DAVID Y. IGE
GOVERNOR

FILE COPY

NOV - 9 2020

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

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

OFFICE OF FACILITIES AND OPERATIONS

October 29, 2020

TO: Keith Kawaoka, Acting Director
Office of Environmental Quality Control
Department of Health

FROM: Tracy Okumura
For Public Works Administrator
Facilities Development Branch

SUBJECT: **Chapter 343, Hawaii Revised Statutes (HRS) Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for Mokapu Elementary School Campus Improvements; TMK: 4-4-009:007 Marine Corps Base Hawaii, Kaneohe Bay; Koolaupoko District, Oahu, Hawaii**

The State of Hawaii Department of Education hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Mokapu Elementary School Campus Improvements project for publication in the next edition of *The Environmental Notice*. As the DEA was prepared to comply with environmental review under both HRS 343 and the National Environmental Policy Act (NEPA), we request that a notice of availability of the project's DEA-AFONSI also be published in the NEPA Actions section of the next issue of the TEN.

We are transmitting a completed OEQC Publication Form, NEPA Action publication form, a shapefile for the action location boundary, and an electronic (searchable) PDF copy of the DEA-AFONSI via the OEQC online submission platform.

If there are any questions, please contact Brenda Lowrey of the Facilities Development Branch, at 784-5091.

TO:bl
Enclosures

21-079

21-076

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Friday, October 30, 2020 12:45:12 PM

Action Name

Mōkapu Elementary School Campus Improvements

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

Koʻolaupoko, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 4-4-009:007

Action type

Agency

Other required permits and approvals

Numerous; see DEA/AFONSI

Proposing/determining agency

State of Hawaii Department of Education

Agency contact name

Brenda Lowrey

Agency contact email (for info about the action)

brenda.lowrey@k12.hi.us

Email address or URL for receiving comments

comments@hhf.com

Agency contact phone

(808) 784-5091

Agency address

3633 Waialae Avenue
Facilities Development Branch, Bldg. E, 2nd Floor
Honolulu, HI 96816
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

HHF Planners

Consultant contact name

Gail Renard

Consultant contact email

comments@hhf.com

Consultant contact phone

(808) 457-3167

Consultant address

733 Bishop Street
Suite 2590
Honolulu, HI 96813
United States
Map It

Action summary

The State of Hawaii Department of Education proposes to construct campus improvements at Mōkapu Elementary School, at a 14-acre site owned by the federal government at Marine Corps Base Hawaii Kaneohe Bay. The action would replace or upgrade the existing school with a modern equivalent school on the same site that would meet 21st century design and technology standards. Construction is planned to start in 2021, with the 1st phase completed by the start of the 2023-2024 school year. The Proposed Action would include approximately 162,000 gross square feet of floor area to include 2- and 3-story classroom buildings, cafeteria, covered playcourt, administration, playfield, parking facilities, and on- and off-site infrastructure improvements and utility connections.

The action is needed to remedy existing over-capacity conditions and facility deficiencies at Mōkapu ES, accommodate its projected enrollment, and provide infrastructure capacity to meet modern technology requirements.

Reasons supporting determination

Refer to Section 7 of DEA/AFONSI, Findings and Anticipated Determination

Attached documents (signed agency letter & EA/EIS)

- Mokapu-ES-DEA-Publication-Form_NEPA-Only-Documents.pdf
- MES_Draft-EA-AFONSI_Oct-2020.pdf
- Kawaoka-Mokapu-ES-Campus-Improvements-DEA-AFONSI-10-29-20.pdf

Action location map

- MokapuES_ProjectBoundary.zip

Authorized individual

Gail Renard

Authorization

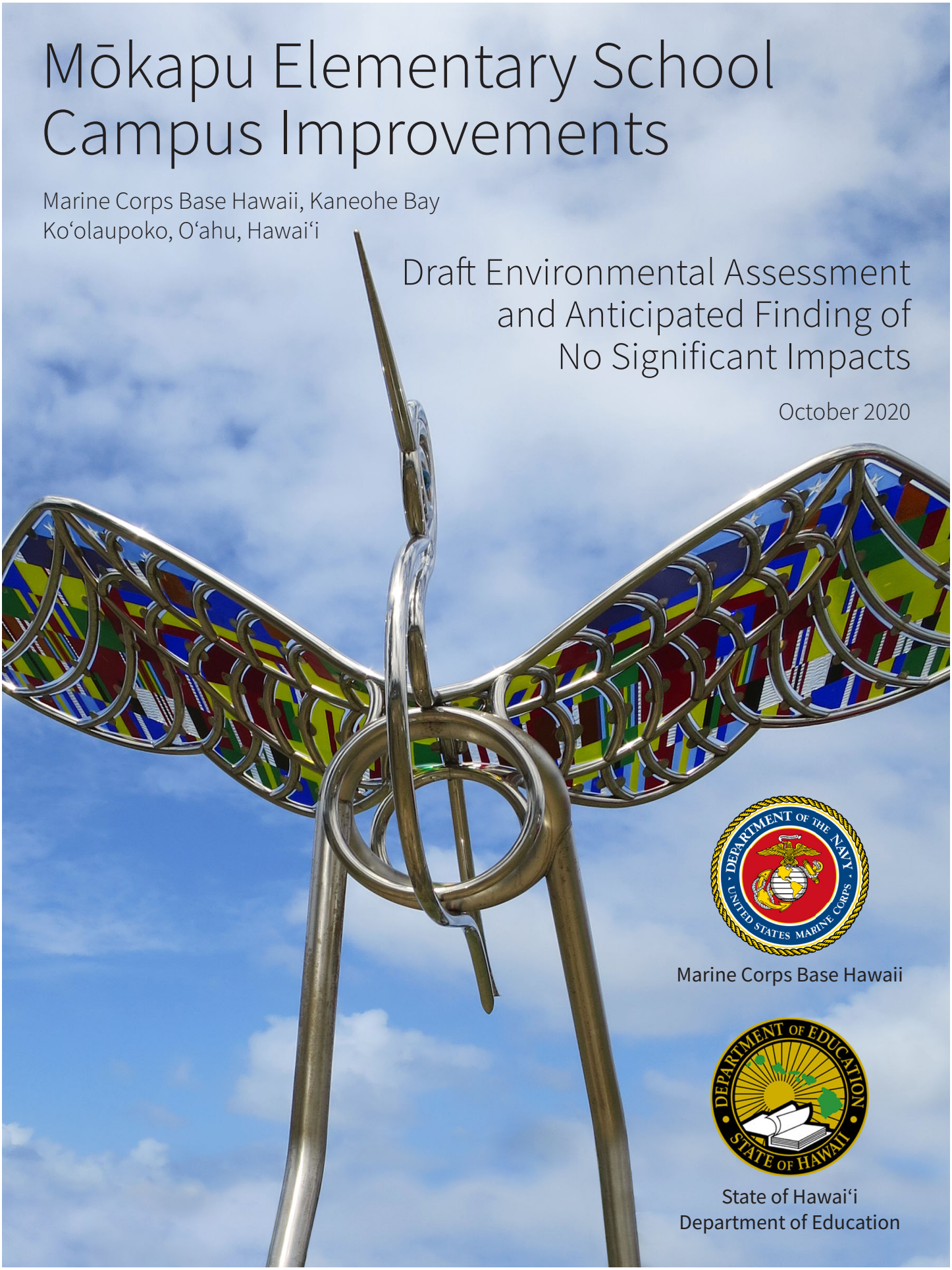
- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Mōkapu Elementary School Campus Improvements

Marine Corps Base Hawaii, Kaneohe Bay
Koʻolaupoko, Oʻahu, Hawaiʻi

Draft Environmental Assessment and Anticipated Finding of No Significant Impacts

October 2020



Marine Corps Base Hawaii

State of Hawaiʻi
Department of Education

Mōkapu Elementary School Campus Improvements

Marine Corps Base Hawaii, Kaneohe Bay
Koʻolaupoko, Oʻahu, Hawaiʻi

Draft Environmental Assessment and Anticipated Finding of No Significant Impacts

October 2020

Marine Corps Base Hawaii

State of Hawaiʻi
Department of Education

Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Mōkapu Elementary School Campus Improvements
Project Location:	Marine Corps Base Hawaii, Kaneohe Bay, Mōkapu Peninsula, Hawaiʻi
Federal Lead Agency:	Marine Corps Base Hawaii
Affected Region:	Honolulu, Hawaiʻi
Federal Action Proponent:	Marine Corps Base Hawaii
State of Hawaiʻi Lead Agency and Project Proponent:	State of Hawaiʻi Department of Education

Points of Contact:

Federal	**State of Hawaiʻi**
Jacquelyn Bomar	Brenda Lowrey
Environmental Compliance and Protection Department	Facilities Development Branch
Marine Corps Base Hawaiʻi	State of Hawaiʻi Department of Education
P.O. Box 63002	3633 Waialae Ave., Bldg. E, 2nd Fl.
Kāneʻohe Bay, HI 96863-3002	Honolulu, HI 96816
jacquelyn.bomar@usmc.mil	brenda.lowrey@k12.hi.us

Date: October 2020

Marine Corps Base Hawaii (MCBH), a Command of the U.S. Navy, along with the State of Hawaiʻi Department of Education as a cooperating agency have prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and Navy regulations for implementing the National Environmental Policy Act and Hawaiʻi Revised Statutes Chapter 343 in accordance with the requirements of Chapter 343, Hawaiʻi Revised Statutes (HRS), as amended, and Hawaiʻi Administrative Rules, Title 11, State of Hawaiʻi Department of Health (DOH). The Proposed Action would demolish most of the existing Mōkapu Elementary School facilities and construct new classroom, administrative, library, and cafeteria facilities beginning in 2021 to support continued school use. The first phase would be completed by the start of the 2023-2024 school year. This Environmental Assessment evaluates the potential environmental impacts associated with the two action alternatives, New Construction Alternative and Partial Reuse Alternative, and the No Action Alternative to the following resource areas: air quality, geological resources, water resources, cultural resources, biological resources, transportation, natural hazards, public health and safety, hazardous materials and wastes.

This page intentionally left blank.

PROJECT SUMMARY

Project Name:	Mōkapu Elementary School Campus Improvements
Proposing/Accepting Agency:	Department of Education, State of Hawaiʻi Facilities Development Branch 3633 Waialae Avenue Honolulu, Hawaiʻi 96816
Location:	1193 Mōkapu Road Marine Corps Base Hawaii (MCBH), Kaneohe Bay Kailua, HI 96734
Tax Map Key:	4-4-009: 007 (14.2 acres)
Proposed Project:	Redevelopment of existing school campus to provide approximately 162,000 gross square feet of floor area for classrooms, administration, library, and cafeteria facilities, along with a covered playcourt, playfield, and surface parking lots.
Chapter 343, Hawaiʻi Revised Statutes "Trigger":	Use of State funds
Landowner:	United States of America
Existing Use:	Public Elementary School
Land Use Designations:	*State Land Use District*: Urban *City and County of Honolulu Development Plan Area*: Koʻolau Poko *City and County of Honolulu Zoning:* F-1 Military and Federal Preservation (all military and federal uses are permitted) *Special Management Area:* Within SMA boundaries
Flood Zone Designation:	Zone D (Unstudied areas where flood hazards are undetermined but flooding is possible). Within 100-year flood boundary of the Mōkapu Central Drainage Channel.
Anticipated Permits and Approvals Required:	National Environmental Policy Act Americans with Disabilities Act Compliance Certificate of Occupancy Hawai`i Environmental Policy Act Compliance Building and Construction Permits Community Noise Permit and/or Noise Variance Construction Plans Approval Grading, Grubbing, and Stockpiling Permits National Historic Preservation Act Compliance Endangered Species Act Compliance National Pollutant Discharge Elimination System Permit Special Flood Hazard Area Development Permit Coastal Zone Management Act compliance

Consultant Contact:	HHF Planners 733 Bishop Street, Suite 2590 Honolulu, HI 96813 Contact: Gail Renard Phone: 457-3167 email: comments@hhf.com
Anticipated Determination	Finding of No Significant Impact (FONSI)

EXECUTIVE SUMMARY

ES.1 Proposed Action

The State of Hawai'i Department of Education (HIDOE) proposes to construct campus improvements at Mōkapu Elementary School, located on a 14-acre site owned by the federal government at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The action would essentially replace or upgrade the existing school with a modern equivalent school on the same site that would meet 21st century design and technology standards. Construction is planned to commence in 2021, with the first phase completed by the start of the 2023-2024 school year. The Proposed Action would include approximately 162,000 gross square feet (GSF) of floor area to include 2- and 3-story classroom buildings, cafeteria, covered playcourt, administration, playfield, parking facilities, and on- and off-site infrastructure improvements and utility connections.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide public school facilities that meet current and projected functional and space requirements and offer a supportive learning environment for pre-kindergarten through sixth grade students at MCBH Kaneohe Bay. The Proposed Action is needed to remedy existing over-capacity conditions and facility deficiencies at Mōkapu Elementary School (ES), accommodate its projected enrollment, and provide infrastructure capacity to meet modern technology and climate control requirements.

ES.3 Alternatives Considered

Alternatives were developed for analysis based upon the following reasonable alternative screening factors:

A. Meets the purpose and need of the Proposed Action

B. Meets the physical siting, functional relationship, and space requirements established by HIDOE (including number of stories, building orientation, etc.) to serve a design enrollment population of 975 students

C. Phasing feasibility

D. Minimizes disruption to school operations, Mōkapu ES students and their families, and the learning environment

E. Safe and efficient motor vehicle, bicycle, and pedestrian traffic flow to and from campus

F. Orientation to community

G. Minimize costs

H. Complies with MCBH Kaneohe Bay's land use plan

MCBH and HIDOE are considering two action alternatives that meet the purpose of and need for the Proposed Action and a No Action Alternative. Alternative 1 (Preferred Alternative) would replace all existing Mōkapu ES facilities with approximately 162,000 square feet (sq ft) of floor area in new facilities that meet current and projected facility requirements for a design enrollment of 975 students. The conceptual plan envisions five new permanent buildings would be constructed (this number could

change in the design process) in two major phases in the north half of the site, generally over the existing playfield. The new buildings would include two classroom buildings with 56 classrooms, an administration/library/media center, cafeteria, and covered play court. The existing 16 permanent school buildings (including library, cafeteria, and administration buildings) and 10 temporary buildings would be demolished, and a large playfield, driveway, and expanded surface parking would be established in their place at the south end of the site along the Mōkapu Road frontage.

Alternative 2 (Partial Reuse Alternative) would construct approximately the same floor area as the Preferred Alternative, although in a different configuration. In this alternative, five existing buildings and would be retained and renovated. Of these, only two buildings that are the most recently built and have larger classrooms would remain as classroom space, while additions to the other three would be constructed. Four new classroom buildings, a cafeteria, and covered playcourt would also be constructed. Because the existing classroom buildings are all one-story structures, retaining five of the buildings would result in a larger overall footprint (approximately 10,000 GSF) than the Preferred Alternative.

Under the No Action Alternative, the Proposed Action would not occur and Mōkapu ES would continue to operate in facilities that do not meet current and projected HIDOE functional and space requirements—i.e., would not meet the project purpose. The No Action Alternative would cause HIDOE to forego available federal grant funding to support a 21st century learning environment for the children of active duty DoD personnel. Classrooms would remain undersized and instruction would continue to utilize temporary (portable) structures that do not provide an optimal environment for student achievement.

ES.4 Summary of Environmental Resources Evaluated in the EA

Council on Environmental Quality regulations, National Environmental Policy Act, and Navy instructions for implementing the National Environmental Policy Act specify that an Environmental Assessment (EA) should address those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The following regulated and non-regulated resources (e.g., that require mitigation measures, consultations and concurrence) were analyzed in the EA (e.g., threatened and endangered species/habitat, historic buildings and archaeological sites eligible for listing on the National Register of Historic Places, within the coastal zone, floodplain management).

The following resource areas have been addressed in this EA: air quality, water resources, geological resources, cultural resources, biological resources, transportation, natural hazards, public health and safety, and hazardous materials and wastes. Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in detail in this EA: land use, visual resources, airspace, noise, infrastructure, socioeconomics, and environmental justice.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions

Table ES-1 provides a tabular summary of the potential impacts to the resources associated with each of the alternative actions analyzed.

ES.6 Public Involvement

The action proponent solicited public and agency comments during a scoping period from March 19, 2020 through April 16, 2020. Comments received during the scoping period were considered in preparing the Draft EA, and comments and responses are provided in Appendix G. This EA/anticipated Finding of No Significant Impact (AFONSI) has been prepared to inform the public of the Proposed Action and to allow the opportunity for public review and comment. A public notice on the Draft EA/AFONSI review period is being published in the Honolulu Star Advertiser and the publication, *The Environmental Notice* (a semi-monthly publication of the Office of Environmental Quality Control [OEQC]), indicating the availability of the Draft EA/AFONSI. The Draft EA/AFONSI is also available on the OEQC's website (http://health.hawaii.gov/oeqc/) and the MCBH website (https://www.mcbhawaii.marines.mil/Resources/Featured-Information/Mokapu-ES/).

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
Air Quality	No impact	Less than significant impacts. The Preferred Alternative would have short-term, intermittent air quality impacts from construction activities. Best management practices (BMPs) would be implemented to control localized increases in dust and particulate matter. Handling and removal of hazardous materials prior to demolition activities would be conducted by qualified personnel, and contractors would comply with applicable federal and state regulations. Air monitoring will be conducted for lead dust and asbestos fibers, if applicable. Operational period impacts would be less than significant because no new sources of air pollutant emissions are included and school-related vehicle trips would be the same with or without the project. Limited, less than significant, greenhouse gas (GHG) emissions are expected from the construction and operation of the Preferred Alternative.	Less than significant impacts. Partial Reuse Alternative would have similar short-term, intermittent construction period impacts as the Preferred Alternative, but with a longer duration and be located closer to existing school facilities. Construction period BMPs would be the same as for the Preferred Alternative. This alternative would have the same less than significant operational period impacts as the Preferred Alternative, as it would not include new sources of air pollutant emissions or cause significant delays in school-related vehicle congestion. This alternative would also result in less than significant GHG emissions.
Geological Resources	No impact	Less than significant impacts. The Preferred Alternative would not affect significant geological features. Construction period BMPs would be implemented to avoid and reduce erosion and sediments resulting from construction activities from reaching receiving waters. No prime or unique farmland would be affected. The design of stormwater facilities incorporation of low impact development (LID) features would improve the quality of stormwater generated at the site during the operational period.	Less than significant impacts similar to the Preferred Alternative, although taking place over a longer duration. Construction period BMPs would avoid or minimize erosion and sediments from being transported to downstream receiving waters.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
Water Resources	No impact	Less than significant impacts. No impacts to drinking water sources. BMPs and National Pollutant Discharge Elimination System (NPDES) permit conditions would be implemented to avoid or minimize potential construction-related sediments and pollutants from being transported offsite to sensitive water resources. During the operational period, stormwater runoff would be directed to onsite drainage infrastructure that include water quality units. LID features would also improve stormwater runoff quality. With the construction of the proposed drainage detention swale, the new school structures would be located outside the 100-year floodplain, and also constructed two feet above the base flood elevation. The project will comply with Presidential Executive Order (EO) 11988 Floodplain Management, including identifying measures to restore and preserve natural and beneficial values of the floodplain.	Less than significant impacts, similar to the Preferred Alternative. BMPs and NPDES permit conditions would be implemented to avoid or reduce construction period impacts to downstream water resources. This alternative would be designed to meet applicable requirements for collection and transmission of stormwater runoff and comply with EO 11988 Floodplain Management.
Cultural Resources	No impact	Less than significant impacts with implementation of mitigation measures for the demolition of historic buildings. No archaeological deposits or human skeletal remains are expected to be encountered during project activities. This alternative would have an adverse effect on properties eligible for National Register of Historic Places (NRHP) listing. Consultation under NRHP Section 106 and HRS 6E is being conducted and appropriate mitigation will be identified in a Memorandum of Agreement (MOA) among HIDOE, MCBH, the Hawaiʻi State Historic Preservation Division,	Less than significant impacts similar to the Preferred Alternative. Like the Preferred Alternative, no archaeological deposits or human skeletal remains are expected to be encountered in this alternative. This alternative would also have an adverse effect on historic buildings eligible for NRHP listing. Consultation under NRHP Section 106 and HRS 6E would be required and appropriate mitigation identified and implemented. Like the Preferred Alternative, this alternative would have no

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
		and other consulting parties. HIDOE will implement the mitigation actions according to the forthcoming MOA. No impacts to traditional cultural properties. No impacts to traditional Hawaiian, or other ethnic group's, rights related to gathering, access, or other customary activities exercised for subsistence, cultural and religious purposes.	impacts to traditional cultural places or traditional cultural practices.
Biological Resources	No impact	Less than significant impacts. No impacts to protected vegetation species. Temporary impacts on threatened and endangered terrestrial species could occur from noise and habitat disturbances associated with construction activities. Endangered Species Act Section 7 consultation with the U.S. Fish and Wildlife Service is beings conducted for project impacts on threatened and endangered species. MCBH determined that the Preferred Alternative project may affect, but is not likely to adversely affect protected fauna species. BMPs and project design elements would be implemented to avoid or minimize impacts to protected species.	Less than significant impacts similar to the Preferred Alternative, although construction period impacts would occur over a longer period. BMPs and design features would avoid or minimize impacts to biological resources, including protected species.
Transportation	No impact	Less than significant impacts. Construction-related traffic would enter MCBH Kaneohe Bay through its Main Gate and avoid off-base neighborhoods along Mōkapu Road and result in no decrease in levels of service on the affected H3 Freeway segment. Operational period traffic conditions would be similar to future without project conditions.	Less than significant impacts similar to the Preferred Alternative, but construction period impacts would likely be less than the Preferred Alternative because the construction would extend over a longer period of time. Same operational period impacts as the Preferred Alternative.
Natural Hazards	No impact	Less than significant impacts. No construction or operational period impacts on seismic,	Same less than significant impacts as the Preferred Alternative.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
		tropical cyclone, tsunami, or sea level rise frequency or severity.	
Public Health and Safety	No impact	Less than significant impacts. Compliance with construction period traffic control plans and the securing of construction areas would avoid or minimize the potential for construction period public health and safety hazards. No environmental health and safety risks associated with the Preferred Alternative that would disproportionately affect children are expected.	Same less than significant impacts as the Preferred Alternative.
Hazardous Materials and Wastes	No impact	Less than significant impacts. BMPs and standard operating procedures would be implemented to manage and/or remove hazardous and regulated materials according to applicable federal, state, and local regulations during demolition activities that may disturb these materials. During the operational period, Mōkapu ES would minimize its use of hazardous materials on campus, and handle, store, and dispose of hazardous or regulated materials and wastes in accordance with applicable regulations.	Same less than significant impacts as the Preferred Alternative.

