over the years created 5,000 acres of solid ground that now holds a full third of the city's population" (Nakamura 1979:112). The Ala Wai Canal is listed as State Inventory of Historic Places (SIHP) # 50-8-14-9757.

4.3.2 Ala Moana Regional Park

Ala Moana Regional Park is a 75.209-acre public park stretching along the modern shoreline from the Kewalo Basin in Honolulu to the west end of the Ala Wai Canal in Waikīkī. It is built almost entirely on fill land, land that was formerly a shallow reef off the Kaka'ako District. This original shoreline and reef area can be seen in an 1880 photograph of the Kaka'ako shore (see Figure 13). The peninsula in the background of this photo would later be expanded and filled to create the Fort Armstrong area, adjacent to the west side of Kewalo Basin, which was also created by dredging the reef. The history of the development of the park has been presented in Robert Weyeneth’s (1987) book *Ala Moana: The People’s Park*, and this book is the main source for the historical information in this section, unless otherwise noted.

Ala Moana Regional Park was one of the many public works projects carried out in the 1930s during the Great Depression. The idea for the park first originated in the 1920s. The park was especially backed by the Outdoor Circle, a club organized in 1911 by the wives of prominent Honolulu businessmen who organized to beautify and clean the city (Watts 1993:50). This group wielded a large influence and was instrumental in municipal planning. They were the main organization that led the push to ban large roadside advertising signs in Hawai‘i in 1927 (Watts 1993:154). The club envisioned Ala Moana as a park that could be used by all of the people of Hawai’i.

The U.S. federal government assumed the title to the site in 1897 with annexation of the new territory and began to use the site as a dump and open air burning area in ca. 1900. They transferred the original 78.87-acre lot to the Territory of Hawaii as Presidential Proclamation No. 1818 in 1927, as shown on a 1927 map (see Figure 22). There were two provisions for the transfer of the land. The first was that the territorial government dredge a channel through the reef to allow boats to travel from the Ala Wai Canal on the east to Kewalo Basin on the west, and the second was to fill a portion of the submerged reef to construct a public park. The dredging of the channel was completed in 1928 by the Hawaiian Dredging Company, managed by Walter Francis Dillingham. Walter Dillingham’s wife, Louise Dillingham was a member of the Outdoor Circle and one of the park’s main proponents. She was also a member of the Honolulu Park Board from the 1930s until her death in 1964.

The dredging plans (including the depths of the original reef) are shown in a 1911 map of Honolulu (see Figure 16). The initial dredged areas for Kewalo Basin, the boat channel in front of the park, and a dredged channel that extended from the west end of the Ala Wai Canal to this boat channel and a second channel across the reef to the sea can be seen in a 1934 map (see Figure 29).

A 1923 map (Figure 20) shows a “Proposed Park” that would be developed into Ala Moana Regional Park. Almost everything depicted on this map is “proposed” including a “proposed public park” on the *mauka* side of the (proposed) Ala Wai Canal, a “Proposed Channel” from the proposed Ala Wai Canal extending into what is now Magic Island, and a vast grid of dashed-in proposed streets. Some of the proposed streets between Kapi‘olani Boulevard and Ala Moana would be cancelled by the construction of the (not yet proposed) Ala Moana Shopping Center. Kewalo Basin is newly created (but does not yet have its present configuration).

A 1925 map (Figure 21) shows the original shoreline in some detail with named three-letter survey points. This surveyed map gives us confidence that very little, if any, of Ala Moana Regional Park is actually built on naturally occurring dryland. This 1925 map offers an explanation for how the proposed park land was anticipated to be created as five areas seaward of Ala Moana Road are called out as “dump” or “city dump” along the “mud shore.” The configuration of “dumps” certainly suggests they are being expanded south onto the shallow shoal.

A 1927 map (Figure 22) does indeed show substantial movement seaward of the “Edge of Dump.” This map explicitly shows a surveyed perimeter of what would become Ala Moana Regional Park (Magic Island being a much later addition) as a result of the reclamation project in

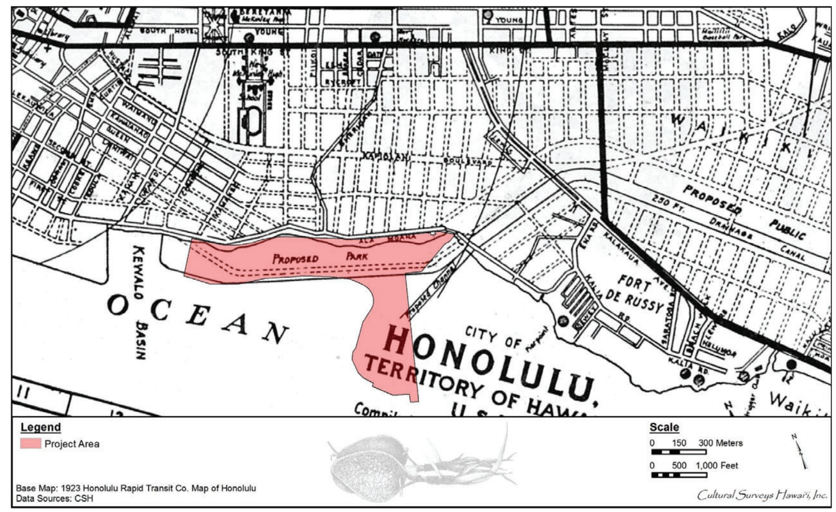


Figure 20. 1923 Honolulu Rapid Transit Company map of Honolulu showing the project area

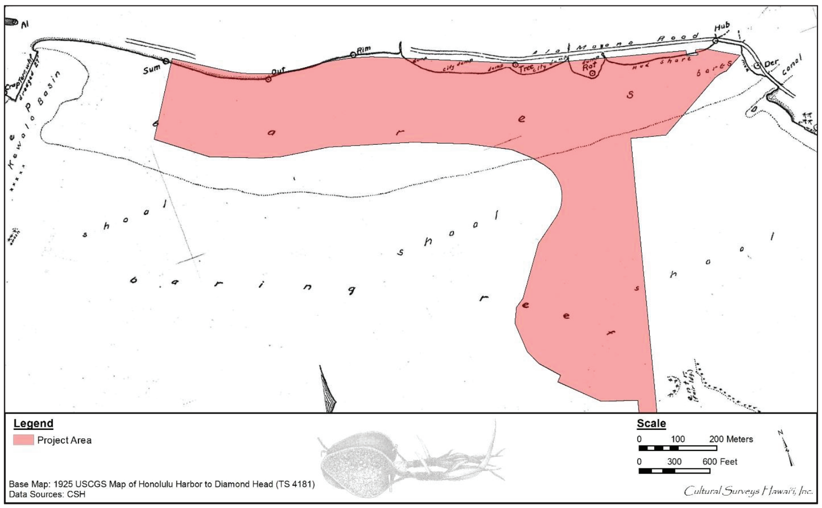


Figure 21. 1925 U.S. Coast and Geodetic Survey map of Honolulu Harbor to Diamond Head (portion) showing the project area; note areas labeled "dump" or "city dump" on the *makai* "mud shore" side of Ala Moana Boulevard

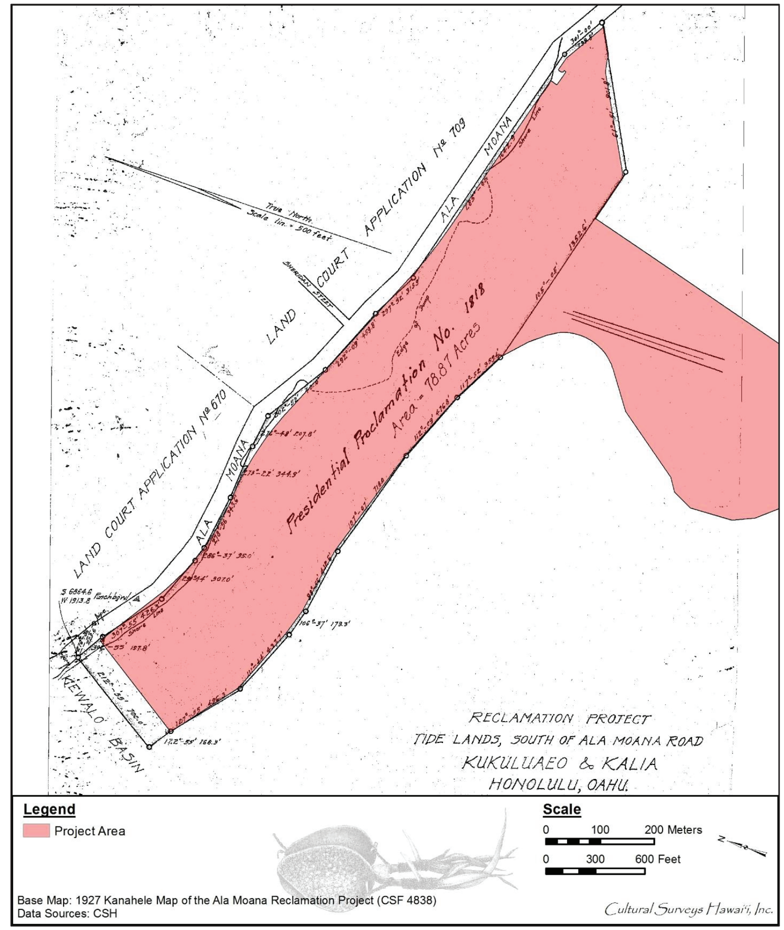


Figure 22. 1927 Kanahele map of the Ala Moana Reclamation Project showing the project area land transfer for the Ala Moana Regional Park from the federal government to the City and County of Honolulu (Hawai'i Land Survey Division 1927)

the “Tide Lands.” This 1927 map specifies Presidential Proclamation No. 1818 dedicating an area of 78.87 acres for the park.

A 1927 aerial photograph (Figure 23) shows the original shoreline and reef edge of the project area. This photograph shows expanding and coalescing dumps on the shallow reef. The plume of smoke over the largest dump almost certainly relates to the pattern of open-air burning of trash depicted in Figure 19. Weyeneth (1987:5) reports a tradition of local wags pointing out the plumes of smoke to gullible ship-board visitors “as Honolulu’s active downtown volcano.”

The Ala Moana Regional Park area was deeded by the federal government to the Territory of Hawaii on 25 October 1927 and then from the territory to the City and County of Honolulu on 16 January 1928 (Weyeneth 1987:5).

It may be noted that the only dredging shown in 1927 is off the mouth of the new Ala Wai Canal which takes a right angle turn southeast toward Diamond Head. The Hawaiian Dredging Company, Ltd. received the contract to dredge the channel and fill the future park site; the work was completed in October 1930 (Weyeneth 1987:5).

A 1931 photograph as viewed from the west (Figure 24) shows a radically different situation from the aerial photograph of four years earlier in that the substrate of Ala Moana Regional Park has just been created as a field of bright white crushed coral. There is a dark patch in the center of this bright field of crushed coral *makai* of Ala Moana Boulevard in the central portion of the park understood to be the large area of “dumps” shown in the 1927 aerial. Evidently the burned dumped material was high enough there was no need for further fill or there was a wish not to interfere with ongoing dump activities.

In July 1931, the Honolulu Park Board approved the designs for the park, originally called Moana Park, by two Hawai‘i landscape architects, Catherine Jones Richards and Robert Oliver Thompson, later Mr. and Mrs. Robert O. Thompson (Weyeneth 1987:9).

> As landscape architects, Richards and Thompson proposed a design for the park layout that included six tennis courts, three baseball fields, volley ball courts, a children’s wading pool, a playground, picnic spots with outdoor grills, a bridle path linking Ala Moana and Kapiolani parks, a small boat harbor designed as a public alternative to private yacht clubs, and clubhouses for local rowing clubs. The central architectural feature was to be an oceanfront recreational complex combining a dance pavilion, restaurant, and bath house, bordered on the mauka (mountain) side by a large sunken pool with fountain and allees (parallel rows) of banyan trees. Instead of a beach, Richards and Thompson proposed a shaded shoreline promenade. [Weyeneth 1987:10]

Plans for the park included a Hawaiian Village, a Japanese teahouse, and Chinese pagodas.

A clearer view of the emerging park land is provided in an oblique aerial photograph as viewed from the east in 1932 (Figure 25). The developing park roughly followed the configuration of the original 1932 landscape plan by Richards and Thompson (Figure 26). The 1932 aerial photograph (see Figure 25) shows the completion of the lagoon features, interior pathways, and seawall at the edge of the filled park land. This photograph also shows the small amount of land in the center, inland section of the park that was originally dry land (dark area of park near Ala Moana Boulevard), rather than former reef land filled with dredged spoils (white areas).

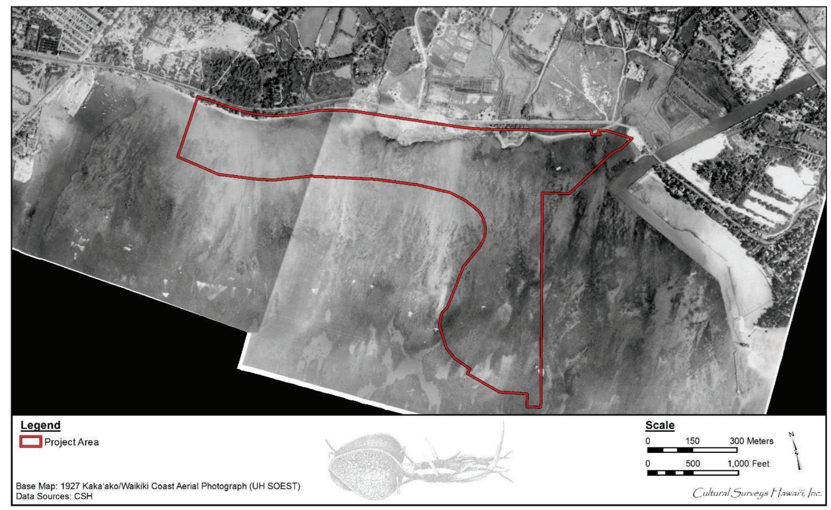


Figure 23. 1927 Kakaako/Waikiki Coast Aerial Photograph (UH SOEST 2012a) showing the project area and the Ala Moana Regional Park area after construction of the Ala Wai Canal but before construction of the park; note the initial dredging for Kewalo Basin can be seen on the left side of the photograph

Figure 24. 1931 photograph of the Honolulu to Waikīkī Coast; the dredged boat channel and the recent fill for the Ala Moana Regional Park can be clearly seen (Hawai'i State Archives 1931)

Figure 25. 1932 photograph of former reef area filled with dredged material to create Ala Moana Regional Park (Hawai'i State Archives 1932)

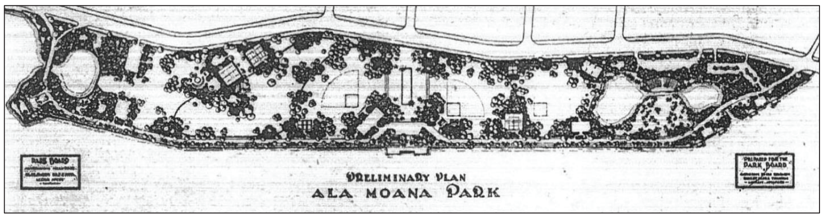


Figure 26. Original landscape plan by Richards and Thompson, 1932 (from Weyeneth 1987:55); the shoreline is bound by a promenade not a beach

By 1932, the lagoons had been dredged, the central recreational area had been paved, and 600 coconut palms and 100 banyan trees, donated by the public, had been planted, as shown on a ca. 1935 photograph of the park (see Figure 33).

A 1933 map (Figure 27) depicts a grid of planned roads (shown as dotted lines) *mauka* of Ala Moana Boulevard. Many of these streets were never built, as the Hawaiian Dredging Company began to fill and level the land. The Ala Moana Regional Park fill land is shown but there are no structures within the park. On this map, Kewalo Basin has been dredged adjacent to the new fill land for Fort Armstrong and the western end of the Ala Wai Canal ends at the open ocean at the east end of the park. The blue dotted line off the coast indicates the edge of dredged areas for Kewalo Basin and the boat channel in front of the park.

The newly dredged fill from the Ala Wai Canal and from the reef just seaward of the emerging Ala Moana Regional Park was used not only to create the Ala Moana Regional Park but also to fill low-lying areas inland. One focus of the inland fill efforts was the low-lying area on the northwest side of the new Ala Wai Canal extending inland from the east corner of the new Ala Moana Regional Park. This area had been an extensive area of shallow ponds and marsh (see Figure 18). This inland extension of fill efforts is evident in the extension of bright white coral fill extending inland from the Diamond Head end of the park on the 1931 aerial photograph (see Figure 24). The Ala Wai Inn (Figure 28) was a very well-known restaurant and bar built on the northwest side of the Ala Wai Canal about midway between Ala Moana Boulevard and Kalākaua Avenue (see Figure 38 for specific location). The caption of a 1933 photo of the Ala Wai Inn by the Department of Parks and Public Grounds, City of County of Honolulu dated 9 August 1933 (see Figure 28) seems incongruous to us in suggesting the Ala Wai Inn was part of "Ala Moana Park." The Ala Wai Inn is 300 m northeast of the northeast corner of Ala Moana Regional Park as we know it today. Part of the early vision for the park was that it would be "a link between Ala Moana and Kapiolani Park" (Weyeneth 1987:11), with the park continuing inland of Ala Moana Boulevard, southeast of Atkinson Boulevard as a promenade on the northwest side of the Ala Wai Canal extending on up past the Ala Wai Inn to Kalākaua Avenue. Presumably the difficulties of creating pedestrian access across Ala Moana Boulevard (and the value of the land) led to Ala Moana Regional Park remaining isolated *makai* of Ala Moana Boulevard.

A 1934 Wright, Harvey and Wright map of Honolulu (Figure 29) aids in visualizing the plan to have a strip of land along the northwest side of the Ala Wai Canal connect the Ala Moana Park to a proposed park extending along the *mauka* side of the Ala Wai Canal toward Diamond Head. This 1934 map also shows a concept involving shallows *makai* of Ala Moana Regional Park separating the park from the dredged channel with seven short groins or piers extending perpendicular out from the shore connecting the park to the deeper water of the dredged channel.

In 1933, Lester McCoy (the "virtual founder of Honolulu's modern park system"; Weyeneth 1987:11) hired Henry Sims Bent to complete working drawings for the new park.

> It is Bent's work that today gives Ala Moana Park its unique character, exemplified in the whimsical canal bridge (completed in 1934), the portals at the Waikiki entrance (named for President Franklin Delano Roosevelt after he dedicated them in 1934), the sports pavilion and banyan garden (completed in 1937), and the lawn bowling green (completed in 1939).

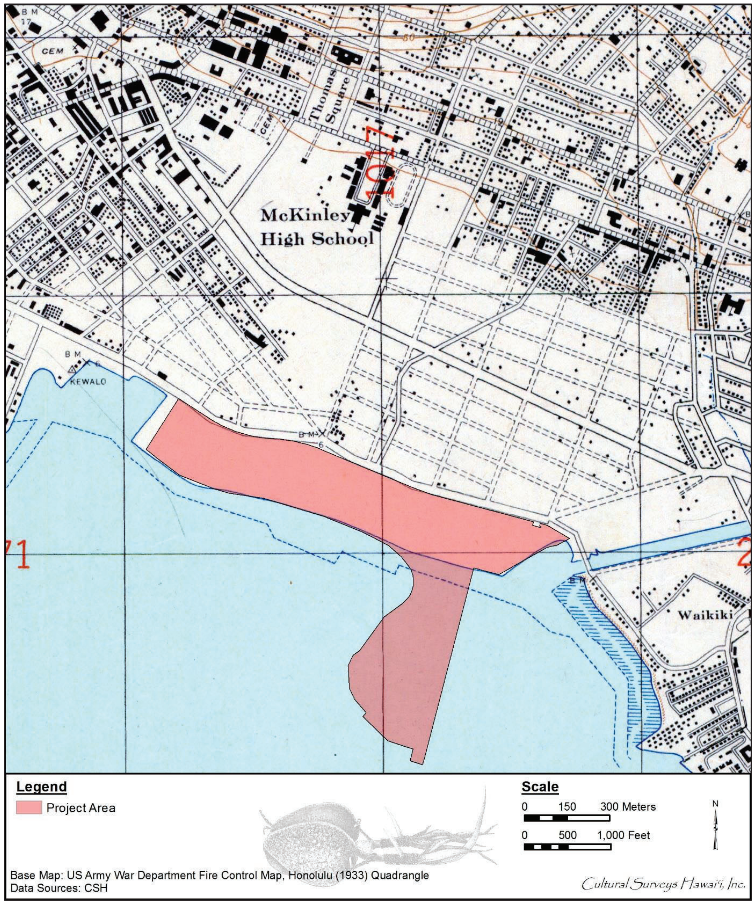


Figure 27. 1933 U.S. Army War Department fire control map of O'ahu, Honolulu quadrangle, showing the project area; Ala Moana Regional Park has been constructed on fill land and the boat channel offshore has been dredged, but the park has not yet landscaped; note streets have been planned on the *mauka* side of Ala Moana Boulevard, as denoted by the dashed lines, but the majority were never built

Figure 28. 1933 photograph of the Ala Wai Canal and the Ala Wai Inn (on right); this land section between Ala Moana Boulevard and Kalākaua Avenue on the northwest side of the Ala Wai Canal adjacent to the northeast end of the Ala Moana Regional Park was first proposed as a promenade area connected to the park (Hawai'i State Archives 1933)

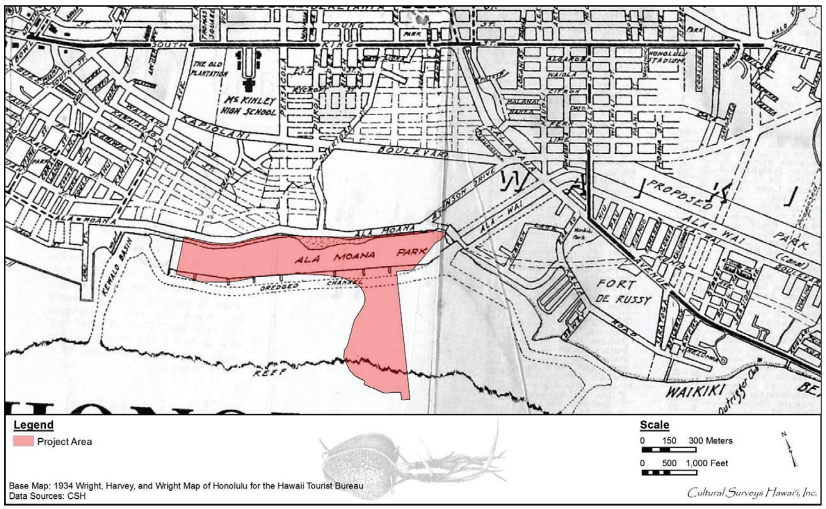


Figure 29. 1934 Wright, Harvey and Wright map of Honolulu for the Hawaii Tourist Bureau, showing the project area and dredged channels for the Kewalo Basin, the Ala Moana boat channel, and a separate channel from the Ala Wai Canal across the reef to the ocean (left to right)

> In addition to his work at Ala Moana, Bent designed the layout and structures of a number of smaller parks in Honolulu, including Mother Waldron Playground, Kawananakoa Playground, the Lanikila Park comfort station, Kalihi-Waena Playground, Haleiwa Beach Park, the wall at Hauula Beach Park, Ala Wai Clubhouse, the park service center near Kapiolani Park, and a design for the Kalakaua Recreational Center. Many of his park designs combined the angular zig-zag motifs associated with the Art Deco style with the curved surfaces typical of Streamline Moderne. [Weyeneth 1987:14]

It is largely due to the vision of landscape architects Richards and Thompson and architect Bent that Ala Moana "park stands as the crowning achievement of the golden age of Honolulu park building during the 1930s" (Weyeneth 1987:14). Ala Moana Regional Park was placed on the Hawai'i Register of Historic Places (HRHP) on 9 June 1988 as part of a City and County of Honolulu Art Deco Parks Thematic Group designated SIHP # 50-80-14-1388 and a National Register of Historic Places (NRHP) Nomination for Ala Moana Regional Park was prepared in 1988 listing the period of significance as 1934.

Henry Sims Bent's first design was an equestrian bridge with the appearance from the side of two half-circles screening the single arch (Figure 30). It was meant to be part of a horse bridle path that connected to the Ala Wai promenade (National Park Service n.d.). This was quickly followed by the Roosevelt portals that were formally dedicated in 1934 during a visit by President Roosevelt to Honolulu. (Weyeneth 1987:17) (Figure 31). The scalloped art deco walls at the portals that allow for planting space within their concave recesses (Figure 32) are understood to date from the same year (1934).

A 1935 aerial photograph (Figure 33) stands in quite sharp contrast to the 1932 aerial photograph (see Figure 25). What in 1932 was a white plain of dredged coral, crushed and compacted, is now extensively landscaped with expanses of grass and many trees. The photographs from 1935 (Figure 34) show how the landscaping of Ala Moana Regional Park was quickly accomplished through the stockpiling and spreading of topsoil on new dredged coral rubble fill land. Other 1935 photographs (Figure 35) show the ongoing construction of the Banyan Tree Court in the central portion of the park and completed walkways and water features in the central McCoy Pavilion area.

The funds for the labor, at times as large as 800-900 workers, to complete the park came from the Federal Employment Relief Administration (FERA) and the Civil Works Administration (CWA). The land was filled with approximately 5 ft of sand and coral rubble dredged from the ocean in front of the park or with sand trucked in from north O'ahu beaches, and placed on the coral reef with about a 1-ft thick layer of topsoil (Arthur Kimbal Thompson Architect, AIA 2004:16–17). The sand, coral rubble, and top soil can be seen in two 1935 photographs (see Figure 34).

Of note in the 1935 aerial photograph is the wide swath on the *makai* side of Ala Moana Boulevard between the two-lane road and the *mauka* park wall that would be used to triple the width of Ala Moana Boulevard seaward. This 1935 aerial photograph aids in reconstructing the relationship of the Ala Moana Regional Park lands to the original land surface. From the earliest maps, the Beach Road that became Moana Road and subsequently Ala Moana Boulevard is shown as pretty much flush on the *makai* edge of dry land (for relatively detailed maps see Figure 21 and

Figure 30. Art Deco style Ala Moana Equestrian Bridge understood as completed in 1934 (Hawai‘i State Archives n.d.)

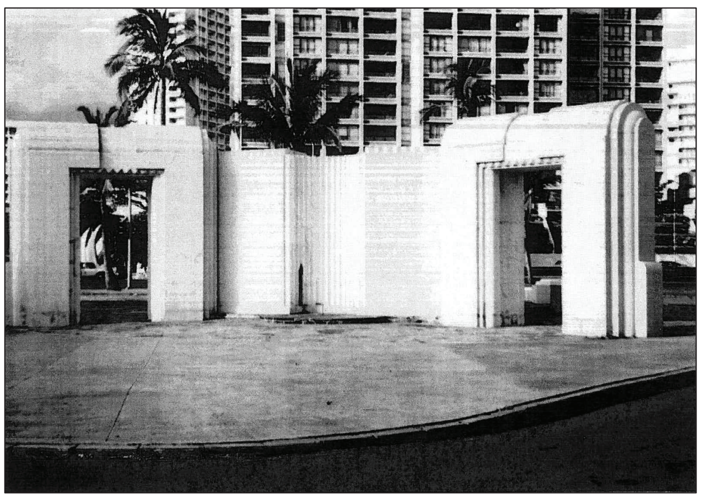


Figure 31. Roosevelt Portal understood as completed in 1934 (in Weyeneth 1987)

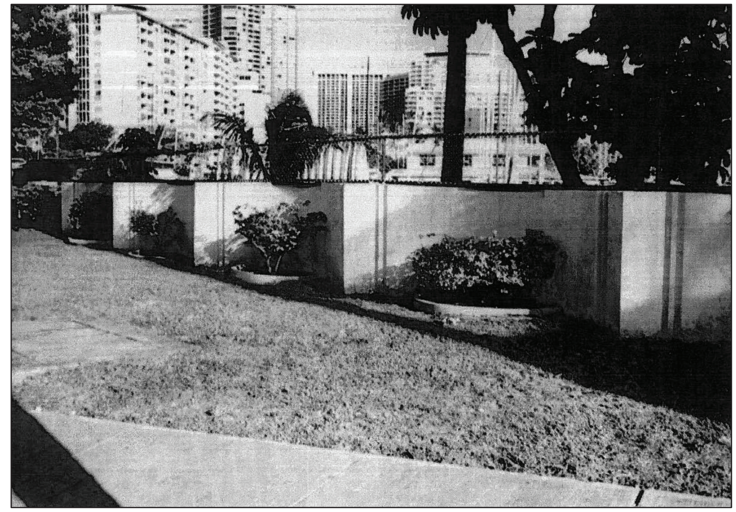


Figure 32. Scalloped Art Deco walls at portals (in Weyeneth 1987)

Figure 22). This depiction of Ala Moana Boulevard’s width expansion, quite significantly seaward after 1935, is an element of proof that Ala Moana Regional Park is built entirely on fill.

Weyeneth (1987:17) explains that the sports pavilion and banyan court were officially completed in 1937, although much of the sports pavilion had been finished somewhat earlier, by 1935 (see Figure 35). The pavilion itself was designed to be a recreation center, offering rooms for crafts and games and, across the courtyard, locker facilities for men and women. The two notable wall-sized murals depicting the Hawaiian *makahiki* (sports festival) and which depict Hawaiian sports such as *‘ulu maika* (game stones) rolling, *hōlua* (sled) sliding, spear throwing, canoeing, surfing, hula dancing, and wrestling were completed by artist Robert Lee Eskridge (Figure 36).

Many of the structures and walls (see Figure 35 and Figure 36) incorporate the angular, scalloped, and curved lines of the Art Deco style. The enclosed Banyan Tree Court, with its reflecting pools and stone planters, was designed to represent a “Pacific” style based partly on a picture of a Balinese garden. The artist, Marguerite Blasingame, later added low-relief sculptures of Hawaiian figures to the courtyard walls.

The many rock walls in the park were made of boulder concrete construction, where concrete is poured into wood molds filled with broken-up coral and lava rocks. This type of construction, chosen during the Depression era for its low expense, necessitated the making of rather massive wall sections. In some sections of the park, the coral/rock is exposed and in other areas the walls have been smoothed by the addition of stucco (Figure 37).

Figure 33. Ca. 1935 photograph of landscaped Ala Moana Regional Park (Hawai'i State Archives 1935a); note the wide swath on the *makai* side of Ala Moana Boulevard between the two-lane road and the *mauka* park wall that would be used to triple the width of Ala Moana Boulevard on the seaward side

Figure 34. 1935 photographs showing dredged material and topsoil stockpiled and spread on new fill land of Ala Moana Regional Park (Hawai'i State Archives 1935b)

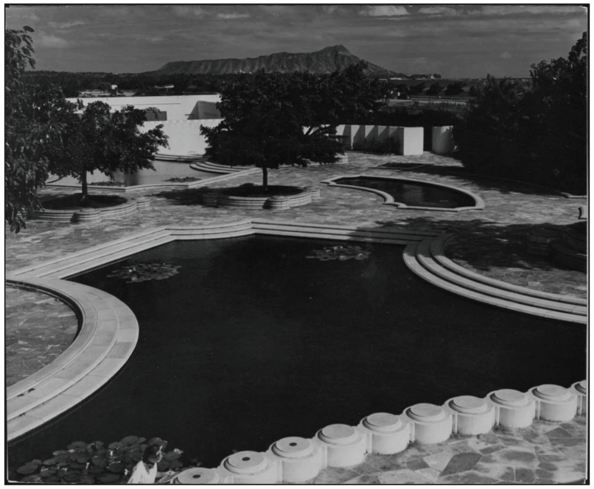


Figure 35. 1935 photographs of Banyan Tree Court: aerial showing construction (top) and completed walkways and water features (bottom) (Hawai‘i State Archives 1935c)

Figure 36. Ala Moana Regional Park Sports Pavilion completed ca. 1935-1937; exterior view (upper) (in Weyeneth 1987), with murals of Hawaiian games (lower) (Hawai‘i State Archives n.d.)

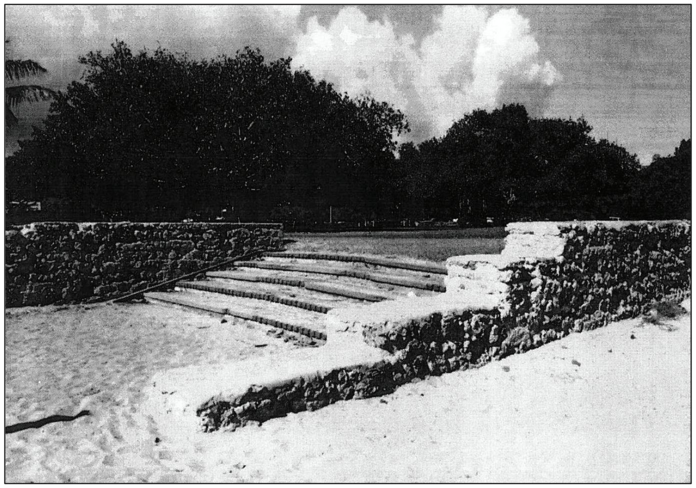


Figure 37. Boulder walls in the park, bare (upper) and stuccoed (lower) (photographs by Robert R. Weyeneth in Weyeneth 1987)

In 1935, the park board planned to acquire land on the *mauka* side of Ala Moana Boulevard so that a continuous parkway and promenade would connect Ala Moana Regional Park and Kapi'olani Park, as shown on the 1936 park plan map (Figure 38). The early development of the western end of this parkway is shown in a 1933 photo, with wooden struts against the Ala Wai Canal next to a worker's tent and the old Ala Wai Inn building. The Ala Wai Inn, a Japanese tea house, was a favorite haunt of pre-World War II naval officers. It became notorious in the 1930s as the opening location for the Massie Affair. In 1931, a naval wife, Thalia Massie, walked away from a party at the Ala Wai Inn to John Ena Road in Waikīkī. She claimed that five Hawaiian local boys kidnapped her off the road and raped her, which later led to the retaliatory "honor killing" of one of the boys (Daws 1968:319–327). Most recent books have discounted the kidnaping and rape and supported the innocence of the five accused boys (e.g., Stannard 2006). Some accounts mistakenly claimed that Massie said she was taken by the boys to Ala Moana Park (Riccio 2003) and that the park was built to erase this association, but this claim has been easily discounted as the park was planned long before this incident. Eventually this parkway area along the Ala Wai Canal was developed, with the current Hawaiian Convention Center built generally on the site of the old Ala Wai Inn, shown in a 1933 photograph (see Figure 28).

A 1936 map of the Ala Moana Regional Park Development shows the landscaping and structural plans developed by Sims and approved by McCoy (see Figure 38). The 1936 Ala Moana Regional Park development plan (see Figure 38) differs from the present configuration of the park in a number of ways. Virtually the entire perimeter of the park was developed differently from what was earlier envisioned; from the configuration of Kewalo Basin to the configuration of streets in the Ala Moana area, to the configuration of the Ala Wai Yacht Harbor, to the configuration of dredged channels seaward. The southeast and northwest ends of Ala Moana Regional Park were subsequently developed as depicted but the central focal area of the park was not developed according to this plan. A 1943 Army War Department terrain map (Figure 39) similarly depicts Kewalo Basin, the streets in the Ala Moana area, and the Ala Wai Yacht Harbor differently from what would be developed. The central configuration of Ala Moana Regional Park is shown differently from the 1936 plan and also differently from what is present today.

In 1941, at the start of World War II, the park was taken over by the military and barbed wire was used to fence off the park from the public (Allen 1999:392). Temporary shacks for housing, bomb shelters, and a gun battery were built in the park. AMTB Battery Ala Moana had four 90 mm dual-purpose guns on a M1 mobile mount. These guns were used by the coast artillery as anti-aircraft and anti-motor-torpedo boat (AMTB) defenses (Williford and McGovern 2003:44). The general location of this battery is shown in Figure 40 and a typical AMTB battery (at Fort Monroe, Virginia) is shown in Figure 41 (Fort Wiki 2015). The battery was constructed in 1944 and destroyed in 1946 (Mason Architects, Inc. 2004: A-15).

In 1945, the army wished to keep half of the park for an Army Air Force rest and recuperation center, but the request was rejected by the city board. The temporary structures were taken down, the gun battery was destroyed, and wire fences were dismantled after the war, the damaged lawns and landscaping plants were resown, and the park was slowly restored.

In 1945, the Territorial Department of Public Works planned to build an airport off the reef of Waikīkī. The proposed location was on the reef off Ala Moana Regional Park. The reef would be dredged and filled for a 3,000-ft runway, hanger, and other structures. The airport would be used for small private airplanes while the new John Rodgers International Airport would take the larger

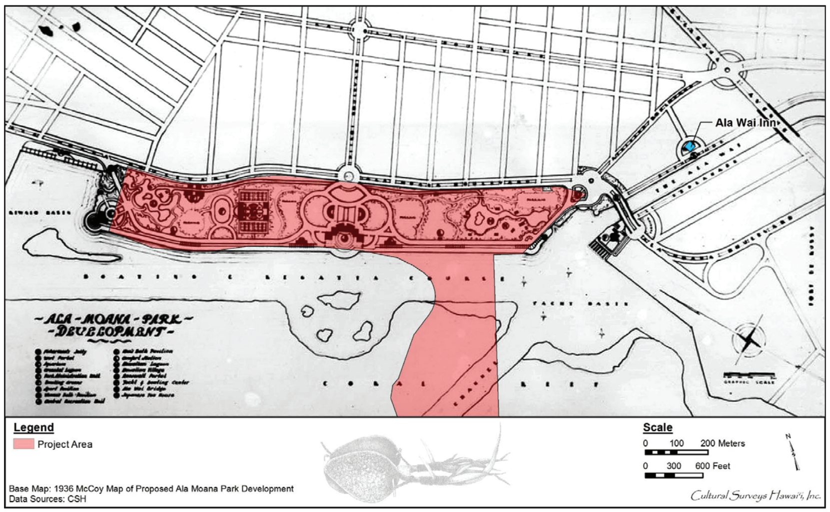


Figure 38. 1936 McCoy map of proposed Ala Moana Park Development showing the project area and landscaping and structural plans for Ala Moana Park; note location of the Ala Wai Inn (Japanese Tea House)

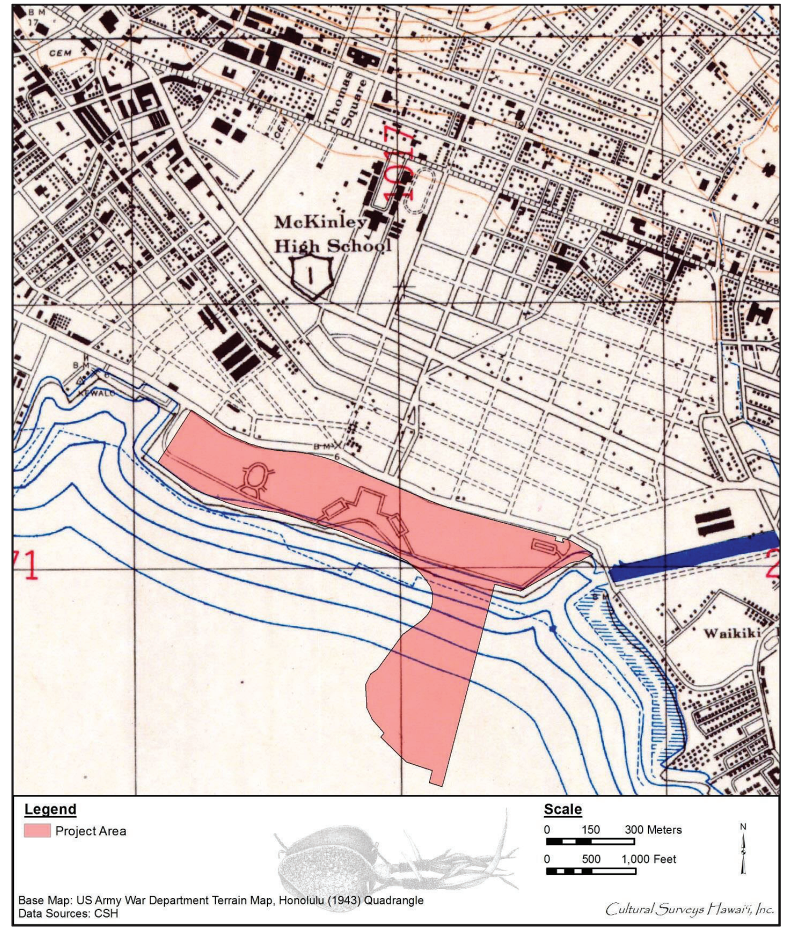


Figure 39. 1943 U.S. Army War Department terrain map of O‘ahu, Honolulu quadrangle, showing the project area; Ala Moana Regional Park has been constructed and landscaped

Figure 40. Former location of Battery AMTB (Anti-Motor-Torpedo Boat) at Ala Moana Regional Park, built in 1944 and destroyed in 1946 (Fort Wiki 2015)

Figure 41. Typical AMTB Battery with 90 mm gun (Fort Monroe, Virgina) (Fort Wiki 2015)

private and commercial planes. The project was included in the Planning Board meetings, but was never taken up by the Legislature (State of Hawai'i Department of Transportation, Airports Division 2015). A plan view of the proposed airport is shown in Figure 42 and Figure 43. These plans show for the first time an approximation of the configuration of Kewalo Basin and the Ala Wai Yacht Harbor. In these renditions a bridge was proposed at the west end of Ala Moana Regional Park across the channel that was dredged ca. 1931 (see Figure 24 and Figure 25). That portion of the dredged channel was apparently still present in 1953 (Figure 45 and Figure 46) but appears to have been filled by 1955 (Figure 47) and certainly by 1959 when the southwest corner of Ala Moana Regional Park looked much as it does today (Figure 48).

During the early decades of the park, a "Hawaiian Village" was constructed by the Diamond Head lagoon (Figure 44).Weyeneth (1987:27) relates that the "Hawaiian Village" of Ulu Mau was constructed in Ala Moana Regional Park in 1948, and park brochures in the 1950s advertised its "authentic grass huts" as must-see sights "for island visitors." Ulu Mau would be renovated in 1960 but later moved to He'eia Kea ca. 1963 for a while before it closed.

4.4 The Vicinity of Ala Moana Regional Park in the Late Twentieth Century

While the full integration of the Ala Moana Regional Park with the Ala Wai Promenade was never quite actualized, one aspect—the construction of "fishermen's stands"—was common to recreation in both the Ala Wai and Ala Moana Regional Park areas. These fishing stands (Figure 47) were often constructed out in the shallows with a creative collection of wood scraps and were used primarily by fishermen attempting to catch mullet with bamboo poles.

The 1953 USGS map (see Figure 46) shows the planned area of the Ala Moana Center as a solid block. One new structure is a radio tower labeled "KONA." The KONA-TV station (now KHON-TV, an affiliate of NBC) broadcast its first hour of television in 1952. The studio was located on Kō'ula Street (west of the project area in Kaka'ako); the transmitter was in the Ala Moana area and the executive offices were in downtown Honolulu. All of these facilities were moved to a new location on Auahi Street in Kaka'ako in the mid-1950s (Stone 1983:243). The Ala Moana Yacht Basin has been created by dredging, and Ala Moana Boulevard is now a two-lane road. On a 1959 USGS map (see Figure 49), the boat channel connecting the Ala Wai Yacht Harbor to Kewalo Basin has been eliminated by expanding the beach area for Ala Moana Regional Park and by blocking the entrances to the harbor. The west end of Ala Wai Canal now is an open channel to the sea.

After the war several changes were made to the park. In 1947, the name of the park changed from Moana to Ala Moana Park. The Hawaiian Village, called Ulu Mau, consisting of a collection of grass huts near the Hawaiian Lagoon, was added in 1948 (see Figure 44), the Oriental Lagoon was remodeled in 1950, and a children's center was added in 1954.

The most important change, however, was the construction of the beach and swimming area at the shoreline of the park. Before this time, swimming was discouraged as two sewers emptied into this area and the ocean was blocked off by a seawall with a narrow beach. Fishermen built wood fishing stands offshore (see Figure 47) and boats used the water channel on the *mauka* side of the park to move from the west end of the Ala Wai Canal where boats were moored to Kewalo Basin

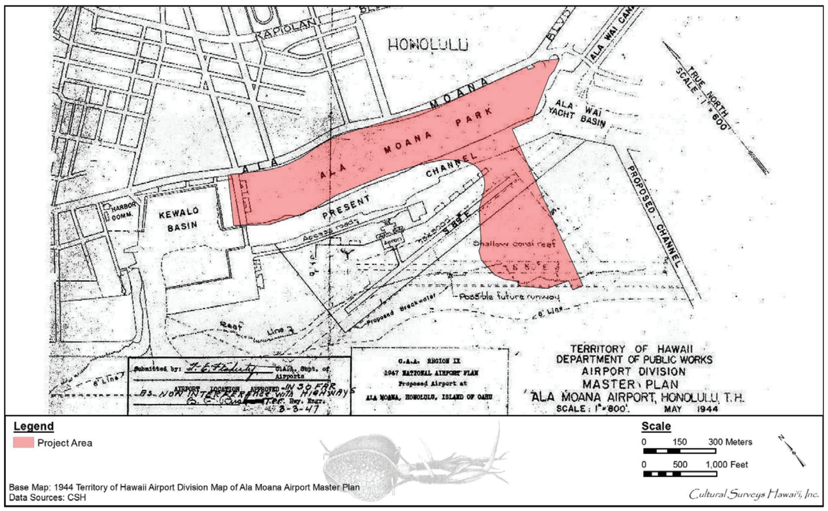


Figure 42. 1944 Territory of Hawaii Airport Division map of Ala Moana Airport Master Plan showing the project area

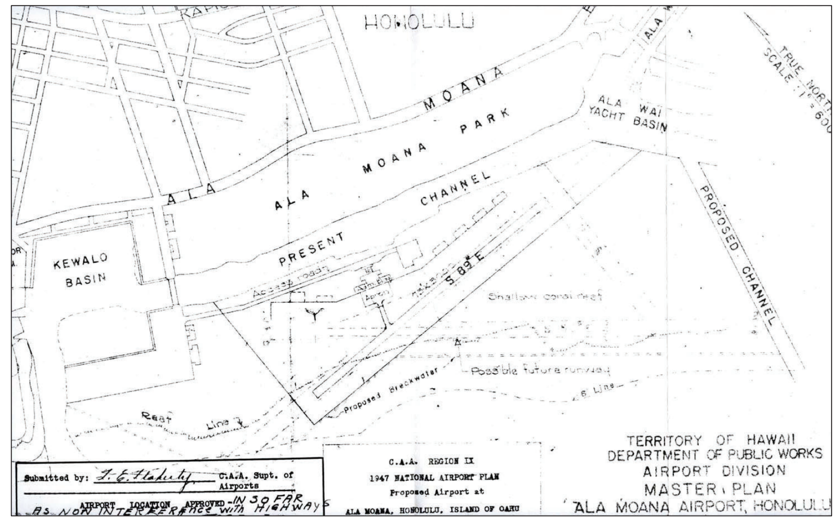


Figure 43. 1947 map of Territory of Hawaii's plans for the Ala Moana Airport for private planes off Ala Moana Park (State of Hawai'i Department of Transportation, Airports Division 2015)

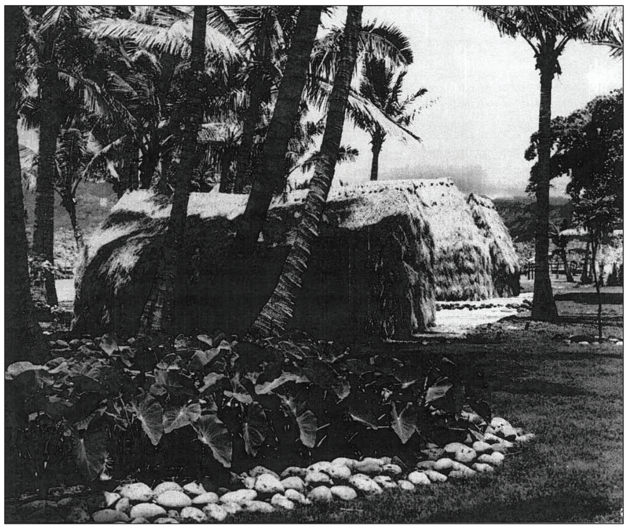


Figure 44. Hale Mau, Hawaiian Village at the East (Hawaiian) Lagoon (1950 photograph by Municipal Reference and Records Center, Honolulu in Weyeneth 1987)

Figure 45. 1952 aerial photograph of Ala Moana Regional Park (UH SOEST 2012b) with narrow beach area and boat channel still open from Kewalo Basin (left) to Ala Moana Yacht Harbor

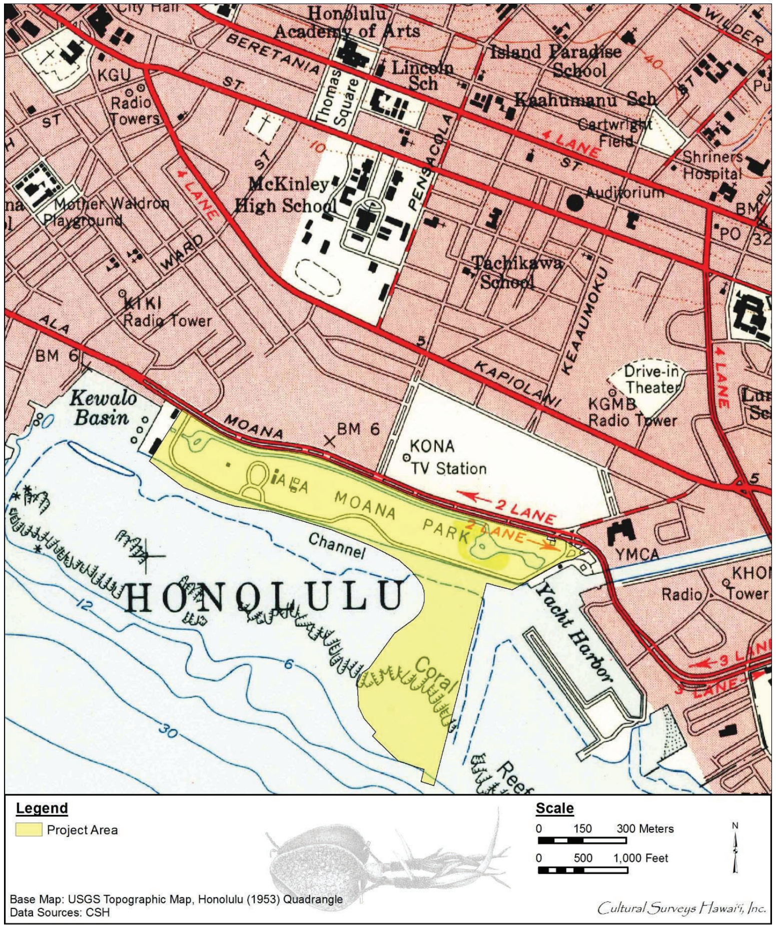


Figure 46. Portion of 1953 Honolulu USGS 7.5-minute topographic quadrangle, showing the project area; the boat channel still connects the Kewalo Basin to the Ala Wai Yacht Harbor

Figure 47. 1954 photograph of fishermen's stands off seawall before construction of new and expanded beach area (photograph by Department of Parks and Recreation, City and County of Honolulu in Weyeneth 1987)

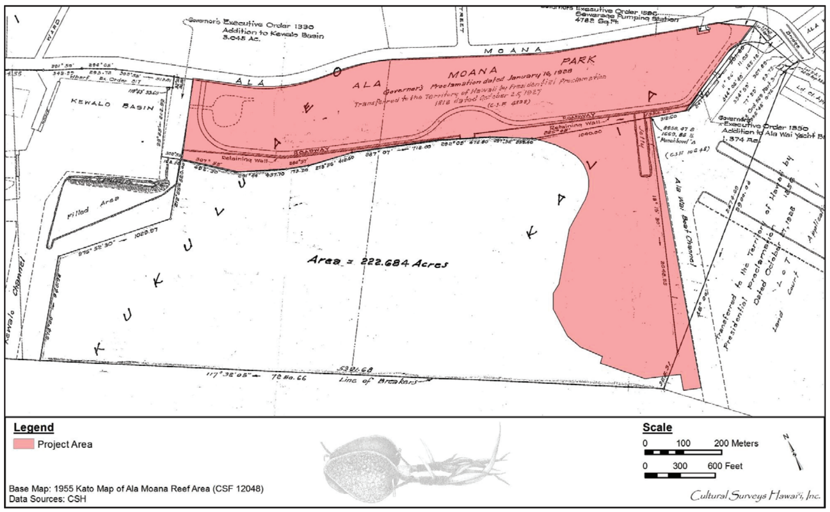


Figure 48. 1955 Kato map of Ala Moana reef area showing the project area

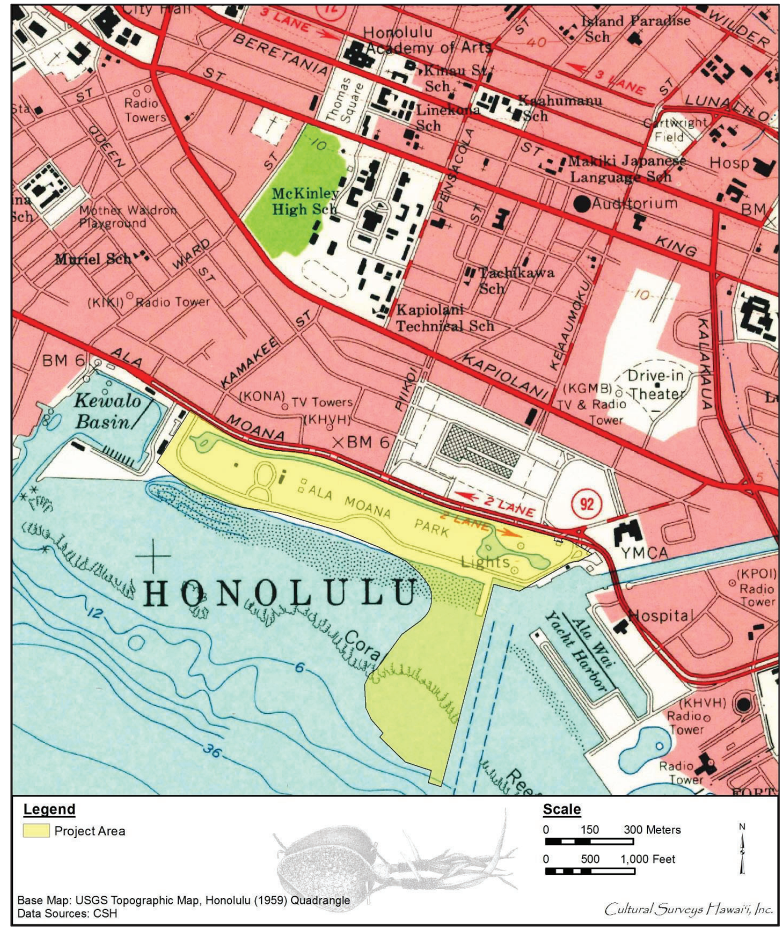


Figure 49. Portion of 1959 Honolulu USGS 7.5-minute topographic quadrangle, showing the project area; the boat channel has been dredged, access to Kewalo Basin has been blocked, and access to the Ala Wai Canal and Yacht Harbor have been partially blocked

and the ocean. This boat channel became obsolete in 1951 when a channel was dredged directly from the Ala Wai Yacht Club across the reef to the ocean. The Territory built a jetty in 1952 that existed until 1959 (see Figure 48 through Figure 50) that kept the polluted waters of the Ala Wai Canal from entering the boating channel, and then filled a portion of the channel in 1954-1955 to create a platform for a beach. The open channel to Kewalo Basin shown in a 1952 aerial photograph (see Figure 45) had been filled in by 1955 (see Figure 48). To create a swimming area, the reef area was dredged 400 ft from the new shoreline. Sand was shipped in from Keawa‘ula Beach in Wai‘anae to create the beach (Clark 1977:62). This sand had to be replenished several times, first in 1976, when sand from a fossil beach ridge at Mokulē‘ia was trucked to Ala Moana. Dressing rooms and showers were added to each side of the McCoy Pavilion in 1959-1961. Two aerial photographs from 1952 and 1959 show the evolution of the beach and dredged areas during this period (compare Figure 45 and Figure 50).

The boom in tourism led to new schemes for resort development in the Ala Moana area. In 1955, there was a suggestion to move the park to a man-made off-shore island and develop the former park into an area of hotels, shops, and theaters. A 1961 plan called for the creation of two new peninsulas, one at the west Kewalo Harbor end and one at the Ala Wai Canal east end, with an island between the two peninsulas called “Magic Island” (Figure 51). In the end only one peninsula, a 36-acre acre filled reef section at the east end of the park, now called “Magic Island,” was created, built between 1962 and 1964 (Figure 52 and Figure 54 through Figure 58). Public demand in 1970 changed the peninsular use from resort development to public recreation.

Development of the Ala Moana Center land, *mauka* of the current project area, on the north side of Ala Moana Boulevard, was also moving forward in this same timeframe. The land was put up for sale as early as 1884 by the Bishop Estate, which had classified the 50-acre lot as unproductive land. They finally found a buyer in 1912, Walter F. Dillingham, head of the Hawaiian Dredging Company. Dillingham purchased the land for $25,000 in order to fill it with the coral left over from his many dredging projects.

The company’s first project was the dredging of the main channels for Honolulu Harbor and Pearl Harbor. In the 1920s, the company won the bid for construction of the Ala Wai Canal as the company had the only type of large dredge necessary for the project. Besides dredging the streams in Waikīkī to form the canal, the company also dredged offshore to obtain crushed coral to fill the ponds and wetlands around the new canal. As a bonus, Dillingham could sell dredged material to private landowners who, as part of the Waikiki Reclamation project, had to fill in their low-lying areas.

In their bid for the contract, Hawaiian Dredging stated that they proposed to “furnish and pay for all of the labor, material, tools and equipment required for the dredging of a Canal, transporting and depositing the dredged or other filling materials upon certain lands, and constructing bridges, dykes, drainage ditches, etc.” The company removed 140,000 cubic yards of dredged material and placed the majority of the crushed coral on the contractor’s property in District No. 1, an area bounded by Sheridan Street, Kapahulu Road, King Street, Wai‘alae Road, and the ocean (Hawaii Department of Public Works 1920).

By 1931, Hawaiian Dredging had already begun to fill in their Kālia lands with coral fill. By 1947, the Ala Moana Center area was filled with crushed coral and the western portion of the lot was used for equipment and lumber storage, as in many portions of coastal Kaka‘ako.

Figure 50. 1959 aerial photograph of Ala Moana Regional Park, with wide beach and swimming area; swimming area blocked from access to Kewalo Basin (left) by peninsula of fill land and from Ala Moana Yacht Harbor (right) by a jetty (UH SOEST 2012c)

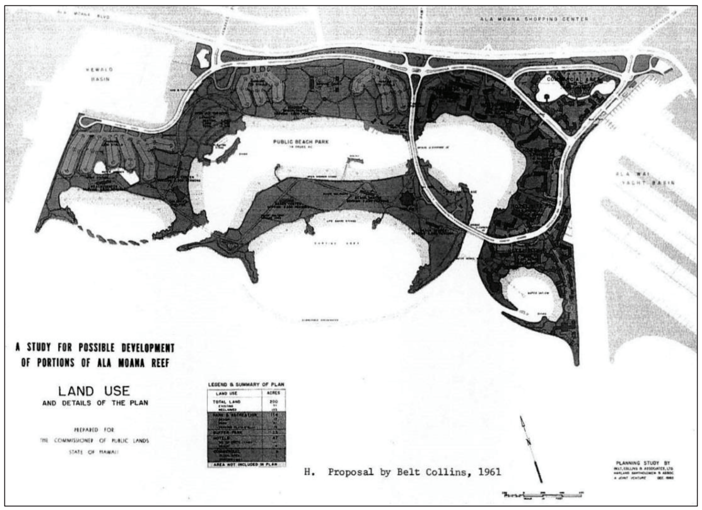


Figure 51. 1961 plans for construction of offshore island for the Ala Moana Regional Park and two peninsulas for resort development in *The Comprehensive Plan, Ala Moana Reef* (Belt Collins and Associates, Harland Bartholomew & Associates 1961) (map from Weyeneth 1987)

Figure 52. 1963 aerial photograph of the Ala Moana Regional Park with initial construction of the Magic Island peninsula (on right) (UH SOEST 2012d)

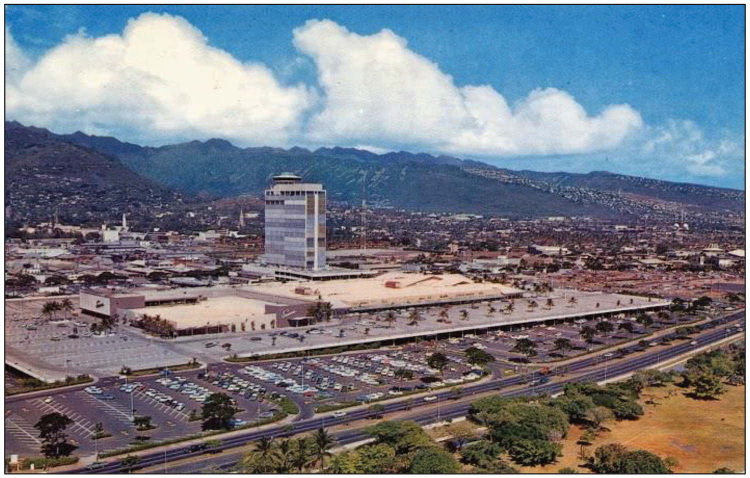


Figure 53. 1966 photograph of the Ala Moana Shopping Center; note Ala Moana Regional Park across from Ala Moana Boulevard on *makai* (lower) side (postcard, unknown photographer)

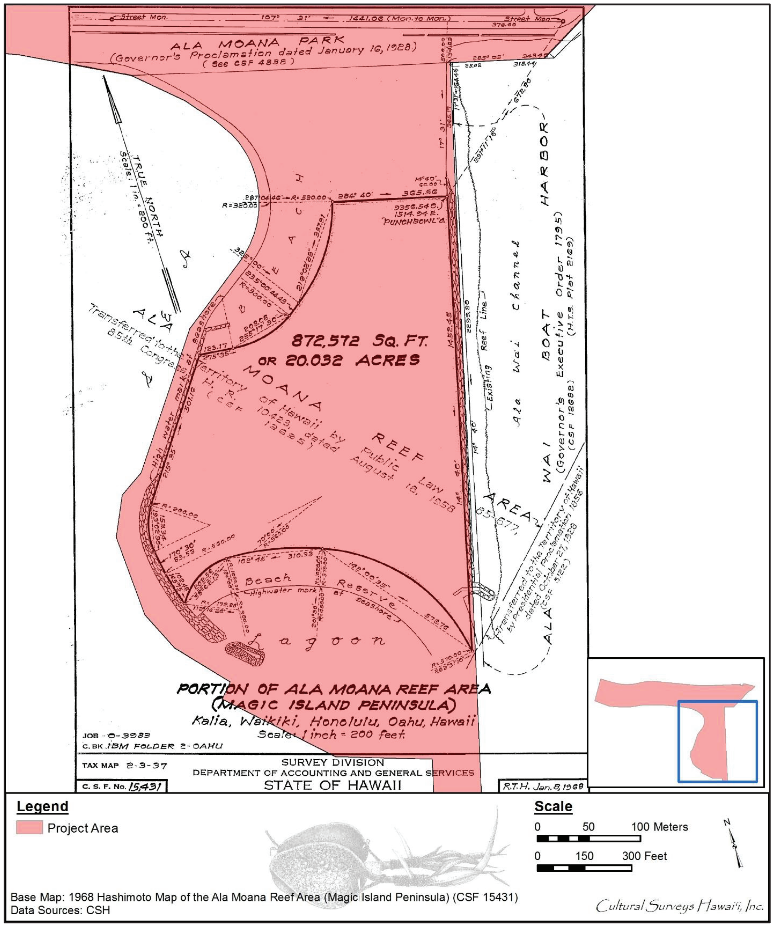


Figure 54. 1968 Hashimoto map of the Ala Moana reef area (Magic Island Peninsula) showing the Magic Island portion of the project area

Figure 55. 1968 aerial photograph of the Ala Moana Regional Park with completed construction of the Magic Island peninsula (on right) (UH SOEST 2012e)

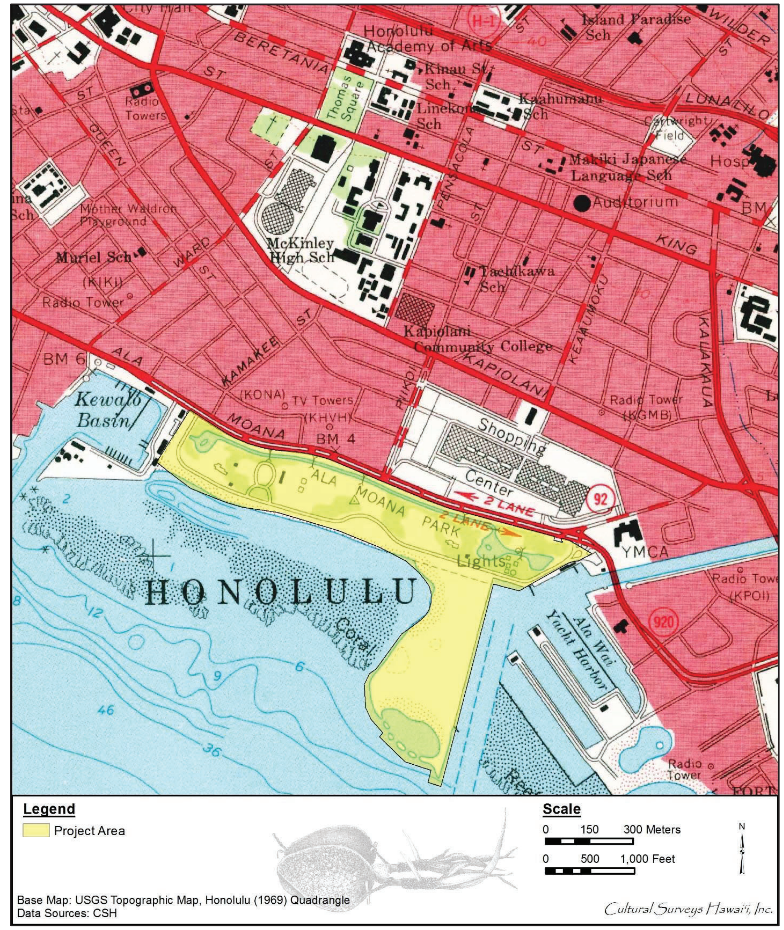


Figure 56. Portion of 1969 Honolulu USGS 7.5-minute topographic quadrangle, showing the project area; the construction of the Magic Island peninsula now completely blocks the Ala Moana Beach area from the Ala Wai Canal and boat harbor

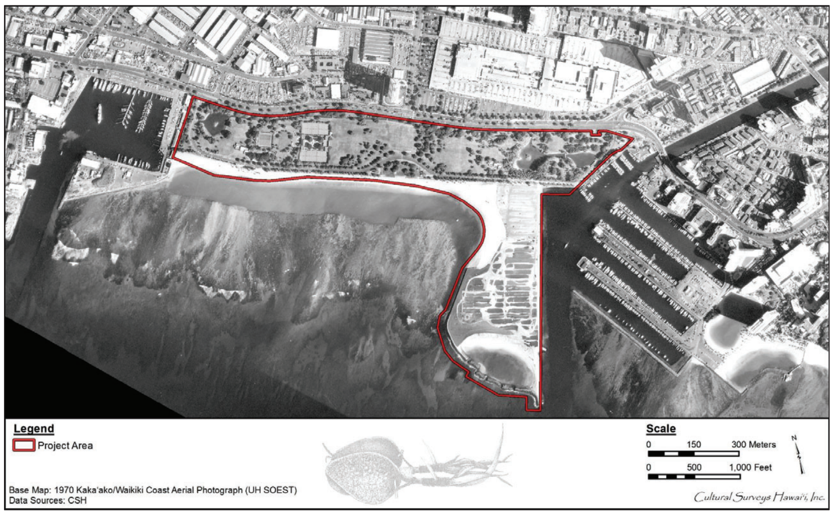


Figure 57. 1970 Kakaako/Waikiki Coast Aerial Photograph (UH SOEST) showing the project area

Figure 58. Magic Island, ca. 2008 (public domain photograph from Wikipedia.com)

Walter's son Lowell Dillingham initiated the Ala Moana Shopping Center project in 1948. Phase I of the shopping center construction project began in 1957. A 1959 map (see Figure 49) and 1959 aerial photograph (see Figure 50) show the shopping center nearing initial completion.

Sears, at the 'Ewa side, and Shirokiya's, on the Diamond Head side, were two of the original tenants of the mall, which had its grand opening on 13 August 1959 (Dashefsky 2009). In 1957, the mall had 87 stores and 4,000 parking spaces within a two-story complex. In 1966, Phase II construction was completed with the addition of 1.35 million sq ft, making it the largest shopping mall in the United States, with 155 stores and 7,800 parking spaces (Figure 53). New wings and levels were added in 1966, 1987, 1999, and 2008; today there are over 290 shops and restaurants on four levels (Gomes 2012; White and Kraus 2007).

The banyan court at Ala Moana Regional Park was altered in the 1970s, when Hazel McCoy donated a large sum to the park to build a new pavilion named for her husband, Lester McCoy. To construct the McCoy Pavilion, which contained assembly rooms and offices, a few of the original locker room structures and wall sections had to be demolished to provide room on the east side of the courtyard. The pavilion was completed in 1975 (Figure 59).

In the end, the park included large open areas, water and fountain features, a sports pavilion with an enclosed banyan garden, a lawn bowling green, an Art Deco style bridge crossing the Ala Wai Canal, a boat harbor, tennis courts, dressing rooms and showers, and extensive landscaping. In 1998, Ala Moana Regional Park was listed on the HRHP as one of Honolulu's Art Deco Parks Thematic Group (see Appendix A).

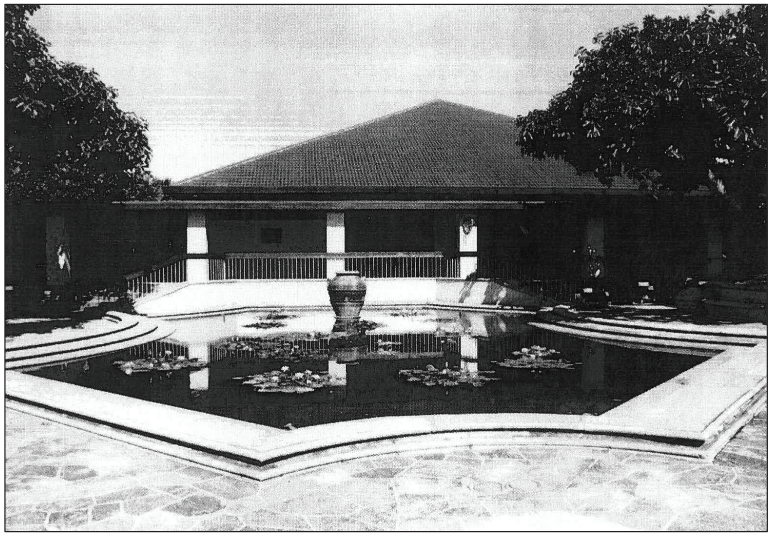


Figure 59. McCoy Pavilion, 1975 (in Weyeneth 1987)

4.5 Current Cultural Events at Ala Moana Regional Park

Currently, AMRP hosts several types of large cultural events including fireworks displays, cultural festivals for various ethnic groups, athletic competitions, and annual parades. These events draw thousands of people to AMRP throughout the year.

Ala Moana Shopping Center hosts its annual Fourth of July Fireworks Spectacular. The fireworks display, which is held at Ala Moana Regional Park, is free and open to the public and draws thousands of spectators every year. In 2018, 60,000 people were estimated to attend the fireworks display (*Honolulu Advertiser* 2018). The Hilton Hawaiian Village's weekly Friday night fireworks display can also be viewed from Magic Island.

The Greek Festival of Hawaii, hosted by Saints Constantine & Helen Greek Orthodox Cathedral of the Pacific, has been held annually at McCoy Pavilion since 1971. The two-day event features entertainment including live music and dancing, various food booths offering traditional Greek food and drinks, and The Greek Marketplace which offers visitors imported products from Greece, clothing, art, and religious gifts and books (Greek Festival of Hawaii 2018).

Since 1970, the annual Hawaiian Scottish Festival & Highland Games, hosted by the Hawaiian Scottish Association, has been held at the McCoy Pavilion during the month of April. The festival features traditional Highland games including the caber toss, stone putts, Scottish hammer throw, and weight tossing. Entertainment includes live music, a Highland Dance Competition, the Aggie Wallace Solo Piping Competition, and demonstrations of swordplay, weaving, and fencing. The festival also features vendors with traditional Scottish food, clothing, jewelry, musical instruments, and housewares (Hawaiian Scottish Association 2017).

On Memorial Day, tens of thousands of people gather at AMRP to participate in the annual Lantern Floating Hawaiʻi ceremony to "honor loved ones and generate hope toward the future" (Shinnyoen.org). The ceremony, which is hosted by the Shinnyo-en Buddhist Order and Nā Lei Aloha Foundation, combines traditional Buddhist rituals with Hawaiian culture. It begins with chants, prayers, and other rituals followed by the floating of lanterns with notes of remembrance and prayers inscribed on them. The first Lantern Floating Hawaiʻi ceremony was held at Keʻehi Lagoon in 1999 before being moved to Ala Moana Beach in 2002.

In 2017, AMRP and Magic Island hosted the homecoming for *Hōkūleʻa* at the end of the Mālama Honua Worldwide Voyage (Figure 60). Beginning in May 2014, the Mālama Honua Worldwide Voyage consisted of a three-year voyage around the globe. *Hōkūleʻa* and her sister canoe *Hikianalia* traveled over 60,000 nautical miles circumnavigating the earth before returning to Hawaiʻi in June 2017. *Hōkūleʻa*'s return attracted thousands of people to Magic Island and was celebrated with a cultural welcoming ceremony followed by an all-day grand celebration that included food, beverages, and live music (Hokulea.com 2018). Both vessels were also welcomed home by sailing canoes from across the Hawaiian Islands and the Pacific, including *Nāmāhoe*, *Moʻokiha o Piʻilani*, *Makaliʻi*, *Hawaiʻi Loa*, *Okeanos Marshall Islands*, and *Fafaite*:

> Hōkūleʻa has voyaged traditionally since 1976, sailing over 150,000 nautical miles throughout the Pacific. Our current Worldwide Voyage began in 2013 with a Mālama Hawaiʻi sail throughout our own archipelago, and continued on to circumnavigate the globe through 2014, 2015 and 2016. June of 2017 marked her

Figure 60. *Hōkūle‘a* docked at Magic Island at the end of the Mālama Honua Worldwide Voyage

> historic homecoming to Hawai‘i capping the global portion of the voyage. [Hokulea.com 2018]

The return of the sailing vessel also marked the first time the *kāli‘i* (to hurl spears at a chief as he landed from a canoe) rite had been publicly witnessed in nearly 200 years. An *‘awa* (*Piper methysticum*) ceremony, "a social tradition" and means of offering "gratitude to the divine, both before and after events and festivals" was also performed (White 1996).

AMRP hosts numerous competitions for various sports including boat racing and surfing. The Hawaii Dragon Boat Festival is held annually at AMRP. Hundreds of people gather at AMRP to participate in competition of local, national, and international teams paddling canoes that have been decorated with Chinese dragon heads and tails. The event also features food booths, craft vendors, games, and live entertainment. The Waikiki Yacht Club hosts monthly regattas (series of boat races) from the Ala Wai Boat Harbor. The Kānaka Ikaika Racing Association (KIRA) also hosts various races throughout the year.

Hawaii Amateur Surfing Association (HASA) State Championship is held annually at the Ala Moana Bowls surf break located east of Magic Island. The event is an invitation-only competition featuring the state's best surfers. Throughout the year, the Hawaiian Surfing Association hosts several competitions across the state where competitors earn points toward an invitation to the State Championships at Ala Moana Bowls. Other surfing competitions held near AMRP include the Oakley Surf Shop Challenge and Local Motion Surf Into Summer which are held at Ala Moana Bowls and the Hawaii Surf Association Surf Series which is held at the Kewalo's surf break located east of the Kewalo Basin Channel.

The Honolulu Triathlon involves a 1,500-m swim in the waters at AMRP, a 25-mile bike ride along Ala Moana Boulevard and Nimitz Highway to the end of Lagoon Drive and back to AMRP, and a 6.2-mile run on a course within AMRP.

A number of annual parades begin at AMRP and Magic Island including the Dr. Martin Luther King Jr. Day Parade, Tax March O‘ahu, Annual Visitor Industry Charity Walk, Aloha Festivals Floral Parade, and the Street Bikers United – Toys for Tots Caravan

4.6 Previous Oral History Research

During the 1970's and 1980's, the University of Hawai‘i Center for Oral History Research (UHCOH) interviewed several former and long-time residents of the Waikīkī area. These included Native Hawaiians and later immigrants to the area including those of Chinese, Japanese, Portuguese, and Caucasian ancestry. UHCOH also interviewed several former and long-time residents of Kaka‘ako as well. An analysis of these oral histories provides a glimpse into the past and a better understanding of how the community observed and remembered daily life as well as significant events and transformations as they occurred.

Several of the interviewees, many of whom were either former residents or frequent visitors of Waikīkī, recalled the "Ala Moana Park" and its surrounding fishing grounds. Interviewees also recalled the burning and dumping of refuse within the Ala Moana area. In general, interviewees vividly recalled the abundance of aquatic resources available in the Kālia area (present AMRP and Ala Wai Boat Harbor areas). Mr. Kenji Nobori, although originally born in Kaka‘ako in 1917, frequented the waters off Ala Moana Beach, learning to fish from his Hawaiian friends:

I used to go with my Hawaiian friends. We go skin diving. Ala Moana, where the park is now, Ala Moana Park. Right across the river (facing *mauka*. Blue Pond or call it today Kewalo Basin). You know the channel? Right across. They had abundance of fish, during my time, So? I used to go around with couple of Hawaiian people; lived near the Bright family. They were expert fishermen. So I tag along with ‘em all the time. Learn the art. Because during those times, something was new. Only the Hawaiian people used to spear. Then gradually, we all learned, they teach you. [UHCOH 1978:1078]

Mr. Nobori also recalled going torch fishing at “Ala Moana Park:”

Our famous ground was down Ala Moana Park. Across the channel. We used to go every week and Sundays. Especially when there’s no moon. We used to bring home lots of this white eel, and white night squid. Loaded. And every now and then, if you fortunate, you catch this red *moano* [manybar goatfish; *Parupeneus multifasciatus*] or *kumu* [whitesaddle goatfish; *Parupeneus porphyreus*]. Pretty big, good size. . . We used to every weekend, and we get about four, five people. We stay till about . . . well, we go soon as dark, about 7:30, 3 o’ clock. We come home about 1 o’ clock in the morning. [UHCOH 1978:1081]

When asked if fish were plentiful in the waters off “Ala Moana Park,” Mr. Nobori recalled an abundance of fish and white eel. Mr. Earl Kalikolehua Vida, a resident of Kālia, also attested to the abundance of marine life in the waters near Ala Moana. Mr. Vida recalled that *limu*, crabs, *‘ōpelu*, *ulua*, and *pāpio* could all be extracted from the waters off Kālia. Mr. Vida also fondly recalled that an old Hawaiian fisherman known as John Kaimi lived along the shore in an area currently occupied by the Ala Wai Boat Harbor:

Now, going towards Waikīkī in that little area, after we pass Charley Fernandes’, and then you’ll find at the corner - see, the Hobron Lane ends right at Ala Moana, but there was an (unpaved) extension that (went) down to the ocean. Well, in that corner was Kaimi. He was an old, old fisherman. In fact, a crackerjack. So, I used to go out fishing with him all the time. All I learned, fishing, was from him. And he knew exactly where to go to get what type of fish. Seaweed, *limu*, crabs, all kinds of stuff. Well, he lived there on the corner. . . He’d have all these nets out and wire traps outside with lobsters and everything else. He was living right on the beach. He can see out there if anybody (was) taking anything from the traps, but they never bothered his things at all. Because he was always – “You want anything? Come, I give you.” He had two nice canoes. Beautiful canoes. Never used an [outboard] motor. He said I was chicken because I’m too lazy to row. . . He built a house. He had a nice house. The house was high. There were only two rooms. There was no toilet. The toilet was downstairs, an outhouse. But upstairs was high. The reason for that was because he hung all these nets underneath the building. All his property. He didn’t want to leave it out. It was all underneath the house. The house was about this high, about eight feet above the ground, with steps going up. And he lived up high on top of that with that big room overlooking the entire ocean. So, he could see from the Honolulu Harbor all the way to Diamond Head, in that area. He was

quite a guy. We buried him there, too. We buried him right out in the ocean there when he passed away. [UHCOH 1985:582-609]

Interestingly, Mr. Vida describes a burial at sea for Mr. John Kaimi. Based on descriptions of the location of the Kaimi home, the burial would have occurred either near or within the current Ala Wai Boat Harbor. Ethnographic data indicates that burial at sea was not uncommon in ancient times:

With the advent of Christianity and exposure to Western ways, two ancient funeral practices of both *ali‘i* and *maka‘āinana* (commoner) were gradually discontinued. One was removing the *pela* (flesh) from the corpse and sinking it into the sea. [Pukui et al. 1972:135]

Interviewee Ella Ling Wong also recalled the location of John Kaimi’s home as well:

Yeah, right over there, there was a nice place, in the night especially. We used to go out there. You know where the Kaimis used to live? Right over there. Oh, we used to go out there and it was sandy. And then we used to go torching at nights. We used to have lots of fun. My neighbor used to take us torching, Japanese man. This Japanese man loved to go and he needs our help so he takes us because he had this long net [with a] stick on each side. Somebody has to hold the other end and boy, we used to go with him and he’d catch all kinds of stuff, lots of shrimp, is it sand shrimps or whatever? It was really good. And then ooh, sometimes we’d step on an eel at night and they slide. Oh, when you scream he get so mad with us. He say we making too much noise. [UHCOH 1985:1829]

Ms. Wong’s family owned a parcel of land at the corner of Hobron Lane and Līpe‘epe‘e Street; in addition to the land, her family owned a freshwater pond and raised ducks, fish, and chickens. Recalling her chores as a child, she described going to Ala Moana Beach, “all the way down to, near Kewalo Basin” to collect “*pūpū*;” these shells were then fed to their ducks:

Oh yeah, but we don’t have to go all the way. If we didn’t have any on this area we moved to the next area. But that’s what we did. But we liked that. Although it was hard work, we enjoyed doing that because it was heavy work. And I was so skinny, [chuckles] but I was tough. We used to go to the rubbish dump, where they empty all the rubbish. You know where Ala Moana is now right there. That used to be the rubbish dump. . . Where the [Ala Moana] Park is. . . And there was a Hawaiian man there. He was supposed to take care of all the rubbish that they bring in. And so when the trucks come in, they just dump those things and then he burns them over there. . . And they even brought in old cars and dump it in there. Just about fill up the ocean. All those old cars. [UHCOH 1985:1830]

Ms. Wong’s recollection of the former refuse dump is of salience. Historic maps (see Figure 21) indicate the refuse dump was located immediately *makai* of the “Old Beach Road” (current Ala Moana Boulevard). Although, Ms. Wong does not identify the exact location of the dump, she does associate the feature with “Ala Moana Park.”

Section 5 Previous Archaeological Research

Several archaeological studies have been conducted in the vicinity of the project area. This section discusses previous archaeological studies in the area (Figure 61 and Table 1) and identifies the types and locations of previously identified historic properties (Figure 62 and Table 2).

5.1 Previous Archaeological Research in Ala Moana Regional Park

In 2003, archaeologists from Pacific Legacy (Ah Sam and Cleghorn 2003) conducted an archaeological assessment of a portion of Ala Moana Regional Park proposed for a canoe *hālau* (canoe shed). Their study emphasized the artificial nature of the park, which was created in the 1920s and 1930s by dredging the ocean in front of the former shoreline (around the Ala Moana Boulevard alignment), and filling the land *makai* of the boulevard to create a park, now 76 acres in size. A review of historic documents and maps and a visual inspection led them to conclude there was no evidence suggesting the possibility of cultural or historic features in the park (Ah Sam and Cleghorn 2003:2). Thus this section of previous archaeological work will focus on areas surrounding the park on areas once *mauka* of the reef on dry land. Previous archaeological study areas near Ala Moana Regional Park are shown on Figure 61, the locations of previously identified archaeological sites are shown on Figure 62; the archaeological studies and their results, including site numbers, are summarized in Table 1 and previously identified historic properties in the vicinity of the project area are summarized in Table 2. A more detailed discussion of each archaeological study follows.

5.2 Previous Archaeological Research in Coastal Kaka‘ako and Kālia

5.2.1 Smith 1989

In 1989, construction workers discovered four bone fragments in a property located on the southeast corner of Kapi‘olani Boulevard and Pi‘ikoi Street (TMK: [1] 2-3-039:019). The find was reported to Marc Smith (1989), State Parks archaeologist. Smith examined the bones and determined only one was human (SIHP # 50-80-14-4243); the remaining fragments were pig bones. The human bone was a right tibia shaft fragment. A 3 August 1989 memorandum to the "Historic Sites File" stated that "On 2 August 1989, Alan Yoshimoto, project supervisor for Nordic Construction . . . called our office to report 'some bones' found at a construction site at 1341 Kapiolani Boulevard." A memorandum addressed to Dr. Ross Cordy (SHPD) dated 10 April 1991, mentioned a formal report for SHPD files with skeletal remains data collection forms appended. The bone was temporarily taken to the Honolulu SHPD office and the site was designated SIHP # -4243.

5.2.2 Athens et al. 1994

During the 1994 excavation of a trench for an underground telephone line near the northeast corner of Pi‘ikoi Street and Kapi‘olani Boulevard, the remains of a single individual were inadvertently discovered and later disinterred (SIHP # 50-80-14-4847) (Athens et al. 1994). Osteological analysis revealed the skeletal remains were of a 12 to 15-year-old female. Radiocarbon analysis of a sample of bone collagen yielded a death date between AD 1295 and AD 1473, supporting the osteological determination of Hawaiian/Polynesian ancestry. The remains were found within a brackish water marsh environment (based on malacological findings) at a

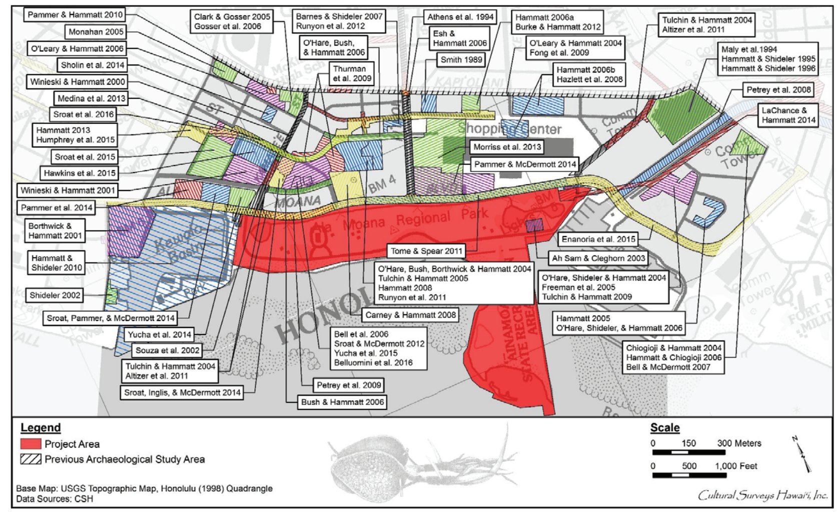


Figure 61. Previous archaeological studies in the vicinity of the current project area

Table 1. Summary of previous archaeological studies and their results

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Smith 1989	State Parks response to inadvertent discovery of human remains	1341 Kapi‘olani Ave	SIHP # -4243 (isolated long bone) found in a disturbed context
Athens et al. 1994	Investigation of inadvertently discovered human remains	Pi‘ikoi St and Kapi‘olani Blvd intersection	Identified SIHP # -4847, an inadvertently discovered scattered human burial dating to ca. 1450s
Maly et al. 1994	Archaeological and historical assessment	Convention Center, TMK [1] 2-3-035, 036	Historic research indicated project adjacent to Kūwili Pond
Hammatt and Shideler 1995, 1996	Subsurface inventory and data recovery	Convention Center, TMK [1] 2-3-035:001	Ten backhoe trenches and seven cores excavated; additional testing near former location of Kūwili Pond, but sediments believed to have been from pond found to be imported fill
Winieski and Hammatt 2000	Archaeological monitoring	Kaka‘ako Improvement District 4, Kamake‘e St	SIHP # -5598 (two adjacent coffin burials); old A horizon noted in some trenches
Borthwick and Hammatt 2001	Archaeological monitoring	Kaka‘ako Improvement District 6	Documented various fill layers over natural tidal flats, consistent with project area location within historic fill land seaward of previous coastline
Winieski and Hammatt 2001	Archaeological monitoring	Victoria Ward Theater, TMK: [1] 2-3-002:001	No pre-Contact materials, historic cultural materials, or human burials encountered
Shideler 2002	Historic American Buildings Survey	Incinerator Number One	Documentation of Incinerator Number One
Souza et al. 2002	Archaeological monitoring	Kaka‘ako Improvement District 7, Kamake‘e St	Three disturbed, pre-Contact burials recorded (SIHP #s -6376, -6377, -6378; location of -6378 unknown); old A horizon in seven of ten profiles

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Ah Sam and Cleghorn 2003	Archaeological assessment (no finds archaeological inventory survey)	Proposed Canoe Hālau, Ala Moana Regional Park, TMK: [1] 2-3-037	No archaeological or historic features identified
Chiojioji and Hammatt 2004	Archaeological literature review and field check	89,000 square foot parcel, TMKs: [1] 2-6-013:001, 003, 004, 007, 008, 009, 011, and 012	From archival research and field check, concluded there had been little subsurface disturbance within this area
O’Hare, Bush, Borthwick, and Hammatt 2004	Archaeological inventory survey	Ko‘olani Condominium, TMKs: [1] 2-3-004:073, 2-3-005:027; 2-3-006:014; 2-3-007:002	Original wetland surface of Kewalo (SIHP # -6636), three historic trash pits (SIHP # -6639), and a historic fill layer (SIHP # -6641) reported
O’Hare, Shideler, and Hammatt 2004	Archaeological assessment	Kapiolani Akahi project, TMKs: [1] 2-6-011:001, 002, 004, 032, 037, 040	Archival research indicated project area might contain evidence of wetlands, a fishpond, and historic fill layers with artifacts
Tulchin and Hammatt 2004	Literature review and field inspection	Kapi‘olani area, bounded by Ala Moana Regional Park, Ward Ave, Kalākaua Ave, and King St, TMKs:[1] 2-3-004, 005, 007, 009, 010, 013, 014, 017, 018, 022, 035, 036, and 038	No archaeological or historic features identified
O’Leary and Hammatt 2004	Archaeological monitoring	Kapi‘olani Blvd from Kalākaua Ave to Kamake‘e St, TMK: [1] 2-3-003	No cultural material observed
Clark and Gosser 2005	Subsurface archaeological inventory survey	TMKs: [1] 2-3-003:075, 085, and 086	SIHP # -6636 designates a subsurface remnant of a small pond present in northern portions of project area

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Freeman et al. 2005	Archaeological inventory survey and cultural impact evaluation	4 acres bounded by Ala Wai and Ala Moana blvds, Hobron Lane, Lipe‘epe‘e St, TMKs: [1] 2-6-011:001, 002, 004, 032, 037, and 040	Identified four sites: disturbed and incomplete human remains (SIHP # -6700), an in situ coffin burial with grave goods (SIHP # -6701), a culturally enriched A horizon (SIHP # -6702), and remnants of a fishpond (SIHP # -6703; location outside area shown on figures)
Hammatt 2005	Literature review and field inspection	Kaio‘o Dr Development, TMKs. [1] 2-6-012:various	Recommended archaeological survey for project area as historic maps indicated area was once a wetland with fishponds
Monahan 2005	Archaeological assessment	Three parcels on corner of Waimanu St. and Ward Ave, TMKs: [1] 2-3-003:073, 096	Nine backhoe trenches excavated on one parcel; no cultural deposits observed
Tulchin and Hammatt 2005	Addendum to an archaeological inventory survey	Ko‘olani Condominium, TMKs: [1] 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002	Eight backhoe test trenches excavated; SIHP # -6636, original wetland surface of Kewalo area; SIHP # -6641, historic garbage layer
Bell et al. 2006	Archaeological inventory survey	Victoria Ward Village Shops, TMKs: [1] 2-3-5:013–017, 022, 023	Eleven burials (SIHP #s -6854 and -6855) found during AIS and additional 50+ burials found during monitoring; historic privy/activity area (SIHP #s -6854 and -6855) and fishpond sediments (Kolowalu Pond, SIHP # -6856) recorded
Bush and Hammatt 2006	Archaeological monitoring	Hokua Tower, Ala Moana Blvd, TMKs: [1] 2-03-004:073; 2-03-005:027; 2-03-006:014; 2-03-007:002	No burials or cultural deposits observed; old A horizon found at eastern end of Auahi St

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Esh and Hammatt 2006	Archaeological monitoring	Pi‘ikoi St from Ala Moana Blvd to Matlock St, TMKs: [1] 2-3-006, 007, 010, 011, 012, 014, 015, 035, 038; 2-4-003, 004, 011, 012	No cultural material identified
Gosser et al. 2006	Archaeological monitoring	Kapi‘olani Blvd and Kamake‘e St corner, TMKs: [1] 2-3-003:075, 085, 086	No cultural material identified
Hammatt 2006a	Archaeological literature review and field inspection	1391 Kapi‘olani Blvd, TMK: [1] 2-3-039:011	No surface historic properties identified
Hammatt 2006b	Archaeological inventory survey	6 acres bounded by Kapi‘olani Blvd, Keaumoku St, Ala Moana Blvd, and Pi‘ikoi St, TMKs: [1] 2-3-038:001, 2-3-040:005, 007, 009, 011, 014, 016, 018	Thirty test trenches excavated; SIHP # -6847, a small, subsurface feature (wooden box with chopsticks, brushes, a bead, animal bones) dating to late nineteenth/early twentieth century
Hammatt and Chiogioji 2006	Literature review and field inspection	Waikīkī Allure Condo Development	Potential for subsurface archaeological resources in project area, including pre- and post-Contact habitation and burial deposits
O’Hare, Bush and Hammatt 2006	Archaeological monitoring	Kaka‘ako Improvement District 10, TMKs: [1] 2-3-004–007	Cluster of 28 historic burials (SIHP # -6658), two isolated disturbed burials (SIHP # -6659), and a historic trash dump (SIHP # -6660); weak A horizon; some fishpond sediments observed
O’Hare, Shideler, and Hammatt 2006	Archaeological inventory survey	Kaio‘o Dr Development, TMKs. [1] 2-6-012:varioius	Twenty backhoe trenches excavated on lots; SIHP # -6848, a pre-Contact fire pit, recorded and radiocarbon dated to AD 1470-1660

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
O'Leary and Hammatt 2006	Archaeological inventory survey	Moana Vista, Kapi‘olani Blvd, TMKs: [1] 2-3-003:072, 088, 102	Excavated 24 test trenches; extensive prior subsurface disturbance noted; no historic properties observed; small area of sand layers noted
Barnes and Shideler 2007	Literature review and field inspection	1235 Kona St/1226 Waimanu St, TMKs: [1] 2-3-007:026 and 049	No surface historic properties identified
Bell and McDermott 2007	Archaeological inventory survey	Block bounded by Ala Wai Blvd, Kalākaua Ave, Ena Rd, Hobron Lane, and Līpe‘epe‘e St	Documented three historic properties: SIHP #s -6873 and -6875, consisting of isolated traditional Hawaiian burials; and SIHP # -6874, subsurface cultural layer of pre-Contact and post-Contact origin
Carney and Hammatt 2008	Archaeological monitoring	Hokua Tower project, Ala Moana Blvd, TMKs: [1] 2-3-005:001, 002, 003 (por.), 024, 026, 027	Isolated human mandible fragment and a historic trash pit (SIHP # -6765) observed
Hammatt 2008	Archaeological monitoring	Ko‘olani Condominium, Waimanu St, TMKs: [1] 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002	Two isolated burials (SIHP #s -6910 and -6912) and a cluster of 16 coffin burials (SIHP # -6911) found
Hazlett et al. 2008	Archaeological monitoring	Ala Moana Center expansion project, TMKs: [1] 2-3-38:001, 2-3-040:005, 007, 009, 011, 014, 016, 018	No cultural material observed; monitoring results within current project area (Kona St Block) indicate fill sediments to below water table; document research indicated Ala Moana Center Phase II project completed in 1960s completely removed prior natural sediments to below water table and replaced them with fill
Petrey et al. 2008	Archaeological monitoring	Ala Wai to Magic Island, TMKs: [1] 2-3-034, 036, 037; 2-6-017, 018; 2-7-036	No cultural material identified

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Fong et al. 2009	Archaeological monitoring	Kapi‘olani Blvd from Kalākaua to Ward Ave, Kamake‘e St from Kapi‘olani Blvd to Auahi St and Atkinson Dr from Kapi‘olani to Ala Moana Blvd	No cultural material identified
Petrey et al. 2009	Archaeological monitoring	Nitmitz Hwy and Ala Moana Blvd, TMKs: [1] 2-1-014 and 027	No cultural deposits identified
Thurman et al. 2009	Archaeological inventory survey	Queen St Parks	Identified one previously documented historic fishpond remnant (SIHP # -6856)
Tulchin and Hammatt 2009	Archaeological monitoring	4-acre area bounded by Ala Wai Blvd, Hobron Lane, Lipe‘epe‘e St, and Ala Moana Blvd, TMKs: [1] 2-6-011:001, 037	Identified additional fragments of previously identified disturbed human burial (SIHP # -6700), as well as second set of human remains (SIHP # -7057)
Hammatt and Shideler 2010	Cultural anthropology and archaeology summary	Kewalo Basin, TMK: [1] 2-1-058	Concluded no pre-twentieth century in situ deposits present within majority of project area
Pammer and Hammatt 2010	Archaeological assessment	0.26-acre Moana Vista project, Kapi‘olani Blvd, TMK: [1] 2-3-003:084	Four test trenches excavated; no cultural material observed
Altizer et al. 2011	Archaeological monitoring	Kapi‘olani Area Revised Sewer System, TMKs: [1] 2-3-004, 005, 007, 009, 010, 013, 014, 017, 018, 022, 035, 036, 038, and 041	One site documented: previously identified SIHP # -6636, a wetland deposit with signs of historic modification for rice cultivation

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Runyon et al. 2011	Archaeological inventory survey	Ko‘olani Phase II project, TMK:[1] 2-3-006:017	Five sites documented; two previously identified sites: an historic trash layer and a wetland sediment (SIHP #s -6641 and -6636); three newly identified sites: a buried pre-Contact and post-Contact cultural layer (SIHP # -7115), an alluvial layer (SIHP # -7116), and a concentration of 27 post-Contact burials (SIHP # -7117)
Tome and Spear 2011	Archaeological monitoring	Ala Moana, TMKs: [1] 2-3-006 and 038	No cultural materials or subsurface features identified
Burke and Hammatt 2012	Archaeological inventory survey	1391 Kapi‘olani Blvd parcel	Identified SIHP # -7193, a historic trash layer
Runyon et al. 2012	Archaeological inventory survey	Corner of Pi‘ikoi St and Kona St, TMKs: [1] 2-3-007:026 and 049	Identified Kewalo wetland sediments (SIHP # -6636) in all 13 test excavations
Sroat and McDermott 2012	Supplemental archaeological inventory survey	Ward Village, TMKs: [1] 2-3-005:013–017, 022, and 023	Further documented SIHP # -6855, subsurface cultural layer/activity area comprised of traditional Hawaiian cultural layer that included numerous pit features and six previously identified human burials
Hammatt 2013	Archaeological inventory survey	Numerous locations between Middle St and Ala Moana Center	Identified Kewalo wetland land surface (SIHP # -6636), Kolowalu Fishpond (SIHP # -6856), a pre- to post-Contact cultural layer containing an isolated human bone fragment (SIHP # -7429), and subsurface privy remnant (SIHP # -7430)
Medina et al. 2013	Archaeological monitoring	Intersection of Kamake‘e St and Queen St, TMKs: [1] 2-3-002 001; 2-3-003:087, 103; 2-3-004:080 (por.)	Identified multiple fill layers and truncated sand A horizon
Morriss et al. 2013	Archaeological inventory survey	Ala Moana Center, TMK: [1] 2-3-038:001 (por.)	Identified potential salt pan signatures in nine trenches and further documented SIHP # -6636 (Kewalo wetland sediments)
LaChance and Hammatt 2014	Archaeological monitoring	Sewer line along Ala Wai Park adjacent to Ala Wai Canal	No cultural deposits identified

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Pammer and McDermott 2014	Archaeological inventory survey	Park Lane, TMK: [1] 2-3-038:001 (por.)	Eight backhoe trenches excavated; two historic properties identified, SIHP # - 6636, pre-Contact to early twentieth century natural wetland deposit and SIHP # -7596, a subsurface trash deposit with historic artifacts
Pammer et al. 2014	Archaeological inventory survey	Ward Neighborhood Block B East (Ward Village Gateway)	Identified five historic properties in 38 test excavations: 1) SIHP # -7655, subsurface salt pan remnants; 2) SIHP # -7656, human skeletal remains; 3) SIHP # -7658, historic buried surfaces; 4) SIHP # -7659, historic water channel; and 5) SIHP # -7660, historic fill layer
Sholin et al. 2014	Archaeological inventory survey	Ola Ka ‘Ilima Artspace Loft, Waimanu St	Six test trenches excavated; scattered historic artifacts found in fill layers
Sroat, Inglis, and McDermott 2014	Archaeological inventory survey	Ward Neighborhood Block K	Identified portions of two historic properties in 35 test excavations: 1) SIHP # -6855, subsurface cultural deposits; and 2) SIHP # -7422, burned trash layer; majority of project area contained modern developed land surface, fill layers, and hydraulic (dredged) fill overlying remnant buried A horizon or organic-rich peat material, Jaucas sand, and gleyed marine sandy clay
Sroat, Pammer, and McDermott 2014	Archaeological inventory survey	Ward Neighborhood Block C West (Ward Village Gateway)	Identified two historic properties in 36 test excavations: 1) SIHP # -7655, subsurface salt pan remnants; and 2) SIHP # -7658, historic buried surfaces
Yucha et al. 2014	Archaeological inventory survey	Ward Neighborhood Block C	Identified burned trash layer (SIHP # -7422); majority of project area contained sand or peat A horizon and Jaucas sand beneath reclamation fill layers; no cultural material or features observed
Enanoria et al. 2015	Archaeological monitoring	Ala Moana Blvd/ Nimitz Hwy Resurfacing and Lighting project	Identified three historic properties, only one near project area, SIHP # -7435, four sets of human skeletal remains within sand deposits near Ala Moana Blvd and Queen St

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Hawkins et al. 2015	Archaeological inventory survey	Ward Neighborhood Block M	Identified two historic properties in 68 test excavations: 1) SIHP # -7429, subsurface cultural deposits consisting of two discrete cultural deposits and associated features; and 2) SIHP # -7686, twentieth century commercial infrastructure remnants
Humphrey et al. 2015	Supplemental archaeological inventory survey	HRTP (City Center)	Fifteen test excavations identified additional components of SIHP # -7429, including three pit features and human burial
Sroat et al. 2015	Archaeological inventory survey	Ward Neighborhood Block I	Eighty-eight test excavations identified two historic properties: SIHP # -7429, subsurface cultural deposits and associated features including burial sites; and SIHP # -7655, subsurface salt pan remnants; pedestrian inspection documented SIHP # -7659, concretized water channel (*'auwai*)
Yucha et al. 2015	Archaeological monitoring	Ward Village Shops Project Kaka'ako, TMKs: [1] 2-3-005:013 through 017, 022, and 023	Four significant historic properties identified; three originally identified during the AIS for this project (Bell et al. 2006) and one originally identified by Yucha et al. (2014) during an AIS for a Block C project area and was reassessed for the current study by Sroat et al. (2014): 1) SIHP # -6854, subsurface cultural layer/activity area, 2) SIHP # -6855, buried cultural layer indicating a former traditional Hawaiian activity area, 3) SIHP # -6856, buried fishpond remnants (Kolowalu Fishpond) 4) SIHP # -7422, post-Contact subsurface cultural deposit (burned trash layer) associated with open-air burning practices

Reference	Nature of Study	Location	Results (SIHP #s 50-80-14)
Belluomini et al. 2016	Archaeological monitoring	Ward Village Shops project, Kaka'ako, TMKs: [1] 2-3-005:013 through 017, 022, and 023	Monitoring conducted from March 2006 through December 2008; four historic properties discussed, three originally identified during the initial (Bell et al. 2006) AIS for the project and one initially identified during another AIS (Yucha et al. 2014); SIHP # -6854, subsurface cultural layer/activity area remnant; SIHP # -6855, an activity area remnant comprised of a subsurface cultural layer that included numerous pit features and six human burial finds; SIHP # -6856, buried fishpond remnants (Kolowalu Fishpond); SIHP # -7422, a post-Contact subsurface cultural deposit (burnt trash layer)
Sroat et al. 2016	Archaeological inventory survey	Block N East project, Kaka'ako, TMKs: [1] 2-3-002:001 (por.), 067, 086, 087	Two historic properties documented: SIHP # -7429 consists of pre- and post-Contact cultural deposits with associated features, including human burials; SIHP # -7686 consists of subsurface historic infrastructure remnants

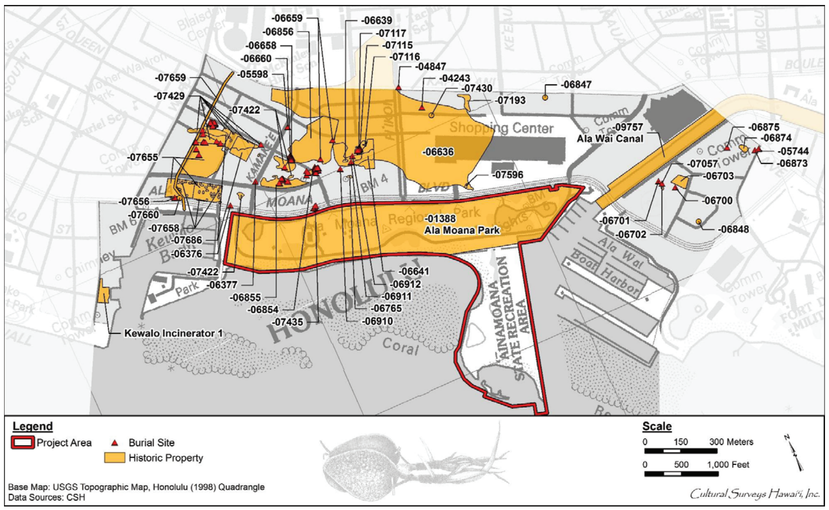


Figure 62. Previously designated archaeological sites in the vicinity of the project area

Table 2. Previously identified historic properties in the vicinity of the project area

SIHP # 50-80-14-	Description of Site	Source
1388	Ala Moana Park	HRHP
4243	Human bone	Smith 1989
4847	Scattered human burial dating to ca. 1450s	Athens et al. 1994
5598	Two adjacent coffin burials	Winieski and Hammatt 2000
5744 (2)	Human burials	Perzinski
6376	Human burial (1)	Souza et al. 2002
6377	Human burial (1)	Souza et al. 2002
6636	Subsurface wetland sediments	O’Hare, Bush, Borthwick, and Hammatt 2004, Clark and Gosser 2005, Runyon et al. 2012, Hammatt 2013
6639	Historic trash pit	O’Hare, Bush, Borthwick, and Hammatt 2004
6641	Historic trash pit	O’Hare, Bush, Borthwick, and Hammatt 2004
6658	Human burials	O’Hare, Bush, Borthwick, and Hammatt 2004
6659	Human burials	O’Hare, Bush, Borthwick, and Hammatt 2004
6660	Historic trash pit	O’Hare, Bush, and Hammatt 2006
6700	Human burial (1)	Freeman et al. 2005
6701	Human burial (1)	Freeman et al. 2005
6702	Subsurface cultural deposit	Freeman et al. 2005
6703	Buried fishpond sediments	Freeman et al. 2005
6765	Historic trash layer	Carney and Hammatt 2008
6847	Wood-lined subsurface feature	Hammatt 2013
6848	Subsurface cultural deposit	O’Hare, Shideler, and Hammatt 2006
6854	Subsurface cultural deposit and human burials (5)	Bell et al. 2006, Belluomini et al. 2016
6855	Subsurface cultural deposit and human burials (7)	Bell et al. 2006, Yucha et al. 2015, Belluomini et al. 2016
6856	Kolowalu Fishpond	Thurman et al. 2009, Belluomini et al. 2016
6873	Human burial (1)	Bell and McDermott 2007
6874	Subsurface cultural layer	Bell and McDermott 2007
6875	Human burial (1)	Bell and McDermott 2007
6910	Human burial (1)	Hammatt 2008
6911	Cluster of 16 coffin burials	Hammatt 2008
6912	Human burial (1)	Hammatt 2008

SIHP # 50-80-14-	Description of Site	Source
7057	Human skeletal remains	Tulchin and Hammatt 2009
7115	Subsurface cultural deposit	Runyon et al. 2011
7116	Pond sediment	Runyon et al. 2011
7117	Burial cluster	Runyon et al. 2011
7193	Historic trash pit	Burke and Hammatt 2012
7422	Subsurface burnt trash deposit	Sroat et al. 2014, Yucha et al. 2015, Belluomini et al. 2016
7429	Subsurface cultural deposit and a human burial	Hammatt 2013, Hawkins et al. 2015, Humphrey et al. 2015, Sroat et al. 2015, Sroat et al. 2016
7430	Subsurface privy remnant	Hammatt 2013
7435 A–D	Human skeletal remains	Enanoria et al. 2015
7596	Subsurface trash deposit	Pammer and McDermott 2014
7655	Salt pan sediments and human burials	Sroat et al. 2015
7656	Human burial (1)	Pammer et al. 2014
7658	Subsurface infrastructure remnants	Sroat et al. 2014
7659	Ward ditch	Pammer et al. 2014, Sroat et al. 2015
7660	Historic trash deposit	Pammer et al. 2014
7686	Commercial infrastructure remnants	Hawkins et al. 2015, Sroat et al. 2016
9757	Ala Wai Canal	NRHP, Maly et al. 1994
No SIHP # assigned	Kewalo Incinerator 1	National Park Service

shallow depth of 50-80 cm below surface. A lack of burial goods and the presence of the remains within an unusual wetlands context strongly suggested the location of the remains did not reflect an intentional burial. Osteological analysis revealed a severe bone infection of the right pubis as the probable cause of death. The individual may have passed away at the very spot of interment and remained undiscovered. Alternatively, the individual may have been interred in an elevated sand berm. Several burials in Kaka‘ako have been found in similar sand berms located around fishponds.