This page intentionally left blank.

TABLE OF CONTENTS

ABSTRACT ..... **ABSTRACT-I**
PROJECT SUMMARY ..... **PROJECT SUMMARY-I**
ABBREVIATIONS AND ACRONYMS ..... **VI**
EXECUTIVE SUMMARY **ES-1**
ES.1 Proposed Action ES-1
ES.2 Purpose of and Need for the Proposed Action ES-1
ES.3 Alternatives Considered ES-1
ES.4 Summary of Environmental Resources Evaluated in the EA ES-2
ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions ES-2
ES.6 Public Involvement ES-3
1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION **1-1**
1.1 Introduction 1-1
1.2 Background 1-1
1.3 Location 1-2
1.4 Purpose of and Need for the Proposed Action 1-7
1.5 Scope of Environmental Analysis 1-7
1.6 Key Documents 1-8
1.7 Relevant Laws and Regulations 1-8
1.8 Public and Agency Participation and Intergovernmental Coordination 1-9
2 PROPOSED ACTION AND ALTERNATIVES **2-1**
2.1 Proposed Action 2-1
2.2 Screening Factors 2-1
2.3 Alternatives Carried Forward for Analysis 2-2
2.3.1 No Action Alternative 2-2
2.3.2 New Construction Alternative (Preferred Alternative) 2-2
2.3.3 Partial Reuse Alternative 2-8
2.4 Alternatives Considered but not Carried Forward for Detailed Analysis 2-11
2.4.1 Alternative Sites 2-11
2.4.2 Greater Building Density 2-11
2.5 Best Management Practices Included in Proposed Action 2-12
3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES **3-1**
3.1 Air Quality 3-3
3.1.1 Regulatory Setting 3-3
3.1.2 Affected Environment 3-4

3.1.3 Environmental Consequences 3-5
3.2 Geological Resources 3-6
3.2.1 Regulatory Setting 3-7
3.2.2 Affected Environment 3-7
3.2.3 Environmental Consequences 3-10
3.3 Water Resources 3-11
3.3.1 Regulatory Setting 3-12
3.3.2 Affected Environment 3-13
3.3.3 Environmental Consequences 3-16
3.4 Cultural Resources 3-20
3.4.1 Regulatory Setting 3-21
3.4.2 Affected Environment 3-21
3.4.3 Environmental Consequences 3-37
3.5 Biological Resources 3-39
3.5.1 Regulatory Setting 3-39
3.5.2 Affected Environment 3-39
3.5.3 Environmental Consequences 3-43
3.6 Transportation 3-46
3.6.1 Regulatory Setting 3-46
3.6.2 Affected Environment 3-47
3.6.3 Environmental Consequences 3-52
3.7 Natural Hazards 3-56
3.7.1 Affected Environment 3-56
3.7.2 Environmental Consequences 3-58
3.8 Public Health and Safety 3-59
3.8.1 Regulatory Setting 3-59
3.8.2 Affected Environment 3-60
3.8.3 Environmental Consequences 3-60
3.9 Hazardous Materials and Wastes 3-61
3.9.1 Regulatory Setting 3-61
3.9.2 Affected Environment 3-62
3.9.3 Environmental Consequences 3-62
3.10 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization . 3-63
4 SECONDARY AND CUMULATIVE IMPACTS 4-1

4.1 Secondary Impacts 4-1
4.2 Cumulative Impacts 4-1
4.2.1 Definition of Cumulative Impacts 4-1
4.3 Scope of Cumulative Impacts Analysis 4-2
4.4 Past, Present, and Reasonably Foreseeable Actions 4-2
4.4.1 Past Actions 4-3
4.4.2 Present and Reasonably Foreseeable Actions 4-3
4.5 Cumulative Impact Analysis 4-4
4.5.1 Air Quality 4-4
4.5.2 Water Resources 4-5
4.5.3 Cultural Resources 4-5
5 CONFORMANCE WITH STATE AND COUNTY PLANS, POLICIES AND CONTROLS 5-1
5.1 State of Hawaiʻi 5-1
5.1.1 State Land Use Law 5-1
5.1.2 Chapter 344, HRS, State Environmental Policy 5-1
5.1.3 Hawaiʻi State Plan, Chapter 266 HRS 5-7
5.1.4 State Functional Plans 5-9
5.1.5 Hawaiʻi Coastal Zone Management Program 5-9
5.2 City and County of Honolulu 5-15
5.2.1 General Plan 5-15
5.2.2 Koʻolau Poko Sustainable Communities Plan 5-16
5.2.3 City and County of Honolulu Land Use Ordinance 5-17
5.2.4 City and County of Honolulu Special Management Area and Shoreline Setback . 5-17
6 OTHER CONSIDERATIONS REQUIRED BY NEPA 6-1
6.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations . 6-1
6.1.1 Coastal Zone Management 6-2
6.2 Irreversible or Irretrievable Commitments of Resources 6-3
6.3 Unavoidable Adverse Impacts 6-3
6.4 Relationship between Short-Term Use of the Environment and Long-Term Productivity 6-4
7 FINDINGS AND ANTICIPATED DETERMINATION 7-1
8 REFERENCES 8-1
9 LIST OF PREPARERS 9-1
10 PARTIES CONSULTED IN THE PREPARATION OF THE EA 10-1
10.1 Early Consultation 10-1

List of Figures

Figure 1-1 Regional Map 1-3
Figure 1-2 Vicinity Map 1-4
Figure 1-3 Location Map 1-5
Figure 1-4 Existing Facilities 1-6
Figure 2-1 Preferred Alternative Site Plan 2-4
Figure 2-2 Partial Reuse Alternative Site Plan 2-9
Figure 3-1 NRCS Soil Classifications 3-9
Figure 3-2 Flood Zones 3-15
Figure 3-3 Proposed 100-Year Floodplain Boundary: Preferred Alternative Site Plan 3-17
Figure 3-4 Area of Potential Effect 3-22
Figure 3-5 1928 USGS Map 3-32
Figure 3-6 Roadways 3-48
Figure 3-7 Traffic Circulation Student Drop-Off and Pick-Up 3-50
Figure 3-8 Morning and Afternoon Peak Hour Traffic with and without Project Construction Traffic 3-53
Figure 3-9 Potential 3.2-Foot Sea Level Rise Exposure 3-57
Figure 5-1 State Land Use Districts 5-2
Figure 5-2 Koʻolau Poko Sustainable Communities Plan Land Use Map 5-19
Figure 5-3 City and County Zoning / Special Management Area 5-20

List of Tables

Table ES-1 Summary of Potential Impacts to Resource Areas ES-4
Table 1-1 Existing vs. Required Floor Area 1-7
Table 2-1 New Construction Alternative (Preferred Alternative) Components (preliminary, subject to change) 2-3
Table 2-2 Preferred Alternative: Preliminary Construction Phasing 2-7
Table 2-3 Partial Reuse Alternative: Preliminary Construction Phasing 2-10
Table 3-1 Summary of Mōkapu ES Historic Resources Evaluation 3-27
Table 3-2 Results of Community Consultation 3-34
Table 3-3 Threatened and Endangered Species Known to Occur or Potentially Occurring in Project Area 3-43
Table 3-4 Results of Multi-Lane Highway Analysis 3-54
Table 3-5 Summary of Potential Impacts to Resource Areas 3-64

Appendices

Appendix A Biological Survey Report A-1
Appendix B NRHP Section 106 Consultation Correspondence B-1
Appendix C Archaeological Subsurface Testing Report C-1
Appendix D Architectural Inventory Survey Significance Evaluations D-1
Appendix E ESA Section 7 Consultation Correspondence E-1
Appendix F CZMA Correspondence F-1
Appendix G HRS 343 Early Consultation Comments and Responses G-1

Abbreviations and Acronyms

Acronym	Definition
AADT	Annual Average Daily Traffic
ACM	Asbestos-containing material
AFONSI	Anticipated Finding of No Significant Impact
AICUZ	Air Installation Compatible Use Zone
APE	Area of Potential Effect
APZ	Accident Potential Zone
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ARPA	Archaeological Resources Protection Act
BMP	best management practice
ca.	circa
CAA	Clean Air Act
CATV	Cable television
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIA	Cultural Impact Assessment
CMP	Construction Management Plan
CMU	concrete masonry unit
CO	carbon monoxide
CO_2	carbon dioxide
CO^2e	carbon dioxide equivalent
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DERP	Defense Environmental Restoration Program
DNL	day-night average sound level
DoD	United States Department of Defense
DoDEA	Department of Defense Education Activity
DoD-OEA	Department of Defense Office of Economic Adjustment
DON	United States Department of the Navy
DPP	City and County of Honolulu Department of Planning and Permitting
DPRI	Defense Policy Review Initiative
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESQD	explosive safety quantity distance
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FIRM	Flood Insurance Rate Map
FL	Fill land, mixed
FONSI	Finding of No Significant Impact
GAO	Government Accountability Office
GHG	greenhouse gas
GSF	gross square feet
HAR	Hawaiʻi Administrative Rules
HCM	Highway Capacity Manual
HDOT	State of Hawaiʻi Department of Transportation
HIDOE	State of Hawaiʻi Department of Education
HIDOH	State of Hawaiʻi Department of Health
HRS	Hawaiʻi Revised Statutes
H^2S	hydrogen sulfide
HUD	U.S. Department of Housing and Urban Development
KmA	Keaau clay
LBP	lead based paint
LEED	Leadership in Energy and

Acronym	Definition
	Environmental Design
LID	low impact development
LOS	level of service
LBP	lead-based paint
LCP	lead-containing paint
LSB	Land Study Bureau
LUO	Land Use Ordinance
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCBH	Marine Corps Base Hawaii
MCDC	Mōkapu Central Drainage Channel
MnC	Mamala stony silty clay loam
MOA	Memorandum of Agreement
Mōkapu ES	Mōkapu Elementary School
mph	Mile(s) per hour
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Reparation Act
NAVFAC Pacific	Naval Facilities Engineering Command, Pacific
NAS	Naval Air Station
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO^2	nitrogen dioxide
NOA	notice of availability
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSF	Net square feet
OEQC	Office of Environmental Quality Control
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
PM^{10}	particulate matter less than or equal to 10 microns in diameter
$PM^{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
ppt	parts per thousand
RCRA	Resource Conservation and Recovery Act
ROI	Region of influence
ROW	Right-of-way
SCP	Sustainable Communities Plan
SHPD	Hawai'i State Historic Preservation Division
SHPO	State Historic Preservation Officer
SLR	sea level rise
SMA	Special Management Area
SO_2	sulfur dioxide
sq ft	square feet (square foot)
TMDL	Total Maximum Daily Load
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps
WMA	Wildlife Management Area

This page intentionally left blank.

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The State of Hawaiʻi Department of Education (HIDOE) proposes to construct campus improvements at Mōkapu Elementary School, located on a 14-acre, federally-owned site at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The action is planned to begin construction in 2021, with the first phase completed by the 2023-2024 school year.

Mōkapu Elementary School (Mōkapu ES) is in HIDOE's Windward Oʻahu District. It is one of six public schools in the Kalaheo Complex, which includes sister schools ʻAikahi, Kailua, and Kainalu Elementary schools, as well as Kailua Intermediate School and Kalaheo High School. Mōkapu ES is located on land leased from MCBH, a Command of the United States (U.S.) Department of the Navy (DON). Enrollment in the 2019-2020 school year was 879 students.

The environmental laws for the State of Hawaiʻi are promulgated by Chapter 343, Hawaiʻi Revised Statutes (HRS) entitled *Environmental Impact Statements* and Chapter 11-200.1, Hawaiʻi Administrative Rules (HAR) entitled *Environmental Impact Statement Rules*. Section 343-5, HRS identifies nine categories of action that trigger the preparation of an environmental assessment (EA). Because one of these triggers is the use of state or county funds, this EA has been prepared in accordance with Chapter 343, HRS and Chapter 11-200.1, HAR.

Similarly, because the action would take place on land leased by the federal government to HIDOE and because federal funding will be used for project implementation, the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] sections 4321–4370h) must be met. NEPA requires the preparation of an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment. This EA has been prepared in accordance with NEPA, as implemented by the Council on Environmental Quality (CEQ) Regulations and Navy and U.S. Marine Corps (USMC) regulations and guidance for implementing NEPA.

Both HIDOE and MCBH have participated to ensure this document meets the requirements of Chapter 343, HRS and Chapter 11-200.1, HAR (for the State of Hawaiʻi environmental review requirements) and NEPA (42 U.S.C. parts 4321-4370h), CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] parts 1500-1508), and Marine Corps regulations and guidance for implementing NEPA (Marine Corps Order 5090.2, and USMC NEPA Manual (Version 2 of September 2011) (for MCBH environmental review requirements).

1.2 Background

Facility Condition Assessments of Mōkapu ES facilities were conducted by the Department of Defense Education Activity (DoDEA) in 2011 and updated in 2018. Although the assessments found that the school was well maintained and provided a good learning environment, it also determined that the school was in poor condition based on school capacity, spatial adequacy, and technology readiness. In addition, multiple buildings were determined to have exceeded their effective service life. Accordingly, Mōkapu ES was placed on a prioritized list of schools at military installations that were eligible for funding and in need of facility improvements.

In late 2015, a grant invitation from the Department of Defense Office of Economic Adjustment (DoD-OEA) was sent to HIDOE to submit a proposal to address Mōkapu ES's over-capacity conditions and

facility deficits. HIDOE conducted a planning study was conducted in 2016 to identify the school's space requirements, assess the potential for reusing existing structures, identify offsite requirements, estimate rough order-of-magnitude construction costs, and recommend a general redevelopment concept for a target enrollment of greater than 900 students. The planning process involved a rapid assessment of facility conditions along with two pre-design charrettes (planning workshops) with school-based stakeholders. Four priorities emerged from the planning charrettes:

- Mitigate existing on-street student pick-up and drop-off vehicular traffic queuing along Mōkapu Road
- Improve multi-modal access (e.g., bicycle and pedestrian) between the school and the community it serves
- Conform with ideal facility functional relationships to support the school's learning style and goals, and
- Identify construction phasing and demolition plans that minimize interruption to student performance and safety

Several alternative courses of action were developed and two alternatives were evaluated in detail:

- Reuse Alternative – renovate several existing school buildings, demolish some existing buildings, and construct several new buildings
- New Construction Alternative – Complete redevelopment of the school with all new facilities

Evaluation of the two alternatives determined that the New Construction Alternative best supports HIDOE's objectives. Detailed descriptions of the screening factors and the two alternatives evaluated in the 2016 planning study are provided in Sections 2.2, 2.3.2, and 2.3.3, respectively.

1.3 Location

Mōkapu ES facilities were originally built starting in 1959 on a 14.2-acre site at MCBH Kaneohe Bay. MCBH Kaneohe Bay is located on Mōkapu Peninsula in the Koʻolau Poko District of the island of Oʻahu, State of Hawaiʻi. It is bordered by the Pacific Ocean on the north, Kāneʻohe Bay to the west and Kailua Bay to the east (Figure 1-1). The civilian residential communities of ʻAikahi Park and Kaimalino lie to the south and MCBH Kaneohe Bay's Nuʻupia Ponds Wildlife Management Area is located along the south border of the installation (Figure 1-2).

The school is bordered by the Hana Like neighborhood on the east, Mōkapu Road on the south, and the Mōkapu Central Drainage Channel, Lawrence Road, and the Waikulu neighborhood on the west and north (Figure 1-3). Originally constructed in 1992, the 260-unit Hana Like neighborhood was redeveloped in 2016 (completed in 2018) as the sixth phase of the Navy's public-private venture regional housing project at MCBH Kaneohe Bay. Land uses in the surrounding area include Bachelor Enlisted Quarters, recreational facilities, and headquarters, operations, logistics, and training facilities.

Existing school facilities include an administration building, a library, a cafeteria, nine classroom buildings, and four restroom structures with a combined floor area of approximately 60,000 gross square feet (GSF). Nine portable classroom buildings, grassed playfield, two playcourts, two basketball courts, a dirt running track, paved parking areas, and a sewer pump station are also located on the site. Figure 1-4 illustrates the existing Mōkapu ES facility layout and uses.

Figure 1-1 Regional Map

Figure 1-2 Vicinity Map

Figure 1-3 Location Map

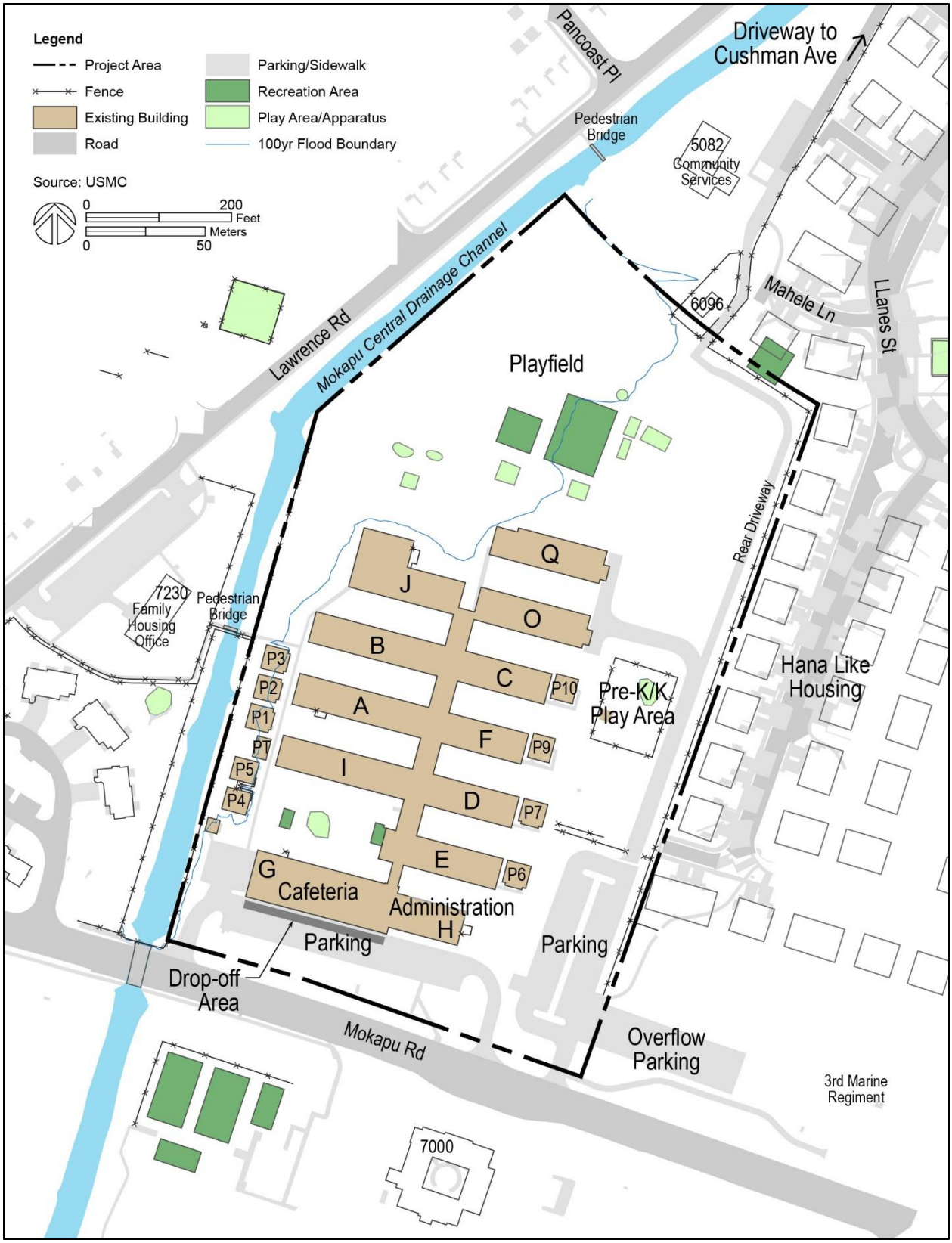


Figure 1-4 Existing Facilities

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide public school facilities that meet current and projected functional and space requirements and offer a supportive learning environment for pre-kindergarten through sixth grade students at MCBH Kaneohe Bay.

The Proposed Action is needed to remedy existing over-capacity conditions and facility deficiencies at Mōkapu ES, accommodate its projected enrollment, and provide infrastructure capacity to meet modern technology and climate control requirements. The DoDEA's 2018 condition assessment rated the school as being in "poor condition," which resulted in Mōkapu ES being ranked as the 33rd highest priority among schools on U.S. military installations by the DoD-OEA.

An analysis of permanent building floor area showed that Mōkapu ES is 42% below HIDOE's program requirement for instructional area, with most of the shortage related to the amount, rather than size, of classrooms. Currently, Mōkapu ES has about 45 classroom spaces and should have 56 classrooms; nine portable classrooms are used to offset this shortfall. According to educators, having adequate classroom space is important to facilitating a 21st century learning environment. Table 1-1 summarizes functional areas at Mōkapu ES that do not meet HIDOE's program requirements.

Table 1-1 Existing vs. Required Floor Area

Functions	*Existing Area (net square feet [NSF])*	*Program Area Required (NSF)*	*% short*
Instructional & Classroom Support	34,697	60,175	-42%
Classrooms (not incl. 8 portables)	incl. above (33,000)	incl. above (55,945)	
Pullout & Itinerant Meeting Rooms	0	incl. above (1,170)	
Faculty Centers	incl. above (857)	incl. above (1,960)	
Computer Center	incl. above (840)	incl. above (1,100)	
Dining/Kitchen/Custodial	7,858	13,950	-44%
Administration (not incl. 1 portable)	4,469	10,290	-57%
Library	5,851	6,970	-16%
Covered Playcourt	none	8,440	missing
TOTAL	**52,875**	**99,825**	**-47%**

Source: HIDOE Project Proposal for Proposed Improvements for Mōkapu ES, December 17, 2018.

As seen in Table 1-1, there are permanent building floor area shortfalls in all functional areas assessed. In addition to the classroom shortfall, kitchen/cafeteria space is significantly undersized. As a result of space limitations, Mōkapu ES students are separated into three lunch periods, where ideally, a school should have a maximum of two lunch periods.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed in this EA include air quality, water resources, geological resources, cultural resources, biological resources, transportation, natural

hazards, public health and safety, and hazardous materials and waste. The study area for each resource analyzed may differ due to how the Proposed Action interacts with or impacts the resource. For example, the study area for geological resources may only include the construction footprint of a building whereas the water quality study area would expand out to include areas that may be impacted by construction or operational sedimentation.

1.6 Key Documents

Key documents are sources of information incorporated into this EA. Documents are considered to be key because of similar actions, analyses, or impacts that may apply to this Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole include:

- Biological Resources Survey Report, David and LeGrande, 2020. Evaluates impacts on protected species that may result from the Proposed Action; recommends best management practices and measures to minimize adverse impacts.
- Archaeological Subsurface Testing Report, International Archaeology, LLC 2020. Background research and subsurface testing of the project area to determine presence/absence of archaeological deposits or features and to contextualize the stratigraphic composition of the area as it relates to the potential for past land use.
- Historic Building Evaluation, MASON, 2020. Inventory survey and evaluation of Mōkapu ES buildings for their eligibility to be listed in the National Register of Historic Places (see Appendix D).

1.7 Relevant Laws and Regulations

This EA was prepared based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- National Environmental Policy Act (42 United States Code [U.S.C.] sections 4321–4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations parts 1500–1508)
- Navy and USMC regulations for implementing NEPA (32 Code of Federal Regulations part 775), which provides policy for implementing Council on Environmental Quality regulations and NEPA (e.g., Marine Corps Order 5090.2A, and USMC NEPA Manual, Version 2 of September 2011)
- Department of Defense Instruction 4715.16
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Rivers and Harbors Act (33 U.S.C. section 407)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- National Historic Preservation Act (NHPA) (54 U.S.C. section 306108 et seq.)
- NHPA implementing regulations (36 CFR Part 800)
- Antiquities Act of 1906
- Archaeological Resources Protection Act (ARPA) of 1979

- ARPA implementing regulations (32 CFR Part 229)
- Curation of Federally-Owned and Administered Archaeological Collections (36 CFR 70)
- Native American Graves Protection and Repatriation Act (NAGPRA)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. section 703–712)
- Comprehensive Environmental Response and Liability Act (42 U.S.C. section 9601 et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Toxic Substances Control Act (15 U.S.C. sections 2601–2629)
- Farmland Protection Policy Act (7 U.S.C. 4201 et seq.)
- Executive Order (EO) 11988, Floodplain Management
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13834, Efficient Federal Operations
- Chapter 343, HRS, which establishes a system of environmental review to ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.
- Chapter 205A, HRS Coastal Zone Management, enacted to provide for the effective management, beneficial use, protection, and development of the coastal zone

A description of the Proposed Action's consistency with relevant laws, policies and regulations is presented in Chapters 5 and 6.

1.8 Public and Agency Participation and Intergovernmental Coordination

In accordance with HAR 11-200.1, HIDOE conducted early consultation on the Proposed Action with several federal, state, and county government agencies, and community organizations prior to the preparation of the Draft EA. These parties are listed in Chapter 10 and any substantive written comments they provided—and responses to the respective comments—are included in Appendix G.

This EA/anticipated Finding of No Significant Impact (AFONSI) has been prepared to inform the public of the Proposed Action and to allow the opportunity for public review and comment. The Draft EA/AFONSI review period begins with a public notice published in the Honolulu Star Advertiser and in the publication, *The Environmental Notice* (a semi-monthly publication of the Office of Environmental Quality Control [OEQC]), indicating the availability of the Draft EA/AFONSI. The Draft EA/AFONSI is also available via the OEQC's website (http://health.hawaii.gov/oeqc/) and the MCBH website (https://www.mcbhawaii.marines.mil/Resources/Featured-Information/Mokapu-ES/).

MCBH is in the process of coordinating or consulting with the U.S. Fish and Wildlife Service, the Hawai'i State Historic Preservation Officer (SHPO), and State of Hawai'i Office of Planning, Coastal Zone Management Program regarding the Preferred Alternative. It is also completing the eight-step process required under EO 11988 (Floodplain Management) to document steps taken to avoid and minimize impacts to floodplains and wetlands.

This page intentionally left blank.

2 Proposed Action and Alternatives

2.1 Proposed Action

The HIDOE proposes to construct campus improvements at Mōkapu Elementary School, located on a 14-acre site owned by the federal government at MCBH Kaneohe Bay. The action would essentially replace or upgrade the existing school with a modern equivalent school on the same site that would meet 21st century design and technology standards. Construction is planned to commence in 2021, with the first phase completed by the start of the 2023-2024 school year. The Proposed Action would include approximately 162,000 GSF of floor area to include 2- and 3-story classroom buildings, cafeteria, covered playcourt, administration, playfield, and parking facilities. The redevelopment also includes related on- and off-site infrastructure improvements and utility connections.

2.2 Screening Factors

NEPA's implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and to meet the purpose and need require detailed analysis.

Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

A. Meets the purpose and need of the Proposed Action
B. Meets the physical siting, functional relationship, and space requirements established by HIDOE (including number of stories, building orientation, etc.) to serve a design enrollment population of 975 students
C. Phasing feasibility
D. Minimizes disruption to school operations, Mōkapu ES students and their families, and the learning environment
E. Safe and efficient motor vehicle, bicycle, and pedestrian traffic flow to and from campus
F. Orientation to community
G. Minimize costs
H. Complies with MCBH Kaneohe Bay's land use plan

Various alternatives were evaluated against the screening factors. The alternatives considered include:

- No Action
- Construction at alternate site
- Greater building density
- New construction
- Partial reuse and redevelopment

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, two action alternatives (New Construction and Partial Reuse) were identified and are analyzed in this EA, along with the No Action Alternative.

2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. Mōkapu ES would continue to operate in facilities that do not meet current and projected HIDOE functional and space requirements—i.e., would not meet the project purpose. The No Action Alternative would cause HIDOE to forego available federal grant funding to support a 21st century learning environment for the children of active duty DoD personnel. Classrooms would remain undersized and instruction would continue to utilize temporary (portable) structures that do not provide an optimal environment for student achievement. Under this alternative, the existing over-capacity conditions at Mōkapu ES would not be corrected and its "poor" condition assessment would not be improved—i.e., would not address the need for the project. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this EA. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

2.3.2 New Construction Alternative (Preferred Alternative)

2.3.2.1 Overview and Components

The New Construction Alternative would replace all existing Mōkapu ES facilities with approximately 162,000 square feet (sq ft) of floor area in new facilities that meet current and projected facility requirements for a design enrollment of 975 students. The conceptual plan envisions five new permanent buildings would be constructed (this number could change in the design process) in two major phases in the north half of the site, generally over the existing playfield. The new buildings would include two classroom buildings with 56 classrooms (Buildings B1 [2-story] and B2 [[3-story]), an administration/library/media center (Building A), cafeteria (Building C), and covered play court (Building D). The existing 16 permanent school buildings (including library, cafeteria, and administration buildings) and 10 temporary buildings would be demolished, and a large playfield, driveway, and expanded surface parking would be established in their place at the south end of the site along the Mōkapu Road frontage. Table 2-1 summarizes the new facilities.

Table 2-1 New Construction Alternative (Preferred Alternative) Components (preliminary, subject to change)

Component	*Use*	*Phase*	*Floors*
Building A	Administration/Library/Media Center	1	2
Building B1	Classroom (lower elementary)	1	2
Building B2	Classroom (upper elementary)	1	3
Building C	Cafeteria	2	1
Building D	Covered Playcourt	2	1
Stormwater Detention Swale	stormwater management	1	n/a
Parking Lot (115 stalls)*	surface parking	1	n/a
Parking Lot (12 stalls)*	surface parking	2	n/a
Parking Lot (72 stalls)*	surface parking	2	n/a
Playfield	playfield	2	n/a

* Stall count subject to change

Because the new classroom buildings would be constructed on a section of campus that has no existing buildings, this alternative would allow the existing school to remain operational during the approximately three- to four-year construction period.

The project would incorporate Leadership in Energy and Environmental Design standards and techniques, commonly referred to as LEED, and be designed to meet LEED Silver certification requirements.

Design Concept

Figure 2-1 presents a conceptual layout of the new school facilities.[1] The new campus layout moves the focus of the school toward the family housing neighborhoods situated at the north end of the site and away from high vehicle volume Mōkapu Road. As is more common in 21st century school design, the classroom and support buildings would be centered around a common courtyard and linked by walkways. Play areas for preschool and kindergarten students would be separated from play areas for the upper grades.

Access, Parking, and Circulation

Primary vehicular access to the school would continue to be via two driveways on Mōkapu Road in the southeast and southwest corners of campus, respectively (Figure 2-1). A temporary access from Cushman Avenue on the north side of the campus would be closed to general vehicle traffic (open for bicycles and pedestrian access). The plan includes enhanced pedestrian and bicycle access from two points along the north boundary, two points along the east boundary with the Hana Like neighborhood, two points from the Mōkapu Road sidewalk, and from the existing pedestrian bridge over Mōkapu Central Drainage Channel (MCDC) on the west.

Three surface parking lots are included in the plan. An approximately 115-stall lot (“Lot 1” in Figure 2-1) would be located along the Lawrence Road/MCDC frontage. The second parking lot would include approximately 72 stalls located in the southeast corner of the site, close to the primary vehicle entrance from Mōkapu Road (“Lot 2”). An approximately 12-stall parking lot would be located adjacent to the Cafeteria, primarily used for loading and service access (“Lot 3”). Approximately 10 accessible parking stalls would be distributed among the three parking lots.

[1] Campus layout is subject to change as the design process proceeds.

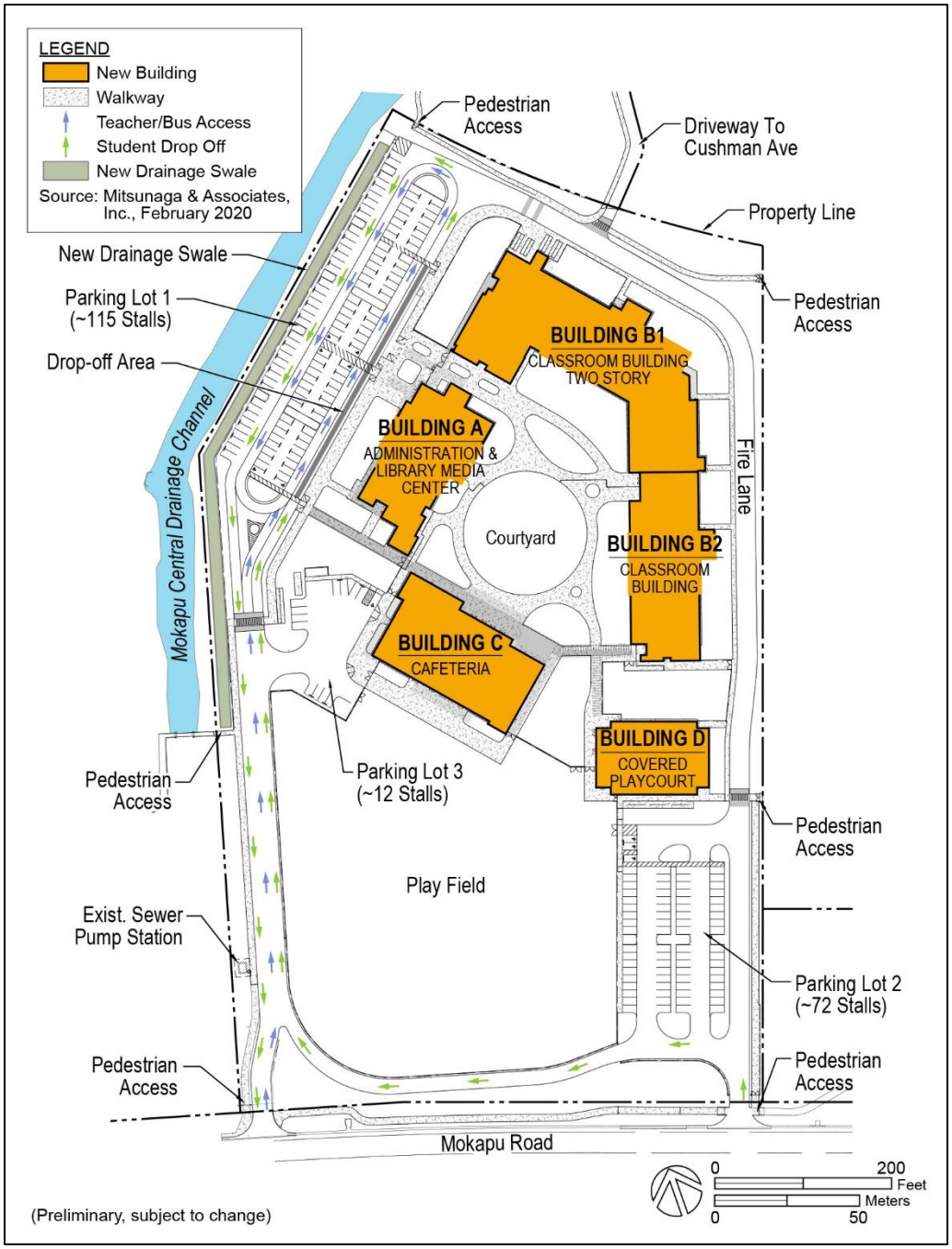


Figure 2-1 Preferred Alternative Site Plan

As shown in green directional arrows in the figure, vehicles dropping off (or picking up) students would enter campus from Mōkapu Road, in the southeast corner of campus. The vehicles would proceed to the west on the south side of the new playfield (parallel to Mōkapu Road), then turn north, proceeding to a student drop-off (and pick-up) area fronting Building A (Administration/Library/Media Center). Vehicles would then continue north, then loop back to the west and south, where they would exit onto Mōkapu Road in the southwest corner of campus. School staff and school buses would access campus from the southwest driveway, proceeding north to the parking lot and drop-off area fronting Building A (route shown in blue directional arrows).

Paved walkways would be provided along the new driveways to safely accommodate pedestrians and bicyclists, including at the driveway from Cushman Road to campus, which would be upgraded and improved with a multi-use path. The two existing pedestrian footbridges that cross MCDC on the west side of campus would be retained.

A fire lane would be aligned along the eastern boundary of campus, extending north from the 72-stall parking lot. The fire lane would provide for continuous vehicular access around the campus perimeter, along with secondary vehicular access via the driveway that links the campus to Cushman Avenue on the north.

Outdoor Elements

In addition to enclosed buildings, the Preferred Alternative includes outdoor components for school-wide assemblies, outdoor learning activities, and group and individual play. A grassed courtyard encircled by the four main school buildings would serve as a focal point and a core campus gathering place for large assemblies. Smaller, enclosed play yards adjacent to the classroom buildings would provide separate play areas for pre-kindergarten and lower grade elementary students. The Preferred Alternative includes covered *lanai* (porch or veranda) that would provide shaded areas for gathering, rest, outdoor instruction, and other activities. A covered playcourt would be located on the east side of campus. The existing large playfield at the north end of the site, where new campus buildings would be constructed, would be replaced at the south end of the site fronting Mōkapu Road.

Landscape design would follow LEED guidelines and incorporate Hawaiian cultural plants, as appropriate to the site conditions and maintenance limitations (e.g., minimum of 50 percent Native Hawaiian species for new trees, shrubs, and ground covers).

Utilities and Infrastructure

The Preferred Alternative includes construction of new potable water, electrical, wastewater, mechanical, storm drainage, and telecommunications systems.

The potable water system would include domestic, irrigation, and fire protection systems via a new 8-inch lateral connecting to the existing 12-inch water main in Mōkapu Road. A new landscape irrigation system would be installed as appropriately treated reclaimed water is not available for irrigation use at this site.

Electrical service would originate from an existing junction box in Mōkapu Road adjacent to the southeast corner of the campus (connected to a nearby substation via existing duct lines in Mōkapu Road).

The existing on-site sewer lift station located along the west boundary south of the portable classrooms would serve as the sewer point of connection and be improved with upgraded pumps.

Water cooled package unit air conditioning systems are proposed for the classroom, administration, and library buildings, with mechanical design following—at a minimum—American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards. Each building would have its own power and water meters.

A new on-site network of inlets and piping would convey stormwater runoff from around the new facilities to stormwater quality units, then discharged to the MCDC. The new drainage detention swale proposed to be aligned parallel to the MCDC within the school property is designed to move the 100-year floodplain out of the proposed facilities' footprint and provides additional detention capacity as a

stormwater quality unit. The new swale (shown in Figure 2-1) would be approximately 16 feet wide, with riprap sides for stability and a permeable surface at the bottom (approximately 3 feet wide) to allow for infiltration. For safety reasons, fencing would be installed on both sides of the swale to prevent unauthorized access by students or others. To facilitate maintenance (i.e., vegetation clearing), a concrete runner would be installed under the fence along its full length to inhibit vegetation growth beneath the fence. The specific design of the stormwater detention swale would be adjusted as project design proceeds and various low impact development (LID) strategies are developed for the project. The detention system would be sized to accommodate, at a minimum, the increase in runoff from existing conditions and limit discharge from the site to pre-development levels to meet the requirements of City and County of Honolulu Department of Planning and Permitting (DPP). The design will also meet Section 438 of the Energy Independence and Security Act of 2007.

New telephone fiber optic cable and cable television (CATV) to serve the campus would originate from existing Hawaiian Telcom infrastructure on Harris Avenue. The route has not yet been confirmed, but the preferred connection point is from an existing cable junction box within a nearby Hana Like cul-de-sac, entering the school campus from the north. Trenching for any new subsurface ducts would occur in previously developed areas such as roadway rights-of-way or landscaped areas.