5.2.3 Maly et al. 1994

The firm Paul H. Rosendahl, Inc. (PHRI) (Maly et al. 1994) conducted an archaeological and historical assessment study for the proposed Convention Center, on the *makai* side of the Ala Wai Canal adjacent to the east end of the current project area. Historic research indicated the project area was adjacent to the large Kūwili Fishpond. For this reason, the authors recommended subsurface testing to report subsurface remains and to look for the pond walls.

5.2.4 Hammatt and Shideler 1995, 1996

In 1995, CSH (Hammatt and Shideler 1995) conducted subsurface testing at a site proposed for the Waikīkī Convention Center (now called the Hawai‘i Convention Center). The crew excavated ten backhoe trenches and seven cores. Most of the excavations had fill material down to within a few centimeters of the original coral reef, an indication that this former wetland area had been extensively filled during the 1920s and 1930s Waikīkī Reclamation Project. Four radiocarbon dates were recovered, and the oldest sediment, from just above the coral reef, wielded a date of AD 985-1920. The pollen analysis of samples from older deposits indicated a dominance of *Pritchardia* palms, which virtually disappeared before the arrival of the Polynesians to the Islands. Additional testing was conducted (Hammatt and Shideler 1996) near one of the trenches located in a former fishpond (Loko Kūwili Pond) in 1994. Results of the data recovery research showed the Stratum III sediments believed to have been related to Kūwili Fishpond were in fact imported fill.

5.2.5 Winieski and Hammatt 2000

In 2000, archaeological monitoring for the Kaka‘ako Improvement District (ID) 4 project was conducted by CSH (Winieski and Hammatt 2000). The project documented two isolated historic coffin burials (SIHP # -5598) on Kamake‘e Street, between Kawaiaha‘o and Waimanu streets. The two adjacent burials were within an undisturbed beach sand deposit, directly underlying an A horizon, which itself was beneath approximately 50 cm of construction fill and pavement. Well-defined burial pits were present, as well as staining from the deteriorated coffin wood. Apart from the coffins, no associated artifacts were discovered during disinterment. During a nearby excavation on Waimanu Street, approximately 2 m west of Kamake‘e Street, a horse or mule skeleton was discovered within an undisturbed sand layer, approximately 1 m below the surface. No other materials were observed during the Kaka‘ako ID 4 project, apart from several modern bottles and bottle fragments discovered within fill materials. One “Star Soda Works” bottle was dated to ca. 1900.

5.2.6 Borthwick and Hammatt 2001

Between 1999 and 2001, CSH conducted archaeological monitoring for the Kaka‘ako Improvement District 6 project, located adjacent to Kewalo Basin and *makai* of the Ward Avenue and Ala Moana Boulevard intersection (Borthwick and Hammatt 2001). The project included an extension of Ward Avenue *makai* of Ala Moana Boulevard, connecting with ‘Āhui Street, as well as improvements to drainage, water, sewer, and utility systems, the construction of a parking lot, and landscaping. Consistent with the project area’s location within infilled coastal waters *makai* of the previous shoreline, the documented stratigraphy consisted of various fill deposits over natural tidal flats characterized by gleyed sandy clay to loamy clay. No historic properties were observed.

5.2.7 Winieski and Hammatt 2001

In 2000, CSH performed archaeological monitoring for Victoria Ward Ltd. at the site of the Ward Village Phase II (Ward Theaters) construction project in Kaka‘ako (Winieski and Hammatt 2001). No pre-Contact materials, historic cultural materials, or human burials were encountered. Stratigraphic profiles within the project area revealed fill materials placed over a pre-existing marsh surface. In the northwest corner of the project area, an old A horizon, naturally deposited pond sediments, and calcareous sand were observed. Similarly, an old A horizon and naturally deposited calcareous sand were observed in the southwest corner of the project area.

5.2.8 Souza et al. 2002

In 2000, CSH completed a monitoring program for the Kaka‘ako ID-7 construction project, encountering three human burials severely disturbed by excavation activities (Souza et al. 2002). The ages and ancestries of the individuals could not be identified; however, the lack of grave goods may indicate they were pre-Contact or early post-Contact. Burial 1 (SIHP # 50-80-14-6376), a single cranium, was inadvertently discovered by construction personnel in the back dirt pile at the base yard. Burial 2 (SIHP # -6377), an adult individual, was encountered by a CSH archaeologist during backhoe excavations for a box drain. The burial was within an undisturbed beach sand deposit. Burial 3 (SIHP # -6378), consisting of a femur and several rib fragments, was also recovered in the base yard.

5.2.9 Chiogioji and Hammatt 2004

In 2004, CSH (Chiogioji and Hammatt 2004) prepared an archaeological literature review and field inspection for the 2.3-acre former Wave nightclub, later used for the Waikīkī Allure condominium development, at the corner of Kalākaua Boulevard and ‘Ena Road in Waikīkī. Background research indicated the study area, from traditional Hawaiian times to the modern era, comprised a drier portion of Waikīkī, at least partially elevated above the region’s fishponds and wetland agricultural fields. An inventory survey with subsurface testing was recommended.

5.2.10 O’Hare, Bush, Borthwick, and Hammatt 2004

In 2003, CSH conducted the Phase I portion of the archaeological inventory survey (AIS) for the Ko‘olani Condominium project in the Kewalo area (O’Hare, Bush, Borthwick, and Hammatt 2004). Thirteen trenches were excavated. Two previously unrecorded historic properties were newly identified, SIHP #s -6639 and -6641, both historic trash pits dated to the early twentieth

century. In addition, one previously recorded historic property, the original wetland surface of Kewalo (SIHP # -6636), was documented.

5.2.11 O’Hare, Shideler, and Hammatt 2004

In 2004, an assessment consisting of archival research and a field inspection was conducted by CSH (O’Hare, Shideler, and Hammatt 2004) at the proposed Kapiolani Akahi project site on Hobron Lane in Waikīkī. From these two sources, a predictive model was generated. Historic maps indicated the project area once had a fishpond and an *‘auwai* (water ditch), and possibly taro *lo‘i* (irrigated patches). Historic artifacts within fill layers were also anticipated.

5.2.12 O’Leary and Hammatt 2004

Between August and October 2004, CSH conducted archaeological monitoring along Kapi‘olani Boulevard for sewer line repairs (O’Leary and Hammatt 2004). Five 0.6-m deep trenches were excavated. The stratigraphy of these trenches consisted of fill materials associated with the original placement of the sewer pipes. No cultural materials were observed.

5.2.13 Tulchin and Hammatt 2004

In 2004, CSH completed a literature review and field inspection for the Kapi‘olani Area Revised Sewer System project (Tulchin and Hammatt 2004). No subsurface testing was conducted as part of the archaeological assessment. No archaeological or historical features were observed within the project area.

5.2.14 Clark and Gosser 2005

Pacific Consulting Services (Clark and Gosser 2005) carried out subsurface testing for a storage facility on the southwest corner of Kapi‘olani Boulevard and Kamake‘e Street, documenting SIHP # -6636, a subsurface remnant of a small pond.

5.2.15 Freeman et al. 2005

In 2004, CSH completed an AIS and cultural impact evaluation for the Ala Wai Gateway project site (Freeman et al. 2005). Twenty-two backhoe trenches were excavated within the project area. Four sites were identified during excavation: disturbed and incomplete human remains (SIHP # 50-80-14-6700), an in situ coffin burial with grave goods (SIHP # 50-80-14-6701), a culturally enriched A horizon (SIHP # -6702), and the remnants of a fishpond (SIHP # 50-80-14-6703). The buried A horizon was only observed in one trench (Trench 11). It contained cultural material, including marine shell midden, fishbone, charcoal, historic glass, and a large mammal bone. Radiocarbon analysis on charcoal samples collected from the A horizon indicate the cultural layer accumulated in the late pre-Contact or early historic period.

5.2.16 Hammatt 2005

In 2005, CSH conducted archival research and a brief field inspection of a proposed condominium development on Kaio‘o Drive in Waikīkī. Archival research, including historic maps, indicated that before the construction of the Ala Wai Canal and the filling in of Waikīkī’s marshes and fishponds, the project area comprised dry land and portions of ponds. Based on this report’s findings and the cultural sensitivity of the entire Waikīkī area, CSH recommended an archaeological inventory survey with a substantial subsurface testing component for the project area.

5.2.17 Monahan 2005

A crew from Scientific Consultant Services, Inc. (SCS) completed an archaeological assessment (no finds AIS) of three parcels at the corner of Waimanu Street and Ward Avenue in 2005 (Monahan 2005). Nine backhoe trenches were excavated through hard, severely impacted, fill layers. No cultural layers or burials were recorded.

5.2.18 Tulchin and Hammatt 2005

In 2005, CSH conducted Phase II of the AIS for the Ko‘olani Condominium project (Tulchin and Hammatt 2005). Two historic properties previously recorded by O’Hare et al. (2004) were identified, SIHP #s 50-80-14-6636 (an original wetland surface of Kewalo) and -6641 (a historic trash fill layer).

5.2.19 Bell et al. 2006

In 2006, CSH completed an AIS for the Victoria Ward Village Shops project (Bell et al. 2006). A total of 86 trenches were excavated within the project area. Three historic properties were identified: 1) SIHP # -6854, a subsurface cultural layer/activity area that contained an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A horizon (containing both historic and prehistoric cultural material), and five previously identified human burials; 2) SIHP # -6855, a subsurface cultural layer/activity area comprised of a traditional Hawaiian cultural layer that included numerous pit features and six previously identified human burials; and 3) SIHP # -6856, a historic fishpond that is part of Land Commission Grant 3194, “Kolowalu,” awarded to Kalae and Kaaua. Subsequent archaeological monitoring associated with the project documented approximately 50 additional pre-Contact or early post-Contact burials associated with SIHP #s 50-80-14 -6854 and -6855 (see Thurman et al. 2009). All burials were found in Jaucas sand deposits. Of historic interest in the monitoring results are the frequent discoveries of late nineteenth century ammunition and animal burials. The Ward Village Shops project area correlates to areas shown on historic maps as a rifle range (1893) and an animal quarantine station (1911), which likely explains these findings.

5.2.20 Bush and Hammatt 2006

Between 2003 and 2005, CSH conducted archaeological monitoring along Auahi Street for the Hokua Tower project (Bush and Hammatt 2006). Excavations took place using a backhoe with a 3-ft-wide bucket, as well as by hand shoveling. Excavations included 350 m of electrical line trenching and two associated manholes. No archaeological finds were encountered during monitoring.

5.2.21 Esh and Hammatt 2006

In 2004, CSH conducted archaeological monitoring for the Rehabilitation of Streets, Unit 5 B project on Pi‘ikoi Street between Ala Moana Boulevard and Matlock Street (Esh and Hammatt 2006). Construction activities in the area primarily consisted of the resurfacing of Pi‘ikoi Street. This activity did not extend deeper than 30 cm below base course, and it did not require archaeological monitoring. Construction activity requiring monitoring was limited to excavation at the intersection of Pi‘ikoi and Young streets for traffic signal improvements. No cultural materials were encountered.

5.2.22 Gosser et al. 2006

In 2006, archaeological monitoring was performed for a 1.84-acre parcel at the west corner of Kapi‘olani Boulevard and Kamake‘e Street (Gosser et al. 2006). Remnants of an unnamed fishpond that had been previously identified (SIHP # -6636) were discovered (Clark and Gosser 2005); however, no cultural materials were observed during monitoring.

5.2.23 Hammatt 2006a

In 2006, CSH completed an archaeological literature review and field inspection of a 1.43-acre area proposed for development of a residential condominium (Hammatt 2006a). No surface historic properties were observed within the project area.

5.2.24 Hammatt 2006b

In late 2005 and early 2006, CSH conducted an AIS of the Ala Moana Expansion project (Hammatt 2006). The investigation’s 30 backhoe trenches revealed no Jaucas sand deposits within the project area. The natural land surface, prior to historic/modern fill episodes, was either a sandy clay or a highly organically enriched peaty layer. This natural surface was largely removed by prior construction-related disturbances within portions of the project area. One historic property (SIHP # 50-80-14-6847) was identified. It consisted of a wooden box placed in a pit cut into the former land surface. The box contained a mix of historic artifacts including, among other things, printed material, wooden chopsticks, pig bone, and a horse brush. It was tentatively dated to the late nineteenth or early twentieth century.

5.2.25 Hammatt and Chiogioji 2006

In 2006, CSH prepared an archaeological literature review and field inspection for the 2.3-acre Waikīkī Allure condominium development at the corner of Kalākaua Boulevard and ‘Ena Road in Waikīkī, an update for a previous literature report (see Chiogioji and Hammatt 2004). Background research indicated the study area, from traditional Hawaiian times to the modern era, comprised a drier portion of Waikīkī, at least partially elevated above the region’s fishponds and wetland agricultural fields. Fieldwork included only a brief pedestrian inspection of the project area. No surface archaeological resources or historic buildings or structures were noted. Based on background research, the authors indicated a potential for subsurface archaeological resources in the project area, including pre- and post-Contact habitation and burial deposits.

5.2.26 O’Hare, Bush, and Hammatt 2006

In 2006, CSH completed archaeological monitoring for the Queen Street Extension project, part of the Kaka‘ako Improvement District 10 (O’Hare et al. 2006). During monitoring of the construction, 30 human burials were found and disinterred. Analysis of their distribution and associated grave goods indicates 28 of the burials (SIHP # 50-80-14-6658) constituted a cemetery, possibly used between the 1840s and the 1880s. The cemetery was located on an elevated sandbar that formed the margin of Kolowalu Pond (SIHP # -6856). Two burials (SIHP # 50-80-14-6659) were isolated finds and were not related to the main cemetery cluster. Historic trash pits (SIHP # 50-80-14-6660) that intruded into the eastern edge of the cemetery were also discovered during monitoring. The human remains and associated grave goods were reburied on site in a specially constructed vault complex.

5.2.27 O'Hare, Shideler, and Hammatt 2006

In 2005, CSH excavated 20 backhoe trenches for the Kaio‘o Drive Condominium project on in Waikīkī. Based on nineteenth and early twentieth century maps and photographs, two ponds once existed in the project area, surrounded by higher ground. In the eastern portion of the project area, six trenches had a layer of organic clay loam that formed at the bottom of a still-water environment. When the location of ponds on a 1927 map is overlain on a modern map of the project area, five of the six trenches fell within the eastern pond and three of the trenches in the western half of the project area fell within or near the predicted location of the second pond. SIHP # -6848 was a fire pit within a buried A horizon found in one trench. Radiocarbon determination of charcoal and rocks from this fire pit date to AD 1470-1660. Additional testing took place to clear a 10 m by 4 m area near this fire pit to determine its extent. No other cultural material was noted near the fire pit.

5.2.28 O'Leary and Hammatt 2006

In 2005, CSH conducted an AIS for the Moana Vista Condominiums project (O'Leary and Hammatt 2006). The project included the excavation of 24 backhoe trenches. The project area was divided into three stratigraphic groups (A–C). Group A contained fill over a disturbed organic A horizon containing coarse gray marine sand. Group B contained fill over Jaucas sand. Group C contained fill over an intact organic A horizon and coarse gray marine sand, similar to Group A. No historic properties were designated.

5.2.29 Barnes and Shideler 2007

In 2007, CSH completed a literature review and field inspection for the 1235 Kona Street/1226 Waimanu Street Reserved Housing project (Barnes and Shideler 2007). No surface historic properties were identified within the project area.

5.2.30 Bell and McDermott 2007

In 2006, CSH conducted an AIS for the Allure Waikīkī Development project between Ala Wai Boulevard, Kalākaua Avenue, and ‘Ena Road. After a pedestrian inspection was conducted and 35 backhoe assisted trenches were excavated, three historic properties were documented: SIHP #s 50-80-14-6873 and -6875, consisting of isolated traditional Hawaiian burials found in sand deposits, and SIHP # -6874, a subsurface cultural layer of pre- and post-Contact origin.

5.2.31 Carney and Hammatt 2008

From 2003 to 2005, CSH conducted archaeological monitoring for the Hokua Tower project (Carney and Hammatt 2008). One historic property was documented (SIHP # 50-80-14-6765) consisting of an historic trash layer containing rusted metal, broken glass, and various bottles dating to the mid-1900s. In addition, a human mandible fragment was found in a displaced secondary context. It was thought that the mandible may have been exposed by coring activities (over 200 cores were drilled); however, the exact origin of the find was unknown.

5.2.32 Hammatt 2008

In 2008, CSH completed archaeological monitoring for the Ko‘olani Condominium project (Hammatt 2008). Three new historic properties were identified, SIHP # -6910, a single pre-Contact burial; SIHP # 50-80-14-6911, a cluster of 16 historic coffin burials believed to comprise a discrete cemetery; and SIHP # 50-80-14-6912, a single burial. The burials were associated with Jaucas

sand deposits buried beneath historic and modern fill. Additionally, various historic trash deposits were observed throughout the project area but were not assessed as significant.

5.2.33 Hazlett et al. 2008

In 2008, CSH performed archaeological monitoring for the 6-acre Ala Moana Expansion project (Hazlett et al. 2008), within the same project area as an earlier AIS (Hammatt 2006b). Hazlett et al. (2008) reported that no cultural materials were observed. Additionally, the monitoring results confirmed the prior inventory survey's observation (Hammatt 2006) that the natural sediments were largely removed to below the water table in areas and replaced by various fill sediments.

5.2.34 Petrey et al. 2008

Between 2006 and 2007, CSH performed archaeological monitoring from Ala Wai to Magic Island for the City and County of Honolulu's Emergency Sewer Bypass project (Petrey et al. 2008). No cultural deposits were identified during monitoring. The investigation concluded the project area's subsurface deposits were disturbed by imported fill materials.

5.2.35 Fong et al. 2009

In 2009, CSH completed archaeological monitoring of construction associated with upgrading existing drainage, water, and sewer systems. The project area included Kapi‘olani Boulevard from Kalākaua Avenue to Ward Avenue, Kamake‘e Street from Kapi‘olani Boulevard to Auahi Street, and Atkinson Drive from Kapi‘olani Boulevard to Ala Moana Boulevard (Fong et al. 2009). No historic properties were observed. The stratigraphy consisted primarily of imported fill material associated with the installation of utilities and road construction. In some instances, pockets of naturally deposited sediment (Jaucas sand and wetland clays) were observed beneath fill deposits.

5.2.36 Petrey et al. 2009

In 2007, CSH completed archaeological monitoring for the Nimitz Highway/Ala Moana Boulevard resurfacing project (Petrey et al. 2009). Project excavations were generally to depths of only 0.6 m below surface, with a maximum depth of 1.0-1.25 cmbs, and exposed various layers of fill. No historic properties were identified.

5.2.37 Thurman et al. 2009

In 2009, CSH completed an AIS for the Queen Street Parks project. Fieldwork involved the excavation of 29 backhoe trenches. One previously identified historic property was recorded, SIHP # 50-80-14-6856, remnants of a historic fishpond, originally identified by Bell et al. (2006). Documented stratigraphy consisted of varying layers of fill, overlying various naturally deposited sediments atop the coral shelf. The fill consisted of imported terrigenous sediment, incinerator material containing burnt historic refuse, crushed coral, and hydraulic pump dredge sediment. Natural sediments consisted primarily of backshore marsh or pond sediments associated with SIHP # -6856 (Kolowalu fishpond). Naturally deposited Jaucas sand deposits were also observed.

5.2.38 Tulchin and Hammatt 2009

Between 2005 and 2008, CSH completed archaeological monitoring for the Ala Wai Watermark project (Tulchin and Hammatt 2009). Monitoring identified additional skeletal fragments associated with a previously identified disturbed human burial (SIHP # 50-80-14-6700), as well as a second set of human remains (SIHP # -7057). Observed stratigraphy consisted of various fill deposits overlying natural marine sands and clays indicative of a marshland environment. In general, the observed naturally deposited sediments had been previously disturbed.

5.2.39 Hammatt and Shideler 2010

In 2010, CSH completed a summary report on the cultural anthropology and archaeology of the Kewalo Basin area to document potential cultural resources (Hammatt and Shideler 2010). The study concluded that no pre-twentieth century in situ deposits are located within the majority of the project area. Potential early twentieth century in situ deposits may be located in the extreme inland portion of the project area. No human burials are expected in the project area with the possible exception of the vicinity of the seaward curb of the Ala Moana/Nimitz alignment.

5.2.40 Pammer and Hammatt 2010

In 2010, CSH conducted an archaeological assessment for a 0.26-acre parcel for the Moana Vista project (Pammer and Hammatt 2010). Four trenches were excavated, but no cultural materials were observed. The study found layers of imported fill over an organic A horizon. The organic A horizon consisted of brown clay loam (peat) containing compressed roots.

5.2.41 Altizer et al. 2011

From 2008 to 2009, CSH conducted archaeological monitoring for the Kapi'olani Area Revised Sewer System project (Altizer et al. 2011). The project comprised multiple sewer line segments located throughout Kaka'ako, Kewalo, and Kālia. The study documented two layers of former wetland sediments, identified as SIHP # 50-80-14-6636. The portion of SIHP # -6636 observed during monitoring was located in an easement off Pensacola Street, between Ho'olai and Kamaile streets, and extended between two low-rise apartment buildings. The location of SIHP # -6636 was consistent with the 1884 Bishop Waikiki Survey map (RM 1090) and the 1897 Monsarrat map (RM 1910), both of which show a pond present in the vicinity of the Kapi'olani Area Revised Sewer System project area. The pond is not named on either map, but is present within former rice fields. The sediments encountered during project-related sewer line excavation are described as a black clay loam, potentially related to rice cultivation. Abundant quantities of freshwater snail shells may indicate the former wetland deposits were modified for rice cultivation.

5.2.42 Runyon et al. 2011

Between 2009 and 2010, CSH conducted an AIS for the 1.73-acre Ko'olani Phase II project in Kaka'ako (Runyon et al. 2011). Twenty-nine test trenches were excavated. Five historic properties were identified, two of which had been previously identified. SIHP # 50-80-14-6636 consists of portions of the former wetland surface of the Kewalo area. SIHP # -6641 is an historic burnt trash layer that was used as fill material to raise the original ground surface. Diagnostic artifacts provided a date range between the 1880s and 1940s. SIHP # -7115 is a subsurface culturally enriched sandy A horizon (cultural layer) containing multiple pit features, and pre- and post-Contact artifacts. Traditional Hawaiian artifacts included two basalt adzes. The historic artifacts dated to the early twentieth century. SIHP # -7116 is a subsurface low-energy alluvial layer characterized as pond sediment. Remnants of the site were found in four trenches whose location corresponds with a pond depicted on historic maps. SIHP # -7116 is a concentration of 27 human burials, 20 of which were found in wooden coffins. The burials were found in sand deposits below

historic and modern fill layers. The presence of a glass bottle dated to between 1879 and 1907 suggests the burials were interred before ca. 1900. The SHPD determined the burials were of Native Hawaiian ancestry.

5.2.43 Tome and Spear 2011

In 2011, SCS conducted archaeological monitoring for the Ala Moana Sewer Reconstruction project (Tome and Spear 2011). No cultural materials or subsurface features were identified. In general, the observed stratigraphy consisted of multiple fill deposits overlying natural sediments (i.e., sand and silty sand).

5.2.44 Burke and Hammatt 2012

In 2011, CSH conducted an AIS of a 1.43-acre parcel located at 1391 Kapi'olani Boulevard. A layer of historic trash, designated as SIHP # -7193, was noted throughout the northern and eastern portions of the project area (Burke and Hammatt 2012). The trash layer corresponds to land reclamation activities during the early to mid-twentieth century, similar to deposits noted in the surrounding area. Artifacts collected range in date from the 1930s to the 1950s.

5.2.45 Runyon et al. 2012

In 2012, CSH completed an AIS for the Senior Residence at Pi'ikoi at the corner of Pi'ikoi and Kona streets (Runyon et al. 2012). Subsurface Kewalo wetland sediments (SIHP # 50-80-14-6636) were observed in all 13 test excavations within the project area. In general, the wetland deposits consisted of very dark brown silty clay loam containing abundant decomposing organic materials (peat), snail shells, rootlets, and charcoal flecking. These sediments were found overlying gleyed sandy clay sediments over the coral shelf. Historic documentation suggests the site was capped with imported fill during early twentieth century land reclamation fill events. The site has been previously documented in nearby areas in Kaka'ako (O'Hare et al. 2003; O'Hare et al. 2004; Runyon et al. 2011; and Tulchin and Hammatt 2005).

A sediment sample collected from SIHP # 50-80-14-6636 was analyzed by Dr. Carl Christensen, professional malacologist. The analysis also noted the snail species represented in the samples were "little changed from those present there and in similar environments in pre-Contact times" (Christensen 2011:9). Of three snail species commonly found in these wetland environments (*T. porrecta*, *M. tuberculata*, and *T. granifera*), one species (*T. porrecta*) found within SIHP # -6636 is now virtually extinct.

5.2.46 Sroat and McDermott 2012

In 2012, CSH completed a supplemental AIS for the Ward Village Shops Phase 2 project (Sroat and McDermott 2012). Five test units were excavated within or adjacent to the extrapolated location of SIHP # -6855. The stratigraphy observed with the five test excavations substantiated the previously extrapolated boundaries of SIHP # 50-80-14-6855, including the sub-boundaries demarcating concentrated areas of traditional Hawaiian deposits.

5.2.47 Hammatt 2013

Between November 2011 and February 2013, CSH conducted an AIS for the Honolulu High-Capacity Transit Corridor project (HHCTCP)—City Center (Section 4), which extended from Kalihi Stream in the west to Ala Moana Center in the east. Two hundred-fifty test excavations were documented. A total of 19 historic properties were identified along the length of the project corridor; however, only one historic property was documented within the vicinity of the current project area (SIHP # 50-80-14-7429).

Hammatt (2013) performed AIS testing within numerous locations between Middle Street and Ala Moana Center. Testing revealed multiple sites, three of which were identified near the current project area—SIHP # 50-80-14-6636 (former wetland land surface), SIHP # -6856 (Kolowalu Fishpond), and SIHP # -7430 (subsurface privy remnant). These wetland sediments represent the natural wetland surface of the Kewalo area. Wetland sediments were identified within 25 AIS test excavations in the East Kaka‘ako and Kālia Geographic Zones for the Honolulu High Capacity Transit Corridor project (T-186 through T-193, T-195, T-196, T-198 through T-200, T-202, T-202A, T-203, T-205, T-207, T-208, T-210 through T-212, T-214, T-219, and T-220). In general, the wetland sediments were documented as variations of brown and gray silty clays, sandy clays, clay loams, and, similar to the current AIS, black silt loam peat layers.

5.2.48 Medina et al. 2013

In 2010, CSH conducted archaeological monitoring for utility relocations, traffic signal installations, and road widening at the intersection of Kamake‘e and Queen streets. Four profiles were drawn for excavated utility trenches at the junction of Queen and Kamake‘e streets, all on the western side. In general, stratigraphy within the project area consisted of various fill materials overlying a remnant or truncated sand A horizon, Jaucas sand, and the coral shelf. On average, the A horizon and lower sand layers began at 50–65 cmbs, and the coral shelf began at 75–120 cmbs. No historic properties were encountered.

5.2.49 Morriss et al. 2013

In 2012, CSH conducted an AIS for the Ala Moana Center ‘Ewa Mall Expansion project (Morriss et al. 2013). The 15.7-acre project included the excavation of 26 test trenches within the western portion of Ala Moana Center. One previously identified site, SIHP # 50-80-14-6636 (Kewalo wetland sediments), was documented. Possible salt pan signatures were observed in nine trenches (Trenches 3, 6, 8, 9, 13, 16, 18, 19, and 23) characterized by greenish-gray clays overlying natural wetland sediment. Seven samples of clay associated with potential salt pans and of natural wetland sediments were analyzed by the Paleo Research Institute for pollen, phytolith, and resistivity. Five samples were analyzed for pollen and phytoliths to determine their correlation with the nearby wetland surface. Resistivity testing was completed on six samples to identify differences between potential salt pan lining clay, marsh, and hydraulic fill deposits. The results of the resistivity testing on the potential salt pan lining clay sediments were suggestive but inconclusive. It was determined that additional testing of the deposits was necessary as well as a more comparative analysis of potential salt pan lining clay and wetland deposit datasets would need to be undertaken.

5.2.50 LaChance et al. 2014

In 2011 and 2012, a crew from CSH (LaChance et al. 2014) monitored the installation of a sewer force main from Ala Wai Park along and across Ala Wai Boulevard to Ala Moana Regional Park. Ground disturbance related to this project included excavation of four access shafts used in microtunneling techniques applied to excavation of the new 72-inch sewer tunnel. As a result of construction techniques applied to this project, such as microtunneling and the use of sheet piles

for shoring, documentation of monitoring efforts was often limited to photographic recordation of events and written descriptions. No cultural deposits or human burials were identified during this project’s monitoring program. The project area’s subsurface deposits appear to have been disturbed by past land use, which likely included extensive earthmoving activity and importation of fill sediments into the project area.

5.2.51 Pammer and McDermott 2014

In 2014, CSH conducted an AIS of the Park Lane Ala Moana project, located at the southeastern corner of the Ala Moana Center, across Ala Moana Boulevard from the present project area. Eight backhoe trenches were excavated. Two historic properties were identified, SIHP # 50-80-14- 6636 , a pre-Contact to early twentieth century natural wetland deposit with culturally modified components, likely associated with agriculture, aquaculture, and possible salt production. It has been previously documented in different portions of the Kewalo area. SIHP # -7596 is a subsurface trash deposit, likely originating from open air burning common in the Kewalo coastal areas. The collected artifacts dated to the turn of the nineteenth century, with diagnostic date ranges of 1890–1902. Although the observed bottles and ceramics did not appear to have been burned or melted, they were collected from within a layer of blackened sediments containing charred wood in addition to the historic artifacts.

5.2.52 Pammer et al. 2014

Between 14 April and 9 June 2014, CSH conducted archaeological inventory surveys of Block B East (Pammer et al. 2014), part of the proposed Ward Village Gateway project. A total of 38 test excavations were completed within Block B East. Five historic properties were identified within the Blocks B East and C West (Ward Village Gateway) project areas. SIHP # 50-80-14-7658 represents the structures of previous twentieth century development land surface consisting of asphalt, concrete, coral and tar pavement, and oil-rolled surfaces. SIHP # -7655 is the remnants of historic salt pans. SIHP # -7656 consisted of a single human cranial fragment encountered within disturbed sand along the *makai* boundary of the project area. SIHP # 50-80-14-7659 consisted of the concretized and rerouted Ward Estate *‘auwai* (water channel). SIHP # 50-80-14-7660 consisted of an historic trash fill deposit located within an abandoned storm drain box along the *makai* boundary of the project area. The historic trash included bottles, ceramic, metal fragments, and boat trash likely related to the nearby fishing and tuna cannery industry.

5.2.53 Sroat, Inglis, and McDermott 2014

Between 14 January and 13 December 2013, CSH conducted an AIS of the Block K project area within the Ward Neighborhood Master Plan (Sroat, Inglis, and McDermott 2014). The Block K project area is located along the southeast side of Kamake‘e Street between Queen and Auahi streets. Thirty-five test excavations were documented within the project area. The stratigraphic sequence within the Block K project area was relatively consistent: modern developed land surface, numerous and variable layers of fill, and hydraulic (dredged) fill overlying natural layers, including a remnant buried A horizon or organic-rich peat material, Jaucas sand, gleyed marine sandy clay, and the coral shelf. Portions of two previously identified historic properties were recorded within the Block K project area: 1) a portion of SIHP # 50-80-14-6855, consisting of 24 subsurface cultural deposits; and 2) a portion of SIHP # 50-80-14-7422, a cultural deposit consisting of a burned trash layer. A sample of 61 artifacts from SIHP # -7422 dated generally to between 1870 and the mid-twentieth century and two artifacts post-date 1930 and 1935, suggesting the deposit likely dates to sometime after 1935.

5.2.54 Sroat, Pammer, and McDermott 2014

Between 14 April and 9 June 2014, CSH conducted an AIS of Block C West (Sroat, Pammer, and McDermott 2014), part of the proposed Ward Village Gateway project. Thirty-six test excavations were completed within Block C West. Five historic properties, SIHP # 50-80-14-7658, -7655, -7656, -7659, and -7660 were identified (see Pammer et al. 2014, above, for site descriptions).

5.2.55 Sholin et al. 2014

In 2014, archaeologists from T.S. Dye & Colleagues (Sholin et al. 2014) completed an AIS into the proposed Ola Ka ~Ilima Artspace Lofts project on a 0.6- acre lot, currently used as a parking lot, at 1025 Waimanu Street in Kaka‘ako. The crew monitored the excavation of several construction boreholes and excavated six archaeological test trenches. The stratigraphy of the trenches consisted of asphalt and fill materials over a thin deposit of clay and basalt marine sand. Historic artifacts and faunal bone were collected from the fill layers and were dated to ca. 1880-1960.

5.2.56 Yucha et al. 2014

Between December 2012 and January 2013, CSH conducted an AIS of the Ward Neighborhood Block C project, located within a parking lot at the intersection of Ala Moana Boulevard and Kamake‘e Street (Yucha et al. 2014). Forty-one test excavations were distributed across the project area. Only one historic property was identified, a burned trash layer located near the corner of Kamake‘e and Auahi streets (SIHP # 50-80-14-7422). Stratigraphy within the project area was largely consistent. A deposit of hydraulic fill material associated with the reclamation infilling of Kaka‘ako during the 1913 to 1930 period was found within the north, west, and south portions of the project area. Beneath the fill layers, a coarse sand A horizon was documented within 25 test excavations throughout the project area, while a peat A horizon was found within three excavations within the northern portion of the project area. A majority of the project area (35 test excavations) contained Jaucas sand. No cultural material or features were observed within the test excavations or within screened sediment samples.

5.2.57 Hawkins et al. 2015

Between 13 January and 1 June 2014, CSH conducted an AIS of the Block M project area within the Ward Neighborhood Master Plan project (Hawkins et al. 2015). The Block M project area is located at the western corner of the intersection of Queen and Kamake‘e streets, and is bound to the southwest by Ward Theaters and to the northwest by the Ward Industrial Center. Sixty-eight test excavations were documented. Portions of two historic properties were identified within the Block M project area: 1) a portion of previously identified SIHP # -7429, consisting of two layered cultural deposits and associated features; and 2) SIHP # -7686, consisting of twentieth century commercial infrastructure remnants.

5.2.58 Humphrey et al. 2015

A 2014 supplemental AIS of the HHCTCP (now termed Honolulu Rail Transit Project –HRTP) City Center project area, from the location of the Kaka‘ako Station to just east of Kamake‘e Street,

further identified SIHP # -7429 within two cultural deposits (Humphrey et al. 2015). The cultural deposits consist of an in situ loamy sand A horizon and an overlying historic fill deposit comprised of redeposited local sediments. These two cultural deposits are designated Component 1 (culturally enriched historic fill) and Component 2 (culturally enriched natural A horizon). Four additional features of SIHP # -7429 were identified, including a fire pit feature within Component 2 and a flexed human burial within the underlying natural Jaucas sand. Stratigraphy consisted of interspersed sand and wetland deposits.

5.2.59 Sroat et al. 2015

Between 17 March and 2 August 2014, CSH conducted an AIS for the Ward Neighborhood Block I project (Sroat et al. 2015). The AIS consisted of 88 test excavations within a parcel. Three historic properties were identified, including SIHP # 50-80-14-7429, pre-Contact to early post-Contact subsurface cultural deposits including human burial sites, SIHP # -7655, subsurface historic salt pan remnants, and SIHP # -7659, a historic subsurface concrete water channel (*‘auwai*) associated with the Ward Estate.

5.2.60 Enanoria et al. 2015

Between 2011 and 2014, CSH conducted archaeological monitoring for the Ala Moana Boulevard/Nimitz Highway Resurfacing and Highway Lighting Replacement project, which extended from Fort Street to Kalākaua Avenue (Enanoria et al. 2015). The project area was divided into five sections. Three sites were identified, but only SIHP # 50-80-14-7435 is near the current project area. Near the intersection of Ala Moana Boulevard and Queen Street, four sets of human remains, including three in situ or partially in situ burials and one previously disturbed individual, were encountered during utility trenching with sand deposits (SIHP # -7435).

5.2.61 Yucha (J.) et al. 2015

From July 2010 through August 2011, CSH conducted archaeological monitoring for the Ward Village Shops project bounded by Kamake‘e Street to the west, Queen Street to the north, Auahi Street to the south, and Queen Lane to the east in Kaka‘ako (TMKs: [1] 2-3-005:013 through 017, 022, and 023) (Yucha et al. 2015).

Four significant historic properties were located within the project area. Three were originally identified during the AIS for this project (Bell et al. 2006) and one was originally identified by Yucha et al. (2014) during an AIS of Block C and reassessed for the current study by Sroat et al. (2014):

1) SIHP # 50-80-14-6854 is a subsurface cultural layer/activity area, which contained an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A horizon (containing both historic and traditional cultural material), and 28 previously identified human burials. No evidence of SIHP # -6854 was identified during the current archaeological monitoring effort.
2) SIHP # 50-80-14-6855 is a buried cultural layer indicating a former traditional Hawaiian activity area, which contained numerous pit features and human burials. The layer also contains historic cultural material and has extensive previous disturbance from modern activities.

3) SIHP # 50-80-14-6856 is comprised of buried fishpond remnants (Kolowalu Fishpond), part of Land Commission Grant 3194, "Kolowalu," awarded to Kalae and Kaaua. No evidence of SIHP # -6856 was identified during the current archaeological monitoring effort.

4) SIHP # 50-80-14-7422 is a post-Contact subsurface cultural deposit (burned trash layer) associated with open-air burning practices.

5.2.62 Belluomini et al. 2016

The Belluomini et al. 2016 archaeological monitoring report documents monitoring conducted from March 2006 through December 2008 in a project area bounded by Kamake'e Street to the west, Queen Street to the north, Auahi Street to the south, and Queen Lane to the east in Kaka'ako.

Four significant historic properties are located in the project area. Three were originally identified during the initial AIS for the project (Bell et al. 2006) and one was initially identified during an AIS (Yucha et al. 2014) of the Howard Hughes Corporation Block C East project and reassessed for the current study during the Howard Hughes Corporation Block K AIS (Sroat et al. 2014):

1) SIHP # 50-80-14-6854 is a subsurface cultural layer/activity area remnant, which contained an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A horizon (containing both historic and prehistoric cultural material), and five human burial finds.

2) SIHP # 50-80-14-6855 is an activity area remnant comprised of a subsurface cultural layer that included numerous pit features and six human burial finds. There are two distinct portions to this cultural layer separated by areas of disturbance and/or a slightly culturally enriched buried A horizon that contains both traditional Hawaiian and historic cultural material.

3) SIHP # 50-80-14-6856 is buried fishpond remnants (Kolowalu Fishpond), part of Land Commission Grant 3194, "Kolowalu," awarded to Kalae and Kaaua.

4) SIHP # 50-80-14-7422 is a post-Contact subsurface cultural deposit (burnt trash layer), which was most likely associated with open-air burning.

5.2.63 Sroat et al. 2016

Sroat et al. 2016 reported on an AIS for the Block N East project area located within the Ward Industrial Center, along the *makai* side of Queen Street between Ward Avenue and Kamake'e Street. In Kaka'ako, (TMKs: [1] 2-3-002:001 [por.], 067, 086, 087). Two historic properties were documented within the Block N East project area:

1. SIHP # 50-80-14-7429 consists of pre- and post-Contact cultural deposits with associated features, including human burials. SIHP # -7429 was previously documented by Hammatt (2013), Hawkins et al. (2015), Humphrey et al. (2015), and Sroat et al. (2015) within adjacent project areas. Within Block N East, SIHP # -7429 consists of culturally enriched natural sand deposits, including an associated human burial ground, and culturally enriched fill deposits utilized as historic living surfaces.
2. SIHP # 50-80-14-7686 consists of subsurface historic infrastructure remnants. SIHP # -7686 was previously identified by Hawkins et al. (2015) within the adjacent Block M project area

as consisting of warehouse building remnants and asphalt road surfaces associated with twentieth century commercial development. Within Block N East, SIHP # -7686 consists of buried asphalt and oil-rolled surfaces.

5.3 Summary of Previous Archaeological Research

Several in situ pre-Contact burials and cultural layers have been found in sand deposits in the Kaka'ako/Kālia coastal area. Cultural layers associated with habitations, agricultural fields, fishponds, salt ponds, and wetlands have also been recorded near the coast. Historic salt works remains, coffin burials, and trash associated with late nineteenth-early twentieth century open-air burning are also commonly identified historic properties. Five burials have been recorded along the northern boundary of the park, one in situ burial, SIHP # 50-80-14-6376, on Kamake'e Street near the northeastern corner of the park (Souza et al. 2002), and four possibly in situ burials, SIHP # 50-80-14-7435, at the termination of Queen Street near the north, central area of the park (Enanoria et al. 2015).

Other sites near the project area include SIHP # 50-80-14-6636, a wetland surface (Altizer et al. 2011; Clark and Gosser 2005; O'Hare, Bush, Borthwick, and Hammatt 2004; Tulchin and Hammatt 2005, etc.), SIHP # 50-80-14-7422, a burned historic trash layer (Sroat, Inglis, and McDermott 2014), and SIHP # -7596, another subsurface historic trash deposit (Pammer and McDermott 2014). In areas of the park near Ala Moana Boulevard, it is possible some pre-Contact burials and cultural layers may still be present, and it is very likely historic trash deposits remain in areas of the park where the old open-air burning grounds extended past the Old Beach Road (now Ala Moana Boulevard) into the present area of Ala Moana Regional Park.

Section 6 Community Consultation

6.1 Introduction

Throughout the course of this assessment, an effort was made to contact and consult with NHOs, agencies, and community members including descendants of the area, in order to identify individuals with cultural expertise and/or knowledge of the *ahupua‘a* of Waikīkī. CSH initiated its outreach effort in October 2018 through letters, email, telephone calls, and in-person contact. CSH concluded its outreach effort in January 2019.

6.2 Community Contact Letter

Letters (Figure 63 and Figure 64) along with a map and an aerial photograph of the project were mailed with the following text:

> At the request of Belt Collins Hawaii LLC, Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a cultural impact assessment (CIA) for the Ala Moana Regional Park and Magic Island Master Plan Project, Waikīkī Ahupua‘a, Honolulu District, O‘ahu, Hawai‘i, TMK [1] 2-3-037:001, 002, 022, 023 and 025. The project area consists of the 76.348-acre Ala Moana Regional Park and the 42.669-acre peninsula called Magic Island for a total area of 119.017 acres. Ala Moana Park Drive runs through the park parallel to the shoreline. The project area is bounded by Ala Moana Boulevard to the north, *mauka* (inland) side, the ocean on the south, *makai* (seaward) side, Kewalo Basin to the west, and Ala Wai Yacht Harbor to the east. The project area is depicted on the 1998 Honolulu U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle and a 2013 Google Earth aerial photograph (Figure 1 and Figure 2).
>
> The City and County of Honolulu is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park and Magic Island and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans. The project area receives the most usage of any other park in the State and is also one of the oldest. Many park users visit daily or several times during the week. The City wishes to extend the Parks' longevity as a gradual increase in visits is forecasted for the foreseeable future.
>
> A Draft Environmental Impact Statement (DEIS) is being prepared which will evaluate direct impacts associated with the proposed action, as well as indirect and cumulative impacts associated with the project. The proposed elements reviewed in the DEIS include:
>
> - Pi‘ikoi Street and Queen Street pedestrian entrance expansion;
> - Widening the shared-use path along the *makai* side of Ala Moana Park Drive;
> - Widening the shared-use path along the Ala Wai Small Boat Harbor;
> - Improvements to the existing canoe launch ramp and crossing;

Cultural Surveys Hawai‘i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

P.O. Box 1114 Kailua, Hawai‘i 96734 Ph: (808) 262-9972 Fax: (808) 262-4950
Job code: WAIKIKI 265 ktanaka@culturalsurveys.com www.culturalsurveys.com

October 2018

Aloha,

At the request of Belt Collins Hawaii LLC, Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a cultural impact assessment (CIA) for the Ala Moana Regional Park and Magic Island Master Plan Project, Waikīkī Ahupua‘a, Honolulu District, O‘ahu, Hawai‘i, TMK [1] 2-3-037:001, 002, 022, 023 and 025. The project area consists of the 76.348-acre Ala Moana Regional Park and the 42.669-acre peninsula called Magic Island for a total area of 119.017 acres. Ala Moana Park Drive runs through the park parallel to the shoreline. The project area is bounded by Ala Moana Boulevard to the north, *mauka* (inland) side, the ocean on the south, *makai* (seaward) side, Kewalo Basin to the west, and Ala Wai Yacht Harbor to the east. The project area is depicted on the 1998 Honolulu U.S.Geological Survey (USGS) 7.5-minute topographic quadrangle and a 2013 Google Earth aerial photograph (Figure 1 and Figure 2).

The City and County of Honolulu is proposing to restore, revitalize, enhance, and improve the Ala Moana Regional Park and Magic Island and facilities as a result of a recent master plan process that outlined both long-term and short-term improvement plans. The project area receives the most usage of any other park in the State and is also one of the oldest. Many park users visit daily or several times during the week. The City wishes to extend the Parks' longevity as a gradual increase in visits is forecasted for the foreseeable future.

A Draft Environmental Impact Statement (DEIS) is being prepared which will evaluate direct impacts associated with the proposed action, as well as indirect and cumulative impacts associated with the project. The proposed elements reviewed in the DEIS include:

- Pi‘ikoi Street and Queen Street pedestrian entrance expansion;
- Widening the shared-use path along the *makai* side of Ala Moana Park Drive;
- Widening the shared-use path along the Ala Wai Small Boat Harbor;
- Improvements to the existing canoe launch ramp and crossing;
- Rearranging the parking along the *makai* side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;
- Configure parking stalls on the *mauka* side of Ala Moana Park Drive to perpendicular and parallel stalls;
- Keyhole parking lot expansion;
- Elongating Magic Island parking lot;
- Improve the pond edges;
- Renovate McCoy Pavilion to include a dining facility;
- Redesign the elevated area in the middle of the park on the *makai* side of Ala Moana Park Drive for Americans with Disabilities Act access;
- Sand replenishment and long-term beach nourishment;

Figure 63. Community consultation letter page one

WAIKIKI 265 – CIA for the Ala Moana Regional Park Master Plan Project

Page 2

- Build a Playground;
- Relocate the Maintenance Yard;
- Drainage canal wall repair;
- Repair the Bridal Bridge;
- Add a dog park near Kewalo Basin
- Create a multiuse facility at the Lawn Bowling area;
- Relocate the Ocean Safety's Honolulu Headquarters;
- Repair Roosevelt Portals at Atkinson Street entrance and improve the entrance at the Kamakee Street.

The purpose of this CIA is to gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about this area in order to assess potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the planned project. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- **General history as well as present and past land use of the project area**
- **Knowledge of cultural sites which may be impacted by future development of the project area—for example, historic and archaeological sites, as well as burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**
- **Cultural associations of the project area, such as *mo'olelo* and traditional uses.**
- **Referrals of *kūpuna* or elders and *kama'āina* who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua'a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.**

In advance, we appreciate your assistance in our research effort. If you are interested in participating in this study, please contact Kellen Tanaka at ktanaka@culturalsurveys.com. We are also available by phone at (808) 262-9972. **We kindly ask for your response by November 9, 2018**.

Mahalo nui loa,

Kellen Tanaka
Cultural Researcher

Figure 64. Community consultation letter page two

- Rearranging the parking along the *makai* side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;
- Configure parking stalls on the *mauka* side of Ala Moana Park Drive to perpendicular and parallel stalls;
- Keyhole parking lot expansion;
- Elongating Magic Island parking lot;
- Improve the pond edges;
- Renovate McCoy Pavilion to include a dining facility;
- Redesign the elevated area in the middle of the park on the *makai* side of Ala Moana Park Drive for Americans with Disabilities Act access;
- Sand replenishment and long-term beach nourishment;
- Build a Playground;
- Relocate the Maintenance Yard;
- Drainage canal wall repair;
- Repair the Bridal Bridge;
- Add a dog park near Kewalo Basin;
- Create a multiuse facility at the Lawn Bowling area;
- Relocate the Ocean Safety's Honolulu Headquarters;
- Repair Roosevelt Portals at Atkinson Street entrance and improve the entrance at the Kamakee Street.

The purpose of this CIA is to gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about this area in order to assess potential impacts to the cultural resources, cultural practices, and beliefs identified as a result of the planned project. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

- **General history as well as present and past land use of the project area**
- **Knowledge of cultural sites which may be impacted by future development of the project area—for example, historic and archaeological sites, as well as burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**
- **Cultural associations of the project area, such as *mo'olelo* and traditional uses.**

- **Referrals of *kūpuna* or elders and *kama‘āina* who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua‘a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area**

In most cases, two or three attempts were made to contact individuals, organizations, and agencies. Community outreach letters were sent to a total of 114 individuals or groups, six responded, and two of these *kama‘aina* and/or *kupuna* (elder) met with CSH for more in-depth interviews. The results of the community consultation process are presented in Table 3.

6.3 Community Contact Table

Below in Table 3 are names, affiliations, dates of contact, and comments from NHOs, individuals, organizations, and agencies contacted for this project. Results are presented below in alphabetical order.

Table 3. Community contact table

Name	Affiliation	Comments
Abordo, Chelsea	Cultural and lineal descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Ah Mai, Karen	Executive Director, Ala Wai Watershed Association	Letter and figures sent via USPS and email 10 October 2018 Mail returned 16 October 2018 Letter and figures sent via email 24 October 2018
Amaral, Annelle	Association of Hawaiian Civic Clubs	Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Aoki, Wendell	President, Hawaii Amateur Surfing Association	Letter and figures sent via USPS and email 10 October 2018 Letter and Figures sent via email 24 figures 2018
Apaka, Jeff	Community Relations Director, Waikīkī Community Center	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

Name	Affiliation	Comments
Arcalas, Cara	Cultural and lineal descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Battle, Cherie Kahealani Keohokālole	Cultural and lineal descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Campbell, Cheryl	President, Oahu Hawaiian Canoe Racing Association	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Cayan, Coochie	SHPD Intake Specialist	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Christensen, Makani	‘Aha Moku Kona Rep	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Crabbe, Kamana‘opono	Ka Pouhana, Office of Hawaiian Affairs	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
DaMate, Leimana	Executive Director, DLNR-Aha Moku	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Del Toro, Benjamin	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Del Toro, Daniel	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

Name	Affiliation	Comments
Del Toro, Rachel	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Del Toro, Samuel	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Dragon Boat Hawaii		Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Egged, Rick	President, Waikiki Improvement Association	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Finley, Robert J.	Chair, Waikiki Neighborhood Board	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Fraser, Gregg	Chieftan, Hawaiian Scottish Association	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Froiseth, Luana	President, Waikīkī Surf Club	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Gomes, Jeffery	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Gomes, Phoebe	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

Name	Affiliation	Comments
Gomes, Robin	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Mail returned 14 October 2018 Letter and figures sent via USPS 24 October 2018 Mail returned 30 October 2018
Gora, Amelia	Cultural descendant	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via USPS and email 24 October 2018
Greek Festival of Hawaii		Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Harris, Cy K.	Cultural descendant	Letter and figures sent via USPS and email 10 October 2018 Email returned 10 October 2018 Letter and figures sent via USPS 24 October 2018
Hawaii Amateur Surfing Association		Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Hawaiian Civic Club of Honolulu		Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Higa, Jennifer	Executive Director, Hawaiian Historical Society	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018

Name	Affiliation	Comments
Higgins, Colette	Professor of History, Windward Community College	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Hilo, Regina	SHPD Burial Sites Specialist	Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Ho, Roy	Nā Lei Aloha Foundation	Letter and figures sent via USPS and email and email 10 October 2018 Letter and figures sent via email 24 October 2018
Holt Takamine, Victoria	Executive Director, PA‘I Foundation	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Joto, Lorelei	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kai, G. Umi	President, ‘Aha Kāne	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Kaleikini, Ali‘ikaua	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kaleikini, Hāloa	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kaleikini, Kala	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

Name	Affiliation	Comments
Kaleikini, Mahiamoku	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kaleikini, Moehonua	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kaleikini, No‘eau	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kaleikini, Paulette Ka‘anohi	Cultural descendant	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via USPS and email 24 October 2018
Kaleikini, Tuahine	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kane, Shad	Member of the Kapolei Hawaiian Civic Club, Chair of the O‘ahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Ali‘i Ai Moku of the Kapuāiwa Chapter of the Royal Order of Kamehameha Ekahi, and ‘Ewa Moku Representative on the State Aha Moku Advisory Committee	Mr. Kane replied via email 23 October 2018: *Here is the Oahu Councils comments you requested. It primarily addresses the possibility of burials. It's ancient cultural history is minimal due it serving as a pass through area. It is only during the monarchy period where we see some activity. Feel free to let me know if you have any questions or concerns.* ***Cultural Impact Assessment for Ala Moana Park, Ala Wai and Magic Island*** *My name is Shad Kane a retired Police Lieutenant, graduate of Kamehameha Schools, University of Hawaii*

Name	Affiliation	Comments
Kane, Shad [cont.]		*and a Masters degree in Public Administration from Central Michigan University. I am a member of the Kapolei Hawaiian Civic Club and the Chair of the Oahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties. I am also the Alii Ai Moku of the Kapuaiwa Chapter of the Royal Order of Kamehameha Ekahi. I am the State of Hawaii ‘Ewa Moku Representative on the State Aha Moku Advisory Committee. I represent the Oahu Council of Hawaiian Civic Clubs on the State of Hawaii HART Station Naming Committee. My comments to your highlighted concerns are:* ***WORK AT PIIKOI AND QUEEN STREET*** ***Pi‘ikoi Street and Queen Street pedestrian entrance expansion;*** *Much of the area of Kakaako anciently was a pass through region between Kou (Honolulu) and Waikiki. Historically both places severed as places of governance. During the period of western occupation and just prior to it there are documented scattered burials especially in the area of the former Portuguese "Holy Ghost" Church and the area of the Keeaumoku Street Walmart. This does not mean*

Name	Affiliation	Comments
Kane, Shad [cont.]		*that there are not others in the area. Burials would have been shallow or as burial mounds. However most burials have been disturbed by previous construction. However in the area of Piikoi Street and Queen Street pedestrian expansion burials would be highly unlikely* ***WORK IN ALA MOANA PARK AREA*** ***Rearranging the parking along the makai side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones; Widening the shared-use path along the makai side of Ala Moana Park Drive Widening the shared-use path along the makai side of Ala Moana Park Drive; Configure parking stalls on the mauka side of Ala Moana Park Drive to perpendicular and parallel stalls Renovate McCoy Pavillion to include a dinning facility Redesign the elevated area in the middle of the park on the makai side of Ala Moana Park Sand replenishment and long-term beach nourishment; Drive for Americans with Disabilities Act access; Keyhole parking lot expansion*** *Anciently burials would have been along the shoreline in sand. This would have been*

Name	Affiliation	Comments
Kane, Shad [cont.]		*the area between Ala Wai Canal and Kewalo. Because of the ancient coral reef the sand has not migrated like other areas such as Waikiki. The beach is not the only place where there is a sand build up but rather the Ala Moana Beach Road and the Park also. This makes digging in the Ala Moana Park Beach Road and the Park area close to the road very sensitive. Minimizing digging and just removing surface material such as asphalt is the only answer. Early planting within the park required transporting some soil. It is important to understand all of Kakaako anciently was coral and very little soil. So it is important to understand any digging in these shoreline areas there is a possibility that Iwi will be found depending how invasive the proposed work will be.* ***<u>ALA WAI AREA</u>*** ***Improvements to the existing canoe launch ramp and crossing;*** ***Widening the shared-use path along the Ala Wai Small Boat Harbor;*** *Previous work in the area of the Ala Wai Small Boat Harbor has been substantial. It is possible that Iwi was found but not reported and left in place during the time of these constructions. Any work in the Ala Wai Small*

Name	Affiliation	Comments
Kane, Shad [cont.]		*Boat Harbor is likely to find previously disturbed Iwi.* ***<u>MAGIC ISLAND</u>*** ***Improve the pond edges; Elongating Magic Island parking lot;*** *Work on Magic Island should be safe in terms discovering Iwi. Much of Magic Island was fill material much like Honolulu Airport.* In January 2019, CSH followed up with Mr. Shad Kane via telephone and asked him to clarify his statement about burials within shoreline areas, and if he meant Ala Moana Blvd. rather than Ala Moana Beach Road. Mr. Kane noted that his statement was a generalization for all coastal or shoreline regions in Hawai'i. He also noted that he did indeed mean the Ala Moana Beach Road within AMRP. However, he also added that fragments of burials are often found within push piles alongside roads, and thus roadways and roadway shoulders are sensitive areas. He recalled that burials once occurred in exposed pit or coral caves following Western contact and the diversion of water for sugar and pineapple. Burials would have been shallow or as burial mounds.
Kashiwa, Greg	Kupuna LLC	Letter and figures sent via email 10 October 2018 Email returned 10 October 2018

Name	Affiliation	Comments
Keana‘āina, Betty	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Kīhei	Cultural Ddescendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Luther	Cultural Ddescendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Michelle	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Noelani	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Regina	Cultural Ddescendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Vicky	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keana‘āina, Wilsam	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keanu, Josephine	Resident, Kūpuna	Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018

Name	Affiliation	Comments
Kekaula, Ashford	Cultural descendant	Letter and figures sent via USPS and email 10 October 2018 Mail returned 16 October 2018 Letter and figures sent via email 24 October 2018
Keli‘inoi, Kalahikiola	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keli‘inoi, Kilinahe	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keli‘inoi, Moani	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keli‘ipa‘akaua, Justin	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kelley, Dr. Charles	Chairman of the Board Emeritus, Outrigger Enterprises Group	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Kelley, Dr. Richard	Chairman of the Board Emeritus, Outrigger Enterprises Group	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Keohokālole, Adrian	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keohokālole, Dennis Ka‘imina‘auoa	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Mail returned 16 October 2018

Name	Affiliation	Comments
Keohokālole, Joseph Moses Keaweaheulu	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Keohokālole, Lori Lani	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kini, Debbie	Cultural descendant	*L*etter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Kini, Nalani	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Koko, Kanaloa	Descendant of the Queen	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Lapilio, Lani Ma‘a	Ma‘a *‘Ohana*	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Lee, Vivien	Researcher for the 1978 UHCOH Kaka‘ako Study	Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Lew, Haumea	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018 Mail returned 28 October 2018
Loftin, Michael David	Executive Director, 808 Cleanups	Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018

Name	Affiliation	Comments
Lopes, Darren	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lopes, Ellen Leina‘ala	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lopes, Kamaha‘o	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lopes, Po‘ohui	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lopes, Puahone Kini	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lopes, Wilfred “Antone”	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lopez, Kealii	Imua Hawaii	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Luka, Alika	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Lum, Bruce		Letter and figures sent via USPS and email 10 October 2018 Mr. Lum replied via telephone 15 October 2018 to schedule interview CSH met with Mr. Lum 26 October 2018

Name	Affiliation	Comments
Lum, Bruce [cont.]		Mr. Lum approved his interview summary on 6 December 2018 CSH reached out to Mr. Lum via telephone on 27 December 2018 in regard to the location where he caught his *'ō'io*. CSH reached out to Mr. Lum via telephone on 8 January 2019 seeking clarification regarding the location of the refuse dump and comments about impacts associated with the widening of the Makai Shared-Use Path. Mr. Lum provided clarification via telephone and submitted the following comments via email on 8 January 2019: *I researched the history of the refuse dump activity that was included in the Draft EIS document published by the City. . . There are two volumes and here's what I found upon searching "dump" and "refuse."* *• Volume 1:* *-Section 4.4 page 4-15 line 17* *•Volume 2:* *-Appendix D-2, Section 3.4 (Cultural Surveys Hawaii) page 29 & page 32 Figure 17* *-Section 7 page 117* *As for the City's questions about the refuse dump's location, I don't have documentation of exact location. From what I have read in the DEIS document, it sounds like it was spread*

Name	Affiliation	Comments
Lum, Bruce [cont.]		*out across an area from Kewalo Basin to the Ala Wai Blvd. area. The government and Belt Collins would be a good source of documentation as to location.* *As for my concerns about the impact that construction of the shared-use path would have on the ocean environment I know that the shoreline and swim channel of Ala Moana Park is integral to the recharging of the aquatic life that currently exists in the ocean areas encompassing Magic Island to Kakaako Waterfront Park, as I have stated in my comments to the DEIS. I fear that the construction will disrupt the substrates along the current makai walkway and pollution from the contaminated soils will seriously disrupt the ecosystem that currently sustains aquatic life in the waters and on the reefs encompassing the ocean areas of Magic Island to Kakaako Waterfront Park.* CSH followed up with Mr. Lum for clarification regarding concerns about the widening of the shared-use path along the Ala Wai Small Boat Harbor via telephone on 17 January 2018. Mr. Lum provided clarifications via telephone. CSH submitted a summary of the telephone call to Mr. Lum for review

Name	Affiliation	Comments
Lum, Bruce [cont.]		and approval on 17 January 2018. Mr. Lum approved the summary of the telephone call on 17 January 2018 and provided additional comments via email: Thanks for attaching the draft CSH file in response to the City's latest questions on my DEIS comments on gathering, etc. *I reviewed the draft and have added my mana'o for consideration. Hopefully I have succeeded in adding to understandings vs. not adding. I find that there are a host of considerations that really need to be more adequately discussed and dealt with in order to properly address the potential impacts to the gathering practiced within and around Ala Moana Park's waters. Mahalo for your willingness to encourage a full and inclusive discussion.*
Mamac, Violet	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Matson, Michelle	Waikīkī Residents Association	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Medeiros Jr., Clarence (and *'Ohana*)	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

Name	Affiliation	Comments
Nakayama, Perry	Researcher for the 1978 UHCOH Kaka'ako Study	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Navales, Pauline Kuku Kaiwi	President, Kumuola Foundation	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018 Mail returned 28 October 2018
Nobrega-Olivera, Malia	Director, Waikīkī Hawaiian Civic Club	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Norman, Carolyn	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Norman, Eileen	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Norman, Kaleo	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Norman, Keli'inui	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Norman, Theodore	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Olds, Nalani	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

Name	Affiliation	Comments
Paddle Surf Hawai'i		Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Paik, Kaleo	Cultural practitioner/ Secretary/Treasurer for Koa Ike Cultural Specialist; Former History and Culture, SHPD 'Aha Wahine Aha Moku Committee, Kona District, Oahu	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Papa Jr., Richard Likeke	Cultural Descendant	Letter and figures sent via USPS and email 10 October 2018 Email returned 10 October 2018 Letter and figures sent via USPS 24 October 2018
Pascua, Bruce H.	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Patterson, Kaleo	Native Hawaiian Church	Letter and figures sent via USPS and email 10 October 2018 Mail returned 15 October 2018 Letter and Figures sent via email 24 October 2018 Mr. Patterson replied via email 25 October 2018: *I am a recognized cultural and lineal descendant of Honolulu. I also am associated with the Pacific Justice and Reconciliation Center a recognized Native Hawaiian Organization. As a cultural practitioner and Hawaiian priest I have conducted historic iwi kupuna protocols related to inadvertent finds makua of*

Name	Affiliation	Comments
Patterson, Kaleo [cont.]		*project, but I have also conducted in recent times many Memorial or funeral protocols and services in the park and the Hawaiian scattering of ashes with Hawaiian canoe launching from the park. This area is related to mauka, and important to promote Hawaiian history, and access for native Hawaiian fishing and gathering, surfing and canoeing. Awareness and protection of known historic sites must be considered, and any new discoveries. Iwi Burial finds during project must likewise be treated appropriately. I am supportive of utilization of indigenous coastal plants and landscaping, and preservation of unique cultural and environmental elements.*
Puahala, Roth	President, Ke One O Kakuhihewa	Letter and figures sent via USPS and email 10 October 2018 Mr. Shad Kane replied on behalf of Mr. Puahala on 23 October 2018
Rash, Regina	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Rasmussen, Todd	Commodore, Waikīkī Yacht Club	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018

Name	Affiliation	Comments
Recca, Joe “Pekelo”	Musician, Narrator, Storyteller, and Cultural Descendant	Letter and figures sent via email 10 October 2018 Email returned 10 October 2018
Rodrigues, Hinano	SHPD, Interim History and Culture Branch Chief	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Roy Jr., Corbett	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Shinnyo-en Hawaii		Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Silva, Adrian Nakea	Chariman, Hui Huliau Inc.	Letter and figures sent via USPS and email 10 October 2018 Email returned 10 October 2018 Letter and figures sent via USPS 24 October 2018
Silva, Lisa Gomes	Cultural descendant	Letter and figures sent via USPS 10 October 2018
Soares, Moani Kaleikini	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Solis, Sheleigh Christina Ka‘āhiki	SHPD, Cultural Historian (O‘ahu)	Letter and figures sent via email 10 October 2018 Ms. Solis replied via email 15 October 2018: *I think Kepa Maly did some work for the rail on this area. You should look and see if he has. That would be a great help to you.*

Name	Affiliation	Comments
Spinney, Charles	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Stand Up Paddle Association of Hawaii		Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Stroud, Soulee LKO	Former President, Association of Hawaiian Civic Clubs Affiliation: Hui Hawaii o Utah	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Suganuma, La‘akea	President, Royal Hawaiian Academy of Traditional Arts and Nā Lei Ali‘i Kawananakoa	Letter and figures sent via USPS and email 10 October 2018 Mr. Suganuma replied via email 11 October 2018: *Mahalo for the notice. I will pass this on to anyone I can think of that may be of assistance.*
Takahashi, Mike	Hawaii Paddleboard Association	Letter and figures sent via email 10 October 2018 Letter and figures sent via email 24 October 2018
Theone, Nicole Gulia	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Mail returned 16 October 2018
Vierra, Walter	President, Hawaiian Canoe Racing Association	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Welch, Winston	Executive Director, The Outdoor Circle	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018

Name	Affiliation	Comments
Wong-Kalu, Hinaleimoana	*Kama‘āina*; Chair, O‘ahu Island Burial Council (OIBC)	Letter and figures sent via USPS and email 10 October 2018 Chair Wong replied via email 11 October 2018: *Mahalo for reaching out to me. . . I am happy to speak with you should you wish to collect manao from me.* CSH met with Chair Wong on 27 November 2018
Woode, Napali	Native Hawaiian Economic Alliance	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Yee, Christian	*Kama‘āina*	Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Yoga Kai Hawai‘i		Letter and figures sent via USPS and email 10 October 2018 Letter and figures sent via email 24 October 2018
Yokooji, Dayleen	Cultural descendant	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Young, Harlin		Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018
Young, Tambry	President, Nā ‘Ohana O Nā Hui Wa‘a	Letter and figures sent via USPS 10 October 2018 Letter and figures sent via USPS 24 October 2018

6.4 Written Testimony from Shad Kane

CSH contacted Roth Puahala, President of Ke One O Kakuhihewa, the O‘ahu Council of the Association of Hawaiian Civic Clubs, on 10 October 2018 concerning the project. Mr. Shad Kane, member of the Kapolei Hawaiian Civic Club, Chair of the O‘ahu Council of the Association of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Ali‘i Ai Moku of the Kapuaiwa Chapter of the Royal Order of Kamehameha Ekahi, and ‘Ewa Moku Representative on the State Aha Moku Advisory Committee, replied on behalf of Ke One O Kakuhihewa by email to CSH on 23 October 2018 with the following statement:

> **Cultural Impact Assessment for Ala Moana Park, Ala Wai and Magic Island**
>
> My name is Shad Kane a retired Police Lieutenant, graduate of Kamehameha Schools, University of Hawai‘i and a Master's degree in Public Administration from Central Michigan University. I am a member of the Kapolei Hawaiian Civic Club and the Chair of the O‘ahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties. I am also the Ali‘i Ai Moku of the Kapuāiwa Chapter of the Royal Order of Kamehameha Ekahi. I am the State of Hawai‘i ‘Ewa Moku Representative on the State Aha Moku Advisory Committee. I represent the O‘ahu Council of Hawaiian Civic Clubs on the State of Hawai‘i HART Station Naming Committee.
>
> My comments to your highlighted concerns are:
>
> **WORK AT PI‘IKOI AND QUEEN STREET**
>
> **Pi‘ikoi Street and Queen Street pedestrian entrance expansion;**
>
> Much of the area of Kaka‘ako anciently was a pass through region between Kou (Honolulu) and Waikīkī. Historically both places served as places of governance. During the period of western occupation and just prior to it there are documented scattered burials especially in the area of the former Portuguese ‘Holy Ghost’ Church and the area of the Ke‘eaumoku Street Walmart. This does not mean that there are not others in the area. Burials would have been shallow or as burial mounds. However most burials have been disturbed by previous construction. However in the area of Pi‘ikoi Street and Queen Street pedestrian expansion burials would be highly unlikely.
>
> **WORK IN ALA MOANA PARK AREA**
>
> **Rearranging the parking along the *makai* side of Ala Moana Park Drive to open views to the ocean and add loading and unloading zones;**
>
> **Widening the shared-use path along the *makai* side of Ala Moana Park Drive Widening the shared-use path along the *makai* side of Ala Moana Park Drive; Configure parking stalls on the *mauka* side of Ala Moana Park Drive to perpendicular and parallel stalls**
>
> **Renovate McCoy Pavilion to include a dining facility**

Redesign the elevated area in the middle of the park on the *makai* side of Ala Moana Park

Sand replenishment and long-term beach nourishment;

Drive for Americans with Disabilities Act access;

Keyhole parking lot expansion

Anciently burials would have been along the shoreline in sand. This would have been the area between Ala Wai Canal and Kewalo. Because of the ancient coral reef the sand has not migrated like other areas such as Waikīkī. The beach is not the only place where there is a sand build up but rather the Ala Moana Beach Road and the Park also. This makes digging in the Ala Moana Park Beach Road and the Park area close to the road very sensitive. Minimizing digging and just removing surface material such as asphalt is the only answer. Early planting within the park required transporting some soil. It is important to understand all of Kaka‘ako anciently was coral and very little soil. So it is important to understand any digging in these shoreline areas there is a possibility that *‘Iwi* will be found depending how invasive the proposed work will be.

ALA WAI AREA

Improvements to the existing canoe launch ramp and crossing;

Widening the shared-use path along the Ala Wai Small Boat Harbor;

Previous work in the area of the Ala Wai Small Boat Harbor has been substantial. It is possible that *‘Iwi* was found but not reported and left in place during the time of these constructions. Any work in the Ala Wai Small Boat Harbor is likely to find previously disturbed *‘Iwi*.

MAGIC ISLAND

Improve the pond edges;

Elongating Magic Island parking lot;

Work on Magic Island should be safe in terms discovering *‘Iwi*. Much of Magic Island was fill material much like Honolulu Airport.

Shad Kane, Chair

Committee on the Preservation of Historic Sites and Cultural Properties

6.5 Written Testimony from Kaleo Patterson

CSH contacted Kaleo Patterson, President of Pacific Justice and Reconciliation Center (PJRC) and Native Hawaiian Church, on 10 October 2018. Mr. Patterson responded to CSH by email on 25 October 2018 with the following statement:

> I am a recognized cultural and lineal descendant of Honolulu.
>
> I also am associated with the Pacific Justice and Reconciliation Center a recognized Native Hawaiian Organization.

> As a cultural practitioner and Hawaiian priest I have conducted historic *‘iwi kupuna* protocols related to inadvertent finds *mauka* of project, but I have also conducted in recent times many Memorial or funeral protocols and services in the park and the Hawaiian scattering of ashes with Hawaiian canoe launching from the park.
>
> This area is related to *mauka*, and important to promote Hawaiian history, and access for native Hawaiian fishing and gathering, surfing and canoeing.
>
> Awareness and protection of known historic sites must be considered, and any new discoveries. *‘Iwi* Burial finds during project must likewise be treated appropriately.
>
> I am supportive of utilization of indigenous coastal plants and landscaping, and preservation of unique cultural and environmental elements.

6.6 *Kama‘āina* Interviews

The authors and researchers of this report extend our deep appreciation to everyone who took the time to speak and share their *mana‘o* and *‘ike* with CSH whether in interviews or brief consultations. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and in no way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

6.6.1 Bruce Lum

On 26 October 2018, Mr. Bruce Lum, a *lawai‘a* (fisherman) and native gatherer, met with CSH at the Pearlridge Shopping Center to discuss the Ala Moana Regional Park (AMRP) and Magic Island Master Plan project and to share his extensive knowledge of the abundant marine resources within the project area.

Born on O‘ahu, Mr. Lum lived in Mānoa as a child before moving to Kaua‘i to be the *hānai* (adopted child) of his maternal grandparents and family. Under the tutelage of his grandfather and *konohiki* uncles, Mr. Lum learned the traditions of fishermen; preparation for assuming the role of a *lawai‘a* within his family. After returning to O‘ahu to attend Kamehameha Schools, he continued learning about the ocean and fishing practices from his father and his paternal uncles.

> I grew up in the *lo‘i* [irrigated terrace], I grew up making *poi* [the Hawaiian staff of life, cooked taro corms, or on rare ocassions breadfruit, pounded and thinned with water]. So my role in the family became *lawai‘a*, so I'm a fisherman. . . . in those early days, amongst the family, I either went into the *lo‘i* or I went into the rivers or I went into the ocean. So either *lawai‘a*, farming or fishing in the rivers, harvesting in the rivers.

Mr. Lum traces his genealogy back 16 generations to the Maui chief, Kekaulike. When King Kamehameha was unable to conquer Kaua‘i, King Kamehameha sent a chief named Manohā to Kaua‘i to strike a treaty and convince Kaumuali‘i, chief of Kaua‘i, to come to O‘ahu and live under the watchful eye of the Kamehameha family. Then, Kamehameha sent his Maui chiefs to oversee Kaua‘i. Mr. Lum's *kupunawahine kualua* (great-great-grandmother) is descended from these Maui chiefs.

> My mother's side of the family is from Kaua‘i. So, my Hawaiian comes from her. And, her *tūtū kāne* is Henry Peters and her *tūtū wahine* is Mele

Homai'kawaialohalani Manohā. . . . the breath of a shark (*kaona*). So, my lineage goes deep. Way back. And, in this aspect, this topic area, so in my family it was typically Hawaiian. What people would call real Hawaiian. . . What that means is that, their side actually, they did not practice it. It's innate. It's just what they did.

. . . My *tūtū wahine*, Mele Homai'kawaialohalani Manohā, she comes from [descends from] Honoapi'ilani and Maewa. So she's part Ni'ihau and part Kaua'i. But even she lived here [Waikīkī] . . . So, I have a steep genealogy in the area of Waikīkī cause they lived on Cartwright Road, next to the zoo. So, they were there when Waikīkī was not like it is today. They told me stories about all the things that happened in Waikīkī, who lived there and the names of the places and how they actually wove into the area.

Mr. Lum has been gathering at AMRP for decades. He gathers the *pūpū o Ni'ihau* (Shells of Ni'ihau) including *momi* (*Euplica varians*), *laikī* (*Mitrela margarita*), and *kahelelani* (*Leptothyra verruca*). These *pūpū* (shells) are *nā mea huna makamae* (treasured secrets). They are highly prized and the best locations and times where they are found are kept a "trade secret" to protect them from over harvesting. Mr. Lum discussed *pūpū o Ni'ihau*:

. . . that's where the most pristine, most valued specimens of that are cause, one, it's protected, so as a result, it's very robust and then the population is restricted. The practitioners are not encumbered by the cautions and the hazards of doing that here [O'ahu].

Mr. Lum recalls when the Ala Moana area was a bog. He stated that Ala Moana used to be a reef and the ocean went all the way up to where Ala Moana Boulevard is today. In ancient times, the area between Diamond Head and Kaka'ako was known as *Kālia*. *Kālia* consisted of shallow reefs along the shoreline.

Kālia used to be shallow reefs . . . they [fishermen] don't even use net. They just join hands and walk around the reef and they all close in, slapping the water, called *pa'i pa'i* [clap]. And all the fish start coming in. It's inside where they have the nets. Close the nets, take what you want, let the rest go.

The area *mauka* of Ala Moana Boulevard was full of artesian wells. Natural drainage brought fresh water down from the mountains into the area where it would mix with salt water creating an ideal incubator for all types of ocean resources.

All of these *'auwai* [irrigation ditch] used to come down from Papakōlea, up Tantulus, Makiki, all that area. And had all these ditches, all of them had artesian wells around them. There were *loko i'a* [fishpond] all over Makiki and McCully. *Loko* [pond] of all kinds, wasn't just for fish. There were *lo'i*, all kinds.

He also depends on the park's beach to gather a wide variety of reef and near shore fishes. He gathers various marine resources for use as bait including *'oama*, ballyhoo, eels, octopus, shrimps, reef fish, shell fish, various juvenile fish and types of *limu* (seaweed).

From a *lawai'a* standpoint, from a practicing *lawai'a* standpoint, . . . A cultural practice in Hawaiian is that's [ocean] your refrigerator. You no go to the refrigerator all the time like the western world goes to their refrigerator. You go to

it by seasons, you go to it by the right factors, you go to it by the right seasons, you go to it by my feelings. My need. Events. Whatever. I do it when I do it. I may not do it for the whole year. But that's ok cause that's how we practice too. We let things rest, we let them recharge. I have to do more of that now because there's more of us there [*Kālia*] and there's more people who don't practice that and they just trample over everything and just upset the whole balance.

Mr. Lum discussed the numerous factors affecting the gathering practices.

Are there plenty people there? Is this the right time of the year? What's our chances of being successful at this? Lot of people, lot of activity. What tide is it? At low tide, you're not gonna find a lot of people floating around over here. They not gonna be around. So, good. Time to go *he'e* [octopus], time to go look for shrimp, bait. Time to go look for eel 'cause they come out and they easier to catch. So, *puhi* [eel] is bait. And *tohei*, the white eel, that's night. We got to go at night. Torching. And the shrimp, nights better . . . Some reef fish, they sleep on the surface. That's catching, not fishing.

Mr. Lum recalled gathering *limu* from the reef along the shore near the lighthouse by Diamond Head.

There's all these walking ponds in the reef. Used to be covered in *limu*. *Limu kala* . . . when we go over there, we just go over there at the right time, pick up the *limu* that's inside the hole. Just pick it up, shake it over the bucket we have. It's full of zebra shrimp. Plenty zebra shrimp. And we used to catch so many fish at Diamond Head using that shrimp. Now, it's a preservation. It opens up every even year. I used to walk that reef, catch what I want, go home. Now, when they open it up, they [public] go over there catch anything that's moving. They shoot anything that's moving. It's terrible.

The rocky beach shoreline (at AMRP) serves as a nursery for seasonal schools of juvenile fish inhabiting the area. It is a source of nourishment and a sanctuary from predators. Mr. Lum believes that modifying the rocky beach shoreline would negatively impact the ecosystem by eliminating nutrients to the seaweed and crustaceans that thrive in these areas which would also affect the fish that depend on them as a food source.

These areas are inside reefs cause they were reefs before. . . . They serve the same purpose, they have the same function as the reef out here, except there is a special function now it does better, . . . the *i'a* [fish] and the shells, the *pūpū*, and the *limu*, they all work together. I look at these areas, not as rocks, not as inconveniences to me as a beach goer. I look at it as perfect because the big fish here has little fish. Little fish cannot stay out here with the big fish. Big fish don't play well with little fish. They eat 'um. I look at these as nurseries, I look at them as pre-schools. This is where the fish come and hide, and grow up, and feed on all the nutrients. This is where all the fish grow up. This is how they learn. . . . Survival skills, nourishment, they grow up, they recharge this reef.

Mr. Lum identified some of the numerous fish species he has observed in AMRP's waterways including mullet, *āholehole* (Hawaiian flag tail, *Kuhlia sandvicensis*), ballyhoo (*Hemiramphus* *brasiliensis*), *halalū* (Big-eyed scad fish, *Trachiurops crumenophthalmus*), *'ō'io* (Bone fish, *Albula vulpes*), *manini* (Convict Surgeonfish, *Acanthurus triostegus*), *kūmū* (White Saddle Goatfish, *Parupeneus porphyreus*), *weke* (Golden-banded goat fish, *Mulloidichthys auriflamma*), *'oama* (juvenile *weke*), *humuhumunukunukuāpua'a* (Aculeate trigger fish, *Rhinecanthus aculeatus*), *kala* (Unicorn surgeon fish, *Naso brevirostris*), *nehu* (Hawaiian anchovy, *Stolephorus purpureus*), *popa'a* (also *po'opa'a*, Hawkfish) *pāpio* (juvenile Black Trevally, *Caranx lugubris*), *kāhala* (Greater Amberjack, *Seriola dumerili*), *moi* (Pacific threadfish, *Polydactus sexfilis*), *moili'i* (juvenile *moi*), *lai* (Leather-back fish, *Scombroides sancti-petri*), *kūpīpī* (Blackspot Sergeant, *Abudefduf sodidus*), *uhu* (Parrotfish, family Scaridae), sardines (Marquesan sardine, *Sardinella marquesensis*), flying gunards, *hīnālea lauwili* (Duperrey's wrass or Saddle wrasse fish, *Thalassoma duperrey*), *'āwela* (Christmas wrasse, *Thalassoma trilobatum*), and *kihikihi* (Moorish idols, *Zanclus conutus Linnaeus*) and many others.

Mr. Lum stated his concerns regarding the proposed sand replenishment and long-term beach nourishment of AMRP, highlighting the potential adverse impact it will have on the existing ecosystem and traditional gathering practices. Mr. Lum made clear that beach nourishment will be disruptive to cultural practices that are dependent on a very consistent, self-sustaining, recharging ecosystem.

> Disturbance [as a result of sand replenishment] will be a disruption 'cause it will take a while for it to go back to how it was, it will take a while for the oceans to sift the sands for us, the gatherers, to have it be what it is and as hard as it is now. It's not plentiful . . . it probably would take me, only one particular time of the year, which is when I get the right currents, right turbidity in the water, so that the gathering happens the way I expect, so I know where to find them in good enough quantities. It would probably take me three months.

According to Mr. Lum, sand replenishment activities at Ala Moana Regional Park and Magic Island would result in the loss of natural and cultural resources:

> The upset of it will be, the nature of the sand, you're gonna bury it all [Ni'ihau shells] . . . It took years before it came back to what it was before because it goes with the tides. Sand moves with tides. This is a primary surfing spot in the summer. During summer, the turbidity of this water, night and day, just like the North Shore, winter big, summer small. Reverses down here, south big, north small. Not only brings them in, nourishes them. It's the filtration system they use in order to eat the algae. All that happens around them is because of that. And you upset that [current shoreline], and that goes south. Gone. And for quite a while. For what? And you got to go fill it again. And with climate change it's gonna happen [sand beach erosion] in half the time it did before.

Mr. Lum is also concerned that construction activities associated with the widening of the Makai Shared-Use Path will result in runoff into the ocean. A city dump for trash was previously located in a small area of land on the *makai* area of Ala Moana Boulevard. Mr. Lum believes ground disturbance will uncover trash and other refuse which has been previously buried and the runoff will carry the pollutants into the ocean.

> If they gonna dig up and do stuff, I think the runoff into the ocean cannot be stemmed the way they say it is. Because they can't be there with that mediation all

> the time permanently. That's what that wall was for. The guys that built the park, they were really smart. That's why it's not very high. There's this wall along the beach. It's a good bench. It serves a purpose. When the king tide comes, it actually saves our butts right now. They only have to plug up the holes, board it up, sand bag it. They were really smart. I hope they treat it as a useful historical feature.

He also believes the proposed reconfiguration of the Magic Island (Ala Wai Boat Harbor) Shared-Use Path will impact the fishermen who currently fish off the wall along the Ala Wai Boat Harbor.

> The idea is to put a boardwalk type of arrangement that extends out past the wall . . . The fishermen who fish in here, they already gave up the reef they used to fish off of, now, they got this little sliver along the wall to stand on. Perching themselves on a ledge of a window . . . and they fish for *halalū*, *pāpio*, stuff in here, every season . . . well they use this ledge and this wall to cast across this channel . . .

Mr. Lum is concerned that the proposed changes to AMRP will result in limited access to marine resources. He is concerned that AMRP will become similar to Waikīkī Beach in that traditional gatherers and fisherman will no longer be allowed to fish and/or access to fishing sites will be cut off.

> We no longer can walk on the beach in Waikīkī and fish. Because why? All of the beach is occupied now by Dave's Dive Shop, umbrellas over chaise lounges parked on the beach and occupying every inch of that beach. Now, that's a cultural impact . . . same thing will happen to Ala Moana. I used to catch *'oama* in Ala Moana, inside the break wall. Between the break wall and the beach. Early in the morning, I used to go there all the time.

Mr. Lum mentioned that the people who use AMRP are multigenerational. *Kama'āina* families come to the park to engage in various cultural practices, including fishing and gathering to supplement their diet. He stated that the rocky beach shoreline is a "passive classroom" where parents could share their *mana'o* (knowledge) about the ocean and its various resources with their *keiki* (children) (see Figure 65 through Figure 69). This type of education is understood as representative of *'āina*-based learning practices.

Mr. Lum believes that not enough detail was provided to the public regarding the extent of modifications to AMRP's shoreline. In particular, he emphasized that valuable and fragile aquatic ecosystems will be negatively impacted by any modifications to the shoreline. Shoreline modifications may cause irreversible damage to shell and aquatic resource gathering. He believes a definitive understanding of the ecosystems must be achieved to prevent negative disruption of those ecosystems.

> If you're going to do your survey in the day, and not nocturnal too. You not, you haven't even started [researching and understanding the entirety of the ecosystem] . . . . if you swim around in the channel and you looking for it, fish have learned just like Hawaiians, if you stick your neck out, then you gonna get [caught]. They see you, they're gone.
>
> . . . The survey did not even scratch the surface of what is happening. It was a minimal, most token observation. All the scientific things were about quality of

sand, depth, quality of water, all this stuff. Nothing about the ecosystem. Their comments on the ecosystem was not based on all the information that's there. It [survey] was only on the low hanging fruit.

Mr. Lum is opposed to the proposed sand replenishment and long-term beach nourishment. He is concerned that it will have an adverse impact on traditional gathering practices and the existing aquatic ecosystems that inhabit the area. It will also affect his ability to gather the treasured *pūpū o Ni‘ihau*; these resources may be buried as a result of the proposed sand replenishment. Fragile aquatic ecosystems will also be disrupted by modifications to the shoreline and from runoff associated with construction activities. To prevent adverse impacts to marine resources, he believes that an in-depth study of the shoreline ecosystem must be achieved and details regarding any potential adverse impacts must be provided to the public.

On 17 January 2019, CSH contacted Mr. Lum to clarify his concerns regarding the reconfiguration of the Magic Island (Ala Wai Boat Harbor) Shared-Use Path and the impacts to the fisherman-gatherers who currently fish off the wall along the Ala Wai Boat Harbor.

Mr. Lum stated that fishermen who fish off the wall, casting into Ala Wai Boat Harbor, use the method known as whipping. A basic whipping rig includes a long leader line attached to the hook. A leader line is additional line attached to the main fishing line. When fishermen cast their lines, they flick their line behind them before casting it into the water. Mr. Lum stated that people who are not paying attention while walking behind a fisherman who is casting their line are in danger of getting snagged by a hook. For decades, fisherman and other park users have co-existed in this area without any cause of concern. However, recent numbers of tourist and new arrivals using the shared-use path boardering the traditional Ala Wai Boat Harbor fishing grounds has increased dramatically in popularity.

Mr. Lum fears that reconfiguring the Magic Island Shared-Use Path will result in more congestion in the area from pedestrians, tourists, and other park users. He stated that tour buses currently park and unload their passengers in the area. Mr. Lum believes that an increase in people around the areas where fishermen cast off into the water will result in increased danger of injuries to people unfamiliar with fisherman whipping and the hazard of lines and hooks in close proximity to non-fisherman using the newly configured shared use path. He also believes that the proposed over-hanging walkway over the water will be detrimental to traditional fishing practices and access to the surrounding reef and waters. The proposed over-hanging walkway will potentially disrupt fishing as people in the area will be closer to the schooling fish and scare away the fish which the fishermen are trying to catch. Mr. Lum is also concerned that the construction of the over-hanging walkway along the Ala Wai Boat Harbor will cut off the path which fisherman and gatherers use to access the reef.

Without adequate "stand-off" space between the fisherman whipping and the passive foot and wheeled traffic using the proposed reconfigured shared-use path, the potential for banning the traditional fishing practices now enjoyed by fisherman will increase as opposing park use purposes compete. Mr. Lum believes that tourisim & commercial purposes will yet again compete with the purposes of traditional park users and uses.

Mr. Lum is concerned that the government will eventually restrict access to traditional gatherers and fishermen at AMRP. He recalled when he used to fish off the downtownt piers near Pier 7. He

stated that observers would not pay attention to the fishermen creating a dangerous situation. As a result, the City put up signs restricting fishing from the piers in the area.

Mr. Lum stated that traditional gatherers face a "thicket of discouragements." He believes that the Department of Land and Natural Resources (DLNR) blames fishermen for the depletion of the ocean's resources, ignoring the harsher impacts and effects of pollution on these resources. He mentioned that traditional gatherers and fishermen are fearful of consuming fish gathered from waters near the Ala Wai outlet, for fear of contamination, since these fish feed on what existis in the highly polluted waters of the Ala Moana area. Smaller reef fish are known to contain pollutants and toxins like ciguatera and in turn they are eaten by the larger fish caught by Ala Moana fisherman.

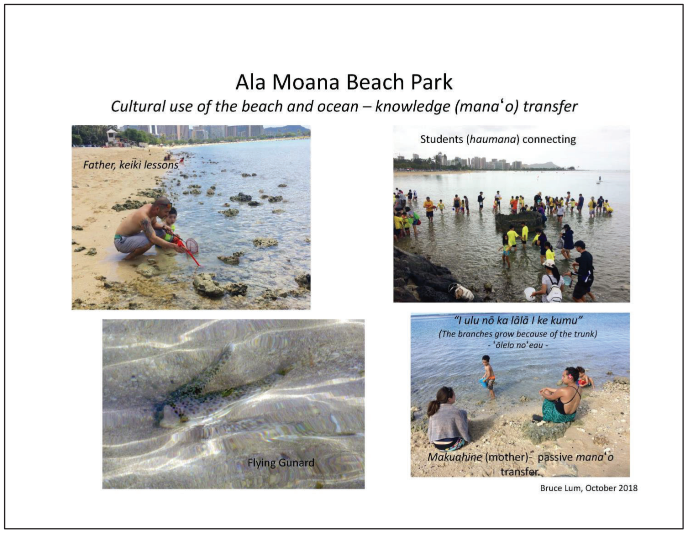


Figure 65. Park users enjoying the rocky beach shoreline at AMRP and engaging in *ʻāina*-based learning (photo courtesy of Bruce Lum 2018)

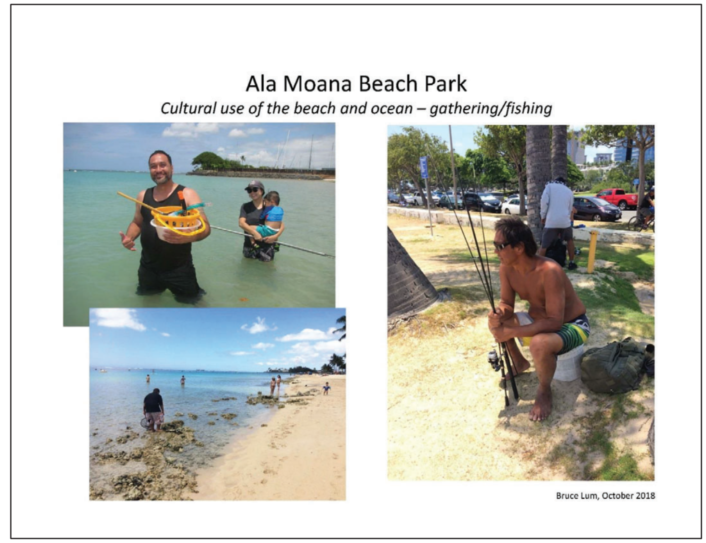


Figure 66. Multi-generational park users gathering and fishing at AMRP (photo courtesy of Bruce Lum 2018)

Figure 67. Multi-generational park users gathering and fishing at AMRP (photo courtesy of Bruce Lum 2018)

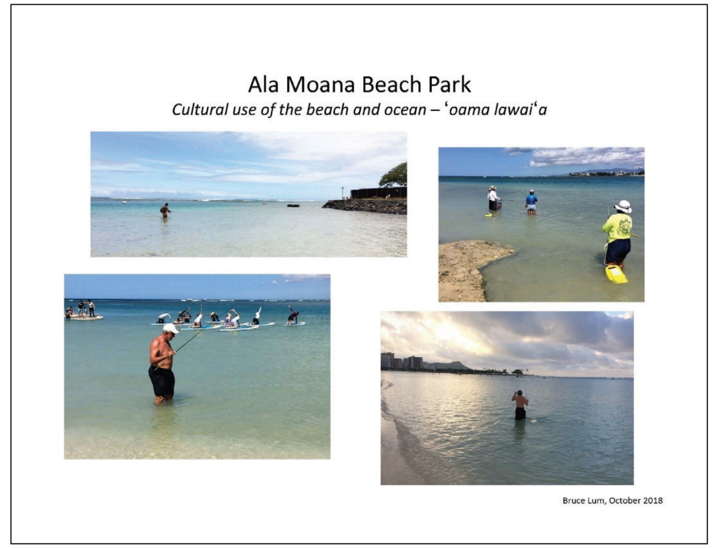


Figure 68. Park users fishing for *'oama* at AMRP (photo courtesy of Bruce Lum 2018)

Ala Moana Beach Park

Cultural use of the beach and ocean – sustenance gathering

Bruce Lum, October 2018

Figure 69. Mr. Lum with *‘ō‘io* caught at AMRP (photo courtesy of Bruce Lum 2018); the *‘ō‘io* was caught casting off the reef. Mr. Lum also fishes in the Ewa and Diamond Head ends of the beach because in certain seasons when the tide is lower, the fish come in toward the channel and the near shore rocks to eat sand turtles and other crustaceans.

6.6.2 Hinaleimoana Wong-Kalu

Ms. Hinaleimoana Wong-Kalu is a Native Hawaiian teacher, cultural practitioner, and community leader. Ms. Wong-Kalu taught grades K-12 at Hālau Lokahi Public Charter School until 2014. Currently, she teaches a Hawaiian cultural-based cognitive skills class to men incarcerated in Hālawa Correctional Facility (HCF) and O‘ahu Community Correctional Center (OCCC). She is also Chair of the O‘ahu Island Burial Council which “oversees the management of Native Hawaiian burial sites and ancestral remains” (Kumu Hina 2018).

On 27 November 2018, Ms. Wong-Kalu met with CSH at Zippy’s Nimitz to discuss the AMRP and Magic Island Master Plan project to share her *mana‘o* of traditional cultural practices within *ahupua‘a* of Honolulu and Waikīkī.

Ms. Wong-Kalu traces her genealogy back to Keawe‘ōpala, son of Alapa‘inui, chief of the island of Hawai‘i. In 1754, Keawe‘ōpala succeeded his father, Alapa‘inui, ruling over the island of Hawai‘i until he was slain by Kalani‘opu‘u (Kamakau 1992:77). Ms. Wong-Kalu’s maternal side of the family is descended from these Hawai‘i chiefs.

Born on O‘ahu, Ms. Wong-Kalu was raised by her maternal grandparents on School Street in the Liliha/Pu‘unui area of Nu‘uanu Valley. Her grandmother, Mona Kanaiokalani Kealoha, was the youngest daughter of 16 children. She often reminisced with Ms. Wong-Kalu, telling her stories about her life:

> . . . for me to be raised by my grandmother, their stories were my stories because that’s all I knew. Those were the only things that I would hear about when I grew up. About the life that my grandmother had, having to boil water for her father’s bath and having to wait for deliveries of *poi* from Honolulu Poi Factory. And when *poi* wasn’t enough, about stretching the *poi* with flour, so that it would be enough for everybody to eat. About old Hawaiian ways and what little was left to the access of our people, that’s what I grew up with from my grandmother.

Ms. Wong-Kalu’s grandmother recalled the entire southern shore was an open and dusty road that spanned from Kewalo Basin to Kālia, passing through the area which is now known as AMRP. She was also familiar with the traditional place names of the area including Ka‘ākaukukui, Kukuluāe‘o, Kaka‘ako, and Kewalo. She spoke of Kaka‘ako as “a hub for ‘hustle and bustle’ where there were always many Hawaiians . . . Honolulu Harbor and Aloha Tower, they’re right there. You only got around by boat, pretty much in those days, so she would have known those places.”

She mentioned that her family was known for gathering *limu*. Her great grandmother, Maria Kahokuokekai Gardner, would travel by foot from her home in Liliha/Pu‘unui through Honolulu and along the coastline of the south shore where she and her family would gather *limu*: “All the way from Honolulu Harbor, as we know it, all the way down to Kahala. More down to the Kahala side. But along that south shore coastline were the gathering places for my family to gather *limu*.”

Ms. Wong-Kalu discussed the association of the McInerny family with the Ala Moana area. In 1857, Patrick Michael McInery, an Irish carpenter, opened a retail shop in downtown Honolulu which expanded to multiple locations across Hawai‘i including a location at Ala Moana Shopping Center in 1959 (*Honolulu Advertiser* 2002). In 1918, McInerny Tract, one of the first subdivisions, was developed in Honolulu. She stated that her grandmother used to refer to the area as the

McInerny Tract. She believes that "when my grandmother spoke of McInerny Tract, it was in that general vicinity" because she knows that "the land was filled in to make Ala Moana."

She also recalled when she would *hoe wa‘a* (paddle canoe) with Kamehameha Schools. She remembers training and preparing for canoe races at AMRP. She paddled the entire area from "Honolulu Harbor to Diamond Head to up the Ala Wai."

> I paddled canoe in here [between shore and reef] for six years, inside here and we would have to swim to the reef as part of our exercises. Part of our laps. We would have to run the entire stretch of the beach, sometimes all the way that way, and then come all the way back. Sometimes just one lap or two laps. The entire way, it looks small here but when you running there, it's not.

Ms. Wong-Kalu would like the City and County of Honolulu to get rid of areas of stagnant water, areas that often become foul-smelling over time. She stated that the water in the whole area is "not really that nice" because AMRP was designed to be a sheltered cove causing the water to sit there for a long time.

Ms. Wong-Kalu has been on the OIBC for over ten years. She mentioned that burials have been recorded *mauka* of the project area. However, burials are not expected to be discovered because the project area is located *makai* of Ala Moana Boulevard which was formerly coral reefs and mudflats, but now consists of all fill land.

> Not until you get into Kālia. . . Kālia is encompassing of some of that Ala Moana area. At least half of Ala Moana is considered within Kālia. So, you wouldn't come upon a burial unless you're more *mauka*, this way, on Atkinson Drive and back around to where the Allure is, of which there are recorded burials.

Ms. Wong-Kalu recommends that the project proponents present the details of the project to the OIBC:

> Even though they are not required to by law, even though there is no concern for burials in the *makai* area cause it's all landfill anyway, the idea is to utilize the opportunity to put it out into a public venue to talk about it.

She also recommends that the city highlight the history of AMRP. She would like the city to utilize the traditional place names when labeling the different areas of AMRP, like Ala Moana Regional Park at Kālia or the Kewalo and Kālia ends of Ala Moana Regional Park.

6.7 Summary of *Kama‘āina* Interviews

Based on the written testimonies from Shad Kane and Kaleo Patterson, in addition to the reviewed and approved interview summaries of Bruce Lum and Hinaleimoana Wong-Kalu, the following is a synthesis of findings within Waikīkī and Honolulu Ahupua‘a.

Shad Kane, Chair of the O‘ahu Council of the Association of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, stated that in ancient times, burials would have been "along the shoreline in sand" in the area between the Ala Wai Canal and Kewalo. However, "the beach is not the only place where there is a sand build up but rather the Ala Moana Beach Road and the Park [AMRP] also." Digging in these shoreline areas, AMRP and Ala Moana

Beach Road are very sensitive due to the "possibility that *‘iwi* will be found depending how invasive the proposed project will be."

Mr. Kane also stated the area of Kaka‘ako was a "pass through region between Kou (Honolulu) and Waikīkī." There are documented burials in the "area of the former Portuguese ‘Holy Ghost’ Church and the area of Ke‘eaumoku Street Walmart." The possibility of discovering burials in the area of the Pi‘ikoi Street and Queen Street pedestrian expansion is highly unlikely since most burials have been disturbed by previous construction. He also mentioned that substantial construction work has been done in the area of the Ala Wai Boat Harbor. He stated that "it is possible that *‘iwi* was found but not reported and left in place. Any work in the Ala Wai Small Boat Harbor is likely to find previously disturbed *‘iwi*." He also stated that "work on Magic Island should be safe in terms discovering *‘iwi*" since "much of Magic Island was fill material."

Kaleo Patterson, cultural and lineal descendant of Honolulu and President of Pacific Justice and Reconciliation Center (PJRC) and Native Hawaiian Church, has conducted "many memorial or funeral protocols and services in the park and the Hawaiian scattering of ashes with Hawaiian canoe launching from the park." He believes that "awareness and protection of known historic sites must be considered," and any new discoveries including *‘iwi* found during project must also be treated appropriately.

Mr. Patterson also supports the "utilization of indigenous coastal plants and landscaping, and preservation of unique cultural and environmental elements." Ms. Hinaleimoana Wong-Kalu, a Native Hawaiian teacher, cultural practitioner, and community leader, also emphasized the unique cultural elements of the region. Specifically, she identified several *wahi pana*, including Ka‘ākaukukui, Kukuluāe‘o, Kaka‘ako, and Kewalo.

Mr. Bruce Lum, a *lawai‘a* and native gatherer, provided CSH with a detailed reconstruction of the traditional landscape of Waikīkī, including the project area, prior to land reclamation activities. He recalled that the Ala Moana area was once a bog and that the reef and ocean used to extend to where Ala Moana Boulevard is today. The area *mauka* of Ala Moana Boulevard was full of artesian wells. Fresh water came down from the mountains through natural drainage and mixed with salt water creating an ideal incubator for all types of ocean resources.

He discussed how AMRP's rocky beach shoreline serves as a nursery for seasonal schools of juvenile fish providing a source of nourishment and a sanctuary from predators. He believes modifying the rocky beach shoreline would negatively impact the ecosystem by eliminating nutrients to the seaweed and crustaceans that thrive in these areas which would also affect the fish that depend on them as a food source.

For decades, Mr. Lum has been gathering various marine resources at AMRP including a wide variety of reef and near shore fishes, octopus, shell fish and types of *limu*. He also gathers the *pūpū o Ni‘ihau* (shells of Ni‘ihau) including *momi* (*Euplica varians*), *lāika* (*Mitrela margarita*), and *kahelelani* (*Leptothyra verruca*). Mrs. Wong-Kalu also identified marine resources, recalling that her family was known for gathering *limu*. Her great grandmother, Maria Kahokuokekai Gardner, would travel by foot from her home in Liliha/Pu‘unui through Honolulu and along the coastline of the south shore where she and her family would gather *limu*.

In regard to the proposed improvements, Mr. Lum highlighted his opposition to the proposed sand replenishment and long-term beach nourishment. He is particularly concerned about negative impacts to the existing ecosystem, and by extension, the myriad of natural resources contained within such habitats. The linkages between the availability of natural resources and the perpetuation of traditional practices were underscored by Mr. Lum's testimony. It may be inferred from Mr. Lum's statements that should there be impacts to the existing ecosystem, traditional gathering practices will be impacted as well. Specifically, Mr. Lum shared concerns about his ability to gather the treasured *pūpū o Ni‘ihau*, which may be buried as a result of the proposed sand replenishment. Mr. Lum also warned of the potential impacts to aquatic ecosystems should runoff from construction areas enter the ocean. He believes an in-depth study of the shoreline ecosystem must be completed and the public must be informed of any potential adverse impacts.

Mr. Lum's statements indexed a desire to protect both ". . . natural resources and subsistence livelihoods" (McGregor 2010:210)." Besides subsistence practices, the other types of cultural practices and beliefs subject to assessment within a CIA include "commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs" (Environmental Council, State of Hawai‘i 1997). Ms. Wong-Kalu touched upon canoe paddling, a well-known and ongoing recreational practice that occurs at AMRP. She also recalled that when she would *hoe wa‘a* with Kamehameha Schools, training and preparing for canoe races occurred at AMRP. She paddled the entire area from "Honolulu Harbor to Diamond Head to up the Ala Wai."

As the Chair of the OIBC, Ms. Wong-Kalu is extremely versed in traditional protocol and is especially knowledgable of all laws pertaining to the protection of *iwi kūpuna*. Ms. Wong-Kalu was raised by her maternal grandparents in the Liliha/Pu‘unui area of Nu‘uanu Valley. Ms. Wong-Kalu's grandmother, Mona Kanaiokalani Kealoha, had shared that the entire south shore was once an open and dusty road that spanned from Kewalo Basin to Kālia, passing through the area now known as AMRP. She spoke of Kaka‘ako as "a hub for ‘hustle and bustle' where there were always many Hawaiians." As population centers, both Waikīkī and Honolulu Ahupua‘a (in particular, the coastal portions of these *ahupua‘a*), are known to contain burials. Ms. Wong-Kalu mentioned that burials have been recorded *mauka* of the project area. However, burials are not expected to be encountered within the project area (*makai* of Ala Moana Boulevard) as it was once formerly coral reefs and mudflats and is now entirely comprised of fill land.

Section 7 Traditional Cultural Practices

Timothy R. Pauketat succinctly describes the importance of traditions, especially in regard to the active manifestation of one's culture or aspects thereof. According to Pauketat,

> People have always had traditions, practiced traditions, resisted traditions, or created traditions . . . Power, plurality, and human agency are all a part of how traditions come about. Traditions do not simply exist without people and their struggles involved every step of the way. [Pauketat 2001:1]

It is understood that traditional practices are developed within the group, in this case, within the Hawaiian culture. These traditions are meant to mark or represent aspects of Hawaiian culture that have been practiced since ancient times. As with most human constructs, traditions are evolving and prone to change resulting from multiple influences, including modernization as well as other cultures. It is well known that within Hawai‘i, a "broader "local" multicultural perspective exists" (Kawelu 2015:3) While this "local" multicultural culture is deservedly celebrated, it must be noted that it has often come into contact with "traditional Hawaiian culture." This contact between cultures and traditions has undoubtedly resulted in numerous cultural entanglements. These cultural entanglements have prompted questions regarding the legitimacy of newly evolved traditional practices. The influences of "local" culture are well noted throughout this section, and understood to represent survivance or "the active sense of presence, the continuance of native stories, not a mere reaction, or a survivable name. Native survivance stories are renunciations of dominance, tragedy and victimry" (Vizenor 1999:vii). Acknowledgement of these "local" influences help to inform nuanced understandings of entanglement and of a "living [Hawaiian] contemporary culture" (Kawelu 2015:3). This section strives to articulate traditional Hawaiian cultural practices as were practiced within the *ahupua‘a* in ancient times, and the aspects of these traditional practices that continue to be practiced today; however, this section also challenges "tropes of authenticity," (Cipolla 2013) and acknowledges the multicultural influences and entanglements that may "change" or "create" a tradition.

This section integrates information from Sections 3–6 in examining cultural resources and practices identified within or in proximity of the project area in the broader context of the encompassing Waikīkī and Honolulu landscape. Excerpts from interviews are incorporated throughout this section where applicable.

7.1 Subsistence and Gathering

Located near the southeastern coast of O‘ahu and extending *mauka* toward the Ko‘olau Mountain Range, the *ahupua‘a* of Waikīkī traditionally was a center of chiefly residence, in addition to being a center of agricultural and aquacultural activities. Historic documents from the late eighteenth century are amongst the first written observations of the Waikīkī environment; included in these observations are notes on the area's agricultural and aquacultural practices. Captain George Vancouver, arriving at "Whyteete" in 1792, described the area in detail. His written observations provide key insight into the types of resource extraction occurring in Waikīkī during the early post-Contact period. He noted numerous, large villages, in "good repair" situated in an extremely fecund area. This area was "interspersed with deep, though not extensive valleys;

which, with the plains near the sea-side, presented a high degree of cultivation and fertility” (Vancouver 1798:161).

The production (and consumption) of *kalo* or taro was vitally important to Waikīkī Ahupua‘a as a whole. Captain James King in 1779 noted that “the natives of these islands are, in general, above the middle size and well made; they walk very gracefully, run nimbly and are capable of bearing great fatigue” (Shintani 1993:10). Accordingly, the high level of physical activity and physical fitness described by Captain King was a normal part of Hawaiian life, and largely attributable to the availability of plant and food resources such as *kalo*, yams, *‘uala*, *niu*, *mai‘a* (banana), *‘ōhia ‘ai* (mountain apple), *limu*, and *i‘a*. Besides the observed contributions to stamina and health, *kalo* was also a revered staple food, believed to have derived from the first-born son of Wakea and Papa.

> . . . the supreme god Kane ‘in the form of Wakea (a form associated with the earth) produced two sequential offspring: the first became kalo (taro) plant, the second became Hāloa, the ancestor of man . . . thus, in kinship terms, the taro is the elder brother and the senior branch of the family tree, mankind belongs to the junior branch, stemming from the younger brother.’ [Trask 2006:76–77]

A vast system of irrigated taro fields was constructed across the littoral plain from Waikīkī Kai to the lower valleys of Mānoa and Pālolo in approximately AD 1400. This field system was an impressive feat of engineering, using a design traditionally attributed to the chief Kalamakua. It took advantage of streams descending from the valleys of Makiki, Mānoa, and Pālolo. The *lo‘i kalo*, in combination with coconut groves and numerous fishponds along the Waikīkī shoreline, enabled the growth of a sizeable population.

The area was also noted for its aquaculture, specifically the raising of *kōloa* (native duck), and *i‘a* (fish). Archibald Menzies (1920), a naturalist accompanying Vancouver’s expedition, also noted the numerous types of vegetation being collected as food resource. These edible plant foods (besides the aforementioned “eddo or taro root”) included yams, *‘uala* and *kapa* (identified by Menzies as the cloth plant). Menzies also noted the cultivation of *kō* (sugarcane) and *kī* on the sloped banks associated with *lo‘i kalo* and *loko i‘a*. Menzies made particular note of the numerous ponds within the Kālia portion of Waikīkī:

> Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with water fowl of various kinds such as ducks, coots, water hens, bitterns, plovers and curlews. [Menzies 1920:23–24]

Historic maps and images depict numerous *loko i‘a* in Waikīkī. Historic documents describe Waikīkī having several hundred artificial freshwater ponds that extended a mile inland from the shoreline.

The *‘ili* of Kukuluāe‘o and Kewalo, as well as the *‘ili* of Kālia were situated amidst the two most intensely populated and cultivated areas on southeastern O‘ahu—Waikīkī and Honolulu (or Kou). During pre-Contact times, Hawaiians used the lowland marshes, wetlands, salt pans, and coral reef flats for gathering *pili* grass (Thrum 1922:639), salt making and farming of fishponds, in addition to limited wetland taro agriculture (Kotzebue 1817). These sites for resource production and extraction supported habitation sites clustered around the *mauka* boundary of the Kaka‘ako area near Queen and King Streets (LaPasse 1855).

The current project area and its surrounds, however, bears little resemblance to the traditional landscape that once existed; due to a long period of land modifications, many species of *lā‘au Hawai‘i* (Hawaiian plants) have been removed. There has been acknowledgement in recent years of the importance of reintroducing native species to public and urban spaces. Traditionally, many of these plant species were important resources, utilized for subsistence and gathering practices. Additionally, many of these plants remain significant to religious beliefs and practices. As ethnobiologist Isabella Aiona Abbott makes clear,

> Hawaiian use and understanding of plants was thoroughly and profoundly religious, based in the strong, polytheistic tradition that was the backbone of Hawaiian culture until 1819. [1992:15]

Study participant Kaleo Patterson recommended that “indigenous coastal plants” be integrated into the AMRP landscape.

Interviewee Bruce Lum, a *lawai‘a* and native gatherer, has been gathering a wide variety of reef and near shore fishes at AMRP for decades. He depends on the park’s beach to gather various marine resources for use as bait including *‘oama*, ballyhoo, eels, octopus, shrimps, reef fish, shell fish, various juvenile fish and types of *limu*. He also gathers the *pūpū o Ni‘ihau* including *momi* (*Euplica varians*), *lāiki* (*Mitrela margarita*), and *kahelelani* (*Leptothyra verruca*). Mr. Lum also noted that the nearshore waters

Mr. Lum recalled the former Waikīkī marshlands, now the current site of the Ala Moana Shopping Center. The area *mauka* of Ala Moana Boulevard was full of artesian wells, and thus responsible for Waikīkī’s naming (“water spurting from many sources”). Mr. Lum explained the importance of fresh water, its path *mauka* to *makai*, and its eventual drainage in the ocean, creating an ideal incubator for all types of aquatic resources. He stated that “there were *loko i‘a* [fishpond] all over Makiki and McCully. *Loko* [pond] of all kinds, wasn’t just for fish. There were *lo‘i*, all kinds.”

Ms. Hinaleimoana Wong-Kalu also touched upon marine resources, recalling ancestral subsistence and gathering practices. Ms. Wong-Kalu’s great grandmother, Maria Kahokuokekai Gardner, would gather *limu* along the coastline of the south shore. The seaweeds traditionally used for food were numerous and diverse, varying “greatly as to locality, season, and regional nomenclature,” despite differences, in general, *limu* was prized as a “spicy addition” to foods (Krauss 1993:16). Specifically, Mr. Lum named *limu kalu*, “a seaweed that had both ceremonial and food uses” (Abbott 1992:116). The utilization of *limu kala* within healing practices is described in the section below. Based on interviewee’s recollections, *limu* was once a ubiquitous cultural resource and remains extant in the offshore waters adjacent to the project area.

7.2 Religious Practice and Burials

Several *heiau* stood in Waikīkī Ahupua‘a, however, these *heiau* were not within or in close proximity to the current project area. However, quite notably, Waikīkī Kai was home to four *heiau* of *po‘okanaka* class associated with human sacrifice including Papa‘ena‘ena Heiau, Kapua Heiau, Helumoa Heiau, and Kūpalaha Heiau. In addition, sacrificial drowning of *kauwā*, an outcast caste, took place at several sites on O‘ahu including Kewalo (immediately west of the current project area) and Waikīkī. The coastal waters of Kewalo once contained a pond called Kawailumalumai that was also used to sacrifice *kauwā*. It should be noted, however, that due to the long land use history of the Waikīkī and Honolulu areas, including several land reclamation events, there may be conflicting information in regard to the location of the original shoreline.

While Waikīkī Ahupua‘a was a location for *heiau* dedicated to human sacrifice, it was also a location for healing. In Waikīkī, a *wahi pana* known as Kawehewehe functioned as a tangible space for healing and the removal of illnesses. The removal of physical and spiritual illness is implied in this *wahi pana*'s name, as the word "*wehe*" (in Kawehewehe), translates as "to remove" (Pukui et al. 1974:383). The healing pond of Kawehewehe was located in the vicinity of the current Saratoga Road. The healing beach also known as Kawehewehe was located nearby, in the area fronting the current Halekūlani Hotel. Traditionally, the sick were brought to this healing beach area where they would proceed to bathe in the healing waters of the ocean. As part of the healing ritual, the ill would wear *lei* made of *limu kala*, by submerging themselves in the water and releasing the *lei* from their neck, they would also release illness from their body.

Chair of the O‘ahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Shad Kane, stated that in ancient times, burials would have been "along the shoreline in sand" in the area between the Ala Wai Canal and Kewalo. However, "the beach is not the only place where there is a sand build up but rather the Ala Moana Beach Road and the Park [AMRP] also." These shoreline areas, including areas in the vicinity of AMRP and Ala Moana Beach Road, are considered very sensitive due to the "possibility that *‘iwi* will be found depending how invasive the proposed project will be."

Mr. Kane also stated that the area of Kaka‘ako was a "pass through region between Kou (Honolulu) and Waikīkī." There are documented burials in the "area of the former Portuguese ‘Holy Ghost' Church and the area of Ke‘eaumoku Street Walmart." The possibility of discovering burials in the area of the Pi‘ikoi Street and Queen Street pedestrian expansion is highly unlikely since most burials have been disturbed by previous construction. He also mentioned that substantial construction work has been done in the area of the Ala Wai Boat Harbor. He stated that "it is possible that *‘iwi* was found but not reported and left in place. Any work in the Ala Wai Small Boat Harbor is likely to find previously disturbed *‘iwi*." He also stated that "work on Magic Island should be safe in terms discovering *‘iwi*" since "much of Magic Island was fill material."

A previous oral history account also indicates that one known burial has occurred at sea, in the area of the current Ala Wai Small Boat Harbor (eastern portion of the harbor, near the current location of the Ilikai Hotel). In an interview conducted by UHCOH, Mr. Earl Kalikolehua Vida described the location of an old Hawaiian fisherman's home at the end of Hobron Lane and along the shoreline. Identifying the fisherman as John Kaimi and noting his extraordinary skill in the water, Mr. Vida recalled burying Kaimi in the offshore waters of Kālia. This custom appears to have an ancient antecedent, as Mary Kawena Pukui has documented a practice involving the removal of "the *pela* (flesh) from the corpse and sinking it into the sea" (Pukui et al. 1972:134).

Modern iterations of burial at sea now consist of the scattering of ashes. Mr. Kaleo Patterson, cultural and lineal descendant of Honolulu and President of Pacific Justice and Reconciliation Center (PJRC) and Native Hawaiian Church, has conducted "many memorial or funeral protocols and services in the park and the Hawaiian scattering of ashes with Hawaiian canoe launching from the park." He has also conducted protocols related to the treatment and preservation of *iwi kūpuna* inadvertently discovered *mauka* of the project area.

Ms. Wong-Kalu, Chair of the OIBC, stated that burials have been recorded *mauka* of the project area. However, burials are not expected to be discovered because the project area is located *makai* of Ala Moana Boulevard which was formerly coral reefs and mudflats, but now consists of all fill land.

Today, the waters off AMRP figure largely in the annual Memorial Day Lantern Floating Hawai‘i ceremony. The ceremony, hosted by the Shinnyo-en Buddhist Order and Nā Lei Aloha Foundation, allows *kama‘āina* the opportunity to remember and honor deceased loved ones. The ceremony, which involves the floating of lanterns inscribed with notes and prayers, combines traditional Buddhist rituals with Hawaiian culture. It begins with the sounding of the *pū* (conch shell) and is followed by *taiko* (Japanese percussion instruments) drumming, *oli*, and *hula*.

7.3 Surfing and Canoe Paddling

The sport of *he‘e nalu* or surfing was well known at Waikīkī. Reverence for the sport is evidenced by the construction and dedication of Papa‘ena‘ena Heiau (a *po‘okanaka* class *heiau*). This *heiau* figured largely in the cultural practice of surfing. The *mo‘olelo* of Kalamakua and His Romantic Meeting with Keleanuinoho‘ana‘api‘api also attests to the ancient significance of the sport within Waikīkī:

> Kalamakua, who was celebrated for the large taro patches he constructed and maintained at Waikīkī, recognized her as the famous surfer Kelea, a chiefess originally from Maui [Kelea, a chiefess and skilled surfer who entered the waves at Waikīkī]. When she emerged from the waves, he offered her his feathered cape (a sign of high rank) and made her his *ali‘i wahine mō‘ī*. [Feeser and Chan 2006:82]

Following Western Contact, surfing declined in Waikīkī. It was not until the beginning of the twentieth century that the sport began experiencing a revival. In the 1960s, the explosive growth of surfing in Waikīkī forced many surfers to explore and discover uncrowded breaks, including the waters off Ala Moana Beach and Kewalo Basin (Clark 1977:64).

Ms. Wong-Kalu recalled when she would *hoe wa‘a* with Kamehameha Schools. For training, members of the team were required to gather and prepare at AMRP, paddling from "Honolulu Harbor to Diamond Head to up the Ala Wai."

In 2017, Magic Island was the site of *Hōkūle‘a* and *Hikianalia*'s homecoming at the end of the Mālama Honua Worldwide Voyage. Also accompanying these vessels were the voyaging canoes *Nāmāhoe*, *Mo‘okiha o Pi‘ilani*, *Makali‘i*, *Hawai‘i Loa*, *Okeanos Marshall Islands*, and *Fafaite* in addition to hundreds of water craft, including outrigger canoes. Beginning in May 2014, *Hōkūle‘a* and her sister canoe *Hikianalia* set sail on a three-year voyage, traveling over 60,000 nautical miles to forge global relationships, encourage sustainability, and advocate for the protection of the world's cultural and natural resources. *Hōkūle‘a* and *Hikianalia*'s return to O‘ahu attracted thousands of people to Magic Island with a *ho‘olaule‘a* (celebration). The event also included the *kāli‘i* rite, the first to be witnessed in nearly 200 years, and a traditional *‘awa* ceremony. In general, "spiritual leaders use ‘awa ceremonially at appointed times, such as at a ritual following a canoe race-meet or before and after significant events and/or festivals" (White 1996).

Section 8 Summary and Recommendations

CSH undertook this CIA at the request of Belt Collins Hawaii LLC. The research broadly covered the *ahupua'a* of Waikīkī Honolulu, including the current project area.

8.1 Results of Background Research

Background research for this study yielded the following results, presented in approximate chronological order:

1. The project area is located offshore of portions of the *'ili* of Kālia in the *ahupua'a* of Waikīkī, and the *'ili* of Kukuluāe'o and Kewalo in the *ahupua'a* of Honolulu. Kālia, meaning "waited for," is a name of the coastal area where the Pi'inaio Stream once emptied into the ocean adjacent to the proposed project area.
2. The *'ili* of Kukuluāe and Kewalo are located in the modern land section called the Kaka'ako Development District. The original location and extent of the area called Kaka'ako is ambiguous. In mid-nineteenth century documents and maps, Kaka'ako was a small *'ili* within the *ahupua'a* of Honolulu. The modern urban Kaka'ako district is comprised of the *'ili* of Kaka'ako, Ka'ākaukukui, Kukuluāe'o, and the *makai* portion of Kewalo, as well as portions of *'ili* called Kawaiaha'o, Honuakaha, Ka'ala'a, 'Āpua, 'Auwaiolimu, Pualoalo, Pu'unui, and Kolowalu.
3. Large portions of Waikīkī were once part of a wide marshland. The name Waikīkī translates as "water spurting from many sources," and reveals the character of the intact watershed system of Waikīkī prior to European Contact, where water from the valleys of Mānoa and Pālolo gushed forth from underground.
4. Translations of the name Kaka'ako are provided by Pukui and Elbert (1986:110) who translate the word *kākā'āko* as "dull, slow," and Thrum (1922:639) who translated the word as "prepare the thatching," as *kākā* means "to chop, beat, or thresh" and *ako* means "thatch."
5. The Waikīkī area was full of aquatic resources including numerous fishponds that dotted the shoreline of the *ahupua'a*. Kālia is associated with a traditional fishing technique used to catch schools of mullet. The fishermen of Kālia became known as human fishnets.
6. Kaka'ako is located between two of the most intensely populated and cultivated areas in southeastern O'ahu during the pre-Contact period: Waikīkī and Honolulu (also known as Kou). Pre-Contact Hawaiians used the lagoonal/estuary environment of the Honolulu plain to construct fishponds. The undeveloped natural condition of the project area consisted of low-lying marshes, tidal flats, and reef areas used to collect marine resources.
7. John Papa 'Ī'ī (1959) discusses early nineteenth century trails in the Honolulu/Waikīkī area that traversed the region which was characterized by ponds, marshlands, and *lo'i* (irrigated terrace). He suggests that the trail, especially as it neared the coastline at Kālia, must have run on a sand berm raised above surrounding wetlands and coral flats. Historic trails on the south side of O'ahu included a trail that ran along the coastal area of Waikīkī most likely where the present Kalākaua Avenue is located. A trail traversed the Kaka'ako area, ultimately connecting Waikīkī to Honolulu. 'Ī'ī (1959:89) described the middle trail (close to the current alignment of Queen Street) extending from Kālia to Kukuluāe'o as

passing "along the graves of those who died in the smallpox epidemic of 1853," and into the center of the coconut grove of Honuakaha.

8. A majority of the land in Kewalo and Kukuluāe'o was used to produce salt. Hawaiians used *pa'akai* (salt) to flavor food, to preserve fish, to use for ceremonial purposes, and for medicinal purposes. Kaka'ako Salt Works continued to manufacture salt for local use as late as 1891, while other economic endeavors in Kaka'ako—such as infrastructure development, reclamation, and coastal dredging—began to shape the twentieth century landscape.
9. A number of reclamation projects involved the dredging of offshore areas to deepen and create boat harbors and using the dredged material to fill in the former swampy land. During the 1920s, Waikīkī's landscape would be transformed when the construction of the Ala Wai Drainage Canal—begun in 1921 and completed in 1928—resulted in the draining and filling in of the remaining fishponds and irrigated fields of Waikīkī. The construction of the canal was one of the many efforts to help urbanize Waikīkī.
10. The Kewalo Basin Harbor was formerly shallow reef that enclosed a deep section of water. The harbor was dredged and filled in the mid-1880s. In 1919, the Hawai'i Government appropriated $130,000 to improve the small harbor of Kewalo for the aim of a harbor extension that was to serve fishing fleets and to relieve Honolulu Harbor. The harbor was completed in 1926. In 1941, the basin was dredged and expanded to its current 55 acres. In 1955, dredged material was placed along the *makai* side to form an 8-acre land section.
11. Construction of Ala Moana Regional Park began in the 1920s following a series of land reclamation projects beginning with the dredging of the nearby channel leading to Kewalo Basin and sand from offsite beaches being brought in to fill in the swampy marshlands. Structural construction on the newly filled land began in the 1930s with the construction of the Sports Pavilion and Banyan Court, the Bridle Path Bridge, the Roosevelt Portals, and a lawn bowling green. Around 1932, the Hawaiian and Japanese Ponds, and a drainage canal, were dredged for both aesthetic and local run-off control purposes. Following World War II, about 55,000 cubic yards of sand were brought in from the west side of the island to create the beach. Another post-World War II addition to AMRP was the 47-acrea Magic Island Peninsula which was first conceptualized in the late-1950s.

8.2 Results of Community Consultations

CSH attempted to contact 114 NHOs, agencies, and community members. Of the six people that responded, two *kama'āina* and/or *kūpuna* provided written testimony and two participated in formal interviews for more in-depth contributions to the CIA. Below is a list of individuals who shared their *mana'o* and *'ike* about the project area:

1. Shad Kane, member of the Kapolei Hawaiian Civic Club, Chair of the O'ahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Ali'i Ai Moku of the Kapuāiwa Chapter of the Royal Order of Kamehameha Ekahi, and 'Ewa Moku Representative on the State Aha Moku Advisory Committee
2. Mr. Kaleo Patterson, cultural and lineal descendant of Honolulu and President of Pacific Justice and Reconciliation Center (PJRC) and the Native Hawaiian Church
3. Mr. Bruce Lum, *kama'āina, lawai'a*, and gatherer of *pūpū o Ni'ihau*
4. Hinaleimoana Wong-Kalu, *kama'āina* and Chair of the OIBC

8.3 Impacts and Recommendations

Based on information gathered from the community consultation, participants voiced and framed their concerns in a cultural context.

1. The community discussed the sensitivity of coastal areas of Waikīkī and Honolulu, and the possibility of encountering *iwi kūpuna* (ancestral remains) during ground disturbance. Mr. Kane stated that in ancient times, burials would have been "along the shoreline in sand" in the region that stretched between Kou (modern-day Kewalo) and Waikīkī (modern-day Ala Wai Canal). Mr. Kane expressed a concern about the sensitivity of coastal areas, including AMRP and Ala Moana Beach Road, noting there is a "possibility that *‘iwi* will be found depending how invasive the proposed project will be." He emphasized the sensitivity of areas within and near roadways. The sensitivity of these areas is evident by the location of SIHP # -7435, consisting of four sets of human remains, near the intersection of Ala Moana Boulevard and Queen Street. Mr. Kane recommended that minimal ground disturbance occur within sensitive areas. Mr. Kane stated that the possibility of discovering burials in the area of the Pi‘ikoi Street and Queen Street pedestrian expansion is highly unlikely since most burials have been disturbed by previous construction. He also noted that Magic Island was constructed of fill material, and thus it is highly unlikely that burials will be encountered during construction activities in that area. Ms. Hinaleimoana Wong-Kalu noted that burials have been recorded *mauka* of the project area, however, burials are not expected within the project area as it was formerly coral reefs and mudflats and is now entirely fill land.
2. Five burials have been recorded along the northern boundary of the park, one *in situ* (situated in the original place or position) burial, SIHP # -6376, on Kamake‘e Street approximately 65 m from the northeastern corner of the park (Souza et al. 2002), and four possibly *in situ* burials, SIHP # -7435, at the termination of Queen Street approximately 30 m from the north, central area of the park (Enanoria et al. 2015). Other recorded historic properties within or near the project area include SIHP # -1388, Ala Moana Regional Park; and SIHP # -7596, a subsurface trash deposit with historic trash artifacts approximately 50 m from the mauka boundary of the park (Pammer and McDermott 2014). In the event that *iwi kūpuna* are identified, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40. In addition, in the event of an inadvertent discovery of human remains, the completion of a burial treatment plan, in compliance with HAR §13-300 and HRS §6E-43, is recommended.
3. Ms. Wong-Kalu recommends that the project proponents present the details of the project to the OIBC.
4. The community expressed a concern regarding "awareness and protection of known historic sites." Mr. Kaleo Patterson recommended that any new discoveries encountered during construction, including *iwi kūpuna*, must be treated appropriately.
5. In the event that *iwi kūpuna* and/or cultural finds are encountered during construction, project proponents must consult with cultural and lineal descendants of the area to develop a reinterment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance.

6. Mr. Lum expressed a concern about the proposed sand replenishment and long-term beach nourishment of AMRP and Magic Island, highlighting the potential adverse impact it will have on the existing ecosystem and traditional gathering practices. Mr. Lum believes that not enough detail was provided to the public regarding the extent of modifications to AMRP's shoreline. He emphasized that valuable and fragile aquatic ecosystems will be negatively impacted by any modifications to the shoreline. Additional studies should be conducted to confirm that sand replenishment activities will not have an adverse impact on the existing ecosystem, and by extension, ongoing gathering practices.
7. Mr. Lum is also concerned that construction activities associated with the widening of the Makai Shared-Use Path will result in runoff into the ocean. Based on his research, Mr. Lum noted that a refuse dump once stretched across an area from Kewalo Basin to the Ala Wai Boulevard area. Historic maps have indicated that a city dump for trash was previously located in a small area immediately *makai* of Ala Moana Boulevard. Previous oral history research also indicates that a refuse dump was located within the present AMRP boundaries. Although, Mr. Lum is not aware of the exact location of the refuse dump, he believes ground disturbance will uncover trash and other refuse which has been previously buried. Should there be runoff, pollutants will be carried into the ocean. He also believes the proposed widening of the Magic Island (Ala Wai Boat Harbor) Shared-Use Path will impact fishermen who access the seawall along the eastern side of the Magic Island peninsula for subsistence and recreational purposes. The current master plan should account for all current users, including fishermen, and provide appropriate mitigation measures to ensure no adverse impacts to any and all users of the Magic Island (Ala Wai Boat Harbor) Shared-Use Path.
8. Ms. Wong-Kalu recommended that the City and County of Honolulu remove areas of stagnant water throughout the park. She also recommended that the history of AMRP be included within the master plan, and that the City should begin to utilize traditional names when identifying specific *wahi pana* (storied places) or landmarks within AMRP. In addition to generating awareness of *wahi pana*, Mr. Patterson recommended that the "utilization of indigenous coastal plants and landscaping, and preservation of unique cultural and environmental elements" be incorporated into the master plan.

Section 9 References Cited

Abbott, Isabella Aiona

1984 *Limu: An Ethnobotanical Study of Some Seaweeds.* Pacific Tropical Botanical Garden, Lawa'i, Kaua'i.

1992 *La'au Hawaii: Traditional Hawaiian Use of Plants*. Bishop Museum Press, Honolulu.

Ah Sam, Jessica A. and Paul L. Cleghorn

2003 *Archaeological Assessment for Ala Moana Beach Park Makiki, Honolulu, Oahu (TMK: 2-3-37).* Pacific Legacy, Inc., Kailua, Hawai'i.

Akana, Collette Leimomi and Kiele Gonzalez

2015 *Hanau Ka Ua: Hawaiian Rain Names*. Kamehameha Publishing, Honolulu, Hawaii.

Alameida, Roy Kakulu

1993 Land Tenure and Land Use in Kawaihapai, O'ahu. Master's thesis in History. University of Hawai'i at Mānoa, Honolulu.

Allen, Gwenfread

1999 *Hawaii's War Years: 1941-1945.* Pacific Mongraph, Kailua, Hawai'i.

Altizer, Kendy, Douglas F. Borthwick, and Hallatt H. Hammatt

2011 *Archaeological Monitoring Report for the Kapi'olani Area Revised Sewer System, Honolulu Ahupua'a, Kona District, Island of O'ahu TMK: (1) 2-3-04, 05, 07, 09, 10, 13, 14, 17, 18, 22, 35, 36, 38, and 41.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Armstrong, Warwick, editor

1983 *Atlas of Hawai'i*. University of Hawaii Press, Honolulu.

Arthur Kimbal Thompson Architect, AIA

2004 *Ala Moana Regional Park Canoe Halau Final Environmental Assessment.* Arthur Kimbal Thompson Architect, AIA, Honolulu.

Athens, Stephen J., Conrad Erkelens, Jerome V. Ward, Robert H. Cowie, and Michael Pietrusewsky

1994 *The Archaeological Investigation of Inadvertently Discovered Human Remains at the Piikoi and Kapiolani Intersection, Kewalo, Waikiki, O'ahu, Hawai'i.* International Archaeological Research Institute, Inc., Honolulu.

Ava Konohiki

2015 Ancestral Visions of 'Āina website. Available online at http://www.avakonohiki.org/.

Barnes, Shawn and David W. Shideler

2007 *Field Check and Literature Review for the Proposed 1235 Kona Street/1226 Waimanu Street Reserved Housing Project Kaka'ako, Kona District, O'ahu Island TMK: [1] 2-3-007:026 & 049.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Beckwith, Martha

1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu.

Bell, Mathew and Matthew M. McDermott

2007 *Archaeological Inventory Survey Report for the Allure Waikīkī Development, Waikīkī Ahupua'a, Honolulu (Kona) District, O'ahu TMK [1] 2-6-13: 1, 3, 4, 7, 8, 9, 11 and 12*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Bell, Matt, Matt McDermott, and Owen O'Leary

2006 *Archaeological Inventory Survey Report for the Victoria Ward Village Shops Project, Waikiki Ahupua'a, Honolulu (Kona) District, O'ahu Island, TMK: (1) 2-3-5: 013–017, 022, and 023.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Belluomini, Scott A., Josephine Yucha, Trevor M. Yucha, and Matthew McDermott

2016 *Archaeological Monitoring Report for the Ward Village Shops Project for Monitoring Conducted from March 2006 through December 2008 Kaka'ako, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu, TMKs: [1] 2-3-005:013 through 017, 022, and 023.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Bingham, Hiram

1847 *A Residence of Twenty-one Years in the Sandwich Islands*. Huntington Publishing, Hartford, Connecticut.

Bishop, S.E.

1884 Honolulu, Kewalo Section. Map by S.E. Bishop, Registered Map 1090. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Bolante, Ronna and Michael Keany

2007 50 Greatest Songs of Hawaii. *Honolulu Magazine*. 1 June 2007. Elctronic document, http://www.honolulumagazine.com/Honolulu-Magazine/June2007/50-Greatest-Songs-of-Hawaii-8217i

Borthwick, Douglas F. and Hallett H. Hammatt

2001 *An Archaeological Monitoring Report for Kaka'ako Improvement District 6 Honolulu, Hawai'i (TMK 2-1-58, 2-3, 2-3-01 thru 05).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Bowers, George M. (U.S. Commission of Fish and Fisheries)

1902 *Report of the Commissioner, the Year Ending June 30, 1901, Part XXVII.* Government Printing Office, Washington D.C.

Burke, Kelly and Hallett H. Hammatt

2012 *Archaeological Inventory Survey Report for the 1391 Kapi'olani Boulevard Parcel, Waikīkī Ahupua'a, Honolulu District, Island of O'ahu TMK: [1] 2-3-039:011.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Bush, Anthony and Hallett H. Hammatt

2006 *Archaeological Monitoring Report for Hawaiian Electric Company Trenching for Hokua Tower Project on Ala Moana Boulevard, Kaka'ako/Kewalo District, Waikīkī Ahupua'a, Island of O'ahu TMK: (1) 2-03-004:073; 2-03-005:027; 2-03-006:014; 2-03-007:002.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Carney, Mary and Hallett H. Hammatt
2008 *An Archaeological Monitoring Report for the Hokua Tower Project Parcel on Ala Moana Boulevard, Kaka‘ako/Kewalo District, Waikiki Ahupua‘a, Island of O‘ahu TMK: (1) 2-03-005: 001, 002, 003, por. 024, 026, and 027.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Chamberlain, Levi
1957 Tour Around O‘ahu: 1828. In *Sixty-Fifth Annual Report of the Hawaiian Historical Society for the Year 1956*. Hawaiian Historical Society, Honolulu.

Chinen, Jon J.
1958 *The Great Māhele, Hawai‘i's Land Division of 1848.* University of Hawaii Press, Honolulu.

Chiogioji, Rodney and Hallett H. Hammatt
2004 *Archaeological Literature Review and Field Check for an Approximately 89,000-sq. ft. Project Area, Waikīkī Ahupua‘a, Kona District, O‘ahu (TMK:2-6-13:1,3,4,7,8,9,11 and 12).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Christensen, Carl C.
2011 *Analysis of Nonmarine Mollusks from Excavations at SIHP # 50-80-14-6636, Kewalo, O‘ahu, Hawai‘i.* Carl C. Christensen, Honolulu.

Cipolla, Craig N.
2013 Native American Historical Archaeology and the Trope of Authenticity. *Historical Archaeology.* Vol. 47, ed. 3:12–22.

Clark, John R.K.
1977 *The Beaches of O‘ahu*. University of Hawaii Press, Honolulu.
2011 *Hawaiian Surfing: Traditions from the Past.* University of Hawai‘i Press, Honolulu.

Clark, Stephen D. and Dennis Gosser
2005 *Final Report: A Subsurface Archaeological Inventory Survey of TMK 2-3-003:075, 085, and 086. Waikīkī Ahupua‘a, Kona District, O‘ahu, Hawai‘i.* Pacific Consulting Services, Inc., Honolulu.

Cook, James P.
1784 *A Voyage to the Pacific Ocean...the Northern Hemisphere...Performed Under the Direction of Captains Cook, Clerke, and gore, in...the Resolution and Discovery...in the years 1776, 1777, 1779, and 1780. Vol. 2 and 3*. G. Nichol and T. Cadell, London.

Cordy, Ross
2002 *The Rise and Fall of the O‘ahu Kingdom.* Mutual Pulishing, Honolulu.

Corney, Peter
1896 *Voyages in the Northern Pacific. Narrative of Several Trading Voyages From 1813 1818, Between the Northwest Coast of America, the Hawaiian Islands and China, with a Description of the Russian Establishments on the Northwest Coast*. Thos. G. Thrum, Honolulu.

Coulter, John Wesley and Chee Kwon Chun
1937 *Chinese Rice Farmers in Hawaii.* UH Research Publications Number 16. University of Hawai‘i, Honolulu.

Daily Bulletin
1892 Board of Health, Quarantine of Coming Asiaties Decided On 7 January:3, eVols (online). University of Hawai‘i at Mānoa Library, Honolulu.

Dashefsky, Howard
2009 *Ala Moana Center turns the big 5-0.* Hawaii News Now website. Electronic document, http://www.hawaiinewsnow.com/story/10894818/ala-moana-center-turns-the-big-5-0?redirected=true

Daws, Gavan
1968 *Shoal of Time. A History of the Hawaiian Islands.* University of Hawaii Press, Honolulu.

Dean, Love
1991 *The Lighthouses of Hawai‘i.* University of Hawaii Press, Honolulu.

DeLeon, David
1978 *A Short History of Manoa Valley from 1800 to Present.* University of Hawai‘i at Mānoa, Hamilton Library, Honolulu.

Elbert, Samuel H. and Noelani Mahoe
1970 *Nā Mele o Hawai‘i Nei: 101 Hawaiian Songs*. University of Hawaii Press, Honolulu, Hawai‘i.

Ellis, William
1827 *Narrative of a Tour through Hawaii, or Owhyhee; With Observations on the Natural History of the Sandwich Islands, and Remarks on the Manners, Customs, Traditions, History, and Language of their Inhabitants*. Printed for B.J. Holdsworth, London.

Emerson, N.B.
1965 *The Unwritten Literature of Hawaii: The Sacred Songs of the Hula*. Collected by Nathaniel B. Emerson. Charles E. Tuttle Company, Rutland, Vermont and Tokyo.

Enanoria, Brittany, Frederick LaChance, Ellena de Leeuw, Pūlama Lima, Douglas Borthwick, and Hallett H. Hammatt
2015 *Archaeological Monitoring Report for the Ala Moana Boulevard/Nimitz Highway Resurfacing & Highway Lighting Replacement Project, Honolulu Ahupua‘a, Honolulu District, O‘ahu Island, TMK: (1) 2-1-014, 2-1-027, 2-3 & 2-6 (Nimitz Hwy. and Ala Moana Blvd.)*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Engineering and Mining Journal
1916 Salt Production in the Hawaiian Islands. *Engineering and Mining Journal,* 1 April 1916:594.

Environmental Council, State of Hawai‘i
1997 *Guidelines for Assessing Cultural Impacts Adopted by the Environmental Council, State of Hawai‘i, November 19, 1997.* Office of Environmental Quality Control, Hawai‘i.

Esh, Kelly and Hallett H. Hammatt
2006 *Archaeological Monitoring Report for the Rehabilitation of Streets Unit 5B Project, Pi‘ikoi Street from Ala Moana Blvd. To Matlock Street, Kewalo ‘Ili, Waikīkī Ahupua‘a, Kona District, O‘ahu Island (TMK: 2-3-06, 07, 10, 11, 12, 14, 15, 35 and 38 and 2-4-03, 04, 1 and 12).* Cultural Surveys Hawai‘i, Inc. Kailua, Hawai‘i.

Feeser, Andrea
2006 *Waikīkī: A History of Forgetting and Remembering*. University of Hawai‘i Press, Honolulu.

Ferrall, Charles C., Jr.
1976 Subsurface Geology of Waikiki, Moiliili and Kakaako with Engineering Application. UH Geology and Geophysics MS, University of Hawai‘i, Honolulu.

Fitzpatrick, Gary
1986 *The Early Mapping of Hawai‘i.* Editions Limited, Honolulu.

Fong, Jeffrey W.K., Douglas F. Borthwick, and Hallett H. Hammatt
2009 *Archaeological Monitoring Report for Rehabilitation of Streets: Unit 9, Phase 1 Kapi‘olani Boulevard from Kalākaua Avenue to Ward Avenue, Kamake‘e Street from Kapi‘olani Boulevard to Auahi Street and Atkinson Drive from Kapi‘olani Boulevard to Ala Moana Boulevard (TMK: [1] 2-1-044, 049, [1] 2-3-001-005, 007, 008, 010, 015, 016, 021, 022, 032, 034-036, 038–041).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

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

Fornander, Abraham
1880 *The Polynesian Race*. Trubner & Company, London.

1917 History of Kualii. *Fornander Collection of Hawaiian Antiquities and Folklore*. Vol. IV, Part II. T.G. Thrum, editor. Bishop Museum Press, Honolulu.

Fort Wiki
2015 *Hawaiian AMTB Batteries.* Electronic map at http://fortwiki.com/Hawaiian_AMTB_Batteries (accessed 23 March 2015).

Freeman, Sallee D.M., Matt McDermott, Constance R. O’Hare, and Hallett H. Hammatt
2005 *Archaeological Inventory Survey and Cultural Impact Evaluation for the Ala Wai Gateway Project Site, Kālia, Waikīkī, O‘ahu TMK: [1] 2-6-011:001, 002, 004, 032, 037 and 040.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Gessler, Clifford
1937 *Hawaii: Isles of Enchantment*. Appleton-Century, New York.

Giambelluca, Thomas W., Michael A. Nullett, and Thomas A. Schroeder
1986 *Rainfall Atlas of Hawai‘i*. Department of Land and Natural Resources. State Historic Preservation Division/ Department of Land and Natural Resources, State of Hawai‘i, Honolulu.

Gomes, Andrew
2012 Can Ala Moana Get Any Bigger? *Honolulu Advertiser*, 30 June 2006. Original article updated 16 May 2012. Electronic document, http://the.honoluluadvertiser.com/article/2006/Jun/30/ln/FP606300357.html (accessed 16 May 2012).

Google Earth
2013 Aerial photographs of Hawai‘i. Google Inc., Mountain View, California. Available at www.google.com/earth.html (accessed 12 May 2012).

Gosser, Dennis C., Richard C. Nees, and Stephen D. Clark
2006 *Archaeological Monitoring Report of TMK: 2-3-003:075, 085, and 086. Waikīkī Ahupua‘a, Kona District, O‘ahu, Hawai‘i.* Pacific Consulting Services, Inc., Honolulu.

Griffin, P. Bion, D.T.P. Keene, and Joseph Kennedy
1987 *Kaka‘ako: Prediction of Sub-Surface Archaeological Resources, Kaka‘ako Community Development District, Archaeological Reconnaissance Survey.* University of Hawai‘i at Mānoa, Honolulu.

Hashimoto
1968 Map of Ala Moana reef area. CSF (Copy Survey Furnished) 15431. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Hammatt, Hallett H.
2005 *Archaeological Literature Review and Field Inspection of the Proposed Kaioo Drive Multi-Family Development in Waikīkī, Kona District, Island of O‘ahu, TMK: (1) 2-6-012: 37, 38, 39, 40, 41, 42, 43, 44, 55, 56, 57 & 58.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006a *Archaeological Literature Review and Field Inspection of the 1391 Kapi‘olani Boulevard Parcel, Waikīkī Ahupua‘a, Kona District, O‘ahu TMK (1) 2-3-39:11.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006b *Archaeological Inventory Survey for the Ala Moana Center Expansion Project Waikīkī Ahupua‘a, Kona District, O‘ahu Island TMK: [1] 2-3-38:001 and 2-3-40:005, 007, 009, 011, 014, 016, & 018.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2008 *Archaeological Monitoring Report for the Ko‘olani Project on Waimanu Street, Kaka‘ako/Kewalo, Waikīkī Ahupua'a, Kona District, Island Of O‘ahu TMK: 2-3-04:73, 2-3-05:27, 2-3-06:14 and 2-3-07:2.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2013 *Draft Archaeological Inventory Survey for the Honolulu High-Capacity Transit Corridor Project, for the City Center (Section 4), Kalihi, Kapālama, Honolulu and Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu TMK: (1) 1-2, 1-5, 1-7, 2-1, 2-3 (Various Plats and Parcels).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H. and Rodney Chiogioji
2006 *Archaeological Literature Review and Field Inspection for a 2.3-acre Project Area, Waikīkī Ahupua‘a, Kona District, O‘ahu (TMK: 2-6-13: 1, 3, 4, 7, 8, 9, 11, and 12).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H. and David W. Shideler
1995 *Archaeological Sub-surface Inventory Survey at the Hawai‘i Convention Center Site, Waikiki, Kona District, O‘ahu.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

1996 *Archaeological Data Recovery at the Hawai‘i Convention Center Site, Waik§k§, Kona District, O‘ahu (TMK 2-3-35:001).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2010 *Kewalo Basin Repairs Project Archaeological Literature Review and Field Inspection Report Kaka‘ako Ahupua‘a, Honolulu (Kona District), O‘ahu TMK: [1] 2-1-058.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hawaii Department of Public Works
1920 Bid Submitted by Walter F. Dillingham, December 23, 1920 for a Proposal for Dredging a Drainage Canal . . . Certain Unsanitary Lands at Waikiki. In *The Story of Waikiki and the "Reclamation Project,"* by Barry Nakamura, 1979, Appendix B. Master's thesis, History Department, University of Hawai‘i at Mānoa, Honolulu.

Hawai‘i Land Survey Division
1921 Hawaii Land Court Application 709 Map 1. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

1927 Map, Reclamation Project, Tide Lands, South of Ala Moana Road, Kukuluaeo & Kalia, Honolulu, Oahu. CSF (Copy Survey Furnished) 4838. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Hawaii Legislature
1901 *First Legislative Assembly of the Territory of Hawaii. 1901. Extra Session*. Grieve Publishing Co., Honolulu.

Hawai‘i State Archives
1880 Photograph of Kaka‘ako coastline. SP-204120. Hawai‘i State Archives, Honolulu.

1931 Aerial photograph of Ala Moana Park area. Hawai‘i State Archives, Honolulu.

1932 Aerial photograph of Ala Moana Park area. PP-65-8-010. Hawai‘i State Archives, Honolulu.

1933 Photograph of Ala Wai Inn and Ala Wai Canal. PP-65-6-005. Hawai‘i State Archives, Honolulu.

1935a Aerial photograph of Ala Moana Park. PP-65-6-017. Hawai‘i State Archives, Honolulu.

1935b Photographs of soil and sand fill, Ala Moana Park. PP-65-6-004 and PP-65-7-012. Hawai‘i State Archives, Honolulu.

1935c Photograph of Banyan Court aerial and close-up PP-65-7-027 and PP-65-6-029. Hawai‘i State Archives, Honolulu.

n.d. Photograph of Sports Pavilion. PP-65-6-027. Hawai‘i State Archives, Honolulu.

n.d. Photograph of Ala Moana Park Equestrian Bridge PP-65-6-001. Hawai‘i State Archives, Honolulu.

Hawai‘i TMK Service
2013 Tax Map Key [1] 2-3-037. Hawai‘i TMK Service, Honolulu.

Hawaiian Gazette
1903 Advertisement for the Kalia Salt Works of E.O. Hall & Company, Ltd. *Hawaiian Gazette*, 23 May:6.

Hawaiian Star
1902 Auction Announcement for the Kakaako Salt Works of E.O Hall & Son. *Hawaiian Star*, 10 July:8.

1904 Article. *Hawaiian Star*, 31 August:6.

Hawkins, Megan T., Ena Sroat, and Matt McDermott
2015 *Archaeological Inventory Survey Report for the Block M Project, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK: [1] 2-3-002:001 (portion)*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hazlett, Alex, Lleliena Loynaz, and Matt McDermott
2008 *Final Archaeological Monitoring Report for the approximately 6-acre Ala Moana Center Expansion Project, Waikiki Ahupua‘a, Honolulu District, O‘ahu Island TMK [1] 2-3-38: 001 and [1] 2-3-40: 005, 007, 009, 011, 014, 016, & 018.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Higgins, J.E.
1904 *The Banana in Hawaii.* Hawaii Agricultural Experiment Station, Bulletin No. 7. Hawaiian Gazette Company, Ltd., Honolulu.

Honolulu Advertiser
1923 Article on the Kalia fisheries. *Honolulu Advertiser*, 11 March:12.

1928 Article. *Honolulu Advertiser*, 17 October.

2002 McInerny says end near for 145-year old retailer. *Honolulu Advertiser*, 20 July.

Honolulu Rapid Transit Map Company
1923 Map of Honolulu. Available online, http://magis.manoa.hawaii.edu/gis/georeferenced/index.html. Archived at the University of Hawai‘i-Mānoa, Hamilton Library, Honolulu.

Ho‘oulumāhiehie
2008a *The Epic Tale of Hi‘iakaikapoliopele*. As Told by Ho‘oulumāhiehie. M. Puakea Nogelmeier, translator. Awaiaulu Press, Honolulu.

2008b *Ka Mo‘olelo o Hi‘iakaikapoliopele*. Original Hawaiian text taken from series of articles in Ka Na‘i Aupuni 1905–1906. Awaiaulu Press, Honolulu.

Huapala
n.d. Waikīkī Hula. Electronic document, http://www.huapala.org/ Wai/Waikiki _Hula_2.html.

Hula Preservation Society
2014 Hula Preservation Society website. Available online at http://hulapreservation.org.

Humphrey, Lisa, Kelly Burke, Jessica Leger, Michelle Pammer, Matt McDermott, Ena Sroat, and Matt McDermott
2015 *Supplemental Archaeological Inventory Survey Report for the City Center (Section 4) of the Honolulu Rapid Transit Project, Kalihi, Kapālama, Honolulu, and Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu Addressing Changes from the Vicinity of Ward Avenue and Halekauwila Street to the Vicinity of Queen and Kamake‘e Streets TMK: [1] 2-3:002, 003, and 004 (Various Parcels).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hustace, Frank Ward
2000 *Victoria Ward and Her Family*. Victoria Ward, Ltd., Honolulu.

Ī‘ī, John Papa
1959 *Fragments of Hawaiian History as Recorded by John Papa ‘I‘i.* Bishop Museum Press, Honolulu.

Kahā‘ulelio, Daniel
2006 *Ka Oihana Lawaia: Hawaiian Fishing Traditions*. Mary Kawena Pukui, translator; M. Puakea Nogelmeier, editor. Bishop Museum Press, Honolulu.

Ka Hoku o ka Pakipika
1862 Article on Kālia. *Ka Hoku o ka Pakipika,* 10 April:4.

Ka Na‘i Aupuni
1906 Article. *Ka Na‘i Aupuni*, Vol. II No. 10, 13 June.

Ka Nupepa Kuokoa
1862 Article on Kālia. *Ka Nupepa Kuokoa,* 22 March:3.
1862 Article on the fishermen of Kālia. *Ka Nupepa Kuokoa,* 12 April:4.
1864 Article on Kālia. *Ka Nupepa Kuokoa,* 23 April:2.
1867 Article on the fishermen of Kālia. *Ka Nupepa Kuokoa,* 19 January:1.
1925 Article. *Ka Nupepa Kuokoa*, 9 April.

Kamakau, Samuel Mānaiakalani
1991a *Tales and Traditions of the People of Old: Nā Mo‘olelo a ka Po‘e Kahiko.* Bishop Museum Press, Honolulu.
1991b *Ka po‘e Kahiko. The People of Old*. Bishop Museum Press, Honolulu.
1992 *Ruling Chiefs of Hawaii*. Kamehameha Schools Press, Honolulu.

Kame‘eleihiwa, Lilikala
1992 *Native Land and Foreign Desires. Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.

Kanahele, George S.
1986 *Ku Kanaka Stand Tall. Search for Hawaiian Values*. University of Hawaii Press, Honolulu.

1995 *Waikīkī: 100 B.C. to 1900 A.D.: An Untold Story*. Queen Emma Foundation, Honolulu.

Kato, Susumo
1955 Map of Ala Moana reef area (CSF 12048). Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Kawelu, Kathleen L.
2015 *Kuleana and Commitment: Working Toward a Collaborative Hawiian Archaeology*. Univeristy of Hawai‘i Press: Honolulu.

Kekahuna, Henry E.P.
1958 *Hawaiian Place Names of O-‘ahu.* Box M-445, Item # 81, Hawai‘i State Archives, Honolulu.

Keliipio, L.D.
1900 Hawaiian Fish Stories and Superstitions. M.K. Nakuina, translator. In *Hawaiian Annual and Almanac for 1901*. Thos. G. Thrum, Honolulu.

Klieger, P. Christiaan
1997 Historical Background. In *Native Hawaiian and Euro-American Culture Change in Early Honolulu, Archaeological Data Recovery, Harbor Court Property, Site No. 50-80-14-2456, Honolulu, Hawai‘i, Chapter 2,* by Susan Lebo, 1997. Bernice Pauahi Bishop Museum, Honolulu.

Kotzebue, Otto von
1817 South O‘ahu. Map by Otto von Kotzebue. In *The Early Mapping of Hawai‘i* by Gary L. Fitzpatrick, 1986. Editions Limited, Honolulu.

Krauss, Beatrice H.
1993 *Plants in Hawaiian Culture*. University of Hawai‘i Press, Honolulu.

Kumuhina.com
2018 *Filmmakers*. Electronic document. Available at: http:kumuhina.com/filmmakers.

Kurlansky, Mark
2002 *Salt: A World History*. Walker Publishing Company, New York.

Kuykendall, Ralph S. and A. Grove Day
1961 *Hawaii: A History, From Polynesian Kingdom to American State*. Revised edition. Prentice-Hall Englewood Cliffs, New Jersey.

LaChance, Frederick and Hallett H. Hammatt
2014 *Archaeological Monitoring Report for the Beachwalk to Ala Moana Park Sewer Project, Waikīkī Ahupua‘a, Honolulu District, Island of O‘ahu (TMKs: [1] 2-3-034: 033, 2-3-037: 001 and 002, 2-6, and 2-7-036 [various parcels]).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Landgraf, Anne Kapulani
1994 *Nā Wahi Pana ‘o Ko‘olau Poko*. University of Hawai‘i Press, Honolulu.

LaPasse, Lt. Joseph de
1855 Plan du Mouillage [Anchorages] d’Honolulu Map. Reprinted in Fitzpatrick, *Early Mapping of Hawai‘i* (Editions Limited, Honolulu, Hawai‘i, 1986), pp. 82–83.

Lucas, Paul F. Nahoa
1995 *Dictionary of Hawaiian Legal Land-Terms*. Paul F. Nahoa Lucas, compiler and editor. Native Hawaiian Legal Corporation, Honolulu.

Lyons, Curtis J.
1875-77 Working map of Waikīkī triangulation points. [Map] Registered Map 726. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

1875–1877 Waikiki-Diamond Head. Map by C. J. Lyons [Map] Registered Map 727. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Malo, David
1951 *Hawaiian Antiquities*. Nathaniel B. Emerson, translator (1898). Bishop Museum Special Publication 2. Second edition. Bishop Museum Press, Honolulu.

2006 *Ka Mo‘olelo Hawai‘i. Hawaiian Traditions*. Malcolm Nāea Chun, translator. First People’s Productions, Honolulu.

Maly, Kepa and Onaona Maly
2003 *Ka Hana Lawai‘a A Me Nā Ko‘a O Na Kai ‘Ewalu: A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands.* Kumu Pono Associates, Hilo, Hawai‘i.

Maly, Kepā, Leta J. Franklin, and Paul H. Rosendahl
1994 *Archaeological and Historical Assessment Study Convention Center Project Area, Land of Waikīkī, Kona District, Island of O‘ahu (TMK: 2-3-35- and 3-4-36:018, 024, 025).* Paul H. Rosendahl, PhD., Inc., Hilo, Hawai‘i.

Mason Architects, Inc.
2004 *Historic Context Report and Historic Preservation for World War II Defensive Accessory Facilities. Building Types Assessment: Splinterproof Shelters and Gun Emplacements.* Mason Architects, Inc., Honolulu.

McAllister, J. Gilbert
1933 *Archaeology of O‘ahu*. Bishop Museum Bulletin 104. Kraus Reprint 1985, Millwood, New York.

McCoy
1936 Map of proposed Ala Moana Park Development.

McGregor, Daviana Pomaikai
1996 An Introduction to the Hoa‘aina and Their Rights. *The Hawaiian Journal of History*, vol. 30 (1996):1–27.

2010 Hawaiian Sustainability. *The Value of Hawai‘i: Knowing the Past, Shaping the Future.* Craig Howes and Jon Osorio, ed. University of Hawai‘i Press, Honolulu.

Medina, Leandra, Ian A. Masterson, and Hallett H. Hammatt
2013 *Draft Archaeological Monitoring Report for the Queen and Kamake‘e, Traffic Signal Project, Kaka‘ako, Honolulu District, O‘ahu Island (TMK: [1] 2-3-002: 001; 2-3-003: 087, 103, and 2-3-004:080 por.).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Menzies, Archibald
1920 *Hawaii Nei: 128 Years Ago*. New Freedom, Honolulu.

Monahan, Christopher M.
2005 *An Archaeological Assessment Report of Three Parcels Measuring Approximately 1.35 Acres in Waikiki Ahupua‘a, ‘Ili of Kewalo, Kona (Honolulu) District, Island of O‘ahu, Hawai‘i [TMK: (1) 2-3-003: 73 and 96]*. Scientific Consultant Services, Inc., Honolulu.

Monsarrat, M.D.
1891 Map of Honolulu. Registered Map 1910. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

1909 Map of Oahu fisheries, Waikiki section. Registered Map 2848. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Morriss, Veronica, Nifae Hunkin, and Matt McDermott
2013 *Archaeological Inventory Survey for the Ala Moana Center ‘Ewa Mall Expansion Project, Kālia, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK: (1)-2-3-038:001 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Nader, Laura, editor
1996 *Naked science: Anthropological inquiry into boundaries, power, and knowledge.* Routledge, New York.

Nakamura, Barry
1979 The Story of Waikiki and the Reclamation Project. Master’s thesis. University of Hawai‘i at Mānoa, Honolulu.

Nakuina, Emma Metcalf
1904 *Hawaii—Its People, Their Legends*. Quoted in Sterling and Summers (*Sites of Oahu*, Bernice Pauahi Bishop Museum, Honolulu, 1978), p. 98.

Nakuina, Moses K.
1990 *The Wind Gourd of La‘amaomao*. First edition. Esther T. Mookini and Sarah Nākoa, translators. Kalamakū Press, Honolulu.

1992 *The Wind Gourd of La‘amaomao*. Second edition. Esther T. Mookini and Sarah Nākoa, translators. Kalamakū Press, Honolulu.

National Park Service
n.d. *Historic American Landscapes Survey: Ala Moana Park*. Washington, D.C.

Newton, L.C.
1939 *Who’s who of the Island of Hawaii, [1938]: a biographical and statistical record of men and women on the Island of Hawaii, Territory of Hawaii, U.S.A.* L.C. Newton, Honolulu.

Edward K. Noda and Associates Inc.
1994 *Ala Wai Canal Improvement Project. Test Boring and Monitoring Well Program, Ala Wai Golf Course, Honolulu, Hawaii*. Prepared for Hawai‘i Department of Land and Natural Resources, Division, Water and Land Development, Report R-89e, 6 July 1994, boring logs, and five figures. Edward K. Noda and Associates, Inc., Honolulu.

Ober, Gerald
1810 Map of Honolulu trails ca. 1810, as described by ‘Ī‘ī. In *Fragments of Hawaiian History as Recorded by John Papa ‘I‘i,* by John Papa ‘Ī‘ī, 1959, Bishop Museum Press, Honolulu.

Oceanit
2004 *Draft: Ala Wai Flood Abatement and Ecosystem Restoration; Ala Wai Watershed Riparian Survey*. Oceanit: Honolulu.

Office of Hawaiian Affairs
2015 *Papakilo Database.* Office of Hawaiian Affairs cultural and historical database. Electronic document, http://papakilodatabase.com/main/index.php.

O'Hare, Constance R., Tony Bush, Douglas Borthwick, and Hallett Hammatt
2004 *Archaeological Inventory Survey for the Ko‘olani Condominium Project, Honolulu Ahupua‘a, Kona District, Island of O‘ahu, (TMK: [1] 2-3-004:73: 2-3-005:27; 2-3-006:14; 2-3-007:2).* Cultural Surveys Hawai‘i, Inc. Kailua, Hawai‘i.

O'Hare, Constance R., Anthony Bush, and Hallett H. Hammatt
2006 *Archaeological Monitoring Report Kaka‘ako Community Improvement District 10, Honolulu Ahupua‘a, Kona District, O‘ahu (TMK: [1] 2-3-004, 005, 006, and 007).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

O'Hare, Constance R., David Shideler, and Hallett H. Hammatt
2004 *Archaeological Assessment for the Kapiolani Akahi Project Site, Kālia, Waikīkī, O‘ahu, TMK: ([1] 2-6-011:001, 002, 004, 032, 037, 040).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006 *Archaeological Inventory Survey for the 116-unit Kaio‘o Multifamily Condominium Project, Waikiki Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK (1) 2-6-012:037-044, 055-058.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

O'Leary, Owen and Hallett H. Hammatt
2004 *Archaeological Monitoring Report for the Emergency Phase Rehabilitation of Streets: Unit 9 Phase I Kapi‘olani Boulevard form Kalākaua Avenue to Kamake‘e Street, Honolulu Ahupua‘a, Kona District, O‘ahu (TMK: [1] 2-3-003).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2006 *Archaeological Inventory Survey for the Moana Vista Project Area on Kapi‘olani Boulevard, Honolulu Ahupua‘a, Kona District, O‘ahu Island (TMK: [1] 2-3-003:072, 088, 102).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Overland Monthly
1909 E.O. Hall & Son, Ltd. [advertisement]. *Overland Monthly,* July-December, Vol. 54:xii.

Pammer, Michelle F. and Hallett H. Hammatt
2010 *Archaeological Assessment for an Approximately 0.26-Acre Moana Vista Project Area on Kapi‘olani Boulevard, Kaka‘ako Ahupua‘a, Kona District, O‘ahu Island (TMK: [1] 2-3-003:084).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pammer, Michelle F. and Matt McDermott
2014 *Archaeological Inventory Survey for the Park Lane Ala Moana Project, Kālia, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu TMK: [1] 2-3-038:001 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pammer, Michelle F., Ena Sroat, and Matt M. McDermott
2014 *Archaeological Inventory Survey Report for the Block B East Project, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK: [1] 2-3-001:005 (por.).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Pauketat, Timothy R.
2001 *The Archaeology of Traditions*. University Press of Florida, Gainesville, Florida.

Petrey, Whitney, Alexander Hazlett, Douglas F. Borthwick, and Hallett H. Hammatt
2008 *Archaeological Monitoring Report for the City and County of Honolulu's Emergency Sewer Bypass Project, Ala Wai to Magic Island, Waikīkī Ahupua‘a, Kona District, Island of O‘ahu TMK: [1] 2-3-034, -036, 037; 2-6-017, -018; 2-7-036.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2009 *Archaeological Monitoring Report for the Nimitz Highway and Ala Moana Boulevard Resurfacing Project Honolulu Ahupua‘a, Kona District, O‘ahu Island TMK: (1) 2-1-014 and 027.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Podmore, G.
1911 Map of Honolulu, Kewalo Section. Registered Map 3094. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Pope, W.T.
1926 *Banana Culture in Hawaii.* Hawaii Agricultural Experiment station, Bulletin No. 55. Hawaiian Gazette Company, Ltd., Honolulu.

Pukui, Mary Kawena
1983 *‘Ōlelo No‘eau: Hawaiian Proverbs & Poetical Sayings*. Bishop Museum Special Publication No. 71. Bishop Museum Press, Honolulu.

1988 *Tales of the Menehune.* Collected or suggested by Mary Kawena Pukui. Retold by Caroline Curtis. Kamehameha Schools Press, Honolulu.

1995 *Na Mele Welo: Songs of Our Heritage.* University of Hawai‘i Press, Honolulu.

Pukui, Mary Kawena and Laura C.S. Green
1995 *Folktales of Hawai‘i.* Bishop Museum Press, Honolulu.

Pukui, Mary K. and Samuel H. Elbert
1986 *Hawaiian Dictionary.* Second edition. University of Hawaii Press, Honolulu.

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

Pukui, Mary K., E.W. Haertig, and Catherine A. Lee
1972 *Nānā i ke Kumu (Look to the Source)* Volume 1 and 2. Hui Hānai, Honolulu.

Pultz, Mary Anne (editor)
1981 *A Botanists Visit to Oahu in 1831: Being the Journal of Dr. F.J.F. Meyen's Travels and Observations about the Island of Oahu.* Press Pacifica, Ltd., Kailua, Hawai‘i.

Riccio, Charles A., Jr.
2003 *Something Terrible has Happened.* Colorado State Patrol Academy. Judge Riccio's Legal Articles. Available online at http://web.archive.org/web/20061012215829/http://www.csp.state.co.us/academy/aclegal.htm.

Runyon, Rosanna, Douglas Borthwick, and Hallett H. Hammatt
2012 *Archaeological Inventory Survey Report for the Senior Residence at Pi‘ikoi Kaka‘ako, Waikīkī Ahupua‘a, Kona District, O‘ahu Island (TMK: [1] 2-3-007:026 & 049).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Runyon, Rosanna, Douglas Thurman, Constance O'Hare, Douglas Borthwick, and Hallett H. Hammatt
2011 *Archaeological Inventory Survey Report for the Ko‘olani Phase II Project, Kaka‘ako, Waikīkī Ahupua‘a, Honolulu (Kona) District, Island of O‘ahu (TMK: [1] 2-3-006:017).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Shideler, Barbara
2002 *Historic American Engineering Record and Index to Photographs: Incinerator Number One (Old Kewalo Incinerator).* Historic American Building Survey. National Park Service, Oakland, California.

Shintani, Terry
1993 *The Wai‘anae Book of Hawaiian Health.* Waianae Coast Comprehensive Health Center, Waianae.

Sholin, Carl E., Nathan J. DiVito, and Thomas S. Dye
2014 *Archaeological Inventory Survey for the Propsed Ola Ka ‘Ilima Artspace Lofts Project, Land of Honolulu, Kona District, O‘ahu Island, TMK: (1) 2-3-003:040.* T. S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

Silva, Noenoe K.
2004 *Aloha Betrayed: Native Hawaiian Resistance to American Colonialism*. Duke University Press, Durham, North Carolina.

Smith, Marc
1989 *Human Bone at 1341 Kapiolani Avenue, Honolulu, O‘ahu (TMK: [1] 2-3-039:19).* Cultural Surveys Hawai‘i, Kailua, Hawai‘i.

Soehren, Lloyd
2015 *A Catalog of Hawaiian Place Names. Compiled for the Records of the Boundary Commission and The Board Commissioners to Quiet Land Titles of the Kingdom of Hawaii.* Collected and annotated by Lloyd J. Soehren. Online at the Ulukau website, http://ulukau.org/cgi-bin/hpn?l=en (accessed 20 March 2015).

Sorenson
1901 Map of Ala Moana and Coarl Reefs. Registered Map 1986. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Souza, Kehaulani E., Mary Perzinski, and Hallett H. Hammatt
2002 *An Archaeological Monitoring Report for the Kaka‘ako Improvement District 7 Project (TMK: [1] 2-1-58, 2-3-01 thru -05).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sroat, Ena, Kelly L. Burke, Megan T. Hawkins, and Matthew McDermott
2016 *Archaeological Inventory Survey Report for the Block N East Project, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu TMKs: [1] 2-3-002:001 (por.), 067, 086, 087*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sroat, Ena and Matt McDermott
2012 *Supplemental Archaeological Inventory Survey Report for the Ward Village Shops Phase 2 Project, Waikīkī Ahupua‘a, Honolulu (Kona) District, O‘ahu Island (TMK: [1] 2-3-005:013-017, 022 & 023).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sroat, Ena, Doug Inglis, and Matt McDermott
2014 *Archaeological Inventory Survey Report for the Ward Block K Project Area, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK: [1] 2-3-005:019, 013 (por.), 017 (por.), and 022 (por.).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sroat, Ena, Michelle F. Pammer, and Matt M. McDermott
2014 *Archaeological Inventory Survey Report for the Block C West Project, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK: [1] 2-3-001:005 (por.)*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sroat, Ena, Megan Hawkins, Kelly Burke, Michelle Pammer, Constance O'Hare, and Matt McDermott
2015 *Archaeological Inventory Survey Report for the Block I Project, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu, TMK: [1] 2-3-002:001 (por.)*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Stannard, David E.
2006 *Honor Killing: Race, Rape and Clarence Darrow's Spectacular Last Case*. Penguin Books, London.

State of Hawaii Department of Transportation, Airports Division
2015 *Hawaii Aviation. An Archive of Historic Photos and Facts.* Electronic documents at http://hawaii.gov/hawaiiaviation (accessed 1 May 2015).

Stearns, H.T.
1978 *Quaternary Shorelines in the Hawaiian Islands*. Bishop Museum Bulletin 237. Bishop Museum Press, Honolulu.

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

Stewart, C.S.
1970 *Journal of a Residence in the Sandwich Islands, During the Years 1823, 1824, and 1825*. University of Hawaii Press for the Friends of the Library of Hawai‘i, Honolulu.

Stokes, John F.G.
1991 *Heiau of the Island of Hawai‘i.* Tom Dye, editor. Bishop Museum Press, Honolulu.

Stone, Scott C.S.
1983 *Honolulu*: *Heart of Hawai‘i*. Continental Heritage Press, Inc., Tulsa, Oklahoma.

Territory of Hawaii

1944 Airport Division Map of Ala Moana Airport Master Plan. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Thrum, Thomas

1883 Retrospect of the Year 1883. *Hawaiian Almanac and Annual for 1884*. Thomas G. Thrum, Honolulu.

1891 Indigenous Hawaiian Woods. *Hawaiian Almanac and Annual for 1892*. Thomas G. Thrum, Honolulu.

1897 Hawaiian Epidemics. *Hawaiian Almanac and Annual for 1897*. Thomas G. Thrum, Honolulu

1905 *Hawaiian Almanac and Annual for 1905*. Thomas G. Thrum Publishing, Honolulu.

1906 Heiaus and Heiau Sites throughout the Hawaiian Islands. *Hawaiian Almanac and Annual for 1907*. Thomas G. Thrum Publishing, Honolulu.

1922 Hawaiian Place Names. In *A Dictionary of the Hawaiian Language*, by Lorin Andrews. Thomas G. Thrum Publishing, Honolulu.

1923a *More Hawaiian Folk Tales. A Collection of Native Legends and Traditions*. A.C. McClurg & Company, Chicago.

1923b Hawaiian Salt Making. *Hawaiian Almanac and Annual for 1924*. Thomas G. Thrum, Honolulu.

1998 *More Hawaiian Folk Tales. A Collection of Native Legends and Traditions*. A.C. McClurg & Company, Chicago.

Thurman, Douglas, Kendy Altizer, Constance R. O'Hare, David W. Shideler, and Hallett H. Hammatt

2009 *Archaeological Inventory Survey Report for the Queen Street Parks, Kaka‘ako, Honolulu District, O‘ahu Island.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Timbol, Amadeo S. and John A Maciolek

1978 *Stream Channel Modification in Hawaii. Part A: Statewide Inventory of Stream; Habitat Factors and Associated Biota, Biological Services Program*. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.

Tome, Guerin and Robert L. Spear

2011 *Archaeological Monitoring Report for the Ala Moana Sewer Reconstruction Project in Waikiki Ahupua‘a, Honolulu District, Island of O‘ahu, Hawai‘i [TMK: (1) 2-3-006 and (1) 2-3-038]*. Scientific Consultant Services Inc., Honolulu.

Trask, Mililani

2006 *Facing Hawai‘i's Future*. Second edition. Essential Information about GMOs. Hawai‘i Seed, Koloa, Hawai‘i.

Tulchin, Todd and Hallett H. Hammatt

2004 *Literature Review and Field Check for the Kapi‘olani Area Revised Sewer System, Honolulu Ahupua‘a, Kona District, Island of O‘ahu (TMK: 2-3-04, 05, 07, 09, 10, 13, 14, 17, 18, 22, 35, 36, & 38).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2005 *Addendum to an Archaeological Inventory Survey for the Ko‘olani Condominium Project, Honolulu Ahupua‘a, Kona District, Island of O‘ahu. (Portions of TMKs 2-3-04:73, 2-3-05:27, 2-3-06:14, 2-3-07:2).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2009 *Archaeological Monitoring Report for the Ala Wai Watermark Project, Waikīkī Ahupua‘a, Honolulu District, O‘ahu TMK: [1] 2-6-011: 001 & 037.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

UH SOEST

1970 UH SOEST Kakaako/Waikiki coast aerial photograph. University of Hawai‘i at Mānoa School of Ocean and Earth Science and Technology–Coastal Geology Group. Online at http://soest.hawaii.edu/coastal/webftp/Oahu/mosaics/

2012a Oahu Ortho-rectified Historical Shoreline Mosaic for 1927. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012b Oahu Ortho-rectified Historical Shoreline Mosaic for 1952. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012c Oahu Ortho-rectified Historical Shoreline Mosaic for 1959. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012d Oahu Ortho-rectified Historical Shoreline Mosaic for 1963. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

2012e Oahu Ortho-rectified Historical Shoreline Mosaic for 1968. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/ coasts/erosion/oahu/mosaics.php (accessed 10 May 2012).

Ulukau

2014 *Māhele Database.* Hawaiian Electronic Library, http://ulukau.org/cgi-bin/vicki?l=en..

USDA (U.S. Department of Agriculture)

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

U.S. Coast and Geodetic Survey
1925 Oahu Island–South Shore, Honolulu Harbor Entrance to Diamond Head, TS 4181. University of Hawai‘i, School of Ocean and Earth Science and Technology (UH SOEST), Coastal Erosion Group website, http://www.soest.hawaii.edu/coasts/erosion/oahu/tsheet.php (accessed 10 May 2012).

USGS (U.S. Geological Survey)
1953 Honolulu USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

1959 Honolulu USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

1969 Honolulu USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

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

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

1933 U.S. Army War Department fire control map, Honolulu Quadrangle. USGS Information Services, Denver, Colorado.

1943 U.S. Army War Department terrain map, Honolulu and Diamond Head Quadrangles. USGS Information Services, Denver, Colorado.

Vancouver, George
1798 *A Voyage of Discovery to the North Pacific Ocean, and Round the World . . . Performed in the Years 1790-1795.* Robinson and Edwards, London.

Vizenor, Gerald
1999 *Manifest Manners: Narratives on Postindian Survivance*. University of Oklahoma Press, Lincoln, Oklahoma.

Von Tempski, Armine
1940 *Born in Paradise.* Buell, Sloan and Pearce, New York.

Wagner, Warren L., Derral Herbst, and Sara H. Sohmer
1990 *Manual of the Flowering Plants of Hawaii*. Volume 1. Bishop Museum Special Publication 83. University of Hawaii Press and Bishop Museum Press, Honolulu.

Waihona ‘Aina
2000 *The Māhele Database.* Electronic document, http://waihona.com

Wall, W.A.
1893 Map of Honoluu and Vicinity. Registered Map 1690. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu.

Watts, Margit Misangyi
1993 *High Tea at Halekulani. Feminist Theory and American Clubwomen*. Carlson Publishing, Brooklyn, New York.

Westervelt, W.D.
1915 *Legends of Old Honolulu*. G.H. Ellis Press, Boston.

1963 *Hawaiian Legends of Old Honolulu*. Charles Tuttle Company, Rutland, Vermont.

Weyeneth, Robert
1987 *Ala Moana: The People’s Park.* Department of Parks and Recreation, Honolulu. Includes unpaginated photographic section with photographs by Ann K. Yoklavitch, Department of Parks and Recreation, City and County of Honolulu, Municipal Reference and Records Center, Honolulu, and Robert R. Weyeneth.

White, Kai and Jim Kraus
2007 *Images of America: Waikīkī*. Arcadia Publishing, Chicago.

Wiegel, Robert L.
2008 *Waikiki Beach, Oahu, Hawaii: History of its transformation from a natural to an urban shore. Shore and Beach.* Vol. 76, No. 2. Electronic document, http://dlnr.hawaii.gov/occl/files/2013/08/Wiegel-2008-ShoreAndBeach-Waikiki-history.pdf.

Wikipedia.com
2008 Photograph of Magic Island. Public domain photograph at Wikipedia.com.

Wilcox, Carol, Kimo Hussey, Vicky Hollinger, and Puakea Nogelmeier
2003 *He Mele Aloha: A Hawaiian Songbook*. ‘Oli‘Oli Production, LLC, Honolulu.

Williford, G. and T. McGovern
2003 *Defenses of Pearl Harbor and Oahu 1907-50.* Osprey Publishing, Oxford, England.

Wisniewski, Richard A.
1984 *Hawaii: The Territorial Years, 1900-1959: A Pictorial History*. Pacific Basin Enterprises, Honolulu.

Winieski, John P. and Hallett H. Hammatt
2000 *An Archaeological Monitoring Report for Kaka‘ako Improvement District 4 Honolulu, Hawai‘i (TMK: [1] 2-3-02 thru 05).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

2001 *Archaeological Monitoring Report for Ward Village Phase II, (Ward Theaters), Kaka‘ako, Honolulu, O‘ahu, Hawai‘i (TMK: [1] 2-3-02:1).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

WRCC (Western Regional Climate Center)
2010 1961-1990 Monthly Climate Summary for Kawailoa. Available online at http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?hi3754

Wright, Harvey, and Wright
1934 Map. Island of Oahu, Territory of Hawaii. Hawaii Tourist Bureau, Honolulu.

Wyban, Carol Araki
1992 *Tide and Current: Fishponds of Hawai‘i.* University of Hawaii Press, Honolulu.

Young, Robert
2005 *Garbage in Paradise: A History of Honolulu's Refuse Division*. City and County of Honolulu's Department of Environmental Services, Division of Refuse Collection and Disposal, Honolulu.

Yucha, Josephine, Scott A. Belluomini, and Matthew McDermott
2015 *Archaeological Monitoring Report for the Ward Village Shops Project for Monitoring Conducted from July 2010 through August 2011, Kaka‘ako, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu TMKs: [1] 2-3-005:013 through 017, 022, and 023.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Yucha, Trevor M., Josephine M. Yucha, and Matt McDermott
2014 *Archaeological Inventory Survey Report for the Ward Block C Project Area, Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu Island, TMK: [1] 2-3-001:001 and 004.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Appendix A National Register of Historic Places (NHRP) Nomination Form

80-14-1388

NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

COPY

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name ALA MOANA PARK
other names/site number

2. Location

street & number Ala Moana Boulevard ☐ not for publication
city, town Honolulu ☐ vicinity
state Hawaii code HI county Honolulu code 03 zip code NA

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
☐ private	[X] building(s)	1	___ buildings
[X] public-local	☐ district	1	___ sites
☐ public-State	[X] site	3	___ structures
☐ public-Federal	☐ structure	___	___ objects
	☐ object	5	___ Total

Name of related multiple property listing:
City & County of Honolulu Art Deco Parks & Playgrounds

Number of contributing resources previously listed in the National Register 0

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ☐ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official Date

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:
☐ entered in the National Register.
☐ See continuation sheet.
☐ determined eligible for the National Register. ☐ See continuation sheet.
☐ determined not eligible for the National Register.
☐ removed from the National Register.
☐ other, (explain:)

Signature of the Keeper Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)	Current Functions (enter categories from instructions)
Recreation & Culture	Recreation & Culture

7. Description

Architectural Classification (enter categories from instructions)	Materials (enter categories from instructions)
Modern Movement	foundation NA
Art deco	walls NA
	roof NA
	other NA

Describe present and historic physical appearance.

Ala Moana Park is a 76 acre beach park located in Honolulu between downtown and Waikiki. It features a mile-long, white sand beach, an offshore coral reef and lawns dotted by palms, banyans and flowering tropical trees. The spatial arrangement for the landscape includes alternating areas of massed foliage and open space, with lagoons located at the eastern and western sides. The eastern lagoon was an Oriental one, "in the characteristic Chinese and Japanese manner." The western one was the Hawaiian Lagoon, "featuring native palms and plants." A drive loops through the park, running parallel to and near the beach for most of its route. The beach itself was created in 1955.

On the Waikiki side the park is entered via a roadway which was originally flanked by fifteen foot concrete portals of curved and angular shapes, scalloped walls and wedge indentations. Scalloped walls that adjoin the outer portals allowing planting space within their concave recesses.

A canal runs along the mauka side of the park and diverts water from mountain streams to the lagoons at either end. An equestrian bridge spans the canal, and its playful semi-circular form and inclined approaches give the appearance of a hump-backed animal.

The largest structure within the park is the sports pavilion. From the exterior this is a modest, stucco walled structure, which houses on the interior a banyan courtyard. This courtyard is perhaps Bent's most noteworthy park design. The sports pavilion, itself stands at one end of the courtyard. It is a gable roofed, open structure with two wall-sized murals by Robert Lee Eskridge depicting the Hawaiian makahiki.

The courtyard is paved with coral stone flagging, and features six intricately detailed planters with benches, four of which contain banyan trees, surrounded by exotically shaped reflecting pools. Two Marguerite Blasingame sculptures in marble are located in niches on the mauka and makai walls of the courtyard. The mauka wall niche contains a stylized Hawaiian man and woman, back-to-back, playing nose flutes. The makai side features another couple sitting face to face with arms and faces touching. Figures of Hawaiians playing traditional games are also present in the coral stone flagging of the passages of the sports pavilion. In 1975 the McCoy Pavilion was built at the Diamond Head side of the banyan courtyard. This modern structure is a sympathetic addition that blends well with the older sports pavilion.

Mauka of the Sports pavilion and banyan courtyard are tennis courts and a lawn bowling green. This is a raised square lawn area of eight lanes enclosed by a wide coral stone walkway and a five-foot decorative cement brick wall. The corners of the wall are rounded, and curved brick benches are inside each curve. These are capped by red Padre tile.

☐ See continuation sheet

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
☐ nationally ☐ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)	Period of Significance	Significant Dates
Recreation	1934	1934
Architecture		

Cultural Affiliation: NA

Significant Person: NA

Architect/Builder: Harry Sims Bent

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Ala Moana Park is significant for its associations with the development of parks in Honolulu during the 1930s as discussed under the context section of the multiple property documentation form. Similarly its architectural significance is covered in that form.

Ala Moana Park is entirely a man-made development. Its oceanfront bathing area has been carved from the fringing coral reef. Its beach the creation of hydraulic engineers. The park lands are a tidal area filled by excavating the offshore reef. The land on which it stands was purchased by the City and County in 1928, even though the city had been using the site as a garbage and refuse dump since the turn of the century. The idea of a park on the present site of Ala Moana Park can be traced to the 1920s, and an interest in civic beautification among socially prominent Honolulu women, especially those involved in the Outdoor Circle.

Louise Dillingham, who was president of the Outdoor Circle from 1929 to 1931 and a member of the city's Shade Tree Commission, the predecessor of the Honolulu Park Board, was an outspoken proponent of the park and fashioned some of the initial ideas for the park's form. In 1931 the Parks Board hired Catherine Jones Richards and Robert O. Thompson, major landscape architects of the period in Honolulu, to plan the park. Their proposal for the spatial arrangement of two lagoons and alternating areas of massed foliage and wide open spaces continue to delineate the contours of the park's design today.

Harry Sims Bent was responsible for the design of such structures as the Waikiki entrance portals (completed 1934), the canal bridge (completed 1934), a lawn bowling green (completed 1939) and the sports pavilion with its banyen courtyard (completed 1937). In addition federal relief labor constructed a small boat harbor, tennis courts, dressing rooms and showers. The park stands as the crowning achievement of the golden age of Honolulu park-building during the 1930s. It is an attractive and functional urban space created in Depression-era Hawaii.

☐ See continuation sheet

9. Major Bibliographical References

Robert Weyeneth. "Ala Moana: The People's Park" (Honolulu, 1987)

☐ See continuation sheet

Previous documentation on file (NPS):
☐ preliminary determination of individual listing (36 CFR 67) has been requested
☐ previously listed in the National Register
☐ previously determined eligible by the National Register
☐ designated a National Historic Landmark
☐ recorded by Historic American Buildings Survey # ____
☐ recorded by Historic American Engineering Record # ____

Primary location of additional data:
☒ State historic preservation office
☐ Other State agency
☐ Federal agency
☐ Local government
☐ University
☐ Other
Specify repository:

10. Geographical Data

Acreage of property 76 Acres

UTM References
A Zone Easting Northing
B Zone Easting Northing
C
D

☐ See continuation sheet

Verbal Boundary Description

This nomination includes all the property owned by the City & County of Honolulu in 1988 as described by Tax Map Key 2-3-37:1.

☐ See continuation sheet

Boundary Justification

This is the historic boundary of the park.

☐ See continuation sheet

11. Form Prepared By

name/title Don Hibbard,
organization State Historic Preservation Office date 4/20/88
street & number 1151 Punchbowl Street, Room 310 telephone 548-6408
city or town Honolulu state Hawaii zip code 96813

APPENDIX D-4

Ala Moana Regional Park Improvements Plan
Historic Feature Review and Retrofit Assessment

PAGE IS INTENTIONALLY LEFT BLANK

Ala Moana Regional Park Improvements Plan
Historic Feature Review and Retrofit Assessment

Introduction

The City and County of Honolulu Department of Design and Construction on behalf of the Mayor's Office has proposed to make improvements to Ala Moana Regional Park (AMRP), tax map key: (1) 2-2-037:001. A master plan for the park was recently completed, which identified needs and preferences of the park users based on public meetings and consultant studies.[1]

The original portion of the park, essentially the portion excluding Magic Island, is listed on the Hawaii Register of Historic Places (HRHP). That portion of AMRP is Site #50-8-14-1388 on the State Inventory of Historic Places, identified as one of the Art Deco Thematic Parks Group of Hawaii. An archaeological literature review and field inspection were undertaken for the master plan to provide an overview of the existing archaeological conditions.[2] The intent of the archaeological study was to facilitate planning and identify possible archaeological constraints to implementing the proposed improvements. The recommendations in the review and inspection report noted that, "An architectural review of the age, condition and integrity of the current structures in the park is needed before alteration (if any) during the proposed improvements to the park."

This report discusses proposed improvements to the HRHP-listed portions of AMRP, specifically the:

- Drainage canal;
- Japanese and Hawaiian Ponds;
- McCoy Pavilion parking area; and
- Repair of the Bridle Bridge and Roosevelt Portals

[1] "Preferred Concept Master Plan Ala Moana Reginal Park", Biederman Redevelopment Ventures, December 2017.
[2] "Draft Literature Review and Field Inspections with Cultural Section for the Ala Moana Regional Park Master Plan Waikīkī Ahupua'a, Honolulu (Kona) District, O'ahu", Cultural Surveys Hawai'i, Inc., January 2017.

Drainage Canal Crossing and Canal Repairs

Proposed Scope:

1. Replace two up to 100-foot long segments of the existing drainage canal in AMRP
2. Repair existing failed sections of the canal walls

Background:

1. There are no specific records on the construction of the canal. Anecdotal information presented in, "The People's Park" is that:
   - Louise Dillingham proposed water waterways because a waterway was less expensive to maintain than landscape grounds.
   - Lagoons along with a drainage canal were dredged in the park to control the runoff from mountain showers toward the ocean at the site.

   The book also discusses how "boulder concrete" was used for the park improvements. The material was reportedly, "…a thin gruel of concrete…poured into wood forms packed solid with boulders of coral and lava rock...". The rocks were debris from park board property and there was no quality control. The use of boulder concrete is specifically noted for being used in the central terrace area pergolas and Roosevelt Portals where it was finished with stucco painted white. There was no discussion on the canal construction[3].
2. Work on the Park was done under the Civil Works Administration, a short-lived U.S. job creation program established by the New Deal during the Great Depression to rapidly create manual labor jobs for millions of unemployed workers. Created November 9, 1933 by Executive Order No. 6420B, under the power granted to President Roosevelt by Title II of the National Industrial Recovery Act of 1933. The CWA ended in July of 1934 (although most employment ended by March 31, 1934). There was no mention if the work was done by local or imported laborers.
3. Due to the lack of skilled labor and material limitations, the canal walls were constructed without footings or with shallow footings, and of poor quality materials. Failure of the walls has occurred several times since in recent years.
4. Adding to the instability of canal walls are the surrounding soils. The park area is reclaimed land with the fill material being dredged spoils from the channel that connected the Ala Wai Boat Harbor and the Kewalo Basin. Geotechnical explorations along the canal show the soils to consist of very loose lagoonal deposits extending to 21.5 feet below the ground surface. In the borings done, the deposits were found to be sand, sandy-gravel and silt. The fill has limited bearing capacity.
5. The City is concerned for public health and safety.

   a. They wish to create a properly engineered box culvert crossing in two sections of the canal to create a wider pedestrian access/egress into the Park at Pi'ikoi Street and Queen Street to provide for emergency evacuation from the park. The wider promenade will also enhance pedestrian and non-motorized vehicles access to the park from the major area streets, and not channel such traffic to the roadway entrances at the Roosevelt Portal and Kamakee Street. Separating pedestrian traffic from vehicular traffic also promotes public safety.

[3] "The People's Park", Robert Weyeneth, 1987

b. The instability of the canal walls is a liability and a collapse could be hazardous to users in the area at the time the failure occurs. Due to the poor soil conditions, the City cannot predict when a failure may occur or how extensive it will be.

<u>Options Considered</u>:

1. Canal Crossing

A discussion of the options considered to expand the canal crossing at the two roadway intersections is presented below. The current condition at the Ala Moana Boulevard crosswalk at the Queen Street intersection is shown in the photo below; the conditions at Piʻikoi Street are similar.

a. Parallel Drain / Backfill Existing Canal
Under this option the canal would be replaced with a piped system, and the canal backfilled to preserve in-place. Upon review of the available space between the Ala Mona Boulevard right-of-way and the canal, it was found that there was inadequate space for a parallel system on the mauka side of the canal. On the makai side there were conflicts with a 12-inch diameter water line and a 69-inch diameter sewer line. As such, this option was not considered viable.

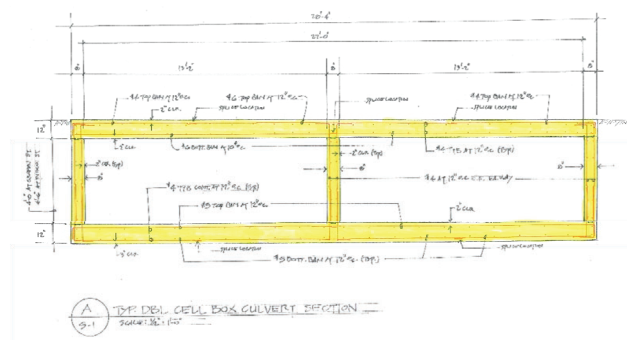
b. Bridge Crossing
Information and quotes for prefabricated bridges were solicited from various manufacturers. The quotes ranged from $50,000 to $85,000 for fabrication and shipping. Another manufacturer quote $280 as square foot installed, which would put the 20-foot wide bridge at $200,000. For the stability of the bridge removal of the section of canal beneath it was recommended by the project structural engineer for construction of the abutments. A precast concrete structure was also considered. The precast supplier also recommended to remove the

existing canal walls for proper support of the bridge, and would not warrant the installation without replacement of the existing walls. Below are images of a prefabricated steel bridge and a precast concrete structure, ConSpan, installed along with the estimated costs.

Prefabricated Steel Bridge, 25 feet wide – estimated cost $530,000

ConSpan Structure – estimated cost $800,000

c. Box Culvert
The box culvert crossing has the benefits of the bridge without the exposed steel truss system, and maintains the rectilinear form of the canal compared to the ConSpan type structure. The box culvert exposed face can blend into the existing canal walls, which as shown in the above Queen Street crossing photograph, are plastered with no underlying construction visible. A double cell box culvert was proposed by the structural engineer to minimize concrete wall thicknesses. The box culvert was priced at $440,000 for a 25-foot wide Piʻikoi Street crossing, making the cost comparable (or less) than the bridge option, which would also require removal of a section of the canal for the abutment as noted above.



A rendering pf the crossing at Pi‘ikoi Street is shown below.

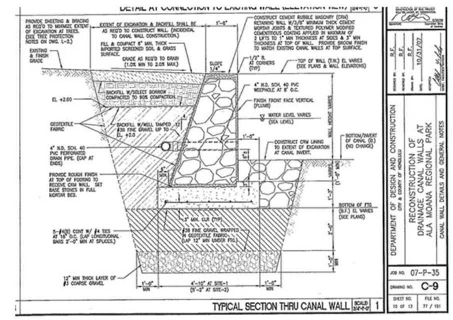
2. Canal Wall Repair

a. Restoration
Boulder concrete, while cost effective during the Great Depression is not a recognized suitable construction material. In discussions with Aaron Uno at HD&C, the largest concrete ready mix supplier on O‘ahu, he informed that HD&C stopped making large aggregate concrete mix. The requirements for aggregate density testing in accordance with industry standards cannot be done on the larger stone and the mixes weren’t accepted by agencies without the tests. The largest aggregate used is 1-1/4” size. Additionally, he informed that boulders and large stones are hard to come by in quantities needed for commercial mixes. The material is not readily or reliably sourced and the quality is not consistent.

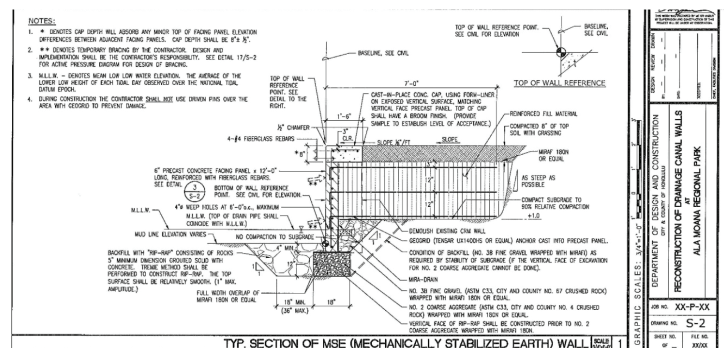
The City needs to comply with current building codes and industry standard test methods to ensure public safety. Using a concrete mix comparable to that used in construction of the park improvements in 1933 is not possible. No design engineer or concrete ready-mix supplier will take liability for specifying or making such an inferior material by today’s standards, and the City cannot jeopardize public safety by assuming the liability to use it. As such restoration with boulder concrete is not a viable option.

b. Reconstruction to mimic existing construction.
In 2007 the City hired a structural engineering firm to develop a wall design that mimicked the existing plastered finished canal wall construction. The wall design was essentially a concrete rubble masonry (CRM) retaining wall with an approximate 5-foot wide footing that extended into the bottom of the canal for support. In addition to not matching the existing construction, the wall construction was very costly. The current estimated cost for this section, is about $3,400 per lineal foot.