2.3.2.2 Phasing

In order to efficiently construct the proposed campus improvements while minimizing disruption to school operations and the learning environment, the project would be implemented in three general construction phases, as described in Table 2-2. (Note: Each phase includes multiple sub-phases; actual construction sequence will be determined by the contractor.)

2.3.2.3 Construction Process

Actual construction methodology would be established by the contractor. However, the construction process would generally be as described below.

Site preparation for this alternative would include site clearing and grubbing and site grading. Construction period best management practices (BMPs) would be established at the site, including erosion, dust, and sediment controls to prevent offsite effects. Construction equipment and vehicles would be mobilized to the site. Construction staging and contractor parking areas may be established on site or at an adjacent overflow parking area adjacent to the east of Mōkapu ES on Mōkapu Road. HIDOE would secure the appropriate approvals from MCBH (e.g., real estate license or lease, Command authorization, etc.) prior to project implementation.

Soft and/or organic soils unsuitable for construction may be removed and backfilled with layer of non-expansive granular fill material to reduce the potential for structural distress from the swelling of on-site expansive clayey soils.

The new offsite telecommunications (including CATV) infrastructure route has not been confirmed, but will likely involve using existing underground duct lines in the Hana Like neighborhood and a short run of new duct lines to bring the fiber cable into the campus from the north. Alternatively, new duct lines (likely PVC duct lines encased in a concrete jacket) installed in roadways, sidewalks, and landscaped areas may be necessary. A possible route for new duct lines may be from Harris Avenue to Lawrence Road. General construction practices for similar work in roadways include sawcutting and trenching, followed by backfill. Additional handholes or manholes may be required for cable pulling purposes. To access the campus from Lawrence Road, the line would cross under the MCDC. A 24- to 30-inch HDPE

pipe would be installed at least 5 feet below the bottom of MCDC through directional drilling (i.e., not open trenching). In this scenario, the new CATV cables would cross under the MCDC into campus within the concrete-encased HDPE pipe. Because it involves property outside the current area leased by HIDOE, the new telecommunications infrastructure may require a real estate agreement with MCBH.

Table 2-2 Preferred Alternative: Preliminary Construction Phasing

PHASE 1	
Sub-Phase	***Description***
1A	• Demolition of existing play structures and covered areas on the eastern portion of the school. • Construction of four (4) Modular Buildings to be used as Portable Classrooms and temporary asphalt concrete fire lane • Demolition of existing portables on the western portion of the school and clearing and grubbing for the construction of the drainage swale • Site preparation for the construction of the Buildings A and B, such as utility relocation, construction of the temporary fire lane, construction of the modular buildings on the east side of campus, and construction of the drainage swale along the Mōkapu Central Drainage Channel
1B	• Clearing and grubbing of the existing playfield and demolition of portables on the western portion of the school • Construction of Building A (Administration and Library Building) and Buildings B1 (2-story Classroom Building) and B2 (3-story Classroom Building), 115-stall parking lot, portions of the driveway loop, portion of the courtyard, and drainage swale • Construction of the parking lot and portions of the driveway loop
1C	• Demolition of the western driveway entrance. • Construction of the new western driveway entrance
PHASE 2	
2A	• Demolition of the eastern driveway entrance • Construction of the new eastern driveway entrance
2B	• Demolition of all existing school buildings excluding the cafeteria, electrical buildings, and sewer lift station • Construction of Building C (Cafeteria Building), Building D (Covered Playcourt), portions of the playfield, balance of the courtyard, and 12-stall parking lot
2C	• Demolition of the existing cafeteria building and electrical building • Construction of 72-stall parking lot, driveway connecting eastern and western driveway entrances, and the balance of the playfield

2.3.2.4 Operations

After completion and relocation of existing school functions into the new facilities, school operations are expected to generally reflect hours and levels of activity as would occur without the project. While the design enrollment of 975 students is greater than the school's Fall 2019 enrollment of 879 students, this reflects the projected future enrollment with or without the project due to expected fluctuations in USMC personnel and family members (historic enrollment levels have periodically been in the 950-student range). In other words, the projected enrollment is a function of the MCBH Kaneohe Bay population and demographics (which is, in part affected by national defense strategy and global geopolitics), and not a function of the campus improvements.

2.3.3 Partial Reuse Alternative

2.3.3.1 Overview and Components

The Partial Reuse Alternative would construct approximately the same floor area as the Preferred Alternative, although in a different configuration. In this alternative, five existing buildings would be retained—Buildings C, F, O, Q (classroom buildings), and J (library) (see Figure 2-2). Only Buildings O and Q—which are the most recently built and have larger classrooms—would remain as classroom space. Buildings C and F would be converted to an administrative wing, with an addition constructed to join the two buildings along their east ends. Building J (library) would be retained and expanded with a new addition.

Because the existing classroom buildings are all one-story structures, retaining five of the buildings would result in a larger overall footprint (approximately 10,000 GSF) than the Preferred Alternative.

A portion of the existing parking lot would also be retained and expanded to provide more parking, off-street queuing, and a consolidated drop-off area along the eastern boundary of campus. Because the majority of family housing in this community is located northeast of campus, the Administration, Cafeteria and covered playcourt are oriented towards the east and the expanded parking area. Separate playfield areas are provided for different age groups and a courtyard area next to the Cafeteria and playcourt provides space for schoolwide assemblies.

Vehicular circulation would be from Mōkapu Road (south) and the driveway to Cushman Avenue (north). A new fire lane/walkway would bisect the campus between Buildings C and O.

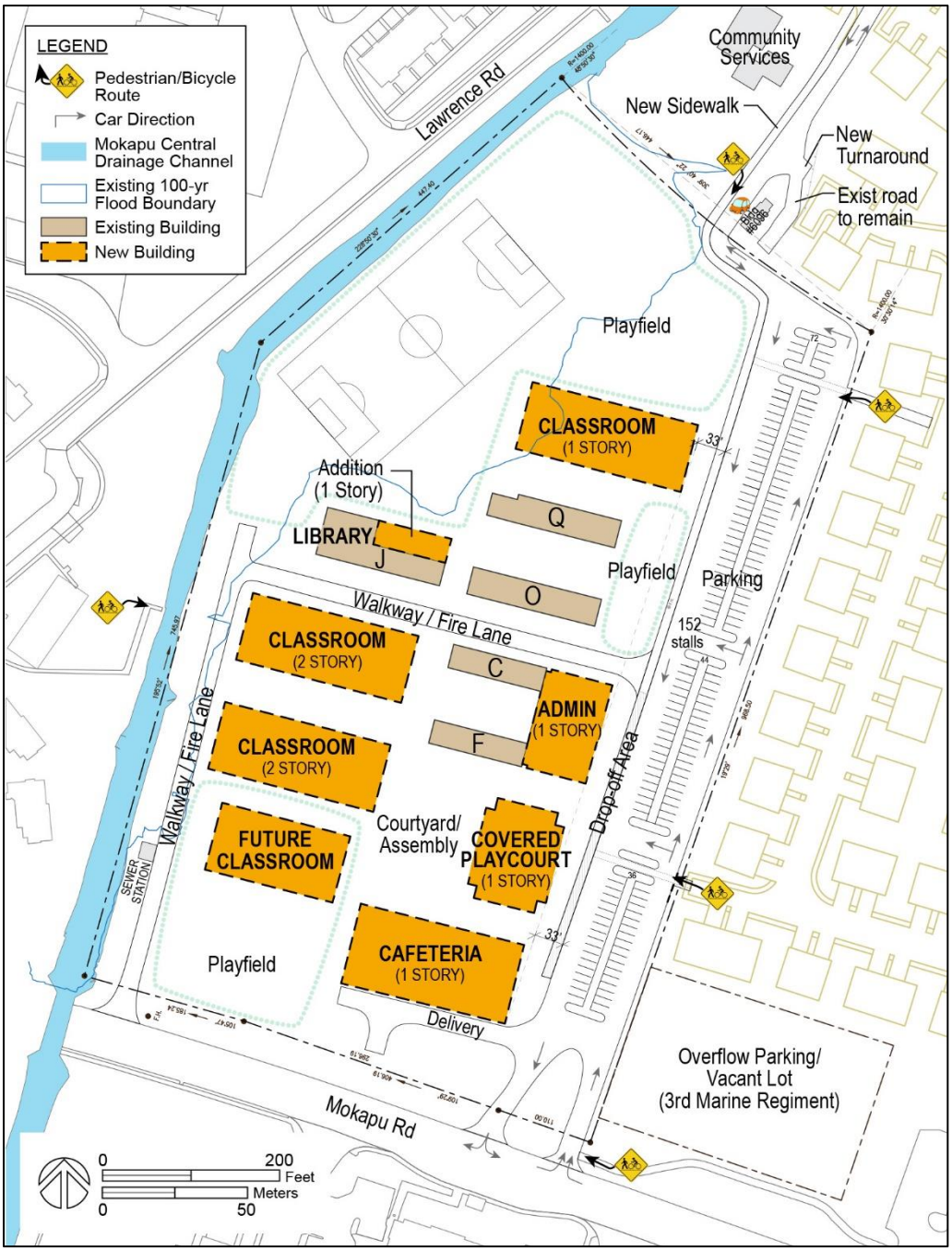


Figure 2-2 Partial Reuse Alternative Site Plan

2.3.3.2 Phasing

Because a primary requirement of design and construction is that the school remain operational throughout construction, construction and renovation activities in this alternative would occur between existing buildings and in close proximity to actively used classrooms. This alternative is estimated to take between eight and ten years to complete in six construction phases, summarized in Table 2-3.

Table 2-3 Partial Reuse Alternative: Preliminary Construction Phasing

PHASE 1	
Sub-Phase	***Description***
1A	Demolish five existing portables on the western portion of the school and install of three new portables next to Buildings C and F
1B	Construct new 16-classroom building behind Building Q
1C	Begin construction of new parking lot
PHASE 2	
2A	Demolish Buildings A, B, and I
2B	Construct two new classroom buildings on site of Buildings A, B, and I
2C	Construct part of fire lane along west side of campus
2D	Renovate Library and construct addition
PHASE 3	
3A	Demolish 11 portables and 1 restroom
3B	Renovate Buildings O and Q
3C	Complete new parking lot construction
PHASE 4	
4A	Demolish Buildings D, E, and remaining restrooms
4B	Renovate Buildings C and F
4C	Construct new Administration addition on east end of Buildings C and F
4D	Construct covered playcourt, courtyard, and assembly area
PHASE 5	
5A	Demolish existing Administration Building and drop-off area
5B	Construct new Cafeteria
5C	Complete southern section of new parking lot and renovate driveways onto Mōkapu Road
PHASE 6	
6A	Demolish existing Cafeteria
6B	Construct new playfield on former Cafeteria site

2.3.3.3 Construction Process

As in the Preferred Alternative, actual construction methodology would be established by the contractor. However, the general process for this alternative would be similar in nature to the Preferred Alternative. The differences would be in a prolonged construction timeline and likely more stringent BMPs for dust and noise control due to the closer proximity and extended duration of the construction activities to existing classrooms and other school facilities.

2.3.3.4 Operations

After project completion, school operations are expected to be similar to the Preferred Alternative, as their design enrollments are identical. The exceptions would be differences in circulation within and to/from campus. In this alternative, vehicles would continue to access campus from the existing unpaved road from Cushman Avenue, while in the Preferred Alternative, all vehicles would access campus from Mōkapu Road (with the exception of emergency situations). In the Partial Reuse Alternative, a new vehicle turnaround area would be added near the north entrance from Cushman Avenue just north of the school property.

As in the Preferred Alternative, the Partial Reuse Alternative would incorporate LEED and other sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.

Because of this alternative's extended construction timeline and likely disruption to school operations and the learning environment, it is not the HIDOE's preferred alternative. However, it is carried through the EA analysis because it is considered a reasonable alternative.

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered, but not carried forward for detailed analysis in this EA as they did not meet the purpose and need for the project and satisfy the reasonable alternative screening factors presented in Section 2.2.

2.4.1 Alternative Sites

2.4.1.1 Alternative Sites within MCBH Kaneohe Bay

Under this alternative, a new campus for Mōkapu ES would be constructed at another site within MCBH Kaneohe Bay. Due to the lack of developable sites in areas on base that are not subject to operational, environmental, and/or safety constraints or planned for other uses, no appropriate sites to construct a new Mōkapu ES campus were identified and this alternative would not meet Screening Factor H (i.e., does not comply with the land use plan for MCBH Kaneohe Bay). Therefore, this alternative was considered but is not being carried forward for detailed analysis in the EA.

2.4.1.2 Alternative Sites in Civilian Community

Under this alternative, new facilities for Mōkapu ES would be constructed in the neighboring off-base community. Because the State of Hawai'i does not own or control adequate developable land area in close proximity to MCBH Kaneohe Bay on which to construct a new elementary school campus or add capacity to existing campuses, land acquisition via lease or purchase would be required. Compared with construction at the existing Mōkapu ES site, this would not meet Screening Factors B, C, D, F, and G, and is not considered a reasonable alternative. Therefore, it is not carried through the environmental analysis.

2.4.1.3 Alternative Schools in Civilian Community

Under this alternative, elementary and pre-kindergarten students from MCBH Kaneohe Bay would be enrolled at existing schools in the civilian community. This would double the existing enrollments of the elementary schools closest to MCBH Kaneohe Bay ('Aikahi Elementary and Kainalu Elementary). Neither school has sufficient capacity to accommodate the increase and new facilities would be required. This alternative would not meet Screening Factors B, D, and F, and is not considered a reasonable alternative. Therefore, it is not carried through the environmental analysis.

2.4.2 Greater Building Density

This alternative would utilize greater building densities than in the Preferred Alternative in order to minimize building footprint and impervious surfaces. For example, instead of two- and three-story buildings, buildings of four stories or more would be constructed—along with structured parking—to reduce the lot coverage by impervious surfaces. Due to HIDOE's design requirements for elementary schools, the Preferred Alternative limits new buildings to a maximum of three stories for classroom

buildings. Furthermore, structured parking can cost three to five times per stall more than surface parking. This alternative would not meet Screening Factors B and G and is not considered a reasonable alternative. Therefore, it is not carried through the environmental analysis.

2.5 Best Management Practices Included in Proposed Action

This section presents an overview of the best management practices (BMPs) that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that HIDOE and MCBH would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action, (2) ongoing, regularly occurring practices, or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not considered potential mitigation measures proposed for the Proposed Action. Proposed BMPs are listed below. Mitigation measures, if any are warranted, are discussed separately in Chapter 3.

Typical Construction Period BMPs

1. Install industry-standard erosion and dust control measures (e.g., dust screens, frequent watering of exposed soils, landscaping of bare earth). In particular, install 12-foot tall fence as protection between existing school facilities and the construction area.
2. Use of properly muffled construction equipment, adherence to all applicable noise regulations
3. Temporary BMPs (e.g., silt fences, storm drain inlet protection, sediment traps, and soil stabilization) and permanent BMPs (e.g., berms, cut-off ditch, and vegetative ground cover) for erosion and sediment control purposes shall conform to the Erosion and Sediment Control Plans
4. Preparation and implementation of a Traffic Control Plan, including plans for detouring, flagging operations, and construction scheduling to minimize temporary traffic inconveniences
5. Preparation and execution of a Construction Management Plan (CMP) to avoid and minimize potential impacts of multi-year, on-site construction activities and ensure construction activities do not degrade the learning environment, base readiness, or quality of life
6. Hazardous Materials and Waste Adherence to all applicable regulations during removal and transport of any hazardous materials or waste
7. Employment of personnel qualified to identify and handle hazardous materials if unexpectedly encountered
8. If deemed warranted, use of personal protective equipment (e.g., protective clothing, eye protection, and respirators) during demolition activities to protect personnel from hazardous materials or waste
9. Employment of BMPs required as conditions of the National Pollutant Discharge Elimination System (NPDES) permit, if any

BMPs for Biological Resources

1. Avoid clearance of woody vegetation taller than 15 feet between June 1 and September 15 (Hawaiian Hoary Bat pupping season)

2. Installation of exterior lighting that minimizes risks to protected species and other wildlife. Specific features will be determined during project design (e.g., fixtures compliant with International Dark-Sky Association standards)
3. A qualified biological monitor, who has the requisite natural resources background, will develop an Endangered Species Awareness field guide that identifies the listed species that could occur within the general project areas, distribute it to those involved in the project, and provide a brief to the project personnel and contractors. The brief will include but not be limited to describing the federally-listed species within and adjacent to the project site, identify precautions to take when operating machinery around foraging birds, identify who to notify in the event of an injury or death of one of the species of concern, and describe actions to take to reduce attracting birds to the construction site to ensure that construction activities do not result in adverse impacts to listed species.
4. Prompt elimination of standing water found on the construction site

BMPs for Cultural Resources

1. Archaeological monitoring during ground disturbing construction activities

This page intentionally left blank.

3 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this Environmental Assessment (EA). In compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and Department of Navy guidelines; the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

"Significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would be expected to be significant.

Under HRS 343, the environmental review process typically begins with the development of a Draft EA, an informational document prepared by the proposing agency (or private applicant) to evaluate the potential environmental impacts of a proposed action. If the agency proposing or approving the action determines that the project may have a "significant" environmental impact, an environmental impact statement (EIS) would be prepared. If the agency determines that the project will not have a significant impact it issues a FONSI. According to HRS 343-2, "significant effect" means "the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic welfare, social welfare, or cultural practices of the community and State." In most cases, an agency determines that an action may have a significant impact on the environment if it meets certain criteria (see Chapter 7 Findings and Anticipated Determination for list of criteria and analyses).

This section addresses potential impacts on the following resources: air quality, water resources, geological resources, cultural resources, biological resources, transportation, natural hazards, public health and safety, and hazardous materials and wastes.

The potential impacts to the following resource areas are considered to be negligible or non-existent so they were not analyzed in detail in this EA:

Land Use: Under Proposed Action, land use would remain the same as under existing conditions. The area leased by HIDOE from MCBH would remain in use as a public school campus, although the footprints of the school facilities would change in size and location within the leased area. Therefore, land use requires no additional analysis in this EA.

Visual Resources: Under the Proposed Action, new two- and three-story classroom buildings would be constructed, which would alter views into the campus from adjacent roadways. However, the introduction of multiple story buildings on campus would not affect views identified in County planning documents as important, scenic, or recommended for maintenance or enhancement (e.g., views from public roads towards the shoreline, sandy beach dunes of Mōkapu Peninsula). Therefore, no additional analysis of visual resources is needed in this EA.

Airspace: Construction and operation of the Proposed Action would not involve impacts to military or civilian airspace or facilities. The proposed school facilities would not extend into the approach or departure surfaces of any civilian or military airport or airfield or involve changes in the use of airspace at MCBH Kaneohe Bay. Therefore, no additional analysis is required with respect to airspace impacts.

Noise: Construction of the Proposed Action would result in short term, intermittent noise impacts from the operation of heavy equipment, power and hand tools, and construction vehicles throughout the project area. However, these impacts are not anticipated to be significant as they would be short term and temporary in nature and construction activities would be conducted in accordance with HAR Chapter 11-46 Community Noise Control. During operation of the Proposed Action, school activities would be similar to existing conditions and not expected to result in perceptible changes to the ambient noise environment. Therefore, additional analysis of noise impacts is not needed in this EA.

Infrastructure: The Proposed Action would require replacing and upgrading connections to existing on-base transmission infrastructure for electrical power, potable and fire protection water, and telecommunications to meet code requirements. Equipment in the existing sewer lift station located on campus would be upgraded and a new storm drainage swale would be constructed. Infrastructure construction and installation activities related to the Proposed Action may result in temporary interruptions in service; however, the contractor would coordinate the activities with the MCBH Kaneohe Bay Facilities Department and HIDOE to minimize any inconvenience to surrounding users. The project is being designed to provide adequate utilities service to the redeveloped school and its operations are unlikely to result in adverse impacts to on- or off-base utilities and infrastructure systems. In an April 8, 2020 letter, the City and County of Honolulu Board of Water Supply noted that the existing water system is adequate to accommodate the proposed development (see Appendix G). Because the impacts to infrastructure are not likely to cause an unacceptable impairment of utility services to MCBH Kaneohe Bay or the surrounding civilian communities, detailed environmental analysis is not warranted in this EA.

Socioeconomics: Construction and operation of the Proposed Action would not impact population; long-term employment/industry characteristics; demand for schools, housing, recreational facilities; or demographic, economic, or fiscal conditions of the City and County of Honolulu or State of Hawaiʻi. Economic benefits of construction job creation would be temporary and associated with project construction. After its completion, the new school facilities would serve a student population that would occur with or without the project and there may be a negligible increase in school staffing. Therefore, the project would not result in secondary impacts related to increasing development capacity or population growth.