CRM Gravity Wall Section



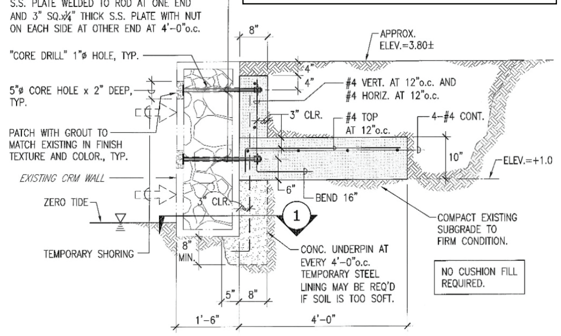
In 2012 the City engaged another structural engineering firm for design of the wall repairs. Two alternatives were developed. One proposed mechanically stabilized earth with 7-foot long tie-back rods. The only similarity of this alternative to that of the existing canal construction is that there was no was foundation, and that the surface finish of the precast concrete panel could be somewhat matched to the that of the existing plaster finished canal wall surface. The current estimated cost for this repair section is about $1,850 per linear foot.



The other alternative developed in 2012 was to try and salvage the existing wall by constructing a structural support behind it and installing anchor bolts through it. This design was applicable only where the existing wall was relatively sound and could be disturbed to install the under pinning and support. It required drilling through the existing wall and re-plastering the face.

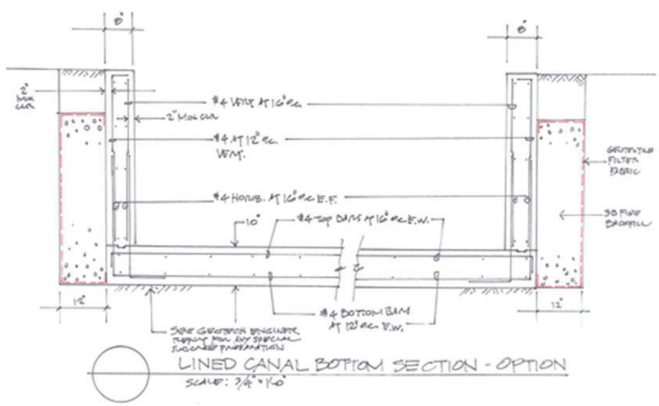
The reinforcement section is not well suited to failed canal wall sections, which would require reconstruction of the wall because of the poor quality of the existing material and need so reconstruct the wall with a footing. The current estimated cost for the reinforcement section is about $1,230 per linear foot. In locations where the wall has failed, a precast concrete facing panel on a coarse aggregate footing, as shown in mechanically stabilized earth wall detail above would be required. The cost for the replacement would probably be similar to the $1,850 per lineal foot.

EXISTING WALL REINFORCEMENT SECTION



c. Replacement

The project structural engineer provided the sketch below to indicate the "ideal" replacement section for the existing canal, without consideration for the existing details of construction. The estimated cost for replacement of the existing with the lined section was $4,760 per lineal foot.



Recommendations:

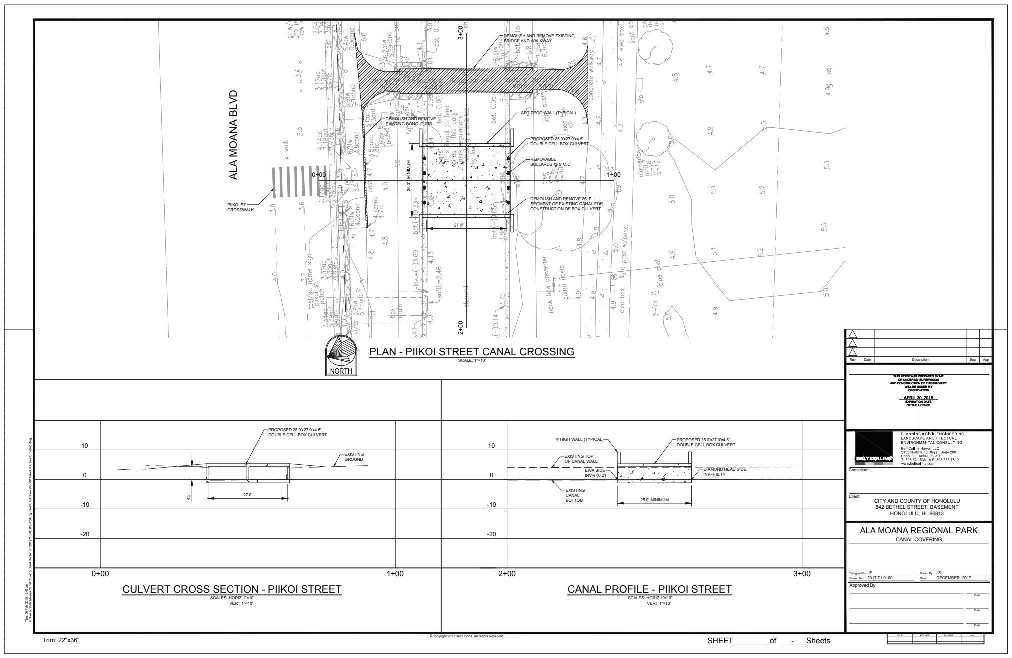
1. Canal Crossing

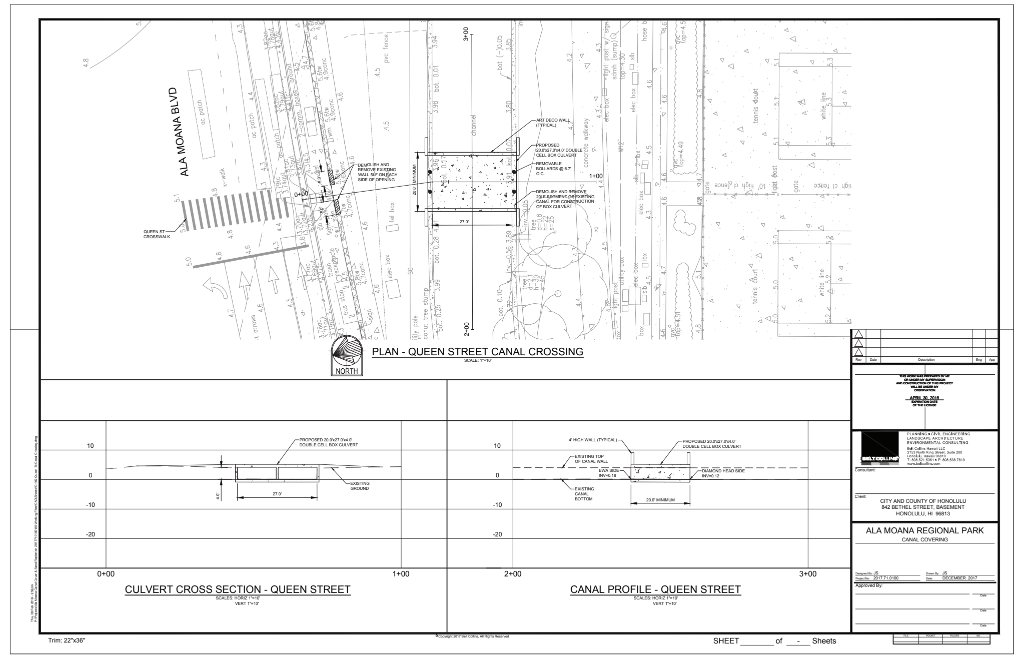
A box culvert crossing is recommended to achieve the improved pedestrian access/egress for the park. It provides the desired canal crossing in the most cost-effective manner and has the flexibility to be buried and be an extension of the park's lawn. It also has a lower long-term maintenance cost than the steel bridge which will require more maintenance in the highly corrosive environment.

The concrete finish of the box will blend in with the plastered canal wall and the structural mid-span support will not obstruct fish and other aquatic life residing in and passing through the canal. Preliminary construction plans showing the proposed box culvert crossing at Pi'ikoi Street and at Queen Street are included on the following pages.

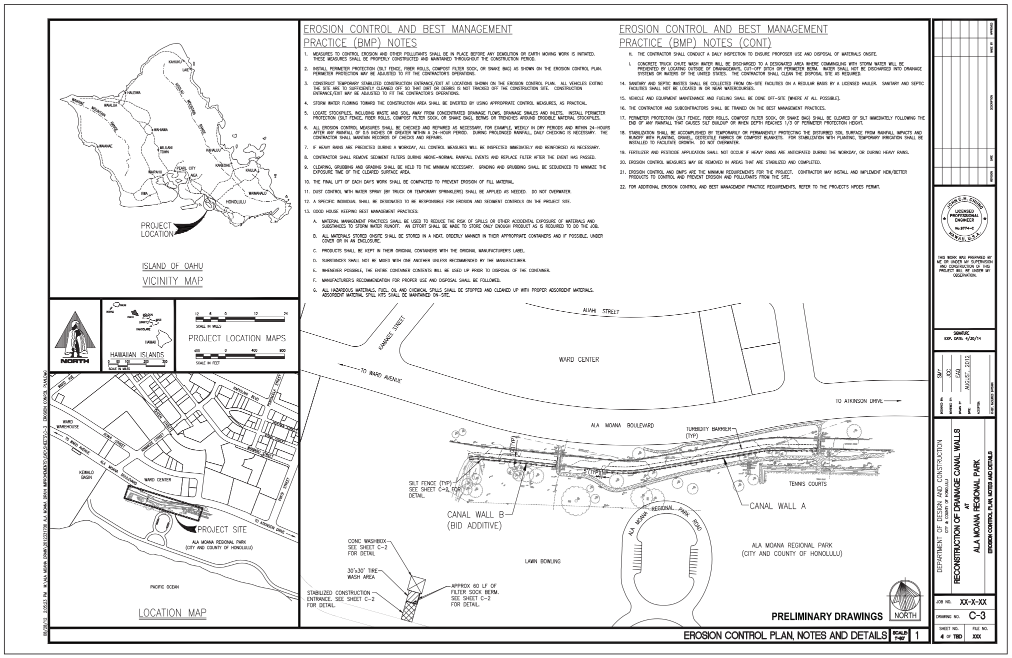
2. Canal Wall Repair

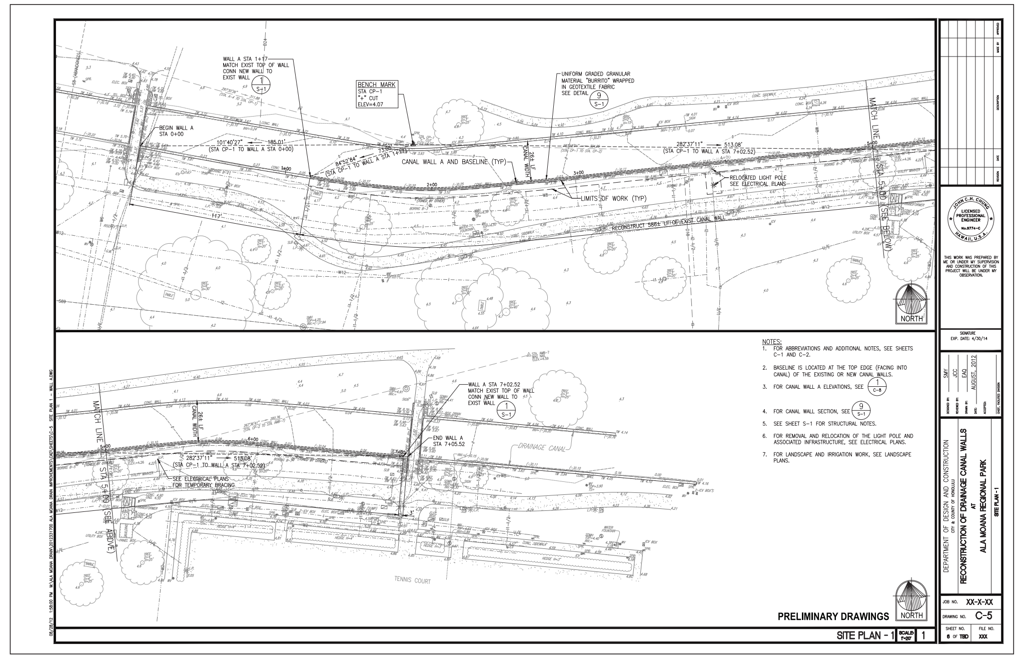
For the wall repair section, in cases where the existing structure has failed, the mechanically stabilized earth or similar system replacing the existing wall with a precast concrete panel is recommended. The panel should be finished to resemble the adjacent plastered canal walls. Removal of the existing wall should be limited to the extent needed to remove the failed section, with adjacent existing canal walls reinforced with a structural support as indicated in the second detail developed for the 2012 repair work. The repairs need to be undertaken as soon as possible on the existing failed section, the preliminary construction plans for which are also included at the end of this section.

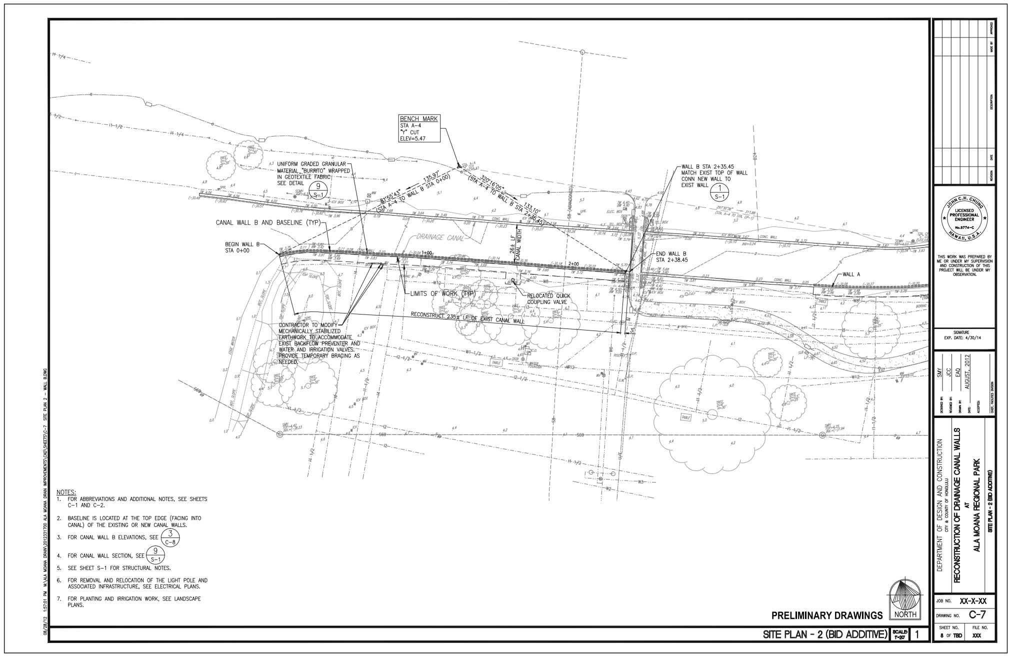


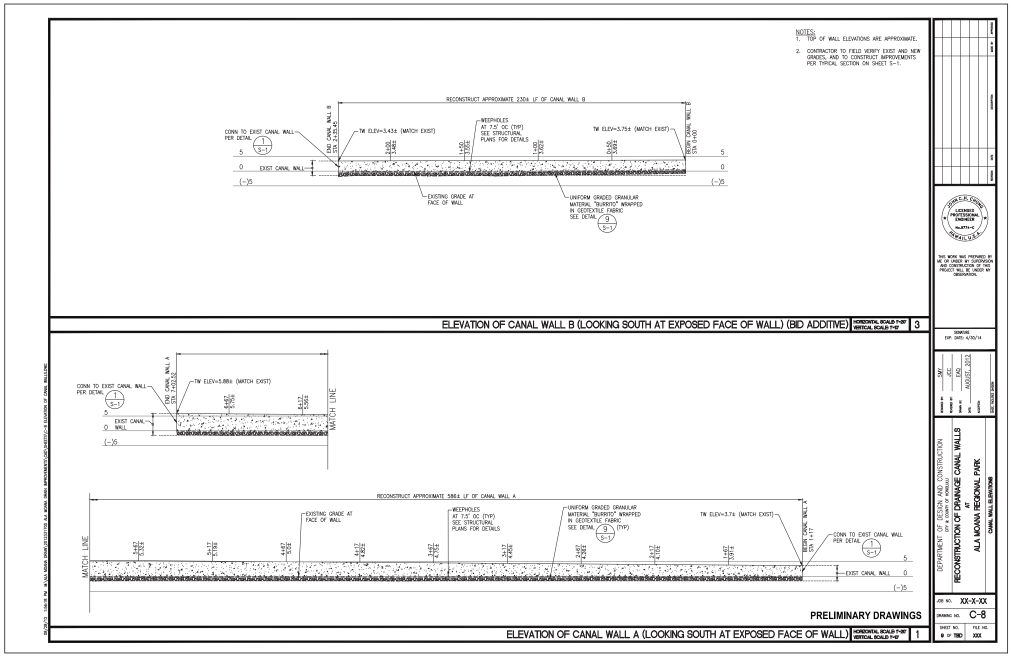


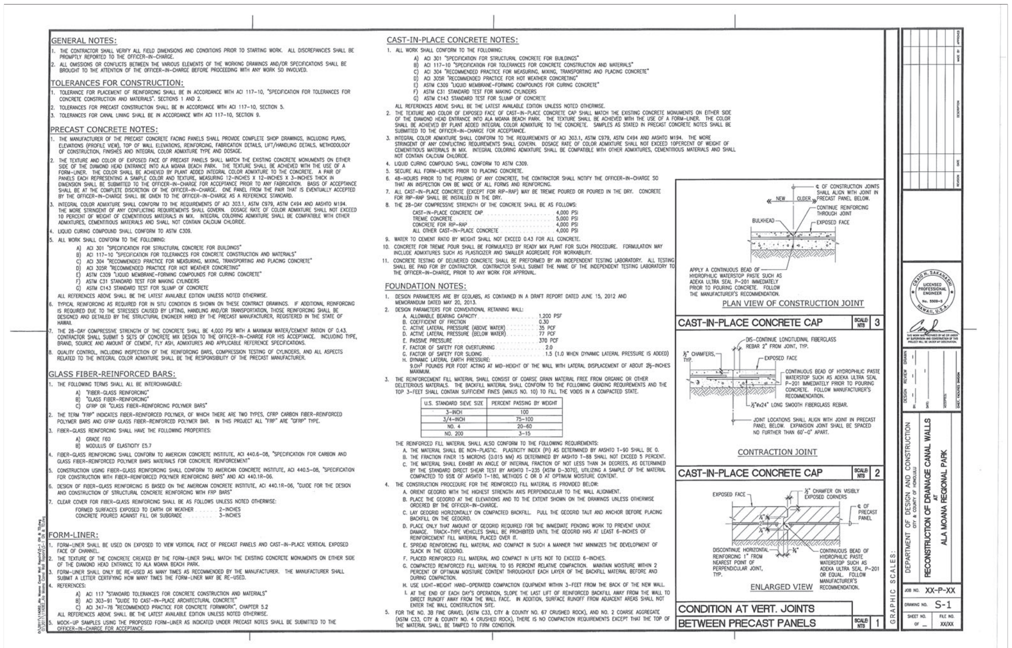
APPENDIX D-4 - Ala Moana Regional Park Improvements Plan Historic Feature Review and Retrofit Assessment

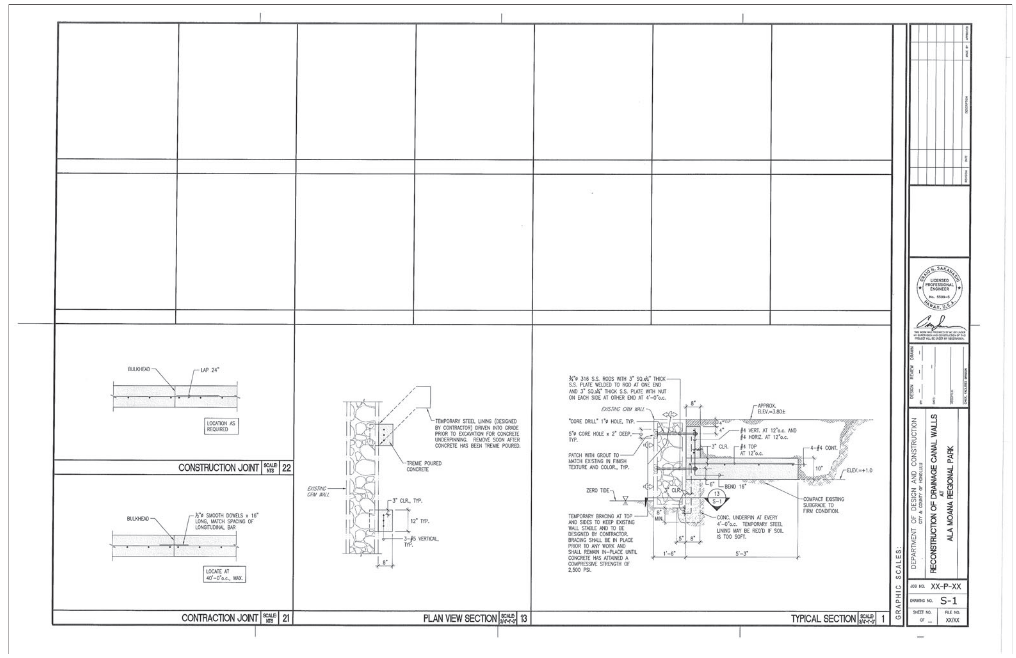

EROSION CONTROL AND BEST MANAGEMENT PRACTICE (BMP) NOTES
1. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY DEMOLITION OR EARTH MOVING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. INSTALL PERIMETER PROTECTION (SILT FENCE, FIBER ROLLS, COMPOST FILTER SOCK, OR SNAKE BAG) AS SHOWN ON THE EROSION CONTROL PLAN. PERIMETER PROTECTION MAY BE ADJUSTED TO FIT THE CONTRACTOR'S OPERATIONS.
3. CONSTRUCT TEMPORARY STABILIZED CONSTRUCTION ENTRANCE/EXIT AT LOCATIONS SHOWN ON THE EROSION CONTROL PLAN. ALL VEHICLES EXITING THE SITE ARE TO SUFFICIENTLY CLEANED OFF SO THAT DIRT OR DEBRIS IS NOT TRACKED OFF THE CONSTRUCTION SITE. CONSTRUCTION ENTRANCE/EXIT MAY BE ADJUSTED TO FIT THE CONTRACTOR'S OPERATIONS.
4. STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES, AS PRACTICAL.
5. LOCATE STOCKPILES, INCLUDING WASTE AND SOIL, AWAY FROM CONCENTRATED DRAINAGE FLOWS, DRAINAGE SWALES AND INLETS. INSTALL PERIMETER PROTECTION (SILT FENCE, FIBER ROLLS, COMPOST FILTER SOCK, OR SNAKE BAG), BERMS OR TRENCHES AROUND ERODIBLE MATERIAL STOCKPILES.
6. ALL EROSION CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY, FOR EXAMPLE, WEEKLY IN DRY PERIODS AND WITHIN 24-HOURS AFTER ANY RAINFALL OF 0.5 INCHES OR GREATER WITHIN A 24-HOUR PERIOD. DURING PROLONGED RAINFALL, DAILY CHECKING IS NECESSARY. THE CONTRACTOR SHALL MAINTAIN RECORDS OF CHECKS AND REPAIRS.
7. IF HEAVY RAINS ARE PREDICTED DURING A WORKDAY, ALL CONTROL MEASURES WILL BE INSPECTED IMMEDIATELY AND REINFORCED AS NECESSARY.
8. CONTRACTOR SHALL REMOVE SEDIMENT FILTERS DURING ABOVE-NORMAL RAINFALL EVENTS AND REPLACE FILTER AFTER THE EVENT HAS PASSED.
9. CLEARING, GRUBBING AND GRADING SHALL BE HELD TO THE MINIMUM NECESSARY. GRADING AND GRUBBING SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF THE CLEARED SURFACE AREA.
10. THE FINAL LIFT OF EACH DAY'S WORK SHALL BE COMPACTED TO PREVENT EROSION OF FILL MATERIAL.
11. DUST CONTROL WITH WATER SPRAY (BY TRUCK OR TEMPORARY SPRINKLERS) SHALL BE APPLIED AS NEEDED. DO NOT OVERWATER.
12. A SPECIFIC INDIVIDUAL SHALL BE DESIGNATED TO BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS ON THE PROJECT SITE.
13. GOOD HOUSE KEEPING BEST MANAGEMENT PRACTICES:
A. MATERIAL MANAGEMENT PRACTICES SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF. AN EFFORT SHALL BE MADE TO STORE ONLY ENOUGH PRODUCT AS IS REQUIRED TO DO THE JOB.
B. ALL MATERIALS STORED ONSITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND IF POSSIBLE, UNDER COVER OR IN AN ENCLOSURE.
C. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.
D. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
E. WHENEVER POSSIBLE, THE ENTIRE CONTAINER CONTENTS WILL BE USED UP PRIOR TO DISPOSAL OF THE CONTAINER.
F. MANUFACTURER'S RECOMMENDATION FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.
G. ALL HAZARDOUS MATERIALS, FUEL, OIL AND CHEMICAL SPILLS SHALL BE STOPPED AND CLEANED UP WITH PROPER ABSORBENT MATERIALS. ABSORBENT MATERIAL SPILL KITS SHALL BE MAINTAINED ON-SITE.
EROSION CONTROL AND BEST MANAGEMENT PRACTICE (BMP) NOTES (CONT)
H. THE CONTRACTOR SHALL CONDUCT A DAILY INSPECTION TO ENSURE PROPOSER USE AND DISPOSAL OF MATERIALS ONSITE.
I. CONCRETE TRUCK CHUTE WASH WATER WILL BE DISCHARGED TO A DESIGNATED AREA WHERE COMMINGLING WITH STORM WATER WILL BE PREVENTED BY LOCATING OUTSIDE OF DRAINAGEWAYS, CUT-OFF DITCH OR PERIMETER BERM. WATER SHALL NOT BE DISCHARGED INTO DRAINAGE SYSTEMS OR WATERS OF THE UNITED STATES. THE CONTRACTOR SHALL CLEAN THE DISPOSAL SITE AS REQUIRED.
14. SANITARY AND SEPTIC WASTES SHALL BE COLLECTED FROM ON-SITE FACILITIES ON A REGULAR BASIS BY A LICENSED HAULER. SANITARY AND SEPTIC FACILITIES SHALL NOT BE LOCATED IN OR NEAR WATERCOURSES.
15. VEHICLE AND EQUIPMENT MAINTENANCE AND FUELING SHALL BE DONE OFF-SITE (WHERE AT ALL POSSIBLE).
16. THE CONTRACTOR AND SUBCONTRACTORS SHALL BE TRAINED ON THE BEST MANAGEMENT PRACTICES.
17. PERIMETER PROTECTION (SILT FENCE, FIBER ROLLS, COMPOST FILTER SOCK, OR SNAKE BAG) SHALL BE CLEARED OF SILT IMMEDIATELY FOLLOWING THE END OF ANY RAINFALL THAT CAUSES SILT BUILDUP OR WHEN DEPTH REACHES 1/3 OF PERIMETER PROTECTION HEIGHT.
18. STABILIZATION SHALL BE ACCOMPLISHED BY TEMPORARILY OR PERMANENTLY PROTECTING THE DISTURBED SOIL SURFACE FROM RAINFALL IMPACTS AND RUNOFF WITH PLANTING, GRAVEL, GEOTEXTILE FABRICS OR COMPOST BLANKETS. FOR STABILIZATION WITH PLANTING, TEMPORARY IRRIGATION SHALL BE INSTALLED TO FACILITATE GROWTH. DO NOT OVERWATER.
19. FERTILIZER AND PESTICIDE APPLICATION SHALL NOT OCCUR IF HEAVY RAINS ARE ANTICIPATED DURING THE WORKDAY, OR DURING HEAVY RAINS.
20. EROSION CONTROL MEASURES MAY BE REMOVED IN AREAS THAT ARE STABILIZED AND COMPLETED.
21. EROSION CONTROL AND BMPS ARE THE MINIMUM REQUIREMENTS FOR THE PROJECT. CONTRACTOR MAY INSTALL AND IMPLEMENT NEW/BETTER PRODUCTS TO CONTROL AND PREVENT EROSION AND POLLUTANTS FROM THE SITE.
22. FOR ADDITIONAL EROSION CONTROL AND BEST MANAGEMENT PRACTICE REQUIREMENTS, REFER TO THE PROJECT'S NPDES PERMIT.
PROJECT LOCATION
ISLAND OF OAHU
VICINITY MAP
HAWAIIAN ISLANDS
PROJECT LOCATION MAPS
NORTH
PROJECT SITE
LOCATION MAP
AUAHI STREET
KAMAKEE STREET
WARD CENTER
TO WARD AVENUE
TO ATKINSON DRIVE
ALA MOANA BOULEVARD
TURBIDITY BARRIER (TYP)
SILT FENCE (TYP) SEE SHEET C-2 FOR DETAIL
CANAL WALL A
CANAL WALL B (BID ADDITIVE)
TENNIS COURTS
ALA MOANA REGIONAL PARK (CITY AND COUNTY OF HONOLULU)
LAWN BOWLING
CONC WASHBOX SEE SHEET C-2 FOR DETAIL
30'x30' TIRE WASH AREA
STABILIZED CONSTRUCTION ENTRANCE, SEE SHEET C-2 FOR DETAIL.
APPROX 60 LF OF FILTER SOCK BERM. SEE SHEET C-2 FOR DETAIL.
PRELIMINARY DRAWINGS
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS AT ALA MOANA REGIONAL PARK
AUGUST 2012
XX-X-XX
C-3
EROSION CONTROL PLAN, NOTES AND DETAILS

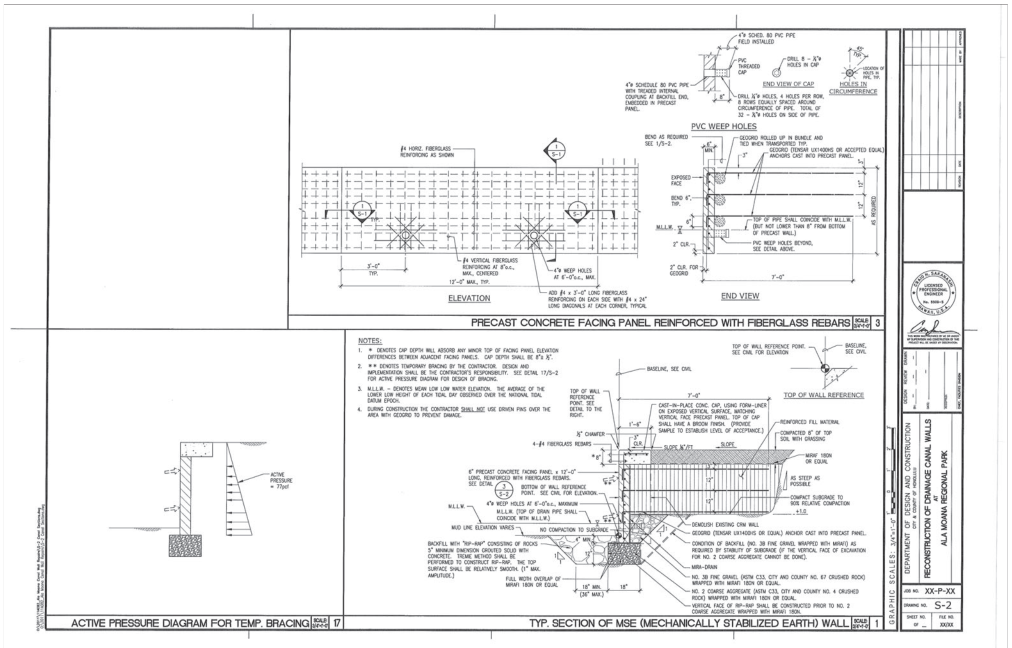

WALL A STA 1+17 MATCH EXIST TOP OF WALL CONN NEW WALL TO EXIST WALL
BENCH MARK
UNIFORM GRADED GRANULAR MATERIAL "BURRITO" WRAPPED IN GEOTEXTILE FABRIC SEE DETAIL
BEGIN WALL A STA 0+00
CANAL WALL A AND BASELINE (TYP)
LIMITS OF WORK (TYP)
RELOCATED LIGHT POLE SEE ELECTRICAL PLANS
MATCH LINE
NORTH
NOTES:
1. FOR ABBREVIATIONS AND ADDITIONAL NOTES, SEE SHEETS C-1 AND C-2.
2. BASELINE IS LOCATED AT THE TOP EDGE (FACING INTO CANAL) OF THE EXISTING OR NEW CANAL WALLS.
3. FOR CANAL WALL A ELEVATIONS, SEE 1 C-8
4. FOR CANAL WALL SECTION, SEE 9 S-1
5. SEE SHEET S-1 FOR STRUCTURAL NOTES.
6. FOR REMOVAL AND RELOCATION OF THE LIGHT POLE AND ASSOCIATED INFRASTRUCTURE, SEE ELECTRICAL PLANS.
7. FOR LANDSCAPE AND IRRIGATION WORK, SEE LANDSCAPE PLANS.
WALL A STA 7+02.52 MATCH EXIST TOP OF WALL CONN NEW WALL TO EXIST WALL
END WALL A STA 7+05.52
SEE ELECTRICAL PLANS FOR TEMPORARY BRACING
DRAINAGE CANAL
TENNIS COURT
PRELIMINARY DRAWINGS
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU
RECONSTRUCTION OF DRAINAGE CANAL WALLS AT ALA MOANA REGIONAL PARK
SMY
JCC
XX-X-XX
C-5
SITE PLAN - 1

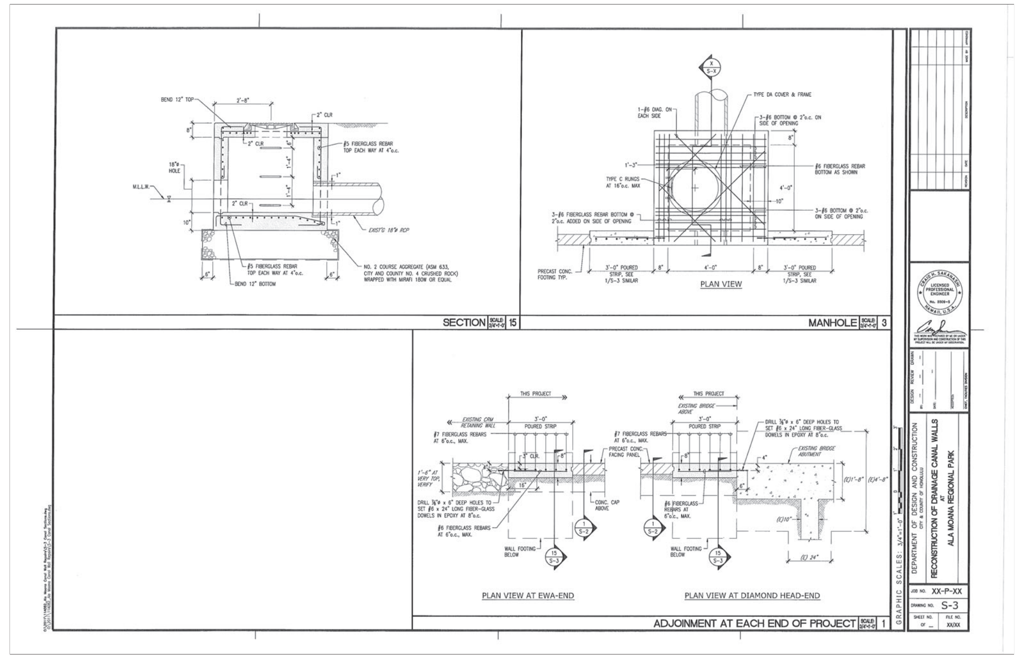

SITE PLAN - 2 (BID ADDITIVE)
PRELIMINARY DRAWINGS
NORTH
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS
AT
ALA MOANA REGIONAL PARK
XX-X-XX
C-7


ELEVATION OF CANAL WALL B (LOOKING SOUTH AT EXPOSED FACE OF WALL) (BID ADDITIVE)
ELEVATION OF CANAL WALL A (LOOKING SOUTH AT EXPOSED FACE OF WALL)
PRELIMINARY DRAWINGS
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS
AT
ALA MOANA REGIONAL PARK
XX-X-XX
C-8


GENERAL NOTES:
TOLERANCES FOR CONSTRUCTION:
PRECAST CONCRETE NOTES:
GLASS FIBER-REINFORCED BARS:
FORM-LINER:
CAST-IN-PLACE CONCRETE NOTES:
FOUNDATION NOTES:
PLAN VIEW OF CONSTRUCTION JOINT
CAST-IN-PLACE CONCRETE CAP
CONTRACTION JOINT
CAST-IN-PLACE CONCRETE CAP
ENLARGED VIEW
CONDITION AT VERT. JOINTS BETWEEN PRECAST PANELS
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS
ALA MOANA REGIONAL PARK
XX-P-XX
S-1


CONSTRUCTION JOINT
CONTRACTION JOINT
PLAN VIEW SECTION
TYPICAL SECTION
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS
ALA MOANA REGIONAL PARK
XX-P-XX
S-1


PRECAST CONCRETE FACING PANEL REINFORCED WITH FIBERGLASS REBARS
ACTIVE PRESSURE DIAGRAM FOR TEMP. BRACING
TYP. SECTION OF MSE (MECHANICALLY STABILIZED EARTH) WALL
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS
ALA MOANA REGIONAL PARK
S-2


SECTION
MANHOLE
ADJOINMENT AT EACH END OF PROJECT
PLAN VIEW AT EWA-END
PLAN VIEW AT DIAMOND HEAD-END
DEPARTMENT OF DESIGN AND CONSTRUCTION
RECONSTRUCTION OF DRAINAGE CANAL WALLS
ALA MOANA REGIONAL PARK
S-3

Japanese Pond and Hawaiian Pond Edge Improvements

Proposed Scope: Improve the edge conditions along the Japanese Pond, on the ʻEwa side of the AMRP and the Hawaiian Pond, on the Diamond Head end of the park.

Background:

1. The two ponds were noted as being dredged by 1932 based on an aerial photograph.[4] The edges appear unimproved in the available photos, which are generally aerial views of the early construction.
2. A Hawaiian Village, called ʻUlu Mau, was added south of the Hawaiian Pond in 1948. No pond edges are apparent in the available photos of the village. Photos from a site visit in December 2016, note the edge condition to be, "top soil fill over dredged coral rubble and sand".[5]
3. A 1987 photo in "The People's Park" (below) shows unimproved edges with spotty vegetation cover and bare dirt.[6]

Eastern Lagoon, showing visual intrusion of recent buildings along park boundary. (RRW)

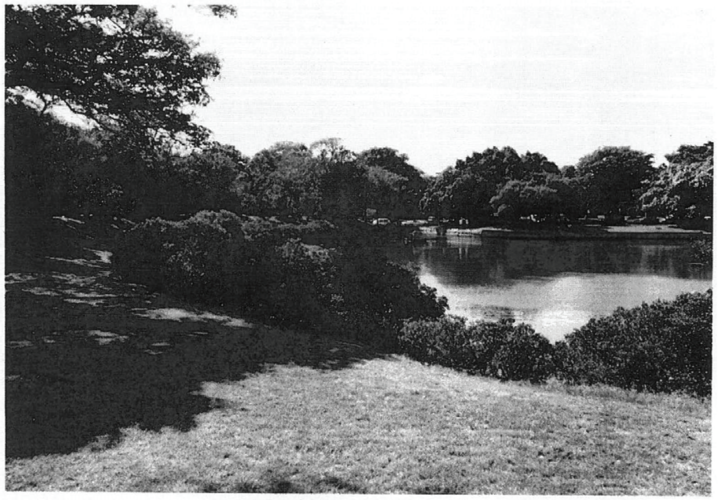
4. The current edge conditions along the Hawaiian Pond are very similar to those of 1987, as shown in the photo below taken March 17, 2017. However, with increased concern for storm

[4] Ibid, Cultural Surveys Hawaiʻi, Inc., January 2017.
[5] Ibid
[6] Ibid, Robert Weyeneth, 1987.

water quality and the conditions in the City's Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) permit, addressing the soil runoff from the park grounds is required. As such, dual rows of compost filter socks have been installed along the banks which block park user access to the pond, take away area for recreational use and significantly detract from the aesthetics of the water feature and area around it.

5. The Japanese Pond was cited as being remodeled in 1950[7], but no photos of the pond edges before or after the remodeling are available.
6. The photo in "The People's Park", on the next page, shows the Japanese Pond edges to be covered with dense bushes along the Ewa and mauka edges with the Diamond Head side having a low concrete-faced wall. No bank erosion is apparent in the photo.

[7] Ibid, Cultural Surveys Hawaiʻi, Inc., January 2017.



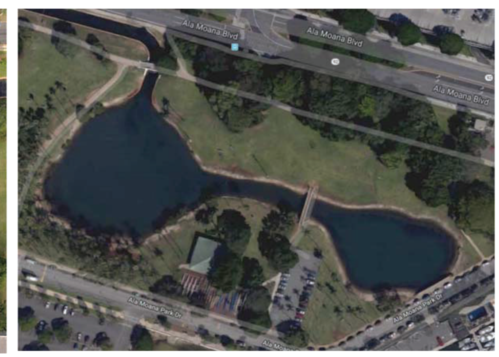
Western lagoon (RRW)

7. As of December 2017, when the photos immediately below were taken, the bushes on the Ewa side of the Japanese Pond have been thinned out compared to the conditions documented in 1987. Also, a portion of the wall along the pond on the downslope side of the bushes is in disrepair.

8. Along the mauka edge of the Japanese Pond the bushes have been removed and the wall exposed. A portion of the wall on the Diamond Head side of the Japanese Pond has been removed with the bank consisting of loose soil and mud.

9. In general, the edge conditions along both ponds is poor and not conducive to either passive or active recreational use. The limited funding at the time of park development in the 1930s did not allow the edges around the ponds to be improved. The edge renovations, assumingly done in 1950 around the Japanese Pond have failed and been removed around at least half of the circumference.

Japanese Pond – December 2017



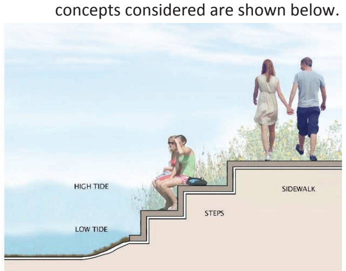
Hawaiian Pond - Google image

Options Considered:

Retaining a grassed edge around the ponds is not considered a viable option given the water surface elevation fluctuations due to tidal influences and storm water flows received by ponds. The edges, as documented in the above historic and current photos, are muddy and uninviting.

Creating a hardened edge all around the ponds will allow park visitors to be closer to the water, but will limit interaction at the water's edge such as for model boat floating, exploring near-edge aquatic life and other similar activities. Hence, a mix of edges is proposed.

Along the unimproved edges of both ponds, a combination of vegetative and hardened edges will be used. It is generally thought that access to the water would be provided at limited areas along the makai sides of both ponds and possibly at one location of each portion of the Hawaiian Pond on the mauka side. Conceptual sketches of the pond edge concepts considered are shown below.



Recommendations:

It is recommended that the historical pond edges be improved. It is proposed that the existing hardened pond edges around the Japanese Pond, and near the Bridal Bridge and at the Ala Moana Park Drive outlet of the Hawaiian Pond be retained. The areas in disrepair should be addressed. Restoring the walls with a similar rocky concrete mix as evidenced in the photos will not be possible, as previously cited for the canal repair. However, the exposed top of wall and pond face can be finished with a concrete or plaster surface to generally match those of the intact portions of the existing walls.

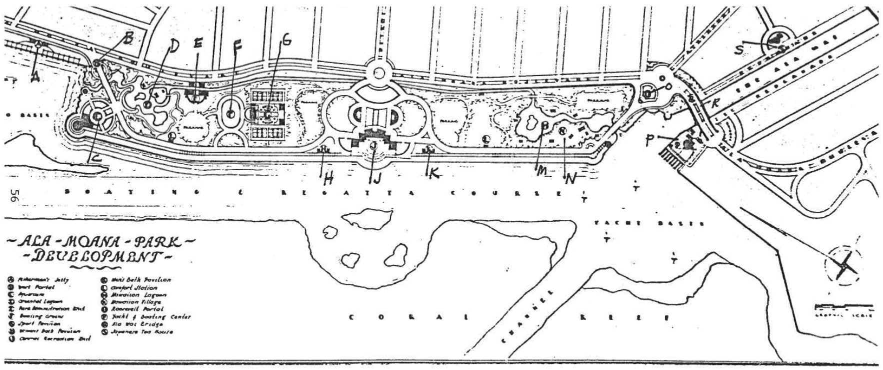
Along the unimproved edges a landscape design should be developed to address the park user activities as identified in the AMRP Master Plan to provide opportunities for interacting with the ponds. The edge treatment at the various locations around the pond should be determined based on existing topography and aesthetics, along with park staff input regarding general park visitor activities and maintenance considerations and requirements. Extensive grading is not to be done and the pond layouts are to be unchanged. It is recognized that the improvements will probably need to be phased based on available funding.

McCoy Pavilion Parking Area

Scope: Reconfigure McCoy Pavilion, "keyhole", parking to optimize the number of parking spaces.

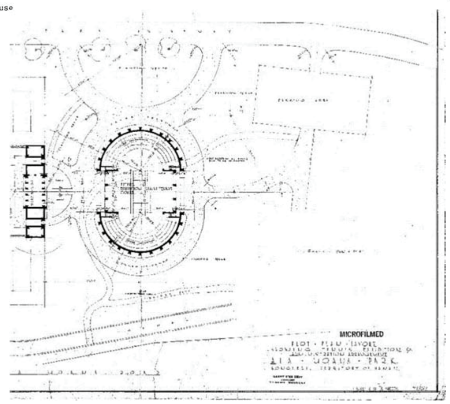
Background:

1. The 1932 Preliminary Plan for Ala Moana Park, as shown in the "The People's Park", proposed only Ala Moana Park Drive with no driveways into the mauka lawn areas or parking lots. The 1936 Ala Moana Park Development plan, also from the "The People's Park", has no parking areas shown. The area currently referred to as the "keyhole" parking area on the 'Ewa side of McCoy Pavilion is designated as the "bowling green" in this plan.
2. The Harry Sims Bent plans, dated, February 1, 1954, for the park show the center area to be an exhibition lawn tennis court, with a parking area makai of what is now the lawn bowl facility that is occupied by landscaping.



A Fishermen;s Jetty
B West Portal
C Aquarium
D Oriental Lagoon
E Park Administration
F Bowling Green
G Sports Pavilion
H Women's Bath Pavilion
J Central Recreation Unit
K Men's Bath Pavilion
L Comfort Station
M Hawaiian Laggon
M Hawaiian Lagoon
N Hawaiian Village
O Roosevelt Portal
P Yacht and Boating Center
R Ala Wai Bridge
S Japanese Tea House

C. Proposal by Lester McCoy, 1936



3. A photo dated 2-9-35 during construction of McCoy Pavilion shows the coral roads in the keyhole area graded with about 4 parallel parking stalls on each side along the middle of the loop. There was no documentation found as to why the parking area as shown in the Bent plan was not developed, or when the lawn bowling area was moved the west of the keyhole. The photos in "The People's Park" show the lawn bowling area in its current location.

4. No vehicle parking is discussed in "The People's Park", except for proposals in the 1960s and 1970s. The City record drawings, show no parking lots within the park until 1949, when the lot by the current canoe hālau was constructed with 42 stalls. Parking areas along the keyhole driveways opposite McCoy Pavilion and the Lawn Bowling area were changed from the parallel configuration to 8 perpendicular stalls on each side at this time as well.[8] No construction drawings for the current configuration of the keyhole parking, which consists of parallel stalls along the driveways, are available. It appears that the parking was to be along the roadways, which were originally unpaved and unstriped.
5. Additional parking was provided with the development of Magic Island in 1962 to 1964. A 1967 Magic Island parking lot improvement plan identified 702 stalls in the area of the existing lot. The drive isles were about 20 feet wide and there were no landscape islands, planters or planting areas within the lot.[9]
6. In general, parking is along Ala Moana Park Drive, which has a total of 356 stalls along both sides of its approximate 1.1-mile length. There are three public parking lots within the park. The 469-stall Magic Island lot is the largest, with the 32- stall lot by the Canoe Halau nearby, on the Diamond Head side of the park. The most centrally located parking is at McCoy Pavilion, where

[8] Ala Moana Park Road Improvements, Kewalo, Honolulu, T.H., Board of Public Parks & Recreation, County & County of Honolulu Planning Division, approved 6/29/49, File No. 77/23.
[9] Parking Lot & Utility Improvements at Magic Island, Job No. 67-P-38, Department of Parks & Recreation City & County of Honolulu, approved 3/9/67, File No. 260/1.

there are 77 stalls along the keyhole driveway, in both a parallel and perpendicular configuration. There is also a small, 5-stall, lot at the maintenance facility reserved for staff use.

7. One of the reoccurring comments in the public meetings on the current park master plan was that parking was inadequate. The City undertook a parking assessment in August 2017 which determined that parking was near capacity, around 90% utilized in the early evening, around the 5 PM hour, during the weekday count, and that the demand exceeded the supply between 10 AM and 5 PM on weekends.

<u>Options Considered</u>:

Based on the current needs of the community, additional parking at AMRP is required. While parking near the beach is favored by most park users, having parking along the makai side of Ala Moana Park Drive is not desirable, as it detracts from ocean vistas and pedestrian and bicyclist promenade areas. As such, the master planning consultant team evaluated locations for a parking lot with the goal of replacing the parking lost along Ala Moana Park Drive by providing drop off and some seating areas along the makai shared use path.

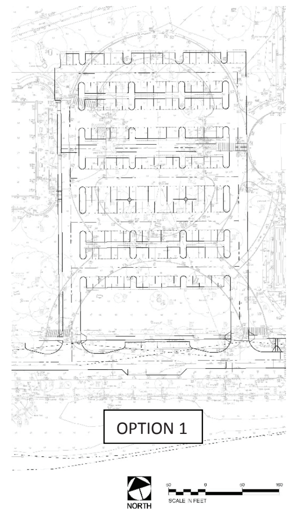
The AMRP Master Plan proposes to decrease the width of the Magic Island parking to expand the beach area and Ala Wai Boat Harbor shared used path. Expanding the Magic Island parking lot further makai is proposed, but only by 260 feet, which is inadequate to replace all the stalls lost with the narrowing of the lot and parking layout changes along Ala Moana Park Drive. Extending the lot too far makai is not preferred as it takes away open lawn areas that are used by private and community groups. Also, having parking centrally located is preferable to concentrating all the parking on the Diamond Head side of the park, as is currently the case.

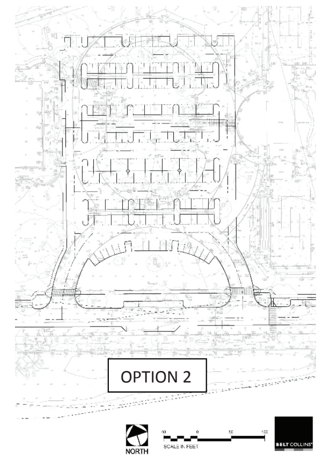
Constructing on existing open lawn areas on either side of the high spot, where Ala Moana Park Drive curves mauka, would decrease recreational areas and locations which are assignable by permit for private and community event use. For similar reasons, adding a parking lot near the Japanese Pond is not favored.

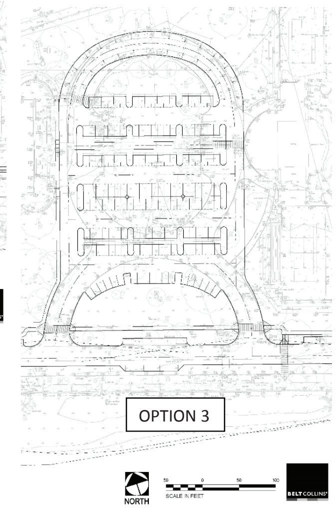
The keyhole area was thus considered an appropriate area to evaluate for expanded parking. The area was originally designated for parking, which was not developed, either due to cost constraints, lack of demand given the limited number of vehicle owners driving to the park in the 1930s, or both. The lawn areas are separated by the driveways that give the keyhole its nickname and are not extensively used. The area is already paved and vehicle-centric with some parking, but it is not efficiently laid out. The area is centrally located and near McCoy Pavilion which holds events that have a demand for participant parking. The keyhole area is also in between the tennis courts and lawn bowling area, with the latter being identified for more intense and diversified use in the master plan, which will increase the demand for nearby parking.

Three parking lot layouts were considered. Option 1 was an engineered layout focused on maximizing the stall count, 175 total, and have conventional T-intersection. The other options considered the existing configuration of the keyhole driveways, as an element of the historical layout of the Bent plan. These layouts retained the curved driveway configurations at Ala

Moana Park Drive to create an arched shaped lawn area. The Option 2 layout shown below loses only one stall compared to the engineering layout, for a total of 174 stalls. Option 3 retained the top of the keyhole generally in its current configuration, providing 167 stalls. This layout was thought to be too inefficient for parking given the 1,155 square yards of additional paving for 24 stalls and the one-way circulation required through the upper semicircle driveway.







<u>Recommendations</u>:

After review of the park areas and uses, expanding parking in the keyhole area, traditionally used as access and parking for the Sports Pavilion, Banyan Court and Lawn Bowling Green, was determined to be the best suited location. It is generally centrally located, is not well suited to open recreational use due to the driveway network with associated parking, and not efficiently laid out for parking. In the interest of maintaining the historical connection to the park's original development plan, the curved driveway connections with an arched shaped lawn area along Ala Moana Park Drive, Option 2, is proposed to be incorporated into the design.

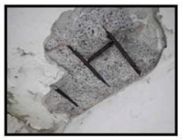
Repair of the Bridle Bridge and Roosevelt Portals

Proposed Scope:

Maintenance repair of the Bridle Bridge, also referred to as the equestrian bridge, and the Roosevelt Portals to address areas of exposed steel reinforcing and underlying concrete.

Background:

1. The Bridle Bridge and Roosevelt Portals were both designed by Bent and completed in 1934 as part of the original improvements to the park.[10]
2. Details of the construction of the bridge are not available. Photos of it, immediately below, taken as part of the AMRP Master Plan show reinforcing steel with small size aggregate concrete, overlain with painted cement plaster.[11] It is therefore not known if boulder concrete was used in the original construction.



Severe spalling with missing concrete and exposed rebar at underside of bridge

Cracked and fallen concrete on the exterior portion of the Diamond Head arch

Moisture infiltration at underside of the Ewa side of the bridge has loosened plaster and paint

Concrete column foundations were cracked and broken at the bases

3. The portals were reportedly constructed of boulder concrete.[12] The AMRP Master Plan recommended patching and refinishing of the portals to restore and preserve it historic character, even though a separate structural assessment of it was not completed.[13]
4. A more recent structural assessment of the AMRP pedestrian bridges engaged by the City found the condition of the Bridle Bridge to be poor to fair.[14] The assessment recommended repairs and improvements.

---

[10] Ibid, Cultural Surveys Hawai'i, Inc., January 2017.
[11] "Inspection Report of Ala Moana Beach Park Bridges", Realty Inspections Inc., May 2015.
[12] Ibid, Robert Weyeneth, 1987.
[13] Ibid, Biederman Redevelopment Ventures, December 2017.
[14] "Ala Moana Regional Park Structural Assessment of Pedestrian Bridges", Nagamine Okawa Engineers, Inc., September 2016.

Options Considered:

The 2016 Bridle Bridge structural assessment recommended to coat the entire bridge with a corrosion inhibiting concrete penetrating sealer on an immediate basis as a temporary measure to stop further deterioration of the exposed areas of the bridge. The long-term recommendations were to:

- repair cracks, spalls and delaminated concrete;
- repair of abutment and pier wall footings;
- seal the deck topping slab and railing;
- repair the undermined areas of the abutment, footings and adjacent channel wall; and
- installing a higher railing at the crow of the bridge safety.

Penetrating sealer materials identified by the project structural engineer include Sika© FerroGard©-903, Andek Corporation Polaseal VCI™ and Cortec MCI-2018. All materials are clear and stop concrete deterioration caused by water penetration and reinforcing steel corrosion. The sealers applied will thus not alter the appearance of the Art Deco structures and will protect them.

As discussed above for repair and restoration of the canal wall, use of historic materials that may have been used in construction of the bridge is not possible given current building codes and industry standards. Therefore, the options considered are more related to selection of a sealer or concrete admixture which will allow application of a cement plaster and painting to have the repaired areas restored to match the existing adjacent portions of the structure and retain the original design of the bridge.

The same materials and restoration will be used on the Roosevelt Portals. The condition of the portals is not as bad as that of the bridge, and extensive spall repair and footing work are not needed. The portals will likely be treated with a corrosion inhibiting concrete penetrating sealer which will provide a protective surfacing for the structure, without altering its character or structure.

Recommendation:

It is recommended that repair of the Bridle Bridge with current industry standard materials be undertaken as soon as possible to stop the corrosion and repair the foundation. A railing should be added as recommended, with the design to match that of the existing and retain the Art Deco character of the structure. The Roosevelt Portals should be repaired as needed with the entire structure sealed to preserve the surface integrity and underlying construction.

PAGE IS INTENTIONALLY LEFT BLANK

APPENDIX E

Biological Resources Survey Report for Ala Moana Regional Park and Magic Island, Island of Oʻahu

PAGE IS INTENTIONALLY LEFT BLANK

Biological Resources Survey Report for Ala Moana Regional Park and Magic Island, Island of Oʻahu

Submitted to

Belt Collins Hawaiʻi LLC

Prepared by

SWCA Environmental Consultants

April 2017

BIOLOGICAL RESOURCES SURVEY REPORT FOR ALA MOANA REGIONAL PARK AND MAGIC ISLAND ISLAND OF O‘AHU

Submitted to

Belt Collins Hawai‘i LLC
2153 North King Street, Suite 200
Honolulu, Hawai‘i 96819
Attention: Joanne E. Hiramatsu

Prepared by

SWCA Environmental Consultants
Bishop Square ASB Tower
1001 Bishop Street, Suite 2800
Honolulu, Hawai‘i 96813
(808) 548-7899
www.swca.com

SWCA Project No. 30476

April 2017

EXECUTIVE SUMMARY

Belt Collins Hawaii LLC requested that SWCA Environmental Consultants (SWCA) conduct a terrestrial flora and fauna survey, an aquatic fauna survey, and a water quality survey in support of an Environmental Impact Statement and related permits for a proposed project at Ala Moana Regional Park and Magic Island on the island of Oʻahu. This report summarizes the findings of the surveys.

SWCA conducted a pedestrian survey for terrestrial flora on March 17, 2017, to record all vascular plant species in the survey area. SWCA conducted a pedestrian survey for terrestrial fauna on March 23, 2017, during the morning hours when wildlife were most likely to be active. This survey consisted of visual and auditory observations. SWCA conducted the aquatic fauna survey on March 27, 2017, which consisted of visual searches from the connecting canal walls and bridges, as well as benthic grab sampling from kayaks. This survey focused on fish and large aquatic invertebrates. SWCA conducted the water quality survey on March 27, 2017, which consisted of collecting water quality parameters and samples from three locations.

The naturally occurring vegetation types and plant species identified during the survey are not considered unique. However, there were 11 native Hawaiian plant species observed in the survey area that were cultivated in the park by the city of Honolulu: ʻākulikuli (*Sesuvium portulacastrum*), *Polyscias racemosa*, loulu lelo (*Pritchardia hillebrandii*), kou (*Cordia subcordata*), kīpūkai (*Heliotropium curassavicum*), naupaka kahakai (*Scaevola taccada*), hau (*Hibiscus tiliaceus*), milo (*Thespesia populnea*), aʻe (*Sapindus saponaria*), ʻuhaloa (*Waltheria indica*), and hala (*Pandanus tectorius*). *Polyscias racemosa* is listed as critically endangered but occurs in the survey area as a cultivated plant only.

In general, the plant and wildlife species observed are typical of urban areas on Oʻahu. No federally listed endangered birds were observed in and around the waterways of the survey area. However, one state-listed species, the white tern (*Gygis alba*), was observed in the survey area amongst other common species. Based on current distribution and habitat requirements, the federal and state endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) may forage or roost in the survey area. For these reasons, avoidance and mitigation measures are recommended for these listed species.

Other federally or state-listed terrestrial fauna species with potential to occur on the island of Oʻahu are not likely to occur in the survey area because it is either outside the range of the species or because appropriate habitat is not found in the survey area. The survey area does not overlap critical habitat of any listed terrestrial faunal species. Therefore, the proposed project is not expected to have a significant, adverse effect on terrestrial wildlife.

None of the aquatic fauna recorded in the aquatic survey area are federally or state-listed threatened, endangered, proposed listed or candidate species. Because no threatened or endangered aquatic species were recorded in the area, the proposed project is not expected to have a significant, adverse effect on biological marine resources.

The water quality sampling showed exceeding values for pH, turbidity, and dissolved oxygen. There is no acceptable standard for total suspended solids for estuaries, and salinity and dissolved oxygen concentration standards are based on deviations from ambient conditions and cannot be assessed against the water quality standards in Hawaiʻi Administrative Rules 11-54. This one-time testing of the water quality at the two ponds and canal is not sufficient for determining water quality standards compliance. The data can only provide background information.

This page intentionally blank

CONTENTS

APPENDICES

FIGURES

TABLES

INTRODUCTION

Belt Collins Hawaii LLC requested that SWCA Environmental Consultants (SWCA) conduct a terrestrial flora and fauna survey, an aquatic fauna survey, and a water quality survey in support of an Environmental Impact Statement and related permits for a proposed project at Ala Moana Regional Park and Magic Island on the island of O'ahu (Figure 1). This report summarizes the findings of the surveys. The terrestrial flora survey was conducted on March 17, 2017, the terrestrial fauna survey was conducted on March 23, 2017, and the aquatic fauna and water quality surveys were conducted on March 27, 2017.

DESCRIPTION OF THE SURVEY AREA

The survey area is in the southern portion of the island of O'ahu, and encompasses the entire Ala Moana Regional Park and Magic Island (Tax Map Key: 230370010000 and 230370250000 see Figure 1). The survey area includes two ponds and a canal that runs parallel to the northern boundary of the park along Ala Moana Boulevard. North of Ala Moana Boulevard is a busy urban area occupied by several commercial and residential properties. The west end of the survey area is bordered by Kewalo Basin, which is a mix-use: commercial and recreational boat harbor, and the east end is bordered by Ala Wai Boat Harbor. The survey area is near the most densely populated community in the state and is frequently used by visitors and residents for recreational activities. The survey area encompasses approximately 40.5 hectares (100 acres).

Ala Moana Regional Park was built by the city and county of Honolulu in the 1930s. Similar to nearby Sand Island, the park sits on a human-made landscape, which consists of dredge material on top of a coral reef. The original shoreline is covered by Ala Moana Boulevard, and the current coastline extends seaward approximately 200 meters (m) from its original location.

Mean annual rainfall for the survey area is approximately 29.1 inches (738.6 millimeters [mm]). Rainfall is typically highest in December and lowest in June (Giambelluca et al. 2016). The nearest National Oceanic and Atmospheric Administration (NOAA) weather recording station to the survey area is the Aloha Tower station (ALOH1), which is 1.8 miles from the survey area. This station recorded lower than average rainfall for 2017 through the end of March (NOAA 2016a).

Figure 1. Ala Moana Regional Park and Magic Island survey area (TMK: 230370010000 and 230370250000).

METHODS

SWCA reviewed available scientific and technical literature regarding natural resources in and near the survey area. This literature review encompassed a thorough search of referenced scientific journals, technical journals and reports, environmental assessments, environmental impact statements, relevant government documents, U.S. Fish and Wildlife Service (USFWS) online data, and unpublished data that provide insight into the area's natural history and ecology. SWCA also reviewed available geospatial data, aerial photographs, and topographic maps of survey area.

Terrestrial Flora

SWCA conducted a pedestrian survey for terrestrial flora on March 17, 2017, to record all vascular plant species in the survey area. Areas more likely to support native plants (e.g., rocky outcrops and unmanaged areas) were more intensively examined. Plants recorded during the survey are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. As environmental conditions change, it is likely that plant community composition, species, and abundances will undergo temporal or seasonal changes.

Terrestrial Fauna

SWCA conducted a pedestrian survey for terrestrial fauna on March 23, 2017, during the morning hours (06:45–08:45) when wildlife were most likely to be active. Visual and auditory observations were made. All observed birds, mammals, reptiles, amphibians, and invertebrate species were noted during the survey. Acoustic surveys for the Hawaiian hoary bat (*Lasiurus cinereus semotus*)—the only native terrestrial mammal species that is still extant within the Hawaiian Islands—were not conducted, but areas of suitable habitat for roosting and foraging were noted during the survey.

Aquatic Fauna

SWCA conducted the aquatic fauna survey on March 27, 2017, which consisted of visual searches from the connecting canal walls and bridges. The two ponds were surveyed from shore, and a kayak was deployed to collect benthic grab samples from the middle of each pond. The survey focused on fish and large aquatic invertebrates. Benthic sediment samples were obtained using a 3.5-liter (0.9-gallon) Ekman SS Grab Sampler. Nine samples were taken—three samples from each pond and three from the canal—between 14:00 and 17:00 during the rising tide (see Figure 15). The samples were sifted through a 1.8-milimeter (mm) sieve to record species and identify them to the lowest taxonomic level.

Water Quality

SWCA conducted the water quality survey on March 27, 2017, which consisted of collecting water quality parameters and samples from three locations between 15:00 and 17:00. A kayak was deployed to collect one water sample from the middle of the east pond, one water sample from the west pond, and one water sample from the eastern end of the connecting canal (see Figure 15). In situ physical parameters include temperature, dissolved oxygen (DO), salinity, pH, and turbidity (Table 1). These were measured using a Horiba Model U53 portable sonde. Before initiating fieldwork, the probes were calibrated according to the manufacturer's specifications to ensure accuracy. The sonde was fully submerged at the sample site, and data were recorded once a stable value was measured. In addition to probe-based measurements, light extinction was measured in the field using a Secchi disk.

Total suspended solids (TSS) samples were collected by submerging sample containers provided by the analytical laboratory approximately 25 centimeters (10 inches) below the water column and collecting a sample free of floating debris and sediment. Poor access to the channel required that this sample be collected using a bucket and then pouring it into a sample container. Samples were labeled with the sample identification number, date, time, and name of sampler before being placed in a cooler with ice and cooled to 6 degrees Celsius (°C). A chain-of-custody form was completed, and the samples were delivered to Food Quality Labs in Honolulu, Hawai‘i, for analysis.

Table 1. Water Quality Field Parameters and Corresponding Analytical Methods

Parameter	Analytical Method	Sample Type	Analytical Location
Temperature	SM 2550	In situ	Field measured
DO	EPA 360.1	In situ	Field measured
Salinity	SM 2520 B	In situ	Field measured
pH	EPA 150.1	In situ	Field measured
Turbidity	SM 2130	In situ	Field measured
Secchi depth	Not applicable	Visual	Field measured
TSS	EPA160.2	Grab	Food Quality Labs

Other information recorded during water quality sampling included tide height, weather conditions and recent weather events, and other activities that may have impacted water quality. Field measurements and laboratory results were compared to the water quality standards (WQS) promulgated through Hawai‘i Administrative Rules (HAR), Title 11, Chapter 54 (HAR 11-54). WQS are generally based on a geometric mean for each parameter; therefore, a minimum of three samples must be collected to compare to the standard. Although a single data point for each parameter is insufficient to determine compliance with WQS, individual data points can provide insight into additional studies that may be needed for the waterbody. All parameters were collected on the same day for the purpose of describing the water quality.

RESULTS

In general, the flora and fauna assemblages are typical of those found in disturbed and urban areas of O‘ahu. No federally listed threatened or endangered plant or animal species or proposed listed or candidate species were directly observed during the pedestrian surveys. However, the state-threatened white tern (*Gygis alba*) was observed and may nest in the survey area (Vanderwerf 2003). In addition, the federally endangered Hawaiian hoary bat may forage and/or roost in the survey area because suitable habitat is present in the survey area (see Mammals results section). The survey area does not encompass any designated or proposed critical habitat for threatened or endangered species.

Terrestrial Flora

No naturally occurring state or federally listed threatened, endangered, proposed listed, or candidate plant species, or rare native Hawaiian plant species, were observed in the survey area. In all, 102 plant species were recorded in the survey area during the survey. Of these, 11 species are native to the Hawaiian Islands: ‘ākulikuli (*Sesuvium portulacastrum*), *Polyscias racemosa*, loulu lelo (*Pritchardia hillebrandii*), kou (*Cordia subcordata*), kīpūkai (*Heliotropium curassavicum*), naupaka kahakai (*Scaevola taccada*), hau (*Hibiscus tiliaceus*), milo (*Thespesia populnea*), a‘e (*Sapindus saponaria*), ‘uhaloa (*Waltheria indica*), and hala (*Pandanus tectorius*). *Polyscias racemosa* is listed as critically endangered but occurs in the survey area as a cultivated plant only. All other native plant species observed are not rare (Wagner et al. 1999).[1] Appendix A provides a list of all plant species observed by SWCA biologists in the survey area.

The vegetation in the survey area consists of two vegetation types: landscaped and ruderal.

Landscaped Vegetation

Landscaped areas at Ala Moana Regional Park and Magic Island are frequently mowed lawns consisting of a mixture of introduced lawn grasses and herbaceous weeds, with a diverse mixture of ornamental trees and shrubs (Figures 2 and 3). Many of the ornamental trees are well established, and at least 25 have been designated as exceptional trees by the Outdoor Circle of Hawai'i. Outdoor Circle defines *exception trees* as "a tree, stand or grove of trees with historic or cultural value, or that by reason of age, rarity, location, size, aesthetic quality or endemic status, is designated by a county arborist advisory committee as worthy of preservation" (The Outdoor Circle 2017). Pitted beardgrass (*Bothriochloa pertusa*) and Bermuda grass (*Cynodon dactylon*) are the most abundant grasses in the landscaped areas. Various cultivated ornamental trees are present throughout the park along pathways in open lawn spaces and adjacent to canals and waterbodies. The cultivated ornamental trees are diverse, but common species include Chinese banyan (*Ficus microcarpa*), coconut (*Cocos nucifera*), *Tabebuia heterophylla*, false olive (*Elaeodendron orientale*), and monkeypod (*Samanea saman*).

Ruderal Vegetation

Ruderal vegetation is found along the edges of cultivated areas where mowing or other maintenance activities are not practical, such as pond or canal edges (Figure 4), or surrounding existing buildings or construction areas. Most of the plant species found in this vegetation type are herbaceous species adapted to colonizing disturbed areas, with some weedy shrubs and small trees. The most common tree and shrub species in these areas are milo, buttonwood (*Conocarpus erectus*), red mangrove (*Rhizophora mangle*), and Indian fleabane (*Pluchea indica*). Abundant and common herbaceous species found in the ruderal vegetation are pitted beardgrass, *Sida ciliaris*, nut sedge (*Cyperus rotundus*), *Boerhavia coccinea*, and Bermuda grass. Milo and 'ākulikuli were the only native plant species observed in this vegetation type.

[1] The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999), Wagner and Herbst (2003), and Staples and Herbst (2005). Recent name changes are those recorded in Wagner et al. (2012). Common/Hawaiian names are provided first, followed by scientific names in parenthesis. If no common or Hawaiian name is known, only the scientific name is provided.

Figure 2. Typical landscaped vegetation in the survey area, showing ornamental trees and mowed areas. Species in this photograph include the broad-crown species *Enterolobium cyclocarpum.*

Figure 3. Landscaped vegetation on the mauka portion of the site includes diverse ornamental trees and mowed herbaceous species. Species in this photograph include pitted beardgrass (*Bothriochloa pertusa*), Bermuda grass (*Cynodon dactylon*), and Indian banyan (*Ficus benghalensis*).

Figure 4. Ruderal vegetation exists at the margins of maintained areas in the survey area, such as pond edges. Species in this photograph include Species specific in these areas include Indian fleabane (*Pluchea indica*).

Terrestrial Fauna

Avifauna

Most of the bird species observed in the survey area were foraging near the beach front or along the shores of the two ponds (Figures 5–7). Several bird species were observed scavenging on what was likely discarded food scraps from park visitors. Birds like the wandering tattler (*Tringa incana*) were observed at the ponds, likely foraging on small aquatic invertebrates (Figure 6). Ducks are common in the survey area and were seen feeding on food provided by park visitors. Black-crowned night-herons observed were likely feeding mostly on the fish in the system (Figure 7).

Biological Resources Survey Report for Ala Moana Regional Park Master Plan, Island of Oʻahu

Figure 5. Spotted dove, common mynahs, and ruddy turnstones foraging in the survey area.

Figure 6. Wandering tattler foraging in the survey area.

Figure 7. Water birds along the water edges. Mallards (left), black-crowned night-heron (*Nycticorax nycticorax*) (right).

Most of the bird species observed in the survey area are species commonly found in disturbed, low- to mid-elevation areas on O‘ahu. In all, 20 bird species were documented (Table 2), including seven birds protected by the Migratory Bird Treaty Act (MBTA) (see Table 2). In addition, the MBTA-protected white tern (*Gygis alba*) is also listed as threatened on O‘ahu by the State of Hawai‘i.

Table 2. Birds Observed in and Near the Survey Area

Common Name	Scientific Name	Status	MBTA
Black-crowned night-heron	*Nycticorax nycticorax*	N	X
Cattle egret	*Bubulcus ibis*	NN	X
Common myna	*Acridotheres tristis*	NN	–
Common waxbill	*Estrilda astrild*	NN	–
Japanese white-eye	*Zosterops japonicus*	NN	–
Hawaiian duck-mallard hybrids*	*Anas* sp.	NN	X
House finch	*Haemorhous mexicanus*	NN	–
House sparrow	*Passer domesticus*	NN	–
Java sparrow	*Lonchura oryzivora*	NN	–
Pacific golden-plover	*Pluvialis fulva*	M	X
Red-vented bulbul	*Pycnonotus cafer*	NN	–
Red-crested cardinal	*Paroaria coronata*	NN	–
Rock dove	*Columba livia*	NN	–
Ruddy turnstone	*Arenaria interpres*	N	X
Spotted dove	*Streptopelia chinensis*	NN	–
Wandering tattler	*Tringa incana*	M	X
White-rumped shama	*Copsychus malabaricus*	NN	–
White tern	*Gygis alba*	N	X
Yellow-fronted canary	*Serinus mozambicus*	NN	–
Zebra dove	*Geopelia striata*	NN	–
Total		**20**	**7**

*These ducks are likely hybrids of the native Hawaiian duck (*Anas wyvilliana*) and the introduced mallard (*Anas platyrhynchos*).

Mammals

The endangered Hawaiian hoary bat is the only native terrestrial mammal species that is still extant within the Hawaiian Islands (USFWS 1998). Hawaiian hoary bats are insectivores and are regularly observed foraging over streams, reservoirs, and wetlands (U.S. Department of Agriculture 2009). The waterways in the survey area would be considered suitable bat foraging habitat.

Hawaiian hoary bats typically roost in dense canopy foliage (or in the subcanopy when canopy is sparse) with open access for launching into flight (U.S. Department of Agriculture 2009). Hawaiian hoary bats have been observed roosting in Chinese banyan, kukui (*Aleurites moluccana*), milo, and rainbow shower tree (*Cassia* x *nealiae*) and could roost in these tree species in the landscaped vegetation type within the survey area. Other trees in the survey area also possess characteristics of roosting trees, and although not yet documented as Hawaiian hoary bat roost trees, they could be used as a day or night roost if bats were present. In addition, Hawaiian hoary bat foraging habitat occurs over the open water of the Ka‘elepulu Pond tributaries; this habitat is similar to the ponds and canal that are in the survey area’s ruderal and landscaped vegetation types.

The survey area is in Ala Moana Regional Park, a recreational park where it is common to find people walking their dogs (*Canis familiaris*). No mammals were observed during the pedestrian survey. Although the small Indian mongoose (*Herpestes javanicus*), feral cat (*Felis catus*), house mouse (*Mus musculus*), and rats (*Rattus* spp.) were not detected, they are likely to occur in the survey area.

Reptiles and Amphibians

No terrestrial reptiles or amphibians were detected. There are no terrestrial reptiles and amphibians native to the Hawaiian Islands.

Insects and Other Invertebrates

The non-native carpenter bee (*Xylocopa sonorina*) was the only invertebrate observed during the survey.

Aquatic Fauna

The survey for aquatic fauna in the canal and ponds was conducted on March 27, 2017.

Canal

The canal connects two ponds and runs parallel to Ala Moana Boulevard along the northern margin of the park. The western pond connects to Kewalo Basin through a culvert that runs under Ala Moana Park Drive where it enters the park at the western end. The eastern pond is connected by a 1-meter-diameter pipe to the Ala Wai Boat Harbor. This pipe runs under the eastern end of Ala Moana Park Drive.

The pedestrian survey for aquatic fauna began at 10:30 at the eastern pond where it connects to the canal. At this time, the tide was fairly low (0.1 meter, NOAA 2016b), and the margins of the pond were exposed. The canal was also dry in many paces (Figure 8).

Figure 8. Partly dry canal at the easement bridge.

This survey continued until the water was deep enough to deploy the grab samplers. High tide was 0.46 meter at 17:00, so the tide was rising during the entire the survey. Flow of water from the direction of Kewalo Basin, where the canal opens into the harbor, was observed during the survey. Once the water depth was sufficient for sampling, the length of the canal was walked from east to west. Grab samples were taken at three locations along the canal (Table 3; see Figure 15).

Table 3. Grab Sampling Results for the Canal

Location	Time	Bottom Type	Substratum	Organisms
C1	14:05	Soft bottom	Black silt with algae on the surface	Algae and snails
C2	14:15	Soft bottom	Black silt	Algae and snails
C3	15:50	Hard (concrete?)	Some coarse gravel	No organisms

The algae observed in the canal grab samples were *Acanthophora spicifera*, *Hypnea* sp., and *Gracilaria salicornia*. The *Gracilaria* occur as small loose fragments. These were probably washed into the canal from the reef. The 1.2-mm sieve only retained shells of the freshwater snail *Tarebia granifera*. These shells were empty, meaning they had probably washed into the canal from freshwater sources. The algae that appeared to be resident in the canal—*Acanthophora* and *Hypnea*—were colonized by small crustaceans (amphipods and tanaids). These crustaceans would have passed through the sieve if they had not been enmeshed in the algae.

The canal is dominated by abundant schools of cichlids (i.e., tilapia) (*Sarotherodon* and/or *Oreochromis* sp.) of all sizes. As water moves into the system, these tightly packed schools spread to the newly submerged sections of the canal (Figure 9).

Biological Resources Survey Report for Ala Moana Regional Park Master Plan, Island of O'ahu

Figure 9. School of tilapia dispersing as the water rises.

The canal has several openings. A large culvert passes water to and from Kewalo Basin at the western end of the system (Figure 10). Several other culverts to the canal pass under Ala Moana Boulevard. Because of the construction at Ala Moana, some of these culverts are fitted with barriers (Figure 11).

Figure 10. Opening of the culvert that transmits water between the Ala Moana Regional Park system and Kewalo Basin.

Figure 11. Openings into the canal from culverts passing under Ala Moana Boulevard. Only one has a detritus collector (right).

Water quality measurements were also taken at one location in the canal (at grab sample location C3). These data are discussed in the Water Quality results sections.

In summary, the canal can be characterized as a tidal conduit connecting the two ponds, which in turn, are connected to two marine inlets, the Kewalo Basin and the Ala Wai Boat Harbor. At low tides, much of the bottom of the canal is exposed, whereas at high tide, all surfaces are submerged. The bottom of the canal is a mixture of hard substrata (concrete in many places and gravel and rubble and fine black silt). No large infauna (benthic species) were found in the sediments in the canal, though algae, mostly unattached, were common and often moving with the tides. The algae were colonized by micro-invertebrates, but they were too small to be captured by the 1.2-mm sieve.

Western Pond

This western pond is directly connected to Kewalo Basin by a culvert that passes under Ala Moana Park Drive. The survey for the western pond began at 14:25 when the tide had reached 0.38 m. The flow of the incoming water was evident as was the surge from the offshore surf.

The northern banks of the pond have been invaded by mangroves (Figure 12), and the southern side has mowed lawn maintained by park personnel.

Figure 12. Margins of the western pond with mangroves on the north side (left) and open grass on the south side (right).

The shallow waters at the margin of the pond has dense populations of small tilapia and poeciliid fishes (either *Gambusia* or *Poecilia reticulata).* Samoan crabs (*Scylla serrata*) were also noted.

In the middle of the pond, large fish were seen jumping, but they could not be identified. Three grab samples were taken in the pond (Table 4; see Figure 15).

Table 4. Grab Sampling Results for the Western Pond

Location	Time	Bottom Type	Substratum	Organisms
W1	14:25	Soft bottom	Mostly gravel not too silty	Algae; many very small amphipods and taenids
W2	14:45	Soft bottom	Black silt	Dead, black plant matter and some crustacean exoskeletal parts; amphipods not abundant
W3	15:55	Soft bottom	Coarse sand and gravel; some silt, but washed off easily; some coarse gravel	No organisms

The grab samples comprised mostly gravel and sand; however, grab sample W1 (see Table 4) contained the same three algae species that were observed in the canal grab samples: *Acanthophora spicifera*, *Hypnea* sp., and *Gracilaria salicornia*. The presence of algae and the presence of silt in only one sample are a result of the tidal influence from the culvert that channels water from nearby Kewalo Basin. Water quality measurements were also taken at one location in the western pond (at grab sample location W2). These data are discussed in the Water Quality results sections.

Eastern Pond

The eastern pond is larger than the western pond (see Figure 15). It is divided into an eastern and a western basin by a narrow strait crossed by a bridge (Figure 13).

Figure 13. Eastern pond. East basin (left), isthmus and bridge (center), and west basin (right).

The eastern pond has large populations of tilapia. Most of the pond margins are covered in litter. The pond is used by model boat enthusiasts and is also used for fishing. Unlike the western pond, there are few mangroves, and the pond's littoral zone is cleared of vegetation. Two grab samples were taken in the larger west basin and one was taken in the east basin (Table 5; see Figure 15).

Table 5. Grab Sampling Results for the Eastern Pond

Location	Time	Bottom Type	Substratum	Organisms
E1	16:20	Soft bottom	Heavy black silt	No organisms
E2	16:45	Soft bottom	Heavy black silt	No organisms
E3	16:55	Soft bottom	Sticky black silt	No organisms

All three grab samples produced black silt with blackened vegetable matter and litter (Figure 14). There are no living macro-organisms in any of the samples.

Figure 14. Results of grab sample from the eastern pond (left): entire sample (right) after silt washed away.

The grab samples of the east pond produced similar substrate type throughout the pond. The thick black, lifeless mud indicates a lack of flow and tidal influence. The absence of tidal exchange allows detritus to settle and decompose, creating a thick layer of mud and silt at the bottom of the pond.

Water quality measurements were also taken at one location in the eastern pond (near grab sample location E2) (see Figure 15). These data are discussed in the Water Quality results sections.

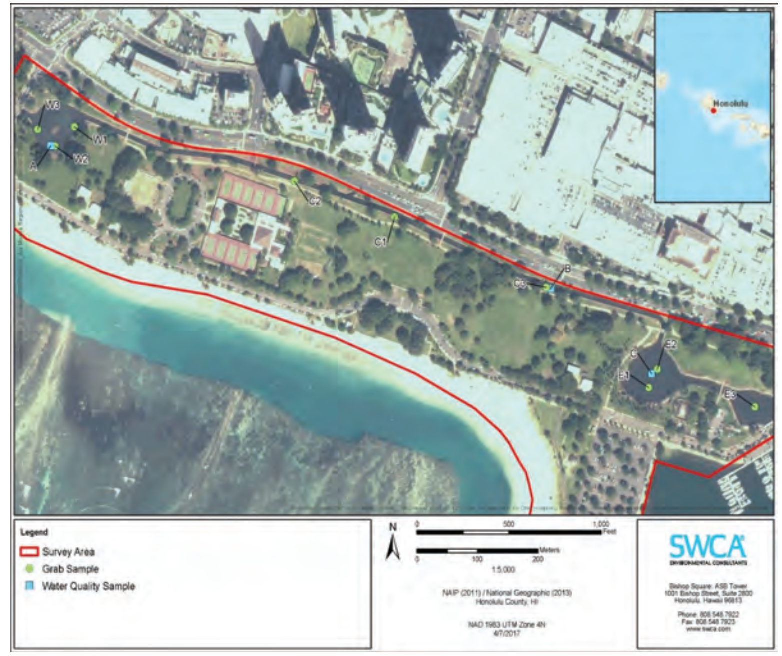


Figure 15. Canal and ponds benthic and water quality sample locations.

Water Quality

Detailed background research was conducted to obtain past data results and analyses to provide context for the water quality survey points; however, no historical data were found. Although water quality testing is performed regularly at several locations within Ala Moana Regional Park, they are all collected from the beach or ocean. These marine sample points are incomparable to the data collected within the system.

It is worth noting, according to the *2014 State of Hawai'i Water Quality Monitoring and Assessment Report* (Hawai'i State Department of Health 2014) and numerous other studies, that several waterbodies within the Ala Wai Watershed, of which Ala Moana Regional Park is a part, have been designated as impaired. In addition, the Ala Moana Beach (Diamond Head) survey point has been listed as Category 5 for turbidity, indicating that the waters do not meet water quality criteria for this parameter, and a total maximum daily load study is needed.

The results for the in situ and collected water samples in the canal and ponds are provided in Table 6.

Table 6. Water Quality Results for the Western Pond, Eastern Pond, and Canal

Parameter	Western Pond		Eastern Pond		Canal	
Depth (approximate inches)	6	15	6	35	60	6
Time	15:00	15:00	17:00	17:00	17:00	15:56
Temperature (°C)	24.93	24.52	25.97	25.77	25.01	26.66
Salinity (‰) (grams per liter)*	26.5	27.0	26.1	26.4	26.6	26.1
DO (milligrams per liter ([mg/L])	8.07	6.82	7.88	7.24	6.11	8.37
DO saturation (%)	116.9	98.5	102.9	106.1	88.7	124.2
pH	8.96	8.97	8.87	8.89	8.9	8.84
Estimated tide (feet)	1.79		1.07		1.43	
Turbidity (nephelometric turbidity unit)	8.6		3.2		5.0	
Secchi depth (inches)	18/bottom		67		7/bottom	
TSS (mg/L)†	2.0		4.0		6.0	

*Salinity was above 0.5 parts per thousand (ppt); estuary WQS were used for comparison.

† Method detection level for TSS = 1.0.

The USFWS National Wetlands Inventory program identifies two estuarine classifications within the pond system. Most of the system is identified as an excavated, subtidal estuarine system with an unconsolidated bottom (E1UBLx). A portion of the western pond is classified as an intertidal estuarine system with broad-leaf evergreen scrub-shrub vegetation that is regularly flooded (E2SS3N). These classifications are generally supported by field observations as well as the salinity values collected in the field. Therefore, SWCA is comparing the collected data with the metrics described in HAR 11-54 WQS (Table 7) for estuaries. HAR 11-54 provides specific values for estuaries and brackish coastal waters (salinity above 0.5 parts per thousand [ppt]). It should be noted, however, that the data collected by SWCA can only provide background information about the waterbody and is not sufficient for determining compliance with the WQS.

Table 7. Pertinent HAR 11-54 Water Quality Standards for Estuaries

Parameter	Water Quality Standards
Temperature	Shall not vary more than 1 degree Celsius (°C) from ambient condition
DO (%)	Not less than 75% saturation
Salinity (‰)	Shall not vary more than 10% from ambient conditions
pH	7.0–8.6
Turbidity (nephelometric turbidity unit)	Geometric mean not to exceed 1.5 Not to exceed 3 more than 10% of the time Not to exceed 5 more than 2% of the time
TSS (mg/l)	N/A

Measured pH values exceeded the acceptable range by 0.2 to 0.3 at all locations. Turbidity values exceeded the mean standard. DO saturation values exceeded the 75% saturation standard.

Currently, there is no accepted water quality standard for TSS for estuaries; therefore, there is no definitive criterion to which the TSS results can be compared. Similarly, salinity and DO concentration WQS are based on deviation from ambient conditions and therefore cannot be assessed against the WQS.

DISCUSSION AND RECOMMENDATIONS

Terrestrial Flora

The vegetation types and species identified during the survey are not considered unique, and none of the naturally occurring native plant species recorded at the site are threatened or endangered, proposed for listing, or candidate plants. Ninety percent of the plant species observed in the survey area are not native to the Hawaiian Islands. However, some of these non-native species are designated as exceptional trees, affording them protection under the Exceptional Tree Act (Act 105). Any action that may endanger these plants is reviewed by the Arborist Advisory Committee of the City and County of Honolulu. A map of protected trees is provided by the Outdoor Circle at their website. With the exception of these exceptional trees, the proposed project is not expected to have a significant, adverse impact on botanical resources.

Weedy non-native plant species are common in the survey area. Most of these weedy species are widespread in Hawai‘i, and their control is not expected to result in a significant decrease in their number or distribution. However, construction activities are known to spread invasive species to new areas through the movement of vehicles and materials. For this reason, SWCA recommends the following invasive species minimization measures to avoid the unintentional introduction or transport of new terrestrial invasive species to O‘ahu:

- All construction equipment and vehicles arriving from outside O‘ahu should be washed and inspected before entering the survey area.
- Construction materials arriving from outside of O‘ahu should also be washed and/or visually inspected (as appropriate) for excessive debris, plant materials, and invasive or harmful non-native species (plants, amphibians, reptiles and insects).
- Inspection and cleaning activities should be conducted at a designated location prior to entry to the project site. The inspectors should be qualified botanists and/or entomologists able to identify invasive species that are of concern relevant to the point of origin of the equipment, vehicle, or material.
- When possible, raw materials (e.g., gravel, rock, soil) should be purchased from a local supplier on O‘ahu to avoid introducing non-native species not present on the island.
- If landscaping occurs as part of the project, native Hawaiian plants or non-invasive plants should be used to the maximum extent possible. Additional information on selecting appropriate (non-invasive) plants for landscaping can be obtained from the following online sources:
  - http://www.nativeplants.Hawaii.edu/
  - http://www.plantpono.org/non-invasive-plants.php
  - http://www.hear.org/alternativestoinvasives/pdfs/mcaac_hpwra_a2i_list.pdf
  - http://www.hear.org/oisc/oahuearlydetectionproject/pdfs/oedposterwhatnottoplant.pdf

Terrestrial Fauna

One state-threatened species—the white tern—was recorded in the survey area. One additional federally and state endangered fauna that may occur in the survey area based on the available habitat is the Hawaiian hoary bat. Other threatened and endangered species were considered initially but dismissed from further analysis because of a lack of suitable habitat or because the survey area is out of their habitat range.

Federally and State-Listed Species

WHITE TERN

The white tern is the only state-listed (threatened) species observed in the survey area and is also protected under the MBTA. On O'ahu, white terns most commonly nest in trees, such as banyan (*Ficus* spp.), monkeypod (*Samanea saman*), and kukui, although other species have been used for nesting and roosting (Vanderwerf 2003). White terns were not specifically observed nesting in the survey area, but suitable nest trees are present.

The white tern lays eggs directly on branches; therefore, eggs and flightless chicks may be vulnerable to displacement and fatality from tree trimming and removal activities (Vanderwerf 2003). This species nests year-round, but egg production decreases in the fall and early winter. The mitigation measures identified below for this species would decrease the probability of chick fatality.

Construction at the site may temporarily displace white terns from nesting and roosting habitat, however long-term impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable habitat nearby. The temporary displacement of these individuals at the survey area is not expected to affect individual's survival or the overall species' populations.

Avoidance and mitigation measures to avoid white tern impacts include the following:

- Tree removal and trimming should be conducted in the fall and early winter when white tern breeding is at its lowest (Vanderwerf 2003).
- Trees should be inspected for white tern eggs or chicks before trees are removed.
- If a white tern nest or chick is found, the tree should not be trimmed or removed until the chick has fledged.

HAWAIIAN HOARY BAT

Hawaiian hoary bats occur on O'ahu in native, non-native, agricultural, and developed landscapes (U.S. Department of Agriculture 2009; USFWS 1998). Hawaiian hoary bats forage in open, wooded, and linear habitats with a wide range of vegetation types. These animals are insectivores and are regularly observed foraging over streams, reservoirs, and wetlands up to 300 feet (100 m) offshore (U.S. Department of Agriculture 2009). Hawaiian hoary bats typically roost in trees greater than 16 feet (5 m) with dense canopy foliage or in subcanopy when canopy is sparse, with open access for launching into flight (Gorresen et al. 2013; U.S. Department of Agriculture 2009). Hawaiian hoary bats have been documented roosting in Chinese banyan, coconut, kukui, milo, and rainbow shower trees and may roost in other trees in the survey area. However, direct effects to bats would only occur if a juvenile bat that is too small to fly but too large to be carried by a parent were present in a tree that was cut down.

Direct impacts to bats could occur during vegetation removal if a juvenile bat that is too small to fly but too large to be carried by a parent is present in a tree or branch that is cut down. To prevent direct impacts to the Hawaiian hoary bat, the following measures are recommended:

- No trees taller than 15 feet (4.6 m) in the survey area should be trimmed or removed between June 1 and September 15 when flightless juvenile bats may be roosting in the trees.
- Any fences that are erected as part of the project should have a barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire.

Implementation of these guidelines, which have been promulgated by the USFWS (1998), are expected to avoid all direct impacts to Hawaiian hoary bats. Because all impacts on the Hawaiian hoary bat will be discountable, the proposed action *may affect, but is not likely to adversely affect*, individuals or populations of the species.

Migratory Bird Treaty Act

SWCA observed seven bird species federally protected under the MBTA during this survey. These species consist of the black-crowned night-heron, cattle egret, Hawaiian duck-mallard hybrids, Pacific golden-plover, ruddy turnstone, wandering tattler, and white tern (see Table 2). Of these, the Pacific golden-plover, ruddy turnstone, and wandering tattler do not nest in Hawai'i. The recommendations for the state-threatened white tern are discussed above in the Federally and State-Listed Species section. Construction in the survey area may temporarily displace some of these bird species; however, long-term effects are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat in nearby areas. The temporary displacement of these individuals at the project site is not expected to affect individual survival or the overall species populations.

Aquatic Fauna

The Ala Moana Regional Park waterway consists of two ponds connected by one canal. Each pond has a connection to the sea, although the western pond's connection is larger. The entire park waterway is human-made. The canal has vertical concrete walls, and in some places the bottom is evidently concrete. There are several large openings into the northern wall of the canal from culverts that pass under Ala Moana Boulevard. The entire waterway is tidal, and at low tide, the canal has no water except in scattered deeper portions. Under the rising tide conditions during the survey, the net flow appeared to be to the north, into these culverts. However, during storm events, these culverts can drain water into the canal. The presence of dead freshwater snails in the sediments indicates that this does occur. There were also several other smaller pipe drains leading into the canal. None of these had flowing water on the day of the survey. It is unclear where they originate and what their purpose is.

The condition of the waterway is heavily influenced by the heavy use of the park. All parts of the system are cluttered with litter, ranging from cups and cans to large pieces of cloth and plastic. The entire system has dense populations of tilapia. These move throughout the system as the canal fills and drains with the tidal flux. The western pond also has large numbers of poeciliid fishes. These likely occur throughout the system but were not identified. It is likely that some marine fishes can enter the western pond on rising tides, but if they do, there is no evidence of them in the canal.

The sediments in the canal varied according to the location. Stretches with hard bottom could not be sampled with the grab sampler. In some cases, it appeared that the bottom of the canal was the concrete used in its construction. In other places, there was enough accumulation of soft sediments that the grab sampler could be used. The deeper locations had black silty muds, whereas shallower areas had sand and fine gravel. There were no infauna found in any of the grab samples. Three species of marine algae were found throughout the canal system and in the western pond. These algae generally rested on the bottom at low tide and were moved about when the tide was in. The only plants that appeared to be attached and growing in the canal were mangroves.

The western pond had sediments of different types in different areas. Sites close to the culvert where water from Kewalo Basin entered the system tended to be coarser with sand and small gravel. The grab sample closest to the point where the canal left the pond had black silty mud. These differences are probably the result of differential water movement in different places of the pond. Areas with more water flow had coarser sediments. No infauna were found in the sediments, but the three algal species seen in the canal also occurred in this pond.

Sediments in all three grab samples in the eastern pond comprised dense sticky mud. No infauna were found. Most of the exchange with ocean water appears to take place at the western end of the system. Water motion in the western pond is relatively high when the tides are changing. Water motion appears to decrease toward the east.

In summary, the substrate of the western pond consists of lose sand and gravel with algae and aquatic microorganisms present. The samples from the east pond yielded no living organisms with a thick, black soft substrate. The two ponds are both filled by culverts that channel water in from the ocean as the tides rise and fall and are connected by a single canal. The samples reveal that the tidal influence and exchange of water between the ponds differ significantly.

Water Quality

Ala Moana Regional Park has had numerous water quality problems in the past. These have included numerous sewage spill incidents that have led to beach warnings along the coastline from Sand Island to Diamond Head. The ponds are not used by swimmers, but they are aesthetically valuable to tourists as a point of attraction as well as a regular recreational spot for residents. Trash and other debris were observed within the canal and the eastern pond, which is not surprising given its location in urban O‘ahu.

The following best management practices are recommended during and after construction to protect water quality in the park waterway:

- Erosion- and sediment-control measures should be in place before earth-moving activities begin. Functionality should be maintained throughout the construction period.
- Turbidity and siltation from project-related work should be minimized and contained through the appropriate use of erosion-control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
- Fueling of land-based vehicles and equipment should take place at least 15.24 m (50 feet) away from the water, preferably over an impervious surface.
- No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
- Construction should be avoided during periods of heavy rainfall periods or other adverse weather conditions.

LITERATURE CITED

Frazier, A.G., T.W. Giambelluca, H.F. Diaz, and H.L. Needham. 2016. Comparison of geostatistical approaches to spatially interpolate month-year rainfall for the Hawaiian Islands. *International Journal of Climatology* 36(3):1459–1470. doi:10.1002/joc.4437.

Gorresen M.P., F.J. Bonaccorso, C.A. Pinzari, C.M. Todd, K. Montoya-Aiona, and K. Brinck, K. 2013. A Five-year Study of Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) Occupancy on the Island of Hawai‘i (HSCU-041). Hawai‘i Cooperative Studies Unit, Hilo.

Hawai‘i State Department of Health. 2014. *Draft 2014 State of Hawaii Water Quality Monitoring and Assessment Report*. Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections 303(D) and 305(B), Clean Water Act (Public Law 97-117).

National Oceanic and Atmospheric Administration (NOAA). 2016a. National Weather Service, Weather Forecast Office. Hydrology in Hawai‘i. Available at: http://www.prh.noaa.gov/hnl/pages/hydrology.php. Accessed April 10, 2017

National Oceanic and Atmospheric Administration (NOAA). 2016b. Center for Operational Oceanographic Products and Services. Tides & Currents. Water Levels. Available at: https://tidesandcurrents.noaa.gov/waterlevels.html?id=1612340&units=standard&bdate=20170327&edate=20170327&timezone=GMT&datum=MLLW&interval=6&action=. Accessed April 10, 2017

Staples, G.W. and D.R. Herbst. 2005. *A Tropical Garden Flora: Plants Cultivated in the Hawaiian Islands and Other Tropical Places*. Honolulu, Hawai‘i: Bishop Museum Press.

The Outdoor Circle. 2017. Exceptional Trees. Available at: http://www.outdoorcircle.org/exceptional-trees.html. Accessed April 19, 2017.

U.S. Department of Agriculture. 2009. *Bats of the U.S. Pacific Islands*. Biology Technical Note No. 20. Natural Resources Conservation Service, Pacific Islands Area.

U.S. Fish and Wildlife Service (USFWS). 1998. *Recovery Plan for the Hawaiian Hoary Bat (Lasiurus cinereus semotus).* Portland, Oregon: U.S. Fish and Wildlife Service, Region 1.

Vanderwerf, E. 2003. Distribution, Abundance, and Breeding Biology of White Terns on Oahu, Hawaii. *The Wilson Bulletin* 115(3):258–262.

Wagner, W.L., and D.R. Herbst. 2003. *Supplement to the Manual of the Flowering Plants of Hawai‘i.* Version 3.1 (12 Dec 2003).

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999. *Manual of the Flowering Plants of Hawai‘i.* Volumes I and II. Revised edition. Honolulu: University of Hawai‘i Press.

Wagner, W.L., D.R. Herbst, N. Khan, and T. Flynn. 2012. Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai‘i and Hawai‘i’s Ferns and Fern Allies. Version 1.3.

Appendix A.

Checklist of Plants Observed during surveys for the Ala Moana Regional Park on March 17, 2017

Table A1 provides an inventory checklist of plant species observed by SWCA on March 17, 2017, during surveys for the Ala Moana Regional Park. The plant names are arranged alphabetically by family and then by species into two groups: monocots and dicots. The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999), Wagner and Herbst (2003), and Staples and Herbst (2005). Recent name changes are recorded in Wagner et al. (2012).

Table notes: P-Polynesian introduced, P?- probably Polynesian introduced but possibly introduced in historic times, I- indigenous, I?- probably indigenous but possibly naturalized, E- endemic, E?- probably endemic but possibly naturalized (Wagner et al. 1999:126–127), X- non-native, X*- non-native cultivated.

Table A1. Checklist of Plants Observed During Flora Surveys for the Ala Moana Regional Park on March 17, 2017

Family	Scientific Name and Authorship	Hawaiian and/or Common Name	Status
MONOCOTS			
Arecaceae	*Adonidia merrillii* (Becc.) Becc.	Manila palm	X*
Arecaceae	*Archontophoenix alexandrae* (F.Muell.) H.Wendl. & Drude	king palm	X
Arecaceae	*Cocos nucifera* L.	niu, ololani, coconut	P
Arecaceae	*Livistona chinensis* (Jacq.) R.Br. ex Mart.	Chinese fan palm, fountain palm	X
Arecaceae	*Phoenix* hybrid	–	X
Arecaceae	*Pritchardia affinis* Beccari	–	X*
Arecaceae	*Pritchardia hillebrandii* Becc.	loulu lelo, loulu	E
Arecaceae	*Pritchardia thurstonii* F. Mueller & Drude	–	X*
Arecaceae	*Pritchardia pacifica* Seem. & H.Wendl.	–	X*
Arecaceae	*Roystonea regia* (Kunth) O.F.Cook	–	X
Arecaceae	*Sabal mauritiiformis* (H. Karsten) Grisebach	–	X*
Arecaceae	*Sabal palmetto* (T. Walter) J. A. & J. H. Schultes	–	X*
Cyperaceae	*Cyperus gracilis* R.Br.	McCoy grass, mau'u hunehune	X
Cyperaceae	*Cyperus rotundus* L.	nut grass, kili'o'opu, mau'u mokae	X
Pandanaceae	*Pandanus tectorius* Parkinson ex Z	hala, pū hala, screwpine	I?
Poaceae	*Axonopus compressus* (Sw.) P.Beauv.	–	X
Poaceae	*Bothriochloa pertusa* (L.) A.Camus	pitted beardgrass	X

Table A1. Checklist of Plants Observed During Flora Surveys for the Ala Moana Regional Park on March 17, 2017

Family	Scientific Name and Authorship	Hawaiian and/or Common Name	Status
Poaceae	*Cenchrus ciliaris* L.	buffelgrass	X
Poaceae	*Cenchrus echinatus* L.	common sandbur, ʻumeʻalu, mauʻu kukū	X
Poaceae	*Cynodon dactylon* (L.) Pers.	Bermuda grass, mānienie, mānienie haole	X
Poaceae	*Dactyloctenium aegyptium* (L.) Willd.	beach wiregrass	X
Poaceae	*Digitaria ciliaris* (Retz.) Koeler	Henry's crabgrass, kūkaepuaʻa	X
Poaceae	*Eragrostis amabilis* (L.) Wight & Arn.	lovegrass	X
Poaceae	*Stenotaphrum secundatum* (Walter) Kuntze	St. Augustine grass, buffalo grass, ʻakiʻaki haole, mānienie ʻakiʻaki, mānienie ʻakiʻaki haole, mānienie māhikihiki	X
DICOTS			
Acanthaceae	*Pseuderanthemum carruthersii* (Seeman) Guillaumin	–	X*
Aizoaceae	*Sesuvium portulacastrum* (L.) L.	ʻākulikuli, sea purslane	I
Amaranthaceae	*Alternanthera pungens* Kunth	khaki weed	X
Apocynaceae	*Plumeria obtusa* L.	Singapore plumeria	X*
Apocynaceae	*Thevetia peruviana* (Pers.) K.Schum.	be-still tree, yellow oleander, lucky nut, nohomālie	X
Araliaceae	*Polyscias racemosa* (C.N.Forbes) Lowry & G.M.Plunkett	–	E
Araliaceae	*Schefflera actinophylla* (Endl.) Harms	octopus tree, umbrella tree	X
Asteraceae	*Calyptocarpus vialis* Less.	–	X
Asteraceae	*Carthamus tinctorius* L.	safflower	X*
Asteraceae	*Eclipta prostrata* (L.) L.	false daisy	X
Asteraceae	*Flaveria trinervia* (Spreng.) C.Mohr	–	X
Asteraceae	*Pluchea indica* (L.) Less.	Indian fleabane, Indian pluchea, marsh fleabane	X
Berberidaceae	*Nandina domestica* Thunberg	heavenly bamboo	X*
Bignoniaceae	*Catalpa longissima* (Jacq.) Dum.-Cours.	–	X
Bignoniaceae	*Crescentia cujete* L.	calabash tree	X*
Bignoniaceae	*Dolichandrone spathacea* (Linnaeus filius) K. Schumann	mangrove trumpet tree	X*

Table A1. Checklist of Plants Observed During Flora Surveys for the Ala Moana Regional Park on March 17, 2017

Family	Scientific Name and Authorship	Hawaiian and/or Common Name	Status
Bignoniaceae	*Kigelia africana* (Lamarck) Bentham	sausage tree	X*
Bignoniaceae	*Tabebuia donnell-smithii* Rose	gold tree	X*
Bignoniaceae	*Tabebuia heterophylla* (DC.) Britton	–	X
Bignoniaceae	*Tabebuia rosea* (Bertol.) DC.	–	X
Bombacaceae	*Adansonia digitata* L.	baobab	X*
Bombacaceae	*Bombax ceiba*	red silk-cotton tree	X*
Boraginaceae	*Cordia subcordata* Lam.	kou	I
Boraginaceae	*Heliotropium curassavicum* L.	kīpūkai, nena, seaside heliotrope, lau poʻopoʻohina (Niʻihau)	I
Boraginaceae	*Tournefortia argentea* L.f.	tree heliotrope	X
Brassicaceae	*Coronopus didymus* (L.) Sm.	swinecress	X
Caryophyllaceae	*Spergularia marina* (L.) Griseb.	saltmarsh sand spurry, mimiʻīlio	X
Celastraceae	*Elaeodendron orientale* N. Jacquin	false olive	X*
Clusiaceae	*Calophyllum inophyllum* L.	kamani, kamanu, Alexandrian laurel	P
Clusiaceae	*Clusia rosea* Jacq.	autograph tree, copey, Scotch attorney	X
Combretaceae	*Conocarpus erectus* L.	sea mulberry, buttonwood, button mangrove	X
Euphorbiaceae	*Aleurites moluccana* (L.) Willd.	kukui, kuikui, candlenut	P
Euphorbiaceae	*Euphorbia prostrata* Aiton	prostrate spurge	X
Fabaceae	*Albizia lebbeck* (L.) Benth.	siris tree, woman's tongue, ʻohai (Niʻihau)	X
Fabaceae	*Cassia fistula L.*	golden shower tree	X*
Fabaceae	*Cassia* x *nealiae* H.S. Irwin & Barneby	rainbow shower tree	X*
Fabaceae	*Delonix regia* (Bojer ex Hook.) Raf.	royal poinciana, flame tree, flamboyant, ʻohai ʻula	X
Fabaceae	*Enterolobium cyclocarpum* (Jacq.) Griseb.	–	X
Fabaceae	*Indigofera suffruticosa* Mill.	indigo, ʻinikō, ʻinikoa, kolū	X
Fabaceae	*Leucaena leucocephala* (Lam.) de Wit	koa haole, ēkoa, lilikoa	X
Fabaceae	*Melilotus indica* (L.) All.	sweet clover	X
Fabaceae	*Peltophorum pterocarpum* (DC.) K.Heyne	–	X

Table A1. Checklist of Plants Observed During Flora Surveys for the Ala Moana Regional Park on March 17, 2017

Family	Scientific Name and Authorship	Hawaiian and/or Common Name	Status
Fabaceae	*Piscidia piscipula* (L.) Sargent	–	X
Fabaceae	*Pithecellobium dulce* (Roxb.) Benth.	ʻopiuma	X
Fabaceae	*Platymiscium stipulare* Benth.	–	X
Fabaceae	*Pterocarpus indicus* Willd.	narra	X*
Fabaceae	*Samanea saman* (Jacq.) Merr.	monkeypod, rain tree, ʻohai, pū ʻohai	X
Fabaceae	*Schotia brachypetala* Sonder	–	X*
Fabaceae	*Tamarindus indica* L.	tamarind	X
Fabaceae	*Tipuana tipu* (Bentham) Kuntze	tipa	X*
Fabaceae	*Wallaceodendron celebicum* Koorders	banuyo	X*
Goodeniaceae	*Scaevola taccada* (Gaertn.) Roxb.	naupaka kahakai, huahekili, naupaka kai, auaka (Niʻihau)	I
Lauraceae	*Cinnamomum camphora* (L.) J.Presl	camphor tree	X
Malvaceae	*Hibiscus tiliaceus* L.	hau	I
Malvaceae	*Lagunaria patersonii* (H. C. Andrews) G. Don	–	X*
Malvaceae	*Sida ciliaris* L.	–	X
Malvaceae	*Thespesia populnea* (L.) Sol. ex Corrêa	milo, portia tree	I
Moraceae	*Ficus benghalensis* L.	Indian banyan	X*
Moraceae	*Ficus benjamina* L.	weeping fig	X*
Moraceae	*Ficus microcarpa* L.f.	Chinese banyan, Malayan banyan	X
Nyctaginaceae	*Boerhavia coccinea* Mill.	–	X
Ochnaceae	*Ochna thomasiana* Engl. & Gilg	–	X
Oleaceae	*Ligustrum japonicum* Thunberg	Japanese privet	X*
Oleaceae	*Olea europaea* subsp. *europaea*	olive, ʻoliwa, ʻoliwa haole	X
Plantaginaceae	*Plantago major* L.	broad-leaved plantain, common plantain, laukahi, kūhēkili	X
Polygonaceae	*Coccoloba uvifera* (L.) L.	sea grape	X
Rhizophoraceae	*Rhizophora mangle* L.	American mangrove, red mangrove	X
Rosaceae	*Rhaphiolepis umbellata* (Thunberg) Makino	–	X*

Table A1. Checklist of Plants Observed During Flora Surveys for the Ala Moana Regional Park on March 17, 2017

Family	Scientific Name and Authorship	Hawaiian and/or Common Name	Status
Rubiaceae	*Morinda citrifolia* L.	noni, Indian mulberry	P
Rutaceae	*Murraya paniculata* (L.) Jack	–	X
Sapindaceae	*Sapindus saponaria* L.	aʻe, mānele	I
Solanaceae	*Solanum lycopersicum* var. *cerasiforme* (Dunal) D.M.Spooner, G.J.Anderson & R.K.Jansen	tomato, ʻōhiʻa lomi, kamako, ʻōhiʻa, ʻōhiʻa haole	X
Sterculiaceae	*Guazuma ulmifolia* Lamarck	–	X*
Sterculiaceae	*Heritiera littoralis* Dryand.	looking-glass tree	X
Sterculiaceae	*Sterculia apetala* (Jacq.) H.Karst.	–	X
Sterculiaceae	*Waltheria indica* L.	ʻuhaloa, ʻalaʻala pū loa, hala ʻuhaloa, hiʻaloa, kanakaloa	I?
Verbenaceae	*Citharexylum spinosum* L.	fiddlewood	X
Verbenaceae	*Vitex negundo* L.	–	X*
Zygophyllaceae	*Guaiacum officinale* L.	–	X

PAGE IS INTENTIONALLY LEFT BLANK

APPENDIX F-1

Baseline Assessment of the Marine Environment Ala Moana Regional Park Beach Replenishment Honolulu, Hawaiʻi

PAGE IS INTENTIONALLY LEFT BLANK

BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT
ALA MOANA REGIONAL PARK BEACH REPLENISHMENT
HONOLULU, HAWAII

Prepared for:

Sea Engineering, Inc.
Makai Research Pier
41-305 Kalanianaole Hwy
Waimanalo, HI 96795

By:

MARINE RESEARCH CONSULTANTS, INC.
1039 WAAKAUA PL.
HONOLULU, HI 96822

June 2018

I. INTRODUCTION AND PURPOSE

In 2016, the City and County of Honolulu addressed the heavily eroded and rocky shoreline area at Ala Moana Regional Park by commissioning a project to relocate rocks from the beach face and to move sand from wider areas of the beach. The project was intended to produce a noticeable impact on the shoreline without the need for a full suite of permits. As such, DLNR allowed rock to be removed from the beach face as long as it did not leave the beach system. In July of 2016 an estimated 300 cubic yards of rock was relocated from the beach face to the back of the beach where it was buried. Sand was moved in October of 2016 from wider parts of the beach to the eroded area. The sand was placed inshore of the high tide line, thereby limiting the extensive permitting process required for placing sand in the water. This project, however, could only move approximately 1,500 cubic yards of sand into the eroded area.

The beach at Ala Moana Regional Park does not have a natural source of sand, and sand moving toward shore over the reef flat is blocked from reaching the beach by the deep swimming channel. The City wishes to artificially nourish the beach with sand to address the erosion problem and to cover the exposed rocks at the shoreline. The beach nourishment project is part of a master plan to produce improvements to the park, and an Environmental Impact Statement (EIS) has been commissioned. This report, intended to support the EIS, provides results of field assessments of the physical, chemical, and biological composition of nearshore waters encompassing the areas where sand nourishment will occur in Ala Moana Regional Park.

II. WATER QUALITY

A. Water Quality Methods

The purpose of the water quality assessment is to provide a quantitative depiction of the existing condition of marine water chemistry in the area that has the potential to be affected by the proposed beach nourishment project. Evaluation of the existing condition of the water chemistry provides an insight into the physical and chemical factors that influence the marine setting. Understanding the existing physical and chemical conditions of the marine environment that presently occur provides a basis for predicting the potential affects that might occur as a result of the proposed project.

Water chemistry field collection was conducted on April 30, 2018. Water chemistry was assessed by collecting four linear sets of samples (i.e. transects) extending perpendicular from the shoreline, extending from the highest wash of waves to the boundary of the dredged basin and undredged reef flat (Figure 1). All samples were collected by investigators working from stand-up paddleboards. Transect 1 was located off the east end of the Park basin and extended to the end of the channel bordering Magic Island. Transects 2 and 3 extended from the central regions of the Park through the dredged swimming basin, while transect 4 was located at the western end of the swim basin adjacent to Kewalo Basin (Figure 1).

Water samples were collected at five locations (six on transect 1) along each transect starting at the most landward area of water adjacent to the beach. Such a sampling scheme is designed to span the greatest range of salinity with respect to potential freshwater efflux at the shoreline. Sampling was more concentrated in the nearshore zone because this area is closest to the region where sand nourishment will occur, and hence is most important with respect to identifying the effects of shoreline modification. At sampling stations within 15 meters (m) of the shoreline, water samples were collected at a single depth approximately in the mid-point of the water column. Beyond 15 m from the shoreline two samples were collected at each station; a surface sample was collected within 10 centimeters (cm) of the air-water interface and a bottom sample was collected within 20 cm of the seafloor.

Water quality parameters evaluated included all specific criteria designated for open coastal waters in Chapter 11-54, Section 06 (b) (Open Coastal waters) of the State of Hawaii Department of Health (DOH) Water Quality Standards. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen (NO_3^- + NO_2^-, hereafter referred to as NO_3^-), ammonium nitrogen (NH_4^+), total phosphorus (TP), chlorophyll a (Chl *a*), turbidity, temperature, pH, and salinity. In addition, silica (Si) and orthophosphate phosphorus (PO_4^{-3}) were also reported because these parameters are sensitive indicators of biological activity and the degree of groundwater mixing.

Water samples were collected by filling pre-rinsed 500-milliliter (ml) acid-washed, triple rinsed, polyethylene bottles and stored on ice. Analyses for Si, NH_4^+, PO_4^{3-}, and NO_3^- were performed with a Technicon Autoanalyzer using standard methods for seawater analysis (Strickland and Parsons 1968, Grasshoff 1983). TN and TP were analyzed in a similar fashion following digestion. Total organic nitrogen (TON) and total organic phosphorus (TOP) were calculated as the difference between TN and dissolved inorganic N, and TP and dissolved inorganic P, respectively.

Water for other analyses was sub-sampled from 1-liter polyethylene bottles and kept chilled until analysis. Chl *a* was measured by filtering enough water through glass-fiber filters to detect color; pigments on filters were extracted in 90% acetone in the dark at -20 ºC for 12-24 hours. Fluorescence before and after acidification of the extract was measured with a Turner Designs fluorometer. Salinity was determined using an AGE Model 2100 laboratory salinometer with a readability of 0.01 parts per thousand (‰ or ppt). Turbidity was determined using a 90-degree nephelometer and reported in nephelometric turbidity units (NTU) (precision of 0.01 NTU). Vertical profiles of salinity, temperature, and depth were acquired using a RBR-Concerto CTD calibrated to factory standards.

EPA and Standard Methods (SM) methods that were employed for chemical analyses, as well as detection limits, are listed in the Code of Federal Regulations (CRF) Title 40, Chapter 1, Part 136, are as follows:

NH_4^+: EPA 350.1, Rev. 2.0 or SM4500-NH3 G, detection limit 0.42 µg/L.
NO_3^- + NO_2^-: EPA 353.2, Rev. 2.0 or SM4500-NO3F, detection limit 0.28 µg/L
PO_4^{-3}: EPA 365.5 or SM4500-P F, detection limit 0.31 µg/L.
Total P: EPA 365.1, Rev. 2.0 or SM4500-P E J, detection limit 0.62 µg/L.
Total N: SM 4500-N C., detection limit 5.60 µg/L.
Si: EPA 370.1 or SM 4500 SiO2 E, detection limit 5.32 µg/L.
Chlorophyll *a*: SM 10200, detection limit 0.006 µg/L.
pH: EPA 150.1 or SM4500H+B, detection limit 0.002 pH units
Turbidity: EPA 180.1, Rev. 2.0 or SM2130 B, detection limit 0.008 NTU.
Temperature: SM 2550 B, detection limit 0.01 degrees centigrade.
Salinity: SM 2520, detection limit 0.003 ppt.
Dissolved Oxygen: SM4500 O G, and detection limit 0.01% sat.

Dr. Steven Dollar and Ms. Andrea Millan conducted all fieldwork. Marine Analytical Specialists located in Honolulu, HI, (Labcode: HI 00009) conducted all laboratory analyses. This analytical laboratory possesses acceptable ratings from EPA-compliant proficiency and quality control testing.

B. Water Quality Results

1. Distribution of Chemical Constituents

The overall distribution of water chemistry constituents reflects the physical structure of the coastal area. The shoreline consists of a coarse sand beach with areas of exposed rubble and rock. The seaward edge of the linear dredged swim channel basin is bounded by a sharp edge cut in the shallow fossil reef flat that extends to the outer reef crest. Water depth is 10-15 feet in the swim channel. At the east side of the Park, an elongated channel extends from the shoreline along the edge of Magic Island and terminates at the reef crest. As there are no deep open channels leading from the open ocean to the inner basin, water circulation within the dredged area is driven mainly by tidal exchange and water flow across the shallow reef flat. As a result, water quality within the nearshore basin is affected by the long residence time.

Table 1 shows results of all water chemistry analyses on samples collected off the Ala Moana Regional Park beach on April 30, 2018. Concentrations of eight dissolved nutrient constituents are plotted as functions of distance from the shoreline in Figure 2. Values of salinity, Chl *a*, turbidity, pH, temperature, and dissolved oxygen are plotted as functions of distance from shore are shown in Figure 3.

Several patterns of distribution are evident in Table 1 and Figures 2 and 3. Most evident is that there are elevated values of several nutrient constituents at the shoreline on several of the transects. The values of Si are elevated at the shoreline of Transect 2, coupled with an anomalously low value of salinity (Figure 3). This pattern is indicative of freshwater entering the ocean at the shoreline. As this pattern is only evident at one site, it can be assumed that this is not the normal situation along the entire beach front.

The values of dissolved nutrients (NO_3^-, NH_4^+, and TN) all show a general trend of elevated values at the shoreline with decreasing concentrations through the swimming channel. This trend is most apparent at Transect 1, where the values at the shoreline are substantially elevated relative to values at the shoreline of the other three transects. As there is no indication of depressed salinity in the nearshore waters of Transect 1, the source of these elevated nutrients is not from groundwater input.

Nutrient composition throughout the swimming channel is relatively consistent on all transects. In the channel bounding the west side of Magic Island, nutrient

concentrations are overall lower than in the swimming channel and show consistent values between the sampling locations 250 m and 400 m from the shoreline.

Considering physical properties of the water column, turbidity, chlorophyll *a*, temperature, dissolved oxygen, and pH all display similar patterns, with peak values at the shoreline, and decreasing values with distance seaward (Figure 3). As with nutrients, the lowest values occur in the Magic Island channel.

In summary, at locations close to the shoreline at Ala Moana Regional Park most water chemistry constituents exhibit elevated values. Throughout the swimming channel, water chemistry is similar throughout the Park. The water column in the channel adjacent to Magic Island seaward of the swimming channel is characteristic of open coastal water conditions.

2. Compliance with DOH Criteria

State of Hawaii Department of Health Water Quality Standards (HDOH-WQS) that apply to the areas offshore of the Ala Moana Regional Park are listed as “open coastal water” in HRS Chapter §11-54-6(b). Two sets of standards are listed depending on whether an area receives more than 3 million gallons per day (mgd) of freshwater input per shoreline mile (“wet standards”), or less than 3 mgd of freshwater input per shoreline mile (“dry”). As the study area off the south coast of Oahu probably receives less than 3 mgd per mile, dry criteria were used for this evaluation.

The HDOH-WQS are also separated into three standards: geometric means, “not to exceed more than 10% of the time,” and “not to exceed more than 2% of the time.” As all these classifications require multiple samplings, they cannot be used for a strict evaluation of whether a single sampling is within compliance standards. However, these values provide a guideline to evaluate the overall status of sampled waters in terms of the relation to State standards.

Shown in Table 1 are all values that exceed the “not to exceed more than 10% of the time”, and “not to exceed more than 2% of the time” under dry conditions. No values of nitrate nitrogen (NO_3^-) exceeded either standard, while all measurements of turbidity exceeded the 2% standard. The consistently elevated turbidity in excess of DOH standards criteria throughout the sampling regime is likely a result of resuspension of the fine-grained sediment that comprises the floor of the swim channel. Ammonium nitrogen (NH_4^+) exceeded the criteria at multiple sampling locations on all four transects. Concentrations of TN, TP, and chlorophyll a were higher than the DOH limits are inshore stations.

As discussed above, the elevated concentration of dissolved nutrients near the shoreline is not likely a result of mixing of groundwater with ocean water, as there are no consistent indications of lower salinity across the beach. As the area is somewhat unique in terms of the dredged swimming channel in a fossil reef with limited flushing capabilities, it is not unexpected that some water quality constituents do not comply with open ocean criteria. This is particularly true for turbidity, which is consistently elevated above the open coastal standards as a result of resuspension of fine-grained sediment that form the channel floor.

Overall, with the exceptions described above, most of the area within the scope of the present project are close to or below the specific criteria of the State Water Quality Standards, with the caveat that this consideration is for a single sample set. As a result, it does not appear that there are any significant inputs of materials from land beyond the immediate shoreline that are impacting coastal ocean waters offshore of Ala Moana Regional Park.

III. BIOTIC COMMUNITY STRUCTURE

A. Biotic Community Structure Methods

Biotic community structure of the marine environment was semi-quantitatively assessed by investigators swimming throughout the offshore area from the shoreline to the inner margin of the dredged reef off each of the survey transect sites described in the sections above. During these reconnaissance swims, notes were taken on physical structure and marine species presence. Numerous photographs were taken of typical features of all habitats to provide a descriptive representation of the area fronting the project site.

B. Biotic Community Structure Results

The following is a description of the distinct biotopes, or zones, that occur in the marine environment off of Ala Moana Regional Park (a biotope is an area of uniform environmental conditions providing a living place for a specific assemblage of plants and animals). Figure 4 is a satellite photograph of the marine area fronting Ala Moana Regional Park showing the results of biotic surveys in terms of occurrence of various

types of biota. The two groups of organisms that are of major interest are seagrass and reef building coral. As such, the intent of the mapping of bottom types shown in Figure 4 is to illustrate the areas of occurrence of these two assemblages.

1. Benthic Composition and Community Structure

The most shoreward region of the intertidal region zone consists of either coarse white sand or coral rubble (Figure 5). Much of the nearshore rubble is emergent at low tide. The rubble that is perpetually covered by water contains scattered small living colonies primarily consisting of the species *Leptastrea purpurea* and *Pocillopora damicornis* (Figure 6). These small corals (maximum size ~15 centimeter diameter) were growing on loose rubble fragments that would be easily removed from the rubble zone if necessary to avoid burial. Total cover of the rubble zone by living coral was well less than 1%.

Seaward of the shoreline shallow zone, water depth increases in the elongated dredged channel that extends the length of the Park. In many areas, bottom cover consists of a bed of coral rubble fragments (Figure 7, top left). The rubble zone grades into a coarse sand bed at a depth of about 5 feet (Figure 7, top right). The “deep rubble zone” is essentially devoid of coral settlement, or any other biotic epi-fauna.

With increasing distance from shore, the bed of the swim channel grades to a sand plain of various textures. In some areas, bottom composition is composed of coarse sand (Figure 7, bottom left), while the deeper areas consist of a fine-grained mud-silt mixture (Figure 7, bottom right). While there is little epi-fauna on the mud floor, there are numerous burrows and associated mounds of sediment that are likely formed by the action of worms, crabs, and shrimp.

Ubiquitous throughout the swim channel floor are expanses of the Hawaiian seagrass, *Halophila hawaiiana*, which is endemic to the Hawaiian Islands. *Halophila hawaiiana* is a flowering plant with roots that hold sediment. It is locally common, within a specific habitat that is characterized by protected waters with calm sandy areas within a narrow depth range that generally does not exceed 4 meters. In some areas this species has been replaced by invasive algal species, although there is no indication that this is occurring at Ala Moana, as there were no other alga observed in the habitat occupied by the seagrass. Like other seagrasses, *Halophila hawaiiana* meadows support a rich community of associated organisms in sediments and on the leaf blades, providing food and shelter for more mobile organisms such as fish and crustaceans. *Halophila hawaiiana* is part of the Hawaiian green sea turtle's diet. As seen in Figure 4, seagrass was observed along the length of the swim channel, but not in the shoreline rubble zones.

The other abundant plant within the Ala Moana area was the alien red algae *Gracilaria salicornia* (Figure 8, lower right). This species of *Gracilaria* is one of the most successful invasive algae in Hawaii and is often found covering expanses of calm water reef flat and tidepools attached to limestone and basalt substrates. While there were areas of mats of *G. salicornia* in the Ala Moana channel, it was not widespread, and was restricted to several locations on the outer edge of the channel and along the margin of the shoreline of Magic Island (Figure 4). Other algae that were observed in the swim channel were patches of the brown alga *Padina* sp. (Figure 8, upper right) and the filamentous cyanobacteria *Lyngbya* sp. (Figure 8, bottom left).

Within the entire survey area, reef building coral were considered rare. The exception is the outer channel bordering the western shoreline of Magic Island. This area differs substantially from the inner swim channel in that it is more oceanic in terms of water quality, particularly in terms of less turbidity in the water column, and solid surfaces that serve as settling substrata. As a result, the outer channel habitat is better suited for colonization and growth of reef corals. As the area is also sheltered from the impacts of large waves by the outer reef flat, there is little evidence of breakage of even delicate growth forms.

The most common species found in the outer channel were the most common species typically found on open coastal reefs in Hawaii. These include *Pocillopora meandrina*, *Porites lobata*, *Montipora patula* and *Montipora capitata* (Figure 9). A species that was commonly observed in the outer channel that is not commonly observed on exposed coastal reefs is *Pocillopora damicornis* (Figure 9, upper left). The growth form of this coral consists of finely branching clusters which are not capable of withstanding wave stress. While coral colonies within the outer channel were common, they did not form a complete cover of bottom substrata. Rather they covered approximately 5-10% of the edges and bottom of the outer channel margins.

2. Reef Fish Composition and Community Structure

Limited visibility in the main swim channel was reduced to the point where visual quantitative assessments of fish populations was not possible. During the course of swim surveys, several species of fish were noted. These included the surgeonfish *Acanthurus triostegus* and *A. leucoparius*, damselfish *Dascyllus albisella*, the tetradonts

Canthigastor jactator, Diodon holocanthus and *Ostracion meleagris*, the trumpetfish *Aulostomus chinensis*, triggerfish *Rhinecanthus rectangulus*, and the Moorish idol *Zanclus cornutus*. All of these species are common on Hawaiian reefs and do not constitute rare or unique species assemblages. No large individuals that would be considered "food fish" were observed. No fish were observed in the shallow nearshore rubble zone.

In summary, the marine communities directly off Ala Moana Regional Park are limited, consisting of species that are tolerant of high turbidity and/or soft benthic habitats. The most prevalent biotic component of the area are the meadows of the Hawaiian seagrass that occur throughout the soft sediment, calm water areas of the swim channel. While scattered small corals occur on the loose rubble in the nearshore zone, the most abundant corals occur in the outer channel bordering Magic Island where flushing rates are elevated relative to the inner channel, and water quality is most oceanic in nature.

3. Threatened and Endangered Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the Hawaiian Islands and is frequently observed throughout the south shore of Oahu. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently in Hawaiian waters. Several green sea turtles were observed within the survey area over the course of the present study. Of particular note was the small size of many of the turtles. As the swim channel basin is essentially isolated from the open ocean by shallow reef berms, the area may serve as a protected refuge for turtles from predatory sharks. In addition, the abundance of seagrass and marine algae may provide a preferred feeding ground for green turtles. No hawksbill turtles were observed during the course of underwater surveys.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. While the present survey was conducted in May when whales are absent from Hawaiian waters, the survey area is not conducive to whale habitation owing to shallow depth and lack of access. The Hawaiian monk seal, (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. No seals were observed during the present survey work at Ala Moana Regional Park.

IV. DISCUSSION and CONCLUSIONS

The purpose of this assessment is to assemble a set of baseline information to make valid evaluations of the potential for influence on the marine environment from the proposed replenishment of beach sands at the shoreline of Ala Moana Regional Park. The information collected in this study provides the basis to understand some of the important processes that are operating in the nearshore ocean, to be able to address any concerns that might be raised in the planning process for the proposed project.

The physical structure of the marine habitats where it is proposed to place offshore sand in the intertidal areas to cover the existing rubble shoreline is composed of a man-made dredged swimming channel that runs parallel to the beach face. As there are no deep openings in the reef flat into which the channel is cut to facilitate exchange of water with the open ocean, the residence time of water in the channel is likely far greater than on an exposed coastline. Results of analyses of water chemistry from samples collected along transects that extend from the shoreline to the outer edge of the channel cut indicate some effects to nutrients in the nearshore zone, likely as a result of low flushing, increased temperature, and in one area, input of fresh water.

While the values of most water quality constituents are near Department of Health water quality standard specific criteria for open coastal waters, values of turbidity are consistently well above the values specified in DOH standards. The elevated values of turbidity are primarily a response to resuspended fine sediment emanating from beach sand that is trapped within the semi-enclosed dredged channel. When offshore sand was placed on the shoreline in Waikiki, nearshore turbidity temporarily increased substantially as fine-grained sediment that was not washed from the donor sand was resuspended in the water column. As it is inevitable that there will be a similar component of fines in material used to nourish the beach at Ala Moana Regional Park, it can be expected that there will be a temporary increase in turbidity over the present levels. Such an increase would be expected to be temporary until fines are winnowed out of the donor sand to the level that exists at present.

Results of biotic surveys reveal that an important component of the benthic community is abundant, patchy meadows of Hawaiian seagrass throughout the deep dredged swim channel. As the specific habitat for this species of seagrass is shallow calm water with soft sand substratum, the floor of the swim channel is an ideal habitat for seagrass. It is apparent that the elevated levels of turbidity owing to resuspended

sediment in the water column of the channel are not an impediment to seagrass occurrence. While placement of offshore sand on the beach will likely result in a temporary increase in resuspended sediment, it is not likely that there will be substantial settlement of new sediment on the floor of the channel sufficient to bury or impact existing assemblages of seagrass. As the new sediment should not be qualitatively different that the existing sand, it is not likely that there will be a change in habitat composition sufficient to alter seagrass abundance. Care should be taken however in the placement of new sand to ensure that it does not cover any existing seagrass beds.

The other component of the benthos that is an important consideration in the environmental effects of sand nourishment is the existence of small corals on rubble in the nearshore zone. As this is the area intended to be transformed from a rubble shoreline to a sand shoreline, with no mitigation in terms of removing rubble prior to sand placement, the new sand would bury these small corals. As the abundance of these corals is very low, and they are all attached to unconsolidated surfaces, a possible mitigation measure would be to move them to either a rubble zone off Ala Moana Park that is not proposed for beach nourishment, or to a location on the outer reef flat. As wave motion on the reef flat adjacent to the channel cut is low, corals transplanted to this area would likely have a high potential for survival. Another alternative would be to donate these corals to the State DAR Coral Nursery on Sand Island.

The marine habitat in the outer channel adjacent to Magic Island is presently populated by a variety of large, healthy corals. These corals are protected from wave impacts by the bordering shallow reef flat and occur in an area where water quality is more similar to open ocean settings than the inner channel. While there may be temporary slight increases in turbidity in this area following beach nourishment, it should not be of a magnitude beyond the natural tolerance of these species. In addition, the more rapid flushing of this area with clean ocean water should prevent any sediment deposition on existing corals.

The swim channel is presently a preferred habitat for green sea turtles, particularly juveniles. Characteristics of the area that are ideal for turtles are protection from predators and abundant food resources in the form of algae and seagrass. The temporary changes to water quality from sand placement should not be of a magnitude to affect turtle behavior, as they seem unaffected by turbid waters. During sand placement operations, observers should be in place to spot any turtles that might enter the work area. If such actions occur, a mitigation plan should be in effect to stop work until turtles leave the area.

Based on the results of this survey, it can be concluded that with proper management and mitigation practices to limit to the extent possible release of fine-grained material to the water column from donor sand, and removal of corals from the rubble zone, the proposed replacement of rubble on the shoreline should have little or no potential for significant permanent effects to the existing marine environment.

V. REFERENCES CITED

Grasshoff, K. 1983. Methods of seawater analysis. Verlag Chemie, Weinheim, 419 pp.

Strickland J. D. H. and T. R. Parsons. 1968. A practical handbook of sea water analysis. Fisheries Research Bd. of Canada, Bull. 167. 311 pp.

FIGURE 1. Satellite image of Ala Moana Regional Park showing beach, dredged linear swim channel, and undredged reef flat. Also shown are locations of water chemistry sampling stations along four transects that extend from the shoreline to the edge of the dredge cut.

TABLE 1. Results of water sampling off Ala Moana Regional Park on April 30, 2018. Samples are collected 10 centimeters from the surface (S), and 20 cm from the ocean floor (B). Where water depth was less than 50 cm, a single sample was collected. Also shown are the State of Hawaii, Department of Health Water Quality Standards (DOH WQS) "not to exceed more than 10% of the time" and "not to exceed more than 2% of the time" water quality standards for open coastal waters under "dry" conditions. Tan shaded values exceed DOH 2% "dry" standards; blue shaded values exceed DOH 10% "dry" standards. For transect sampling station locations, see Figure 1.

	STATION	DEPTH (m)	DFS (m)	PO_4^{3-} (µg/L)	$NO_3^-+NO_2^-$ (µg/L)	NH_4^+ (µg/L)	Si (µg/L)	TOP (µg/L)	TON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	SALINITY (o/oo)	pH std. units	Chl-a (µg/l)	TEMP deg. C	Diss. O_2 % sat.
TRANSECT 1		1	0	9.92	6.72	119.70	114.80	51.77	418.46	61.69	544.88	43.10	34.54	8.08	2.24	25.19	97.70
		2	5	2.79	1.68	5.46	104.44	11.78	181.16	14.57	188.30	6.05	34.57	8.09	0.43	24.64	96.90
		3	50S	2.17	2.52	16.52	112.00	9.61	166.88	11.78	185.92	4.88	34.50	8.08	0.26	24.54	91.08
		4	50B	4.34	2.52	33.04	106.96	9.61	179.62	13.95	215.18	6.34	34.57	8.08	0.26	24.54	90.14
		5	120S	1.86	1.96	1.68	92.40	8.99	121.66	10.85	125.30	1.27	34.50	8.04	0.09	24.18	90.42
		6	12B	3.41	1.68	1.68	91.56	8.37	114.52	11.78	117.88	2.41	34.46	8.01	0.14	24.20	74.88
		7	250S	3.10	1.96	1.68	92.12	8.37	107.38	11.47	111.02	1.12	34.46	8.07	0.16	24.64	99.46
		8	250B	4.34	0.56	1.54	95.48	7.75	116.34	12.09	118.44	1.72	34.43	8.02	0.15	23.48	104.26
		9	400S	3.72	BDL	1.54	87.92	7.75	99.54	11.47	101.22	1.02	34.50	8.13	0.09	22.46	98.29
		10	400B	5.89	1.40	1.68	94.36	8.06	122.36	13.95	125.44	3.00	34.53	8.04	0.16	24.26	75.93
TRANSECT 2		11	0	7.44	2.66	8.12	223.44	12.09	166.74	19.53	177.52	13.90	33.84	8.35	0.58	26.53	99.76
		12	15	5.27	2.94	7.42	112.28	8.99	147.14	14.26	157.50	3.31	34.53	8.21	0.20	24.30	101.32
		13	30S	7.44	1.96	7.70	117.88	6.82	115.36	14.26	125.02	5.33	34.53	8.08	0.30	25.80	109.23
		14	30B	5.89	2.10	6.72	127.40	8.37	106.68	14.26	115.50	4.51	34.53	8.09	0.31	25.84	106.43
		15	60S	5.58	5.60	6.58	121.24	6.82	109.20	12.40	121.38	1.98	34.49	8.13	0.12	24.79	95.65
		16	60B	4.96	2.52	1.40	92.12	8.06	101.64	13.02	105.56	3.32	34.43	8.06	0.16	24.32	80.17
		17	120S	5.89	2.02	4.34	99.43	7.22	104.96	13.11	111.32	1.14	34.50	8.11	0.17	25.21	106.34
		18	120B	6.20	5.88	8.12	101.92	7.44	101.92	13.64	115.92	1.48	34.54	8.16	0.16	24.31	94.54
TRANSECT 3		19	0	4.34	4.76	11.48	122.92	13.33	170.38	17.67	186.62	3.91	34.68	8.43	0.41	28.11	125.54
		20	15	5.27	5.32	15.26	144.76	9.30	160.44	14.57	181.02	5.41	34.53	8.15	0.44	26.29	99.76
		21	30S	4.34	BDL	0.98	117.88	8.99	150.92	13.33	152.04	6.34	34.57	8.11	0.61	25.34	94.53
		22	30B	5.27	0.70	11.76	117.04	9.30	137.34	14.57	149.80	2.91	34.50	8.11	0.71	25.34	93.35
		23	50S	4.03	0.84	3.50	125.44	8.37	115.36	12.40	119.70	3.91	34.57	8.13	0.34	25.18	97.48
		24	50B	4.96	1.26	2.66	108.92	8.99	111.72	13.95	115.64	2.64	34.54	8.09	0.52	24.42	82.29
		25	100S	2.48	1.96	5.74	120.40	9.61	117.46	12.09	125.16	3.88	34.47	8.13	0.33	24.92	93.49
		26	100B	4.96	2.94	4.20	123.48	8.37	112.42	13.33	119.56	3.79	34.50	8.09	0.40	24.42	82.90
TRANSECT 4		27	0	4.96	4.48	12.60	149.80	8.99	193.62	13.95	210.70	4.17	34.91	8.53	0.37	29.18	122.22
		28	15	4.65	1.82	8.54	114.24	8.68	139.86	13.33	150.22	3.87	34.61	8.22	0.69	29.13	121.45
		29	25	5.27	0.98	3.64	111.44	9.30	147.28	14.57	151.90	3.37	34.61	8.14	1.04	26.36	118.35
		30	50S	4.96	0.98	BDL	129.08	9.30	128.80	14.26	130.06	7.07	34.43	8.13	0.57	25.47	101.77
		31	50B	8.06	BDL	19.32	160.72	10.23	167.72	18.29	187.04	3.95	34.54	8.09	1.31	25.45	103.23
		32	100S	5.89	1.96	2.24	130.48	17.05	132.58	22.94	136.78	6.45	34.54	8.13	0.88	25.19	101.93
		33	100B	7.44	BDL	16.52	127.12	13.02	189.70	20.46	206.22	5.43	34.50	8.20	1.18	24.70	86.56
DOH WQS	DRY	NTE 10%			10.00	5.00				30.00	180.00	0.50	*	**	0.50	***	****
		NTE 2%			20.00	9.00				45.00	250.00	1.00	*	**	1.00	***	****
Analytical Method				EPA 365.3	EPA 353.2	EPA 350.1	EPA 370.1			SM 4500P B5	SM 4500N C	SM 2130B	SM 2520	EPA 150.1	SM 10200	SM 2550B	SM 4500 OG

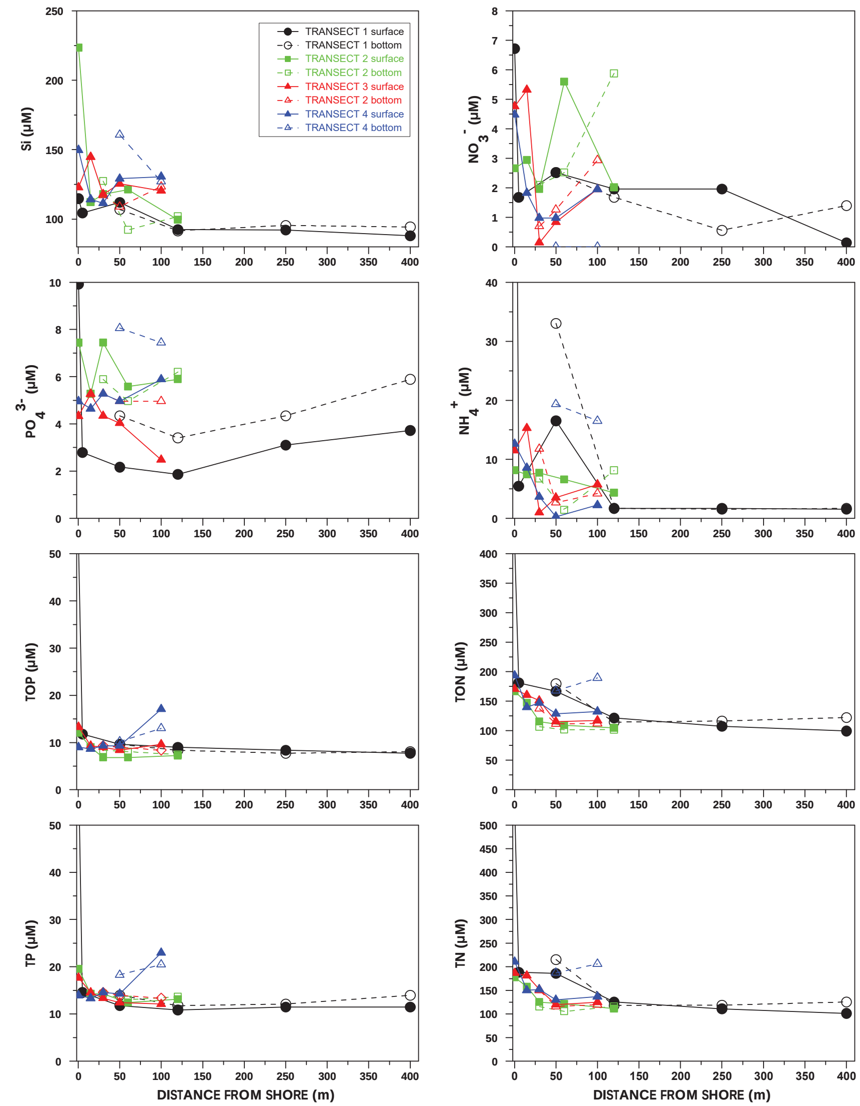


FIGURE 2. Plots of dissolved nutrients in surface and bottom samples collected on April 30, 2018, as a function of distance from the shoreline along four transects off Ala Moana Regional Park, Honolulu, Hawaii. For transect locations, see Figure 1.

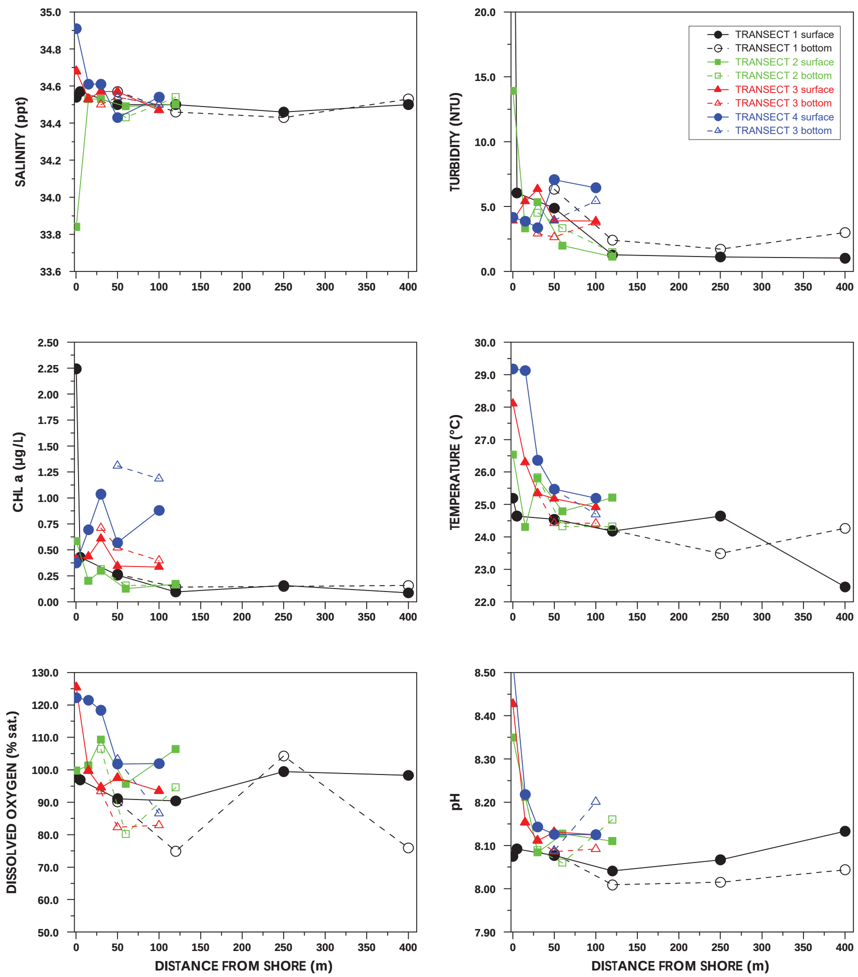


FIGURE 3. Plots of physical properties of water in surface and bottom samples collected on April 30, 2018, as a function of distance from the shoreline along four transects off Ala Moana Regional Park, Honolulu, Hawaii. For transect locations, see Figure 1.

FIGURE 4. Map of Ala Moana Regional Park offshore marine environment showing color coded observations of benthic composition. Where no living bottom cover was observed, benthic type is classified as sand or mud. Seagrass (*Halophila hawaiiana*) was ubiquitous throughout the soft sediment surfaces of the swim channel (Figure 7). Small corals growing on loose rubble occurred in the nearshore rubble zone (Figure 8), while large corals (Figure 9) occurred only in the easternmost area of the swim channel extending along the shoreline of Magic Island.

Figure 5. Views of Ala Moana Regional Park shorelines. Upper two photos show sand shoreline. Bottom photos show exposed rubble/cobbles at shoreline that is planned for sand replenishment.

Figure 6. Reef building corals in shoreline rubble zone include *Leptastrea purpura* (upper left and right), *Porites lobata* (upper right), *Pocillopora damicornis* (lower left), and *Psammocora stellata* (lower right).

Figure 7. Sediment types in Ala Moana Regional Park marine areas. Top photos show nearshore rubble beds. Bottom photos show floor of swimming channel composed of various grain sizes of silty sand. Numerous burrow holes, likely from worms, shrimp and crabs, are visible in both bottom photos.

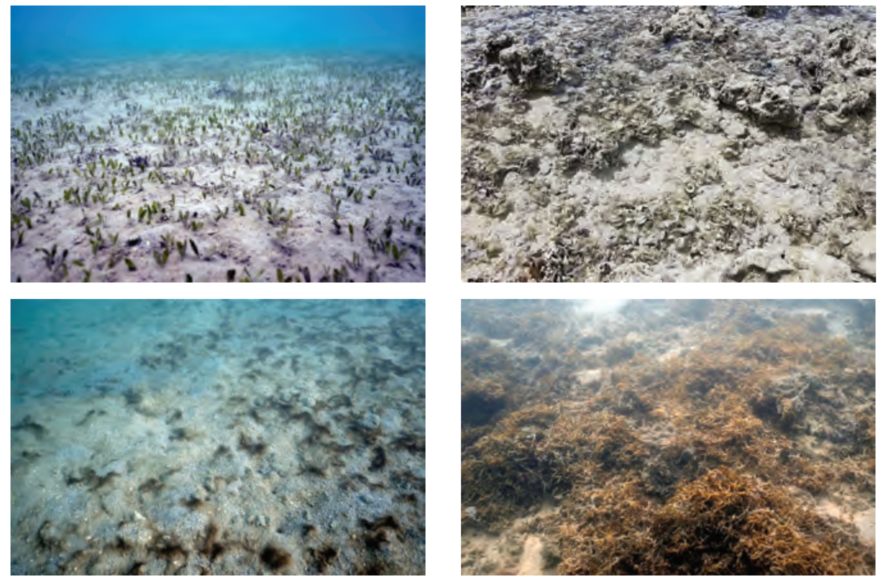


Figure 8. Upper left photo shows meadow of seagrass *Halophila hawaiiana* covering patch of sand flat in swimming channel. Algae found in swimming channel include *Padina* sp. (upper right), *Lyngbya* sp. (lower left), and *Gracilaria saliconia* (lower right).

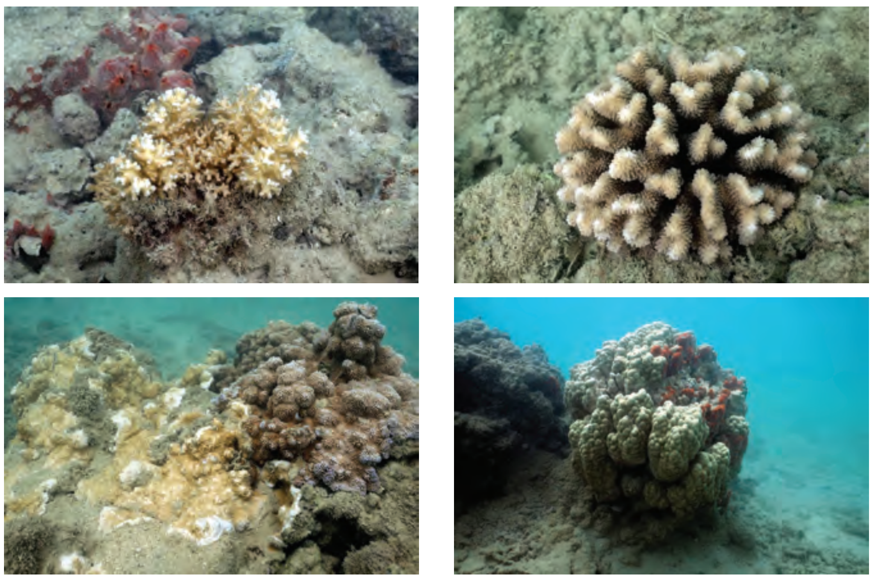


Figure 9. Corals occurring on the channel walls off Magic Island included *Pocillopora damicornis* (top left), *Pocillopora meandrina* (top right), *Montipora patula* and *M. capitata* (lower left), and *Porites lobata* (lower right).

APPENDIX F-2

Baseline Assessment of the Marine Environment Ala Moana
Regional Park Beach Replenishment
Donor Sites
Honolulu, Hawaiʻi

PAGE IS INTENTIONALLY LEFT BLANK

BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT
ALA MOANA REGIONAL PARK BEACH REPLENISHMENT
DONOR SITES

HONOLULU, HAWAII

Prepared for:

Sea Engineering, Inc.
Makai Research Pier
41-305 Kalanianaole Hwy,
Waimanalo, HI 96795

By:

MRCI
MARINE RESEARCH CONSULTANTS, INC.
1039 WAAKAUA PL.
HONOLULU, HI 96822

December 3, 2018

I. INTRODUCTION AND PURPOSE

In 2016, the City and County of Honolulu addressed the heavily eroded and rocky shoreline area at Ala Moana Regional Park by commissioning a project to relocate rocks from the beach face and to move sand from wider areas of the beach. The project was intended to produce a noticeable impact on the shoreline without the need for a full suite of permits. As such, DLNR allowed rock to be removed from the beach face as long as it did not leave the beach system. In July of 2016 an estimated 300 cubic yards of rock was relocated from the beach face to the back of the beach where it was buried. In October of 2016 sand was moved from wider parts of the beach to the eroded area. The sand was placed inshore of the high tide line, thereby limiting the extensive permitting process required for placing sand in the water. This project, however, could only move approximately 1,500 cubic yards of sand into the eroded area.

The beach at Ala Moana Regional Park does not have a natural source of sand, and sand moving toward shore over the reef flat is blocked from reaching the beach by the deep swim channel. The City wishes to artificially nourish the beach with sand to address the erosion problem and to cover the exposed rocks at the shoreline. The beach nourishment project is part of a master plan to produce improvements to the park, and an Environmental Impact Statement (EIS) has been commissioned.

This report, intended to support the EIS, provides results of field assessments of the physical, chemical, and biological composition of four areas off the southern shoreline of Oahu that have been selected as potential sand donor sites. Evaluation of the existing condition of the water chemistry and resident biota provides an insight into predicting the potential affects that might occur as a result of sand removal for the proposed project. A separate report has been prepared and submitted that assessed the nearshore waters encompassing the areas where sand nourishment will occur within Ala Moana Regional Park.

II. WATER QUALITY

A. Methods

Four areas that could serve as potential offshore sand donor sites have been selected by Sea Engineering, Inc. These four areas are designated as "Ala Wai", "Ala Moana," and "Reef Runway (Large and Small)" (Figure 1). Within each of these areas three water sampling stations were selected. Within each site, one station was near the eastern boundary, one in the central region, and on near the western boundary (Figures 2 and 3). Near the Reef Runway site was a smaller area to the west of the main site, which was designated "Reef Runway small" in which a single water sampling station was established (Figure 3).

Water chemistry field collection was conducted on November 14, 2018. All samples were collected by investigators working from a 19-foot boat. At each station three samples were collected: one near the surface, one in the middle of the water column, and one just above the seafloor. Water samples were collected using a Niskin-type oceanographic sampling bottle. This device is lowered through the water column with endcaps cocked in an open position. At the desired sampling depth, a weighted messenger is released from the surface, which triggers closure of the endcaps, isolating a parcel of water. On the surface, water was transferred from the Niskin bottle to 500-milliliter (ml) acid-washed, triple rinsed, polyethylene bottles and stored on ice.

Water quality constituents that were evaluated include all specific criteria designated for open coastal waters in Chapter 11-54, Section 06 (b) (Open Coastal waters) of the State of Hawaii Department of Health (DOH) Water Quality Standards. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen (NO_3^- + NO_2^-, hereafter referred to as NO_3^-), ammonium nitrogen (NH_4^+), total phosphorus (TP), Chlorophyll a (Chl *a*), turbidity, temperature, pH, and salinity. In addition, silica (Si) and orthophosphate phosphorus (PO_4^{-3}) were also reported because these parameters are sensitive indicators of biological activity and the degree of freshwater mixing.

Analyses for Si, NH_4^+, PO_4^{3-}, and NO_3^- were performed with a SEAL Autoanalyzer using standard methods for seawater analysis (Strickland and Parsons 1968, Grasshoff 1983). TN and TP were analyzed in a similar fashion following digestion. Total organic nitrogen (TON) and total organic phosphorus (TOP) were calculated as the difference between TN and dissolved inorganic N and TP and dissolved inorganic P, respectively.

Water for other analyses was sub-sampled from 500-ml polyethylene bottles and kept chilled until analysis. Chl *a* was measured by filtering enough water through glass-fiber filters to detect color; pigments on filters were extracted in 90% acetone in the dark at -20 °C for 12-24 hours. Fluorescence before and after acidification of the extract was measured with a Turner Designs Trilogy Fluorometer model 7200-000 equipped with an extracted chlorophyll non-acidification module. Salinity was determined using a Mettler Toledo Seven Excellence Multi-parameter meter with an InLab 731-ISM conductivity probe calibrated to Hach Instruments using a 35.00 ppt, 53.0 mS/cm traceable salinity standard with a readability of 0.01 parts per thousand (‰ or ppt). Turbidity was determined using a Hanna Instruments Model #HI88703 Turbidimeter, and reported in nephelometric turbidity units (NTU) (precision of 0.01 NTU). Vertical profiles of salinity, temperature, and depth were acquired using an RBR-Concerto CTD calibrated to factory standards.

EPA and Standard Methods (SM) methods that were employed for chemical analyses, as well as detection limits, are listed in the Code of Federal Regulations (CRF) Title 40, Chapter 1, Part 136, and are as follows:

NH_4^+: EPA 350.1, Rev. 2.0 or SM4500-NH3 G, detection limit 0.42 µg/L.
NO_3^- + NO_2^-: EPA 353.2, Rev. 2.0 or SM4500-NO3F, detection limit 0.28 µg/L.
PO_4^{-3}: EPA 365.5 or SM4500-P F, detection limit 0.31 µg/L.
Total P: EPA 365.1, Rev. 2.0 or SM4500-P E J, detection limit 0.62 µg/L.
Total N: SM 4500-N C., detection limit 5.60 µg/L.
Si: EPA 370.1 or SM 4500 SiO2 E, detection limit 5.32 µg/L.
Chlorophyll *a*: SM 10200, detection limit 0.006 µg/L.
pH: EPA 150.1 or SM4500 H+B, detection limit 0.002 pH units.
Turbidity: EPA 180.1, Rev. 2.0 or SM2130 B, detection limit 0.008 NTU.
Temperature: SM 2550 B, detection limit 0.01 degrees centigrade.
Salinity: SM 2520, detection limit 0.003 ppt.
Dissolved Oxygen: SM4500 O G, and detection limit 0.01% sat.

All fieldwork was conducted by Dr. Steven Dollar and Ms. Andrea Millan. All laboratory analyses were conducted by Marine Consulting and Analytical Resources LLC located in Honolulu, HI.

B. Results

1. *Distribution of Chemical Constituents*

Table 1 shows results of all water chemistry analyses on samples collected at the Ala Moana donor sites on November 14, 2018. Several patterns of distribution are evident in Table 1. Most evident is that most of the concentrations of nutrients can be considered "low," as only one measurement exceeds the DOH criteria for exceedances more than 2% or 10% of the time under "wet" conditions for open coastal waters. The criteria for distinguishing between wet and dry conditions depends on the input of freshwater along the shoreline. As the area of study receives input from numerous streams draining the Ala Wai and Keehi Lagoon areas, it is appropriate to assume wet conditions apply in this case.

Inspection of Table 1 reveals that two stations in the Ala Wai donor site had elevated concentrations in surface waters of all dissolved nutrients (PO_4^{3-}, NO_3^-, NH_4^+, Si, TP, TN) along with reduced salinity. These stations (1 and 3) were located closest to the discharge of the Ala Wai Canal (Figure 2). Nutrient concentrations at station 10 located in the "small" Reef Runway donor site were elevated relative to the concentrations at the "large" Reef Runway site, although salinity was not correspondingly depressed. The small Reef Runway site was located closest to the Hickam Harbor entrance channel. Flow of water seaward from the inner areas of Hickam Harbor may be the cause of the elevated values at the small Reef Runway sampling station.

Considering physical properties of the water column, turbidity and Chlorophyll *a* were uniformly low with all values below 0.56 NTU and 0.49 µg/L, respectively (Table 1). Temperature, dissolved oxygen, and pH all display similar patterns, with similar values throughout the sampling range. There were no indications of distinctive vertical stratification through the water column for any of the measured constituent (Table 1).

Overall, water chemistry throughout the four potential sand donor sites is generally consistent with values close to or below specific criteria of the State Water Quality Standards (with the caveat that this consideration is for a single sample set). Elevated concentrations of nutrients and lower values of salinity were detected at two of the stations at the Ala Wai site. It is likely that these anomalies are the result of sampling within the discharge plume of the Ala Wai Canal. As the present sampling event was conducted during a period of dry weather, it is probable that the data would more strongly reflect discharge from land if sampling is conducted following a significant rain event.

III. BIOTIC COMMUNITY STRUCTURE

A. Methods

Biotic community structure of the marine environment was semi-quantitatively assessed by investigators swimming from the centers of each sand donor site in both the north and south directions until the "edge" of the deposit was reached. The "edges" were defined as the region where bottom cover consisted of materials other than sand, or where biotic composition comprised the majority of the benthic surface. It should be noted that these edges corresponded closely with the delineations provided by Sea Engineering maps. During these reconnaissance swims, notes were taken on physical structure and marine species abundance. Numerous photographs were taken of typical features of all habitats to provide a descriptive representation of the areas comprising the donor sites. Reconnaissance swims to the offshore edge of the Ala Moana deposit site were not conducted owing to depth limitations of diving operations.

B. Results

1. Benthic Community Structure

At the interiors of all four donor sites, the ocean floor consisted of uniform beds of white calcareous sand with distinct ripple patterns oriented parallel to the shoreline (Figures 4 and 5). At all of the sites that were inspected by divers, these deposits had distinct edges, or boundaries where the sand beds were marked by either stands of algae, seagrass, coral, or coral rubble.

The dominant biota in the benthic habitats bounding the sand deposits were assemblages of algae and seagrass. At the Reef Runway Large site, the sand deposits were bounded by meadows of the endemic Hawaiian seagrass *Halophila hawaiiana* . Seagrass occurred in varying densities from thinly distributed single plants to dense meadows that occupied expanses up to tens of meters in dimension (Figures 5-7). The only area where seagrass was not observed was on the offshore boundary area of the Ala Wai donor site.

Other common marine plants observed at the boundaries of the sand deposits were fields of the green alga *Avrainvillea erecta* (Figures 5 and 6). At the Ala Moana donor site, vast meadows of *A. erecta* were observed at the offshore and inshore boundaries of the sand deposits. Interspersed in the meadows of *A. erecta* were patches of seagrass (Figures 6 and 7). At the Ala Moana site, beds of the green calcareous algae *Halimeda* sp. were also common (Figure 7).

The area seaward of the Ala Wai donor site was distinctly different than either the Reef Runway or the Ala Moana area. No seagrass or species of green algae were observed off the Ala Wai. Rather, bottom cover was typified by extensive tracts of the blue-green alga *Lyngbya majuscula*, which nearly covered the sand surface (Figure 9).

The other class of benthos that is generally found to inhabit benthic offshore habitats in Hawaii are reef building corals. As corals generally require a solid substratum on which to settle and grow, there were no corals within the sand donor deposits. However, corals were observed on several solid surfaces observed near the sand deposits. A metal frame of unidentified source was embedded in the sand near the inshore boundary of the Ala Moana site (Figure 8). The upper surfaces of the frame were colonized by numerous coral colonies consisting of the species *Porites lobata*, *Pocillopora meandrina*, and *Montipora capitata*. Scattered rubble fragments that were the dead remnants of large corals also were observed to provide solid substratum for new settlement and growth (Figure 6). Other attached biota that were present within the boundary areas included the conical shaped sponge *Spirastrealla vagabunda*, and scattered sea cucumumbers (*Holothuria* sp.) (Figure 8.)

The inner edge of the Ala Wai deposit site forms a distinct margin that abuts a solid platform that can be considered a thriving coral reef. Several large helmet-shaped colonies of *Porites lutea* and *P. lobata* greater than one meter in diameter suggest that the area has not been subjected to severe stresses in recent decades (Figure 10).

2. Reef Fish Composition and Community Structure

Essentially no reef fish occurred in the central regions of the sand donor sites. Fish were noted within the algae beds on the boundaries of the donor sites, although their occurrence was rare and was generally limited to the vicinity of rubble features. These included the surgeonfish *Acanthurus triostegus* and *A. leucoparius*; damselfish *Dascyllus albisella*; the tetradonts *Canthigastor jactator, Diodon holocanthus,* and *Ostracion meleagris*; the trumpetfish *Aulostomus chinensis*; triggerfish *Rhineccanthus rectangulus*; and the Moorish idol *Zanclus cornutus*. All of these species are common on Hawaiian reefs, and do not constitute rare or unique species assemblages. No large individuals that would be considered “food fish” were observed.

In summary, the marine communities at the boundaries of the sand deposits consist primarily of a variety of marine algae and seagrass. Corals are limited to small colonies growing on rubble fragments. The exception is the inshore boundary of the Ala Wai site which consists of an extensive reef habitat.

3. Threatened and Endangered Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the Hawaiian Islands, and is frequently observed throughout the south shore of Oahu. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from Hawaiian waters. Several green sea turtles were observed within the survey area, outside the boundary of the sand donor sites, over the course of the present study. In addition, the abundance of seagrass and marine algae may provide a preferred feeding ground for green turtles. No hawksbill turtles were observed during underwater surveys.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. While the present survey was conducted in November before whales are usually present in Hawaiian waters, the survey area is conducive to whale habitation during the winter season. The Hawaiian monk seal, (*Monachus schauinslandi*) is an endangered earless seal that is endemic to

the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. While seals may transit the donor area sites, there are no beaches present for haul-out.

IV. DISCUSSION and CONCLUSIONS

The purpose of this assessment is to assemble baseline information to make valid evaluations of the potential for influence to the marine environment from the proposed replenishment of beach sands at the shoreline of Ala Moana Regional Park. The present study deals specifically with the offshore donor sites; a separate report provides the same assessment for the sand recipient areas at Ala Moana Regional Park. The information collected in these studies provides the basis to understand some of the important processes that are operating in the nearshore ocean to be able to address any concerns that might be raised in the planning process for the proposed project.

The physical structure of the marine habitats of the donor sites consists of uniform beds of white calcareous sand marked by deep ripple patterns from wave forces. While the scope of the present survey did not include analyses of soft sediment infauna, there was minimal macro epi-fauna observed on the surfaces of the sand deposits. The edges of the deposits were delineated by the occurrence of algal meadows consisting of several species of blue-green (*Lyngbya majuscula*) and green algae (primarily *Halimeda* spp., *Avrainvillea erecta*). In addition to marine algae, seagrass (*Halophila hawaiiana*) occurred in expansive meadows at the boundaries of, and beyond the Reef Runway and Ala Wai donor sites. No seagrass was observed off the Ala Wai site.

Reef building corals were not a major component of the benthic community bordering the Reef Runway and Ala Moana sites, occurring primarily as encrustations on rubble features. The inshore boundary of the Ala Wai site (which was the shallowest area in the survey) consisted a bed of coral rubble which graded into a solid limestone platform colonized by an extensive reef community. Other invertebrates observed within the sand boundary habitats included sparse sea cucumbers and sponges. Reef fish were also scarce in the boundary areas and were limited to small individuals and limited species.

Evaluation of water chemistry at the donor sites indicated that for the single sample set, values of all constituents represent pristine open coastal waters. The exception occurred at the locations nearest to the discharge of the Ala Wai canal within the Ala Wai donor site. Water chemistry in this area reflected discharge of canal waters with elevated nutrient concentrations coupled with decreased salinity. As the present survey was conducted during a period of relatively dry weather, it would be expected that the effects of canal water discharge would be greater during and following episodes of heavy rainfall. With the exception of a single concentration of ammonium nitrogen, all water quality constituents were below the Department of Health water quality standard specific criteria for open coastal waters under wet criteria.

The removal of sand from offshore deposits will likely result in a temporary increase in resuspended sediment in the water column. It is not likely that there will be substantial settlement of new sediment on the seafloor sufficient to bury or impact existing assemblages of algae, seagrass or corals that presently inhabit the areas adjacent to the deposits. As the new sediment should not be qualitatively different than the existing sand, it is not likely that the project will result in a change in habitat composition sufficient to alter biotic abundance.

Based on the results of this survey, it is recommended that environmental impacts can be eliminated or minimized by limiting sand extraction to the central regions of the donor site. In addition, management and mitigation practices should be put in place to limit to the extent possible release of fine-grained material to the water column during the extraction of donor sand. With these conditions, the proposed project should have little or no potential for significant permanent effects to the existing marine environment.

V. REFERENCES CITED

Grasshoff, K. 1983. Methods of seawater analysis. Verlag Chemie, Weinheim, 419 pp.

Strickland J. D. H. and T. R. Parsons. 1968. A practical handbook of sea water analysis. Fisheries Research Bd. of Canada, Bull. 167. 311 pp.

FIGURE 1. Aerial photograph of the south shore of Oahu showing four potential sand donor sites for the Ala Moana Beach Restoration project.

FIGURE 2. Aerial photograph of the south shore of Oahu showing two potential sand donor sites for the Ala Moana Beach Restoration project: Ala Moana and Ala Wai. Green circles indicate water chemistry monitoring stations. Pink arrows show approximate tracks of benthic survey transects.

FIGURE 3. Aerial photograph of the south shore of Oahu showing two potential sand donor sites for the Ala Moana Beach Restoration project: Reef Runway Large and Reef Runway Small. Green circles indicate water chemistry monitoring stations. Pink arrows show approximate tracks of benthic survey transects.

TABLE 1. Results of water sampling for Ala Moana Sand Project at four potential sand donor sites on November 14, 2018. Samples are collected near the surface (S), mid-water column (M), and 20 cm from the ocean floor (B). Also shown are the State of Hawaii, Department of Health Water Quality Standards (DOH WQS) "not to exceed more than 10% of the time" and "not to exceed more than 2% of the time" for open coastal waters under "wet" conditions. The single tan shaded shaded value exceed DOH 2% "wet" standards; no values exceed the DOH 10% "wet" standards. For sampling station locations, see Figures 1-3.

DONOR SITE	SAMPLE STATION	DEPTH (m)	PO4 (µg/L)	$NO_3^- + NO_2^-$ (µg/L)	NH4 (µg/L)	Si (µg/L)	TOP (µg/L)	TON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	Salt (ppt)	pH (rel)	Chl-a (µg/l)	TEMP deg. C	Diss. O_2 % sat.
ALA WAI	1	0.3	4.09	11.14	5.33	270.22	10.39	81.94	14.48	98.42	0.34	34.15	8.16	0.32	26.66	96.58
		7.5	1.74	0.28	0.80	31.55	7.33	76.15	9.06	77.22	0.22	34.52	8.08	0.26	26.67	95.90
		15.3	0.05	bdl	1.01	31.36	6.90	76.13	6.95	77.14	0.23	34.60	8.07	0.29	26.67	95.54
	2	0.3	0.07	0.14	1.46	31.20	8.47	81.33	8.53	82.92	0.18	34.64	8.21	0.26	26.63	94.70
		7.5	0.05	0.28	2.91	32.20	7.76	73.02	7.82	76.22	0.25	34.64	7.89	0.25	26.65	95.58
		15.5	0.06	0.14	7.25	28.56	8.88	65.39	8.94	72.79	0.12	34.64	8.13	0.27	26.64	95.17
	3	0.3	0.13	3.63	7.07	144.64	10.77	73.09	10.91	83.79	0.33	34.41	8.19	0.32	26.53	93.09
		8.7	0.07	0.14	11.42	26.98	10.03	65.21	10.11	76.78	0.14	34.60	8.21	0.26	26.53	91.93
		17.3	0.06	0.14	5.28	31.03	10.71	70.04	10.77	75.46	0.28	34.60	7.80	0.29	26.53	91.32
ALA MOANA	4	0.3	2.39	0.52	2.30	25.81	9.47	74.11	11.86	76.93	0.20	34.56	8.21	0.23	26.73	96.26
		13.5	2.14	0.33	7.13	25.24	6.48	68.56	8.61	76.02	0.31	34.56	8.19	0.25	26.73	95.91
		27.0	2.45	0.15	5.21	25.67	5.94	65.52	8.39	70.88	0.22	34.52	8.17	0.26	26.74	94.08
	5	0.3	2.51	0.14	2.60	25.81	3.93	68.42	6.44	71.16	0.38	34.56	8.21	0.25	26.72	95.74
		13.5	2.17	bdl	6.62	24.72	4.96	60.16	7.13	66.78	0.21	34.60	8.18	0.25	26.73	95.79
		27.8	1.61	bdl	1.29	24.67	5.97	67.66	7.58	68.95	0.29	34.56	8.19	0.26	26.73	95.16
	6	0.3	2.23	bdl	7.01	25.05	8.38	65.65	10.61	72.66	0.23	34.56	8.21	0.24	26.73	96.49
		14.0	2.60	bdl	1.11	25.13	7.33	70.03	9.93	71.13	0.22	34.60	8.13	0.26	26.73	96.06
		28.1	1.43	bdl	bdl	25.48	11.50	78.53	12.92	78.53	0.21	34.56	8.15	0.27	26.70	95.37
REEF RUNWAY	7	0.3	2.17	bdl	1.75	33.27	9.68	73.96	11.85	75.71	0.23	34.63	8.19	0.43	26.66	96.58
		9.9	2.05	0.14	bdl	32.91	7.35	70.71	9.40	70.85	0.34	34.60	8.02	0.45	26.67	95.90
		18.9	2.36	0.14	bdl	33.59	3.56	77.80	5.91	77.94	0.28	34.52	8.08	0.49	26.67	95.54
	8	0.3	2.11	0.16	0.46	33.40	5.20	73.43	7.30	74.05	0.29	34.56	8.22	0.47	26.63	94.70
		9.4	1.77	0.22	3.82	33.10	6.09	67.21	7.86	71.26	0.27	34.52	8.08	0.46	26.65	95.58
		18.9	1.49	0.29	3.32	32.86	5.60	68.59	7.08	72.20	0.32	34.60	8.14	0.49	26.64	95.17
	9	0.3	2.73	0.35	6.44	35.52	6.58	67.88	9.31	74.68	0.59	34.52	8.19	0.44	26.53	93.09
		8.4	2.29	0.42	3.88	35.80	10.56	71.70	12.85	75.99	0.48	34.60	8.15	0.46	26.53	91.93
		16.5	2.51	0.48	2.97	36.29	8.68	73.63	11.19	77.08	0.51	34.60	8.15	0.43	26.53	91.32
SMALL REEF RUNWAY	10	0.3	2.76	2.60	3.18	39.34	8.28	70.76	11.04	76.54	0.37	34.56	8.02	0.20	26.65	89.82
		4.6	3.84	2.51	12.46	39.53	9.25	61.90	13.10	76.87	0.43	34.56	8.17	0.22	26.65	89.26
		9.7	0.12	1.93	2.91	39.08	11.78	72.98	11.90	77.81	0.40	34.56	8.06	0.20	26.65	88.80
DOH WQS	WET	NTE 10%		14.00	8.50				40.00	250	1.25	*	**	0.90	***	****
		NTE 2%		25.00	15.00				60.00	350	2.00	*	**	1.75	***	****
			EPA 365.3	EPA 353.2	EPA 350.1	EPA 370.1			SM 4500P B5	SM 4500N C	SM 2130B	SM 2520	EPA 150.1	SM 10200	SM 2550B	SM 4500 OG

FIGURE 4. Reef Runway "Small" donor site: Three views of sand deposits at the Reef Runway "small" donor site (top left, right). Rubble bed at inshore edge of sand deposit (bottom left). See Figure 1 for location of Reef Runway sites.

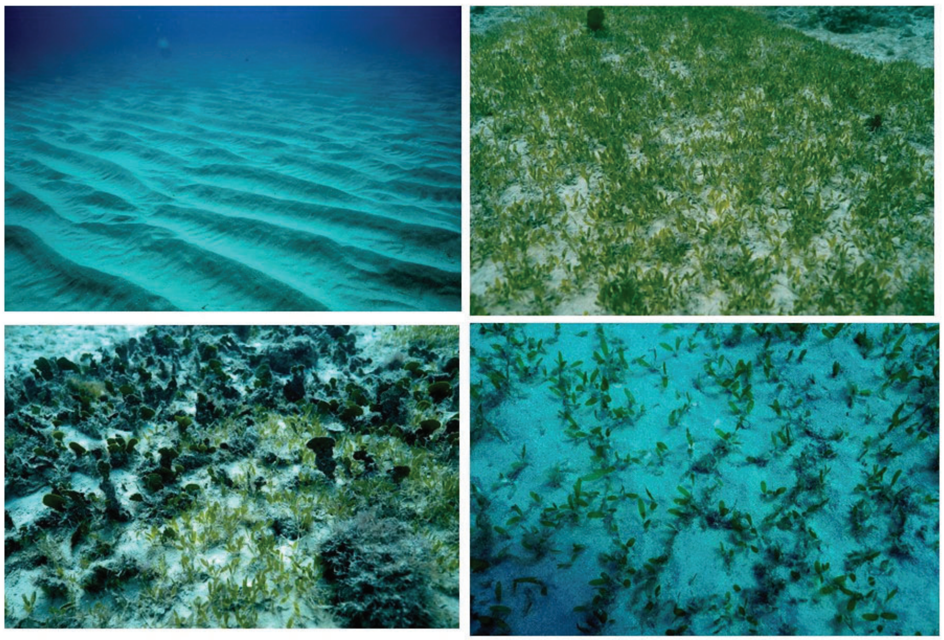


FIGURE 5. Reef Runway "Large" donor site: Sand deposit at center of donor site (upper left); bed of seagrass (*Halophila hawaiiana*) at inshore edge of donor site (upper, lower right); mixed bed of seagrass and green alga *Avrainvillea erecta* at offshore edge of donor site (lower left). See Figure 1 for location of Reef Runway donor sites.

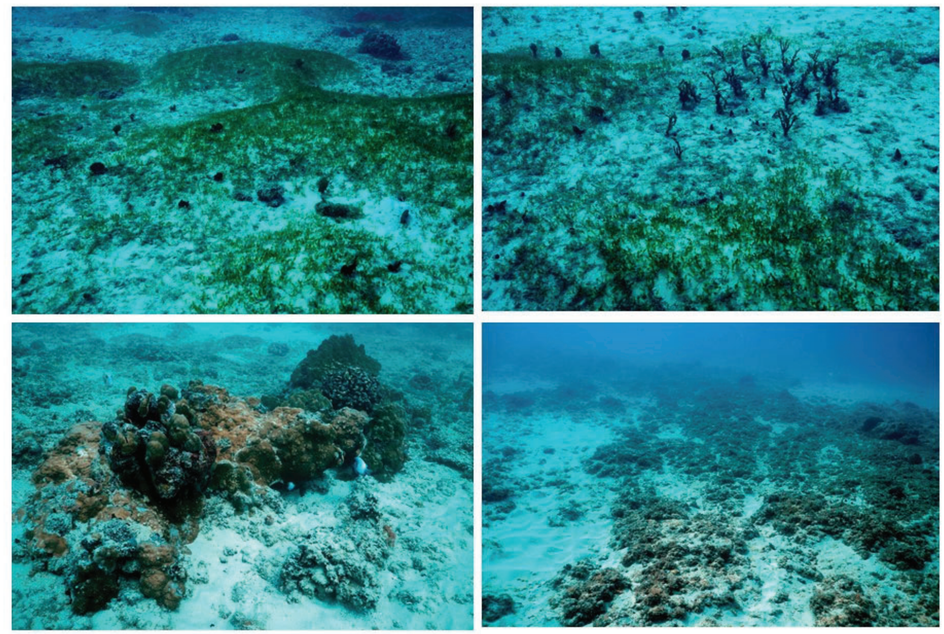


FIGURE 6. Reef Runway "Large" donor site: Mixed beds of seagrass and green algae (*Avrainvillea erecta* and *Halimeda* sp.) (top left and right);); coral rubble encrusted with *Montipora patula (bottom left)*; rubble bed (bottom right). For location of donor sites, see Figure 1.

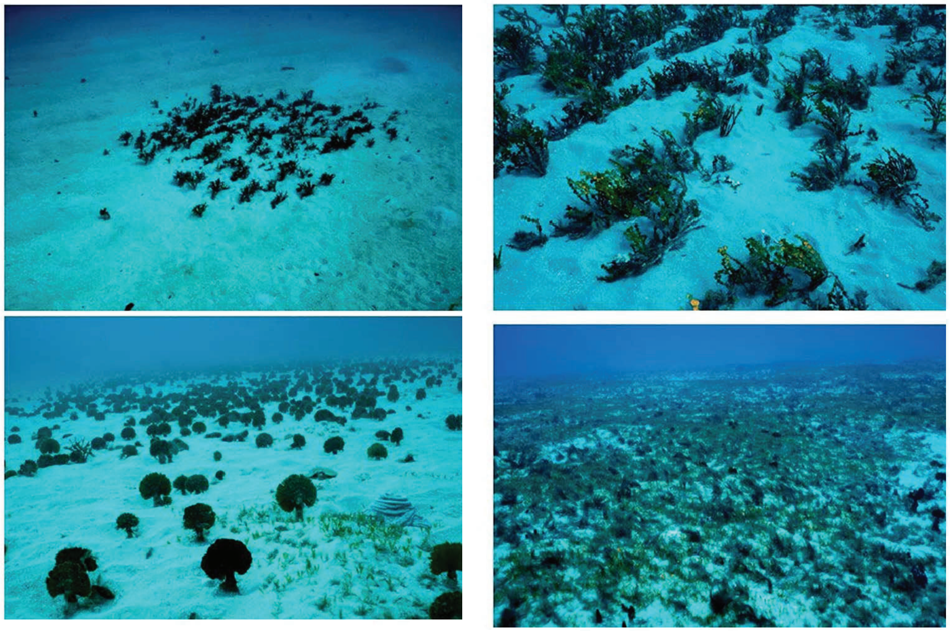


FIGURE 7. Ala Moana donor site. Beds of calcareous green alga *Halimeda* sp. at inshore edge of sand deposit (top left and right); mixed field of green alga *Avrainvillea erecta* and seagrass *Halophila hawaiiana* at offshore edge of sand deposit (bottom left and right). See Figure 1 for location of donor site.

FIGURE 8. Ala Moana donor site: Metal frame colonized by numerous reef corals observed in center of Ala Moana donor site (left); small colony of *Porites lobata*, sea cucumber *Holothuria* sp., and green conical sponges *Spirastrealla vagabunda* on inshore edge of Ala Moana donor site (top right). Bottom photos show distinct boundary between sand deposit and algal bed (right). See Figure 1 for location of donor sites.

FIGURE 9. Ala Wai donor site: Beds of blue-green algae *Lyngbya majuscula* at offshore edge of Ala Wai donor site. The Ala Wai site was the only donor area where seagrass was not observed. See Figure 1 for location of donor sites.

FIGURE 10. Ala Wai donor site: boundary of inner edge of sand deposit and reef structure (top left and right); reef platform inshore of sand deposit (bottom left); large colony of *Porites lutea* at inner edge of sand deposit (bottom right). See Figure 1 for locations of donor sites.

APPENDIX G

Coastal Assessment and Design Report Ala Moana Regional Park Beach Nourishment Project
Honolulu, Oʻahu, Hawaiʻi

PAGE IS INTENTIONALLY LEFT BLANK

Coastal Assessment and Design Report
Ala Moana Regional Park
Beach Nourishment Project

Honolulu, Oahu, Hawaii

January 2019

Prepared for:
Belt Collins Hawaii LLC
2153 North King Street
Honolulu, HI 96819

Prepared by:
Sea Engineering, Inc.
Makai Research Pier
41-305 Kalanianaole Hwy.
Waimanalo, HI 96795

Job No. 25593

TABLE OF CONTENTS

LIST OF FIGURES

Coastal Assessment and Design Report – Beach Nourishment
Ala Moana Regional Park DRAFT

LIST OF TABLES

1. INTRODUCTION

1.1 Project Location and General Description

Ala Moana Regional Park is located on the south shore of Oahu, Hawaii, between Kewalo Basin and the Ala Wai Small Boat Harbor. The 119-acre park, which is owned and administered by the City and County of Honolulu, was dedicated in 1934. The park includes a large expanse of green area and a variety of amenities, including nearly 4,000 lineal feet of beach between Kewalo Basin and Magic Island.

The beach area and adjacent swim channel were constructed over several decades. The swim channel was originally dredged to provide passage for boats between the Kewalo Basin and Ala Wai boat harbors. The beach was constructed in the mid-1950s. In the time following initial construction of the beach, sand has been eroded and replenished, though much of the evidence of nourishment is anecdotal. The most obvious sand loss has occurred along the shoreline across from the tennis courts extending 1,400 feet to the east, resulting in narrowing of the sand beach and exposure of rocky material in the shallow nearshore waters. This shoreline shape was first seen in aerial images in the early 1960s and that same general shape exists today. At high tide, there is no dry beach in this area.

1.2 Project Background

In 2016, the City addressed the heavily-eroded and rocky shoreline area by commissioning a project to relocate rocks from the beach face and to move sand from the wider areas. The project was intended to produce a noticeable impact on the shoreline without the need for a full suite of permits. DLNR allowed rock to be removed from the beach face as long as the rocks did not leave the beach system. A volunteer effort in July of 2016 was led by City work crews, where an estimated 300 cubic yards of rock was relocated from the beach face to the back of the beach where it was buried along the wall. Sand was moved in October of 2016 from wider parts of the beach to the eroded area. The sand was placed inshore of the high tide line, thereby limiting the extensive permitting process required for placing sand in the water. This project, however, could only move approximately 1,500 cubic yards of sand into the eroded area due to space constraints.

Ala Moana Beach does not have a natural source of sand, and any sand that moves toward shore over the reef flat is blocked from reaching the beach by the deeper swimming channel. The City wishes to artificially nourish the beach with sand to address the erosion problem and the exposed rocks in the nearshore waters, thereby improving the user's experience. The beach nourishment project is part of a master plan to produce improvements to the park, and an Environmental Impact Statement (EIS) has been commissioned. The work presented in this report is in support of that EIS. The objectives of this study are:

1. Investigate potential sand sources
2. Develop sand recovery, transport, and placement methodology
3. Design the beach nourishment plan

2. PROJECT SITE DESCRIPTION

2.1 Regional Setting

Ala Moana Regional Park is located on two parcels covering approximately 120 acres along Oahu's south shore. The site is bordered on the west by Kewalo Basin, on the north by Ala Moana Boulevard, and on the east by the Ala Wai Canal and Ala Wai Boat Harbor. The park layout and stationing for the location of features are shown in Figure 2-1 and Figure 2-2.

The park was constructed by filling low-lying wetlands. A channel was dredged through the nearshore reef to connect Kewalo Basin with the Ala Wai Boat Harbor. Further development along the shoreline included additional dredging of the channel, further construction of the Kewalo Basin area, and construction of Magic Island, resulting in an essentially isolated alongshore channel. Sand fill on the inshore side of the channel produced a sandy beach.

Park Engineering performed a topographic survey of the park during October of 2015. Coastal engineers from Sea Engineering, Inc., performed a topographic survey of the beach and an assessment of the shoreline on December 4, 2017, and a bathymetric survey of the swim channel on December 13, 2017. Those surveys were combined into a single data set and were integrated into the comprehensive topographic survey performed by Park Engineering and the results are presented in Section 3.1.

The existing Ala Moana beach shoreline is generally oriented east-west through most of the park, before turning toward the south (seaward) near Magic Island. A low wall separates the beach from the backshore through the western and central regions of the beach. Higher walls and stairs are found in the central region, then the beach widens, and the beach is backed by vegetation along Magic Island. A driveway and sidewalks are found inshore of much of the beach. McCoy Pavilion, tennis and croquet courts, concessions, and large grassed areas are located between the park driveway and Ala Moana Boulevard. Five ocean safety lifeguard towers (1B through 1E) are located along the beach.

Presently, the nearshore channel is typically about 300 feet across and is frequented by swimmers and paddleboarders, and surfers cross the channel to get to the surf breaks, which are located about 1,000 feet offshore of the channel.

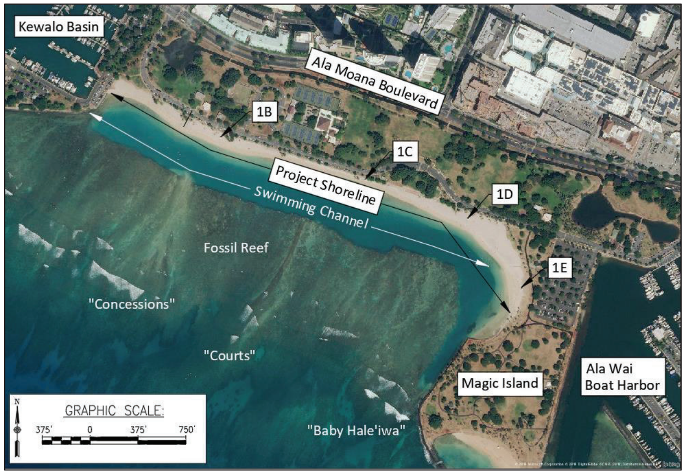


Figure 2-1 Overview of project site

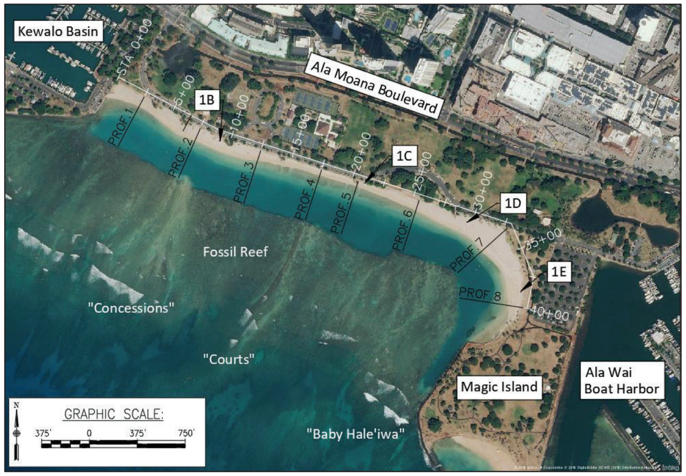


Figure 2-2 Stationing along project shoreline in white and profile locations (Profile 1 through Profile 8) in black

2.2 Shoreline Description

2.2.1 Ala Moana Beach

Ala Moana beach shares its western (Ewa) boundary with Kewalo Basin at Sta. 0+00 (see Figure 2-2 for stationing). Beach volleyball is common in this area and two new sand volleyball courts were recently constructed between the low wall and the driveway. A shower facility is located at Sta. 3+75. The average dry beach width in this area is approximately 50 feet, measured from the backshore seawall to the berm/foreshore slope grade change. The nearshore waters contain rock rubble, with no appreciable sand, between Sta. 0+00 and about Sta. 3+60. The beach berm elevation varies between +3.5 and +5.0 feet above MSL along this portion of beach. The top of wall elevation varies between +5.5 to +6.2 feet above MSL. The foreshore beach slope varies between 1V:11.2H near the Ewa end and 1V:6.4H near Sta. 6+80. The swimming channel in this region is about 270 feet wide. Figure 2-3 and Figure 2-4 show the beach and typical cross-shore profile in this area, respectively.

The shoreline continues east towards lifeguard tower 1B. The dry beach widens to approximately 88 feet near Sta. 6+45 and the sand extends seaward to the swimming channel. Figure 2-5 shows the typical view along this wider portion of beach looking west. The beach berm elevation varies between +3.8 and +5.0 feet above MSL along this portion of beach. The top of wall elevation varies between +5.9 and +6.5 feet above MSL. The foreshore beach slope varies between 1V:6.4H at about Sta. 6+80 and 1V:7.2H near Sta. 10+00. The swimming channel in this region is about 260 feet wide. Figure 2-5 and Figure 2-6 show the beach and typical cross-shore profile in this area, respectively. An ADA-compliant access mat and shower facility are located at Sta. 6+75 and an additional shower facility is located at Sta. 10+50.

East of lifeguard tower 1B, the beach begins to narrow, and the nearshore rock rubble is exposed again starting at about Sta. 12+80 (Figure 2-7), increasing in area as the beach continues to narrow. The dry beach width narrows from 63 feet at Sta. 10+00 to 14 feet at Sta. 17+50. The seawall elevation varies between +5.6 and +6.5 feet. The beach berm elevation varies between +3.8 and +5.4 feet above MSL and the foreshore beach slope steepens from 1V:10.3H at Sta. 12+50 to 1V:6.6H at Sta. 17+50. The swimming channel in this area is approximately 300 feet wide. A shower facility is located at Sta. 14+50 across from the tennis courts. Figure 2-8 and Figure 2-10 show the typical cross-shore profiles at Sta. 12+50 and Sta. 17+50, respectively while Figure 2-9 shows Lifeguard Tower 1C in its new location.

The shoreline continues east to its narrowest section at Sta. 20+50 where the dry beach width is only about 8 feet from the backshore wall to the berm and foreshore slope grade change (Figure 2-11). The nearshore rock rubble is exposed to about 85 feet seaward of the beach toe (Figure 2-12). Continuing east, the dry beach width begins to widen from 8 feet to about 50 feet at Sta. 25+50 (Figure 2-13). The backshore seawall continues, varying between +5.3 to +5.9 feet with a heightened portion rising to about +9.5 feet between Sta. 23+00 to Sta. 26+70 (Figure 2-14). Between this higher section of seawall is a wide stairway which goes from the beach berm elevation up to about +8.5 feet.

The 2016 sand pushing project was undertaken along this stretch of shoreline, from about Sta. 13+00 to Sta. 24+00. This is the narrowest stretch of beach, and at high tides, there can be no dry beach. Lifeguard Tower 1C was relocated approximately 250 feet in the Ewa direction

where the beach is slightly wider. Due to the narrow beach and extensive rocky area, this portion of beach is the least utilized within the park.

The beach curves south into Magic Island starting at about Sta. 30+00 (Figure 2-15). The backshore becomes a grassy area while the wall continues east along Ala Moana Park Drive. The beach face transitions to a much flatter slope (approximately 1V:25H) and the beach width gradually decreases from its widest section of 195 feet, tapering to 0 feet at the seawall along Magic Island where the beach terminates (Figure 2-16 and Figure 2-17). This stretch of beach has been observed to be very popular with users, due to the width of beach, extension of sand into the water, and proximity to the comfort station, showers, and parking. Due to the low elevation and flat profile, this area is also prone to extensive inland flooding during high water levels.

Figure 2-3 Shoreline near Sta. 2+50 looking east

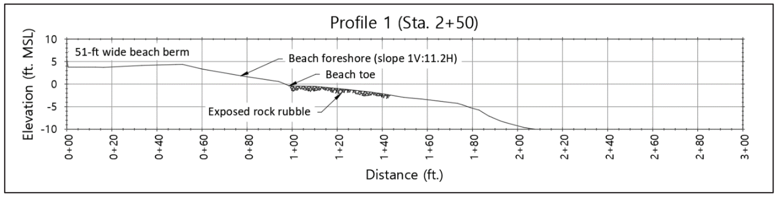


Figure 2-4 Profile 1 at Sta. 2+50

Figure 2-5 Shoreline near Sta. 7+50 looking west

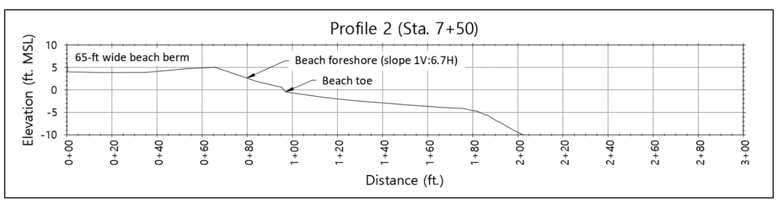


Figure 2-6 Profile 2 at Sta. 7+50

Figure 2-7 Shoreline narrowing with rock outcropping shown near Sta. 12+50 looking east

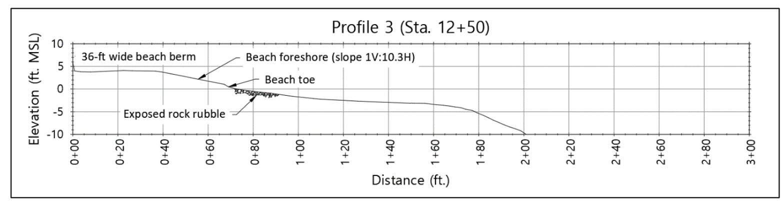


Figure 2-8 Profile 3 at Sta. 12+50

Figure 2-9 Lifeguard tower 1C being affected by beach narrowing

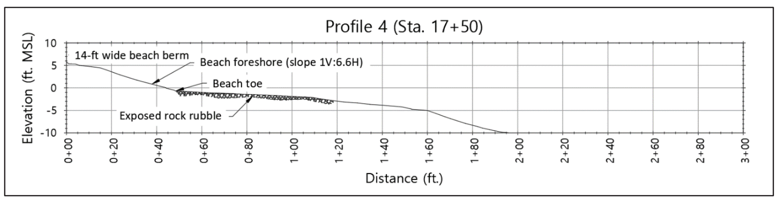


Figure 2-10 Profile 4 at Sta. 17+50

Coastal Assessment and Design Report – Beach Nourishment
Ala Moana Regional Park DRAFT

Figure 2-11 Narrowest section of beach at Sta. 20+50

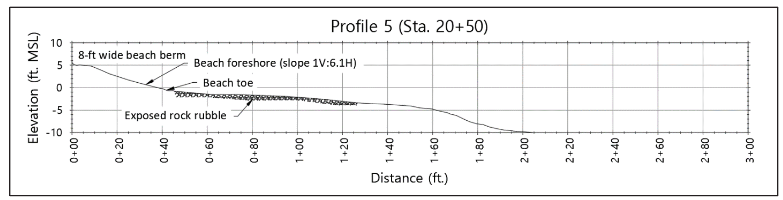


Figure 2-12 Profile 5 at Sta. 20+50

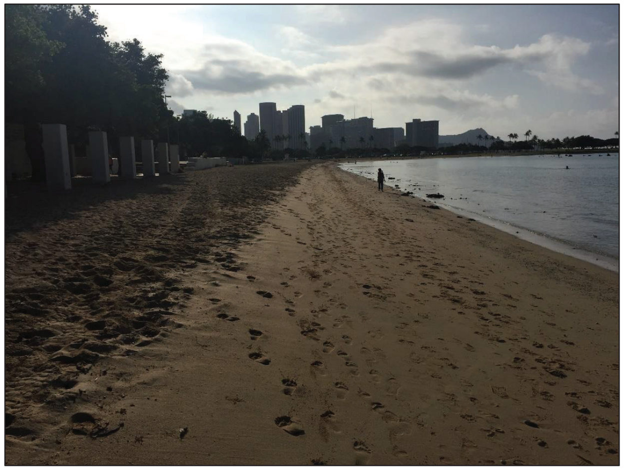


Figure 2-13 Beach beginning to widen near Sta. 25+50 looking east

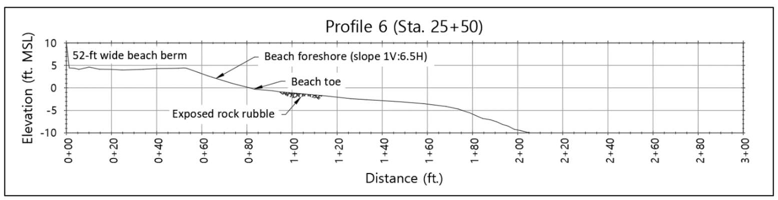


Figure 2-14 Profile 6 at Sta. 25+50

Figure 2-15 View of beach curving south into Magic Island near Sta. 33+00

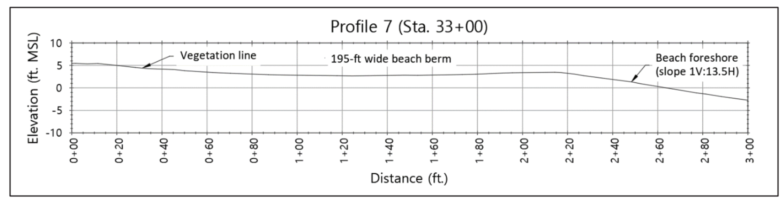


Figure 2-16 Profile 7 at Sta. 33+00

Figure 2-17 East extent of shoreline at Magic Island near Sta. 40+00

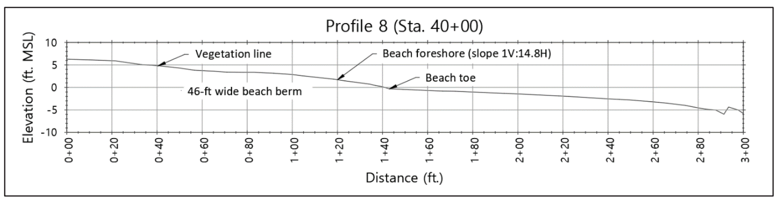


Figure 2-18 Profile 8 at Sta. 40+00

2.3 Elevated Water Levels

In 2017 Hawaii experienced longer than expected elevated water levels, leading to significant coastal inundation, especially at urban low-elevation urban areas such as Waikiki, Ala Wai Boulevard, and Mapunapuna. While "King Tides" received negative notoriety as being the cause of the inundation, they contributed only a small fraction of the water level rise. King Tides refer to the higher tide levels that result of the alignment of the earth, sun, and moon during the winter and summer months. During these times, high tide can reach an elevation of as much as +1.9 ft msl. In spring and fall, the highest high tides sometime reach only about +1.2 ft msl.

The ocean surface does not have a consistent elevation. Sea level anomalies exist as a result of such processes as El Nino, global warming, geostrophic currents due to the rotation of the earth, and mesoscale eddies that propagate across the ocean. On June 23, 2017, the highest water level of the year was measured at +3.2 ft mllw, which was 0.6 ft above the King Tide. The additional elevation was due to a mesoscale eddy around the Hawaiian Islands. The duration of these eddies cannot always be predicted, and the associated higher water levels lasted for much of 2017, resulting in an alarming amount of coastal erosion.

The effects of these higher water levels were seen at Ala Moana Beach as inundation of the beach area. Figure 2-19 through Figure 2-22 show the amount of flooding during the May 2017 high tides.

Figure 2-19 Inundation of beach area near Magic Island (May 26, 2017)

Figure 2-20 Inundation of beach area near Tower 1C (May 26, 2017)

Figure 2-21 Inundation of beach area east of Tower 1B (May 26, 2017)

Figure 2-22 Inundation of beach area and volleyball court (May 26, 2017)

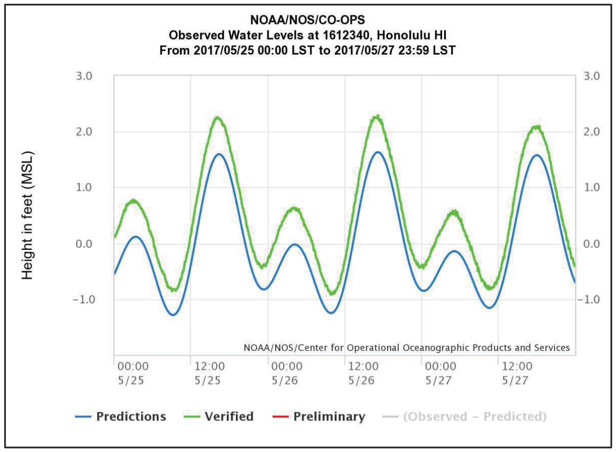


Figure 2-23 Predicted and measured tides at Honolulu Harbor (May 25-27, 2017)

2.4 Site Investigations

Site investigations of the park were undertaken in December of 2017 to characterize the topography and swimming channel which would drive the design. A topographic survey of the beach was performed at 50-foot spacing for the entire length of sand beach on December 4 and 6, 2017. This topographic survey serves as the base map for the beach nourishment design. The survey was integrated into the park-wide survey performed by ParEn in 2016.

A bathymetric survey was performed on December 13, 2017, using a small motor boat and a single-beam echosounder. The configuration has the capability of operating in less than one foot of water. The bathymetric survey was performed along transects across the swimming channel. Transect spacing was approximately 100 feet. Overlap on the makai side overlapped with the topographic survey, and the boat surveyed as close to the reef as possible.