Environmental Justice: The Proposed Action would generally result in short-term and temporary construction period impacts that would be limited to the local project area and avoided or minimized through BMPs and adherence to environmental permit conditions (see Section 2.5). Construction activities would be contained within the boundaries of MCBH Kaneohe Bay and not affect off-base

communities. As the phases of construction proceed at different locations within the Mōkapu ES campus, each construction area would be secured and monitored to prevent unauthorized entry and potential exposure to injury or hazardous materials. During the operational period, school activities would comply with federal and state requirements if hazardous materials are used, handled, or stored on campus, and disposed of in accordance with applicable regulations. Therefore, analyses in this EA indicates that construction and operation of the Proposed Action would not result in disproportionately high and adverse human health or environmental effects on any minority or low-income populations, including off-base population groups.

3.1 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases. Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

3.1.1 Regulatory Setting

3.1.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining the air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO^2), nitrogen dioxide (NO^2), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM^{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM^{2.5}$), and lead (Pb). CO, SO^2, Pb, NO^2, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone, NO^2, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes.

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for these pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

The State of Hawaii regulates ambient air quality standards defined in Chapter 11-59 of the Hawaii Administrative Rules. State standards have been established for particulate matter, SO^2, NO^2, CO, ozone and Pb. The State has also set a standard for hydrogen sulfide (H^2S).

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment.

3.1.1.2 General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their

precursors) exceed specified thresholds. This rule is not applicable for this project as there are no nonattainment or maintenance areas in Hawai‘i.

3.1.1.3 Greenhouse Gases

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

USEPA issued the Final *Mandatory Reporting of Greenhouse Gases Rule* on September 22, 2009. GHGs covered under the Final *Mandatory Reporting of Greenhouse Gases Rule* are carbon dioxide (CO_2), methane, nitrogen oxide (NO_x), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a global warming potential. The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential rating system is standardized to CO_2, which has a value of one. The equivalent CO_2 rate is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions as carbon dioxide equivalent (CO^2e) are required to submit annual reports to USEPA.

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources the Navy and HIDOE have implemented a number of renewable energy projects. The Navy has established Fiscal Year 2020 GHG emissions reduction targets of 34 percent from a FY 2008 baseline for direct GHG emissions and 13.5 percent for indirect emissions. Examples of Navy-wide GHG reduction projects include energy efficient construction, thermal and photovoltaic solar systems, geothermal power plants, and the generation of electricity with wind energy. The Navy continues to promote and install new renewable energy projects.

3.1.2 Affected Environment

Air quality in the State can be generally characterized as relatively clean and low in pollution. The USEPA characterizes air quality by comparing concentrations of criteria pollutants to established NAAQS. The Hawai‘i Department of Health (HDOH) has established ambient air quality standards similar to the NAAQS. Criteria pollutants at the national level include carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, ozone, and lead. Based on ambient air monitoring data (most recently for calendar year 2018), Hawai‘i was in attainment of the Federal NAAQS (State of Hawai‘i, 2020). In addition, pollutant concentrations within the State comply with state standards, which are equal to or more stringent than NAAQS.

Within MCBH Kaneohe Bay, sources of airborne emissions generally include fuel combustion by aircraft engines and motor vehicles, boilers, and generators. There are no identified sources of air pollution at MCBH Kaneohe Bay that would result in non-compliance with federal or state criteria pollutant standards, including in the project area. An engine test cell and a corrosion-control hangar are covered under a HDOH Clean Air Branch “non-covered” (i.e., minor) emissions permit (NAVFAC Pacific, 2018). Motor vehicles are also considered an indirect source of air pollution. MCBH Kaneohe Bay generally

experiences overall low traffic volumes on base, although queuing may occur at the entry gates due to security inspections of visitor credentials.

3.1.3 Environmental Consequences

Project actions are considered as having significant impacts on air quality if it results in substantial adverse effect on air quality by contributing to a violation of federal or state air quality regulations of substantially increases GHG emissions.

3.1.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no impacts to ambient air quality. Therefore, no impacts to air quality or air resources would occur with implementation of the No Action Alternative.

3.1.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

Potential Impacts

Under the New Construction Alternative, there would be short-term, intermittent air quality impacts at the project area due to the operation of construction equipment, vehicles, and privately-owned vehicles. Site clearing, grubbing and grading would result in localized increases in particulate matter. Construction period BMPs would be implemented at the site, including erosion, dust, and sediment controls such as dust screens, frequent watering of exposed soils, and landscaping of bare earth (see list of typical construction period BMPs in Section 2.5. Handling and removal of hazardous materials prior to demolition activities will be conducted by qualified personnel, and contractors will take appropriate measures to comply with applicable USEPA, Occupational Safety and Health Administration (OSHA), and state regulations, and air monitoring will be conducted for lead dust and asbestos fibers, if applicable (see discussion of Hazardous Waste and Materials in Section 3.9).

During the operational period, the Preferred Alternative is not expected to significantly affect local and regional air quality, as it would not include new sources of air pollutant emissions. It would not cause significant delays in vehicle congestion to or from the school compared with the No Action Alternative, as the school enrollment is expected to be the same with or without the Proposed Action. School staffing, and its related vehicle trips, would be related to enrollment, which would be the same with or without the Proposed Action. Therefore, the Preferred Alternative would not result in significant impacts to air quality.

Greenhouse Gases

Implementation of the Preferred Alternative would contribute directly to emissions of GHGs from the combustion of fossil fuels. A rough estimate of GHG generated during the construction period was derived using the Green Footstep calculator (URL: www.greenfootstep.org; Rocky Mountain Institute, 2009) assuming construction of 162,000 sq ft of educational space on a previously developed site of about 610,000 sq ft on O‘ahu, with a total building lifetime of 50 years. The calculation indicated GHG emissions of about 43,540 tons (39,500 metric tons) over the 4-year construction period—an annual average of 10,885 tons (9,875 metric tons) of CO_2e per year from demolition, construction, and clearing activities. After the facility is operational, routine activities would generate approximately 1,973 tons (1,790 metric tons) of CO_2e each year. These estimated annual GHG emissions fall below the threshold of 25,000 metric tons of CO_2e at or above which USEPA requires suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and other facilities emitting GHGs to provide

annual reporting. This limited amount of emissions would not likely contribute to global warming to any discernible extent.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to air quality.

3.1.3.3 Partial Reuse Alternative Potential Impacts

Potential Impacts

Like the Preferred Alternative, the Partial Reuse Alternative would result in short-term, intermittent construction-related air quality impacts at the project area. However, due to its longer construction period, construction air quality impacts would be longer in duration and be located closer to existing school facilities, due to reuse and renovation of existing buildings. Construction period BMPs would be implemented, as in the Preferred Alternative, including those related to air monitoring for hazardous materials. Operational period impacts would be the same as in the Preferred Alternative, with no significant impacts on local or regional air quality as it would not include new sources of air pollutant emissions or cause significant delays in vehicle congestion compared with the No Action Alternative.

Greenhouse Gases

Implementation of the Partial Reuse Alternative would contribute directly to emissions of GHGs from the combustion of fossil fuels. A rough estimate of GHG generated during the construction period was derived using the Green Footstep calculator (URL: www.greenfootstep.org; Rocky Mountain Institute, 2009) assuming construction of 150,865 sq ft of new educational space (in addition to 22,500 sq ft of renovated space) on a previously developed site of about 610,000 sq ft on O‘ahu, with a total building lifetime of 50 years. The calculation indicated GHG emissions for both construction and operations would be slightly less than in the Preferred Alternative. During the construction period, about 42,770 tons (38,800 metric tons) of CO_2e is estimated to be generated. Because of the longer construction period (8 to 10 years), the annual average would be less than in the Preferred Alternative—4,277 to 5,350 tons (3,880 to 4,850 metric tons) of CO_2e per year from demolition, construction, and clearing activities. After the facility is operational, routine activities would generate approximately 1,840 tons (1,667 metric tons) of CO_2e each year. These estimated annual GHG emissions fall below the threshold of 25,000 metric tons of CO_2e at or above which USEPA requires suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and other facilities emitting GHGs to provide annual reporting. This limited amount of emissions would not likely contribute to global warming to any discernible extent.

Therefore, implementation of the Partial Reuse Alternative would not result in significant impacts to air quality.

3.2 Geological Resources

This discussion of geological resources includes topography, geology, and soils of a given area. Topography is typically described with respect to the elevation, slope, and surface features found within a given area. The geology of an area may include bedrock materials, mineral deposits, and fossil remains. The principal geological factors influencing the stability of structures are soil stability and seismic properties. Soil refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility determine the ability for the ground to support structures and facilities. Soils are typically described in terms of their type,

slope, physical characteristics, and relative compatibility or limitations with regard to particular construction activities and types of land use.

3.2.1 Regulatory Setting

Consideration of geologic resources extends to prime or unique farmlands. The Farmland Protection Policy Act (FPPA) was enacted in 1981 in order to minimize the loss of prime farmland and unique farmlands as a result of federal actions. The implementing procedures of the FPPA require federal agencies to evaluate the adverse effects of their activities on farmland, which includes prime and unique farmland and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects.

3.2.2 Affected Environment

3.2.2.1 Geology

Mōkapu Peninsula consists of about 2,950 acres formed by four Pleistocene cinder cones and associated lavas and a younger Pleistocene limestone bench (Macdonald and Abbott, 1970 in International Archaeology, June 2020. Major landforms on the peninsula include Ulupaʻu Crater to the northeast (about 630 feet above mean sea level [MSL]), Puʻu Hawaiʻiloa in the center (340 feet MSL), Pali Kilo and Pyramid Rock to the northwest, extensive dunes along the north coast, and wetlands and shallow ponds formed by the Nuʻupia fishponds, consisting of Nuʻupia Pond, Halekou Pond, and Kaluapuhi Pond, along the southeast coast.

The Mōkapu ES project area occupies a flat plain in the central portion of the peninsula over an area of former marshland extending north from Halekou Pond that was filled during extensive mid-20th century land reclamation actions. Recent geotechnical boring in the project area (Geolabs, Inc., 2020 in International Archaeology, 2020) offers detailed information about the current status of fills and natural sediments in the project area. Twelve borings on the Mōkapu ES property generally encountered surface fills underlain by coralline deposits, highly weathered volcanic tuff, and medium hard to hard volcanic tuff formation. The investigations indicated that the site is covered with between 1.5 and 8 feet of fill, which includes clayey silt, sandy silt, sandy clay, and silty sand, to basalt cobbles and coralline sand. In the southwestern portion of the project area, i.e., the area of the former marshland, the bores encountered terrigenous, grayish-brown clayey silt below the fill at seven feet below surface. Based on the boring results, it is reasonable to interpret this layer of clayey silt as representing buried wetland deposits.

3.2.2.2 Topography

Although Mōkapu Peninsula is topographically diverse, and includes shoreline areas at mean sea level (MSL) along with several prominent geological features that rise several hundred feet above MSL, developed areas of the base are generally flat with elevations ranging from MSL to about 20 feet above MSL (NAVFAC PAC, 2018). The Mōkapu ES project area is generally level, with the highest point about 10 feet MSL in the northeast corner and the lowest point about 4 feet above MSL along the western side of the playfields. Most of the campus is at an elevation of about eight feet above MSL, sloping to about four to five feet above MSL along the western boundary towards MCDC. The road leading north from campus to Cushman Avenue is about eight feet above MSL.

3.2.2.3 Soils

According to U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) soils classifications, there are three general soil types found on the project area, as shown in Figure 3-1. The northern portion of the site is characterized by Keaau clay (KmA), 0 to 2 percent slopes. This soil is poorly drained with negligible runoff. It consists of very dark grayish-brown and dark brown mottled clay above a white to very pale brown reef limestone or consolidated coral sand. Mamala stony silty clay loam (MnC), 0 to 12 percent slopes, is found in the southeastern section of the project area. This soil is found on coastal plains, is well drained, with medium runoff properties. It has a dark reddish brown stony silty clay loam surface stratum capping a reddish brown silty clay subsoil. The southwestern section of the project area, roughly coincident with the former wetland, is primarily fill land, mixed (FL). This soil is well drained, with low runoff properties.

The Land Study Bureau (LSB) of the University of Hawaiʻi prepared an inventory and evaluation of the State's land resources during the 1960s and 1970s. The LSB evaluated the quality or productive capacity of certain lands for selected crops and overall suitability for agricultural use. A five-class productivity rating system was established with "A" representing the class of highest productivity and "E" the lowest. The project area is not classified by LSB.

The Agricultural Lands of Importance in the State of Hawaiʻi (ALISH) land classification system was developed by the State Department of Agriculture in 1977. The project area is located in urbanized lands that are not classified under the ALISH system.

Soils present at the site are not considered prime or unique farmland.

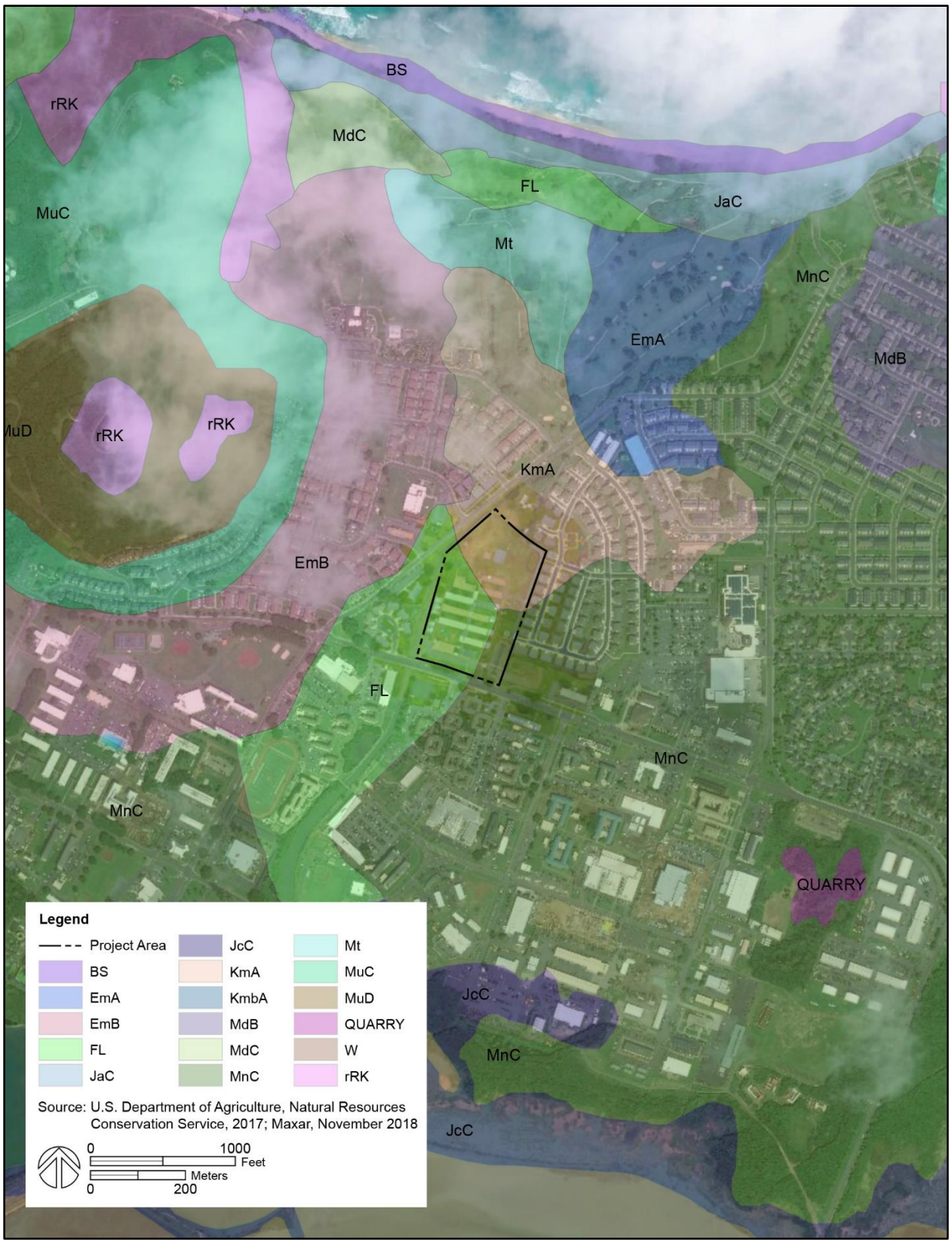


Figure 3-1 NRCS Soil Classifications

3.2.3 Environmental Consequences

Geological resources are analyzed in terms of drainage, erosion, prime farmland, and land subsidence. The analysis of topography and soils focuses on the area of soils that would be disturbed, the potential for erosion of soils from construction or operational areas. The potentially affected environment for geological resources is limited to lands that would be disturbed by any proposed facility development or demolition.

3.2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline geology, topography, or soils. Therefore, no impacts to geological resources would occur with implementation of the No Action Alternative.

3.2.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

The study area encompasses the proposed construction and ground disturbance areas related to the Preferred Alternative. Construction of this alternative would result in ground disturbance to remove soils unsuitable for construction and to install subsurface infrastructure, backfill and compaction with selected granular fill, demolition and removal of the existing buildings, and construction of a new drainage swale. During operations, no further ground disturbance is anticipated.

Geology

No significant geological features would be altered by construction or operation of this alternative.

Topography

Portions of the project area would be graded to provide suitable conditions for constructing the new facilities and a new drainage swale would be excavated and be aligned parallel to the MCDC. Construction period BMPs, such as those listed in Section 2.5, will be implemented to avoid and reduce erosion and sediments to reach receiving waters from these changes to the site's topography. During the operational period, no changes to topography are anticipated.

Soils

As noted above, construction period ground disturbance associated with site and building foundation preparation would be required for this alternative, along with excavation and construction of a new storm drainage swale. Construction period BMPs (see Section 2.5) and conditions of the project's NPDES permit would avoid or reduce the potential for soil erosion and subsequent offsite transport of sediments. Soils that are unsuitable for building foundations would be excavated and replaced with non-expansive granular fill material. No prime or unique farmland is present at the project area and none would be impacted by this alternative.

During the operational period, this alternative is not expected to include ground disturbance or changes to soil conditions. Stormwater runoff generated at the site would be directed to on-site inlets and into stormwater quality units. Stormwater runoff would be treated to meet the project's stormwater runoff quality requirements before being discharged into the MCDC. The detention swale would address the project's stormwater runoff requirements and include a permeable bottom for infiltration. Stormwater quality units and LID strategies would improve the quality of runoff that reaches the MCDC.

Therefore, implementation of this alternative would not result in significant impacts to geological resources.

3.2.3.3 Partial Reuse Alternative Potential Impacts

The study area encompasses the proposed construction and ground disturbance areas related to the Partial Reuse Alternative, which is the same as in the Preferred Alternative.

Construction period impacts such as grading, excavation and backfill of unsuitable soils, and demolition activities would be similar to the Preferred Alternative, although they would take place over a longer duration. No significant geological features exist on the project area and none would be impacted by construction or operation of this alternative. This alternative would not impact prime or unique farmland because none are present at the site.

As in the Preferred Alternative, construction BMPs and NPDES permit conditions would avoid or reduce the potential for soil erosion and sedimentation of stormwater runoff during construction activities.

Operational period impacts to geology, topography, and soils are not anticipated with this alternative, as school operations do not include further ground disturbance or changes to landforms at the site.

Therefore, implementation of the Partial Reuse Alternative would not result in significant impacts to geological resources.

3.3 Water Resources

This discussion of water resources includes groundwater, surface water, marine waters, wetlands, floodplains, and shorelines. This section also discusses the physical characteristics of marine waters, wetlands, etc.; wildlife and vegetation are addressed in Section 3.5, Biological Resources.

Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater is used for water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. Sole source aquifer designation provides limited protection of groundwater resources which serve as drinking water supplies.

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. A Total Maximum Daily Load (TMDL) is the maximum amount of a substance that can be assimilated by a water body without causing impairment. A water body can be deemed impaired if water quality analyses conclude that exceedances of water quality standards occur.

Marine waters would typically include estuaries, waters seaward of the historic height of tidal influence, and offshore high salinity waters. Marine water quality would be described as the chemical and physical composition of the water as affected by natural conditions and human activities. Additionally, marine waters may include an area within a National Marine Sanctuary requiring an action proponent to avoid adverse water quality impacts in order to prevent damage to resources within the sanctuary.

Wetlands are jointly defined by USEPA and USACE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include “swamps, marshes, bogs and similar areas.”

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality

and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100-year and 500-year flood. Floodplain delineation maps are produced by the Federal Emergency Management Agency and provide a basis for comparing the locale of the Proposed Action to the floodplains.