Topographic and bathymetric survey lines are shown on Figure 2-24.

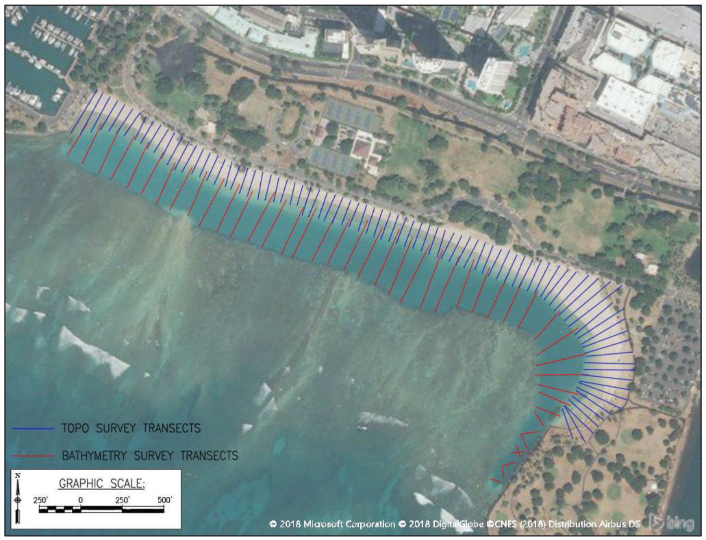


Figure 2-24 Topographic and bathymetric survey lines (December 2017)

The topographic survey showed that the backshore elevation of the beach was quite low, varying between about 3 and 5 feet above mean sea level (msl). This low elevation allows inundation at higher tides, even when waves at the beach are small. The rocky reef flat between the beach and the swimming channel was typically about 1 to 3 feet below msl. Depths within the swimming

channel were consistently found to exceed 10 feet, reaching as much as 23 feet deep around Profile 5 and Profile 6 in Figure 2-25.

The field team returned to the park on January 21, 2018, to investigate the bottom substrate and attempt to identify sand resources within the swimming channel. Divers swam along the 8 transects shown on Figure 2-25 and performed jet probing at three locations on each transect—inner channel margin, mid-channel, and outer channel margin, approximately 25%, 50%, and 75% of the distance across the swimming channel respectively. The divers also observed the reef cut on the offshore side of the swim channel for sand deposits. Sand samples were obtained on the beach and at the jet probe locations.

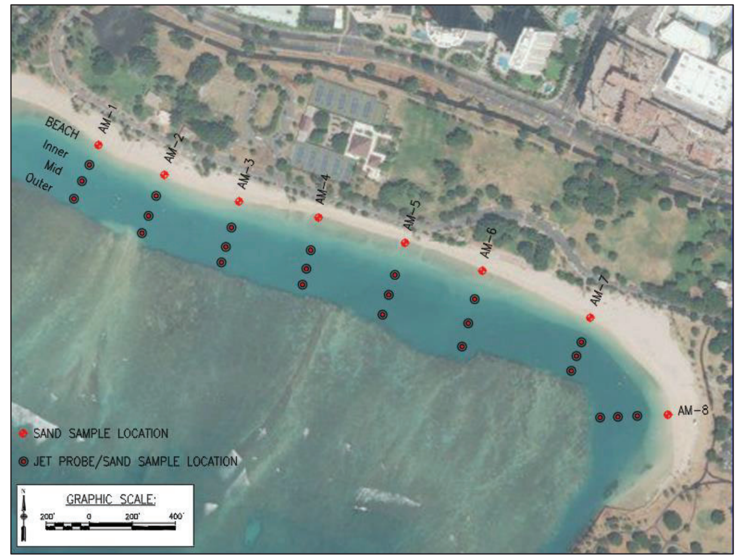


Figure 2-25 Jet probe and sand sampling locations, January 21, 2017

The results of the Ala Moana beach sand grain size analyses are shown in Table 2-1. The samples show median grain size D_{50} in the range of 0.37 mm to 0.47 mm, with the exception of AM-8, which contained significantly coarser material. Samples AM-1 through AM-7 are considered moderately sorted to moderately well sorted. Sample AM-8 is poorly sorted and contains the highest fine fraction, likely due to the limited wave action in that location.

Table 2-1 Ala Moana sand sample summary

Location	D_{50} (mm)	Sorting σ	% fines
AM-1	0.39	0.6	0.6
AM-2	0.47	0.6	0.3
AM-3	0.43	0.7	0.8
AM-4	0.37	0.7	0.6
AM-5	0.37	0.8	0.9
AM-6	0.42	1.0	0.5
AM-7	0.44	0.7	0.7
AM-8	0.78	1.3	1.5

The divers found great variability in the sediment throughout the swimming channel. Along the swimming channel floor, the sand appeared to be highly-oxidized and the grain size and consistency resulted in the sediment best being described as "muddy". The margins of the swimming channel contained coarser sand, as sand eroded from the beach made up the inner portion and sand from the reef flat contributed to the outer portion. This sand was observed to generally be significantly coarser than the beach sand and regularly was noted to have cobbles or mud mixed with the sand. Photographs of sand in the central area of the park beach are shown in Figure 2-26. The sand at the inner and outer channel locations was found to be noticeably coarser than the beach sand with the appearance of being poorly sorted. The sediment from mid-channel resembled mud when it was wet. The photograph of the mid-channel sample shows large chunks of consolidated material that were produced during drying. Grain size analyses were performed on the beach samples only.

The quantity of sand in the channel that would be available for use on the beach was considered to be too small and too spread out to be recoverable. The sand within the park waters was therefore eliminated as a source of project beach sand.

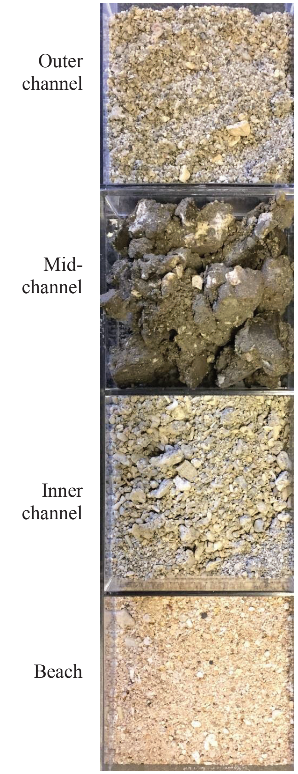


Figure 2-26 Example of variability in sand quality from the beach toward the reef.

2.5 Shoreline History

Prior to the development of Ala Moana Regional Park, the shoreline was characterized by a very narrow beach which fronted coastal wetlands (see Figure 2-27). Shoreline alteration began in the 1920s, and a shore-parallel boat channel was dredged to connect the Ala Wai canal and boat harbor with Kewalo Basin and its channel to deep water (see Figure 2-28). In 1951, the Ala Wai Harbor entrance channel was dredged, which eliminated the need for the boat channel. The present Ala Moana shoreline came into being in 1955 when a new shore-parallel channel was dredged further offshore, and the dredged material was used to fill in the old boat channel and create a bench on which sand could be placed to create a beach. The dredging plans (Application by the Board of Harbor Commissioners, March 1954) indicate that the new dredged channel depth was to be 20 feet. Approximately 55,000 cy of sand was imported from Yokohama Beach to cover the dredged fill and create a sand beach. The west end of the beach butted up against the Kewalo Basin peninsula, and the east end abutted a large jetty adjacent to the Ala Wai channel (see Figure 2-29). In 1964 Magic Island was constructed and became the eastern terminus of the beach. Dredging was conducted along a portion of the west side of Magic Island to provide additional swimming area; however, the dredging did not extend all the way through the shallow fringing reef flat to connect to deep water (see Figure 2-30). By the early 1970s the sand along Ala Moana Beach was almost gone and the dredged coral fill was exposed. In 1976 the beach was nourished with an additional 30,000 cy of sand obtained from an inland fossil dune source in Mokuleia (Campbell and Moberly, 1978). To our knowledge no additional nourishment has been accomplished since 1976. Figure 2-31 and Figure 2-32 show the aerial images from 1982 and 2005, respectively.

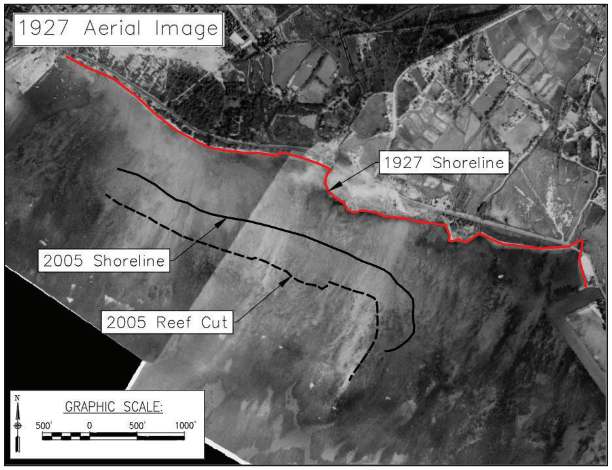


Figure 2-27 1927 Aerial image with the overlay of the 1927 shoreline, 2005 shoreline, and 2005 reef cut

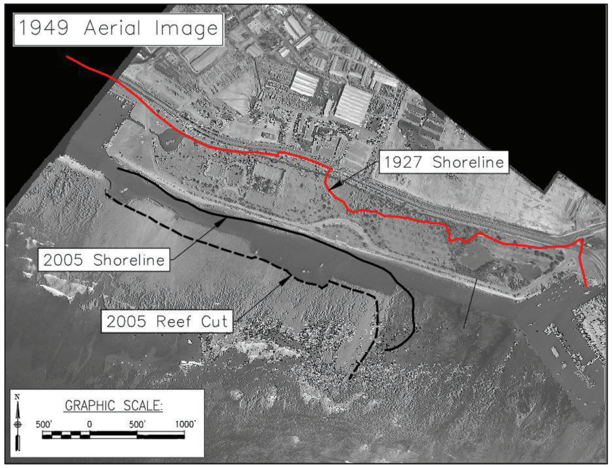


Figure 2-28 1949 Aerial image with the overlay of the 1927 shoreline, 2005 shoreline, and 2005 reef cut

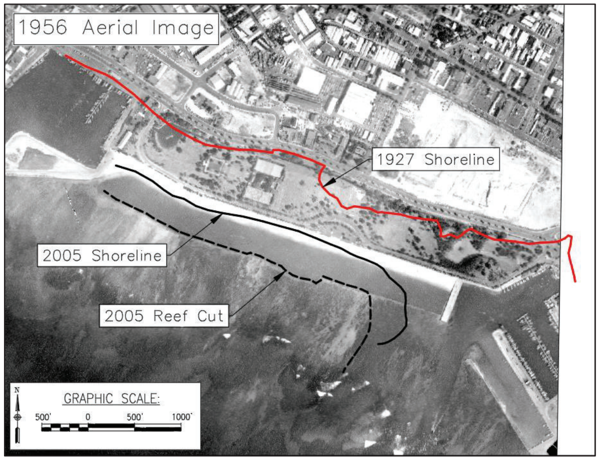


Figure 2-29 1956 Aerial image with the overlay of the 1927 shoreline, 2005 shoreline, and 2005 reef cut

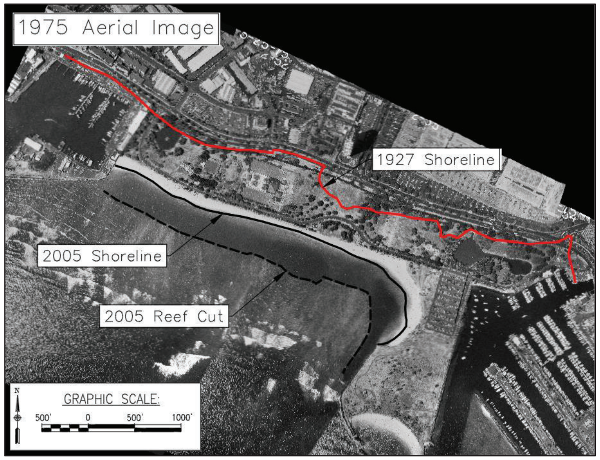


Figure 2-30 1975 Aerial image with the overlay of the 1927 shoreline, 2005 shoreline, and 2005 reef cut

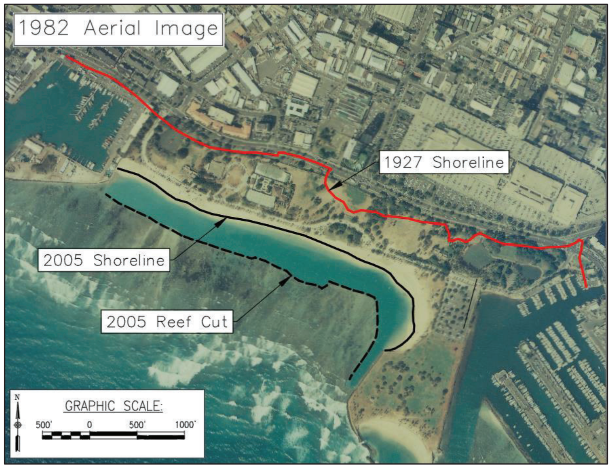


Figure 2-31 1982 Aerial image with the overlay of the 1927 shoreline, 2005 shoreline, and 2005 reef cut

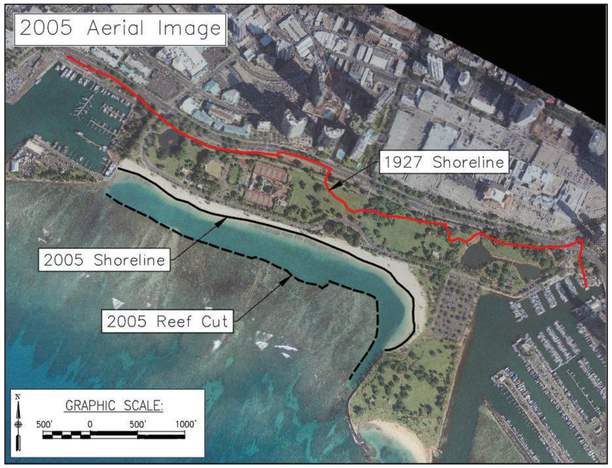


Figure 2-32 2005 Aerial image with the overlay of the 1927 shoreline, 2005 shoreline, and 2005 reef cut

2.6 Shoreline Trends

The erosion history at Ala Moana beach has been analyzed with aerial photographs by the University of Hawaii Coastal Geology Group. The CGG compared the low water mark digitized from aerial photographs between 1927 and 2005. In the project vicinity, photographs from 1927, 1949, 1952, 1957, 1968, 1970, 1974, 1975, 1982, and 2005 were available. The analyses for the project shoreline are presented as transects 18 through 86 in Figure 2-33 . The study indicates that the project shoreline has experienced erosion at the middle and end portions of the beach with the most severe erosion occurring at the Magic Island end of the beach.

Beach nourishment projects were undertaken during this period and were not factored into the CGG analyses. This variability in the historical shoreline positions can therefore result in misleading conclusions about the beach and erosion rates. To better show the more natural shoreline trend, a shoreline change analysis was performed using the shoreline positions from 1965, 1968, 1970, and 1975 (shorelines determined by UH CGG). These years were chosen as they represent the shoreline in its current configuration since the construction of Magic Island. Additionally, high resolution aerial imagery from 1963 and 1965 were obtained and used to infer the shoreline for those years. These additional shorelines were added to the dataset provided by CGG. Transect 54 from the CCG study was chosen to measure relative shoreline change since it is located where the most severe beach narrowing has occurred. The shoreline change and change rates for each of the years discussed are presented in Table 2-2. The average shoreline change rate was determined using periods of only shoreline retreat (erosion) in an attempt to remove periods where beach nourishment or sand pushing activities may have occurred. The average shoreline erosion rate was found to be 2.4 ft/yr.

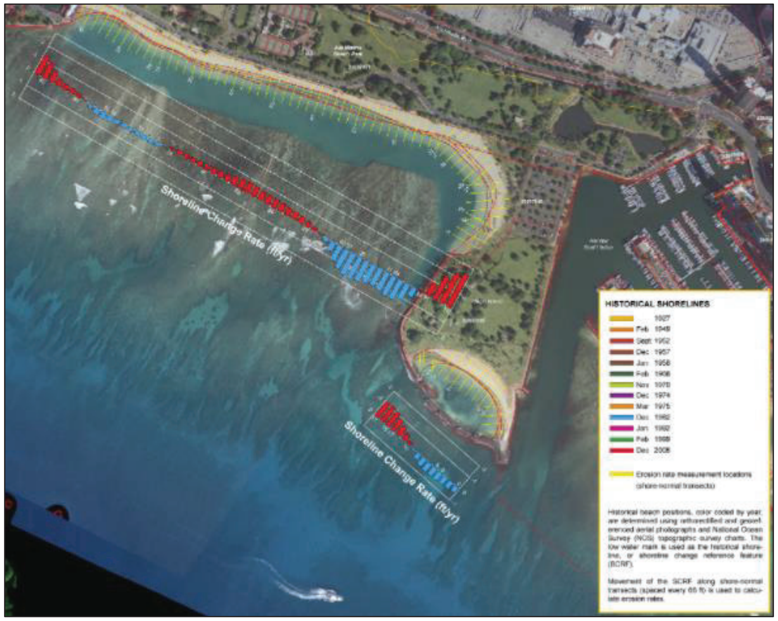


Figure 2-33 Historical shoreline change analysis (UH Coastal Geology Group).

Table 2-2 Historical shoreline change rates for shoreline positions determined by CGG and SEI at Transect 54. The average is shown for the periods of beach erosion (i.e., 1965-1975). Negative values indicate shoreline retreat.

Start Year	End Year	Duration (yrs)	Change (ft)	Rate (ft/yr)
1963	1965	2	1.2	0.6
1965	1968	3	-3.3	**-1.1**
1968	1970	2	-7.2	**-3.6**
1970	1975	5	-12.0	**-2.4**
1975	1982	7	8.2	1.2
1982	2005	23	21.2	0.9
			Average:	**-2.4**

More recent trends of shoreline change were analyzed using Google Earth aerial imagery between 2004 to 2014. The central portion of the beach, which has experienced beach narrowing, was analyzed using Google Earth aerial images from 2004, 2006, 2008, 2009, 2011, 2013, and 2014. Shoreline positions were inferred from the aerial imagery and change rates were determined at Transect 54 (see Figure 2-34). An erosion rate of 2.9 ft/yr (see Table 2-3) was found using this method which closely matches the average erosion rate from the CCG shorelines previously discussed. This value will be used later to estimate the shoreline response and renourishment interval.

The CGG reported erosion rates were less than 1 ft/yr, possibly because beach nourishment was not factored into their analyses.

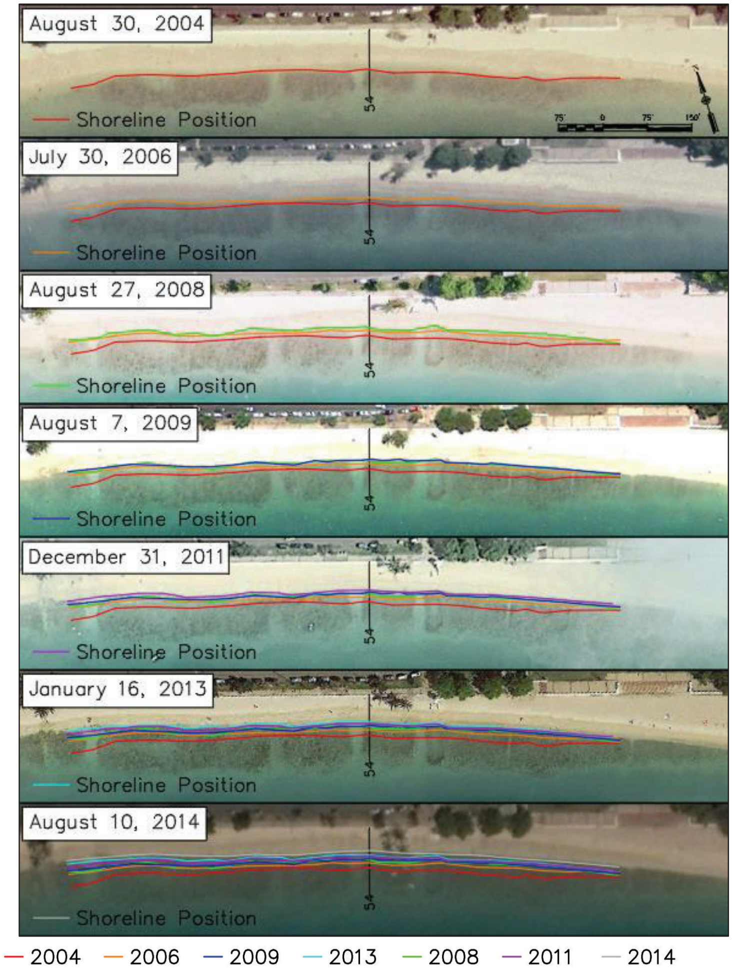


Figure 2-34 Historical shoreline analysis using Google Earth aerial imagery between 2004 and 2014 at transect 54

Table 2-3 Historical shoreline change analysis results from Google Earth imagery at transect 54. Negative values indicate shoreward movement of the shoreline.

Start Date (mm/dd/yyyy)	End Date (mm/dd/yyyy)	Duration (yrs)	Change (ft)	Rate (ft/yr)
8/30/2004	7/30/2006	1.92	-8.7	-4.5
7/30/2006	9/27/2008	2.16	-5.1	-2.4
9/27/2008	8/7/2009	0.86	-2.1	-2.5
8/7/2009	12/31/2011	2.40	-5.0	-2.1
12/31/2011	1/16/2013	1.05	-2.4	-2.3
1/16/2013	8/10/2014	1.56	-5.3	-3.4
			Average:	**-2.9**

3. OCEANOGRAPAHIC SETTING

3.1 Bathymetry and Nearshore Bottom Conditions

Ala Moana Regional Park is located on the south shore of Oahu, Hawaii, between Kewalo Basin and the Ala Wai Small Boat Harbor. Ala Moana Beach is a man-made shoreline consisting of dredged coral rubble fill underlying the sandy beach. The shoreline is fronted by a 300-foot wide swimming channel with depths up to 23 feet. Seaward of the swimming channel is a broad shallow fossil limestone reef which extends approximately 0.5 miles offshore to the local surf breaks. The reef flat is generally 5 feet or less out to the surf zone and then begins to deepen from the 10-foot contour down to deep water. Detailed nearshore bathymetry information is available via the U.S. Army Corps of Engineers (USACE) Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) dataset.

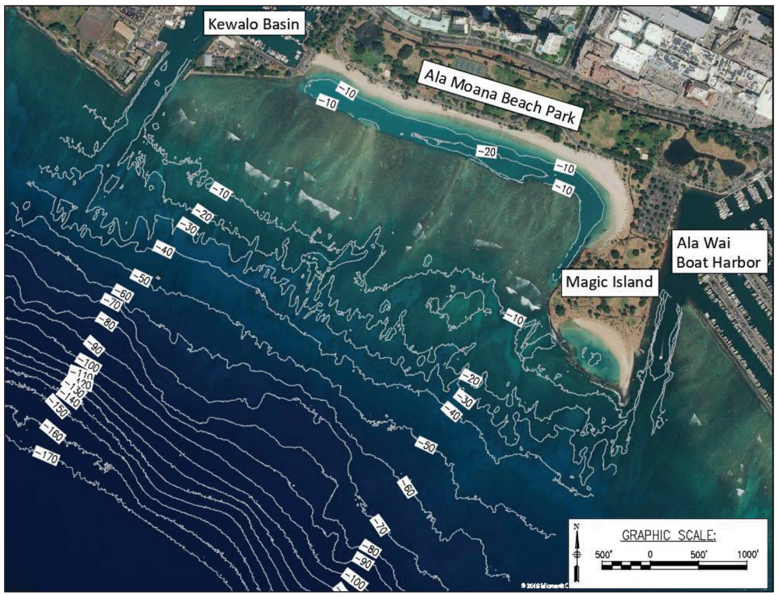


Figure 3-1 Project area bathymetry (contours in feet MSL)

3.2 Wind

The prevailing wind throughout the year is the northeasterly trade wind. Its average frequency varies from more than 90% during the summer season to only 50% in January, with an overall annual frequency of 70%. Westerly, or Kona, winds occur primarily during the winter months, generated by low pressure or cold fronts that typically move from west to east past the islands.

Figure 3-2 shows a wind rose diagram applicable to the site based on wind data recorded at Honolulu International Airport between 1949 and 1995.

Tradewinds are produced by the outflow of air from the Pacific Anticyclone high pressure system, also known as the Pacific High. The center of this system is located well north and east of the Hawaiian chain and moves to the north and south seasonally. In the summer months, the center moves to the north, causing the tradewinds to be at their strongest from May through September. In the winter, the center moves to the south, resulting in decreasing tradewind frequency from October through April. During these months, the tradewinds continue to blow; however, their average monthly frequency decreases to 50%.

During the winter months, wind patterns of a more transient nature increase in prevalence. Winds from extra-tropical storms can be very strong from almost any direction, depending on the strength and position of the storm. The low-pressure systems associated with these storms typically track west to east across the North Pacific north of the Hawaiian Islands. At Honolulu Airport, wind speeds resulting from these storms have on several occasions exceeded 60 mph. Kona winds are generally from a southerly to southwesterly direction, usually associated with slow moving low-pressure systems known as Kona lows situated to the west of the island chain. These storms are often accompanied by heavy rains.

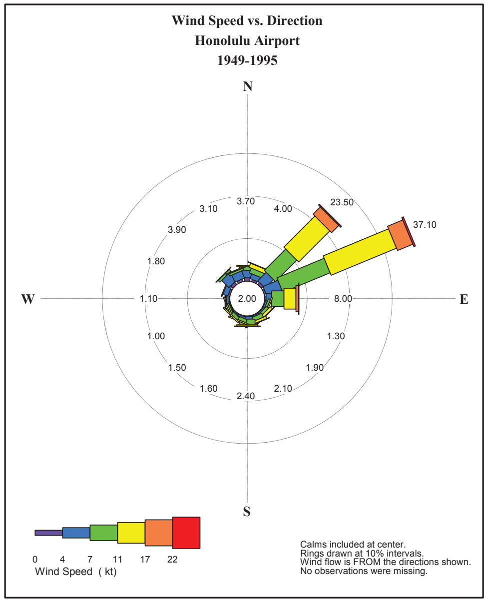


Figure 3-2 Wind Rose Honolulu Airport 1949-1995

3.3 Water Levels

3.3.1 Tides

Hawaii tides are semi-diurnal with pronounced diurnal inequalities (i.e., two high and low tides each 24-hour period with different elevations). A modulation of the tidal range results from the relative position of the moon and the sun: when the moon is new or full, the moon and the sun act together to produce larger "spring" tides; when the moon is in its first or last quarter, smaller "neap" tides occur (Rapaport, 2013). The cycle of spring to neap tides and back is half the 27-day period of the moon's revolution around the earth and is known as the fortnightly cycle. The combination of diurnal, semi-diurnal and fortnightly cycles dominates variations in sea level throughout the islands.

The geometry of the oceans - the basin shape, local coastline, bays, and even harbor geometry - has a major effect on the local behavior of the tides. On scales of oceanic basins, tides exist as very long waves propagating in patterns determined by their period and the geometry of the basin. Lines along which high tide occurs at the same time (called phase lines), converge to several points where the tidal range is zero. There are four of these points, called "amphidromes" in the Pacific: one on the North Pacific near the dateline, one near the equator in

the eastern North Pacific, one in the central South Pacific near Tahiti, and one east of New Zealand. Phase lines rotate counter-clockwise around the amphidromes in the North Pacific and clockwise around the ones in the South Pacific. For example, at the Hawaiian Islands, the offshore diurnal tide reaches the island of Hawaii island first, then sweeps across Maui, Oahu and finally Kauai. Tidal currents result from tidal variations of sea level, and near the shore are often stronger than the large-scale circulation (Rapaport, 2013).

Tidal predictions and historical extreme water levels are given by the Center for Operational Oceanographic Products and Services, NOS, NOAA, website. A tide station is located at Honolulu Harbor, Station 1612340, and the water level data based on the 1983-2001 tidal epoch is shown in Table 3-1.

Table 3-1 Water level data for Honolulu Harbor, Station 1612340 (NOAA)

Datum	Elevation (feet, MLLW)	Elevation (feet, MSL)
Mean Higher High Water	+1.9	+1.1
Mean High Water	+1.4	+0.6
Mean Sea Level	+0.8	0.0
Mean Low Water	+0.2	-0.7
Mean Lower Low Water	0.0	-0.8

Hawaii is also subject to periodic extreme tide levels due to large scale oceanic eddies that propagate through the islands. Eddies are circulations of about 50 to 200 km across that are often variable over a period of weeks to months depending on the latitude. These eddies produce tide levels up to 0.5 to 1.0 feet higher than normal for periods of up to several weeks in the Hawaiian Islands.

3.3.2 Sea Level Rise

The present rate of global mean sea-level change (SLC) is +3.4 ± 0.4 mm/year (Sweet, 2017), where a positive number represents a rising sea level. SLC appears to be accelerating compared to the mean of the 20th Century. Factors contributing to the measured rise in sea level include decreasing global ice volume and warming of the ocean. Sea level, however, is highly variable. The historical sea level trend for Honolulu Harbor, Station 1612340, is shown in Figure 3-3 (NOAA, 2017). The mean historical rate of sea level change (RSLC) is +1.48 ± 0.21 mm/yr based on monthly data for the period 1905 to 2017. The tide gauge data also shows interannual anomalies exceeding 0.5 feet (15 cm) in Honolulu Harbor.

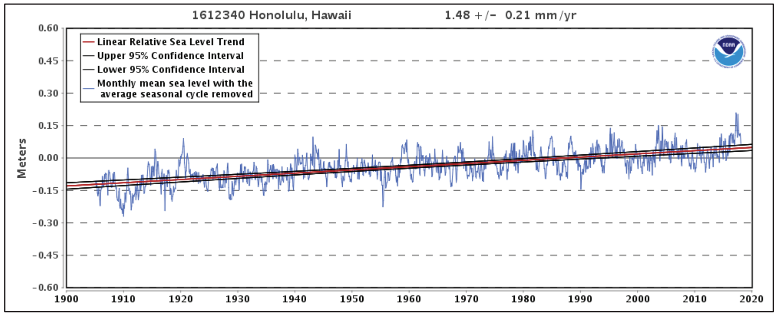


Figure 3-3 Mean sea level trend, Honolulu Harbor, Station 1612340, 1905 to present (NOAA, 2017)

The National Oceanic and Atmospheric Administration (NOAA) recently revised their sea level change projections through 2100 taking into account up-to-date scientific research and measurements. NOAA is projecting that global sea level rise as shown by their "Extreme" scenario could be as high as about 8 feet by 2100. NOAA's recent report also identifies specific regions that are susceptible to a higher than average rise in sea level. Hawaii has thus far experienced a rate of sea level rise that is less than the global average; however, this is expected to change. Hawaii is in the "far field" of the effects of melting land ice. This means that those effects have been significantly less in Hawaii compared to areas closer to the ice melt. Over the next few decades, this effect is predicted to spread to Hawaii, which will then experience sea level rise greater than the global average.

Figure 3-4 presents mean sea level rise scenarios for Hawaii based on the revised NOAA projections, taking into account the far-field effects. While the projections are based on the most current scientific models and measurements, discretion is necessary in selecting the appropriate scenario. Selecting the appropriate sea level change projection is a function of many parameters, including topography, coastal setting, criticality of infrastructure, potential for resilience, budget, and function.

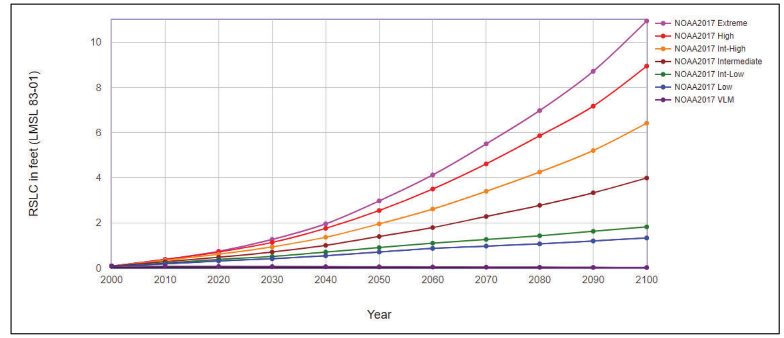


Figure 3-4 Hawaii sea level rise projections (adapted from NOAA, 2017)

Table 3-2 Hawaii Local Mean Sea Level rise scenarios (feet)

Scenario	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
Extreme	0.38	0.74	1.26	1.95	2.97	4.12	5.50	6.97	8.71	10.94
High	0.38	0.71	1.13	1.76	2.54	3.50	4.61	5.86	7.17	8.94
Intermediate-High	0.35	0.61	0.94	1.36	1.95	2.61	3.40	4.25	5.20	6.42
Intermediate	**0.28**	**0.48**	**0.71**	**1.00**	**1.40**	**1.79**	**2.28**	**2.77**	**3.33**	**3.99**
Intermediate-Low	0.21	0.38	0.51	0.71	0.90	1.10	1.26	1.43	1.63	1.82
Low	0.18	0.31	0.41	0.54	0.71	0.87	0.97	1.07	1.20	1.33

An important conclusion of the regional climate assessment is that NOAA's revised *Intermediate* rate is recommended for planning and design purposes in Hawaii. The *Intermediate* rate projects that sea level in Hawaii will rise 2.3 feet by 2070 (Table 3-2). Given the recent upwardly revised projections and the potential for future revisions, consideration may also be given to the *Intermediate-High* rate for planning and design purposes, which projects that sea level in Hawaii will rise 3.4 feet by 2070.

3.3.3 Vulnerability to Sea Level Rise

Sea level rise has the potential to impact beaches and shorelines in Hawaii. Impacts may include beach narrowing and beach loss, loss of land due to erosion, and infrastructure damage due to inundation and flooding. The impacts from anomalous sea level events (e.g., king tides, mesoscale eddies, storm surge) are also likely to increase. A 2015 study found that, due to increasing sea level rise, average shoreline recession (erosion) in Hawaii is expected to be nearly twice the historical extrapolation by 2050, and nearly 2.5 times the historical extrapolation by 2100 (Anderson et al., 2015).

The State of Hawaii recently published the *Sea Level Rise Vulnerability and Adaptation Report for Hawaii*, which discusses the anticipated impacts of projected future sea level rise on coastal hazards, and the potential physical, economic, social, environmental, and cultural impacts of sea level rise in Hawaii (Hawaii Climate Change Mitigation and Adaptation Commission, 2017). The University of Hawaii conducted numerical modeling to estimate the potential impacts that a 3.2-foot rise in sea level would have on coastal hazards including passive flooding, annual high wave flooding, and coastal erosion. These three coastal hazards are combined to form the "Sea Level Rise Exposure Area" shown in blue in Figure 3-5, encompassing a large portion of the park and extending mauka of Ala Moana Boulevard.

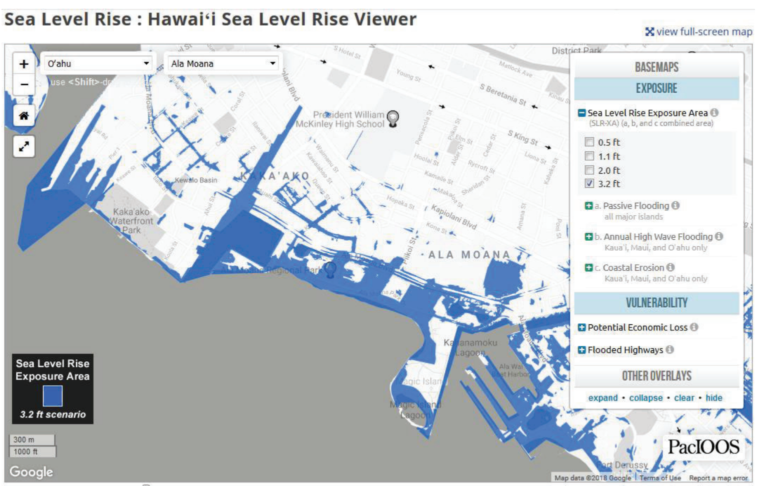


Figure 3-5 ***Sea Level Rise Exposure Area*** **(Ala Moana)**

The beach nourishment designs presented in Section 5 are partially constrained by existing infrastructure. The top of the landscaping wall that extends along the inshore margin of the beach was measured to vary in elevation between +5.5 and +6.5 ft msl. The beach fill templates are therefore limited to that elevation or only slightly higher to keep sand from spilling over the wall. The landscaping wall is considered to be historic and there are presently no plans to modify the wall.

The effect of sea level rise on the beach is a consideration for the City. While academic models show that the beach profile can move higher and inshore with rising water levels, these models assume an unconstrained and continuous sandy profile. This, however, is not the case at Ala Moana beach. As sea levels rise, sand that would be mobilized to form a higher inshore berm would likely be washed over the wall. In addition, the availability of sand will be less, since the supply of sand is limited to the amount of sand inshore of the swim channel. The beach can be re-nourished periodically to account for sea level rise; however, a higher backshore wall may

soon become necessary to achieve and maintain the beach elevations necessary to mitigate flooding.

None of the beach nourishment designs are expected to contribute to or worsen the impact of sea level rise.

3.4 Waves

3.4.1 General Wave Climate

The wave climate in Hawaii is dominated by long period swell generated by distant storm systems, by relatively low amplitude, short period waves generated by more local winds, and the occasional bursts of energy associated with intense local storms. Typically, Hawaii receives five general surface gravity wave types: 1) northeast tradewind waves, 2) southeast tradewind waves 3) southern swell, 4) North Pacific swell, and 5) Kona wind waves. The dominant swell regimes for Hawaii are shown in Figure 3-6.

Tradewind waves occur throughout the year and are the most persistent April through September when they usually dominate the local wave climate. They result from the strong and steady tradewinds blowing from the northeast quadrant over long fetches of open ocean. Tradewind deepwater waves are typically between 3 to 8 feet high with periods of 5 to 10 seconds, depending upon the strength of the tradewinds and how far the fetch extends east of the Hawaiian Islands. The direction of approach, like the tradewinds themselves, varies between north-northeast and east-southeast and is centered on the east-northeast direction. The project site is well sheltered from the direct approach of tradewind waves by the island itself, and only a portion of the tradewind wave energy refracting and diffracting around the southeast end of the island reaches Ala Moana.

During the winter months in the northern hemisphere, strong storms are frequent in the North Pacific in the mid latitudes and near the Aleutian Islands. These storms generate large North Pacific swells that range in direction from west-northwest to northeast and arrive at the northern Hawaiian shores with little attenuation of wave energy. These are the waves that have made surfing beaches on the north shores of Oahu and Maui famous. Deepwater wave heights often reach 15 feet and in extreme cases can reach 30 feet. Periods vary between 12 and 20 seconds, depending on the location of the storm. The project site is sheltered by the island itself from swell approach from the north and northwest.

Southern swell is generated by storms in the southern hemisphere and is most prevalent during the summer months of April through September. Traveling distances of up to 5,000 miles, these waves arrive with relatively low deepwater wave heights of 1 to 4 feet and periods of 14 to 20 seconds. Depending on the positions and tracks of the southern hemisphere storms, southern swells approach between the southeasterly and southwesterly directions. The project site is directly exposed to swell from the southerly direction and these waves represent the greatest source of wave energy reaching the project site.

Kona storm waves also directly approach the project site; however, these waves are fairly infrequent, occurring only about 10 percent of the time during a typical year. Kona waves typically range in period from 6 to 10 seconds with heights of 5 to 10 feet, and approach from the southwest. Deepwater wave heights during the severe Kona storm of January 1980 were about 17 feet. These waves have a significant impact on the south and west shores of Oahu.

Severe tropical storms and hurricanes obviously have the potential to generate extremely large waves, which in turn could potentially result in large waves at the project site. Recent hurricanes impacting the Hawaiian Islands include Hurricane Iwa in 1982 and Hurricane Iniki in 1992. Iniki directly hit the island of Kauai and resulted in large waves along the southern shores of all the Hawaiian Islands. Damage from these hurricanes was extensive. Although not a frequent or even likely event, they should be considered in the project design, particularly with regard to shoreline structures, both in the water and on land near the shore.

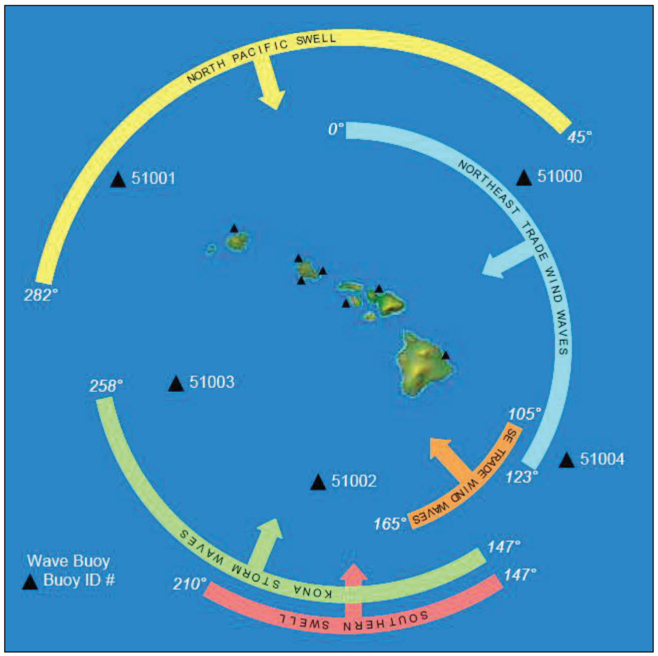


Figure 3-6 Hawaii dominant swell regimes

3.4.2 Prevailing Deepwater Waves

Wave data available from the National Oceanographic and Atmospheric Administration (NOAA) was compiled and analyzed to identify the primary components of the wave climate affecting the

project site. These data provide a 31-year wave record and were statistically analyzed to determine the frequency of occurrence of different wave heights, periods, and directions along the coast.

Wave hindcasting is a tool used to calculate past wave events based on weather models and historical data (Hubertz, 1992). With the proper inputs, wave hindcast models can calculate historical wave climates anywhere in the world. Hindcast model outputs are often recorded for a single location, known as a "virtual buoy".

WaveWatch III (WWIII) is a numerical wave model used to forecast and hindcast waves. Hindcast data for a 31-year period (1979-2010) are available around the Hawaiian Islands from NOAA/NCEP. For this study, hindcast data were obtained from virtual buoy Station 82551, located approximately 28 miles south-southwest of the project site (Figure 3-7).

Figure 3-7 Project site and virtual buoy locations

It is rare for the sea state to consist of a singular wave condition. Wave events are described by wave height, peak period, and peak direction. The wave parameters from the hindcast model are calculated from a modeled wave spectrum. The spectrum shows the distribution of wave energy relative to wave frequency (wave frequency is the inverse of wave period) and wave direction. This methodology allows multiple wave conditions to be accounted for at the same time for a more accurate description of the sea state. Figure 3-8 is a wave height rose diagram that shows the percent occurrence of wave height and direction for waves as measured at Station 82551. Table 3-3 is the corresponding histogram. Figure 3-9 is a wave period rose diagram that shows the percent occurrence of wave period and direction for waves as measured at Station 82551. Table 3-4 is the corresponding histogram. A directional filter was applied within the analysis to only include waves approaching from the south direction between east (90°) and west (270°). The prevailing deepwater wave condition for the project site has a significant wave height of 2.0 feet, a peak period of 15 seconds, and a direction of SSW.

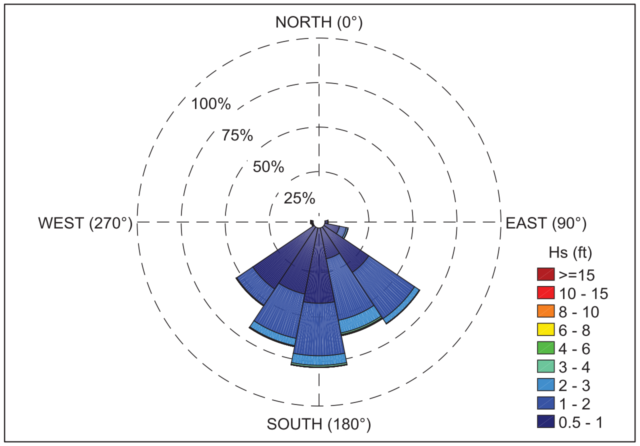


Figure 3-8 Station 82551 virtual buoy wave height rose from Jan 1979 - Jan 2010

Table 3-3 Station 82551 wave height and direction histogram from Jan 1979 - Jan 2010

Hs (ft) \ Dir (deg)	90	112.5	135	157.5	180	202.5	225	247.5	270	Total
0.5-1.0	1.7	8.5	30.7	17.6	42.3	37.9	41.9	0.4	0.6	181.6
1-2	0.1	4.0	31.3	35.3	29.5	25.4	11.0	0.2	0.3	137.0
2-3	0.1	1.0	3.3	7.3	5.4	4.2	0.3	0.1	0.2	21.7
3-4	0.0	0.1	0.2	0.9	0.9	0.4	0.1	0.1	0.1	2.8
4-6	0.0	0.0	0.0	0.5	0.2	0.1	0.0	0.1	0.1	1.1
6-8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3
8-10		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
10-12				0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-14				0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-16					0.0	0.0	0.0	0.0	0.0	0.0
16-20					0.0	0.0	0.0	0.0	0.0	0.0
20+					0.0	0.0	0.0			0.0
Total	1.9	13.5	65.5	61.8	78.4	68.0	53.3	0.9	1.5	
	90	112.5	135	157.5	180	202.5	225	247.5	270	Overall
Mean	0.78	1.01	1.13	1.42	1.13	1.09	0.83	2.57	2.04	1.13
Standard Deviation	0.66	0.58	0.48	0.71	0.63	0.56	0.40	2.93	2.15	0.64
Minimum	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Maximum	7.74	8.07	8.10	13.35	20.18	23.75	20.34	19.91	17.06	23.75

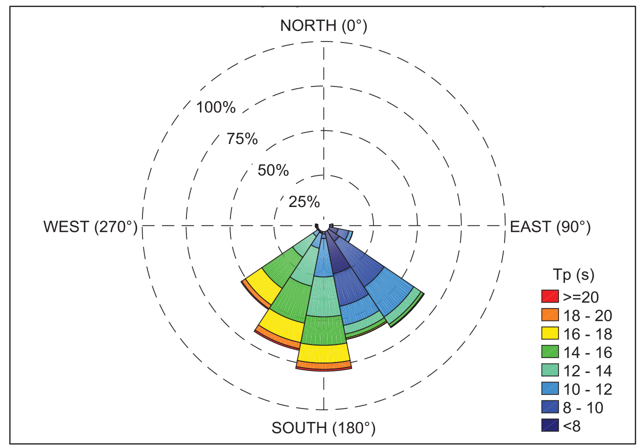


Figure 3-9 Station 82551 virtual buoy wave period and direction rose from Jan 1979 - Jan 2010

Table 3-4 Station 82551 wave period and direction histogram from Jan 1979 - Jan 2010

Tp (s) \Dir (deg)	90	112.5	135	157.5	180	202.5	225	247.5	270	Total
4-6	0.1	4.7	2.1	6.8	0.7	0.3	0.3	0.3	0.2	15.5
6-8	0.1	0.3	5.2	17.4	0.7	0.4	0.3	0.3	0.2	24.8
8-10	1.4	6.3	30.8	18.6	2.6	0.4	0.1	0.2	0.3	60.8
10-12	0.2	2.2	20.3	11.0	21.6	8.5	3.3	0.1	0.4	67.5
12-14	0.0	0.1	5.0	4.9	22.4	21.7	14.0	0.0	0.2	68.4
14-16	0.0	0.0	1.6	2.2	16.0	21.2	21.1	0.0	0.1	62.1
16-18			0.4	0.7	10.0	11.1	11.2	0.0	0.0	33.5
18-20			0.0	0.1	3.5	3.5	2.4		0.0	9.5
20+			0.0	0.0	1.0	0.9	0.6		0.0	2.6
Total	1.9	13.5	65.5	61.8	78.4	68.0	53.3	0.9	1.5	
	90	112.5	135	157.5	180	202.5	225	247.5	270	Overall
Mean	9.16	7.91	9.84	8.97	13.52	14.36	14.79	7.32	9.69	12.09
Standard Deviation	1.35	2.44	1.91	2.61	2.71	2.36	2.16	2.17	3.04	3.44
Minimum	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01
Maximum	15.30	15.14	20.59	22.05	24.46	23.65	23.33	16.59	22.03	24.46

3.4.3 Offshore Wave Transformation

As deepwater waves propagate toward shore, they begin to encounter and be transformed by the ocean bottom. In shallow water, the wave speed becomes related to the water depth. As waves slow down with decreasing depth, the process of *wave shoaling* steepens the wave and increases the wave height. *Wave breaking* occurs when the wave profile shape becomes too steep to be maintained. This typically occurs when the ratio of wave height to water depth is about 0.8, and is a mechanism for dissipating the wave energy. Wave energy is also dissipated due to bottom friction. The phenomenon of *wave refraction* is caused by differential wave speed along a wave crest as the wave passes over varying bottom contours, and can cause wave crests to converge or diverge and may locally increase or decrease wave heights. Not strictly a shallow water phenomenon, *wave diffraction* is the lateral transmission of wave energy along the wave crest, and would cause the spreading of waves in a shadow zone, such as occurs behind a breakwater or other barrier.

Simulating Waves Nearshore (SWAN) is a third-generation wave model developed by Delft University of Technology that computes random, short-crested wind-generated waves in coastal regions and inland waters (Booij, *et al*, 1999). The SWAN model can be applied as a steady state or non-steady state model, and is fully spectral (over the total range of wave frequencies). Wave propagation is based on linear wave theory, including the effect of wave generated currents. SWAN provides many output quantities, including two-dimensional spectra, significant wave height and mean wave period, and average wave direction and directional spreading. For this project, the SWAN model was used to transform waves from deep water to the project site. SWAN model results were used to determine wave conditions at the shore as well as provide wave parameter input for a nearshore numerical wave model, BOUSS-2D.

A nested 5-grid setup in the SWAN wave model was used to propagate the deepwater prevailing waves to the project area. The wave conditions are applied along all boundaries of the largest grid, which has a resolution of 1,640 feet and nests intermediate grids with resolutions of 656, 328, and 164 feet and then a nearshore grid with a resolution of 33 feet. Figure 3-10 shows the SWAN grid nesting scheme in relation to the project site.

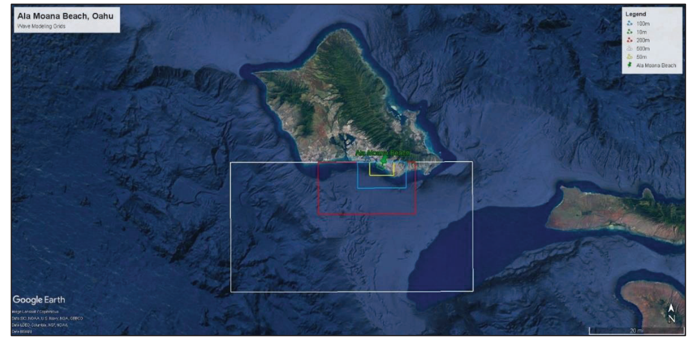


Figure 3-10 Nested grid scheme used in the SWAN model

Figure 3-11 shows the nearshore transformation of the prevailing SSW swell (2.0 ft significant wave height, 15 second period, and SSW direction) from deepwater to Ala Moana Beach Park.

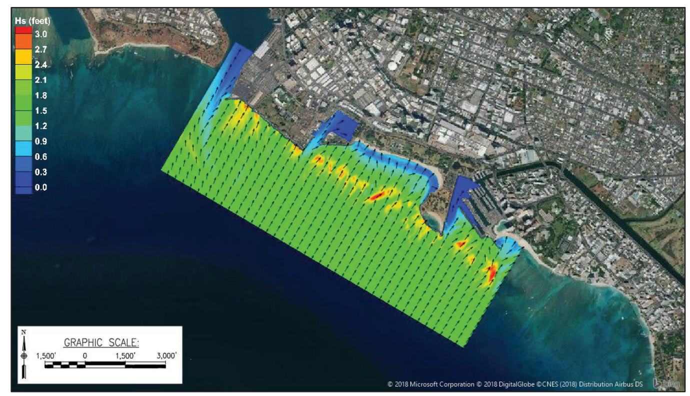


Figure 3-11 Nearshore SWAN results for the prevailing SSW swell

3.4.4 Nearshore Wave Pattern and Coastal Processes

As waves move into shallow water, bathymetry has greater influence on wave behavior. Waves interact with the bottom dissipating more energy through depth induced breaking and bottom friction. The prevailing wave condition described above was modeled using the BOUSS-2D numerical wave model to investigate the wave crest transformation as the wave approaches shore.

BOUSS-2D (Nwogu and Demirbilek, 2001) simulates the propagation and transformation of waves in coastal regions and harbors based on a time-domain solution of Boussinesq-type equations. The governing equations are valid from deep to shallow water and can simulate most of the phenomena of interest in the nearshore zone and in harbor basins including shoaling and refraction over variable bathymetry, reflection and diffraction near structures, energy dissipation due to wave breaking and bottom friction, and breaking-induced longshore and cross-shore ("rip") currents.

BOUSS-2D is a phase resolving model, meaning that wave crests and troughs are modeled and propagated in time and space. The result is an accurate representation of wave heights and wave patterns across the domain. BOUSS-2D is particularly useful in complex shallow water bathymetry and was used to determine wave patterns at the project site. The prevailing SSW swell was run at mean sea level to simulate a typical water level at the project site.

A snapshot image from the BOUSS-2D model showing the nearshore wave patterns for the prevailing SSW swell is shown in Figure 3-12 . As an incident wave encounters the *Courts* surf site, the wave crest very quickly changes shape as the wave slows over the surf shoal and speeds up around the shoal, producing two curved wave patterns (see Figure 3-12). These waves propagate over the reef and into shore independently of each other, retaining curved crests as they approach the shore with a convex shape. Each wave reaches the beach with a curved front, pushing sand along the beach in either direction away from the center of the wave. While the wave heights at the shore are not very large, the nearly constant wave action on the shoreline produces slow and steady sand transport away from the central beach area, resulting in the eroded shoreline shape that has been seen in aerial photographs from as early as 1960.

A wave pattern with similar effects can be seen near the west end of the model domain. A wave propagates over the reef to the east of the Kewalo Basin channel and then toward the Ewa end of the beach. This wave reaches the shoreline at an angle toward Diamond Head.

The modeling shows that these waves are responsible for the sediment transport patterns and the beach shape at the park (Figure 3-13). At the shoreline, the wave from *Courts* pushes sand alongshore in both directions, resulting in a divergence zone where the erosion is noted to be the worst. The waves from Kewalo push sand in the Diamond Head direction, creating a convergence zone with sand moving in the Ewa direction from the *Courts* wave. The beach width in this area is at its maximum and excess sand is being lost into the swim channel. Sand moving in the Diamond Head direction from the *Courts* wave continues alongshore, resulting in accretion along the wide part of the beach between the stairs and the Magic Island parking lot. Small oblique waves along the Magic Island shoreline also transport sand toward the wide part of the beach.

Figure 3-12 BOUSS-2D results for the prevailing SSW swell

Figure 3-13 Nearshore wave patterns and sediment transport for the modeled prevailing SSW swell

4. COASTAL HAZARDS

4.1 Hurricanes

The Hawaiian Islands are annually exposed to severe tropical cyclonic storms (hurricanes). Hurricanes are caused by intense low-pressure vortices that are usually spawned in the eastern tropical Pacific Ocean and travel westward. While they typically pass south of the Hawaiian Islands, their paths are unpredictable, and they will occasionally pass near or over the islands. In recent decades, Hurricane Iwa (1982) and Hurricane Iniki (1992) directly hit the island of Kauai and resulted in large waves along southern shores of Oahu. Damage from these hurricanes was extensive, not only on Kauai, which was subject to both high winds and waves, but also along coastal areas of other islands exposed to the large waves.

4.2 Kona Storms

Kona storms occur when the winter low pressure systems that travel across the North Pacific Ocean dip south and approach the islands. Strong southerly and southwesterly winds generated by these storms result in large waves on exposed shorelines, and often heavy rains. The project site is susceptible to damage from Kona storms, which occur during winter months, generally between October and April. Kona storms typically generate waves with significant heights of 9 to 16 feet and periods of 8 to 11 seconds. Occasional strong Kona storms have caused extensive damage to south- and west-facing shorelines on Oahu. Deepwater wave heights during a severe Kona storm in January 1980 were about 17 feet with a period of 9 seconds.

4.3 Still Water Level Rise

Storms and large waves produce storm surge and wave setup that results in elevated water levels at the shoreline. During prevailing, annual conditions this water level rise can be on the order of a foot above the tide level. However, during extreme events, the still water level rise can be significantly greater.

4.4 Tsunami

Tsunami are waves that result from large-scale displacements of the seafloor. They are most commonly caused by large magnitude earthquakes (typically magnitude 7.0 or greater). If the earthquake involves a large segment of land that displaces a large volume of water, the water will travel outwards in a series of waves, each of which extends from the ocean surface to the seafloor where the earthquake originated. Tsunami waves typically have small wave heights in deep water but can have wavelengths of hundreds of miles and travel at speeds up to 500 miles per hour. A tsunami can travel from one side of the Pacific to the other in less than a day. The speed decreases rapidly as the water shoals. The waves increase greatly in height as they shoal and can push further inland. The water then recedes, also at considerable speed, and the recession often causes as much damage as the original wave front itself.

Most tsunamis in Hawaii originate from the tectonically active areas located around the Pacific Rim (e.g., Alaska, Japan, and Chile). Waves created by earthquakes in these areas take hours to reach Hawaii, and the network of sensors that is part of the Pacific Tsunami Warning System are able to provide Hawaii with several hours advance warning prior to arrive of tsunami waves

generated from these locations. Less commonly, tsunamis originate from seismic activity in the Hawaiian Islands, and there is less advance warning for these locally-generated events.

5. BEACH FILL DESIGN

In general, the objectives of this beach nourishment project are:

- Produce a wider beach to increase useable beach area
- Increase elevation of the dry beach to provide more useable area during high tides
- Reduce inundation/flooding of the backshore

Design of the beach nourishment options presented in this chapter were based on beach profiles and topographic surveys conducted previously by SEI. The shoreline is divided into 3 areas; the Ewa area, central area, and Diamond Head (DH) area, and each area has its own rationale for beach fill. Specific areas identified as needing nourishment included:

- The central eroded area across from the tennis courts, where the beach is the most narrow
- The wide beach flat between lifeguard towers 1D and 1E, where the elevation is low and susceptible to inundation
- The Ewa end of the beach where backshore elevations are low and the area is susceptible to flooding

There is no specific engineering design code for beach nourishment projects. Beach fill can be as little or as much as the owner desires, with limitations being sand availability, cost, and adverse impacts. The options presented below have generally been refined to show what is believed to be the upper limit of each design, typically constrained by space (e.g., swim channel) or infrastructure (e.g., landscaping wall).

The beach fill is assumed to take an initial foreshore slope of 1V:6H, which is typical of the existing condition in the Ewa and central areas.

5.1 Option 1

Option 1 beach nourishment consists of widening the beach in the central area to 60 feet measured from the beach crest to the backshore seawall. In effect, this will renourish the eroded sand to straighten the shoreline through the central area. The dry beach width in the central area (Profile 3 to Profile 6) would be increased by up to 45 feet and the MSL shoreline position would move seaward by up to 52 feet. Sand on the dry beach would be placed to elevation +6 ft msl, which is the approximate height of the landscaping wall at the back of the beach.

The Ewa and Diamond Head areas will be nourished with sand inshore of the MSL line only. The sand would be placed to approximate elevation +6 ft msl and tapered into the existing beach face.

After Option 1 nourishment, the entire length of shoreline would have a beach foreshore slope of 1V:6H, which closely matches the typical foreshore slope of the existing beach. The beach berm elevation along the entire beach would be increased to about +6 feet MSL which is the approximate elevation of the backshore seawall crest.

Figure 5-1 shows the footprint (in dashed lines) of the Option 1 beach nourishment plan with the blue and green lines indicating the existing and proposed shorelines, respectively. Figure 5-2

and Figure 5-3 show the design profiles along the shoreline. There is no change to the shoreline position in the Ewa and Diamond Head areas.

Table 5-1 provides the details of the proposed Option 1 beach nourishment effort at each of the 8 profiles along the beach. Table 5-2 provides the details of the proposed footprint and fill volume for each area. The majority of the fill volume would be placed in the central and Diamond Head areas. The total fill volume for this option would be 37,600 cubic yards of sand.

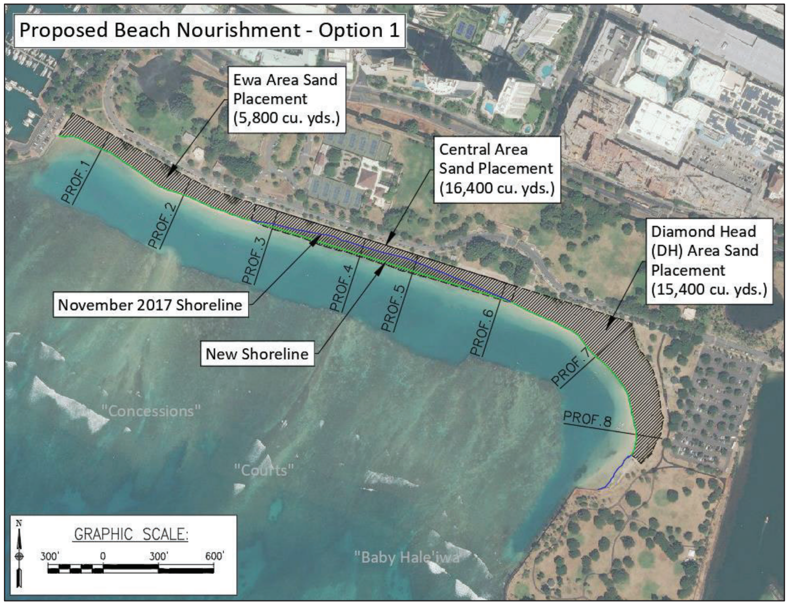


Figure 5-1 Option 1 sand placement layout

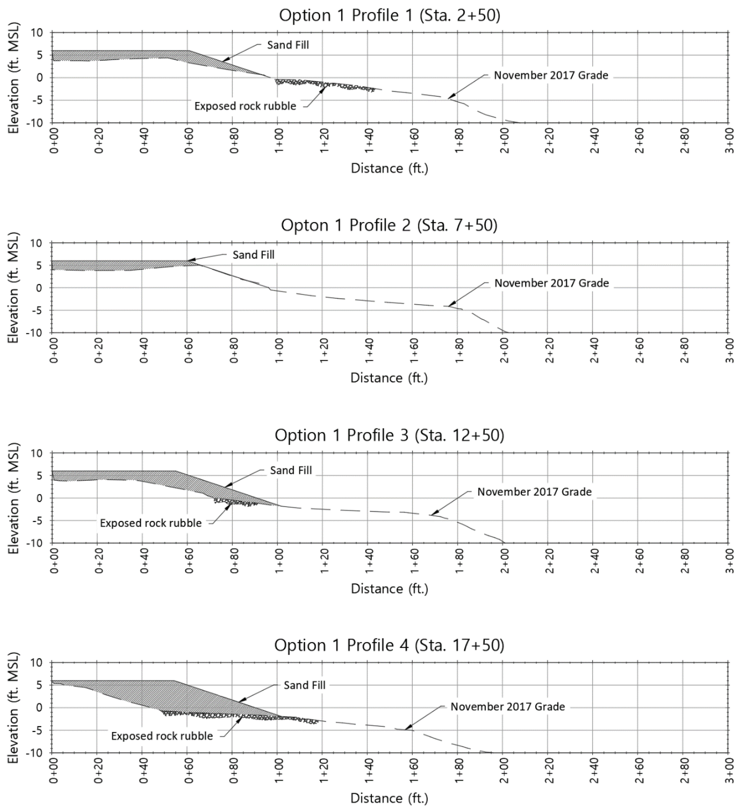


Figure 5-2 Option 1 beach nourishment profiles 1, 2, 3, and 4 (wall at Sta. 0+00)

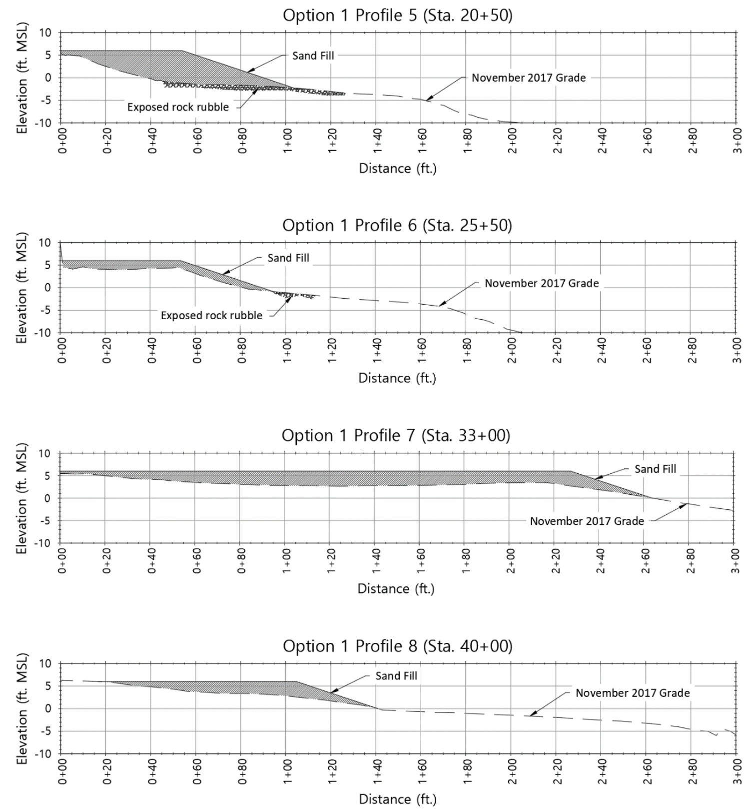


Figure 5-3 Option 1 beach nourishment profiles 5, 6, 7, and 8 (wall at Sta. 0+00 for profiles 5 and 6)

Table 5-1 Option 1 Beach Nourishment Profile Data

Profile	Dry Beach Increase (ft)	MSL Line Movement Seaward (ft)	Slope
1	9	0	1V:6H
2	0	0	1V:6H
3	18	17	1V:6H
4	39	46	1V:6H
5	45	52	1V:6H
6	0	8	1V:6H
7	11	0	1V:6H
8	5	0	1V:6H

Table 5-2 Option 1 Beach Nourishment Footprint and Volume Data

Area	Footprint	Footprint seaward of MHHW	Fill Volume
	sq. ft. (acres)	sq. ft. (acres)	cu. yds.
Ewa Area	114,500 (2.63)	7,500 (0.17)	5,800
Central Area	148,500 (3.41)	76,500 (1.76)	16,400
DH Area	202,400 (4.65)	11,900 (0.27)	15,400
Total:	**465,400 (10.67)**	**95,900 (2.20)**	**37,600**

5.2 Option 2

Option 2 beach nourishment consists of widening the beach in the central area to match the 1957 shoreline position. A review of historic images suggests that the 1957 beach may have had been nourished soon before the photograph. The 1957 shoreline therefore represents the widest that the beach has been. The dry beach width in the central area (Profile 3 to Profile 6) would be increased by up to 78 feet and the MSL shoreline position would be moved seaward by up to 85 feet. Sand on the dry beach would be placed to elevation +6 ft msl, which is the approximate height of the landscaping wall at the back of the beach.

The Ewa and Diamond Head areas will be nourished with sand inshore of the MSL line similar to Option 1. The sand would be placed to approximate elevation +6 ft msl and tapered into the existing beach face.

After Option 2 nourishment, the entire length of shoreline would have a beach foreshore slope of 1V:6H, which closely matches the typical foreshore slope of the existing beach. The beach berm

elevation along the entire beach would be increased to about +6 feet MSL which is the approximate elevation of the backshore seawall crest.

Figure 5-4 shows the footprint (in dashed lines) of the Option 2 beach nourishment plan with the blue and green lines indicating the existing and proposed shorelines, respectively. Figure 5-5 and Figure 5-6 show the design profiles along the shoreline. There would be no change to the shoreline positions in the Ewa and Diamond Head areas.

Table 5-3 provides the details of the proposed Option 2 beach nourishment effort at each of the 8 profiles along the beach. Table 5-4 provides the details of the proposed footprint and fill volume for each area. The majority of the fill volume would be placed in the central and Diamond Head areas. The total fill volume for option would be 50,600 cubic yards of sand.

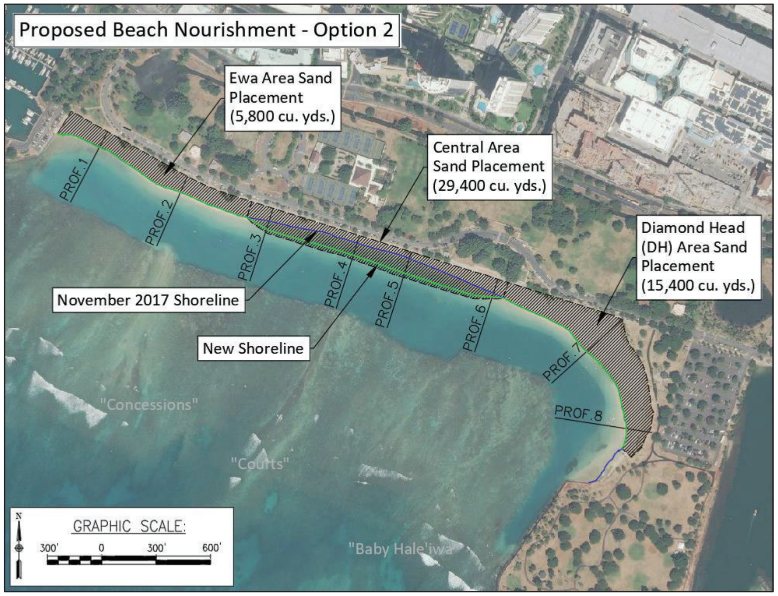


Figure 5-4 Option 2 sand placement layout

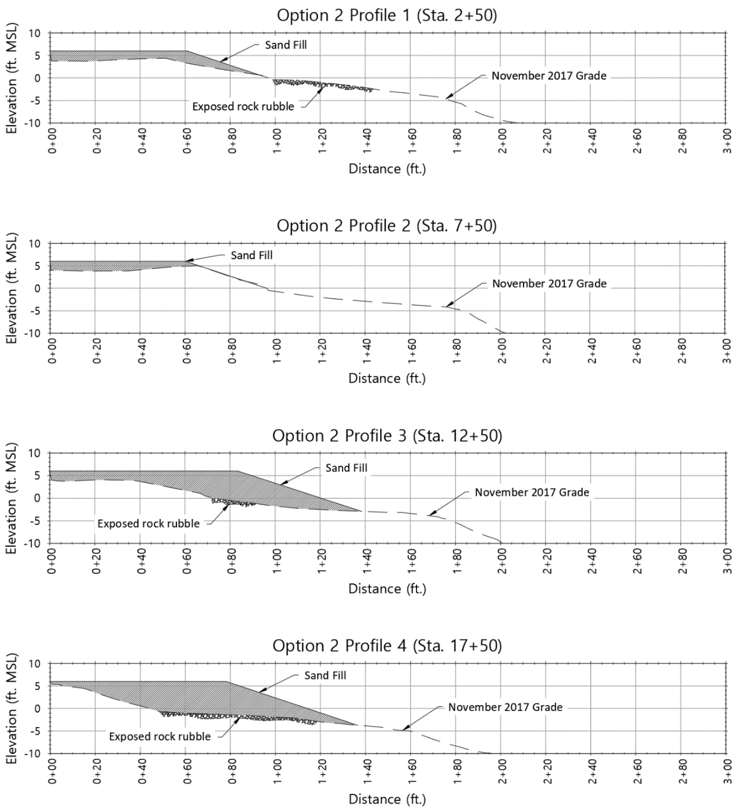


Figure 5-5 Option 2 beach nourishment profiles 1, 2, 3, and 4 (wall at Sta. 0+00)

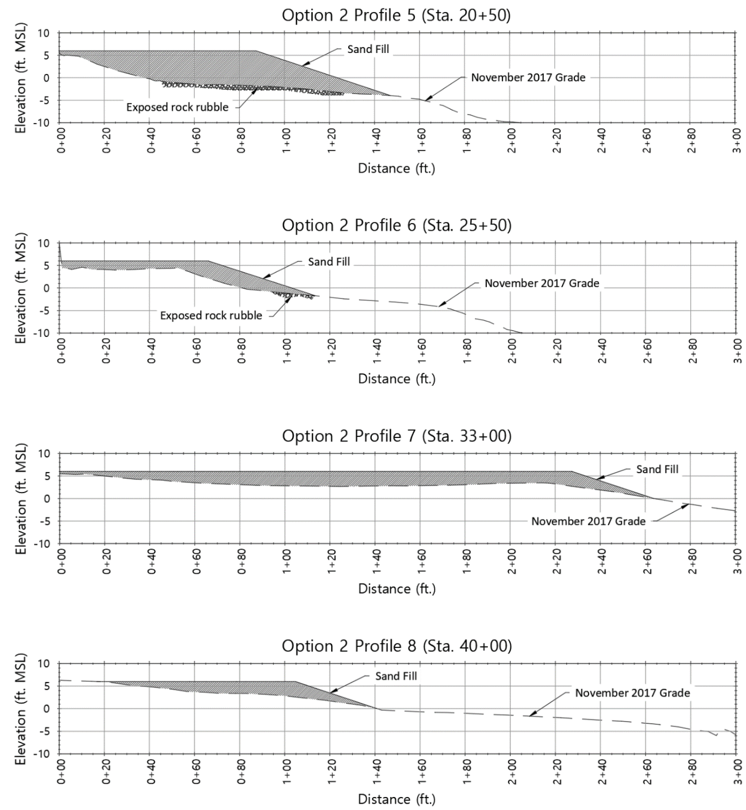


Figure 5-6 Option 2 beach nourishment profiles 5, 6, 7, and 8 (wall at Sta. 0+00 for profiles 5 and 6)

Table 5-3 Option 2 Beach Nourishment Profile Data

Profile	Dry Beach Increase (ft)	MSL Line Movement Seaward (ft)	Slope
1	9	0	1V:6H
2	0	0	1V:6H
3	46	47	1V:6H
4	63	70	1V:6H
5	78	85	1V:6H
6	13	21	1V:6H
7	11	0	1V:6H
8	5	0	1V:6H

Table 5-4 Option 2 Beach Nourishment Footprint and Volume Data

Area	Footprint	Footprint seaward of MHHW	Fill Volume
	sq. ft. (acres)	sq. ft. (acres)	cu. yds.
Ewa Area	114,500 (2.63)	7,500 (0.17)	5,800
Central Area	204,500 (4.69)	132,500 (3.04)	29,400
DH Area	202,400 (4.65)	11,900 (0.27)	15,400
Total:	**521,400 (11.97)**	**151,900 (3.49)**	**50,600**

5.3 Option 3

Option 3 beach nourishment would require the greatest volume of sand of the three options. This option would widen the beach in both the Ewa and Central areas to the 1957 shoreline position, as well as along the Magic Island end of the shoreline. The 1957 shoreline was seen in aerial images to be widest the beach had been historically. The majority of the fill volume would be placed in the central and Diamond Head areas. The dry beach width in the central area (Profiles 3 to Profile 6) would be increased by up to 78 feet and the MSL shoreline position would be moved seaward by up to 85 feet. Sand on the dry beach would be placed to elevation +6 ft msl, which is the approximate height of the landscaping wall at the back of the beach.

The Diamond Head area will be nourished with sand inshore of the msl contour and the beach would be extended to the Magic Island end of the beach, where the beach would be widened seaward. After Option 3 nourishment, the entire length of shoreline would have a beach foreshore slope of 1V:6H, which closely matches the typical foreshore slope of the existing beach. The beach berm elevation along the entire beach would be increased to +6 feet above MSL which would closely match the backshore seawall crest elevation.

Figure 5-7 shows the footprint (in dashed lines) of the Option 3 beach nourishment plan with the blue and green lines indicating the existing and proposed shorelines, respectively. Figure 5-8 and Figure 5-9 show the design profiles along the shoreline. This option requires the most sand and in all three areas, the shoreline position would be shifted seaward, resulting in the widest beach of the three options.

Table 5-5 provides the details of the proposed Option 3 beach nourishment effort at each of the 8 profiles along the beach. Table 5-6 provides the details of the proposed footprint and fill volume for each area. The total fill volume for option would be 65,700 cubic yards of sand.

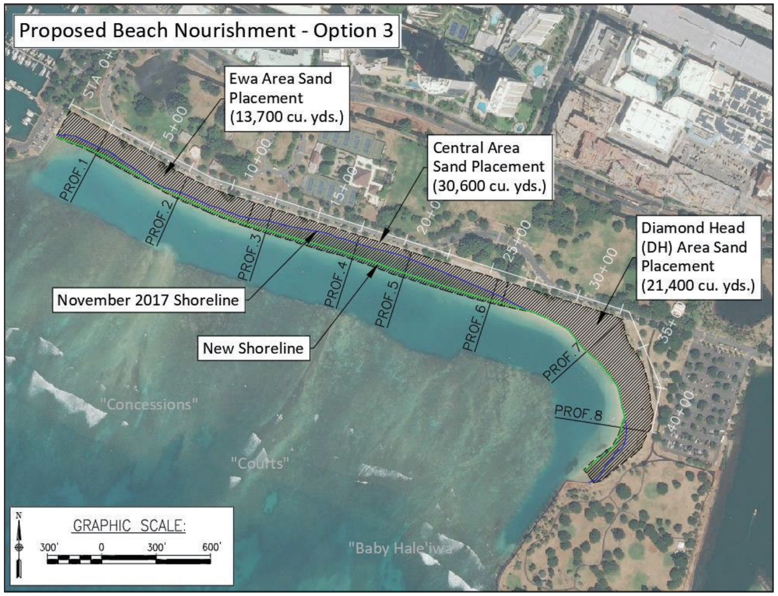


Figure 5-7 Option 3 sand placement layout

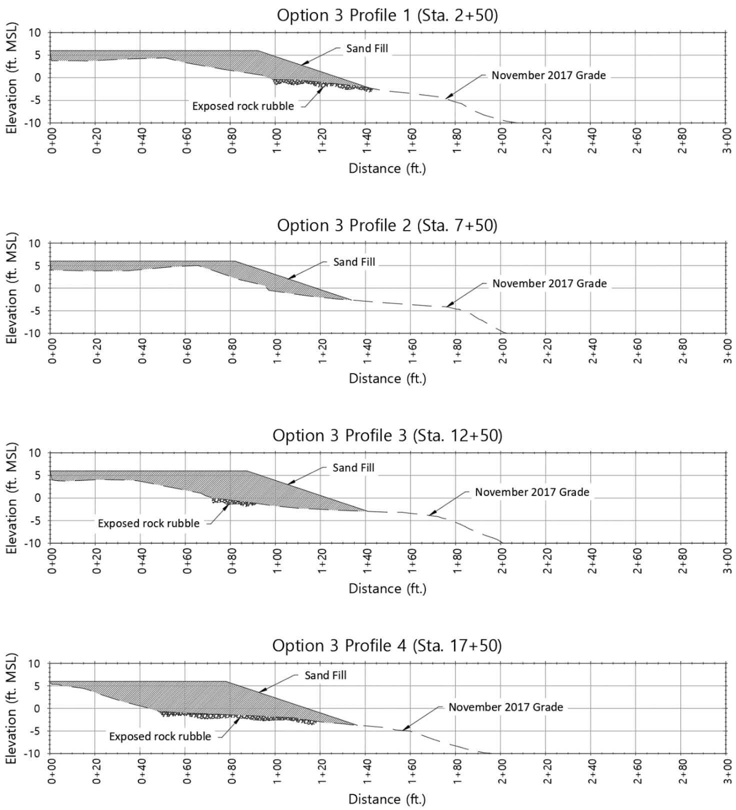


Figure 5-8 Option 3 beach nourishment profiles 1, 2, 3, and 4 (wall at Sta. 0+00)

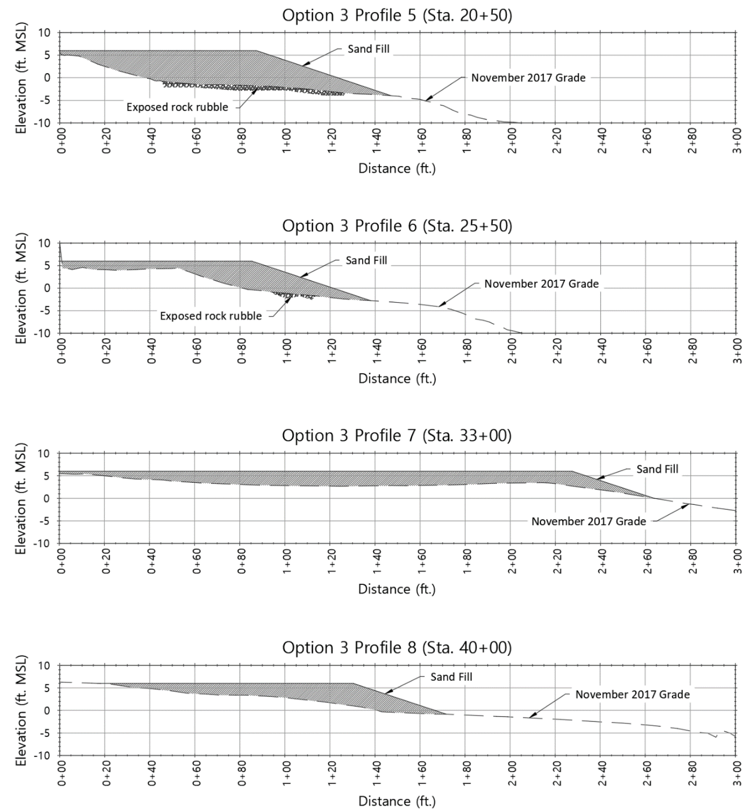


Figure 5-9 Option 3 beach nourishment profiles 5, 6, 7, and 8 (wall at Sta. 0+00 for profiles 5 and 6)

Table 5-5 Option 3 Beach Nourishment Profile Data

Profile	Dry Beach Increase (ft)	MSL Line Movement Seaward (ft)	Slope
1	41	31	1V:6H
2	16	21	1V:6H
3	50	50	1V:6H
4	63	70	1V:6H
5	78	85	1V:6H
6	32	40	1V:6H
7	11	0	1V:6H
8	30	25	1V:6H

Table 5-6 Option 3 Beach Nourishment Footprint and Volume Data

Area	Footprint	Footprint seaward of MHHW	Fill Volume
	sq. ft. (acres)	sq. ft. (acres)	cu. yds.
Ewa Area	159,600 (3.66)	51,400 (1.18)	13,700
Central Area	208,500 (4.79)	137,700 (3.16)	30,600
DH Area	238,000 (5.46)	40,000 (0.92)	21,400
Total:	**606,100 (13.91)**	**229,100 (5.26)**	**65,700**

5.4 Berm Enhancement in DH Area

In addition to the previously discussed options, more sand volume may be added in the DH area above the beach berm level presented in each option. This will provide additional sand volume for future sand pushing towards the central area of the beach where the erosion is expected to keep occurring, and will mitigate backshore flooding in the area. Figure 5-10 shows the proposed footprint (approx. 77,000 square feet) for the berm enhancement in the DH area. The elevation of the beach in this region would be raised above the nourished beach crest (+6 feet MSL) to provide additional sand volume. Approximately 2,500 cu. yds. of additional sand would be provided for every 1-foot elevation increase above +6 feet MSL. Figure 5-11 shows Profile 7 with the berm enhancement for additional berm heights of 1, 2 and 3 feet.

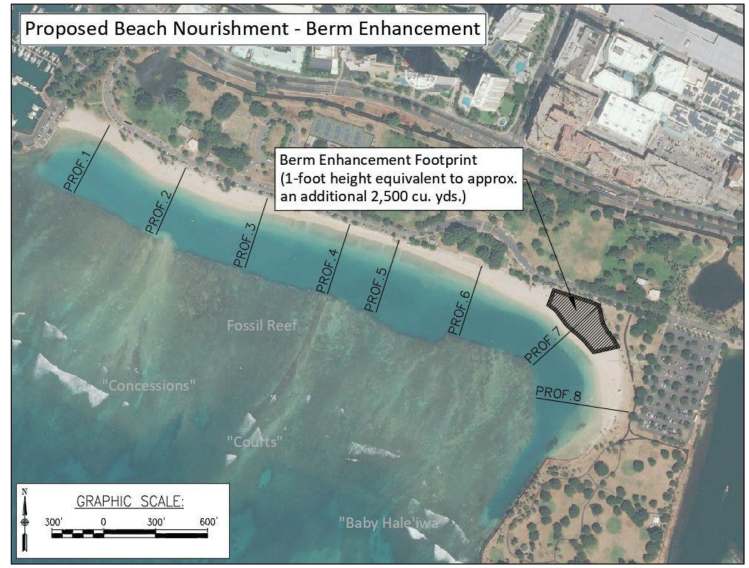


Figure 5-10 Berm enhancement footprint

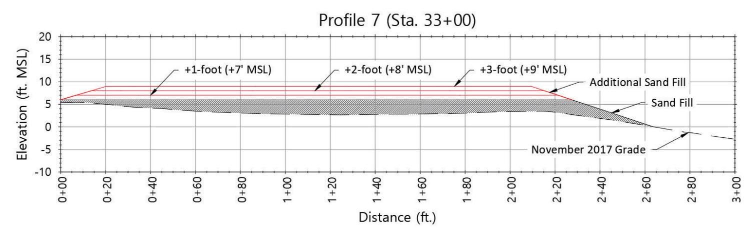


Figure 5-11 Berm enhancement profile 7

5.5 Renourishment Interval

Although the beach is generally protected by the reef from wave energy, the nearly constant small waves lapping up onto the beach can cause a slow and steady transport of sand as shown by the wave modeling presented in Section 3.4.4. Given the project site's exposure to wave action and its history of erosion, beach nourishment without stabilizing structures will not be a permanent improvement. The erosion rate of the central portion of the beach was presented in Section 2.6 to be about 2.4 feet per year since 2004.

If the historical erosion rate of 2.4 feet per year remains constant into the future, it can reasonably be expected that the beach at this location would return to its pre-nourishment condition after about 20 years for the Option 1 nourishment and after about 35 years for the Option 2 and Option 3 nourishments. With increasing sea level, however, greater wave energy will reach the beach and possibly increase erosion rates. Recent State sea level rise studies forecast as much as 3.2 feet of sea level rise by the year 2100. Additionally, storm impacts from hurricanes or Kona storms could result in a rapid and irreversible loss of sand.

Regular maintenance of the beach is recommended to keep the usability of the beach at a high level. It is recommended that following the initial sand placement, re-nourishment be conducted at regular intervals in order to maintain an improved beach width. The additional sand added to the Diamond Head beach area can be used to add volume to eroding parts of the beach in a similar manner as was used in the 2016 sand pushing. This could be executed rather efficiently and on an as-needed basis while the supply lasts.

6. SAND SOURCE INVESTIGATIONS

6.1 Introduction

A key component to the success of beach maintenance is the availability of suitable sand for beach nourishment. The potential sources of sand must be carefully evaluated in terms of quality, quantity, cost, and general feasibility. The majority of Hawaii beaches are composed of calcareous (calcium carbonate) sand, made of skeletal fragments of marine organisms such as corals, coralline algae, mollusks, echinoids, and forams. The density of calcium carbonate is more than 2.7 g/cm^3; however, microscopic pores and hollow grains make the effective density somewhat lower. The composition of sand is determined by the relative abundance of each species and therefore varies with location.

In the past, sand for beach nourishment was typically obtained from other beaches on Oahu or from on-land deposits that were commercially available. Mokuleia Inland Beach Sand, mined by Hawaiian Cement, was a high-quality relic beach sand deposit found several hundred meters inland of the beach. Published median grain size D_{50} is 0.60 mm and the sand is considered to be moderately sorted. This sand has been used for nourishment projects at the Hilton Hawaiian Village, Kuhio Beach, and Makaha Surfside. Unfortunately, however, Hawaiian Cement has reported that this sand is no longer available.

Maui Dune Sand is currently mined by Hawaiian Cement and Ameron. It is a fine to medium sand on the Wentworth scale with a D_{50} of 0.25 mm. It contains a relatively high percentage of fines, contains upland sediment (dirt), and has a medium to dark brown color. It has not been used for beach nourishment projects on Oahu, and Maui County in 2017 placed a complete moratorium on the use of this sand.

Offshore deposits present an alternative source of sand. These deposits can be dredged and transported to shore. Offshore sand deposits can present a suitable cost-effective source of sand for beach fill and nourishment, particularly when considering the limited availability of suitable, natural sand from onshore sources. Offshore sand deposits occurring within the same littoral cell can have grain size characteristics and composition that are very similar to the adjacent beach sand.

6.2 Sand Characteristics and Quality

The State Department of Land and Natural Resources (DLNR) beach nourishment guidelines specify that fill sand used to nourish a beach must meet several specific requirements:

- The sand shall contain no more than six percent fine material (sand grain size smaller than 0.074 mm)
- The sand shall contain no more than ten percent coarse material (sand grain size greater than 4.76 mm)
- The grain size distribution will fall within 20% of the existing beach grain size distribution
- The overfill ratio of the fill sand to existing sand shall not exceed 1.5
- The sand will be free of contaminants such as silt, clay, sludge, organic matter, turbidity, grease, pollutants, and others
- The sand will be primarily composed of naturally occurring carbonate beach or dune sand

The majority of the current fill sand requirements are related to grain size. In order to ascertain the grain size characteristics, a sieve analysis is performed, which is done by mechanically shaking a sand sample through a series of sieves of decreasing screen size. The material captured on each sieve is weighed, and this establishes the grain size distribution curves. The median diameter (grain diameter that is finer than 50% of the sample), or D_{50}, is often used by engineers to quantify the grain size of a sample. Similarly, D_{16} and D_{84} are obtained, and they are used to quantify the range of grain sizes present in a sample known as sorting, σ, defined by:

$$\sigma = \frac{\phi_{84} - \phi_{16}}{4} - \frac{\phi_{95} - \phi_{5}}{6.6}$$

where $\phi = -\log_2(D)$ where D is given in millimeters. Descriptive sorting values are presented in Table 6-1.

Table 6-1 Sorting value descriptions

Sorting Range (ϕ units)	Description
0.00 – 0.35	very well sorted
0.35 – 0.50	well sorted
0.50 – 0.71	moderately well sorted
0.71 – 1.00	moderately sorted
1.00 – 2.00	poorly sorted
2.00 – 4.00	very poorly sorted
4.00 – ∞	extremely poorly sorted

Color and abrasion resistance are also important characteristics of fill sand. While natural calcareous beaches range in color from light brown to white, sand in offshore deposits usually turns a gray color as a result of anaerobic conditions typically produced by a lack of wave action and associated mixing. Even though an offshore sand source may be suitable in terms of grain size characteristics, a gray color can be undesirable.

6.3 Methodology

Sea Engineering conducts seafloor investigations from their boats *Huki Pau* and *Huki Pono* (Figure 6-1 and Figure 6-2). The *Huki Pau* is a 74-foot twin-screw workboat set up to support diving and marine construction operations. The vessel has a large open well-deck, knuckleboom crane, and built-in diving stations. The four-point mooring system allows for stable placement of the boat for vibracore operations.

The *Huki Pono* is a 43-foot twin screw workboat set up to support diving and marine survey operations in the Hawaiian islands. The vessel has three steering stations and a large, air-conditioned deckhouse ideal for use as a support center for survey or ROV operations.

Figure 6-1 ***Huki Pau***

Figure 6-2 ***Huki Pono***

Sea Engineering's offshore sand investigations typically employ the following: sub-bottom profiling, side scan sonar surveys, towed camera surveys, diver reconnaissance and sampling, jet probing, and vibracoring.

Geophysical sub-bottom profiling systems are essentially echo-sounders that use lower acoustic frequencies to penetrate into the substrate. Where common echo-sounders may use an acoustic frequency in the vicinity of 200 kHz, sub-bottom system frequencies are typically between 0.5 kHz and 20 kHz. The term sub-bottom refers to a generally hard layer of sediment or rock that underlies recent soft sediment deposition. The lower the acoustic frequency, the deeper into the bottom the system can penetrate.

Sea Engineering uses an EdgeTech 0512i "chirp" sub-bottom profiler with an EdgeTech 3200XS processing system. The chirp processors use signal processing to shape the acoustic wavelets used to image the substrate, providing significantly greater image resolution than traditional impulsive systems such as boomers and sparkers. Different wavelets are available with the system for use in different terrains. After on-site system deployment, trial survey lines are typically conducted using various pulse configurations. The optimal pulse for the substrate in Waikiki was found to be a 20 ms pulse with a frequency range of 0.5 kHz to 7 kHz. This relatively low frequency range is necessary for penetration into the coralline limestone sands and gravels found in Hawaii. The EdgeTech 0512i system is in fact a specialty system for use in coarse sand environments.

The sub-bottom data is reviewed with EdgeTech software, sub-bottom horizons are digitized for processing, and sand thicknesses are measured at discrete locations along the tracklines. Text files containing position and either bottom or sub-bottom elevations can be outputted for analysis and presentation. Surfaces representing the bottom and sub-bottom can be created and the difference is the volume of sand in the deposit.

Side-scan sonar transmits acoustic signals with wide vertical beam widths out to either side of the sonar towfish. A receiver then records the signals that are reflected back from the seafloor to the towfish. Hard bottom areas and features produce more intense reflections than sediments. The result is a plan view acoustic image of seafloor characteristics, allowing mapping of bottom type across a swath of seafloor.

Jet probing is conducted to determine the thickness of sediments overlying consolidated or hard bottom substrate, and is therefore an important means of testing and verifying sub-bottom profiling accomplished by remote sensing equipment. A jet probe consists of a length of pipe connected to a water pump by flexible hose. A diver jets the pipe and hose vertically into the sediment deposit until "refusal" is encountered. The refusal can be described as hard, crunchy, or soft; hard indicates a solid bottom, crunchy indicates a gravel layer, and soft indicates that the hole is collapsing and seizing the pipe or that there is insufficient hose to penetrate further.

Vibracoring is a method of pushing a thin-walled tube into the sand deposit and extracting a core of sediment up to about 8 ft long. The sand characteristics over the full core can be analyzed and the results interpolated and extrapolated to better characterize the deposit as a whole. Based on the findings, certain areas within the deposit can then be targeted or avoided, as necessary.

Figure 6-3 Vibracore on the deck of the Huki Pau

6.4 South Shore (Oahu) Offshore Sand Deposits

Offshore sand investigations around Oahu have been performed for several decades, including specific studies pertaining to the characterization and quantification of sand deposits along the south shore of Oahu. These studies have identified sand sources of varying quantities, including small patches or thin deposits. The following discussion presents findings from the previous studies as well as results of the investigations conducted for the present Ala Moana beach nourishment project. The discussion is limited to those deposits that may have sufficient capacity for this project. Original site names are kept consistent with names from the original projects where possible.

6.4.1 Hilton

6.4.1.1 Historical sand data (Hilton)

Sea Engineering (SEI) was contracted in 2004 to investigate possible inland and offshore sand sources for a project to improve the Hilton Hawaiian Village lagoon. In search of offshore sand, a survey was conducted offshore of the Hilton Hawaiian Village to identify and map possible marine sand sources for the lagoon restoration project.

The survey was conducted with differential GPS and divers swimming transects and probing sand thicknesses. Sand probes were accomplished using a combination of water jet, air jet, and manual probes. Sand samples were collected using a push corer and hand trowels. Representative samples were submitted for laboratory grain size analyses.

The primary deposit investigated was approximately 850 ft by 620 ft in dimension, located in water depths of 40 to 55 feet to the southwest of the Hilton Hawaiian Village beach. The maximum sand thickness probed was 5 feet, and the average sand thicknesses in the center of the deposit were about 4 feet. The total estimated volume of sand in the deposit was determined to be approximately 40,500 cubic yards. The size characteristics of a representative sample showed the sand to be very similar to the beach sand. The median grain size, D_{50}, was 0.55 mm and the sorting was considered moderate. The deposit was characterized by a gray color with visible shell fragments, giving the appearance of coarser, poorly sorted sand.

The offshore sand was not used for the lagoon improvement project.

6.4.1.2 2017 sand investigations (Hilton)

SEI returned in 2017 to further investigate the "*Hilton*" sand deposit. During initial reconnaissance, vibracoring directed at the center of the deposit was noted to penetrate more than 6 feet into the sand deposit; 2004 jet probing had only estimated the thickness to be about 4 feet. Initial analyses of these cores, *Hilton 1.1* and *Hilton 1.2*, were favorable, so SEI followed with a dive team that systematically jet probed a total of 34 locations in the deposit along defined transects to better characterize the size of the deposit. The sampling locations and measured thicknesses are shown on Figure 6-4. The results of the jet probing showed an estimated sand volume of 45,400 cy of sand.

Five additional vibracore samples were obtained from the "*Hilton*" sand deposit following the jet probing. The vibracore locations are shown on Figure 6-4 and the grain size analysis data from those vibracores is presented in Table 6-2 and Figure 6-5. Median grain size ranges from 0.47 to 0.83 mm, with a minimal percentage of fines.

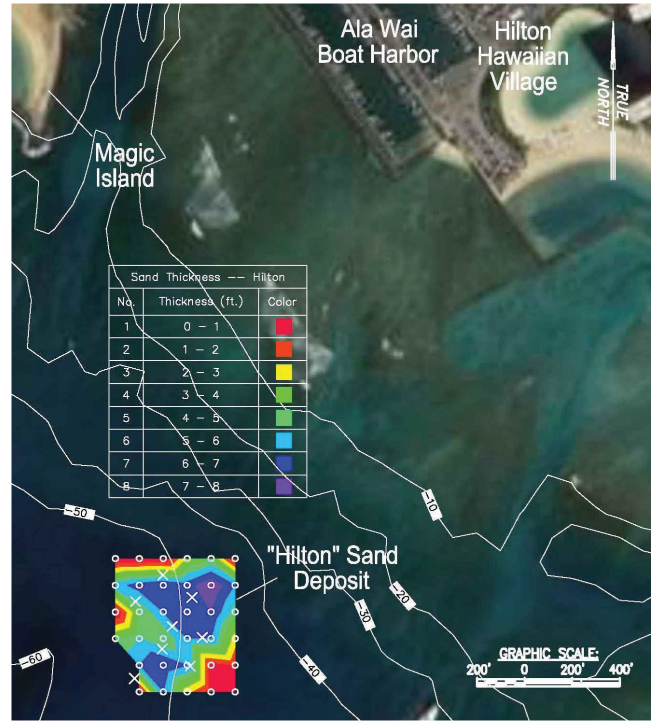


Figure 6-4 "*Hilton*" sand deposit thickness.
Jet probe locations shown by white "o" and vibracore locations shown by white "x".

Table 6-2 "*Hilton*" offshore sand source summary

Location	D_{50} (mm)	Sorting σ	% fines	Core length (inches)	Water depth (feet)	Source	Year
Hilton 1.1	0.47	0.7	0.7	85	47	SEI	2017
Hilton 1.2	0.48	0.6	0.6	85	47	SEI	2017
H-2X.1	0.54	0.8	1.4	67	50	SEI	2017
H-2X.2	0.66	0.7	0.7	79	48	SEI	2017
H-2X.5	0.50	0.7	0.7	80	51	SEI	2017
H-2X.6	0.77	1.1	1.4	79	53	SEI	2017
H-2X.7	0.83	1.7	0.4	86	50	SEI	2017

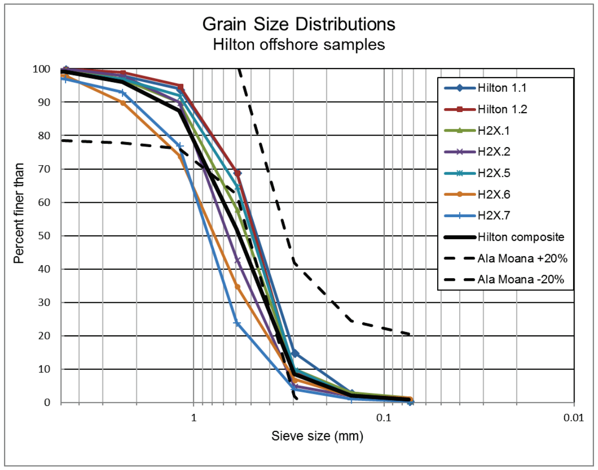


Figure 6-5 Grain size distribution for "*Hilton*" offshore sand deposit

6.4.1.3 *RR—Inner (2018)*

Investigation in the vicinity of the Reef Runway found a sand deposit located in about 60 feet of water approximately 1,500 to 3,000 feet from the runway (Figure 6-6). The patch of sand, referred to as "RR—Inner 1a" is roughly 1,000 ft by 2,000 feet in dimension and was initially investigated with a sub-bottom profiler to determine deposit thickness. Divers later investigated the site with a jet probe to verify deposit thickness, and later with a vibracore to determine the grain size through the deposit. Jet probes penetrated 2 to 4 ft into the sand. The grain size, jet probe, and vibracore information are presented in Table 6-3 and Figure 6-7. The deposit contains an estimated 200,000 cy of sand based on the sub-bottom profiling data.

A smaller sand field located nearby to the northwest of the "RR—Inner 1a" site was also investigated by the field team. This field, labeled "RR Inner – 1b", is shown in Figure 6-6 and covers approximately 450,000 sf. Divers performed jet probes in 10 locations and push core sediment sampling at 2 locations shown on that figure.

The sand sample from the two sites, referred to as "RR—Inner 1a" and "RR—Inner 1b", are combined to form a composite "RR—Inner". Samples "RR-6.5" and "RR-6.6" are in "RR—Inner 1b"; all the rest are from "RR—Inner 1a".

The median grain size for the samples was in the range of 0.24 to 0.41 mm. The fine material in the samples ranged from 2.1% to 6.6%, which is within DLNR's range of acceptability, but notably higher than the beach sand, which was less than 1% for all samples except AM-8.

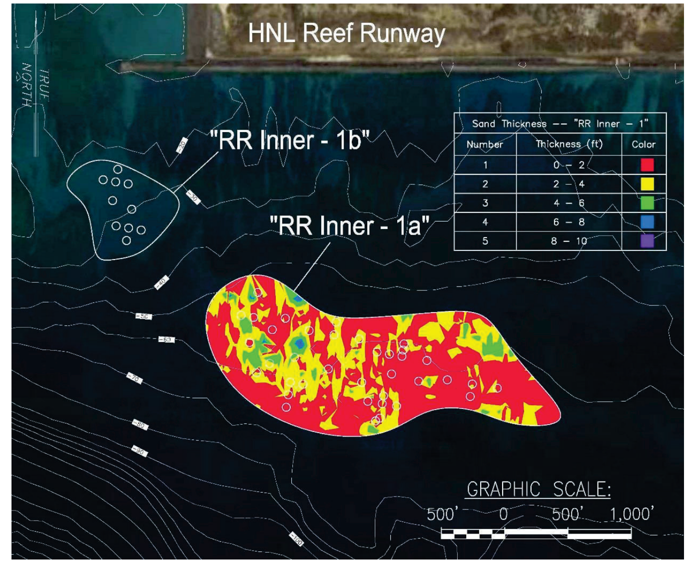


Figure 6-6 "*RR—Inner*" location map and sand deposit thickness. Jet probes locations shown by white "o".

Table 6-3 "*RR—Inner*" offshore sand source summary

Location	D_{50} (mm)	Sorting σ	% fines	Core length (inches)	Source	Year
RR 3.1	0.27	0.8	2.1	n/a	SEI	2018
RR 3.2	0.34	0.8	2.2	n/a	SEI	2018
RR-3.3	0.33	0.9	2.7	30	SEI	2018
RR 4.1	0.36	0.7	2.9	19	SEI	2018
RR 4.2	0.41	0.9	5.1	21	SEI	2018
RR 4.3	0.34	1.1	6.6	15	SEI	2018
RR 4.4	0.24	0.8	3.8	21	SEI	2018
RR-6.1	0.41	1.1	1.4	n/a	SEI	2018
RR-6.2	0.42	0.7	1.3	n/a	SEI	2018
RR-6.3	0.27	0.8	1.8	n/a	SEI	2018
RR-6.4	0.34	0.7	1.7	n/a	SEI	2018
RR-6.5	0.36	0.8	1.4	n/a	SEI	2018
RR-6.6	0.26	0.7	1.4	n/a	SEI	2018

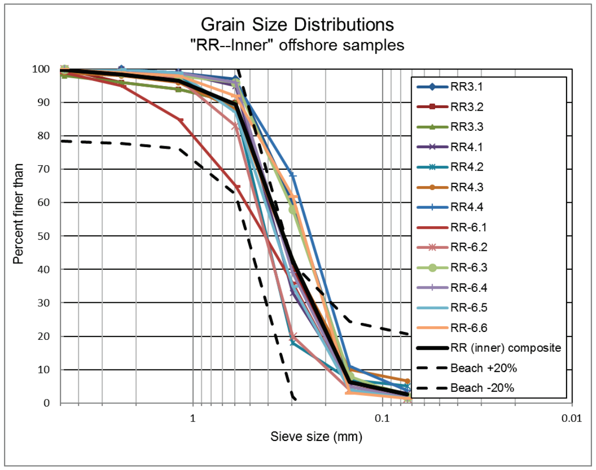


Figure 6-7 Grain size distribution for "*Reef Runway—Inner*" offshore sand deposit

6.4.2 Ala Moana—Offshore (2018)

The University of Hawaii Coastal Geology Group (CGG) produced a report entitled "South Oahu Reeftop Sand Bodies" as part of the U.S. Army Corps of Engineers' Regional Sediment Management program (2010). The study used aerial images to identify ephemeral and non-ephemeral sand deposits along the south shore of Oahu. The use of aerial images, however, limits the findings to visible deposits in shallow water. The identified sand deposits were generally found at water depths less than 60 feet, and most less than about 40 feet.

Sea Engineering performed additional investigations between Ala Wai Small Boat Harbor channel and Kewalo Basin channel, specifically focusing on water depths of 40 to 100 feet. Approximately 4.5 miles of drop camera footage and side-scan sonar were obtained. Analysis of the data revealed a sand deposit extending offshore of Ala Moana Beach Park. Diver jet probes and sand samples were obtained in 8 locations (Figure 6-8) and the data is presented in Table 6-4. Sand size characteristics and sand thickness were found to be variable across the deposit.

The diver investigations were later followed by a sub-bottom profiler survey of the deposit thickness (Figure 6-8). The sub-bottom survey found that the deposit had thickness of up to about 12 feet. The entire deposit, shown in Figure 6-8, is estimated to contain more than 250,000 cy of sand; the central portion of the deposit, identified by the white polygon and having the greatest thickness, was estimated to contain 71,000 cy of sand based on sub-bottom profiling results. The sand samples from the "Ala Moana—Offshore" deposit had median diameters in the

range of 0.18 mm to 0.51 mm and contained up to 5.4% fine material which is within DLNR's range of acceptability.

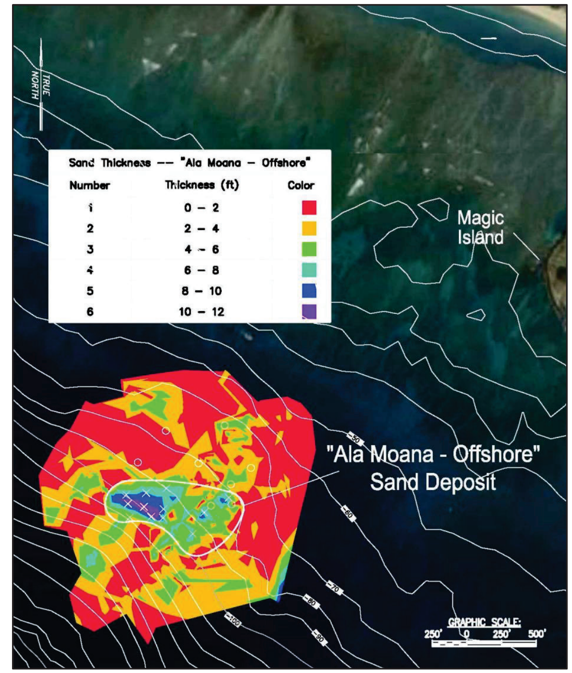


Figure 6-8 "Ala Moana—Offshore" location map and sand deposit thickness. Jet probes locations shown by white "o" and vibracore locations shown by white "x".

Table 6-4 "Ala Moana Offshore" sand source summary

Location	D_{50} (mm)	Sorting σ	% fines	Source	Year
AMO-3.3	0.44	1.3	3.5	SEI	2018
AMO-3.4	0.49	1.3	3.0	SEI	2018
AMO-3.5	0.38	1.1	3.6	SEI	2018
AMO-3.6	0.46	1.2	3.1	SEI	2018
AMO-3.7	0.49	1.2	1.7	SEI	2018
AMO-3.8	0.23	1.1	3.4	SEI	2018
AMO-3.9	0.42	1.2	2.5	SEI	2018
AMO-4.1	0.34	1.2	5.1	SEI	2018
AMO-4.2	0.18	1.1	5.4	SEI	2018
AMO-4.4	0.51	1.3	4.7	SEI	2018

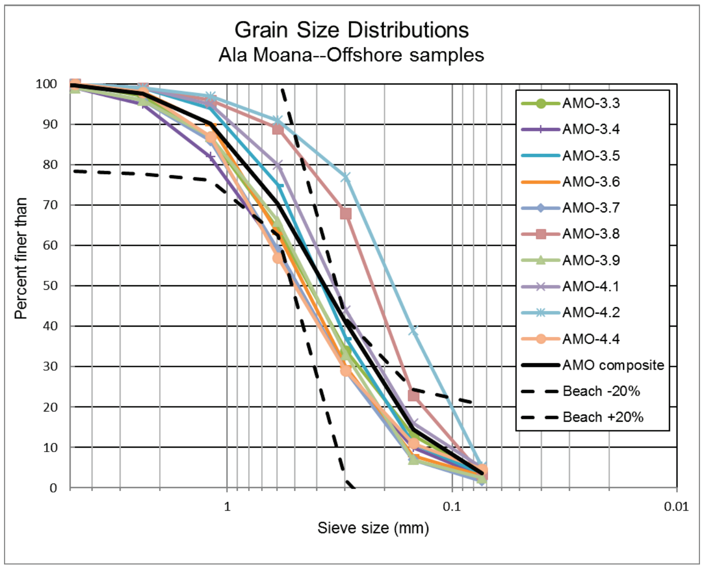


Figure 6-9 Grain size distribution for "*Ala Moana—Offshore*" offshore sand deposit

6.4.3 Pacific Aggregate Inland Sand (2018)

Pacific Aggregate has a quarry and processing operation in Waianae that specializes in the production of coral base aggregate. The property covers 200 acres and the quarry produces a wide variety of coral aggregates, primarily for the concrete industry.

During operations they found remnants of an inland beach from a higher sea level stand, now buried under roughly 30 feet of overburden. The deposit is referred to as "Natural" or "Inland" sand. This layer is up to about 10 feet thick and the spatial extent is not presently known. A boring elsewhere on their property showed sand, but no more detail is known at this point.

The quarry mines the "Natural" sand and stockpiles it separately from the crushed limestone sand. The quarry also produces a "Blended" sample, which is composed of sediment that they scoop up off the ground at the base of the "Natural" excavation. This is not actually a controlled blend, but rather a combination of the "Natural" sand and any surrounding material that crumbled through the excavation process. The owner reported that the "Blended" sample might be ~50% "Natural", though identifying the relative percentages may be difficult.

Sand samples of the "Natural" sand had an observably high quantity of fine material, and in general, the sand was poorly sorted. At our request, the quarry performed additional processing, which involved reducing the speed of the rinsing augers and increasing the water flow. This reduced the percentage of material passing through the #200 sieve to 0.5%. The grain size distributions are presented in Table 6-5 and Figure 6-10.

Table 6-5 "Pacific Aggregate" sand source summary

Sample ID	D_{50} (mm)	Sorting (σ)	% fines	Source	Year
"Natural Washed"	0.61	1.0	0.5	SEI	2018
"Blended Washed"	0.70	1.2	1.1	SEI	2018

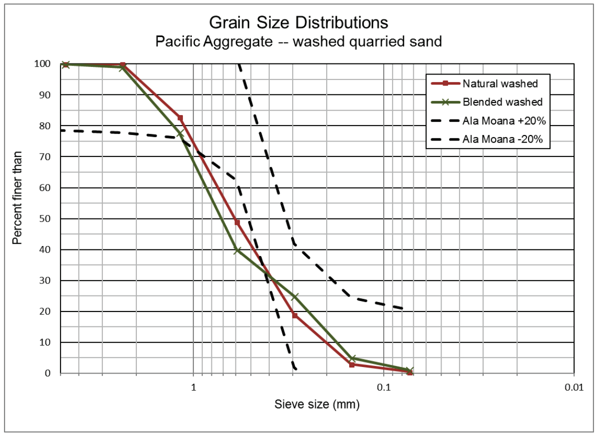


Figure 6-10 Grain size distribution for Pacific Aggregate washed quarry sand

The wide beach area where berm enhancement is proposed was found in 2016 to contain good quality sand extending below about 6 inches from the surface. This sand could be excavated and used on the beach face, and the void left could be filled with the Pacific Aggregate "washed natural" sand. While the sand may no longer be considered natural beach sand, the sand could be buried in the back beach, where it may be decades before it is exposed. This would limit the need for offshore sand and could be used as additional sand for the project.

6.4.4 Sand Quality Summary

The results of extensive surveying and sampling from three offshore sites have been presented in this section. The sites were located with a combination of side-scan sonar, sub-bottom profiling, drop camera video, and aerial photograph analysis. The potential sand sites were investigated with diver jet probing, push core and grab sand sampling, and vibracore sand sampling. The samples were analyzed by geologists and grain size analyses were performed by a professional laboratory. The sample grain size distributions were compiled into a composite for each site, and the composites are shown on Figure 6-11. Also on that figure are the Ala Moana beach composite and +/–20% bounds for the beach sand.

The figure shows that the offshore deposits contain suitable sand for Ala Moana beach. The "Reef Runway—Inner", "Ala Moana—Offshore", and "Hilton" composite sand samples fall mostly within the guidelines set forth by DLNR (see Section 6.2). A photograph comparing the beach sand with the offshore sand is shown as Figure 6-12.

While the "Hilton" sand's D_{50} falls on the coarse side compared with Ala Moana beach sand and outside the +/–20% bounds, coarser sand is expected to be more stable and therefore should be

included for consideration for this project. It was reported that some of the Ala Moana beach sand was obtained from Yokohama beach; Smith and Cheung (2002) reported the median grain size for Yokohama beach sand to be 0.49 mm and coarse sand was observed in the Diamond Head area below the surface sand.

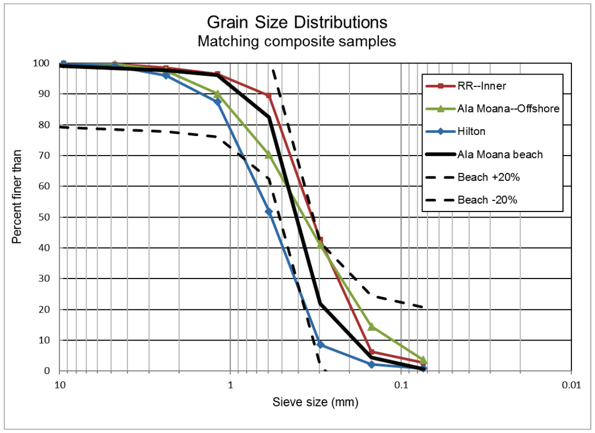


Figure 6-11 Composite Ala Moana beach sand and +/-20% bounds, along with the composite offshore sand samples

Figure 6-12 Ala Moana beach sand and matching offshore sand

6.5 Overfill Factor

A beach undergoes an adjustment period following nourishment. The beach equilibrium profile is achieved as sand moves cross shore and alongshore and there may be an accompanying decrease in beach volume. This loss of sand is compensated for through an overfill ratio, which describes the compatibility of the native beach and borrow sands and is dependent on the size distributions of the native and nourishment (borrow) sand.

The overfill ratio is determined based on the sand size characteristics of the two sands and represents the volume of fill necessary to yield the desired beach volumes calculated previously. Bodge (2004) compared overfill ratio methods and developed an expression that is believed to produce more accurate results than the previous methods.

The mean grain size, M, and sorting, σ, for the native and borrow sands are calculated as presented in the Coastal Engineering Manual (2006) as

$$M = \frac{(\phi_{16} + \phi_{50} + \phi_{84})}{3}$$

$$\sigma = \frac{(\phi_{84} - \phi_{16})}{4} + \frac{(\phi_{95} - \phi_5)}{6}$$

where $\phi = -\log_2(D)$ where D is given in millimeters.

The dimensionless grain size difference is calculated as

$$M'_b - M'_n = \frac{M_b - M_n}{\sigma_b}$$

where subscripts n and b refer to the native (i.e., beach) and borrow (i.e., offshore) sand, and the overfill ratio is read from Figure 6-13.

The mean diameter M_b and sorting σ_b of the three composite offshore sand samples and the composite beach sand sample are presented in Table 6-6. These values produce a dimensionless grain size difference of -0.02, which is used along with Figure 6-13 to yield an overfill ratio of $K = 1$. An overfill ratio of 1.0 indicates that the native and borrow sand have the same grain size distribution, i.e. the borrow sand is not finer in size than the native beach sand, thus no significant loss of finer material is expected to rapidly occur after sand placement, and thus no over filling is necessary in order to achieve the desired increase in beach size. Based on the overfill ratios presented in Table 6-6, the required sand fill for the three options are presented in Table 6-7.

Table 6-6 Grain size parameters for overfill ratio calculations

Parameter	*Ala Moana Beach ("Native")*	*RR—Inner ("Borrow")*	*Ala Moana—Offshore ("Borrow")*	*Hilton ("Borrow")*
Mean grain size, *M*, (*ϕ units*)	1.31	1.65	1.36	0.7
Sorting (σ)	0.78	0.92	1.42	1.02
Grain size difference (M_b-M_n) / σ	'---	0.37	0.04	-0.60
Overfill factor (*K*)	'---	1.27	1.02	1.00

Table 6-7 Required sand volumes based on overfill factor

	(as designed)	*RR—Inner*	*Ala Moana—Offshore*	*Hilton*
Option 1	37,600	47,750	38,350	37,600
Option 2	50,600	64,260	51,610	50,600
Option 3	65,700	83,440	67,010	65,700

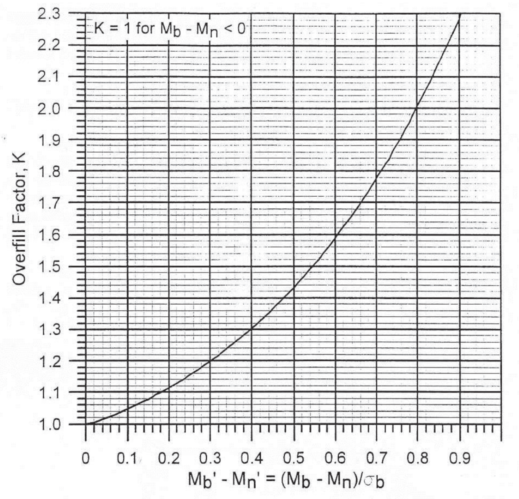


Figure 6-13 Dean's overfill ratio expressed as a single curve (Bodge, 2004).

6.6 Sand deposit constraints

The offshore sand deposits identified in previous sections have been characterized based on applicability to the project (i.e., volume and grain size). There are some additional constraints for each of the offshore sand deposits, addressed individually below.

6.6.1 RR—Inner

The "RR—Inner" sand deposit is located near the Ewa end of the Daniel K. Inouye Honolulu International Airport Reef Runway. The deposit is in 30 to 100 feet of water and is believed to contain more than 200,000 cy of sand. The measured median grain size ranged from 0.24 mm to 0.42 mm, which is slightly finer than the Ala Moana beach sand. The offshore sand, however, contains a significant amount of fine material—2.1% to 6.1%—which is expected to produce noticeable turbidity, even though the fines are less than the limit set forth by DLNR.

Oceanographic conditions are not expected to be a concern during recovery, though waves and weather will have to be monitored. The site is not located significantly close to any surf sites or other recreational activities. The site is, however, located close to the Pearl Harbor channel. Operations are likely to require coordination with the military base and possible the airport. Our crew was interrogated by a security boat during field work.

Extraction of sand from this deposit is expected to have no effect of the airport's Reef Runway or any other structure. The sand deposit is a minimum of 600 feet from the runway, with

significant hard substrate in between. The extraction of sand is not expected to change the wave pattern or cause any instability of the shore protection along the runway.

6.6.2 Ala Moana--Offshore

The "*Ala Moana—Offshore*" deposit is located in nearshore waters off Ala Moana Regional Park. The sand deposit is directly offshore of the popular *Courts* surf sites, approximately 2,300 feet offshore of the reef break. The sand deposit is in 70 to 100 feet of water, and the central part of the deposit, shown previously on Figure 6-8, contains the thickest sand. Removal of an average of 4 feet of sand from this polygon would recover 52,000 cy of sand.

Effect of the dredging on surf breaks is addressed in Section 9.12.2.

6.6.3 Hilton

The "Hilton" deposit is located is nearshore waters off Waikiki near the Hilton Hawaiian Village resort. Oceanographic conditions are not expected to be a concern. The area is popular with recreational users, including swimmers, kayakers, and stand-up paddleboarders. Ala Moana Bowls, Rockpiles, In Betweens, and Kaisers are nearby surf spots. The shuttle boats for the Atlantis Submarine pass this area several times per day.

The "Hilton" sand deposit contains an estimated 45,000 cy of sand. The median grain size sampled was in the range of 0.47 mm to 0.83 mm. The sand is slightly coarser than the Ala Moana beach sand. Fines ranged from 0.4% to 1.4%.

The State of Hawaii is producing an Environmental Impact Statement for improvements to Waikiki Beach. The "Hilton" sand deposit has been discussed as a source of sand for nourishing part of Waikiki Beach. Since all of the offshore sand deposits lie within the State's Conservation District, it may be challenging to obtain permission to use the "Hilton" sand at Ala Moana.

7. CONSTRUCTION METHODOLOGY

The "Reef Runway—Inner", "Ala Moana—Offshore", and "Hilton" sites are shown in the Section 6 to be satisfactory sand source options for beach nourishment at Ala Moana beach. The following discussion of dredging and distribution methods would generally apply to any of the offshore sand deposits. A preferred sand source has not yet been identified, and the final dredging plan would depend partially on permit conditions, as well as the work plan prepared by the contractor hired to perform the work; thus, a range of techniques is presented herein.

7.1 Dredging System

Dredging systems for beach nourishment purposes are designed to recover sand from the seafloor and deliver it to an alternate site. There are various ways to accomplish these operations, some of which store the sand onboard the dredging vessel or deliver it to nearby barges or ships, while others transport the sand directly through a pipeline to the shore. Storing the sand on the dredging vessel requires that the vessel return to a commercial harbor on a regular basis to discharge recovered materials, requiring considerable time, energy, and harbor space. If the sand is pumped to shore, booster pumps and additional barges may be necessary if the distance to the project beach is excessive. The third strategy would be placement of the dredged sand in ships or barges that could be cycled through the recovery and delivery process close to the project site to increase dredging efficiency. This would allow for simultaneous loading and offloading of pairs of these barges and would allow the dredge barge to remain in place for the duration of the recovery effort.

All of these techniques require that the dredge barge be anchored with a stable, minimum four-point mooring in the recovery area. Anchors would be placed within the sand field and marked with floats or buoys, as depicted in Figure 7-1. A four-point mooring would allow the barge to change locations within the recovery area and remain securely anchored without having to adjust anchor placement.

There are several potential dredging techniques that might be employed for the project area, all of which are discussed in the following sections.

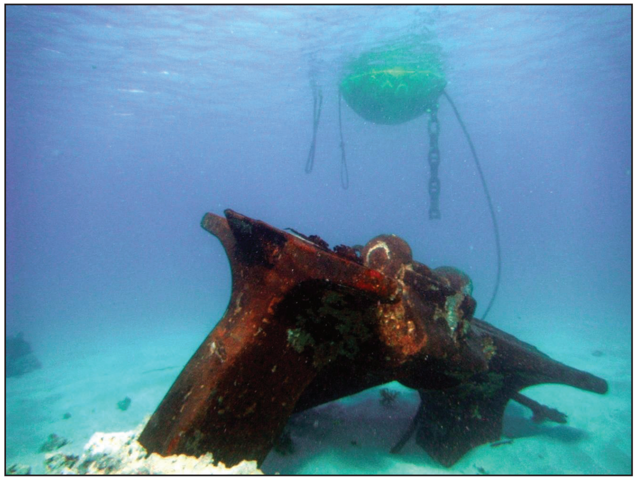


Figure 7-1 Example: Anchor and Anchor Float used in the 2012 Waikiki Beach Maintenance Project.

7.1.1 Clamshell Dredging

Clamshell dredging, shown in Figure 7-2, describes the process of mechanically scooping and lifting the sediment, in this case sand, from the seafloor. An environmental clamshell bucket, such as the one shown in Figure 7-3, is lowered from a crane in the open position, and upon the clamshell reaching the bottom, the crane operator closes the clamshell jaws and lifts the material out of the water. The operator then rotates the crane and opens the bucket to dispense the material into a waiting barge, such as a hopper barge (Figure 7-4).

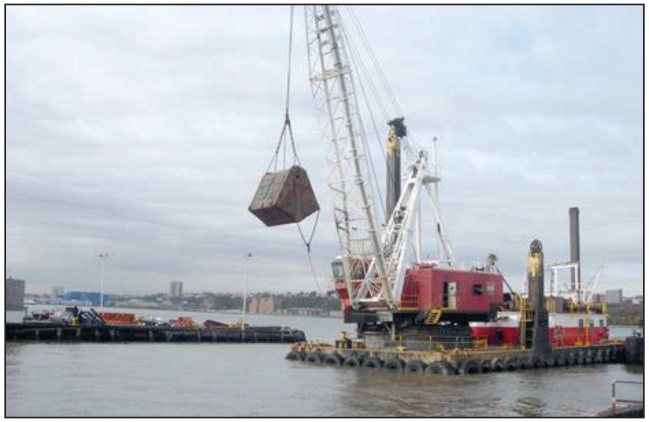


Figure 7-2 Example: Clamshell Dredge with Environmental Bucket
(http://www.conedison.com/ehs/2009annualreport/environmental_stewardship)

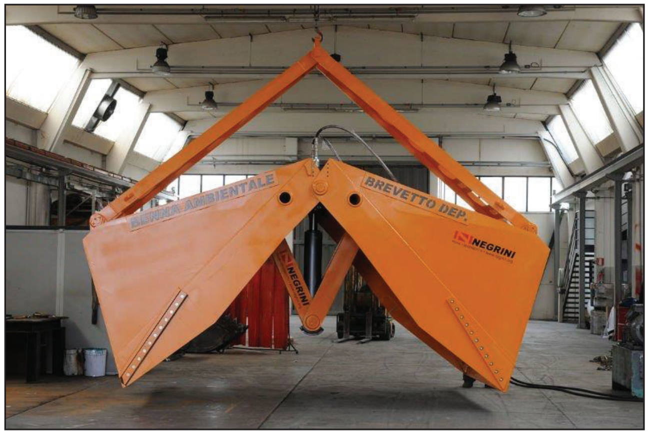


Figure 7-3 Example: Environmental Clamshell Bucket
(http://www.alibaba.com/product-free/107658423/Environmental_clamshell_grab.html)

Figure 7-4 Hopper Barge
(http://www.thecargogroup.net/)

Environmental clamshell buckets, also called level-cut buckets, are designed to remove a thin layer of sediment from the seafloor surface, while leaving the lower sediment undisturbed. Figure 7-5 shows a schematic of the level-cut process. The bucket is lowered to the seafloor with the jaws open. Upon reaching bottom, the jaws are closed, skimming off the upper portion of sediment, approximately 6 inches in some cases. Although the bucket does not penetrate deeply into the seafloor, the jaw width is great enough that the thin layer of sediment recovered still results in a full bucket and efficient operation.

While recovering a thin surface layer is valuable when dealing with contaminated sediments, in the case of offshore sand recovery, this process allows for recovery of sand from thin sand deposits. Positioning software allows the operator to precisely place the bucket to recover sediment from the proper location.

Clamshell bucket sizes vary from as small as one cu. yd. to over 20 cu. yd., and can be either sealed or open. Newer technology allows removal of material with only slightly more water content than in the *in situ* sediment. The end plates of the buckets overlap and rubber seals help to prevent loss of water and sediment as the bucket is raised.

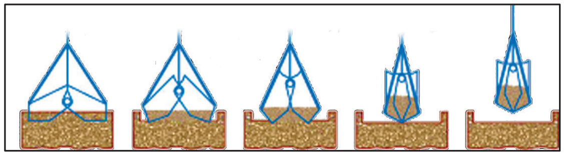


Figure 7-5 Level-cut dredging schematic (www.cablearm.com)

Clamshell dredging is often used in association with a large barge, such as the hopper barge shown in Figure 7-4, on which the sediment is deposited. Once the sediment is onboard the barge, transport is accomplished by either moving the barge to a dock and offloading or using a waterborne sand delivery system to deliver the sand to the shoreline.

The benefits of using clamshell dredging are that it is very mobile, it can operate at any depth that the crane cable can reach, it can be used in moderate swell conditions, and it can recover a wide variety of material types. Additionally, little specialized equipment beyond the clamshell is needed for dredging operations. The technology of the environmental buckets helps to reduce environmental impacts due to turbidity and increase efficiency in recovering sand, reducing time and cost of the operation. Additionally, the amount of water that is accumulated from the clamshell dredging process is much less than with hydraulic dredging presented in the next section, and the small amount of water can be discharged at an approved location.

The drawbacks are that it is less efficient than other dredging systems, such as those utilizing hydraulic or slurry pumps, and it requires the sand deposits to be thick enough that the clamshell does not reach hard substrate.

7.1.2 Submersible Slurry Pump

Submersible slurry pumps, referred to as "Toyo Pumps" after the largest supplier of such, are distinguishable by the way that they are lowered from overhead and suspended above the sediment they are pumping. The pumps can be hydraulically or electrically driven, and are available in a range of sizes. Models are available with up to 400 hp. Toyo DP75B (75hp) hydraulic pumps were used successfully for dredging both the 2007 Kuhio Beach restoration project and 2012 Waikiki Beach Maintenance Project. Respectively, the projects pumped approximately 10,000 and 24,000 cu. yd. of sand from offshore onto the beach within the Kuhio Beach crib walls.

Several equipment elements are required to successfully recover sand utilizing a submersible pump. A barge and crane are necessary to position a hydraulic or electric powered pump over the sand bottom. The crane can move the pump across a small area, dependent on the crane size and length of its boom. Accessing different portions within the recovery area is achieved by repositioning of the pump barge using a minimum four-point mooring array. Additionally, depending on the size of the slurry pump, a booster pump may be required if the distance to the shoreline is excessive. An additional piece of equipment called a "jet ring" can be mounted on the pump to aid in entraining sand to increase the percent of sand in the slurry. This jet ring

requires a water pump on deck and an additional 4-inch water hose connected to the submersible pump. An illustration of this dredge system is shown on Figure 7-6, taken from the Kuhio Beach project after-action report (American Marine, 2007). Figure 7-7 shows the Healy Tibbitts dredge barge used in the 2012 Waikiki Beach Maintenance Project.

The benefit of the submersible pump is its precise positioning and ability to reach into tight spaces. Using a crane-tip GPS unit to locate the pump, the operator can accurately position the pump to within a few feet of any location to effectively remove the sand from near the edges and corners of the recovery area. In addition, sand recovery with a slurry pump can be more efficient than mechanical recovery when a high sand to water ratio can be achieved.

The primary drawbacks to the submersible pump are that the operation is labor intensive and it requires dewatering. Operation requires a crane operator, a rigger, and several people to handle the pumps, generators, and pipelines on deck. Additionally, the pump must be held at a relatively constant height above the sand. If the pump is lifted too high it will not entrain the sand, and if it is too low the slurry will become too concentrated and the pipeline may clog. Maintaining this balance is especially difficult for the crane operator in the presence of swells greater than one to two feet; however, the dredge equipment can be operated from an ocean-going barge, which provides reasonable seaworthiness. Submersible pumping requires that the slurry be properly dewatered, which increases on-land space requirements. For example, the 2012 Waikiki Maintenance project utilized a one-acre dewatering basin within Kuhio Beach Park, requiring the Diamond Head basin to be completely closed to the public. Given the location of the offshore deposits identified in Section 6, hydraulically pumping sand to shore does not appear to be a viable option. If a submersible pump is used to dredge the sand, the sand and slurry would then have to be contained in a barge until the water can be released into the ocean.

Contractor production records for the 2012 Waikiki Maintenance project showed that the contractor recovered 400 to 800 cy of sand in a 10-hour day, and placed sand on the beach at a rate of 1,500 to 2,000 cy in a 5-hour day.

Submersible slurry pumps are not expected to be used to recover sand for this project.

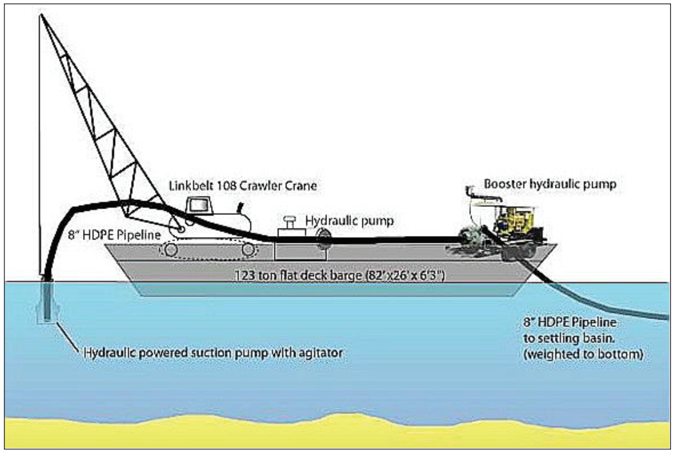


Figure 7-6 Schematic of sand pumping arrangement (American Marine, 2007)

Figure 7-7 Healy Tibbitts Crane Barge used in the 2012 Waikiki Beach Maintenance Project

7.1.3 Delivery to a Nearby Harbor

The offshore sand sources identified in Section 6 as being satisfactory matches for the Ala Moana beach sand are too far from the project site to consider pumping the sand to shore. The next best option is to dredge the sand and load it into a barge, either through clamshell dredging or hydraulic dredging. After the barge is loaded with sand, it could be transported to an offloading site such as a commercial harbor, where the sand would be offloaded, possibly stockpiled, and transported to Ala Moana park. Barging can require extensive time and energy between towing the barge to a commercial harbor, such as Honolulu Harbor or Kalaeloa (Barber's Point) Harbor. Barge travel distances are presented in Table 7-1.

Table 7-1 Barge distances from offshore sand sources to commercial harbors on Oahu

	Barge distance (miles, roundtrip)		
	RR—Inner	Ala Moana—Offshore	Hilton
to Honolulu Harbor	13	7	8
to Kalaeloa Harbor	30	40	42
to Ala Wai Boat Harbor	14	3	2

The most efficient delivery would be through the Ala Wai Small Boat Harbor. Delivery of the sand directly to Ala Moana park is possible by barging the sand into the Ala Wai Small Boat Harbor channel and mooring alongside the Magic Island parking lot. The barge would be moored with two lines on shore and two anchors within the harbor. This mooring configuration has recently been recommended for the upcoming Ala Wai canal maintenance dredging project (R.M. Towill Corporation, 2017). A subsequent biological assessment of the mooring site for that project reportedly found no concern regarding impacts to EFH.

The sand would be offloaded onto a conveyor belt system and transported into waiting dumptrucks which would then move the sand systematically to the nourishment areas. Sand conveyance and trucking within the park could be performed during evening and night time hours to limit the impact on park users. Most of the Magic Island parking lot would stay open during the day, with the area adjacent to the barge closed for equipment. This method would have the shortest barge and truck routes, and it would be the fastest and least expensive of the delivery options. Production rates of around 1,000 cy per day are anticipated with this method.

Alternatives initially considered include delivery to Honolulu and Kalaeloa Harbors. Pier space at Honolulu Harbor is limited, and personnel at Hawaii Dept. of Transportation, Harbors Division, reported that the harbor does not accept bulk product delivery such as sand. Kalaeloa Harbor would be the nearest commercial facility for offloading sand. Barging to Kalaeloa, however, would entail an ocean transit of as much as 25 miles to the harbor, offloading of the barge into dump trucks, and the 25-mile truck route back to the sand recovery site. This method would result in an involved and circuitous delivery to the project site, which is only a few miles from the sand deposits presented Section 6. In addition to the distance traveled to deliver the sand at pier side, additional travel may be required to dewater the barge at an acceptable offshore location prior to offloading.

If offloading alongside Magic Island is not possible, then discussions between the City and the State are recommended to determine if a short-term offloading site at Honolulu Harbor could be developed for use during the project. It is possible that a temporary offloading site could be accommodated on the west side of Sand Island. There is some presently unutilized land, and a barge could access the shoreline via the Kalihi channel and the seaplane runway adjacent to the shore.

Figure 7-8 Example of barge offloading at Ala Wai and Magic Island

7.1.4 Offloading and trucking to project site

Pier side delivery of sand from a barge requires adequate space to offload sand into dump trucks. The sand could be loaded onto trucks with an excavator or similar equipment, or a conveyor system could be deployed for more efficient handling. Examples of sand conveyance from barge to shore are shown as Figure 7-9 and Figure 7-10. Conveyor belt systems can move an estimated 150 cy of sand per hour.

Using mid-size (15 cu. yd.) or larger (20 cu. yd.) dump trucks for truck hauling of the sand would require between 3,250 and 4,300 truckloads for the 65,000 cy required for Option 3. An estimated 45 to 60 days of trucking would then result in approximately 60 to 100 dump truck loads delivered to Ala Moana each day. Based on a 10-hour workday, this would mean 6 to 10 dump truck deliveries per hour.

The advantage of truck hauling is that it minimizes impacts to the seafloor by eliminating delivery pipes to the shoreline. The disadvantages would include the increased cost due to time,

equipment, and energy to move the sand by trucks rather than pipe it directly to the shoreline, and additional traffic impacts from moving 8 to 10 dump trucks into and out of the project area each hour.

Figure 7-9 Barge-mounted conveyor system

Figure 7-10 Barge-mounted conveyor system

7.1.5 Sand Placement

As sand is trucked to the project site, the sand would be moved directly to the beach and placed to the design lines and grades. There is no dewatering associated with the truck hauling method. Sand movement and placement during the 2012 Waikiki Beach nourishment project was accomplished using standard mechanical equipment, including a front-end bucket loader, dump trucks, and bulldozers. This method is proposed for use with the present project.

Sand movement and placement during the 2007 Kuhio Beach project was accomplished using standard mechanical equipment, a front-end bucket loader, bulldozers, and trucks (Figure 7-11 and Figure 7-12). The same method could be used to accomplish this project. Some noise and smell from the equipment, and possibly some additional short-lived odor from the sand, will be unavoidable.

The beach width will be increased from onshore to offshore, thus building dry substrate for machinery to operate on as it is built seaward. Proper beach shape would be verified during construction with surveys and by placing survey stakes with final beach height markings as references. Design beach profiles and volume calculations would be part of the construction drawings.

A containment system will be required in the area of active sand placement to reduce the potential for turbidity impacts to coastal waters during sand placement in the water. Silt curtains and fences will be required, consistent with previous requirements of the DOH. Schematics of these containment devices are shown as Figure 7-13 through Figure 7-15.

Phasing of the sand placement is not important since the beach dynamics are relatively slow. It is recommended, however, that once placement begins in an area, nourishment continue until complete in that area. Working on one area at a time would limit the impact to park users, as much of the beach would stay open during the work day.

Figure 7-11 Sand placement, 2012 Waikiki Beach Maintenance Project.

Figure 7-12 Example: floating silt curtain and small bulldozer used for sand placement in the 2012 Waikiki Beach Maintenance project.

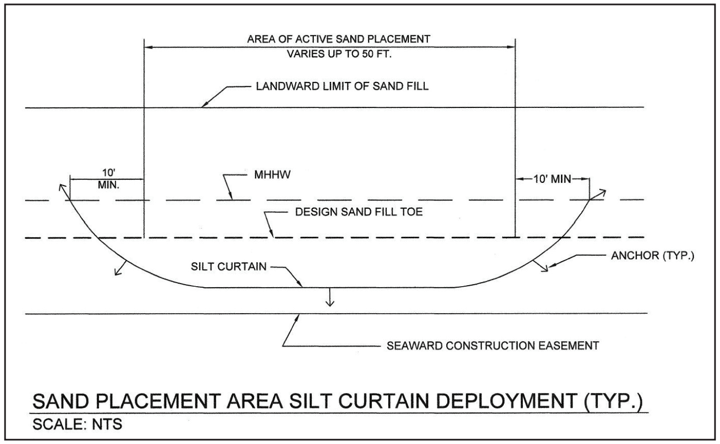


Figure 7-13 Silt curtain layout for sand placement

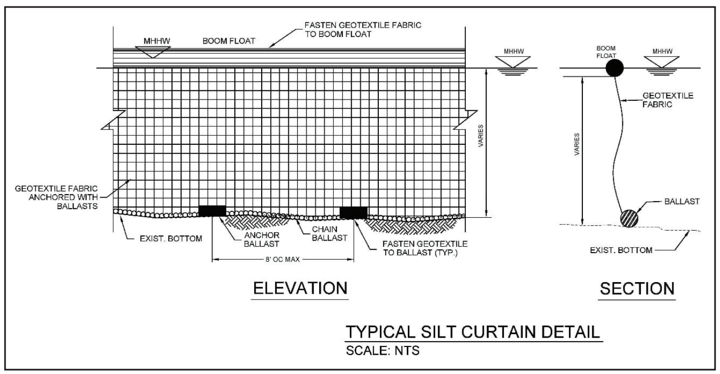


Figure 7-14 Typical silt curtain detail

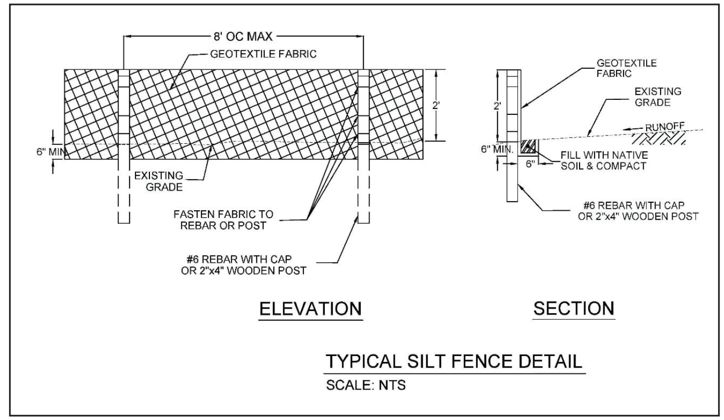


Figure 7-15 Typical silt fence detail

7.1.6 Dewatering

7.1.7 General Method

State of Hawaii Department of Health and U.S. Clean Water Act regulations require that the water accumulated on the barge during the dredging process be discharged in a way that reduces the occurrence of turbidity in the ocean water. Ideally, the discharge should be accomplished with no direct dredge water flow back to coastal waters. A direct and effective way to dewater a barge is to discharge the water into an enclosed basin on the beach, above the high water line, and let the water percolate into the ground.

7.1.8 Potential Dewatering Sites

While clamshell dredging typically entrains minimal water content, it is possible that residual water may accumulate over time and require dewatering. Dewatering of the barge can be accomplished by pumping the water from the moored barge to the beach. The beach area selected for dewatering, shown previously on Figure 7-8, is as much as 250 wide. While the barge configuration for transporting the sand is not known at this time, it is assumed that the barge will have nominal capacity of 2,000 cy and it will need dewatering when it contains up to about 500 cy of residual water, possibly every 3 to 5 days. Water would be piped from the barge around the Magic Island parking lot to the beach as shown on Figure 7-8. A 4 to 6-inch diameter pipe for transporting the water could be deployed with minimal disturbance to users. The pipe could be trenched into the ground or it could have pedestrian ramps where the pipe is exposed.

Figure 7-8 shows a 5,000 square foot dewatering basin. The basin would be constructed by excavating sand to make a pit that is surrounded by a sand berm. The berm would be lined with a stabilizing geotextile layer. Water would be pumped into a diffuser to reduce the potential of the water from eroding the berm. A water depth of 2.7 feet in the basin would be required to accommodate 500 cy of water. Pumping water at a rate of 400 to 800 gallons per minute would require 2 to 4 hours to empty water from the barge. At a calculated absorption rate of 150 to 200 cy/hr, the water would be absorbed into the beach in about 3 hours.

7.1.9 Operational Considerations

The wave and wind environment at the sand recovery site presents a challenge for the dredging contractor. Dangerous conditions can occur from both south Pacific swell and tradewinds, and can be reasonably expected to occur at any point during project construction. The most advantageous work period is fall to early winter, when southern swell and tradewinds can be expected to be the least intense. Strong tradewinds can also create seas and currents that would make it difficult to hold the dredge barge and scows in relatively stable positions. For this reason, the operation is proposed to occur during low wave and wind conditions in the fall months.

There are no oceanographic constraints to offloading in a commercial harbor, which would be expected to be sheltered from wave energy. Similarly, sand placement at Ala Moana beach could be satisfactorily accomplished during any time of the year. Tides are more critical than waves for sand placement on the beach.

8. MARINE RESOURCES

8.1 Ala Moana Regional Park Assessment

Water quality and marine biology of the park's nearshore waters were assessed by Marine Research Consultants Inc. (MRCI) for this project. Water chemistry was assessed by collecting four linear sets of samples (i.e., transects) extending perpendicular from the shoreline, extending from the highest wash of waves to the boundary of the dredged basin and un-dredged reef flat. Biotic community structure of the marine environment was assessed by Marine Research Consultants biologists swimming throughout the nearshore area from the shoreline to the inner margin of the dredged reef off each of the survey transect sites described above. During these reconnaissance swims, notes were taken on physical structure and marine species presence. Numerous photographs were taken of typical features of all habitats to provide a descriptive representation of the area fronting the project site.

The purpose of this assessment is to assemble a set of baseline information to make valid evaluations of the potential for influence on the marine environment from the proposed replenishment of beach sands at the shoreline of Ala Moana Regional Park. The information collected in this study provides the basis to understand some of the important processes that are operating in the nearshore ocean, to be able to address any concerns that might be raised in the planning process for the proposed project.

8.1.1 Water Quality

Water chemistry field collection was conducted on April 30, 2018. Water chemistry was assessed by collecting four linear sets of samples (i.e., transects) extending perpendicular from the shoreline, extending from the highest wash of waves to the boundary of the dredged basin and un-dredged reef flat (Figure 8-1).

The overall distribution of water chemistry constituents reflects the physical structure of the coastal area. The shoreline consists of a coarse sand beach with areas of exposed rubble and rock. The seaward edge of the linear dredged swim channel basin is bounded by a sharp edge cut in the shallow fossil reef flat that extends to the outer reef crest. Water depth is 10 to 15 feet in the swim channel. At the east side of the Park, an elongated channel extends from the shoreline along the edge of Magic Island and terminates at the reef crest. As there are no deep open channels leading from the open ocean to the inner basin, water circulation within the dredged area is driven mainly by tidal exchange and water flow across the shallow reef flat. As a result, water quality within the nearshore basin is affected by the long residence time.

Table 8-1 and Figure 8-2 and Figure 8-3 present results of the water quality sampling. Several patterns of distribution are evident in Table 8-1 and Figure 8-2 and Figure 8-3. Most evident is that there are elevated values of several nutrient constituents at the shoreline on several of the transects. The values of Si are elevated at the shoreline of Transect 2, coupled with an anomalously low value of salinity (Figure 8-3). This pattern is indicative of freshwater entering the ocean at the shoreline. As this pattern is only evident at one site, it can be assumed that this is not the normal situation along the entire beach front.

The values of dissolved nutrients (NO_3^-, NH_4^+, and TN) all show a general trend of elevated values at the shoreline with decreasing concentrations through the swimming channel. This trend is most apparent at Transect 1, where the values at the shoreline are substantially elevated relative to values at the shoreline of the other three transects. As there is no indication of depressed salinity in the nearshore waters of Transect 1, the source of these elevated nutrients is not from groundwater input. Nutrient composition throughout the swimming channel is relatively consistent on all transects. In the channel bounding the west side of Magic Island, nutrient concentrations are overall lower than in the swimming channel and show consistent values between the sampling locations 250 m (820 ft) and 400 m (1,300 ft) from the shoreline. Considering physical properties of the water column, turbidity, chlorophyll a, temperature, dissolved oxygen, and pH all display similar patterns, with peak values at the shoreline, and decreasing values with distance seaward (Figure 8-3). As with nutrients, the lowest values occur in the Magic Island channel.

Figure 8-1 Satellite image of Ala Moana Regional Park showing beach, dredged linear swim channel, and undredged reef flat. Also shown are locations of water chemistry sampling stations along four transects that extend from the shoreline to the edge of the dredge cut.

Table 8-1 Results of water sampling off Ala Moana Regional Park on April 30, 2018.

Samples are collected 10 centimeters from the surface (S), and 20 cm from the ocean floor (B). Where water depth was less than 50 cm, a single sample was collected. Also shown are the State of Hawaii, Department of Health Water Quality Standards (DOH WQS) "not to exceed more than 10% of the time" and "not to exceed more than 2% of the time" water quality standards for open coastal waters under "dry" conditions. Tan shaded values exceed DOH 2% "dry" standards; blue shaded values exceed DOH 10% "dry" standards.

STATION	DEPTH (m)	DFS (m)	PO_4^{3-} (µg/L)	$NO_3^-+NO_2^-$ (µg/L)	NH_4^+ (µg/L)	Si (µg/L)	TOP (µg/L)	TON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	SALINITY (o/oo)	pH std. units	Chl-a (µg/l)	TEMP deg. C	Diss. O_2 % sat.
TRANSECT 1	1	0	9.92	6.72	119.70	114.80	51.77	418.46	61.69	544.88	43.10	34.54	8.08	2.24	25.19	97.70
	2	5	2.79	1.68	5.46	104.44	11.78	181.16	14.57	188.30	6.05	34.57	8.09	0.43	24.64	96.90
	3	50S	2.17	2.52	16.52	112.00	9.61	166.88	11.78	185.92	4.88	34.50	8.08	0.26	24.54	91.08
	4	50B	4.34	2.52	33.04	106.96	9.61	179.62	13.95	215.18	6.34	34.57	8.08	0.26	24.54	90.14
	5	120S	1.86	1.96	1.68	92.40	8.99	121.66	10.85	125.30	1.27	34.50	8.04	0.09	24.18	90.42
	6	12B	3.41	1.68	1.68	91.56	8.37	114.52	11.78	117.88	2.41	34.46	8.01	0.14	24.20	74.88
	7	250S	3.10	1.96	1.68	92.12	8.37	107.38	11.47	111.02	1.12	34.46	8.07	0.16	24.64	99.46
	8	250B	4.34	0.56	1.54	95.48	7.75	116.34	12.09	118.44	1.72	34.43	8.02	0.15	23.48	104.26
	9	400S	3.72	BDL	1.54	87.92	7.75	99.54	11.47	101.22	1.02	34.50	8.13	0.09	22.46	98.29
	10	400B	5.89	1.40	1.68	94.36	8.06	122.36	13.95	125.44	3.00	34.53	8.04	0.16	24.26	75.93
TRANSECT 2	11	0	7.44	2.66	8.12	223.44	12.09	166.74	19.53	177.52	13.90	33.84	8.35	0.58	26.53	99.76
	12	15	5.27	2.94	7.42	112.28	8.99	147.14	14.26	157.50	3.31	34.53	8.21	0.20	24.30	101.32
	13	30S	7.44	1.96	7.70	117.88	6.82	115.36	14.26	125.02	5.33	34.53	8.08	0.30	25.80	109.23
	14	30B	5.89	2.10	6.72	127.40	8.37	106.68	14.26	115.50	4.51	34.53	8.09	0.31	25.84	106.43
	15	60S	5.58	5.60	6.58	121.24	6.82	109.20	12.40	121.38	1.98	34.49	8.13	0.12	24.79	95.65
	16	60B	4.96	2.52	1.40	92.12	8.06	101.64	13.02	105.56	3.32	34.43	8.06	0.16	24.32	80.17
	17	120S	5.89	2.02	4.34	99.43	7.22	104.96	13.11	111.32	1.14	34.50	8.11	0.17	25.21	106.34
	18	120B	6.20	5.88	8.12	101.92	7.44	101.92	13.64	115.92	1.48	34.54	8.16	0.16	24.31	94.54
TRANSECT 3	19	0	4.34	4.76	11.48	122.92	13.33	170.38	17.67	186.62	3.91	34.68	8.43	0.41	28.11	125.54
	20	15	5.27	5.32	15.26	144.76	9.30	160.44	14.57	181.02	5.41	34.53	8.15	0.44	26.29	99.76
	21	30S	4.34	BDL	0.98	117.88	8.99	150.92	13.33	152.04	6.34	34.57	8.11	0.61	25.34	94.53
	22	30B	5.27	0.70	11.76	117.04	9.30	137.34	14.57	149.80	2.91	34.50	8.11	0.71	25.34	93.35
	23	50S	4.03	0.84	3.50	125.44	8.37	115.36	12.40	119.70	3.91	34.57	8.13	0.34	25.18	97.48
	24	50B	4.96	1.26	2.66	108.92	8.99	111.72	13.95	115.64	2.64	34.54	8.09	0.52	24.42	82.29
	25	100S	2.48	1.96	5.74	120.40	9.61	117.46	12.09	125.16	3.88	34.47	8.13	0.33	24.92	93.49
	26	100B	4.96	2.94	4.20	123.48	8.37	112.42	13.33	119.56	3.79	34.50	8.09	0.40	24.42	82.90
TRANSECT 4	27	0	4.96	4.48	12.60	149.80	8.99	193.62	13.95	210.70	4.17	34.91	8.53	0.37	29.18	122.22
	28	15	4.65	1.82	8.54	114.24	8.68	139.86	13.33	150.22	3.87	34.61	8.22	0.69	29.13	121.45
	29	25	5.27	0.98	3.64	111.44	9.30	147.28	14.57	151.90	3.37	34.61	8.14	1.04	26.36	118.35
	30	50S	4.96	0.98	BDL	129.08	9.30	128.80	14.26	130.06	7.07	34.43	8.13	0.57	25.47	101.77
	31	50B	8.06	BDL	19.32	160.72	10.23	167.72	18.29	187.04	3.95	34.54	8.09	1.31	25.45	103.23
	32	100S	5.89	1.96	2.24	130.48	17.05	132.58	22.94	136.78	6.45	34.54	8.13	0.88	25.19	101.93
	33	100B	7.44	BDL	16.52	127.12	13.02	189.70	20.46	206.22	5.43	34.50	8.20	1.18	24.70	86.56
DOH WQS	DRY	NTE 10%		10.00	5.00				30.00	180.00	0.50	*	**	0.50	***	****
		NTE 2%		20.00	9.00				45.00	250.00	1.00	*	**	1.00	***	****
Analytical Method			EPA 365.3	EPA 353.2	EPA 350.1	EPA 370.1			SM 4500P B5	SM 4500N C	SM 2130B	SM 2520	EPA 150.1	SM 10200	SM 2550B	SM 4500 OG

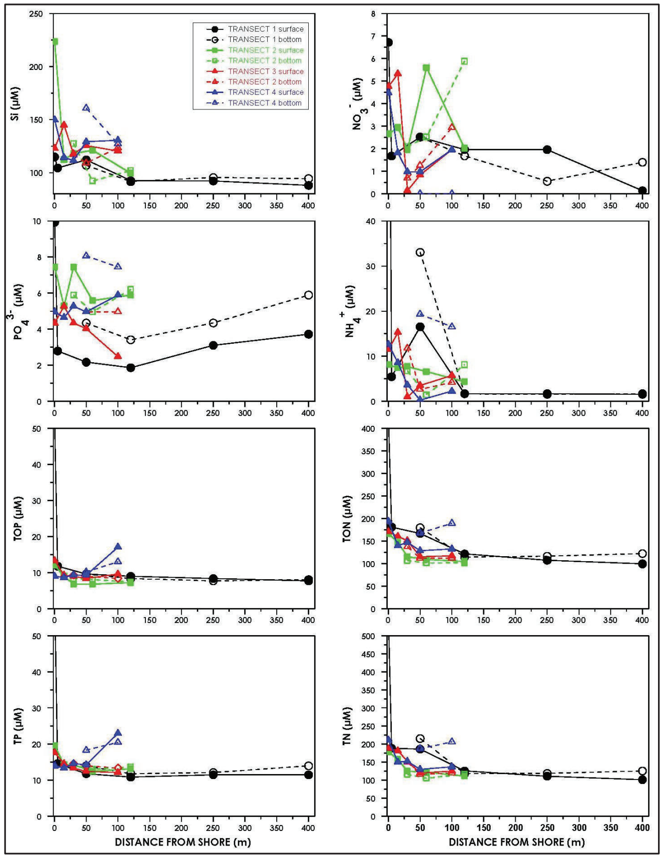


Figure 8-2 Plots of dissolved nutrients in surface and bottom samples collected on April 30, 2018, as a function of distance from the shoreline along four transects off Ala Moana Regional Park, Honolulu, Hawaii.

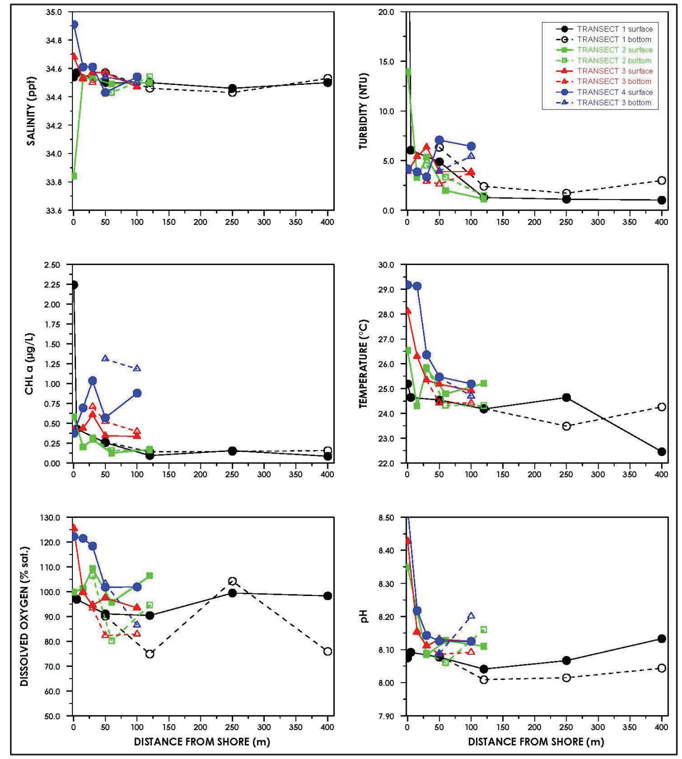


Figure 8-3 Plots of physical properties of water in surface and bottom samples collected on April 30, 2018, as a function of distance from the shoreline along four transects off Ala Moana Regional Park, Honolulu, Hawaii..

8.1.2 Biotic Community Structure

Biotic community structure of the marine environment was assessed by MRCI biologists on April 30, 2018, by swimming throughout the nearshore area from the shoreline to the inner margin of the dredged reef off each of the survey transect sites described above. Transect locations are shown on Figure 8-4. The most shoreward region of the intertidal region zone consists of either coarse white sand or coral rubble (Figure 8-5). Much of the nearshore rubble is emergent at low tide. The rubble that is perpetually covered by water contains scattered small living colonies primarily consisting of the species *Leptastrea purpurea* and *Pocillopora* *damicornis* (Figure 8-6). These small corals (maximum size ~15 centimeter diameter) were growing on loose rubble fragments that would be easily removed from the rubble zone if necessary to avoid burial. Total cover of the rubble zone by living coral was well less than 1%.

Seaward of the shoreline shallow zone, water depth increases in the elongated dredged channel that extends the length of the Park. In many areas, bottom cover consists of a bed of coral rubble fragments (Figure 8-7, top left). The rubble zone grades into a coarse sand bed at a depth of about 5 feet (Figure 8-7, top right). The "deep rubble zone" is essentially devoid of coral settlement, or any other biotic epi-fauna. With increasing distance from shore, the bed of the swim channel grades to a sand plain of various textures. In some areas, bottom composition is composed of coarse sand (Figure 8-7, bottom left), while the deeper areas consist of a fine-grained mud-silt mixture (Figure 8-7, bottom right). While there is little epi-fauna on the mud floor, there are numerous burrows and associated mounds of sediment that are likely formed by the action of worms, crabs, and shrimp.

Ubiquitous throughout the swim channel floor are expanses of the Hawaiian seagrass, *Halophila hawaiiana*, which is endemic to the Hawaiian Islands. *Halophila hawaiiana* is a flowering plant with roots that hold sediment. It is locally common, within a specific habitat that is characterized by protected waters with calm sandy areas within a narrow depth range that generally does not exceed 4 meters. In some areas this species has been replaced by invasive algal species, although there is no indication that this is occurring at Ala Moana, as there were no other alga observed in the habitat occupied by the seagrass. Like other seagrasses, *Halophila hawaiiana* meadows support a rich community of associated organisms in sediments and on the leaf blades, providing food and shelter for more mobile organisms such as fish and crustaceans. *Halophila hawaiiana* is part of the Hawaiian green sea turtle's diet. As seen in Figure 8-4, seagrass was observed along the length of the swim channel, but not in the shoreline rubble zones.

The other abundant plant within the Ala Moana nearshore area was the alien red algae *Gracilaria salicornia* (Figure 8-8, lower right). This species of *Gracilaria* is one of the most successful invasive algae in Hawaii and is often found covering expanses of calm water reef flat and tidepools attached to limestone and basalt substrates. While there were areas of mats of *G. salicornia* in the Ala Moana swim channel, it was not widespread, and was restricted to several locations on the outer edge of the channel and along the margin of the shoreline of Magic Island (Figure 8-4). Other algae that were observed in the swim channel were patches of the brown alga *Padina sp.* (Figure 8-8, upper right) and the filamentous cyanobacteria *Lyngbya sp.* (Figure 8-8, bottom left).

Within the entire survey area, reef building coral were considered rare. The exception is the outer channel bordering the western shoreline of Magic Island. This area differs substantially from the inner swim channel in that it is more oceanic in terms of water quality, particularly in terms of less turbidity in the water column, and solid surfaces that serve as settling substrata. As a result, the outer channel habitat is better suited for colonization and growth of reef corals. As the area is also sheltered from the impacts of large waves by the outer reef flat, there is little evidence of breakage of even delicate growth forms.

The most common species found in the outer channel were the most common species typically found on open coastal reefs in Hawaii. These include *Pocillopora meandrina*, *Porites lobata*,

Montipora patula and *Montipora capitata* (Figure 8-9). A species that was commonly observed in the outer channel that is not commonly observed on exposed coastal reefs is *Pocillopora damicornis* (Figure 8-9, upper left). The growth form of this coral consists of finely branching clusters which are not capable of withstanding wave stress. While coral colonies within the outer channel were common, they did not form a complete cover of bottom substrata. Rather they covered approximately 5-10% of the edges and bottom of the outer channel margins.

Figure 8-4 Map of Ala Moana Regional Park offshore marine environment showing color coded observations of benthic composition.

Figure 8-5 Views of Ala Moana Regional Park shorelines. Upper two photos show sand shoreline. Bottom photos show exposed rubble/cobbles at shoreline that is planned for sand replenishment.

Figure 8-6 Reef building corals in shoreline rubble zone.

Leptastrea purpura **(upper left and right),** ***Porites lobata*** **(upper right),** ***Pocillopora damicornis*** **(lower left), and** ***Psammocora stellata*** **(lower right)**

Figure 8-7 Sediment types in Ala Moana Regional Park marine areas.

Top photos show nearshore rubble beds. Bottom photos show floor of swimming channel composed of various grain sizes of silty sand. Numerous burrow holes, likely from worms, shrimp and crabs, are visible in both bottom photos.

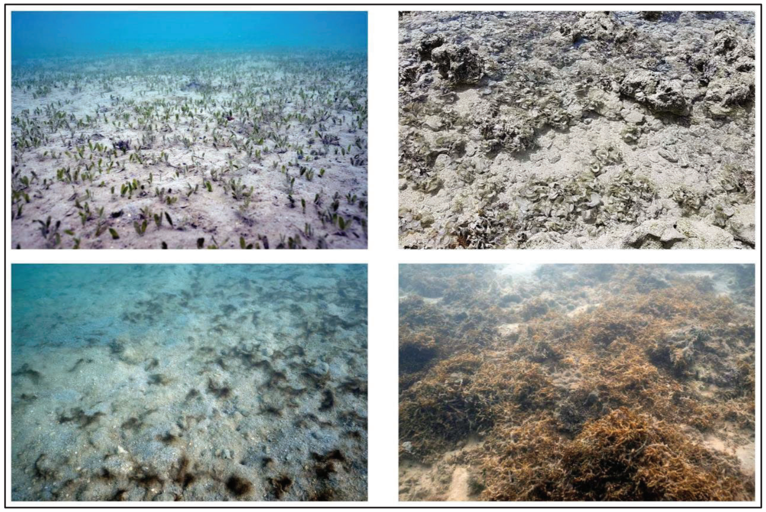


Figure 8-8 Upper left photo shows meadow of seagrass *Halophila hawaiiana* covering patch of sand flat in swimming channel. Algae found in swimming channel include *Padina sp.* (upper right), *Lyngbya* sp. (lower left), and *Gracilaria saliconia* (lower right).

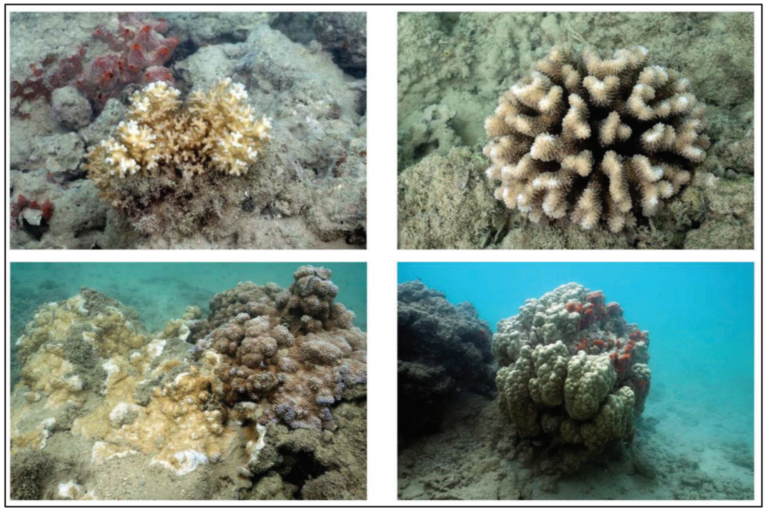


Figure 8-9 Corals occurring on the channel walls off Magic Island included *Pocillopora damicornis* (top left), *Pocillopora meandrina* (top right), *Montipora patula* and *M. capitata* (lower left), and *Porites lobata* (lower right).

8.1.3 Reef Fish Composition and Community Structure

Limited visibility in the main swim channel was reduced to the point where visual quantitative assessments of fish populations was not possible. During the course of swim surveys, several species of fish were noted. These included the surgeonfish *Acanthurus triostegus* and *A. leucoparius*, damselfish *Dascyllus albisella*, the tetradonts *Canthigastor jactator*, *Diodon holocanthus* and *Ostracion meleagris*, the trumpetfish *Aulostomus chinensis*, triggerfish *Rhinecanthus rectangulus*, and the Moorish idol *Zanclus cornutus*. All of these species are common on Hawaiian reefs and do not constitute rare or unique species assemblages. No large individuals that would be considered "food fish" were observed. No fish were observed in the shallow nearshore rubble zone.

In summary, the marine communities directly off Ala Moana Regional Park are limited, consisting of species that are tolerant of high turbidity and/or soft benthic habitats. The most prevalent biotic component of the area are the meadows of the Hawaiian seagrass that occur throughout the soft sediment, calm water areas of the swim channel. While scattered small corals occur on the loose rubble in the nearshore zone, the most abundant corals occur in the outer channel bordering Magic Island where flushing rates are elevated relative to the inner channel, and water quality is most oceanic in nature.

8.1.4 Threatened and Endangered Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the Hawaiian Islands and is frequently observed throughout the south shore of Oahu. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently in Hawaiian waters. Several green sea turtles were observed within the survey area over the course of the present study. Of particular note was the small size of many of the turtles. As the swim channel basin is essentially isolated from the open ocean by shallow reef berms, the area may serve as a protected refuge for turtles from predatory sharks. In addition, the abundance of seagrass and marine algae may provide a preferred feeding ground for green turtles. No hawksbill turtles were observed during the course of underwater surveys. Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. While the present survey was conducted in May when whales are absent from Hawaiian waters, the survey area is not conducive to whale habitation owing to shallow depth and lack of access. The Hawaiian monk seal, (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. No seals were observed during the present survey work at Ala Moana Regional Park.

8.2 Sand Borrow Site Assessments

MRCI also conducted a water quality and marine biological assessment of the offshore sand borrow sites during mid-November of 2018. The purpose of this assessment is to assemble baseline information to make valid evaluations of the potential for influence to the marine environment from the proposed dredging and replenishment of beach sands.

8.2.1 Water Quality

Three areas that could serve as potential offshore sand donor sites have been selected by Sea Engineering Inc. These three areas are designated as "Hilton", "Ala Moana—Offshore" and "RR—Inner" (Figure 8-10). Within each of these areas three water sampling stations were selected. Within each site, one station was near the eastern boundary, one in the central region, and on near the western boundary. Within the "RR—Inner" site, there was a smaller area to the west of the main site, which was designated "RR—Inner 1b" in which a single water sampling station was established.

Water quality analyses are presented in Table 8-2. Inspection of Table 8-2 reveals that two stations in the "Hilton" donor site had elevated concentrations in surface waters of all dissolved nutrients (PO_4^{3-}, NO_3^-, NH_4^+, Si, TP, TN) along with reduced salinity. These stations (1 and 3) were located closest to the discharge of the Ala Wai Canal. Nutrient concentrations at station 10 located in the smaller "RR—Inner 1b" donor site were elevated relative to the concentrations at the larger "RR—Inner 1a" site, although salinity was not correspondingly depressed. The "RR—Inner 1b" site was located closest to the Hickam Harbor entrance channel. Flow of water seaward from the inner areas of Hickam Harbor may be the cause of the elevated values at the "RR—Inner 1b" sampling station.

Considering physical properties of the water column, turbidity and Chlorophyll a were uniformly low with all values below 0.56 NTU and 0.49 µg/L, respectively (Table 8-2). Temperature, dissolved oxygen, and pH all display similar patterns, with similar values throughout the sampling range. There were no indications of distinctive vertical stratification through the water column for any of the measured constituent (Table 8-2).

Figure 8-10 Aerial photograph of the south shore of Oahu showing potential sand donor sites for the Ala Moana Beach Restoration project.

Table 8-2 Results of water sampling for Ala Moana Sand Project at four potential sand donor sites on November 14, 2018.

Samples are collected near the surface (S), mid-water column (M), and 20 cm from the ocean floor (B). Also shown are the State of Hawaii, Department of Health Water Quality Standards (DOH WQS) "not to exceed more than 10% of the time" and "not to exceed more than 2% of the time" for open coastal waters under "wet" conditions. The single tan shaded shaded value exceeds DOH 2% "wet" standards; no values exceed the DOH 10% "wet" standards.

DONOR SITE	SAMPLE STATION	DEPTH (m)	PO4 (µg/L)	$NO_3^-+NO_2^-$ (µg/L)	NH4 (µg/L)	Si (µg/L)	TOP (µg/L)	TON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	Salt (ppt)	pH (rel)	Chl-a (µg/l)	TEMP deg. C	Diss. O_2 % sat.
ALA WAI	1	0.3	4.09	11.14	5.33	270.22	10.39	81.94	14.48	98.42	0.34	34.15	8.16	0.32	26.66	96.58
		7.5	1.74	0.28	0.80	31.55	7.33	76.15	9.06	77.22	0.22	34.52	8.08	0.26	26.67	95.90
		15.3	0.05	bdl	1.01	31.36	6.90	76.13	6.95	77.14	0.23	34.60	8.07	0.29	26.67	95.54
	2	0.3	0.07	0.14	1.46	31.20	8.47	81.33	8.53	82.92	0.18	34.64	8.21	0.26	26.63	94.70
		7.5	0.05	0.28	2.91	32.20	7.76	73.02	7.82	76.22	0.25	34.64	7.89	0.25	26.65	95.58
		15.5	0.06	0.14	7.25	28.56	8.88	65.39	8.94	72.79	0.12	34.64	8.13	0.27	26.64	95.17
	3	0.3	0.13	3.63	7.07	144.64	10.77	73.09	10.91	83.79	0.33	34.41	8.19	0.32	26.53	93.09
		8.7	0.07	0.14	11.42	26.98	10.03	65.21	10.11	76.78	0.14	34.60	8.21	0.26	26.53	91.93
		17.3	0.06	0.14	5.28	31.03	10.71	70.04	10.77	75.46	0.28	34.60	7.80	0.29	26.53	91.32
ALA MOANA	4	0.3	2.39	0.52	2.30	25.81	9.47	74.11	11.86	76.93	0.20	34.56	8.21	0.23	26.73	96.26
		13.5	2.14	0.33	7.13	25.24	6.48	68.56	8.61	76.02	0.31	34.56	8.19	0.25	26.73	95.91
		27.0	2.45	0.15	5.21	25.67	5.94	65.52	8.39	70.88	0.22	34.52	8.17	0.26	26.74	94.08
	5	0.3	2.51	0.14	2.60	25.81	3.93	68.42	6.44	71.16	0.38	34.56	8.21	0.25	26.72	95.74
		13.5	2.17	bdl	6.62	24.72	4.96	60.16	7.13	66.78	0.21	34.60	8.18	0.25	26.73	95.79
		27.8	1.61	bdl	1.29	24.67	5.97	67.66	7.58	68.95	0.29	34.56	8.19	0.26	26.73	95.16
	6	0.3	2.23	bdl	7.01	25.05	8.38	65.65	10.61	72.66	0.23	34.56	8.21	0.24	26.73	96.49
		14.0	2.60	bdl	1.11	25.13	7.33	70.03	9.93	71.13	0.22	34.60	8.13	0.26	26.73	96.06
		28.1	1.43	bdl	bdl	25.48	11.50	78.53	12.92	78.53	0.21	34.56	8.15	0.27	26.70	95.37
REEF RUNWAY	7	0.3	2.17	bdl	1.75	33.27	9.68	73.96	11.85	75.71	0.23	34.63	8.19	0.43	26.66	96.58
		9.9	2.05	0.14	bdl	32.91	7.35	70.71	9.40	70.85	0.34	34.60	8.02	0.45	26.67	95.90
		18.9	2.36	0.14	bdl	33.59	3.56	77.80	5.91	77.94	0.28	34.52	8.08	0.49	26.67	95.54
	8	0.3	2.11	0.16	0.46	33.40	5.20	73.43	7.30	74.05	0.29	34.56	8.22	0.47	26.63	94.70
		9.4	1.77	0.22	3.82	33.10	6.09	67.21	7.86	71.26	0.27	34.52	8.08	0.46	26.65	95.58
		18.9	1.49	0.29	3.32	32.86	5.60	68.59	7.08	72.20	0.32	34.60	8.14	0.49	26.64	95.17
	9	0.3	2.73	0.35	6.44	35.52	6.58	67.88	9.31	74.68	0.59	34.52	8.19	0.44	26.53	93.09
		8.4	2.29	0.42	3.88	35.80	10.56	71.70	12.85	75.99	0.48	34.60	8.15	0.46	26.53	91.93
		16.5	2.51	0.48	2.97	36.29	8.68	73.63	11.19	77.08	0.51	34.60	8.15	0.43	26.53	91.32
SMALL REEF RUNWAY	10	0.3	2.76	2.60	3.18	39.34	8.28	70.76	11.04	76.54	0.37	34.56	8.02	0.20	26.65	89.82
		4.6	3.84	2.51	12.46	39.53	9.25	61.90	13.10	76.87	0.43	34.56	8.17	0.22	26.65	89.26
		9.7	0.12	1.93	2.91	39.08	11.78	72.98	11.90	77.81	0.40	34.56	8.06	0.20	26.65	88.80
DOH WQS	WET	NTE 10%		14.00	8.50				40.00	250	1.25	*	**	0.90	***	****
		NTE 2%		25.00	15.00				60.00	350	2.00	*	**	1.75	***	****
			EPA 365.3	EPA 353.2	EPA 350.1	EPA 370.1			SM 4500P B5	SM 4500N C	SM 2130B	SM 2520	EPA 150.1	SM 10200	SM 2550B	SM 4500 OG

8.2.2 *Benthic community structure*

Biotic community structure of the marine environment was semi-quantitatively assessed by investigators swimming from the centers of each sand donor site in both the north and south directions until the "edge" of the deposit was reached. The "edges" were defined as the region where bottom cover consisted of materials other than sand, or where biotic composition comprised the majority of the benthic surface. During these reconnaissance swims, notes were taken on physical structure and marine species abundance. Numerous photographs were taken of typical features of all habitats to provide a descriptive representation of the areas comprising the donor sites. Reconnaissance swims to the offshore edge of the "RR—Inner 1a" deposit site were not conducted owing to depth limitations of diving operations.

At the interiors of all four donor sites, the ocean floor consisted of uniform beds of white calcareous sand with distinct ripple patterns oriented parallel to the shoreline (Figure 8-11 and Figure 8-12). At all of the sites that were inspected by divers, these deposits had distinct edges, or boundaries where the sand beds were marked by either stands of algae, seagrass or coral rubble.

The dominant biota in the benthic habitats bounding the sand deposits were assemblages of algae and seagrass. At the "RR—Inner 1a" site, the sand deposits were bounded by meadows of the endemic Hawaiian seagrass *Halophila hawaiiana*. Seagrass occurred in varying densities from thinly distributed single plants to dense meadows that occupied expanses up to tens of meters in dimension (Figure 8-12 to Figure 8-14). The only area where seagrass was not observed was on the offshore boundary area of the "Hilton" donor site.

Other common marine plants observed at the boundaries of the sand deposits were fields of the green alga *Avrainvillea erecta* (Figure 8-12 and Figure 8-13). At the "Ala Moana—Offshore" donor site, vast meadows of *A. erecta* were observed at the offshore and inshore boundaries of the sand deposits. Interspersed in the meadows of *A. erecta* were patches of seagrass (Figure 8-13). At the "Ala Moana—Offshore" site, beds of the green calcareous algae *Halimeda* sp. were also common (Figure 8-13).

The area seaward of the "Hilton" donor site was distinctly different than either the "RR—Inner" or the "Ala Moana—Offshore" area. No seagrass or species of green algae were observed off the "Hilton" site. Rather, bottom cover was typified by extensive tracts of the blue-green alga *Lyngbya majuscula*, which nearly covered the sand surface (Figure 8-14).

The other class of benthos that is generally found to inhabit benthic offshore habitats in Hawaii are reef building corals. As corals generally require a solid substratum on which to settle and grow, there were essentially no corals within the sand donor deposits. However, corals were observed on several solid surfaces observed near the sand deposits. A metal frame of unidentified source was embedded in the sand near the inshore boundary of the "Ala Moana—Offshore" site (Figure 8-15). The upper surfaces of the frame were colonized by numerous coral colonies consisting of the species *Porites lobata*, *Pocillopora meandrina*, *Montipora capitata*, and *Leptastrea spp*. Scattered rubble fragments that were the dead remnants of large corals also were observed to provide solid substratum for new settlement and growth (Figure 8-14). Other attached biota that were abundant within the boundary areas included the conical shaped sponge *Spirastrealla vagabunda*, and scattered sea cucumbers (*Holothuria sp.*) (Figure 8-15)

The inner edge of the "Hilton" deposit site forms a distinct margin that abuts a solid platform that can be considered a thriving coral reef (Figure 8-17). Several large helmet-shaped colonies of *Porites lutea* and *P. lobata* greater than one meter in diameter suggest that the area has not been subjected to severe stresses in recent decades.

Figure 8-11 Three views of sand deposits at the "RR—Inner 1b" donor site (top/bottom left, top right. Rubble bed at inshore edge of sand deposit (bottom right).

Figure 8-12 Sand deposit at center of "RR—Inner 1a" donor site (upper left); bed of seagrass (*Halophila hawaiiana*) at inshore edge of donor site (upper/lower right); mixed bed of seagrass and green alga *Avrainvillea erecta* at offshore edge of donor site (lower left).

Figure 8-13 "RR—Inner 1a" donor site. Mixed beds of seagrass and green algae (*Avrainvillea erecta* and *Halimeda sp.*) (top left, top right); coral rubble encrusted with *Montipora patula* (bottom left); rubble bed (bottom right).

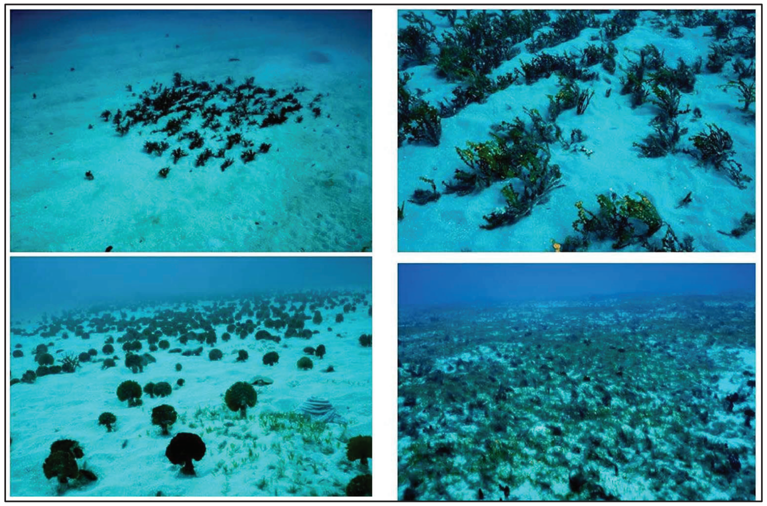


Figure 8-14 "Ala Moana—Offshore" donor site. Beds of calcareous green alga *Halimeda sp.* at inshore edge of sand deposit (top left, top right); mixed field of green alga *Avrainvillea erecta* and seagrass *Halophila hawaiiana* at offshore edge of sand deposit (bottom left and right).

Figure 8-15 "Ala Moana—Offshore" donor site. Metal frame colonized by numerous reef corals observed in center of "Ala Moana—Offshore" donor site (left); small colony of *Porites lobata*, sea cucumber *Holothuria sp.*, and green conical sponges *Spirastrealla vagabunda* on inshore edge of "Ala Moana—Offshore" donor site (top right). Bottom photos show distinct boundary between sand deposit and algal bed.

Figure 8-16 "Hilton" donor site. Beds of blue-green algae *Lyngbya majuscule* at offshore edge of "Hilton" donor site. The "Hilton" site was the only donor area where seagrass was not observed.

Figure 8-17 "Hilton" donor site. Boundary of inner edge of sand deposit and reef structure (top left and top right); reef platform inshore of sand deposit (bottom left): large colony of *Porites lutea* at inner edge of sand deposit (bottom right).

8.2.3 Reef fish composition and community structure

Essentially no reef fish occurred in the central regions of the sand donor sites. Fish were noted within the algae beds on the boundaries of the donor sites, although their occurrence was rare, and were generally limited to the vicinity of rubble features. These included the surgeonfish *Acanthurus triostegus* and *A. leucoparius*, damselfish *Dascyllus albisella*, the tetradonts *Canthigastor jactator*, *Diodon holocanthus*, and *Ostracion meleagris*, the trumpetfish *Aulostomus chinensis*, triggerfish *Rhineccanthus rectangulus*, and the Moorish idol *Zanclus cornutus*. All of these species are common on Hawaiian reefs, and do not constitute rare or unique species assemblages. No large individuals that would be considered "food fish" were observed.

In summary, the marine communities at the boundaries of the sand deposits consist primarily of a variety of marine algae and seagrass. Corals are limited to small colonies growing on rubble fragments. The exception is the inshore boundary of the "Hilton" site which consists of an extensive reef habitat.

8.2.4 Threatened and Endangered Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the Hawaiian Islands, and are frequently observed throughout the south shore of Oahu. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from Hawaiian waters. Several green sea turtles were observed within the survey area over the course of the present study. In addition, the abundance of seagrass and marine algae may provide a preferred feeding ground for green turtles. No hawksbill turtles were observed during the course of underwater surveys.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. While the present survey was conducted in November before whales are usually present in Hawaiian waters, the survey area is conducive to whale habitation during the winter season. The Hawaiian monk seal (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. While seals may transit the donor area sites, there are no beaches present for haul-out.

9. POTENTIAL IMPACTS

Previous beach nourishment efforts in Hawaii and domestically have generated data on potential project impacts. Review of these projects, including the recent Waikiki Beach Nourishment and Iroquois Point Beach Nourishment efforts, and their outcomes has resulted in the following list of potential impacts. This list is not exclusive and additional, undiscussed and/or undocumented impacts may evolve during the course of the project.

9.1 Ala Moana Regional Park Assessment

9.1.1 Impacts to Biotic Community Structure

Results of biotic surveys reveal that an important component of the benthic community is abundant, patchy meadows of Hawaiian seagrass throughout the deep dredged swim channel. As the specific habitat for this species of seagrass is shallow calm water with soft sand substratum, the floor of the swim channel is an ideal habitat for seagrass. It is apparent that the elevated levels of turbidity owing to resuspended sediment in the water column of the channel are not an impediment to seagrass occurrence. While placement of offshore sand on the beach will likely result in a temporary increase in resuspended sediment, it is not likely that there will be substantial settlement of new sediment on the floor of the channel sufficient to bury or impact existing assemblages of seagrass. As the new sediment should not be qualitatively different that the existing sand, it is not likely that there will be a change in habitat composition sufficient to alter seagrass abundance. Care should be taken however in the placement of new sand to ensure that it does not cover any existing seagrass beds.

The other component of the benthos that is an important consideration in the environmental effects of sand nourishment is the existence of small corals and other benthic organisms in and on the rubble in the nearshore zone. As this is the area intended to be transformed from a rubble shoreline to a sand shoreline, with no mitigation in terms of removing rubble prior to sand placement, the new sand would bury these small corals and other benthic creatures. As the abundance of these corals is very low, and they are all attached to unconsolidated surfaces, a possible mitigation measure would be to move them to either a rubble zone off Ala Moana Park that is not proposed for beach nourishment, or to a location on the outer reef flat. As wave motion on the reef flat adjacent to the channel cut is low, corals transplanted to this area would likely have a high potential for survival. Another alternative would be to donate these corals to the State DAR Coral Nursery on Sand Island.

Another aspect of the rubble is its utility as habitat for juvenile fish. Covering the nearshore rubble with sand would result in a loss of habitat. The shallow reef on the offshore side of the swim channel, however, also serves as habitat for juvenile fish and other organisms, and the nearshore rubble covers a very small area relative to the shallow reef. Considering the nearshore rubble and the shallow reef as part of the same ecosystem, the loss of habitat that results from covering the nearshore rubble with sand would amount to a loss in habitat of 4%.

The marine habitat in the outer channel adjacent to Magic Island is presently populated by a variety of large, healthy corals. These corals are protected from wave impacts by the bordering shallow reef flat and occur in an area where water quality is more similar to open ocean settings than the inner channel. While there may be temporary slight increases in turbidity in this area following beach nourishment, it should not be of a magnitude beyond the natural tolerance of these species. In addition, the more rapid flushing of this area with clean ocean water should prevent any sediment deposition on existing corals.

Sand transport patterns are not expected to change from those presented in Section 3.4.4. Fine material may be suspended and move with the currents and into the swim channel, while coarser sand is expected to move along the shoreline. Only the fraction of the fine material that is contacted by waves will be suspended at any given time. This material would amount to a fraction of an inch spread over the swim channel bottom.

9.1.2 Impacts to Water Quality

The physical structure of the marine habitats where it is proposed to place offshore sand in the intertidal areas to cover the existing rubble shoreline is composed of a man-made dredged swimming channel that runs parallel to the beach face. As there are no deep openings in the reef flat into which the swim channel is cut to facilitate exchange of water with the open ocean, the residence time of water in the channel is likely far greater than on an exposed coastline. Results of analyses of water chemistry from samples collected along transects that extend from the shoreline to the outer edge of the swim channel cut indicate some effects to nutrients in the nearshore zone, likely as a result of low flushing, increased temperature, and in one area, input of fresh water.

While the values of most water quality constituents are near Department of Health water quality standard specific criteria for open coastal waters, values of turbidity are consistently well above the values specified in DOH standards. The elevated values of turbidity are primarily a response to resuspended fine sediment emanating from beach sand that is trapped within the semi-enclosed dredged channel. When offshore sand was placed on the shoreline in Waikiki, nearshore turbidity temporarily increased substantially as fine-grained sediment that was not washed from the donor sand was resuspended in the water column.

9.1.3 Conclusion

Results of the water monitoring indicate that the present turbidity in the nearshore area and swim channel are considered high, owing to resuspension and lack of flushing of fine-grained sediment. As a result, marine biota that presently colonize the area are already adapted to high-turbidity environments. While the magnitude of turbidity is likely to increase temporarily immediately following sand placement, it is not likely to be of a magnitude qualitatively different than existing conditions. In addition, turbidity is also one attribute that small fish may use for defense against predation from larger fish, so turbidity may actually serve as a positive attribute for juvenile fish. Turtles are also presently abundant in the highly-turbid waters of the swim channel and are not likely to be affected by small, temporary changes associated with sand placement.

Based on the results of this survey, it can be concluded that with proper management and mitigation practices to limit to the extent possible release of fine-grained material to the water column from donor sand, and removal of corals from the rubble zone, the proposed replacement

of rubble on the shoreline should have little or no potential for significant permanent effects to the existing marine environment.

At locations close to the shoreline at Ala Moana Regional Park most water chemistry constituents exhibit elevated values. Throughout the swimming channel, water chemistry is similar throughout the Park. The water column in the channel adjacent to Magic Island seaward of the swimming channel is characteristic of open coastal water conditions.

Additionally, most of the area within the scope of the present project are close to or below the specific criteria of the State Water Quality Standards, with the caveat that this consideration is for a single sample set. As a result, it does not appear that there are any significant inputs of materials from land beyond the immediate shoreline that are impacting coastal ocean waters offshore of Ala Moana Regional Park.

9.2 Sand Borrow (Donor) Site Assessment

9.2.1 Impacts to Benthic Community Structure

The physical structure of the marine habitats of the donor sites consists of uniform beds of white calcareous sand marked by deep ripple patterns from wave forces. While the scope of the present survey did not include analyses of soft sediment infauna, there was minimal macro epi-fauna observed on the surfaces of the sand deposits. The edges of the deposits were delineated by the occurrence of algal meadows consisting of several species of blue-green (*Lyngbya majuscula*) and green algae (primarily *Halimeda spp*., *Avrainvillea erecta*). In addition to marine algae, seagrass (*Halophila hawaiiana*) occurred in expansive meadows at the boundaries of, and beyond the "RR—Inner" and "Ala Moana—Offshore" donor sites. No seagrass was observed off the "Hilton" site.

Reef building corals were not a major component of the benthic community bordering the "RR—Inner" and "Ala Moana—Offshore" sites, occurring primarily as encrustations on rubble features. The inshore boundary of the "Hilton" site (which was the shallowest area in the survey) consisted a bed of coral rubble which graded into a solid limestone platform colonized by an extensive reef community. Other invertebrates observed within the sand boundary habitats included sparse sea cucumbers and sponges. Reef fish were also scarce in the boundary areas and were limited to small individuals and limited species.

9.2.2 Impacts to Water Quality

Evaluation of water chemistry at the donor sites indicated that for the single sample set, values of all constituents represent pristine open coastal waters. The exception occurred at the locations nearest to the discharge of the Ala Wai canal within the "Hilton" donor site. Water chemistry in this area reflected discharge of canal waters with elevated nutrient concentrations coupled with decreased salinity. As the present survey was conducted during a period of relatively dry weather, it would be expected that the effects of canal water discharge would be greater during and following episodes of heavy rainfall. With the exception of a single concentration of ammonium nitrogen, all water quality constituents were below the Department of Health water quality standard specific criteria for open coastal waters under wet criteria.

Overall, water chemistry throughout the three potential sand donor sites is generally consistent with values close to or below specific criteria of the State Water Quality Standards (with the caveat that this consideration is for a single sample set). Elevated concentrations of nutrients and lower values of salinity were detected at two of the stations at the "Hilton" site. It is likely that these anomalies are the result of sampling within the discharge plume of the Ala Wai Canal. As the present sampling event was conducted during a period of dry weather, it is probable that the data would more strongly reflect discharge from land if sampling is conducted following a significant rain event.

The removal of sand from offshore deposits will likely result in a temporary increase in resuspended sediment in the water column. It is not likely that there will be substantial settlement of new sediment on the seafloor sufficient to bury or impact existing assemblages of algae, seagrass, or corals that presently inhabit the areas adjacent to the deposits due to the use of an Environmental Clamshell Bucket. As the new sediment should not be qualitatively different than the existing sand, it is not likely that the project will result in a change in habitat composition sufficient to alter biotic abundance.

9.2.3 Conclusion

Based on the results of this survey, it is recommended that environmental impacts can be eliminated or minimized by limiting sand extraction to the central regions of the donor site. In addition, management and mitigation practices should be put in place to limit to the extent possible release of fine-grained material to the water column during the extraction of donor sand. With these conditions, the proposed project should have little or no potential for significant permanent effects to the existing marine environment.

9.3 Fines and Turbidity

Sand recovered from the ocean, though highly compatible with the dry beach sand, would still have some fine content that would be winnowed from the beach system and moved offshore during the initial equilibration process and beach erosion events. Dredging, transport, and placement of carbonate sand can also increase the percent of fines through mechanical abrasion of the friable grains. Turbidity can occur at the offshore sand dredging site or along the beach where sand is placed.

Turbidity, or a reduction in water transparency, occurs when fine sediment particles are suspended in the water column. Turbidity is anticipated to be a temporary construction impact, and would naturally dissipate as fine sediment settles out of the water column.

9.3.1 Turbidity at Dredge Sites

Offshore turbidity is to be expected at the dredge site. As the clamshell bucket grabs sand from the seafloor, it would disturb fine particles adjacent to the bucket. As the bucket is raised through the water column, minor volumes of sand containing fine particles would be released into the water column. Turbidity at the dredge site will be reduced by using an environmental clamshell bucket, which is an industry best practice and has been used to minimize turbidity during dredging of harbor channels in Hawaii. Environmental clamshell buckets typically have tighter seals and overlapping sides. These buckets are designed to minimize sediment loss from

within the bucket, resuspension at the dredge site, and water entrainment with each grab. A conservative estimate of the amount of material that leaks from an environmental bucket is only 0.5% (Palermo et al., 2008). This material is expected to fall out of suspension rapidly near the dredge location.

The use of a suction dredge would result in the majority of bottom material disturbed being drawn into the dredge pipeline, with only a small amount of disturbed material escaping the dredge to affect adjacent areas or water quality. Loss rates for suction dredges have been estimated to be less than 0.1% (Hayes and Wu, 2001). Careful placement of anchors and cables would insure that they do not move about and disturb/suspend bottom material.

Turbidity generated from dredging operations is expected to be transported with the currents moving parallel to shore. Wave action has the potential to transport turbidity inshore. These water quality impacts are expected to be temporary, lasting only during the actual dredging operations, and are expected to be localized to the immediate vicinity of the dredging. Best Management Practices (BMPs) will be followed throughout the sand recovery work, consistent with the State Department of Health Water Quality Certification that will be required for the project.

9.3.2 Nearshore Turbidity

Beach restoration projects can generate turbidity plumes that can be unsightly and affect water clarity for days. Although sand fill placed on a beach must closely match the existing beach sand with respect to grain size, offshore sand will typically have a higher percentage of fines than native beach sand. Additionally, fines may be generated during dredging and placement of offshore sand onto the beach. After placement, wave action can suspend the fines creating turbidity plumes offshore of the nourished

Silt curtains and containment barriers would be deployed along the shoreline where sand placement is occurring. Following placement of sand on the beach, there will likely be periodic turbidity associated with equilibration of the beach profile and planform and during large wave events, as sand moves along the beach and cross-shore. Larger sand size grains are currently stable along the coastline and make up the existing beach face; however, finer material will likely move in the offshore direction.

It is inevitable that there will be a component of fines in the material used to nourish the beach at Ala Moana Regional Park, and it can be expected that there will be a temporary increase in turbidity over the present levels. Such an increase would be expected to be temporary until fines are winnowed out of the donor sand to the level that exists at present.

9.3.3 Turbidity analyses

Laboratory turbidity tests were performed on numerous sand samples from three potential borrow areas and Ala Moana Beach to evaluate the relative differences in turbidity generation between the beach sand and offshore sand and assess possible impacts of turbidity along the beach. Turbidity was determined by measuring the scattering of the light through sample cells that contained distilled water and sand in suspension.

The offshore sand source "RR—Inner" was sampled using a diver hand core system. Offshore sand sources "Ala Moana—Offshore" and "Hilton" were sampled using a ship-mounted vibracore. The offshore samples were composites from sand throughout the core. Ala Moana Beach was sampled in seven locations on the beach face; and samples from two additional locations were obtained to compare backbeach and beach face samples. A total of 27 samples were analyzed for turbidity as follows:

- "RR—Inner" (6)
- "Ala Moana—Offshore" (7)
- "Hilton" (5)
- "Ala Moana Beach" (9)

9.3.4 Methodology

Turbidity was measured using a Hach 2100Q Portable Turbidimeter (Figure 9-1). The instrument has an optical laser configuration that measures the scattering of the light passing through the sample cell (Figure 9-2). Turbidity is measured in Nephelometric Turbidity Units (NTUs), a standard turbidity unit for United States environmental monitoring. The instrument was calibrated once before the first experiment using the manufacturer's 20, 100, and 800 NTU StablCal primary calibration standards and the 10 NTU primary verification standard. The cells used for the turbidity readings were glass Hach Lab Turbidimeter Sample Cells.

All sample bottles and sample cells were meticulously cleaned. The sample bottles were vigorously cleaned with tap water. The sample cells were cleaned with tap water and filled with distilled water, then left filled for a minimum of 24 hours. The sample cells remained filled with distilled water until use to avoid contamination from air. Before each turbidity test, the cells were emptied, cleaned with tap water, and filled once more with distilled water until overflowing. The outside walls were treated with a thin coating of Hach silicone oil to cover imperfections and scratches and to minimize stray light.

Test samples were prepared with one tablespoon of dry sand placed in a 120 mL Polystyrene sample bottle. The bottle was then filled with 100 mL of distilled water. Preceding each turbidity test run, the sample bottle was shaken vigorously to emulate turbulence. The suspension was immediately poured into a cleaned Hach cell, which was then inverted three times following the manufacturer's guidelines and placed in the machine. The turbidity runs began immediately upon cell insertion within the analyzer.

A reading was taken for each sample at the following time intervals:

- 30 seconds
- 1 minute
- 2 minutes
- 5 minutes
- 10 minutes
- 20 minutes
- 1 hour

- 2 hours
- 4 hours
- 6 hours
- 24 hours

Results were stored on the device's internal memory, then uploaded to a computer for further analysis.

Figure 9-1 2100Q Portable Turbidimeter

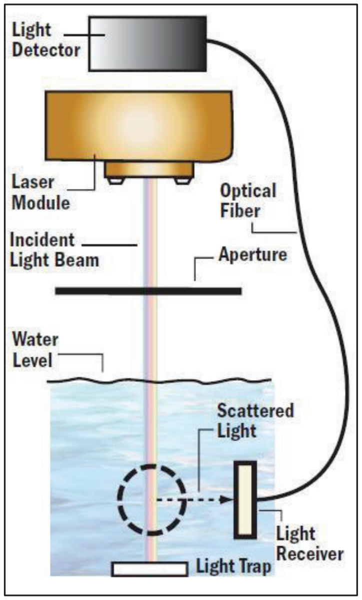


Figure 9-2 Laser Nephelometer Optical Configuration (Sadar, Cason, and Engelhardt; 2009)

9.3.5 Results

Data are plotted as turbidity versus time. Sample results from "Ala Moana Beach", "RR Inner - 1a", "RR Inner – 1b", "Ala Moana—Offshore", and "Hilton" are plotted on Figure 9-3 through Figure 9-6. A summary of the average values is plotted on Figure 9-7. The turbidity results should not be considered indicative of turbidity levels that are to be expected during the actual beach nourishment because they result from artificial experiments in a small sample bottle. Rather, they are useful to evaluate differences between the existing beach sand and the possible nourishment sand.

All samples tested showed initial turbidity that decreased exponentially with time. "RR Inner" samples had initial turbidity values ranging from 360 to 950 NTUs, where 1,000 NTUs is the maximum reading on the turbidimeter. "Ala Moana—Offshore" samples each had initial turbidity values in excess of 1,000 NTUs; however, the values decreased rapidly over the first 2 hours, where the average value of 62 was the lowest of the four sites. Even though the "Hilton" samples were the coarsest of the sites, three of the five samples had initial turbidity in excess of 1,000 NTU, while the other two were in excess of 850 NTU. The "Hilton" average turbidity was

essentially tied with "Ala Moana—Offshore" as the lowest of the four site averages after about six hours.

The Ala Moana Beach turbidity results show interesting patterns. The beach face samples had relatively low initial turbidity, ranging from about 120 to about 720 NTU. The turbidity, however, did not decrease as rapidly as did the turbidity of the offshore samples. After six hours, the measured turbidity ranged from 31 to 106. Two back beach samples were analyzed to show the turbidity of sand that has not been recently washed of fine material by waves. This sand was expected to have higher turbidity than the beach face sand. This was in fact measured to be the case, with the back beach samples having initial turbidity exceeding 1,000 NTU. The turbidity of the two back beach samples decreased rapidly, and after six hours their turbidity was lower than the beach face samples.

9.3.6 Long-term Turbidity

Sand from within the offshore sand deposits is expected to become well mixed during excavation, transport, and placement on the beach. Average turbidity values for the targeted area in the deposit are important, as they are representative of the material that will eventually be placed on the beach. Overall, while the average initial turbidity of each potential offshore source was higher than the Ala Moana beach samples, after about 90 minutes, the measured turbidity of the beach samples was higher than the turbidity of the offshore samples. The results suggest that initial elevated turbidity is expected during sand placement and periodically during larger wave events. The results also indicate that the offshore sand is compatible with the existing beach sand and turbidity should return to typical existing levels after a short period of adjustment.

This is supported by the comparison of the offshore sand with two samples obtained from the beach inshore of the regular reach of wave action that have not had their fine material washed out by wave action. As the beach erodes, this fine material become exposed to wave action and its steady release contributes to nearshore turbidity. The turbidity results for these two samples are included with the other beach samples in Figure 9-3; however, comparison with the offshore sand is more applicable, as that sand is what would make up the new beach. Figure 9-8 shows the turbidity measurements for the "Ala Moana—Offshore samples" compared with the two inshore beach samples. The figure shows that the two inshore beach samples have significantly higher initial turbidity than the "Ala Moana—Offshore" sand and the turbidity remained higher for six hours, after which all samples had essentially the same turbidity.

This suggests that over the long term any turbidity caused by the new beach fill should not greater than currently resulting from existing sand on the beach.