Shorelines can be located along marine (oceans), brackish (estuaries), or fresh (lakes) bodies of water. Physical dynamics of shorelines include tidal influences, channel movement and hydrological systems, flooding or storm surge areas, erosion and sedimentation, water quality and temperature, presence of nutrients and pathogens, and sites with potential for protection or restoration. Shoreline ecosystems are vital habitat for multiple life states of many fish, birds, reptiles, amphibians, and invertebrates. Different shore zones provide different kinds and levels of habitat, and when aggregated, can significantly influence life. Organic matter that is washed onto the shore, or "wrack," is an important component of shoreline ecosystems, providing habitat for invertebrates, soil and organic matter, and nutrients to both the upland terrestrial communities and aquatic ecosystems.

3.3.1 Regulatory Setting

The Safe Drinking Water Act is the federal law that protects public drinking water supplies throughout the nation. Under the Safe Drinking Water Act, The USEPA sets standards for drinking water quality. Groundwater quality and quantity are regulated under several statutes and regulations, including the Safe Drinking Water Act.

The Clean Water Act (CWA) establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES) program, on the amounts of specific pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution.

The State NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES Construction General Permit for stormwater discharges. Construction or demolition that necessitates an individual permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan that is implemented during construction. As part of the 2010 Final Rule for the CWA, titled *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category*, activities covered by this permit must implement non-numeric erosion and sediment controls and pollution prevention measures.

Wetlands are currently regulated by the USACE under Section 404 of the CWA as a subset of all "Waters of the United States." Waters of the United States are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by USEPA and the USACE. The CWA requires that Hawai'i establish a Section 303(d) list to identify impaired waters and establish TMDLs for the sources causing the impairment.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into wetlands and other Waters of the United States. Any discharge of dredge or fill into Waters of the United States requires a permit from the USACE.

Section 438 of the Energy Independence and Security Act establishes storm water design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 ft^2 must "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

Section 10 of the Rivers and Harbors Act provides for USACE permit requirements for any in-water construction. USACE and some states require a permit for any in-water construction. Permits are required for construction of piers, wharfs, bulkheads, pilings, marinas, docks, ramps, floats, moorings, and like structures; construction of wires and cables over the water, and pipes, cables, or tunnels under the water; dredging and excavation; any obstruction or alteration of navigable waters; depositing fill and dredged material; filling of wetlands adjacent or contiguous to waters of the U.S.; construction of riprap, revetments, groins, breakwaters, and levees; and transportation of dredged material for dumping into ocean waters.

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

The Coastal Zone Management Act of 1972 (CZMA) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Actions occurring within the coastal zone commonly have several resource areas that may be relevant to the CZMA. The CZMA regulatory setting discussion is discussed in Section 3.6.1

Executive Order 11990, *Protection of Wetlands,* requires that federal agencies adopt a policy to avoid, to the extent possible, long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

Executive Order 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a one percent chance of inundation by a flood event in a given year.

3.3.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under water quality resources at the Mōkapu ES site on MCBH Kaneohe Bay.

3.3.2.1 Groundwater

Marine Corps Base Hawaii Kaneohe Bay—including the project area—does not lie over a drinking water source. Portions of the campus in the southwest sector of the project area are located on fill land over a

former wetland. A 2020 geotechnical engineering survey of twelve borings encountered groundwater at depths between about 4 and 14 feet below existing ground surface, which generally correspond to elevations of -4 to 1.5 feet MSL (Geolabs, 2020). Due to the proximity of the project area to Kāneʻohe Bay and the Pacific Ocean, water levels are expected to vary with tidal fluctuations and storm events, and may also vary with seasonal rainfall, time of the year, surface water runoff, and other factors.

3.3.2.2 Surface Water

There is no surface water present at the project area. The closest surface water to the project area occur at the Nuʻupia Ponds Complex, approximately 3,500 feet south of the project area. The MCDC collects and directs stormwater runoff from inland areas of Mōkapu Peninsula south to the Nuʻupia Ponds Complex, ultimately connecting to Kāneʻohe Bay. An approximately 1,200-foot-long segment of MCDC runs along the western boundary of Mōkapu ES (see Figure 1-4).

3.3.2.3 Marine Waters

The waters of Kailua Bay and outer portions of Kaneohe Bay—are designated Class A marine waters by the State of Hawaiʻi. The management objective of Class A waters is to protect the waters for recreational and aesthetic enjoyment. Marine waters surrounding Mōkapu Peninsula are classified and regulated by the State of Hawaii under Title 11 Hawaiʻi Administrative Rules, DOH, Chapter 54 Water Quality Standards. No marine waters are located within the project area.

3.3.2.4 Wetlands

There are no extant wetlands located within the project area. The nearest wetlands are found at the Klipper Golf Course and Nuʻupia Ponds Complex, approximately 2,300 feet north and 3,500 feet south of the project area, respectively.

3.3.2.5 Shorelines

The project area does not include any shoreline areas. It is approximately 3,000 feet south of the Pacific Ocean shoreline located north of the Klipper Golf Course and 4,300 feet northeast of the Kāneʻohe Bay shoreline near the installation's main gate and Nuʻupia Ponds.

3.3.2.6 Floodplains

There are two types of flood-designated areas at MCBH Kaneohe Bay: (1) flood zones designated by the Federal Emergency Management Agency (FEMA), and depicted in Flood Insurance Rate Maps and (2) floodplains specific to the MCDC, derived via independent flood studies (NAVFAC Pacific, 2017).

According to Flood Insurance Rate Map (FIRM) data produced by FEMA, the project area is located in Zone D, areas in which flood hazards are undetermined, but possible (see Figure 3-2).

Figure 3-2 Flood Zones

Mōkapu Central Drainage Channel is an approximately 6,200-foot-long channel designed to facilitate rapid flow of stormwater runoff from the relatively flat, low-lying inland areas of the peninsula to the Nuʻupia Ponds Complex, where it ultimately empties into the marine waters of Kaneohe Bay. The northern end of the MCDC originates at the southern edge of the Klipper Golf Course. From there, the channel flows south through the central area of the base, where an extensive system of box culverts, pipes, swales, and ditches conveys surface runoff into the MCDC (NAVFAC Pacific, 2017). A 2020 drainage analysis by Mitsunaga & Associates, Inc. updated 1995 and 2003 MCDC drainage studies and identified the 100-year floodplain boundary and 100-year flood elevation in the vicinity of Mōkapu ES. The updated 100-year design flood elevation was determined by using flood elevations from the 2003 MCDC drainage study and translating them to updated elevations. The current calculated 100-year design flood elevation was estimated at 7.33 feet above MSL. The proposed 100-year flood boundary is shown in relation to the Preferred Alternative site plan in Figure 3-3 (see light blue line).

3.3.3 Environmental Consequences

In this EA, the analysis of water resources looks at the potential impacts on groundwater, surface water, wetlands, floodplains and shorelines. Groundwater analysis focuses on the potential for impacts to the quality, quantity, and accessibility of the water. The analysis of surface water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality. Marine waters analysis includes potential changes to physical and chemical characteristics. The impact assessment of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland. The analysis of floodplains considers if any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters. The analysis of shorelines considers if the Proposed Action will affect shoreline ecological functions such as channel movement and hydrological systems; flooding or storm surge areas, areas of erosion and sedimentation, water quality and temperature, presence of nutrients and pathogens, and sites with the potential for protection or restoration.

3.3.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline water resources. Therefore, no impacts to water resources would occur with implementation of the No Action Alternative.

3.3.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

The study area for the analysis of effects to water resources associated with the Preferred Alternative includes the project area and potential downstream receiving waters.

Groundwater, Surface Water, Marine Waters, Wetlands, Shorelines

Because the project area does not overlie a drinking water source, no impacts to the accessibility or quality of groundwater resources are expected from the Preferred Alternative during construction or operations.

During project construction, activities such as site preparation, grading, grubbing, demolition of existing facilities, utilities trenching, and excavation of the proposed drainage detention swale may generate soil erosion, sedimentation, and transport of pollutants that could reach the MCDC and downstream surface waters such as the Nuʻupia Ponds, marine waters, wetlands, and the shoreline. Best management

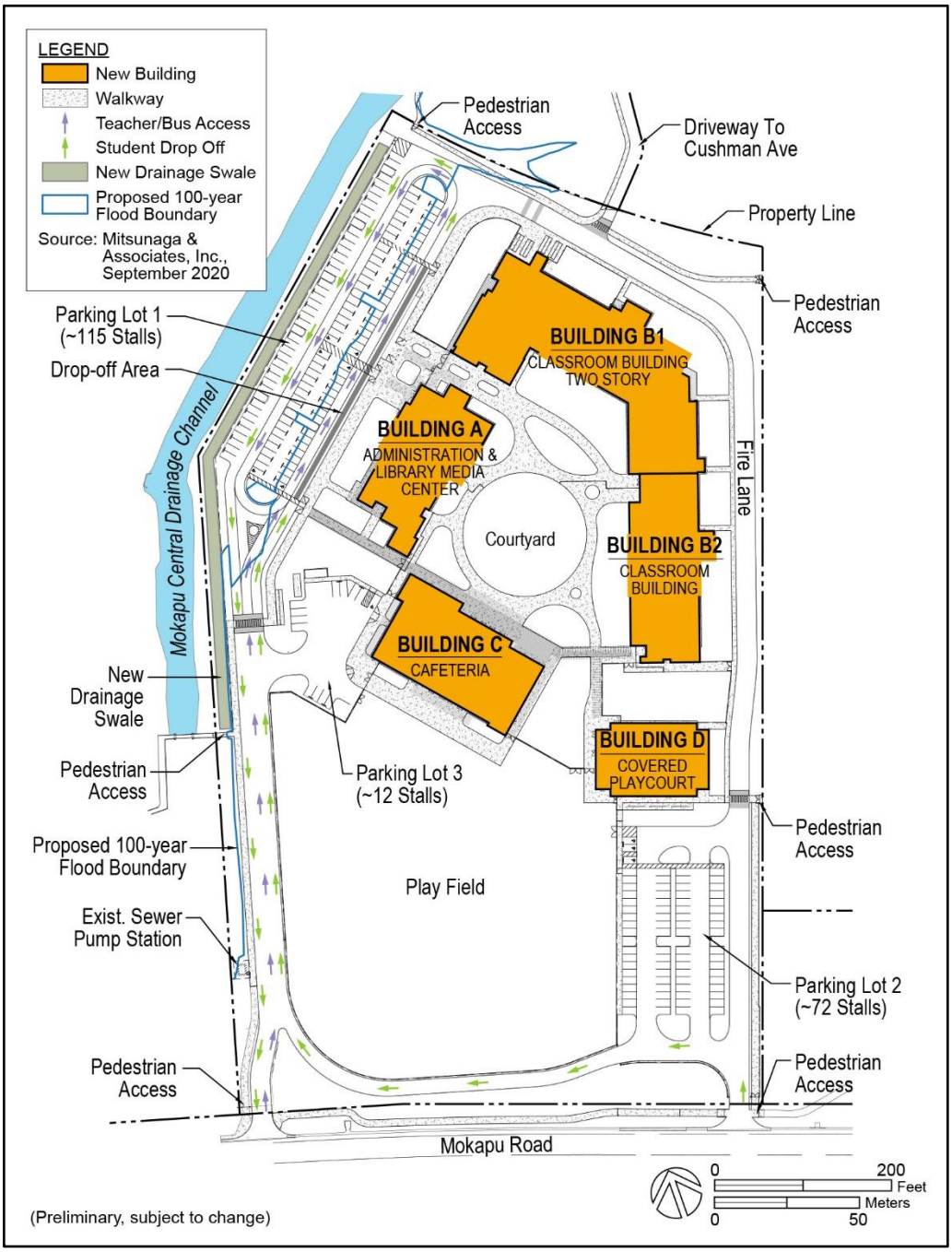


Figure 3-3 Proposed 100-Year Floodplain Boundary: Preferred Alternative Site Plan

practices described in Section 2.5, along with compliance with NPDES permit conditions, would avoid or minimize potential impacts by preventing or reducing construction-related sediments and pollutants from being transported offsite via MCDC to sensitive water resources.

During the operational period, all stormwater runoff from the project area would be directed into onsite storm drainage infrastructure, including water quality units, prior to discharge into the MCDC. In addition, other LID features will be incorporated into the project design to reduce offsite flows and potential associated water quality impacts.

Floodplains

The Preferred Alternative would construct a new drainage detention swale along a portion of the project area's western boundary. The swale would be sized to compensate for the amount of runoff conveyance lost due to the Preferred Alternative and ensure that the flood elevation does not increase from existing conditions. Stormwater runoff from the redeveloped campus would be directed to this swale, which would reduce the 100-year flood area along the alignment of the swale. The swale would have an overflow inlet that connects to an existing culvert that directs stormwater into MCDC just south of the pedestrian bridge.

The new school structures would be located outside the proposed 100-year floodplain boundary (see Figure 3-3). In addition, the proposed school buildings would be constructed at an elevation of at least 2 feet above the 100-year base flood elevation, or 9.33 feet above MSL or higher. This would provide a secondary level of protection from flooding for the new school facilities.

A portion of the project site along the western boundary is located in the proposed 100-year floodplain. This area includes the proposed drainage swale, surface parking, and pedestrian walkways. Therefore, the Preferred Alternative is subject to EO 11988 Floodplain Management. The EO requires that federal agencies follow a prescribed decision-making process for projects that have potential impacts to or within the floodplain. Specifically, an eight-step decision-making process is required to help agencies evaluate projects that have potential impacts to or within the floodplain and how the impacts can be avoided or minimized. The eight steps are summarized below.

1. Determine if the proposed action is in the base floodplain (i.e., area with a one percent or greater chance of flooding in any given year).
2. Conduct early public review, including public notice.
3. Identify and evaluate practicable alternatives to locating in the base floodplain, including alternative sites outside of the floodplain.
4. Identify impacts of the proposed action.
5. If impacts cannot be avoided, develop measures to minimize the impacts and restore and preserve natural and beneficial values of the floodplain.
6. Reevaluate alternatives.
7. Present the findings and a public explanation.
8. Implement the action.

The EO 11988 eight-step decision-making process is being conducted for the Preferred Alternative. As noted above, a portion of the project area is located in the floodplain **(*Step 1*)**. This Draft EA and publication of its notice of its availability serve as ***Step 2*** of the process.

Step 3. Alternatives to the Preferred Alternative were evaluated to determine if they were practicable, including alternative sites, alternative actions, and no action. The existing Mōkapu ES is on land leased by HIDOE from the DoD to serve students whose parents are military members assigned to MCBH Kaneohe Bay. The HIDOE does not control alternative sites on the installation outside the floodplain on which to construct new school facilities. Furthermore, as noted in Section 2.4.1.1, due to the lack of developable sites in areas on base that are not subject to operational, environmental, and/or safety constraints or planned for other uses, no appropriate sites to construct a new Mōkapu ES campus were identified. Alternate sites in the civilian community were also evaluated, but dismissed due to lack of available developable land under HIDOE's control (see Section 2.4.1.2). Using existing schools in the civilian community to address the project's purpose and need were also evaluated; however, the nearest elementary schools lack sufficient capacity to accommodate the increase (see Section 2.4.1.3).

An alternative to renovate and reuse some existing school facilities and construct eight new school structures/building additions was also evaluated; it is carried through this EA as the Partial Reuse Alternative. As described in Section 2.3.3, implementation of this alternative would take up to twice as long as the Preferred Alternative and likely result in greater disruption to school operations and the learning environment due to the difficulty of phasing work in close proximity to existing classrooms and facilities. Furthermore, one of the new classroom buildings in this alternative may encroach into the floodplain, depending on its final design. Alternative actions were also evaluated, including greater building density for the Preferred Alternative, involving four-story buildings and structured parking. As described in Section 2.4.2, this alternative would not meet HIDOE design requirements for elementary school classroom buildings. Therefore, none of the alternatives evaluated are considered practicable for this Proposed Action. No action is not practicable because existing Mōkapu ES facilities do not meet current and projected functional and space requirements for its service population. The over-capacity conditions and facility deficiencies would be unmet, and the school would not be able to accommodate its projected enrollment (that would occur with or without the project), or provide infrastructure capacity to meet modern technology requirements.

Step 4. The proposed drainage detention swale would result in relocating the floodplain boundary toward the west, generally within less than 100 feet of the swale (see Figure 3-3). Direct impacts to the floodplain involve (1) relocating the floodplain boundary by constructing a drainage detention basin (2) constructing school buildings above the estimated floodplain elevation, and (3) constructing surface parking and pedestrian facilities within the new floodplain boundaries. The existing 100-year floodplain in the upper portion of campus generally encompasses the school's existing open playfield—an area constructed by fill, grading, and landscaping (see Figure 1-4). The Preferred Alternative would result in new facilities constructed over the existing playfield, which is sometimes used as a loafing site for Hawaiian Stilt (*Himantopus mexicanus knudseni*), a federally- and state-listed endangered species. A biological resources report indicated that construction period disturbance to the stilts would likely result in them moving to another lawn area within the installation (see Appendix A). There is adjacent additional loafing and foraging habitat and the disturbance would be temporary. A replacement playfield would be located on the southern portion of the project area, creating a similar flat, open grassed area. The Preferred Alternative would not involve the placement of any permanent occupied structures within the floodplain. In addition, the new school buildings would be constructed at least two feet above the base flood elevation.

Step 5. The existing floodplain that would be affected by the Preferred Alternative is not a natural area, but was created by grading, fill, and landscaping. Although new impervious surfaces would be

introduced in the existing floodplain by construction of new school facilities, beneficial values of the floodplain would be preserved through the creation of a new detention swale, which would move the 100-year floodplain out of the proposed new facilities' footprints. The swale would have an unlined bottom, allowing runoff to infiltrate into the ground. An overflow inlet would direct runoff in excess of the swale's capacity into MCDC through existing culverts. All stormwater runoff from the project area would be directed into water quality units within the new onsite storm drainage infrastructure prior to discharge into the MCDC. The stormwater quality units (including the detention swale) would allow potential pollutants to settle out of runoff, and be routinely maintained and cleared. The replacement playfield would provide similar open, grassed loafing areas for bird species such as the Hawaiian Stilt.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to water resources.

3.3.3.3 Partial Reuse Alternative Potential Impacts

The study area for the analysis of effects to water resources is the same as in the Preferred Alternative.

Groundwater, Surface Water, Marine Waters, Wetlands, Shorelines

As in the Preferred Alternative, the Partial Reuse Alternative does not overlie a drinking water source and no impacts to the accessibility or quality of groundwater resources are expected during construction or operations.

Similar to the Preferred Alternative, construction period impacts may generate soil erosion, sedimentation, and transport of pollutants that could reach MCDC and downstream surface waters, marine waters, wetlands, and the shoreline. Best management practices described in Section 2.5, along with compliance with NPDES permit conditions, would avoid or minimize potential impacts by preventing or reducing construction-related sediments and pollutants from being transported offsite via MCDC to sensitive water resources.

This alternative does not include construction of a drainage detention swale; however, it is assumed that it would include modernization of existing on-site storm drainage infrastructure, including stormwater quality units that would reduce potential pollutants from entering sensitive downstream water resources.

Floodplains

Like the Preferred Alternative, this alternative is also located within FEMA Zone D. The proposed campus layout is shown in relation to the existing 100-year floodplain boundary in Figure 2-2. As depicted, one of the classroom buildings may encroach into the existing floodplain. No stormwater detention basin is proposed for this alternative; however, this alternative would meet all applicable requirements for collection and transmission of stormwater runoff, including, if necessary, onsite detention capability. If constructed as shown, a proposed new building would be located in the floodplain and this alternative would be subject to EO 11988 requirements, including the identification of measures to restore and preserve natural and beneficial values of the floodplain if practicable alternatives are not identified.

Therefore, implementation of this alternative would not result in significant impacts to water resources.

3.4 Cultural Resources

This discussion of cultural resources includes prehistoric and historic archaeological sites; historic buildings, structures, and districts; and physical entities and human-made or natural features important

to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Hawaiians or other groups consider essential for the preservation of traditional culture.

3.4.1 Regulatory Setting

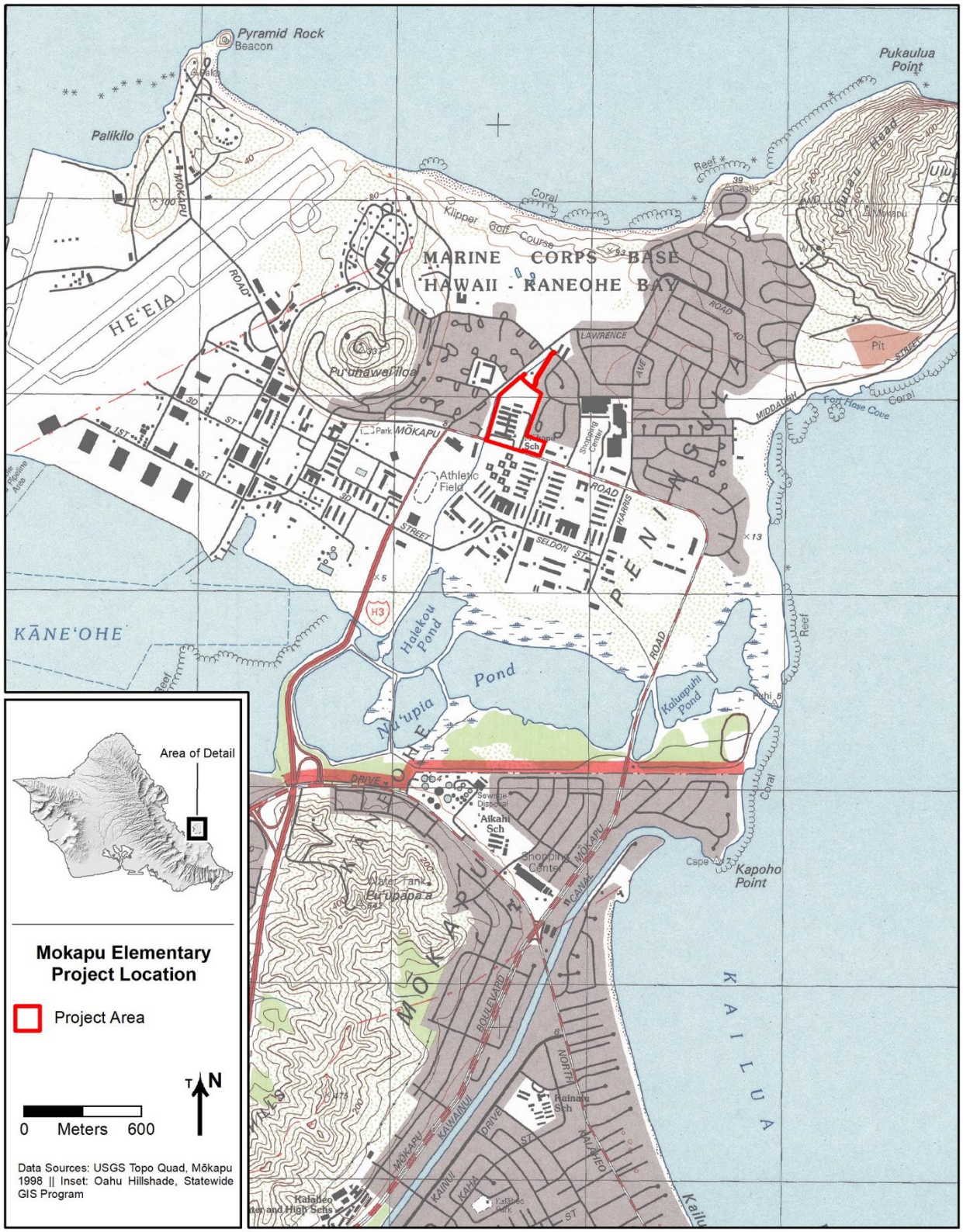
Cultural resources are governed by other federal laws and regulations, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, Department of Defense Instruction 4715.16, and Marine Corps Order P5090.2A. Federal agencies' responsibility for protecting historic properties is defined primarily by sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties. Cultural resources also may be covered by state, local, and territorial laws.

3.4.2 Affected Environment

Cultural resources listed in the National Register of Historic Places (NRHP) or eligible for listing in the NRHP are "historic properties" as defined by the NHPA. The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. The NRHP includes properties on public and private land. Properties can be determined eligible for listing in the NRHP by the Secretary of the Interior or by a federal agency official with concurrence from the applicable State Historic Preservation Office (SHPO). A NRHP-eligible property has the same protections as a property listed in the NRHP. The historical properties include archaeological and architectural resources.

Inventories of cultural resources at MCBH Kaneohe Bay have been conducted to identify historical properties that are listed or potentially eligible for listing in the NRHP, including most recently at the project area.

The area of potential effect (APE) for cultural resources is the geographic area or areas within which an undertaking (project, activity, program or practice) may cause changes in the character or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this Proposed Action, MCBH determined that the APE encompasses approximately 14.2 acres and includes an area defined as the school campus, area adjacent to the east to be used for construction staging, portions of Mōkapu Road to the south where utility connections may be made, and two pedestrian ways extending north from the campus (see Figure 3-4; also in Appendix B, Enclosure 1 of August 18, 2020 MCBH letter to Hawai'i State Historic Preservation Division [SHPD]).



Source: International Archaeology, LLC, 2020

Figure 3-4 Area of Potential Effect

Archaeological evidence suggests that Hawaiians traditionally established temporary fishing camps along the shorelines and edges of former wetlands on Mōkapu Peninsula. They practiced agriculture as well as fishing and marine resource collection. By the later pre-Contact period, permanent residences focused on subsistence activities were established at multiple locations.

Traditional small-scale subsistence farming, fishing, and salt collection continued on the peninsula through the 19th and early 20th centuries (Cordy, 1984, in International Archaeology, 2020), while post-Contact influences were reflected by the addition of a Catholic Church in the late 1830s or early 1840s on the shore adjoining Kāneʻohe Bay (Drolet et al., 1996 in in International Archaeology, 2020). According to Tomonari-Tuggle, 2014b (in International Archaeology, 2020), after the mid-19th century Mahele and Kuleana Act (the redistributions of lands), more than 25 commoners made claims to properties but none were subsequently awarded. Portions of the peninsula were used to grow *hala* (*Pandanus tectorius*) trees and crops including sweet potato *(ʻuala, Ipomoea batatas*), gourds (*ipu, Lagenaria siceraria*), and musk melon (*Cucumis melo*) (Devaney et al., 1982 and Wagner et al., 1990 in International Archaeology, 2020). Commercial agricultural and ranching activities expanded on Mōkapu Peninsula in the second half of the 19th century, extensively denuding and eroding much of the peninsula by the early 20th century (MacCaughey, 1917 and Devaney et al., 1982 in International Archaeology, 2020).

Other areas remained the property of *aliʻi*, or ruling class. In Kāneʻohe, this included 9,500 acres awarded to Queen Kalama as LCA 4452, which among other parcels consisted of the peninsular ʻili of Heleloa, Ulupaʻu, and Nuʻupia (Devaney et al., 1982 in International Archaeology, 2020). Kuwaʻaohe and two fishpond tracts, Halekou and Kaluapuhi, were designated Crown lands (Devaney et al., 1982, Lyons and Brown, n.d., and Tuggle and Hommon, 1986 in International Archaeology, 2020).

During the last decades of the 19th century, most of the peninsula was used as grazing land for cattle and horses, possibly including the project area. Grazing continued in many parts of the peninsula until the 1930s, as did the cultivation of truck farms. Based on land use data from the 1920s and 1930s compiled by Tomonari-Tuggle, 2014a in International Archaeology, 2020, there is no evidence for cultivation within the project area during the early 20th century, although there were multiple farm plots adjacent to the project area. A road cuts diagonally through the project area from southeast to northwest, possibly skirting the edge of the wetland area.

In 1918, through Executive Order 2900, President Woodrow Wilson designated 322 acres in the central portion of Mōkapu Peninsula as the U.S. Army's Kuwaaohe Military Reservation (Fort Kuwaaohe). The Army began dredging areas of Kāneʻohe Bay to clear areas for piers, boat landings, and wharves. Kuwaaohe Military Reservation deactivated at the end of World War I and subsequently leased as ranch lands (Devaney, 1982 and Tuggle and Hommon, 1986 in International Archaeology, 2020).By the middle of the 20th century, the U.S. military had acquired the peninsula for defense and training. The eastern side of Mōkapu Peninsula became the Army's Fort Hase and the western side became the Navy's seaplane base, which was commissioned Naval Air Station Kaneohe in 1941. Construction included dredge and fill operations that added 280 acres to the Kaneohe Bay side of the installation in the area around the airfield. By late 1941, there were about 150 facilities on the air station. On December 7, 1941, Naval Air Station Kaneohe was attacked by Japan. The attack focused on the airfield. During the attack, aircraft hangars and other buildings suffered varying degrees of damage and 19 people were killed (NAVFAC Pacific, 2018).

3.4.2.1 Archaeological Resources

The project area has been classified as having a low to moderate sensitivity for archaeological finds. Consistent with this categorization, previous archaeology projects near Mōkapu ES have yielded relatively few archaeological finds. The scarcity of archaeological discoveries is likely due to the highly developed nature of this portion of the peninsula; it may also reflect pre- and post-Contact patterns of local land use. Archaeologists have documented the presence of several distinctive modern fills in the vicinity. Two archaeological monitoring projects in the immediate vicinity of the project area (i.e., installation of Valve Pit B along Mōkapu Road immediately south of the project and dredging along Lawrence Road to the west of the project) yielded no archaeological finds (Prishmont et al., 2001 and Schilz et al. 1996a in International Archaeology, 2020). Backhoe test trenching of 32 trenches in advance of family housing construction immediately north and east of the Mōkapu ES campus yielded no archaeological materials or human skeletal remains (Shun, 1991 in International Archaeology, 2020).

Archaeological subsurface testing for the project was conducted by International Archaeology, LLC to identify the presence/absence of archaeological deposits and to contextualize the stratigraphic composition of the area as it relates to the potential for past land use. The fieldwork was undertaken between July 16 and July 24, 2020 to fulfill historic preservation obligations under the NHPA Section 106 and Hawaiʻi Revised Statutes (HRS) 6E-8 and Hawaiʻi Administrative Rules §13-275. All work was conducted in compliance with the Antiquities Act of 1906, the Archaeological Resources Protection Act (ARPA) of 1979, ARPA-implementing regulations (32 Code of Federal Regulations Part 229), Department of Defense Instruction 4715.16, and Marine Corps Order P5090.2A.

The subsurface testing included 11 backhoe trenches excavated across the project area and in one location north of the property where pedestrian walkways are proposed. Trench locations were placed within the school grounds around the perimeter of a former wetland that was buried during the mid-20th century by fills. The trenches were 10 to 16 feet long by 2-1/2 feet wide, with depths dictated by findings. A detailed description of the testing methodology is found in Appendix C. No archaeological deposits or human skeletal remains were encountered during fieldwork. A small number of isolated artifacts, including primarily glass bottle and metal fragments, were collected from 20th-century fills in six trenches. Selected samples of preserved botanical remains were collected from the buried wetland layers in two trenches.

According to MCBH's internal cultural resources management plan, there are no archaeological districts within the project area.

3.4.2.2 Architectural Resources

Mōkapu ES was constructed in 1960, with a new library built in circa (ca.) 1970, and two new classroom buildings added in 1994. Beginning ca. 1965, portables have provided ancillary classroom and restroom space on campus, with the number of buildings fluctuating over time.

Mason Architects, Inc. (MASON) conducted an inventory survey and evaluation of Mōkapu ES. The study area used for the architectural inventory survey conforms to the boundaries of the Mōkapu ES campus. The study area comprises the entire 14.2-acre school site. Within this study area boundary, a total of 28 buildings were identified for architectural study. This includes 18 permanent (concrete, slab-on grade) buildings (which includes covered walkways integral to their design) and 10 wood-frame portables. Pre-manufactured sheds, play equipment, and roads and driveways were not identified for inclusion in the survey.

Historical Background

Naval Air Station (NAS) Kaneohe was commissioned in 1941 and functioned in that role for the duration of World War II. The site was deactivated in 1949 after the wind down of the war. In January of 1952, the NAS was reactivated as Marine Corps Air Station (MCAS) Kaneohe, amid the United States military's renewed focus in the Pacific theater due to the Korean War.

The first Mōkapu Elementary School on base was established at NAS Kaneohe, but shuttered when the air station was deactivated. In September of 1952, the Territorial Department of Public Instruction re-opened the school within the existing facilities at MCAS. It was situated in former NAS World War II buildings located on the west side of Lawrence Road. Upon reopening, the school served about 100 children of military and civil service personnel, and within a year enrollment reached 235 students in grades K-6. Through the 1950s, enrollment continued to grow, as more Marine units were assigned to Kaneohe, in support of the Korean War. The Korean War ended in 1953, soon after the air station was activated.

The explosion of births after World War II created the baby boom generation that necessitated an unprecedented demand for new schools in the mid-twentieth century nationwide. The growth in enrollment at the original MCAS elementary school occurred in step with a similar enrollment surge in the Kailua-Kaneohe area, on trend with Oʻahu overall enrollments. The MCAS Kaneohe was no exception; the need for new classrooms and facilities was badly needed. By early 1956, the Territorial Department of Public Instruction predicted a need for three to five new schools in the Kailua area by the end of the decade. The status of the Territory of Hawaii, on the brink of Statehood, likely contributed to the demand. In addition to this estimate for Kailua, the Territorial Department of Public Instruction announced that a new elementary school for MCAS Kaneohe was "definitely needed," as student enrolment was projected to climb to almost 600 by the start of the 1956-57 school year.

In June of 1959, the year of Hawaii's Statehood, the Federal Department of Health, Education, and Welfare earmarked just over $1 million for the Territory of Hawaii to construct a new elementary school on MCAS Kaneohe, near the existing one housed in World War II buildings. The architectural firm Law & Wilson prepared drawings for the new school by the end of August that year, and in mid-September, the federal funding for the new, thirty-classroom school was approved for the Hawaii State Department of Public Instruction. The school was called "Mōkapu 2nd Elementary School" on original drawings, which was to indicate that the original elementary school on the base was still in use.

The school project was implemented by the City and County of Honolulu, Department of Buildings, under the Hawaiʻi State Department of Education. United Construction Co. was selected as the contractor based on their low bid of "$946,727 in January of 1960." Groundbreaking occurred in February, construction started around March, and the school was dedicated on December 9, 1960. Students (over 800 in total) were moved onto the campus in November of 1960.

American involvement in the Vietnam War began in 1961, soon after the school was constructed. The MCAS Kaneohe troops and squadrons trained for, and deployed to, Southeast Asia through the duration of the conflict, until its end in 1975.

Physical Development History

The original configuration of the campus, dedicated in December of 1960, consisted of the Administration building (H); the Cafetorium (G); Kindergarten building (I); five Classrooms (A, B, C, D, and

E); Library (F); as well as three toilet rooms (K, L, M). The buildings were situated on a portion of the lot about 475 feet by 825 feet, enclosed by a 4-foot-high chain link fence that defined the schoolyard.

Overcrowded schools were common in the late 1950s and early 1960s on Oahu, and Mōkapu ES was no exception. Historic drawings indicate that within just five years of completion of the Mōkapu ES campus, additional classroom space was already needed. A short row of five portable buildings consisting of four classrooms and a portable toilet (PT-1) was installed on the west side of the campus by ca. 1965. These portables were all constructed by Hicks Construction Co., Inc. Of these, only two classrooms, P1 and P2, and PT-1 remain today. By 1967, an additional portable classroom, currently P3, was added to the north end of that row.

To address the need for more permanent classroom space, drawings were prepared in 1969 for a six-classroom building (current Library, Building J). Designed by Arthur A. Kohara, Architect, for the Division of Public Works (DAGS), this classroom building would eventually be converted into the school's library. The school's central axis/walkway was extended to connect to the new building. This extension added another toilet room (N) to the campus, which was designed to match the existing school design. The original library (Building F) was renovated around 1970 as well, and would be converted into a classroom building around 1987. Also, around 1970, the schoolyard fence line was moved out at the north and east sides to expand the schoolyard to the limits of the lot lines.

Drawings dated 1973 show that P6 and P7 (plus another non extant portable located where P10 is today) were brought to the campus from Benjamin Parker Elementary School, Kaneohe, at that time. Plans prepared in 1974 show that two portable classrooms (not extant) from Pearl Ridge Elementary were added at the north end of the west row of portables.

In 1982 a new paved play court, approximately 80 feet by 100 feet, was installed in the schoolyard north of the campus buildings. This is currently defined by two basketball courts. It was installed adjacent to an existing 50-foot by 50-foot paved play court that had been built at a previous, unknown date. In 1986, the Pearl Ridge Elementary portables were relocated to Kanoelani Elementary School, along with the northernmost portable on the eastern row of portables.

Around 1987, the school's original library (Building F) was converted into a classroom building, and renovations were performed at Buildings A and B (original double sliding doors to the classrooms were removed and the openings filled with single, hinged wood doors and concrete masonry unit [CMU] infill).

Portable classrooms P4 and P5 were both added ca. 1988. Portable classroom P9 was installed ca. 1992. By 1993, Mōkapu Elementary was enrolled to its full capacity of 865 students, and an additional 450 military students in the area attended off base schools in Kailua (including elementary students). Requests for bids on the construction of two 4-classroom buildings were announced in newspapers that same year. Two new reinforced concrete classroom buildings (Classroom Buildings O and Q) were completed ca. 1994, designed by Vernon Kim & Associates under DAGS. P10 was installed by 1997.

Architectural Description

The original 1960 portion of the Mōkapu ES campus was designed with its one-story buildings (or "fingers") arranged in parallel rows, and connected to a central spine or axis. The long, straight, covered walkway (axis) incorporates three covered multi-purpose areas with skylights, as well as restroom facilities (Buildings K, L, M). The school buildings were constructed with pre-cast concrete beams, slab on grade foundations, and CMU exterior walls and essentially flat roofs. Precast concrete grilles and

breeze block screens are used liberally throughout the school, to define the outer walls of central walkway spine, as decorative elements at the multipurpose areas, as well as on the south side of each classroom building for screen walls.

Each of the original classroom buildings has an almost continuous bank of jalousie windows along its north side, and a covered walkway along its south side, separated from its neighbor by a grassy courtyard/outdoor space. Original drawings indicate the original windows contained glass jalousies that have since been replaced with a composite material. The double-height Cafetorium has large clerestory windows.

Buildings O and Q, constructed at the north ca. 1995, are generally in keeping with the original layout. Their construction details are different, yet generally compatible with the original campus buildings.

Historical Significance

To qualify as eligible for listing on the National Register of Historic Places, an historic property must meet at least one of the following four NRHP criteria:

(A) associated with events that have made a significant contribution to the broad patterns of our history; or

(B) associated with the lives of persons significant in our past; or

(C) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) have yielded, or may be likely to yield, information important in prehistory or history.

A property must also retain its historic integrity and generally be at least 50 years old in order to be eligible for the NRHP. Integrity ensures that the property conveys its significance through its physical features. The NRHP's seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association.

The Mōkapu ES buildings built between 1960 and 1970 are evaluated as eligible for the Hawaii State and National Registers of Historic Places under Criteria A and C. The buildings constructed after ca. 1970 are evaluated as not eligible. See Table 3-1 for a summary the resources evaluated and their significance evaluations. A detailed listing of the facilities surveyed is included in Appendix D, with photographs.

Table 3-1 Summary of Mōkapu ES Historic Resources Evaluation

Original Name/ Subsequent Name	*Year Built*	*Significance Evaluation*
Classroom A	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.
Classroom B	1960	Eligible (same as Classroom A).
Classroom C	1960	Eligible (same as Classroom A).
Classroom D	1960	Eligible (same as Classroom A).
Classroom E	1960	Eligible (same as Classroom A).

Original Name/ Subsequent Name	*Year Built*	*Significance Evaluation*
Library/ Classroom F	1960	Eligible (same as Classroom A). Originally served as the school's library, later converted to a classroom.
G (Cafeteria)	1960	Eligible (same as Classroom A).
H (Administration)	1960	Eligible (same as Classroom A).
Kindergarten Classroom/ I	1960	Eligible (same as Classroom A).
Six Classroom Building (J)/ Library	ca. 1970	Eligible (same as Classroom A).
Toilet & Janitor Storeroom/ K	1960	Eligible (same as Classroom A).
Toilet/ L	1960	Eligible (same as Classroom A).
Toilet/ M	1960	Eligible (same as Classroom A).
Toilet/ N	ca. 1970	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.
O	ca. 1994	Not eligible. Although this building was added to the campus ca. 1994 in a compatible manner and design, it does not meet the exceptional importance threshold under National Register Criteria Consideration G for individual listing, nor is it eligible as a contributing element. (Properties less than 50 years in age are not eligible for listing on the Hawaii Register.)
P1	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.
P2	ca. 1965	Eligible (same as P1).
P3	ca. 1967	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation.
P4	ca. 1988	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.
P5	ca. 1988	Not eligible (same as P4).