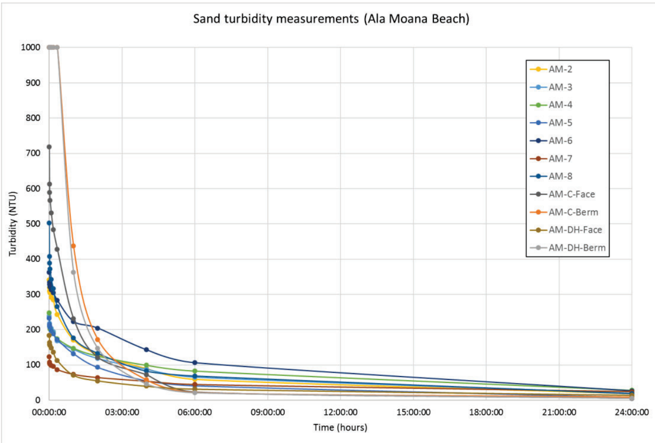


Figure 9-3 Turbidity results for Ala Moana Beach samples

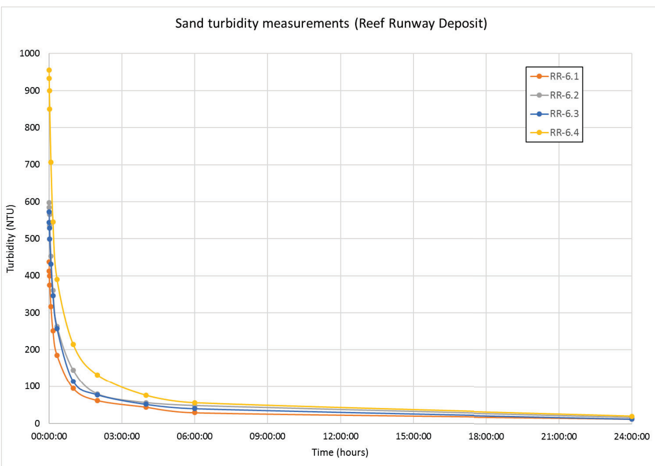


Figure 9-4 Turbidity results for "RR Inner - 1b" sand deposit

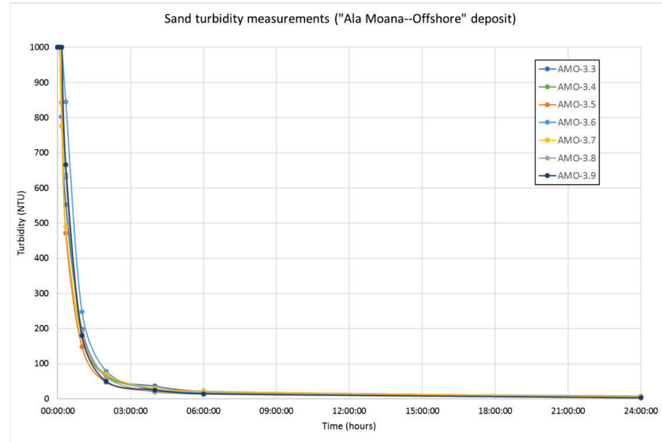


Figure 9-5 Turbidity results for "Ala Moana—Offshore" sand deposit

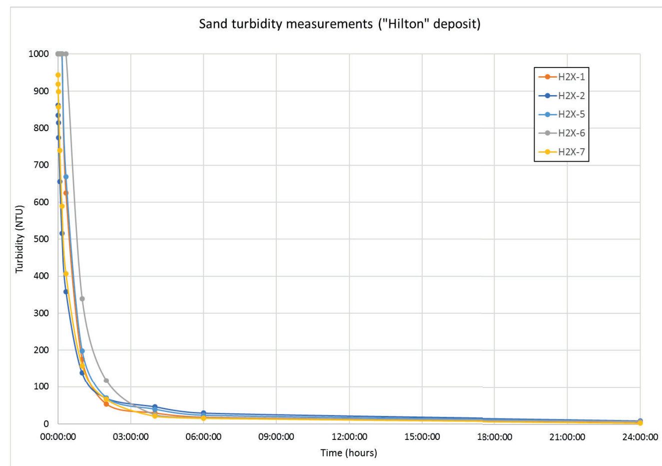


Figure 9-6 Turbidity results for "Hilton" sand deposit and beach composite

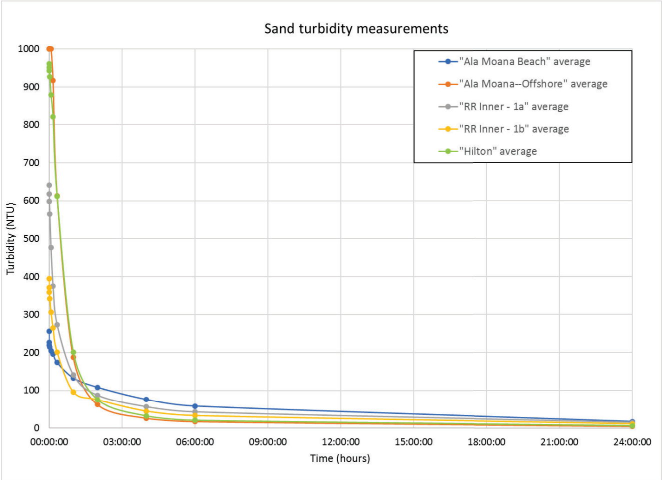


Figure 9-7 Average turbidity results for offshore sources and Ala Moana beach

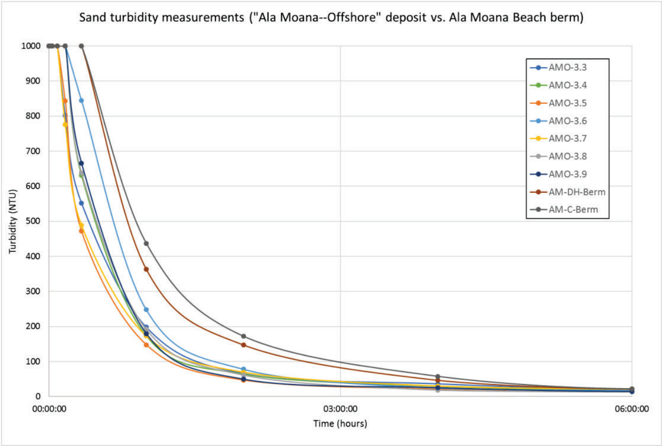


Figure 9-8 Turbidity result comparison for "Ala Moana—Offshore" sand deposit and Ala Moana beach berm samples

9.4 Sand Compaction

Compaction occurs when grains are pressed together, reducing pore space between them. Heavily compacted sand can become partially or wholly lithified (solidified), having consistency ranging from compact but friable (able to be easily broken down into sand grains), to more rock-like. Indurated (well compacted) beach rock cannot be easily broken up into individual sand grains.

Sand compaction was observed after the 2012 Waikiki Beach Maintenance project along the truck haul route between the dewatering basin and the sand placement area. A 1- to 3-foot tall hardened berm formed along the seaward edge of the haul route (Figure 9-9). SEI engineers attributed this sand compaction to loaded dump trucks traveling over the beach fill. Additionally, chemical processes in the form of carbonate dissolution likely contributed to the hardening of the beach fill.

Sand would be moved through the park utilizing the driveway where possible. Bulldozers would operate on the beach to spread the sand. The combination of pressure, dissolution of calcium carbonate material from fresh water, and the presence of fines could increase the chances of induration (hardening) of the placed sand. Compaction can be minimized by mechanically loosening or turning the sand along the truck haul route every few days. Moreover, haul routes can be monitored and plowed after project completion, if needed.

Figure 9-9. Sand compaction and induration along Waikiki Beach

9.5 Initial Sand Placement

The slope and shape of a beach face (i.e., beach profile) is a function of grain size and wave energy. Low energy beaches with finer sand tend to have flatter slopes than high-energy beaches composed of coarse sand. When sand is first placed on a beach, the sand will generally be loose and uncompacted. Wave action will help the beach adjust toward an "equilibrium profile" based on the characteristics of the nourishment sand. During this period, the sand can be expected to be loosely compacted and users might sink into the sand somewhat. Over a period of time, the sand is expected to become compacted and resemble the present condition of the beach. The length of time that compaction would take is a function of wave energy, and therefore, the exact time compaction would take is unknown.

Users should be alerted of potential changed conditions until the equilibrium profile has been achieved. The City should consider implementing proper signage noting such conditions.

9.6 Coral Rubble

Coral cobbles and rubble were an issue during the 2012 Waikiki Beach Maintenance project. These larger grains were uncomfortable for beach users, as they tended to accumulate in the nearshore at the toe of the beach. The potential for coral rubble was addressed by engineers during the design process, and efforts were made to reduce recovery of large pieces of rubble from the offshore sand deposit. However, the amount of rubble reaching the beach still exceeded construction specifications, specifically for long and narrow pieces of rubble that were able to fit through a screen on the hydraulic sand pump. After placement, the rubble became concentrated at the beach toe, just offshore of the waterline. The contractor removed coral rubble by hand, and the Waikiki Improvement Association organized volunteer rock picking efforts.

Though the grain size distributions of the offshore sand areas have been documented, coral rubble, or sediment grains that are much larger than the median grain size, may exist sporadically within the sand deposit. During offshore sand sampling, limited coral rubble was encountered in the offshore sand deposits. Rubble, however, may exist in discreet pockets within the sand deposits.

One of the disadvantages of clamshell dredging is that there is no method to screen coral rubble from the recovered sand at the dredge site. The contractor, therefore, should monitor the sand for coral rubble as the clamshell bucket empties the sand onto the scow. If excessive coral rubble is encountered in an area within the offshore sand deposit, sand recovery operations should move to a different location within the deposit.

Screening the sand as it is offloaded from the scow is possible, but would drastically slow production and could still allow cobbles to enter the beach system. Careful inspection of the sand as it is being recovered is the most effective way to minimize rubble content by identifying any areas that have higher volumes of large grains.

9.7 Sand Dynamics

Chronic erosion will continue to affect the shoreline along the full length of Ala Moana beach, as will seasonal and episodic erosion and beach adjustment events. In addition to these natural

phenomena, the beach may also be impacted by large magnitude events such as strong Kona storms, hurricanes, tsunamis, extreme water level changes, and other oceanographic and atmospheric catastrophes. Any and all of these can cause a large-scale change in the beach. As a result of one or more of these events, all placed sand and more could be lost from the beach.

9.8 Design Life

If the historical erosion rate of 2.4 feet per year remains constant into the future, it can reasonably be expected that the beach at this location would return to its pre-nourishment condition after about 20 years for the Option 1 nourishment and after about 35 years for the Option 2 and Option 3 nourishments. With increasing sea level, however, greater wave energy will reach the beach and possibly increase erosion rates. Recent State sea level rise studies forecast as much as 3.2 feet of sea level rise by the year 2100. Additionally, storm impacts from hurricanes or Kona storms could result in a rapid and irreversible loss of sand.

Regular maintenance of the beach is recommended to keep the usability of the beach at a high level. It is recommended that following the initial sand placement, re-nourishment be conducted at regular intervals in order to maintain an improved beach width. The additional sand added to the Diamond Head beach area can be used to add sand to eroding areas in a similar manner as in the 2016 sand pushing. This could be executed rather efficiently and on an as-needed basis while the supply lasts.

9.9 Anoxic Content

There are some portions of the offshore sand areas that have anoxic conditions beneath the surface of the sand. When sand is recovered from anoxic environments, it would typically have a gray color and an odor. Both of these issues would be expected as part of the restoration and enhancement phases. Both the color and odor have been documented to fade with exposure to sun and air, based on previous sand recovery efforts in Hawaii.

9.10 Marine Activities

The anchor lines at the offshore sand site would be in place for the duration of sand recovery operations, and floating sections or anchor lines would be marked with floats and lights as needed. The machinery operating on the barge would be run from the early morning until later in the afternoon each day. Some lighting would be needed on the barge to conduct operations during the morning hours.

Dredging and barging would be taking place in the nearshore waters, and are expected to directly impact ocean recreation and access in the area. Careful planning will be necessary to minimize these impacts, resulting in a recommendation for longer work days, and working seven days a week, to significantly reduce the overall duration of the project.

Public safety during construction is of utmost importance. A Notice to Mariners detailing construction activities and locations should be publicly issued through the United States Coast Guard prior to mobilization of construction equipment on site. A public awareness campaign is recommended to be initiated through the City and DLNR to help spread awareness about construction activities. DPR will be coordinated with so they may inform park users of construction activities. All onshore and offshore hazards will be clearly marked with signage and/or marker floats. Transit corridors, both on the beach and in the water, will be clearly labeled. Flag persons will be provided as needed.

9.11 Beach Activities

Placement operations on the beach would require lengths of the coast to be cordoned off during trucking operations. Crossing guards would be placed intermittently along the shoreline to assist the public in transiting across the access route. While operating, the heavy machinery would emit noise and exhaust. Again, working longer days, seven days a week, will limit the overall impact by reducing overall project duration. The 2016 sand pushing project successfully operated during evening and nighttime hours, thus reducing the impact on users.

9.12 Surf Activities

9.12.1 Impact on access

Surfing takes place along the reef edge offshore of the park, generally during the summer months under southern swell conditions, but can happen year around. The beach nourishment project is expected to have no effect on the surf break; however, users typically enter the water from within the park. During construction, parts of the beach will be closed, and surfers may need to take a different route across the shoreline to the surf sites.

9.12.2 Impact on surf breaks

The *Courts* surf break is located about 3,000 ft directly inshore of the proposed sand dredge area "Ala Moana—Offshore" identified earlier in this report. Additional nearby surf breaks include *Concessions* and *Baby Haleiwa*. Surfers have reported concerns that a change to the bathymetry might affect the characteristics of the surfing waves, particularly at *Courts*. A surfing wave is the result of complex interactions between wind, water, seafloor, other waves, and currents. Waves at a particular site may change many times over the course of a day, either subtly or dramatically due to changes in the tide level, wind, swell direction, and wave period. Waves entering shallow water are transformed by shoaling, refraction, breaking, and energy dissipation. All of these factors would have to be considered to assess possible impacts on surfing waves.

Wave modeling can be performed to try to understand the effect, if any, sand dredging would have on a wave passing over the dredge site and propagating toward shore. To approximate the sand borrow pit, the bathymetry of the dredge pit was reduced by 4 feet, which is considered to be a reasonable scenario. This would produce approximately 52,000 cy of sand. The boundary of the dredge pit sloped by 1v:3h to represent the stable slope of sand.

Wave models BOUSS-2D and SWAN were run independently, using the same input wave conditions over the the pre- and post-dredge bathymetry. The two models resolve the wave characteristics in a different manner; comparison of the results will indicate the degree of uncertainty or confidence in the analysis. The input wave conditions were a high prevailing south swell with deepwater significant wave height H_s = 2.6 ft, period T = 16 s, and direction south-southwest, resulting in breaking wave heights of 5 to 6 feet. The model output in the form

of wave energy was produced at each grid point throughout the model domain. This energy was converted into wave height for comparison of the effects of the dredge pit.

The two models agree well in spatial pattern and in magnitude. The results show that the dredge pit causes decreases in wave heights of less than 1 inch at *Courts*. For the BOUSS-2D model, the breaking wave height at *Courts* decreased by 0.8 inches, or 1.1%, due to the dredge pit, and for the SWAN model, the breaking wave height at *Courts* decreased by 0.5 inches, or 1.0%, due to the dredge pit. Conversely, model output shows that the wave heights at *Concessions* and *Baby Haleiwa* would be expected to increase by up to 1 inch.

Differences this small are considered to be less than the inherent accuracies of the wave models; therefore, the results basically indicate that this dredging scenario is not expected to result in a noticeable change to the surf. It is anticipated that the actual dredging would be slightly different than the scenario presented, likely covering a larger area with a shallower depth of pit. That scenario would be expected to have even less impact on the wave heights. Over time, the dredge pit is expected to gradually fill in, further diminishing any differences with the pre-dredge condition.

9.13 Recreational Hazards

Users experience certain recreational hazards in Ala Moana Regional Park. These hazards include swimming accidents such as drowning, collisions between users, trips and falls, sharp objects, and poor water quality. These hazards exist at the park and will continue to exist after the nourishment project.

Each option entails placing sand over hard and sharp objects that are presently found on the reef flat between the sand beach and the swim channel. The sand thickness will be greater on the inshore portion of the beach, and the thickness will taper down to nothing at the offshore extend of the fill. The rock and rubble that is initially covered by the sand will continue to exist and will eventually become exposed as the sand erodes from the beach. These exposed rocks will pose a risk to users who may otherwise believe that the bottom is completely sand. Additionally, sand is mobile by nature and should not be expected to remain in place. Sand that is present in a certain location at one point in time may not be in the same place later. Changing bottom conditions should be expected even with a successfully completed nourishment project.

Users should be forewarned that bottom conditions have changed and may continue to change, and that hard material still lies below the sand. The City should consider implementing proper signage noting such conditions.

See also Section 9.5 for a discussion of initial placement of sand.

9.14 Effects on Endangered Species

9.14.1 Sand placement impacts

As discussed in Section 8.1.4, biologists noted the presence of sea turtles in the project area. No obvious congregation or resting areas were noted, but the turtles appeared to forage on the algae that grows in the swimming channel. Turtle abundance did not appear to be negatively affected by the number of people in the water or all the water recreation activities which occur at the park.

The biologists reported that the temporary changes to water quality from sand placement should not be of a magnitude to affect turtle behavior, as they seem unaffected by turbid waters. During sand placement operations, observers should be in place to spot any turtles that might enter the work area. If turtles are seen to enter the work area, a mitigation plan should be in effect to stop work until turtles leave the area.

9.14.2 Noise at Dredge Site

The operation of an underwater pump during dredging activities will produce an underwater sound that can be perceived by marine creatures. The ears of marine mammals and sea turtles are sensitive to changes in sound pressure which is produced by the amplitude, wavelength, and frequency of a sound wave. While audiograms are not available for whales and sea turtles, it is generally accepted that 120 dB causes disturbance to these sea creatures.

The underwater sound intensity level of a pump has not presently been determined; however, the level can be inferred based on the sound intensity level of the pump in air. The following relationship can be used to convert the source in-air sound level intensity to the source underwater sound level intensity:

$$\text{dB (water)} = \text{dB(air)} + 62$$

Pumps with power ratings of 75 Hp like the one used for the 2006 Kuhio Beach project and 2012 Waikiki Maintenance project are reported to generally produce in-air sound levels of about 90 dB; the corresponding source underwater sound level would be 152 dB. Propagation losses are primarily caused by spherical spreading and can be calculated using the following relationship:

$$\text{Propagation Losses} = 20\log(r)$$

where

r = radial distance from the source in meters

Using 152 dB as the source underwater sound level and using a threshold level of 120 dB for continuous noise for marine creature disturbance, the resulting operational clearance distance is found from:

$$20\log(r) = 152-120$$

which gives

$$r = 40 \text{ m (131 ft)}.$$

Thus, sea turtle disturbance would be limited to within about a 130-foot radius of the pumping operation. Turtles would be expected to move away from the disturbance.

A submersible pump is not anticipated to be used for this project. A clamshell bucket dredge is expected to have no noise concerns.

9.14.3 Endangered Species Monitoring

The following Best Management Practices (BMPs) as typically recommended by the National Marine Fisheries Service (NMFS) will be adhered to during construction of the project to avoid impacts to the turtles:

1. Conduct a survey for marine protected species before any work in the water starts, and if a marine protected species is in the area, a 150-foot buffer must be observed between the protected species and the work zone.
2. Establish a safety zone around the project area whereby observers will visually monitor this zone for marine protected species 30 minutes prior to, during, and 30 minutes post project in-water activity. Record information on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible) and any other disturbances (visual or acoustic).
3. Conduct activities only if the safety zone is clear of turtles.
4. Upon sighting of a turtle within the safety zone during project activity, immediately halt the activity until the animal has left the zone. In the event a marine protected species enters the safety zone and the project activity cannot be halted, conduct observations and immediately contact NMFS staff in Honolulu to facilitate agency assessment of collected data.
5. For on-site project personnel that may interact with a protected species potentially present in the project area, provide education on the status of any listed species and the protections afforded to those species under Federal laws.

A summary of anticipated effects on endangered species is as follows:

- By using the above BMPs noise/physical disturbance to green sea turtles is expected to be temporary and insignificant and not result in adverse behavioral changes.
- Based on the in-water work being conducted in relatively shallow water with silt curtains confining the sediment, any exposure of marine protected species to turbidity and sedimentation would be temporary and not significant.
- The sand recovery sites are not frequented by turtles or used as a foraging area due to a lack of algae on the sand bottom, the sand recovery equipment will be fitted with fences/barriers to prevent turtle entanglement or entrapment, and the above discussed BMPs will be implemented, thus physical disturbance to turtles is anticipated to be temporary and not significant during the sand recovery operations.

Given the extensive turtle foraging area in Ala Moana Regional Park, and the relatively small percent loss which would result from the project, the change in turtle foraging habits and habitats is not expected to be significant.

9.15 Noise impacts on land

Equipment operation at the offloading site and being used in the sand placement operations along the shoreline are expected to produce sound that exceeds current background noise levels. As the separation distance from the operating equipment decreases, very high noise levels (80+ dBA) can be expected to occur. Back up alarms which use beeping high frequency signals near 1,000 Hz can be relatively loud and tend to be intrusive because they occur in the high frequency band where the background ambient noise level tends to be lower.

It may not be feasible to mitigate construction noise to the extent that it does not at times exceed existing background noise levels or is inaudible to beach users or nearby residents. Some reduction is practical, however, and the following measures could be implemented.

- Broadband noise backup alarms in lieu of higher frequency beepers could be used for construction vehicles and equipment. Broadband noise alarms tend to be less audible and intrusive with distance as they blend in with other background noise sources.
- The project should specify use of the quietest locally available equipment, e.g., high insertion loss mufflers, fully enclosed engines, and rubber-tired equipment when possible.
- The use of horns for signaling should be limited or prohibited.
- Worker training on ways to minimize impact noise and banging will be required.

10. MITIGATION

10.1 Mitigation During Construction

10.1.1 Protection of Endangered Species

The following Best Management Practices (BMPs) as typically recommended by the National Marine Fisheries Service (NMFS) will be adhered to during construction of the project to avoid impacts to the turtles (BMPs repeated from Section 9.14.3).

1. Conduct a survey for marine protected species before any work in the water starts, and if a marine protected species is in the area a 150-foot buffer must be observed between the protected species and the work zone.
2. Establish a safety zone around the project area whereby observers will visually monitor this zone for marine protected species 30 minutes prior to, during, and 30 minutes post project in-water activity. Record information on the species, numbers, behavior, time of observation, location, start and end times of project activity, sex or age class (when possible) and any other disturbances (visual or acoustic).
3. Conduct activities only if the safety zone is clear of turtles.
4. Upon sighting of a turtle within the safety zone during project activity, immediately halt the activity until the animal has left the zone. In the event a marine protected species enters the safety zone and the project activity cannot be halted, conduct observations and immediately contact NMFS staff in Honolulu to facilitate agency assessment of collected data.
5. For on-site project personnel that may interact with a protected species potentially present in the project area, provide education on the status of any listed species and the protections afforded to those species under Federal laws.

10.1.2 Best Management Practices During Construction

Best Management Practices (BMPs) for construction operations will be developed to help minimize adverse impacts to coastal water quality and the marine ecosystem as part of the permitting process. Follow are examples of the project specifications the Construction Contractor will be required to adhere to for environmental protection measures, including, but not limited to, the following:

- The Contractor shall perform the work in a manner that minimizes environmental pollution and damage as a result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of the construction period.
- Any construction related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at the conclusion of the construction work.
- The Contractor shall submit a Best Management/Environmental Protection Plan for approval prior to initiation of construction. The plan shall include, but not be limited to:
    1. Protection of Land Resources
    2. Protection of Water Resources
    3. Disposal of Solid Waste
    4. Disposal of Sanitary Waste

5. Disposal of Hazardous Waste
6. Dust Control
7. Noise Control

- The construction contractor shall be required to employ standard BMPs for construction in coastal waters, such as daily inspection of equipment for conditions that could cause spills or leaks; cleaning of equipment prior to operation near the water; proper location of storage, refueling, and servicing sites; and implementation of adequate spill response procedures, stormy weather preparation plans, and the use of silt curtains and other containment devices.
- No contamination (trash or debris disposal, alien species introductions, etc.) of marine (reef flats, lagoons, open oceans, etc.) environments adjacent to the project site shall result from project related activities.
- The Contractor shall confine all construction activities to areas defined by the drawings and specifications. No construction materials shall be stockpiled in the marine environment outside of the immediate area of construction.
- The Contractor shall keep construction activities under surveillance, management and control to avoid pollution of surface or marine waters. Construction related turbidity at the project site shall be controlled so as to meet water quality standards. All water areas affected by construction activities shall be monitored by the Contractor. If monitoring indicates that the turbidity standards are being exceeded due to construction activities, the Contractor shall suspend the operations causing excessive turbidity levels until the condition is corrected. Effective silt containment devices shall be deployed where practicable to isolate the construction activity, and to avoid degradation of marine water quality and impacts to the marine ecosystem. In-water construction shall be curtailed during sea conditions that are sufficiently adverse to render the silt containment devices ineffective.
- Waste materials and waste waters directly derived from construction activities shall not be allowed to leak, leach or otherwise enter marine waters.
- Fueling of project related vehicles and equipment should take place away from the water. A contingency plan to control the accidental spills of petroleum products at the construction site should be developed. Absorbent pads, containment booms and skimmers will be stored on site to facilitate the cleanup of petroleum spills.
- The project shall be completed in accordance with all applicable State and County health and safety regulations.
- The sand shall be of beach-compatible quality, moderately well sorted with rounded and polished grains composed of primarily calcareous material. The sand shall be dominantly composed of naturally occurring carbonate beach or dune sand. Crushed limestone or other man-made or non-carbonate sands are not allowable.
- All construction material including sand shall be free of contaminants of any kind including: excessive silt, sludge, anoxic or decaying organic matter, turbidity, temperature or abnormal water chemistry, clay, dirt, organic material, oil, floating debris, grease or foam or any other pollutant that would produce an undesirable condition to the beach or water quality.
- Sand fill placement shall not be done during storms.
- Any spills or other contaminations shall be immediately reported to the DOH Clean Water Branch (808-586-4309).

- Best management practices shall be utilized to minimize adverse effects to air quality and noise levels, including the use of emission control devices and noise attenuating devices.
- A dust control program shall be implemented, and windblown sand and dust shall be prevented from blowing offsite by watering when necessary.
- Public safety best practices shall be implemented, possibly including posted signs, areas cordoned off, and on-site safety personnel.
- Public access along the shoreline during construction shall be maintained so far as practicable and within the limitations necessary to ensure safety.
- The Contractor shall review all best management practices with the project applicant/representative prior to the commencement of beach nourishment activities.

11. REFERENCES

Bailey-Brock, J. and E. Krause. 2008. *Gray's Beach infauna study of source sand off Waikiki*. University of Hawaii at Manoa, Water Resources Research Center No. WWRC-2009-01. 13 pp.

Campbell, J.F. and R. Moberly. 1978. *Ala Moana Beach Erosion: Monitoring and Recommendations*. Hawaii Institute of Geophysics report 78-10.

Hampton, M.A., C.H. Fletcher, J.H. Barry, and S.J. Lemmo. 2002. "The Halekulani Sand Channel and Makua Shelf Sediment Deposits: Are They a Sand Resource for Replenishing Waikiki's Beaches?" In: Robbins, L.L., O.T. Magoon, and L. Ewing (eds.). 2000. *Carbonate Beaches 2000*: First International symposium on Carbonate Sand Beaches, Reston, VA, American Society of Civil Engineers, p. 67-81.

Hampton, M.A., C.T. Blay, C. Murray, L.Z. Torresan, C.S. Frazee, B.M. Richmond, and C.H. Fletcher. 2003. Data Report: *Geology of Reef-Front Carbonate Sediment Deposits Around Oahu, Hawaii*. U.S. Geological Survey Open File Report. OFR 03-441. https://pubs.usgs.gov/of/2003/0441/intro.html

Hawaii Climate Change Mitigation and Adaptation Commission. 2017. *Hawaii Sea Level Rise Vulnerability and Adaptation Report*. Prepared by Tetra Tech, Inc. and the State of Hawaii Department of Land and Natural Resources, Office of Conservation and Coastal Lands, under the State of Hawaii Department of Land and Natural Resources Contract No: 64064.

Marine Research Consultants, Inc. 2018a. *Baseline Assessment of the Marine Environment, Ala Moana Regional Park Beach Replenishment, Honolulu, Hawaii*. June 2018.

Marine Research Consultants, Inc. 2018b. *Baseline Assessment of the Marine Environment, Ala Moana Regional Park Beach Replenishment Donor Sites, Honolulu, Hawaii*. December 2018.

Palermo, M.R., P.R. Schroeder, T.J. Estes, and N.R. Francingues. 2008. *Technical Guidelines for Environmental Dredging of Contaminated Sediments*. U.S. Army Engineer Research and Development Center report ERDC/EL TR-08-29.

R.M. Towill Corporation. 2017. *Final Environmental Impact Statement, Ala Wai Canal Dredgin and Improvements*. Prepared for the State of Hawaii Department of Land and Natural Resources. December 2017.

Sadar, M., S. Cason, and T. Engelhardt. 2009. "Measuring Turbidity in the Laser Age." *Opflow*, American Water Works Association.

Sea Engineering, Inc. 2010. *Final Environmental Assessment, Waikiki Beach Maintenance*. Prepared for the State of Hawaii, Department of Land and Natural Resources. 145 pages.

Sea Engineering, Inc. 2004. *Sand Source Investigation for the Hilton Hawaiian Village Lagoon Restoration Project.* Report Prepared for Planning Solutions Inc.

Smith, D.A. and K.F. Cheung. 2002. "Empirical Relationships for Grain Size Parameters of Calcareous Sand on Oahu, Hawaii." *J. Coastal Research*, 18(1), pp. 82-93.

State of Hawaii Department of Land and Natural Resources. 2004. *Request for Proposals, Waikiki Beach Small-Scale Sand Pumping Project.*

Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler, and C. Zervas, *2017. Global and Regional Sea Level Rise Scenarios for the United States*. NOAA Technical Report NOS CO-OPS 083. NOAA/NOS Center for Operational Oceanographic Products and Services.

University of Hawaii Coastal Geology Group. 2018. Hawaii Coastal Erosion Website - Oahu.

University of Hawaii Coastal Geology Group. 2010. "South Oahu Reeftop Sand Bodies." Diamond Head to Pearl Harbor – RSM workshop, September 8, 2010.

U.S. Army Corps of Engineers. 2006. *Coastal Engineering Manual*.

U.S. Army Corps of Engineers. 1984. *Shore Protection Manual*.

Wiegel, R.L. 2002. *Waikiki, Oahu, Hawaii, An Urban Beach—Its History from a Coastal Engineering Perspective.*

APPENDIX A –BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT, ALA MOANA REGIONAL PARK BEACH REPLENISHMENT, HONOLULU, HAWAII.

Marine Research Consultants, Inc.
June 2018

BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT ALA MOANA REGIONAL PARK BEACH REPLENISHMENT HONOLULU, HAWAII

Prepared for:

Sea Engineering, Inc.
Makai Research Pier
41-305 Kalanianaole Hwy
Waimanalo, HI 96795

By:

MRCI
MARINE RESEARCH CONSULTANTS, INC.
1039 WAAKAUA PL.
HONOLULU, HI 96822

June 2018

I. INTRODUCTION AND PURPOSE

In 2016, the City and County of Honolulu addressed the heavily eroded and rocky shoreline area at Ala Moana Regional Park by commissioning a project to relocate rocks from the beach face and to move sand from wider areas of the beach. The project was intended to produce a noticeable impact on the shoreline without the need for a full suite of permits. As such, DLNR allowed rock to be removed from the beach face as long as it did not leave the beach system. In July of 2016 an estimated 300 cubic yards of rock was relocated from the beach face to the back of the beach where it was buried. Sand was moved in October of 2016 from wider parts of the beach to the eroded area. The sand was placed inshore of the high tide line, thereby limiting the extensive permitting process required for placing sand in the water. This project, however, could only move approximately 1,500 cubic yards of sand into the eroded area.

The beach at Ala Moana Regional Park does not have a natural source of sand, and sand moving toward shore over the reef flat is blocked from reaching the beach by the deep swimming channel. The City wishes to artificially nourish the beach with sand to address the erosion problem and to cover the exposed rocks at the shoreline. The beach nourishment project is part of a master plan to produce improvements to the park, and an Environmental Impact Statement (EIS) has been commissioned. This report, intended to support the EIS, provides results of field assessments of the physical, chemical, and biological composition of nearshore waters encompassing the areas where sand nourishment will occur in Ala Moana Regional Park.

II. WATER QUALITY

A. Water Quality Methods

The purpose of the water quality assessment is to provide a quantitative depiction of the existing condition of marine water chemistry in the area that has the potential to be affected by the proposed beach nourishment project. Evaluation of the existing condition of the water chemistry provides an insight into the physical and chemical factors that influence the marine setting. Understanding the existing physical and chemical conditions of the marine environment that presently occur provides a basis for predicting the potential affects that might occur as a result of the proposed project.

Water chemistry field collection was conducted on April 30, 2018. Water chemistry was assessed by collecting four linear sets of samples (i.e. transects) extending perpendicular from the shoreline, extending from the highest wash of waves to the boundary of the dredged basin and undredged reef flat (Figure 1). All samples were collected by investigators working from stand-up paddleboards. Transect 1 was located off the east end of the Park basin and extended to the end of the channel bordering Magic Island. Transects 2 and 3 extended from the central regions of the Park through the dredged swimming basin, while transect 4 was located at the western end of the swim basin adjacent to Kewalo Basin (Figure 1).

Water samples were collected at five locations (six on transect 1) along each transect starting at the most landward area of water adjacent to the beach. Such a sampling scheme is designed to span the greatest range of salinity with respect to potential freshwater efflux at the shoreline. Sampling was more concentrated in the nearshore zone because this area is closest to the region where sand nourishment will occur, and hence is most important with respect to identifying the effects of shoreline modification. At sampling stations within 15 meters (m) of the shoreline, water samples were collected at a single depth approximately in the mid-point of the water column. Beyond 15 m from the shoreline two samples were collected at each station; a surface sample was collected within 10 centimeters (cm) of the air-water interface and a bottom sample was collected within 20 cm of the seafloor.

Water quality parameters evaluated included all specific criteria designated for open coastal waters in Chapter 11-54, Section 06 (b) (Open Coastal waters) of the State of Hawaii Department of Health (DOH) Water Quality Standards. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen ($NO_3^- + NO_2^-$, hereafter referred to as NO_3^-), ammonium nitrogen (NH_4^+), total phosphorus (TP), chlorophyll a (Chl *a*), turbidity, temperature, pH, and salinity. In addition, silica (Si) and orthophosphate phosphorus (PO_4^{-3}) were also reported because these parameters are sensitive indicators of biological activity and the degree of groundwater mixing.

Water samples were collected by filling pre-rinsed 500-milliliter (ml) acid-washed, triple rinsed, polyethylene bottles and stored on ice. Analyses for Si, NH_4^+, PO_4^{3-}, and NO_3^- were performed with a Technicon Autoanalyzer using standard methods for seawater analysis (Strickland and Parsons 1968, Grasshoff 1983). TN and TP were analyzed in a similar fashion following digestion. Total organic nitrogen (TON) and total organic phosphorus (TOP) were calculated as the difference between TN and dissolved inorganic N, and TP and dissolved inorganic P, respectively.

Water for other analyses was sub-sampled from 1-liter polyethylene bottles and kept chilled until analysis. Chl *a* was measured by filtering enough water through glass-fiber filters to detect color; pigments on filters were extracted in 90% acetone in the dark at -20 °C for 12-24 hours. Fluorescence before and after acidification of the extract was measured with a Turner Designs fluorometer. Salinity was determined using an AGE Model 2100 laboratory salinometer with a readability of 0.01 parts per thousand (‰ or ppt). Turbidity was determined using a 90-degree nephelometer and reported in nephelometric turbidity units (NTU) (precision of 0.01 NTU). Vertical profiles of salinity, temperature, and depth were acquired using a RBR-Concerto CTD calibrated to factory standards.

EPA and Standard Methods (SM) methods that were employed for chemical analyses, as well as detection limits, are listed in the Code of Federal Regulations (CRF) Title 40, Chapter 1, Part 136, are as follows:

NH_4^+: EPA 350.1, Rev. 2.0 or SM4500-NH3 G, detection limit 0.42 µg/L.
$NO_3^- + NO_2^-$: EPA 353.2, Rev. 2.0 or SM4500-NO3F, detection limit 0.28 µg/L
PO_4^{-3}: EPA 365.5 or SM4500-P F, detection limit 0.31 µg/L.
Total P: EPA 365.1, Rev. 2.0 or SM4500-P E J, detection limit 0.62 µg/L.
Total N: SM 4500-N C., detection limit 5.60 µg/L.
Si: EPA 370.1 or SM 4500 SiO2 E, detection limit 5.32 µg/L.
Chlorophyll *a*: SM 10200, detection limit 0.006 µg/L.
pH: EPA 150.1 or SM4500H+B, detection limit 0.002 pH units
Turbidity: EPA 180.1, Rev. 2.0 or SM2130 B, detection limit 0.008 NTU.
Temperature: SM 2550 B, detection limit 0.01 degrees centigrade.
Salinity: SM 2520, detection limit 0.003 ppt.
Dissolved Oxygen: SM4500 O G, and detection limit 0.01% sat.

Dr. Steven Dollar and Ms. Andrea Millan conducted all fieldwork. Marine Analytical Specialists located in Honolulu, HI, (Labcode: HI 00009) conducted all laboratory analyses. This analytical laboratory possesses acceptable ratings from EPA-compliant proficiency and quality control testing.

B. Water Quality Results

1. Distribution of Chemical Constituents

The overall distribution of water chemistry constituents reflects the physical structure of the coastal area. The shoreline consists of a coarse sand beach with areas of exposed rubble and rock. The seaward edge of the linear dredged swim channel basin is bounded by a sharp edge cut in the shallow fossil reef flat that extends to the outer reef crest. Water depth is 10-15 feet in the swim channel. At the east side of the Park, an elongated channel extends from the shoreline along the edge of Magic Island and terminates at the reef crest. As there are no deep open channels leading from the open ocean to the inner basin, water circulation within the dredged area is driven mainly by tidal exchange and water flow across the shallow reef flat. As a result, water quality within the nearshore basin is affected by the long residence time.

Table 1 shows results of all water chemistry analyses on samples collected off the Ala Moana Regional Park beach on April 30, 2018. Concentrations of eight dissolved nutrient constituents are plotted as functions of distance from the shoreline in Figure 2. Values of salinity, Chl a, turbidity, pH, temperature, and dissolved oxygen are plotted as functions of distance from shore are shown in Figure 3.

Several patterns of distribution are evident in Table 1 and Figures 2 and 3. Most evident is that there are elevated values of several nutrient constituents at the shoreline on several of the transects. The values of Si are elevated at the shoreline of Transect 2, coupled with an anomalously low value of salinity (Figure 3). This pattern is indicative of freshwater entering the ocean at the shoreline. As this pattern is only evident at one site, it can be assumed that this is not the normal situation along the entire beach front.

The values of dissolved nutrients (NO_3^-, NH_4^+, and TN) all show a general trend of elevated values at the shoreline with decreasing concentrations through the swimming channel. This trend is most apparent at Transect 1, where the values at the shoreline are substantially elevated relative to values at the shoreline of the other three transects. As there is no indication of depressed salinity in the nearshore waters of Transect 1, the source of these elevated nutrients is not from groundwater input.

Nutrient composition throughout the swimming channel is relatively consistent on all transects. In the channel bounding the west side of Magic Island, nutrient concentrations are overall lower than in the swimming channel and show consistent values between the sampling locations 250 m and 400 m from the shoreline.

Considering physical properties of the water column, turbidity, chlorophyll *a*, temperature, dissolved oxygen, and pH all display similar patterns, with peak values at the shoreline, and decreasing values with distance seaward (Figure 3). As with nutrients, the lowest values occur in the Magic Island channel.

In summary, at locations close to the shoreline at Ala Moana Regional Park most water chemistry constituents exhibit elevated values. Throughout the swimming channel, water chemistry is similar throughout the Park. The water column in the channel adjacent to Magic Island seaward of the swimming channel is characteristic of open coastal water conditions.

2. Compliance with DOH Criteria

State of Hawaii Department of Health Water Quality Standards (HDOH-WQS) that apply to the areas offshore of the Ala Moana Regional Park are listed as "open coastal water" in HRS Chapter §11-54-6(b). Two sets of standards are listed depending on whether an area receives more than 3 million gallons per day (mgd) of freshwater input per shoreline mile ("wet standards"), or less than 3 mgd of freshwater input per shoreline mile ("dry"). As the study area off the south coast of Oahu probably receives less than 3 mgd per mile, dry criteria were used for this evaluation.

The HDOH-WQS are also separated into three standards: geometric means, "not to exceed more than 10% of the time," and "not to exceed more than 2% of the time." As all these classifications require multiple samplings, they cannot be used for a strict evaluation of whether a single sampling is within compliance standards. However, these values provide a guideline to evaluate the overall status of sampled waters in terms of the relation to State standards.

Shown in Table 1 are all values that exceed the "not to exceed more than 10% of the time", and "not to exceed more than 2% of the time" under dry conditions. No values of nitrate nitrogen (NO_3^-) exceeded either standard, while all measurements of turbidity exceeded the 2% standard. The consistently elevated turbidity in excess of DOH standards criteria throughout the sampling regime is likely a result of resuspension of the fine-grained sediment that comprises the floor of the swim channel. Ammonium nitrogen (NH_4^+) exceeded the criteria at multiple sampling locations on all four

transects. Concentrations of TN, TP, and chlorophyll a were higher than the DOH limits are inshore stations.

As discussed above, the elevated concentration of dissolved nutrients near the shoreline is not likely a result of mixing of groundwater with ocean water, as there are no consistent indications of lower salinity across the beach. As the area is somewhat unique in terms of the dredged swimming channel in a fossil reef with limited flushing capabilities, it is not unexpected that some water quality constituents do not comply with open ocean criteria. This is particularly true for turbidity, which is consistently elevated above the open coastal standards as a result of resuspension of fine-grained sediment that form the channel floor.

Overall, with the exceptions described above, most of the area within the scope of the present project are close to or below the specific criteria of the State Water Quality Standards, with the caveat that this consideration is for a single sample set. As a result, it does not appear that there are any significant inputs of materials from land beyond the immediate shoreline that are impacting coastal ocean waters offshore of Ala Moana Regional Park.

III. BIOTIC COMMUNITY STRUCTURE

A. Biotic Community Structure Methods

Biotic community structure of the marine environment was semi-quantitatively assessed by investigators swimming throughout the offshore area from the shoreline to the inner margin of the dredged reef off each of the survey transect sites described in the sections above. During these reconnaissance swims, notes were taken on physical structure and marine species presence. Numerous photographs were taken of typical features of all habitats to provide a descriptive representation of the area fronting the project site.

B. Biotic Community Structure Results

The following is a description of the distinct biotopes, or zones, that occur in the marine environment off of Ala Moana Regional Park (a biotope is an area of uniform environmental conditions providing a living place for a specific assemblage of plants and animals). Figure 4 is a satellite photograph of the marine area fronting Ala Moana Regional Park showing the results of biotic surveys in terms of occurrence of various types of biota. The two groups of organisms that are of major interest are seagrass and reef building coral. As such, the intent of the mapping of bottom types shown in Figure 4 is to illustrate the areas of occurrence of these two assemblages.

1. Benthic Composition and Community Structure

The most shoreward region of the intertidal region zone consists of either coarse white sand or coral rubble (Figure 5). Much of the nearshore rubble is emergent at low tide. The rubble that is perpetually covered by water contains scattered small living colonies primarily consisting of the species *Leptastrea purpurea* and *Pocillopora damicornis* (Figure 6). These small corals (maximum size ~15 centimeter diameter) were growing on loose rubble fragments that would be easily removed from the rubble zone if necessary to avoid burial. Total cover of the rubble zone by living coral was well less than 1%.

Seaward of the shoreline shallow zone, water depth increases in the elongated dredged channel that extends the length of the Park. In many areas, bottom cover consists of a bed of coral rubble fragments (Figure 7, top left). The rubble zone grades into a coarse sand bed at a depth of about 5 feet (Figure 7, top right). The "deep rubble zone" is essentially devoid of coral settlement, or any other biotic epi-fauna.

With increasing distance from shore, the bed of the swim channel grades to a sand plain of various textures. In some areas, bottom composition is composed of coarse sand (Figure 7, bottom left), while the deeper areas consist of a fine-grained mud-silt mixture (Figure 7, bottom right). While there is little epi-fauna on the mud floor, there are numerous burrows and associated mounds of sediment that are likely formed by the action of worms, crabs, and shrimp.

Ubiquitous throughout the swim channel floor are expanses of the Hawaiian seagrass, *Halophila hawaiiana*, which is endemic to the Hawaiian Islands. *Halophila hawaiiana* is a flowering plant with roots that hold sediment. It is locally common, within a specific habitat that is characterized by protected waters with calm sandy areas within a narrow depth range that generally does not exceed 4 meters. In some areas this species has been replaced by invasive algal species, although there is no indication that this is occurring at Ala Moana, as there were no other alga observed in the habitat occupied by the seagrass. Like other seagrasses, *Halophila hawaiiana* meadows support a rich community of associated organisms in sediments and on the leaf blades, providing food and shelter for more mobile organisms such as fish and

crustaceans. *Halophila hawaiiana* is part of the Hawaiian green sea turtle's diet. As seen in Figure 4, seagrass was observed along the length of the swim channel, but not in the shoreline rubble zones.

The other abundant plant within the Ala Moana area was the alien red algae *Gracilaria salicornia* (Figure 8, lower right). This species of *Gracilaria* is one of the most successful invasive algae in Hawaii and is often found covering expanses of calm water reef flat and tidepools attached to limestone and basalt substrates. While there were areas of mats of *G. salicornia* in the Ala Moana channel, it was not widespread, and was restricted to several locations on the outer edge of the channel and along the margin of the shoreline of Magic Island (Figure 4). Other algae that were observed in the swim channel were patches of the brown alga *Padina* sp. (Figure 8, upper right) and the filamentous cyanobacteria *Lyngbya* sp. (Figure 8, bottom left).

Within the entire survey area, reef building coral were considered rare. The exception is the outer channel bordering the western shoreline of Magic Island. This area differs substantially from the inner swim channel in that it is more oceanic in terms of water quality, particularly in terms of less turbidity in the water column, and solid surfaces that serve as settling substrata. As a result, the outer channel habitat is better suited for colonization and growth of reef corals. As the area is also sheltered from the impacts of large waves by the outer reef flat, there is little evidence of breakage of even delicate growth forms.

The most common species found in the outer channel were the most common species typically found on open coastal reefs in Hawaii. These include *Pocillopora meandrina*, *Porites lobata*, *Montipora patula* and *Montipora capitata* (Figure 9). A species that was commonly observed in the outer channel that is not commonly observed on exposed coastal reefs is *Pocillopora damicornis* (Figure 9, upper left). The growth form of this coral consists of finely branching clusters which are not capable of withstanding wave stress. While coral colonies within the outer channel were common, they did not form a complete cover of bottom substrata. Rather they covered approximately 5-10% of the edges and bottom of the outer channel margins.

2. Reef Fish Composition and Community Structure

Limited visibility in the main swim channel was reduced to the point where visual quantitative assessments of fish populations was not possible. During the course of swim surveys, several species of fish were noted. These included the surgeonfish *Acanthurus triostegus* and *A. leucoparius*, damselfish *Dascyllus albisella*, the tetradonts

Canthigastor jactator, Diodon holocanthus and *Ostracion meleagris*, the trumpetfish *Aulostomus chinensis*, triggerfish *Rhinecanthus rectangulus*, and the Moorish idol *Zanclus cornutus*. All of these species are common on Hawaiian reefs and do not constitute rare or unique species assemblages. No large individuals that would be considered "food fish" were observed. No fish were observed in the shallow nearshore rubble zone.

In summary, the marine communities directly off Ala Moana Regional Park are limited, consisting of species that are tolerant of high turbidity and/or soft benthic habitats. The most prevalent biotic component of the area are the meadows of the Hawaiian seagrass that occur throughout the soft sediment, calm water areas of the swim channel. While scattered small corals occur on the loose rubble in the nearshore zone, the most abundant corals occur in the outer channel bordering Magic Island where flushing rates are elevated relative to the inner channel, and water quality is most oceanic in nature.

3. Threatened and Endangered Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the Hawaiian Islands and is frequently observed throughout the south shore of Oahu. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently in Hawaiian waters. Several green sea turtles were observed within the survey area over the course of the present study. Of particular note was the small size of many of the turtles. As the swim channel basin is essentially isolated from the open ocean by shallow reef berms, the area may serve as a protected refuge for turtles from predatory sharks. In addition, the abundance of seagrass and marine algae may provide a preferred feeding ground for green turtles. No hawksbill turtles were observed during the course of underwater surveys.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. While the present survey was conducted in May when whales are absent from Hawaiian waters, the survey area is not conducive to whale habitation owing to shallow depth and lack of access. The Hawaiian monk seal, (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. No seals were observed during the present survey work at Ala Moana Regional Park.

IV. DISCUSSION and CONCLUSIONS

The purpose of this assessment is to assemble a set of baseline information to make valid evaluations of the potential for influence on the marine environment from the proposed replenishment of beach sands at the shoreline of Ala Moana Regional Park. The information collected in this study provides the basis to understand some of the important processes that are operating in the nearshore ocean, to be able to address any concerns that might be raised in the planning process for the proposed project.

The physical structure of the marine habitats where it is proposed to place offshore sand in the intertidal areas to cover the existing rubble shoreline is composed of a man-made dredged swimming channel that runs parallel to the beach face. As there are no deep openings in the reef flat into which the channel is cut to facilitate exchange of water with the open ocean, the residence time of water in the channel is likely far greater than on an exposed coastline. Results of analyses of water chemistry from samples collected along transects that extend from the shoreline to the outer edge of the channel cut indicate some effects to nutrients in the nearshore zone, likely as a result of low flushing, increased temperature, and in one area, input of fresh water.

While the values of most water quality constituents are near Department of Health water quality standard specific criteria for open coastal waters, values of turbidity are consistently well above the values specified in DOH standards. The elevated values of turbidity are primarily a response to resuspended fine sediment emanating from beach sand that is trapped within the semi-enclosed dredged channel. When offshore sand was placed on the shoreline in Waikiki, nearshore turbidity temporarily increased substantially as fine-grained sediment that was not washed from the donor sand was resuspended in the water column. As it is inevitable that there will be a similar component of fines in material used to nourish the beach at Ala Moana Regional Park, it can be expected that there will be a temporary increase in turbidity over the present levels. Such an increase would be expected to be temporary until fines are winnowed out of the donor sand to the level that exists at present.

Results of biotic surveys reveal that an important component of the benthic community is abundant, patchy meadows of Hawaiian seagrass throughout the deep dredged swim channel. As the specific habitat for this species of seagrass is shallow calm water with soft sand substratum, the floor of the swim channel is an ideal habitat for seagrass. It is apparent that the elevated levels of turbidity owing to resuspended sediment in the water column of the channel are not an impediment to seagrass occurrence. While placement of offshore sand on the beach will likely result in a temporary increase in resuspended sediment, it is not likely that there will be substantial settlement of new sediment on the floor of the channel sufficient to bury or impact existing assemblages of seagrass. As the new sediment should not be qualitatively different that the existing sand, it is not likely that there will be a change in habitat composition sufficient to alter seagrass abundance. Care should be taken however in the placement of new sand to ensure that it does not cover any existing seagrass beds.

The other component of the benthos that is an important consideration in the environmental effects of sand nourishment is the existence of small corals on rubble in the nearshore zone. As this is the area intended to be transformed from a rubble shoreline to a sand shoreline, with no mitigation in terms of removing rubble prior to sand placement, the new sand would bury these small corals. As the abundance of these corals is very low, and they are all attached to unconsolidated surfaces, a possible mitigation measure would be to move them to either a rubble zone off Ala Moana Park that is not proposed for beach nourishment, or to a location on the outer reef flat. As wave motion on the reef flat adjacent to the channel cut is low, corals transplanted to this area would likely have a high potential for survival. Another alternative would be to donate these corals to the State DAR Coral Nursery on Sand Island.

The marine habitat in the outer channel adjacent to Magic Island is presently populated by a variety of large, healthy corals. These corals are protected from wave impacts by the bordering shallow reef flat and occur in an area where water quality is more similar to open ocean settings than the inner channel. While there may be temporary slight increases in turbidity in this area following beach nourishment, it should not be of a magnitude beyond the natural tolerance of these species. In addition, the more rapid flushing of this area with clean ocean water should prevent any sediment deposition on existing corals.

The swim channel is presently a preferred habitat for green sea turtles, particularly juveniles. Characteristics of the area that are ideal for turtles are protection from predators and abundant food resources in the form of algae and seagrass. The temporary changes to water quality from sand placement should not be of a magnitude to affect turtle behavior, as they seem unaffected by turbid waters. During sand placement operations, observers should be in place to spot any turtles that might

enter the work area. If such actions occur, a mitigation plan should be in effect to stop work until turtles leave the area.

Based on the results of this survey, it can be concluded that with proper management and mitigation practices to limit to the extent possible release of fine-grained material to the water column from donor sand, and removal of corals from the rubble zone, the proposed replacement of rubble on the shoreline should have little or no potential for significant permanent effects to the existing marine environment.

V. REFERENCES CITED

Grasshoff, K. 1983. Methods of seawater analysis. Verlag Chemie, Weinheim, 419 pp.

Strickland J. D. H. and T. R. Parsons. 1968. A practical handbook of sea water analysis. Fisheries Research Bd. of Canada, Bull. 167. 311 pp.

FIGURE 1. Satellite image of Ala Moana Regional Park showing beach, dredged linear swim channel, and undredged reef flat. Also shown are locations of water chemistry sampling stations along four transects that extend from the shoreline to the edge of the dredge cut.

TABLE 1. Results of water sampling off Ala Moana Regional Park on April 30, 2018. Samples are collected 10 centimeters from the surface (S), and 20 cm from the ocean floor (B). Where water depth was less than 50 cm, a single sample was collected. Also shown are the State of Hawaii, Department of Health Water Quality Standards (DOH WQS) "not to exceed more than 10% of the time" and "not to exceed more than 2% of the time" water quality standards for open coastal waters under "dry" conditions. Tan shaded values exceed DOH 2% "dry" standards; blue shaded values exceed DOH 10% "dry" standards. For transect sampling station locations, see Figure 1.

STATION	DEPTH (m)	DFS (m)	PO_4^{3-} (µg/L)	$NO_3^-+NO_2^-$ (µg/L)	NH_4^+ (µg/L)	Si (µg/L)	TOP (µg/L)	TON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	SALINITY (o/oo)	pH std. units	Chl-a (µg/l)	TEMP deg. C	Diss. O_2 % sat.
TRANSECT 1	1	0	9.92	6.72	119.70	114.80	51.77	418.46	61.69	544.88	43.10	34.54	8.08	2.24	25.19	97.70
	2	5	2.79	1.68	5.46	104.44	11.78	181.16	14.57	188.30	6.05	34.57	8.09	0.43	24.64	96.90
	3	50S	2.17	2.52	16.52	112.00	9.61	166.88	11.78	185.92	4.88	34.50	8.08	0.26	24.54	91.08
	4	50B	4.34	2.52	33.04	106.96	9.61	179.62	13.95	215.18	6.34	34.57	8.08	0.26	24.54	90.14
	5	120S	1.86	1.96	1.68	92.40	8.99	121.66	10.85	125.30	1.27	34.50	8.04	0.09	24.18	90.42
	6	12B	3.41	1.68	1.68	91.56	8.37	114.52	11.78	117.88	2.41	34.46	8.01	0.14	24.20	74.88
	7	250S	3.10	1.96	1.68	92.12	8.37	107.38	11.47	111.02	1.12	34.46	8.07	0.16	24.64	99.46
	8	250B	4.34	0.56	1.54	95.48	7.75	116.34	12.09	118.44	1.72	34.43	8.02	0.15	23.48	104.26
	9	400S	3.72	BDL	1.54	87.92	7.75	99.54	11.47	101.22	1.02	34.50	8.13	0.09	22.46	98.29
	10	400B	5.89	1.40	1.68	94.36	8.06	122.36	13.95	125.44	3.00	34.53	8.04	0.16	24.26	75.93
TRANSECT 2	11	0	7.44	2.66	8.12	223.44	12.09	166.74	19.53	177.52	13.90	33.84	8.35	0.58	26.53	99.76
	12	15	5.27	2.94	7.42	112.28	8.99	147.14	14.26	157.50	3.31	34.53	8.21	0.20	24.30	101.32
	13	30S	7.44	1.96	7.70	117.88	6.82	115.36	14.26	125.02	5.33	34.53	8.08	0.30	25.80	109.23
	14	30B	5.89	2.10	6.72	127.40	8.37	106.68	14.26	115.50	4.51	34.53	8.09	0.31	25.84	106.43
	15	60S	5.58	5.60	6.58	121.24	6.82	109.20	12.40	121.38	1.98	34.49	8.13	0.12	24.79	95.65
	16	60B	4.96	2.52	1.40	92.12	8.06	101.64	13.02	105.56	3.32	34.43	8.06	0.16	24.32	80.17
	17	120S	5.89	2.02	4.34	99.43	7.22	104.96	13.11	111.32	1.14	34.50	8.11	0.17	25.21	106.34
	18	120B	6.20	5.88	8.12	101.92	7.44	101.92	13.64	115.92	1.48	34.54	8.16	0.16	24.31	94.54
TRANSECT 3	19	0	4.34	4.76	11.48	122.92	13.33	170.38	17.67	186.62	3.91	34.68	8.43	0.41	28.11	125.54
	20	15	5.27	5.32	15.26	144.76	9.30	160.44	14.57	181.02	5.41	34.53	8.15	0.44	26.29	99.76
	21	30S	4.34	BDL	0.98	117.88	8.99	150.92	13.33	152.04	6.34	34.57	8.11	0.61	25.34	94.53
	22	30B	5.27	0.70	11.76	117.04	9.30	137.34	14.57	149.80	2.91	34.50	8.11	0.71	25.34	93.35
	23	50S	4.03	0.84	3.50	125.44	8.37	115.36	12.40	119.70	3.91	34.57	8.13	0.34	25.18	97.48
	24	50B	4.96	1.26	2.66	108.92	8.99	111.72	13.95	115.64	2.64	34.54	8.09	0.52	24.42	82.29
	25	100S	2.48	1.96	5.74	120.40	9.61	117.46	12.09	125.16	3.88	34.47	8.13	0.33	24.92	93.49
	26	100B	4.96	2.94	4.20	123.48	8.37	112.42	13.33	119.56	3.79	34.50	8.09	0.40	24.42	82.90
TRANSECT 4	27	0	4.96	4.48	12.60	149.80	8.99	193.62	13.95	210.70	4.17	34.91	8.53	0.37	29.18	122.22
	28	15	4.65	1.82	8.54	114.24	8.68	139.86	13.33	150.22	3.87	34.61	8.22	0.69	29.13	121.45
	29	25	5.27	0.98	3.64	111.44	9.30	147.28	14.57	151.90	3.37	34.61	8.14	1.04	26.36	118.35
	30	50S	4.96	0.98	BDL	129.08	9.30	128.80	14.26	130.06	7.07	34.43	8.13	0.57	25.47	101.77
	31	50B	8.06	BDL	19.32	160.72	10.23	167.72	18.29	187.04	3.95	34.54	8.09	1.31	25.45	103.23
	32	100S	5.89	1.96	2.24	130.48	17.05	132.58	22.94	136.78	6.45	34.54	8.13	0.88	25.19	101.93
	33	100B	7.44	BDL	16.52	127.12	13.02	189.70	20.46	206.22	5.43	34.50	8.20	1.18	24.70	86.56
DOH WQS	DRY	NTE 10%		10.00	5.00				30.00	180.00	0.50	*	**	0.50	***	****
		NTE 2%		20.00	9.00				45.00	250.00	1.00	*	**	1.00	***	****
Analytical Method			EPA 365.3	EPA 353.2	EPA 350.1	EPA 370.1			SM 4500P B5	SM 4500N C	SM 2130B	SM 2520	EPA 150.1	SM 10200	SM 2550B	SM 4500 OG

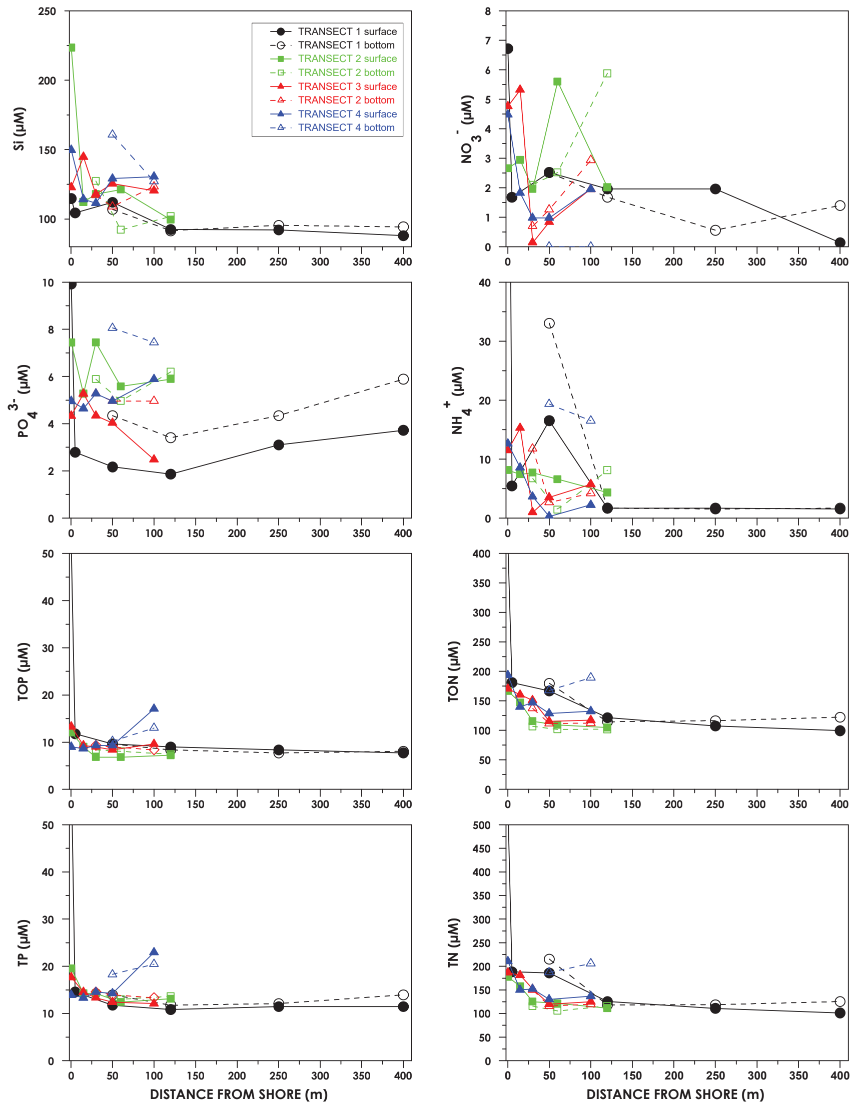


FIGURE 2. Plots of dissolved nutrients in surface and bottom samples collected on April 30, 2018, as a function of distance from the shoreline along four transects off Ala Moana Regional Park, Honolulu, Hawaii. For transect locations, see Figure 1.

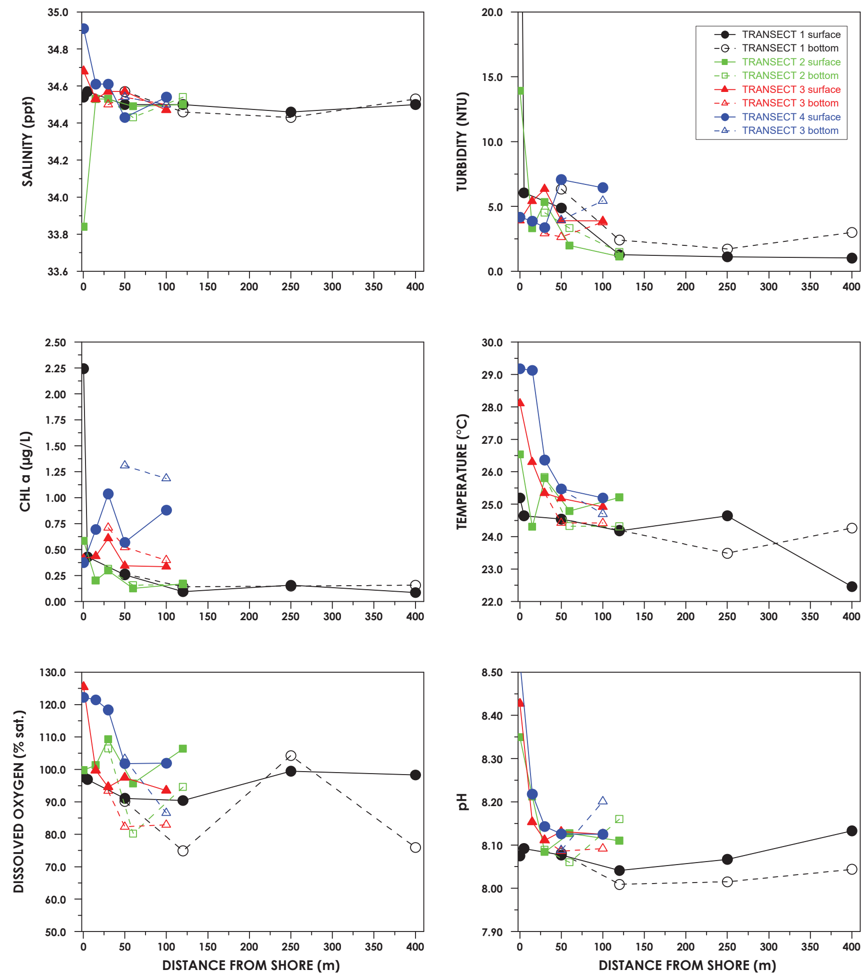


FIGURE 3. Plots of physical properties of water in surface and bottom samples collected on April 30, 2018, as a function of distance from the shoreline along four transects off Ala Moana Regional Park, Honolulu, Hawaii. For transect locations, see Figure 1.

FIGURE 4. Map of Ala Moana Regional Park offshore marine environment showing color coded observations of benthic composition. Where no living bottom cover was observed, benthic type is classified as sand or mud. Seagrass (*Halophila hawaiiana*) was ubiquitous throughout the soft sediment surfaces of the swim channel (Figure 7). Small corals growing on loose rubble occurred in the nearshore rubble zone (Figure 8), while large corals (Figure 9) occurred only in the easternmost area of the swim channel extending along the shoreline of Magic Island.

Figure 5. Views of Ala Moana Regional Park shorelines. Upper two photos show sand shoreline. Bottom photos show exposed rubble/cobbles at shoreline that is planned for sand replenishment.

Figure 6. Reef building corals in shoreline rubble zone include *Leptastrea purpura* (upper left and right), *Porites lobata* (upper right), *Pocillopora damicornis* (lower left), and *Psammocora stellata* (lower right).

Figure 7. Sediment types in Ala Moana Regional Park marine areas. Top photos show nearshore rubble beds. Bottom photos show floor of swimming channel composed of various grain sizes of silty sand. Numerous burrow holes, likely from worms, shrimp and crabs, are visible in both bottom photos.

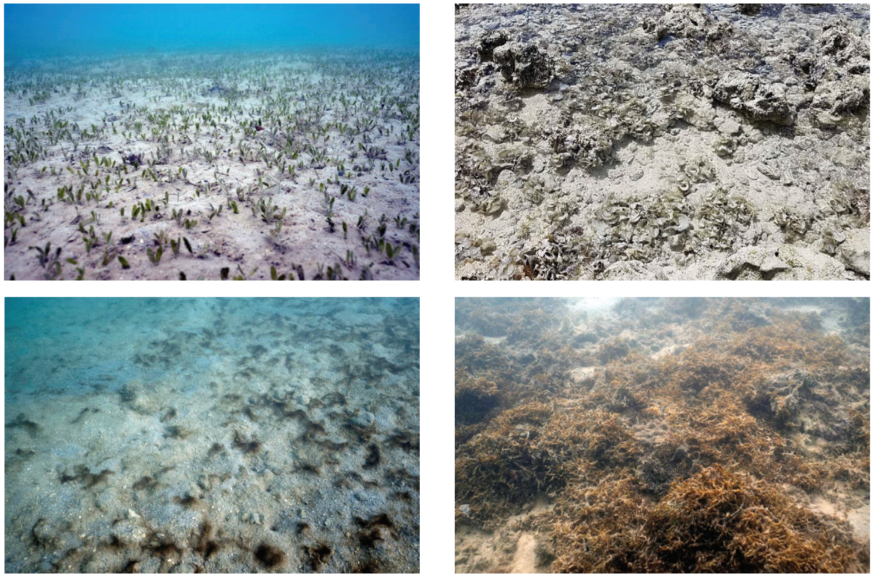


Figure 8. Upper left photo shows meadow of seagrass *Halophila hawaiiana* covering patch of sand flat in swimming channel. Algae found in swimming channel include *Padina* sp. (upper right), *Lyngbya* sp. (lower left), and *Gracilaria saliconia* (lower right).

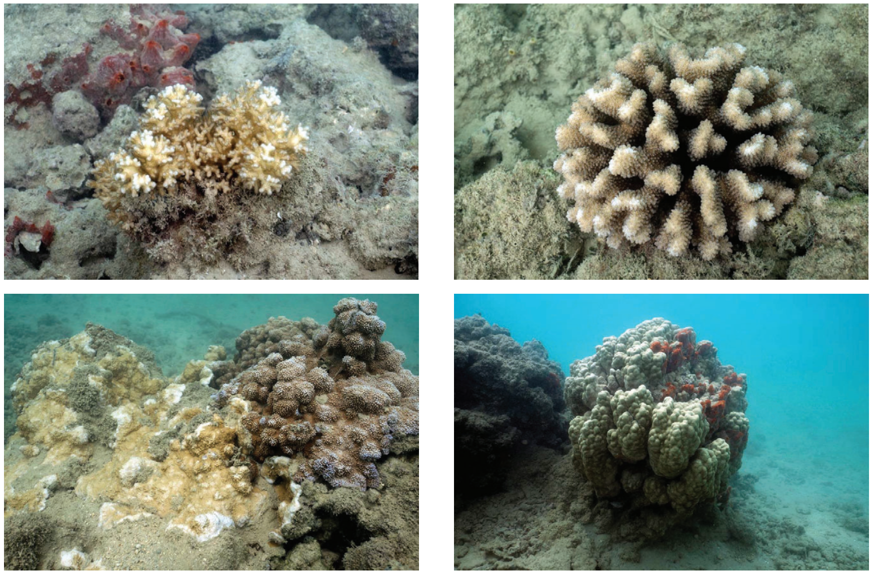


Figure 9. Corals occurring on the channel walls off Magic Island included *Pocillopora damicornis* (top left), *Pocillopora meandrina* (top right), *Montipora patula* and *M. capitata* (lower left), and *Porites lobata* (lower right).

APPENDIX B –BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT, ALA MOANA REGIONAL PARK BEACH REPLENISHMENT DONOR SITES, HONOLULU, HAWAII.
Marine Research Consultants, Inc.
December 2018

BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT ALA MOANA REGIONAL PARK BEACH REPLENISHMENT DONOR SITES

HONOLULU, HAWAII

Prepared for:

Sea Engineering, Inc.
Makai Research Pier
41-305 Kalanianaole Hwy,
Waimanalo, HI 96795

By:

MRCI
MARINE RESEARCH CONSULTANTS, INC.
1039 WAAKAUA PL.
HONOLULU, HI 96822

December 3, 2018

I. INTRODUCTION AND PURPOSE

In 2016, the City and County of Honolulu addressed the heavily eroded and rocky shoreline area at Ala Moana Regional Park by commissioning a project to relocate rocks from the beach face and to move sand from wider areas of the beach. The project was intended to produce a noticeable impact on the shoreline without the need for a full suite of permits. As such, DLNR allowed rock to be removed from the beach face as long as it did not leave the beach system. In July of 2016 an estimated 300 cubic yards of rock was relocated from the beach face to the back of the beach where it was buried. In October of 2016 sand was moved from wider parts of the beach to the eroded area. The sand was placed inshore of the high tide line, thereby limiting the extensive permitting process required for placing sand in the water. This project, however, could only move approximately 1,500 cubic yards of sand into the eroded area.

The beach at Ala Moana Regional Park does not have a natural source of sand, and sand moving toward shore over the reef flat is blocked from reaching the beach by the deep swim channel. The City wishes to artificially nourish the beach with sand to address the erosion problem and to cover the exposed rocks at the shoreline. The beach nourishment project is part of a master plan to produce improvements to the park, and an Environmental Impact Statement (EIS) has been commissioned.

This report, intended to support the EIS, provides results of field assessments of the physical, chemical, and biological composition of four areas off the southern shoreline of Oahu that have been selected as potential sand donor sites. Evaluation of the existing condition of the water chemistry and resident biota provides an insight into predicting the potential affects that might occur as a result of sand removal for the proposed project. A separate report has been prepared and submitted that assessed the nearshore waters encompassing the areas where sand nourishment will occur within Ala Moana Regional Park.

II. WATER QUALITY

A. Methods

Four areas that could serve as potential offshore sand donor sites have been selected by Sea Engineering, Inc. These four areas are designated as “Ala Wai”, “Ala Moana,” and “Reef Runway (Large and Small)” (Figure 1). Within each of these areas three water sampling stations were selected. Within each site, one station was near the eastern boundary, one in the central region, and on near the western boundary (Figures 2 and 3). Near the Reef Runway site was a smaller area to the west of the

main site, which was designated “Reef Runway small” in which a single water sampling station was established (Figure 3).

Water chemistry field collection was conducted on November 14, 2018. All samples were collected by investigators working from a 19-foot boat. At each station three samples were collected: one near the surface, one in the middle of the water column, and one just above the seafloor. Water samples were collected using a Niskin-type oceanographic sampling bottle. This device is lowered through the water column with endcaps cocked in an open position. At the desired sampling depth, a weighted messenger is released from the surface, which triggers closure of the endcaps, isolating a parcel of water. On the surface, water was transferred from the Niskin bottle to 500-milliliter (ml) acid-washed, triple rinsed, polyethylene bottles and stored on ice.

Water quality constituents that were evaluated include all specific criteria designated for open coastal waters in Chapter 11-54, Section 06 (b) (Open Coastal waters) of the State of Hawaii Department of Health (DOH) Water Quality Standards. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen (NO_3^- + NO_2^-, hereafter referred to as NO_3^-), ammonium nitrogen (NH_4^+), total phosphorus (TP), Chlorophyll a (Chl *a*), turbidity, temperature, pH, and salinity. In addition, silica (Si) and orthophosphate phosphorus (PO_4^{-3}) were also reported because these parameters are sensitive indicators of biological activity and the degree of freshwater mixing.

Analyses for Si, NH_4^+, PO_4^{3-}, and NO_3^- were performed with a SEAL Autoanalyzer using standard methods for seawater analysis (Strickland and Parsons 1968, Grasshoff 1983). TN and TP were analyzed in a similar fashion following digestion. Total organic nitrogen (TON) and total organic phosphorus (TOP) were calculated as the difference between TN and dissolved inorganic N and TP and dissolved inorganic P, respectively.

Water for other analyses was sub-sampled from 500-ml polyethylene bottles and kept chilled until analysis. Chl *a* was measured by filtering enough water through glass-fiber filters to detect color; pigments on filters were extracted in 90% acetone in the dark at -20 °C for 12-24 hours. Fluorescence before and after acidification of the extract was measured with a Turner Designs Trilogy Fluorometer model 7200-000 equipped with an extracted chlorophyll non-acidification module. Salinity was determined using a Mettler Toledo Seven Excellence Multi-parameter meter with an InLab 731-ISM conductivity probe calibrated to Hach Instruments using a 35.00 ppt, 53.0 mS/cm traceable salinity standard with a readability of 0.01 parts per thousand (‰ or ppt). Turbidity was determined using a Hanna Instruments Model #HI88703 Turbidimeter, and reported in nephelometric turbidity units (NTU) (precision of 0.01 NTU). Vertical profiles of salinity, temperature, and depth were acquired using an RBR-Concerto CTD calibrated to factory standards.

EPA and Standard Methods (SM) methods that were employed for chemical analyses, as well as detection limits, are listed in the Code of Federal Regulations (CRF) Title 40, Chapter 1, Part 136, and are as follows:

NH_4^+: EPA 350.1, Rev. 2.0 or SM4500-NH3 G, detection limit 0.42 µg/L.
NO_3^- + NO_2^-: EPA 353.2, Rev. 2.0 or SM4500-NO3F, detection limit 0.28 µg/L.
PO_4^{-3}: EPA 365.5 or SM4500-P F, detection limit 0.31 µg/L.
Total P: EPA 365.1, Rev. 2.0 or SM4500-P E J, detection limit 0.62 µg/L.
Total N: SM 4500-N C., detection limit 5.60 µg/L.
Si: EPA 370.1 or SM 4500 SiO2 E, detection limit 5.32 µg/L.
Chlorophyll *a*: SM 10200, detection limit 0.006 µg/L.
pH: EPA 150.1 or SM4500 H+B, detection limit 0.002 pH units.
Turbidity: EPA 180.1, Rev. 2.0 or SM2130 B, detection limit 0.008 NTU.
Temperature: SM 2550 B, detection limit 0.01 degrees centigrade.
Salinity: SM 2520, detection limit 0.003 ppt.
Dissolved Oxygen: SM4500 O G, and detection limit 0.01% sat.

All fieldwork was conducted by Dr. Steven Dollar and Ms. Andrea Millan. All laboratory analyses were conducted by Marine Consulting and Analytical Resources LLC located in Honolulu, HI.

B. Results

1. *Distribution of Chemical Constituents*

Table 1 shows results of all water chemistry analyses on samples collected at the Ala Moana donor sites on November 14, 2018. Several patterns of distribution are evident in Table 1. Most evident is that most of the concentrations of nutrients can be considered "low," as only one measurement exceeds the DOH criteria for exceedances more than 2% or 10% of the time under "wet" conditions for open coastal waters. The criteria for distinguishing between wet and dry conditions depends on the input of freshwater along the shoreline. As the area of study receives input from numerous streams draining the Ala Wai and Keehi Lagoon areas, it is appropriate to assume wet conditions apply in this case.

Inspection of Table 1 reveals that two stations in the Ala Wai donor site had elevated concentrations in surface waters of all dissolved nutrients (PO_4^{3-}, NO_3^-, NH_4^+, Si, TP, TN) along with reduced salinity. These stations (1 and 3) were located closest to the discharge of the Ala Wai Canal (Figure 2). Nutrient concentrations at station 10 located in the "small" Reef Runway donor site were elevated relative to the

concentrations at the "large" Reef Runway site, although salinity was not correspondingly depressed. The small Reef Runway site was located closest to the Hickam Harbor entrance channel. Flow of water seaward from the inner areas of Hickam Harbor may be the cause of the elevated values at the small Reef Runway sampling station.

Considering physical properties of the water column, turbidity and Chlorophyll *a* were uniformly low with all values below 0.56 NTU and 0.49 µg/L, respectively (Table 1). Temperature, dissolved oxygen, and pH all display similar patterns, with similar values throughout the sampling range. There were no indications of distinctive vertical stratification through the water column for any of the measured constituent (Table 1).

Overall, water chemistry throughout the four potential sand donor sites is generally consistent with values close to or below specific criteria of the State Water Quality Standards (with the caveat that this consideration is for a single sample set). Elevated concentrations of nutrients and lower values of salinity were detected at two of the stations at the Ala Wai site. It is likely that these anomalies are the result of sampling within the discharge plume of the Ala Wai Canal. As the present sampling event was conducted during a period of dry weather, it is probable that the data would more strongly reflect discharge from land if sampling is conducted following a significant rain event.

III. BIOTIC COMMUNITY STRUCTURE

A. Methods

Biotic community structure of the marine environment was semi-quantitatively assessed by investigators swimming from the centers of each sand donor site in both the north and south directions until the "edge" of the deposit was reached. The "edges" were defined as the region where bottom cover consisted of materials other than sand, or where biotic composition comprised the majority of the benthic surface. It should be noted that these edges corresponded closely with the delineations provided by Sea Engineering maps. During these reconnaissance swims, notes were taken on physical structure and marine species abundance. Numerous photographs were taken of typical features of all habitats to provide a descriptive representation of the areas comprising the donor sites. Reconnaissance swims to the offshore edge of the Ala Moana deposit site were not conducted owing to depth limitations of diving operations.

B. Results

1. Benthic Community Structure

At the interiors of all four donor sites, the ocean floor consisted of uniform beds of white calcareous sand with distinct ripple patterns oriented parallel to the shoreline (Figures 4 and 5). At all of the sites that were inspected by divers, these deposits had distinct edges, or boundaries where the sand beds were marked by either stands of algae, seagrass, coral, or coral rubble.

The dominant biota in the benthic habitats bounding the sand deposits were assemblages of algae and seagrass. At the Reef Runway Large site, the sand deposits were bounded by meadows of the endemic Hawaiian seagrass *Halophila hawaiiana* . Seagrass occurred in varying densities from thinly distributed single plants to dense meadows that occupied expanses up to tens of meters in dimension (Figures 5-7). The only area where seagrass was not observed was on the offshore boundary area of the Ala Wai donor site.

Other common marine plants observed at the boundaries of the sand deposits were fields of the green alga *Avrainvillea erecta* (Figures 5 and 6). At the Ala Moana donor site, vast meadows of *A. erecta* were observed at the offshore and inshore boundaries of the sand deposits. Interspersed in the meadows of *A. erecta* were patches of seagrass (Figures 6 and 7). At the Ala Moana site, beds of the green calcareous algae *Halimeda* sp. were also common (Figure 7).

The area seaward of the Ala Wai donor site was distinctly different than either the Reef Runway or the Ala Moana area. No seagrass or species of green algae were observed off the Ala Wai. Rather, bottom cover was typified by extensive tracts of the blue-green alga *Lyngbya majuscula*, which nearly covered the sand surface (Figure 9).

The other class of benthos that is generally found to inhabit benthic offshore habitats in Hawaii are reef building corals. As corals generally require a solid substratum on which to settle and grow, there were no corals within the sand donor deposits. However, corals were observed on several solid surfaces observed near the sand deposits. A metal frame of unidentified source was embedded in the sand near the inshore boundary of the Ala Moana site (Figure 8). The upper surfaces of the frame were colonized by numerous coral colonies consisting of the species *Porites lobata*, *Pocillopora meandrina*, and *Montipora capitata*. Scattered rubble fragments that were the dead remnants of large corals also were observed to provide solid substratum for new settlement and growth (Figure 6). Other attached biota that were

present within the boundary areas included the conical shaped sponge *Spirastrealla vagabunda*, and scattered sea cucumumbers (*Holothuria* sp.) (Figure 8.)

The inner edge of the Ala Wai deposit site forms a distinct margin that abuts a solid platform that can be considered a thriving coral reef. Several large helmet-shaped colonies of *Porites lutea* and *P. lobata* greater than one meter in diameter suggest that the area has not been subjected to severe stresses in recent decades (Figure 10).

2. Reef Fish Composition and Community Structure

Essentially no reef fish occurred in the central regions of the sand donor sites. Fish were noted within the algae beds on the boundaries of the donor sites, although their occurrence was rare and was generally limited to the vicinity of rubble features. These included the surgeonfish *Acanthurus triostegus* and *A. leucoparius*; damselfish *Dascyllus albisella*; the tetradonts *Canthigastor jactator, Diodon holocanthus,* and *Ostracion meleagris*; the trumpetfish *Aulostomus chinensis*; triggerfish *Rhineccanthus rectangulus*; and the Moorish idol *Zanclus cornutus*. All of these species are common on Hawaiian reefs, and do not constitute rare or unique species assemblages. No large individuals that would be considered "food fish" were observed.

In summary, the marine communities at the boundaries of the sand deposits consist primarily of a variety of marine algae and seagrass. Corals are limited to small colonies growing on rubble fragments. The exception is the inshore boundary of the Ala Wai site which consists of an extensive reef habitat.

3. Threatened and Endangered Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the Hawaiian Islands, and is frequently observed throughout the south shore of Oahu. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from Hawaiian waters. Several green sea turtles were observed within the survey area, outside the boundary of the sand donor sites, over the course of the present study. In addition, the abundance of seagrass and marine algae may provide a preferred feeding ground for green turtles. No hawksbill turtles were observed during underwater surveys.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. While the present survey was conducted in November before whales are usually present in Hawaiian waters, the survey area is conducive to whale habitation during the winter season. The Hawaiian monk seal, (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. While seals may transit the donor area sites, there are no beaches present for haul-out.

IV. DISCUSSION and CONCLUSIONS

The purpose of this assessment is to assemble baseline information to make valid evaluations of the potential for influence to the marine environment from the proposed replenishment of beach sands at the shoreline of Ala Moana Regional Park. The present study deals specifically with the offshore donor sites; a separate report provides the same assessment for the sand recipient areas at Ala Moana Regional Park. The information collected in these studies provides the basis to understand some of the important processes that are operating in the nearshore ocean to be able to address any concerns that might be raised in the planning process for the proposed project.

The physical structure of the marine habitats of the donor sites consists of uniform beds of white calcareous sand marked by deep ripple patterns from wave forces. While the scope of the present survey did not include analyses of soft sediment infauna, there was minimal macro epi-fauna observed on the surfaces of the sand deposits. The edges of the deposits were delineated by the occurrence of algal meadows consisting of several species of blue-green (*Lyngbya majuscula*) and green algae (primarily *Halimeda* spp., *Avrainvillea erecta*). In addition to marine algae, seagrass (*Halophila hawaiiana*) occurred in expansive meadows at the boundaries of, and beyond the Reef Runway and Ala Wai donor sites. No seagrass was observed off the Ala Wai site.

Reef building corals were not a major component of the benthic community bordering the Reef Runway and Ala Moana sites, occurring primarily as encrustations on rubble features. The inshore boundary of the Ala Wai site (which was the shallowest area in the survey) consisted a bed of coral rubble which graded into a solid limestone platform colonized by an extensive reef community. Other invertebrates observed within the sand boundary habitats included sparse sea cucumbers and sponges. Reef fish were also scarce in the boundary areas and were limited to small individuals and limited species.

Evaluation of water chemistry at the donor sites indicated that for the single sample set, values of all constituents represent pristine open coastal waters. The exception occurred at the locations nearest to the discharge of the Ala Wai canal within the Ala Wai donor site. Water chemistry in this area reflected discharge of canal waters with

elevated nutrient concentrations coupled with decreased salinity. As the present survey was conducted during a period of relatively dry weather, it would be expected that the effects of canal water discharge would be greater during and following episodes of heavy rainfall. With the exception of a single concentration of ammonium nitrogen, all water quality constituents were below the Department of Health water quality standard specific criteria for open coastal waters under wet criteria.

The removal of sand from offshore deposits will likely result in a temporary increase in resuspended sediment in the water column. It is not likely that there will be substantial settlement of new sediment on the seafloor sufficient to bury or impact existing assemblages of algae, seagrass or corals that presently inhabit the areas adjacent to the deposits. As the new sediment should not be qualitatively different than the existing sand, it is not likely that the project will result in a change in habitat composition sufficient to alter biotic abundance.

Based on the results of this survey, it is recommended that environmental impacts can be eliminated or minimized by limiting sand extraction to the central regions of the donor site. In addition, management and mitigation practices should be put in place to limit to the extent possible release of fine-grained material to the water column during the extraction of donor sand. With these conditions, the proposed project should have little or no potential for significant permanent effects to the existing marine environment.

V. REFERENCES CITED

Grasshoff, K. 1983. Methods of seawater analysis. Verlag Chemie, Weinheim, 419 pp.

Strickland J. D. H. and T. R. Parsons. 1968. A practical handbook of sea water analysis. Fisheries Research Bd. of Canada, Bull. 167. 311 pp.

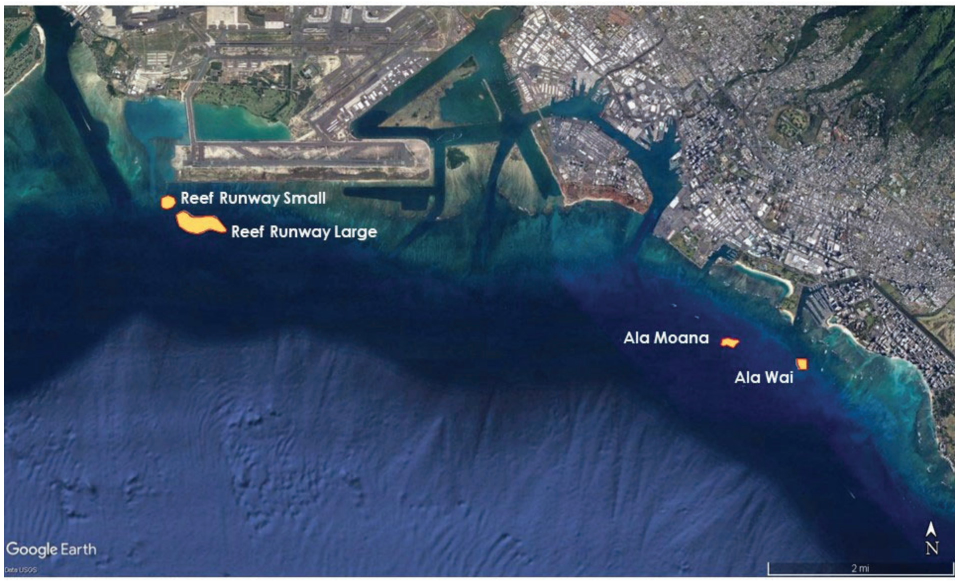


FIGURE 1. Aerial photograph of the south shore of Oahu showing four potential sand donor sites for the Ala Moana Beach Restoration project.

FIGURE 2. Aerial photograph of the south shore of Oahu showing two potential sand donor sites for the Ala Moana Beach Restoration project: Ala Moana and Ala Wai. Green circles indicate water chemistry monitoring stations. Pink arrows show approximate tracks of benthic survey transects.

FIGURE 3. Aerial photograph of the south shore of Oahu showing two potential sand donor sites for the Ala Moana Beach Restoration project: Reef Runway Large and Reef Runway Small. Green circles indicate water chemistry monitoring stations. Pink arrows show approximate tracks of benthic survey transects.

TABLE 1. Results of water sampling for Ala Moana Sand Project at four potential sand donor sites on November 14, 2018. Samples are collected near the surface (S), mid-water column (M), and 20 cm from the ocean floor (B). Also shown are the State of Hawaii, Department of Health Water Quality Standards (DOH WQS) "not to exceed more than 10% of the time" and "not to exceed more than 2% of the time" for open coastal waters under "wet" conditions. The single tan shaded shaded value exceed DOH 2% "wet" standards; no values exceed the DOH 10% "wet" standards. For sampling station locations, see Figures 1-3.

DONOR SITE	SAMPLE STATION	DEPTH (m)	PO4 (µg/L)	$NO_3^-+NO_2^-$ (µg/L)	NH4 (µg/L)	Si (µg/L)	TOP (µg/L)	TON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	Salt (ppt)	pH (rel)	Chl-a (µg/l)	TEMP deg. C	Diss. O_2 % sat.
ALA WAI	1	0.3	4.09	11.14	5.33	270.22	10.39	81.94	14.48	98.42	0.34	34.15	8.16	0.32	26.66	96.58
		7.5	1.74	0.28	0.80	31.55	7.33	76.15	9.06	77.22	0.22	34.52	8.08	0.26	26.67	95.90
		15.3	0.05	bdl	1.01	31.36	6.90	76.13	6.95	77.14	0.23	34.60	8.07	0.29	26.67	95.54
	2	0.3	0.07	0.14	1.46	31.20	8.47	81.33	8.53	82.92	0.18	34.64	8.21	0.26	26.63	94.70
		7.5	0.05	0.28	2.91	32.20	7.76	73.02	7.82	76.22	0.25	34.64	7.89	0.25	26.65	95.58
		15.5	0.06	0.14	7.25	28.56	8.88	65.39	8.94	72.79	0.12	34.64	8.13	0.27	26.64	95.17
	3	0.3	0.13	3.63	7.07	144.64	10.77	73.09	10.91	83.79	0.33	34.41	8.19	0.32	26.53	93.09
		8.7	0.07	0.14	11.42	26.98	10.03	65.21	10.11	76.78	0.14	34.60	8.21	0.26	26.53	91.93
		17.3	0.06	0.14	5.28	31.03	10.71	70.04	10.77	75.46	0.28	34.60	7.80	0.29	26.53	91.32
ALA MOANA	4	0.3	2.39	0.52	2.30	25.81	9.47	74.11	11.86	76.93	0.20	34.56	8.21	0.23	26.73	96.26
		13.5	2.14	0.33	7.13	25.24	6.48	68.56	8.61	76.02	0.31	34.56	8.19	0.25	26.73	95.91
		27.0	2.45	0.15	5.21	25.67	5.94	65.52	8.39	70.88	0.22	34.52	8.17	0.26	26.74	94.08
	5	0.3	2.51	0.14	2.60	25.81	3.93	68.42	6.44	71.16	0.38	34.56	8.21	0.25	26.72	95.74
		13.5	2.17	bdl	6.62	24.72	4.96	60.16	7.13	66.78	0.21	34.60	8.18	0.25	26.73	95.79
		27.8	1.61	bdl	1.29	24.67	5.97	67.66	7.58	68.95	0.29	34.56	8.19	0.26	26.73	95.16
	6	0.3	2.23	bdl	7.01	25.05	8.38	65.65	10.61	72.66	0.23	34.56	8.21	0.24	26.73	96.49
		14.0	2.60	bdl	1.11	25.13	7.33	70.03	9.93	71.13	0.22	34.60	8.13	0.26	26.73	96.06
		28.1	1.43	bdl	bdl	25.48	11.50	78.53	12.92	78.53	0.21	34.56	8.15	0.27	26.70	95.37
REEF RUNWAY	7	0.3	2.17	bdl	1.75	33.27	9.68	73.96	11.85	75.71	0.23	34.63	8.19	0.43	26.66	96.58
		9.9	2.05	0.14	bdl	32.91	7.35	70.71	9.40	70.85	0.34	34.60	8.02	0.45	26.67	95.90
		18.9	2.36	0.14	bdl	33.59	3.56	77.80	5.91	77.94	0.28	34.52	8.08	0.49	26.67	95.54
	8	0.3	2.11	0.16	0.46	33.40	5.20	73.43	7.30	74.05	0.29	34.56	8.22	0.47	26.63	94.70
		9.4	1.77	0.22	3.82	33.10	6.09	67.21	7.86	71.26	0.27	34.52	8.08	0.46	26.65	95.58
		18.9	1.49	0.29	3.32	32.86	5.60	68.59	7.08	72.20	0.32	34.60	8.14	0.49	26.64	95.17
	9	0.3	2.73	0.35	6.44	35.52	6.58	67.88	9.31	74.68	0.59	34.52	8.19	0.44	26.53	93.09
		8.4	2.29	0.42	3.88	35.80	10.56	71.70	12.85	75.99	0.48	34.60	8.15	0.46	26.53	91.93
		16.5	2.51	0.48	2.97	36.29	8.68	73.63	11.19	77.08	0.51	34.60	8.15	0.43	26.53	91.32
SMALL REEF RUNWAY	10	0.3	2.76	2.60	3.18	39.34	8.28	70.76	11.04	76.54	0.37	34.56	8.02	0.20	26.65	89.82
		4.6	3.84	2.51	12.46	39.53	9.25	61.90	13.10	76.87	0.43	34.56	8.17	0.22	26.65	89.26
		9.7	0.12	1.93	2.91	39.08	11.78	72.98	11.90	77.81	0.40	34.56	8.06	0.20	26.65	88.80
DOH WQS	WET	NTE 10%		14.00	8.50				40.00	250	1.25	*	**	0.90	***	****
		NTE 2%		25.00	15.00				60.00	350	2.00	*	**	1.75	***	****
			EPA 365.3	EPA 353.2	EPA 350.1	EPA 370.1			SM 4500P B5	SM 4500N C	SM 2130B	SM 2520	EPA 150.1	SM 10200	SM 2550B	SM 4500 OG

FIGURE 4. Reef Runway "Small" donor site: Three views of sand deposits at the Reef Runway "small" donor site (top left, right). Rubble bed at inshore edge of sand deposit (bottom left). See Figure 1 for location of Reef Runway sites.

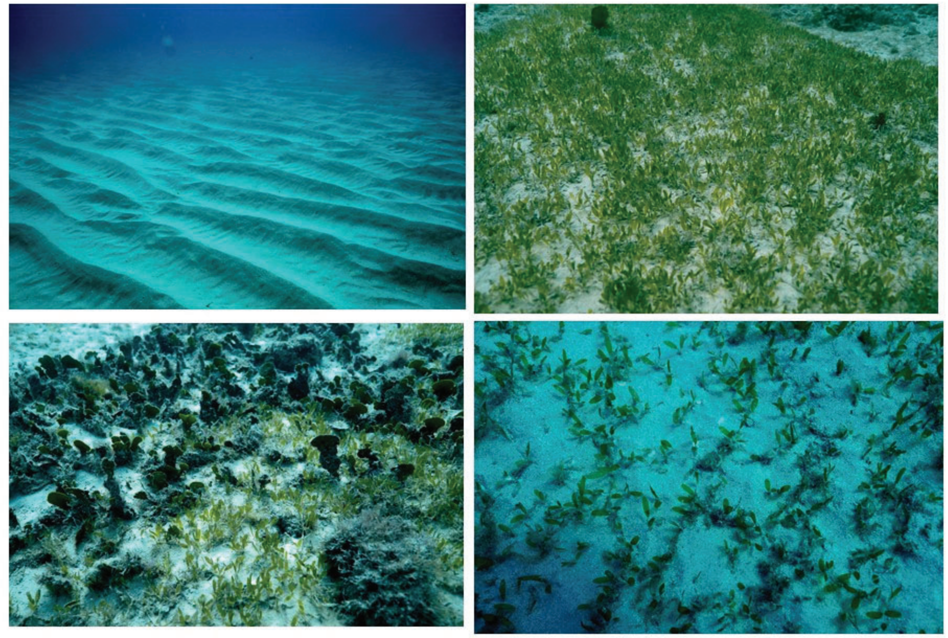


FIGURE 5. Reef Runway "Large" donor site: Sand deposit at center of donor site (upper left); bed of seagrass (*Halophila hawaiiana*) at inshore edge of donor site (upper, lower right); mixed bed of seagrass and green alga *Avrainvillea erecta* at offshore edge of donor site (lower left). See Figure 1 for location of Reef Runway donor sites.

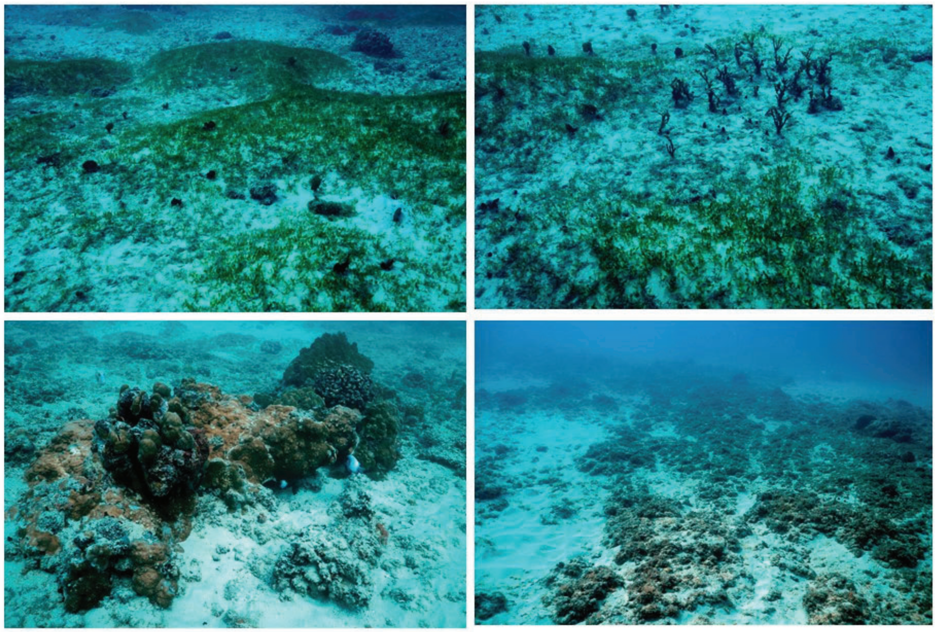


FIGURE 6. Reef Runway "Large" donor site: Mixed beds of seagrass and green algae (*Avrainvillea erecta* and *Halimeda* sp.) (top left and right);); coral rubble encrusted with *Montipora patula (bottom left)*; rubble bed (bottom right). For location of donor sites, see Figure 1.

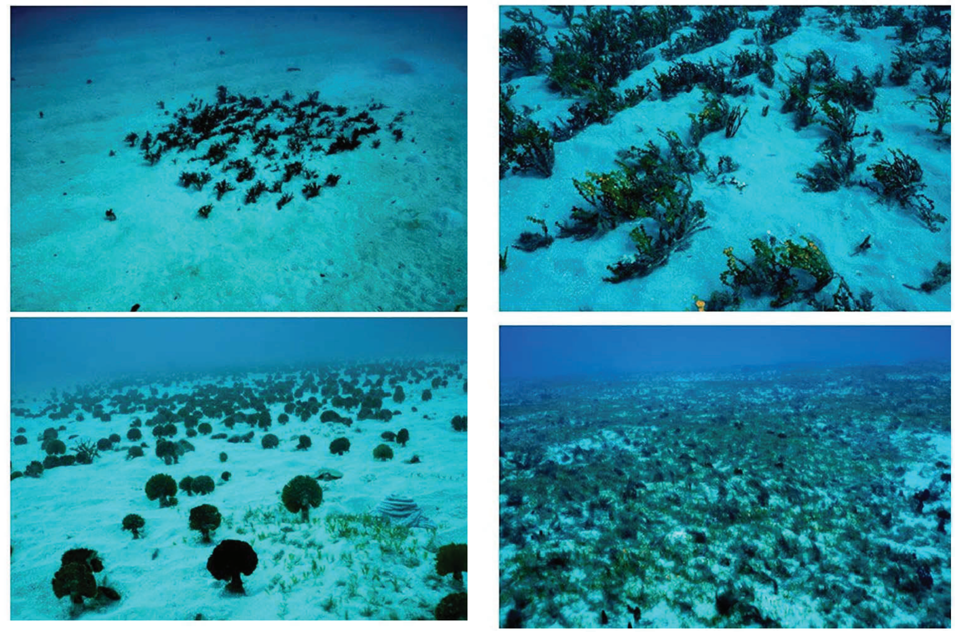


FIGURE 7. Ala Moana donor site. Beds of calcareous green alga *Halimeda* sp. at inshore edge of sand deposit (top left and right); mixed field of green alga *Avrainvillea erecta* and seagrass *Halophila hawaiiana* at offshore edge of sand deposit (bottom left and right). See Figure 1 for location of donor site.

FIGURE 8. Ala Moana donor site: Metal frame colonized by numerous reef corals observed in center of Ala Moana donor site (left); small colony of *Porites lobata*, sea cucumber *Holothuria* sp., and green conical sponges *Spirastrealla vagabunda* on inshore edge of Ala Moana donor site (top right). Bottom photos show distinct boundary between sand deposit and algal bed (right). See Figure 1 for location of donor sites.

FIGURE 9. Ala Wai donor site: Beds of blue-green algae *Lyngbya majuscula* at offshore edge of Ala Wai donor site. The Ala Wai site was the only donor area where seagrass was not observed. See Figure 1 for location of donor sites.

FIGURE 10. Ala Wai donor site: boundary of inner edge of sand deposit and reef structure (top left and right); reef platform inshore of sand deposit (bottom left); large colony of *Porites lutea* at inner edge of sand deposit (bottom right). See Figure 1 for locations of donor sites.