Original Name/ Subsequent Name	*Year Built*	*Significance Evaluation*
P6	ca. 1973	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register. Should be re-evaluated in 2023, when it reaches 50 years.
P7	ca. 1973	Not eligible (same as P6). Should be re-evaluated in 2023, when it reaches 50 years.
PT-1	ca. 1965	Eligible (same as P1).
P9	ca. 1992	Not eligible. Does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.
P10	ca. 1997	Not eligible (same as P9).
Q	ca.1994	Not eligible (same as O).
Sewage Lift Station	1960	Eligible (same as Classroom A).
Electrical Room/ Transformer vault	1960	Eligible (same as Classroom A).
Mason Architects, Inc., 2020		

Under Criterion A, the Mōkapu ES campus is associated with both national and local events that "have made a significant contribution to the broad patterns of our history." Mōkapu ES is an intact representation of a program to build new elementary schools across the nation in the mid-twentieth century. The preceding Great Depression and World War II had impaired new school construction and building maintenance for decades and new elementary schools were needed to accommodate exploding enrollments, as the children of the Baby Boom generation (born 1946-1964) began to reach school age. These factors created a desperate situation for school districts nationwide, resulting in makeshift classrooms, "double-shift" programs at some schools, and the widespread use of temporary buildings. The architectural plans for Mōkapu ES were developed the same year that the Territory of Hawaii entered Statehood (1959). This period saw a tremendous growth in jet travel, tourism, and development of transportation infrastructure, hotel construction and related industries. This period was also marked by increased interest in the Pacific region by the U.S. military, as the U.S. navigated between the Korean War (1950-1953) and the Vietnam War (1961-1975). These national and local events resulted in a tremendous population growth in Hawaii, and highlighted the importance of new elementary schools.

Under Criterion C, Mōkapu ES campus "embodies the distinctive characteristics of a type, period, or method of construction." This educational form was a departure from earlier models, which were typically expressed in classical or gothic styles. The Mōkapu ES finger plan campus layout, with its one-story buildings or "fingers" arranged in parallel rows and connected to a central spine that functioned as a long, straight, covered walkway, had become one of just a few common plan types by the late 1940s nationwide. The origins of the finger plan model derived from influences of the Progressive Movement, a social and political reform era of the United States (1890-1920) that believed in the ability of education to improve the individual and society. In the finger plan model, each classroom could have fresh air and

cross ventilation, natural light, and, as in Hawai'i, direct access to the outdoors via exterior doors. Mōkapu ES's intact original campus form with its concrete and CMU buildings separated by courtyards, and connected to a central, covered walkway, along with the buildings' modern architectural features (including; nearly flat roofs, decorative and functional breeze blocks grilles/screens, large expanses of jalousie windows, clerestory windows (at the Cafetorium), wide unadorned cantilevered eaves, and roof cut-outs/skylights), make it a good example of a Mid-Century Modern finger plan school.

According to MCBH's internal cultural resources management plan, there are no Historic Districts within the project area.

3.4.2.3 Traditional Cultural Properties

A Traditional Cultural Property (TCPs) is generally one eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King, 1998). Though the NRHP does not include intangible resources, the identification of TCPs can help preserve the physical properties associated with the intangible aspects of a local community's cultural history. Native Hawaiian Organizations with cultural affiliation to Mōkapu Peninsula have been consulted, and no traditional cultural properties associated with the project area have been identified or proposed.

3.4.2.4 Cultural Impact Assessment

A cultural impact assessment (CIA) was conducted to identify any practices customarily and traditionally exercised for subsistence, cultural and religious purposes associated with the project area, and to address the effects that the Proposed Action may have on these practices. The CIA was conducted following protocols established by the State of Hawai'i OEQC, and this section summarizes the assessment's findings.

Although the size of the project consists of a relatively modest footprint, the assessment of cultural impacts extends well beyond the proposed Mōkapu Elementary School improvements and campus. The study area refers to the extent of Mōkapu Elementary School campus. The *ahupua'a* is usually the appropriate geographical unit for a cultural impact assessment. However, in this case it makes sense to limit the geographical extent of inquiry to the peninsula, as this is often considered an area isolated from the rest of the lands of Ko'olau Poko district.

Methods

Archival and Ethnographic Research. Historical documents and maps pertaining to the Mōkapu Peninsula were used as a foundation for the background historical information and to document the evolution of land use during the early periods. Existing oral histories and ethnographies conducted for Marine Corps Base Hawaii (1995 & 2014), the local base newspaper, *Windward Marine*, and ethnographic and landscape studies formed the basis of the analysis of cultural impacts[2].

Community Consultation. Community consultation is an important component of the cultural impact assessment because it helps to identify the contemporary cultural practitioners in the area of the

[2] *Mōkapu Peninsula Oral History Study Pu'u Hawai'i Loa Family Housing Project Site*, *Marine Corps Base Hawaii Lands of He'eia and Kāne'ohe*, *Island of O'ahu* (Maly, 1995); *Mōkapu: A Paradise on the Peninsula, Stories From Not So Long Ago* (Tomonari-Tuggle and Arakaki, 2014); and *Mōkapu Peninsula Archaeological and Ethno-Historic Reconnaissance and Assessment* (William Barrera, 1981).

proposed development. The primary method for finding cultural practitioners was via the project network and employees of Mōkapu Elementary School and MCBH Kaneohe Bay.

Historical Background

Early Land Tenure and Use. Mōkapu Peninsula comprises *ʻili* (small land divisions) from two larger ahupuaʻa, Heʻeia and Kāneʻohe (see Figure 3-5 for 1928 USGS map of Mōkapu Peninsula). Mōkapu is the ʻili within Heʻeia located on the western and northern sides of the peninsula, while the ʻili of Kāneʻohe include Heleloa, Kuwaʻaʻohe (Kuaʻaʻohe), Kaluapuhiwaho, and Ulupaʻu. Kāneʻohe ʻili comprise the eastern two thirds of the peninsula. Though they seem disconnected, Hawaiians considered the ocean fisheries of Kāneʻohe Bay as part of the ahupuaʻa of Heʻeia and Kāneʻohe. The project area is located within the ʻili of Kuwaʻaʻohe.

Prior to western contact, Hawaiians lived on Mōkapu Peninsula for at least 500-800 years. Land Commission Awards indicate they cultivated dryland crops such as *ʻuala* (sweet potato) and *ipu* (gourds). Other sources suggest they also managed groves of *hala* (pandanus) trees, *wauke* (paper mulberry), *ʻulu* (breadfruit), and may have grown *kalo* (taro) and *pia* (arrowroot) in the marshy areas on the peninsula (Maly, 1995). One of the most important resources and most famed *wahi pana* (notable place) of the peninsula were the *loko iʻa*, the fishponds.

Most Hawaiian Kingdom-era maps depict three fishponds: Nuʻupia, Halekou, and Kaluapuhi. Archaeological evidence dates the pond sediment from Halekou-Nuʻupia fishponds to about 900 to 1100 B.P. indicating early development of the pond complex. These fishponds are *loko kuapā* fishponds or walled fishponds—meaning they are made by building a wall on a reef. Both Halekou and Nuʻupia fishponds are separated from Kāneʻohe Bay by a wall. A shared wall divides the two ponds. Loko kuapā were monumental projects that demanded a lot of manpower to construct. They were usually built under the direction of an *aliʻi nui* (high chief) and managed by a *konohiki* (or head) of an *ahupuaʻa*.

Following the change in land tenure and the Māhele in 1848, the entire *ahupuaʻa* of Kāneʻohe was awarded to Hazaleleponi Kalama, a *kaukau aliʻi* (chiefess of lesser rank) and wife of Kamehameha III (Kauikeaouli). The entire ahupuaʻa of Heʻeia was awarded to Abenera Pākī, descended from Maui chiefs and married to an heiress of the Kamehameha family. Three commoners also claimed lands for their sweet potato plots, gourds, salt pans, hala groves, and house lots within the Mōkapu Peninsula. Notes and native testimony indicate there were others living at Mōkapu who did not make claims. Pākī's land and fishing right for the ʻili of Mōkapu eventually passed to John Wyllie Davis.

Catholic Mission. A Catholic mission was established at Mōkapu, Heʻeia during the 1830s by a group of Catholics apparently fleeing religious persecution in Honolulu (Schoofs, 1978). A stone church situated on a hill overlooking Kāneʻohe Bay was dedicated to St. Catherine in 1844. A little village was constructed near the church to accommodate the congregation (Ibid, 1978). The smallpox epidemic of 1856 decimated a large part of the congregation and the few survivors moved away within a few years.

Figure 3-5 1928 USGS Map

Ranching and Farming. Ranching began at the peninsula in the 1880s, possibly earlier. Kalama may have run livestock on her lands on the peninsula during the 1860s. After Kalama's death in 1870, Charles C. Harris purchased her land, fishponds, fishing rights, and livestock (Tomonari-Tuggle and Arakaki, 2014). His daughter, Nannie Roberta Harris Rice (aka Nannie Rice), inherited her father's estate in 1881. She leased the land to Kaneohe Ranch starting in 1893. In addition to angus cattle, there were also horses, sheep, and goats on the ranch at the time. A ranch house and infrastructure for water, including two windmills and water tanks, were situated on the ranch lands. In 1917, a new shareholder of the ranch, James B. Castle, purchased the ranch from Nannie Rice. On the western end, in the ʻili of Mōkapu, a descendant of the Davis family, Wally Davis, also ran cattle and horses. Arthur Rice took over the Davis operation around 1915. Mōkapu Peninsula was the winter grazing ground for the herds that were then moved to Coconut Grove and Kawainui during the summer (Ibid).

In the first three decades of the 20th century, truck farmers also cultivated crops on small parcels of leased land. Many were Japanese families that grew commercially viable crops such as papaya, sweet potato, watermelon, Irish potato, pumpkins, squash and sweet corn in addition to vegetables for home use (Tomonari-Tuggle and Arakaki, 2014). Most families lived on their leased land. Some farmers lived and worked on the plain just north of Halekou Pond, in the vicinity of the project area (Ibid).

Territorial Game Farm. In 1921, the Territory of Hawaiʻi established a game farm on 345 acres on the north side of Nuʻupia Fishpond. Lands of the Game Farm included the Halekou and Kaluapuhi Fishponds. The purpose of the Game Farm was to produce and establish game birds throughout the territory, using imported exotic birds from stock raised in the U.S., Japan, Australia, the East Indies, and Africa (Tomonari-Tuggle and Arakaki, 2014). By the end of 20 years of operation in the late 1930s, over 60,000 birds had been hatched and released to the six main Hawaiian islands.

In addition to the game work performed by the Mōkapu Game Farm, the department also utilized the waters of Halekou (and possibly Kaluapuhi) Fishpond for studying mullet, salmon, and Rainbow trout for sport fisheries.

Mōkapu Tract Subdivision. The early 1930s Mōkapu Tract Subdivision was the vision of a partnership between Samuel Wilder King, Bishop Trust Co., Ltd., and A.H. Rice & Co., Ltd. The ʻili of Mōkapu was subdivided into parcels consisting of a quarter acre to over one acre (Tomonari-Tuggle and Arakaki, 2014). These parcels served as second homes for many families who would spend time there on the weekends, while others lived there full-time. Many families were attracted to the fishing opportunities afforded by Mōkapu and spent much of their time catching and processing fish and sharing with the local community at Mōkapu.

Kaneohe Marine Corps Air Station. As noted in Section 3.4.2, in 1918, Woodrow Wilson signed Executive Order 2900 setting aside approximately 322.5 acres on Mōkapu Peninsula for the Kuwaaohe Military Reservation, an Army installation. There is not much information on its use during this period except that the installation was deactivated following the end of World War I. Although Kuwaaohe Reservation was deactivated, the Army continued to use the peninsula for coastal defense (Tomonari-Tuggle and Arakaki, 2014). Battery Kuwaaohe was built on the west rim of Ulupaʻu Crater in 1927 and railroad infrastructure added in the crater in 1934.

By 1939, NAS Kaneohe was established on the western side of Mōkapu Peninsula. The purpose of the station was to accommodate seaplane squadrons in support of the fleet at Pearl Harbor. Much of the initial work of constructing the base comprised dredging and filling 280 acres of land between Davis

Point and the Kāneʻohe Bay side of Heleloa (Tomonari-Tuggle and Arakaki, 2014). A good portion of the western coastline was completely modified by dredging activities, significantly altering the landscape.

In 1940, the Navy condemned the Mōkapu Tract Subdivision giving families three months to vacate their homes. The first 30 marines arrived at the naval air station in November 1940 and the facility was officially commissioned on February 15, 1941. By the end of 1941, approximately 150 facilities had been completed, including the airstrip, housing, gasoline storage facilities, and maintenance buildings.

Mōkapu Elementary School. Elementary education was first offered at Kaneohe Naval Air Station in 1946 after the Navy began accepting dependents to live on the station. Prior to this, only servicemen and women were allowed to live on base. The first Mōkapu School was located in the vacated Gunnery School Building. The first classes were initiated on September 4, 1946 and the school was called the Kailua Annex (Steele, 1965).

As described in Section 3.4.2.2, the current Mōkapu Elementary School was constructed in 1960. The local base newspaper, Windward Marine, reported in January 1960 that the new school site was approximately 10 acres of fenced land facing Mōkapu Road, near station housing and adjacent Platt Field, the large 1st Marine Brigade parade ground (Windward Marine January 29, 1960). Groundbreaking for the new school occurred on February 3, 1960 with kahuna David (Daddy) Bray Sr., officiating. Students moved into their new school on Monday, November 21, 1960 (Windward Marine November 25, 1960).

Community Consultations

Attempts were made to reach long-time or former employees of Mōkapu Elementary School; however, these attempts did not lead to any interviewees. Table 3-2 indicates the results of community consultation.

Table 3-2 Results of Community Consultation

Name	*Affiliation*	*Contacted (Y/A/N)*	*Knowledge of Area*	*Comments*
Almanza, Paloma	Mōkapu Elementary School, Principal	Y	N	
Cleghorn, June	MCBH Environmental Dept, Cultural Resources Manager	Y	Y	There are no cultural practices associated with the school site. There are no contemporary cultural practitioners for the fishponds.
Solomon, Amy	MCBH, School Liaison	Y	S	Provided Mōkapu ethnography and *Windward Marine* articles

Key: Y=Yes; N=No; A=Attempted (at least 3 attempts were made to contact individual, with no response); S=Some knowledge

Traditional Cultural Practices of Mōkapu

During the assessment of cultural impacts for the proposed improvements to Mōkapu Elementary School, several traditional cultural practices or resources were identified that are associated with the Mōkapu Peninsula. All of these were gleaned from ethnographies associated with the Mōkapu Peninsula, primarily from Kepā Maly's 1995, M*ōkapu Peninsula Oral History Study Puʻu Hawaiʻi Loa Family Housing Project Site*. Maly's work drew from earlier ethnographic work conducted by William Barrera in 1981, *Mōkapu Peninsula [Marine Corps Airstation, Kaneohe Bay] Archaeological and Ethno-*

Historic Reconnaissance and Assessment and supplemented these early oral histories with multiple ethnographies. The following is a brief discussion of some of the major traditional cultural practices linked to Mōkapu Peninsula.

Fishing. Fishing is probably the most widespread tradition practiced by former residents of Mōkapu and by residents of Heʻeia and Kāneʻohe who traveled to the peninsula to fish. In his ethnographic study (1995), Kepā Maly interviewed several former residents of Mōkapu who identified fishing practices they utilized while there. Most were passed down from their parents and grandparents although some learned by watching other peninsula residents gather and fish. The diversity of fish gathered and caught are a testament to the rich fishing grounds and variety of fish habitat along the perimeter of the peninsula. Most people who lived at Mōkapu—or who visited the area in order to fish—did not catch fish from the fishponds. These were considered private property and were avoided. Rather, they frequented the expansive shallow reefs on the western edge, the channels and reef edges, Mokumanu (Bird Island), Keawanui, Pali Kilo (Pyramid Rock), ʻUlupau, and the east coast near Kailua to access their breadbasket. Interviewees mentioned fishing for and gathering over 28 varieties of fish and crustaceans from the various nearshore and offshore fisheries.

Heleloa Dunes and Human Burials. Heleloa is the ahupuaʻa adjacent to Kuwaʻaʻohe. Maly (1995) reports that an 1899 map depicts "burial hills" in the sand dunes of Heleloa. When the military began its development of the Mōkapu Peninsula in 1937, an extensive sand burial site was revealed (SIHP Site No. 50-80-11-1017). The University of Hawaiʻi and Bishop Museum collaborated on documenting and removing the burials where they were later stored at the Bishop Museum (Buck, 1964). The site has since been designated on the National and State Register of Historic Places as Mōkapu Burial Area.

Ultimately, 965 burials were removed from Heleloa Dunes in the late 1930s. Many more were uncovered and removed during subsequent development of the base.

Numerous displaced human skeletal remains (*iwi*) have been found in sand fill that underlies several housing areas near the project area (International Archaeology, 2020). The Mololani Housing Area (northeast of project area), the Waikulu Neighborhood (northwest of the project area) and the Marine Corps Community Services New Youth Center (north of the project area) were all constructed on sand fill with identified secondary human remains. All *iwi* were recovered from primarily sand fill that is thought to originate from two distinct locations on the peninsula. Test trenches excavated in fill for the Hana Like Housing Area, east of and adjacent the project area, found no displaced human skeletal remains (Ibid). Iwi were considered sacred by Hawaiians because they possess the mana, or spiritual essence, of a person.

Iwi, including displaced burials, are now protected by NAGPRA, the Native American Graves Protection and Repatriation Act. There are protocol in place to consult with lineal descendants and Native Hawaiian Organizations following the exposure of secondary burials.

Loko Iʻa (Fishponds). The construction and maintenance of a fishpond required a tremendous amount of skill and labor. Cultivation and propagation centered primarily on the prized *ʻamaʻama* (mullet) and *ʻawa* (milkfish). In 1900, an inventory of fishponds found 360 throughout the islands with 99 of them being active (Keala et al. 2007). Nuʻupia fishpond was leased through the 1950s, even after the military gained ownership of the ponds—although probably not during the war.

Halekou fishpond was operated as part of the Mōkapu Game Park. The pond was altered with the construction of several fish pens. Beyond the open water of Halekou Pond, wetlands extended to the

north into the project area. Although a few farmers leased parcels just beyond the wetlands, there is no indication the wetlands were utilized for hunting or gathering.

Traditional Cultural Practices of Project Area

Traditionally, the project area was in the ʻili of Kuwaʻaʻohe in the ahupuaʻa of Kāneʻohe. At least a portion of the project area was within a marshy area north of the Halekou fishpond. Borings of the soils within the study site confirm there was once a marshy environment in the northeast part of the project area. The MCDC (adjacent to the project area) is a vestige of the wetlands that once existed in the vicinity.

Although there is archaeological evidence that the area near the study site was used as a temporary habitation, possibly a campsite, there are no documented traditional cultural practices for the marshy part of the fishpond complex at Mōkapu Peninsula. Interviewees of ; 1995 ethnographic study mentioned two plants found in the marshy areas, the ʻ*akulikuli* and the ʻ*akaʻakai*; however, they did not say what the plants were used for. *ʻAkulikuli* (*Sesuvium portulacastrum*) is a coastal herb, a succulent that is edible, but can have a very salty taste. *ʻAkaʻakai* is the great bulrush (*Seirpus validus*) that grows at the edge of fresh or brackish water marshes and was traditionally used for house thatch and mats for bedding.

The marshy environment of the project area and open grassland of the peninsula could have supported many seabirds and shorebirds—a potential food supply for Hawaiian residents of the peninsula. Bird hunting and gathering was most likely an opportunistic food acquisition strategy as there was a limited supply of birds and no known tradition of managing bird stocks. Archaeological investigations have unearthed bird bones along with fish, pig, dog, and chicken remains in association with human habitation on the peninsula so there is physical evidence that birds were consumed; however, no oral tradition of their use remains.

The lands north and east of Halekou fishpond were farmed by Japanese truck farmers in the 1920s and 1930s. They grew corn, papaya, watermelon, sweet potato and Irish potato. For the most part, their tenure was short-lived as all of them were forced to move once the military acquired the land, starting in the late 1930s.

The school site and the surrounding area has been filled with fill material that may originate from elsewhere on Mōkapu Peninsula, starting during the build-up for World War II (Allen and Reith, 2014). It is possible that during grading and construction, more displaced iwi could be found in the fill that underlies the school. Although these iwi have already been desecrated through removal from their original burial ground, they are still considered sacred and appropriate protocol should be followed if they are unearthed. The project area is not known as a burial ground and, as reported in Section 3.4.2.1, no archaeological deposits, burials, or secondarily deposited human skeletal remains were encountered during archaeological subsurface testing of the project area in July 2020.

No specific Native Hawaiian or other traditional practices have been linked to the school site. The project area and vicinity have been drastically modified from their original form with grading and filling. The military base has constructed housing and infrastructure on the fill. If there were cultural practitioners who visited the study area, the control of access to resources at the base since the 1930s has discouraged cultural practitioners from entering the area.

3.4.3 Environmental Consequences

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed.

3.4.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to cultural resources. Therefore, no impacts to cultural resources would occur with implementation of the No Action Alternative.

3.4.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

In accordance with Section 106 of the NHPA, MCBH consulted with the Hawaiʻi SHPO, Oʻahu Island Burial Council, Office of Hawaiian Affairs, National Trust for Historic Preservation, Historic Hawaiʻi Foundation, Boyd ʻOhana, Diamond ʻOhana, Kekoʻolani ʻOhana, Keohokalole ʻOhana, Koʻolauloa Hawaiian Civic Club, Paik ʻOhana, Paoa/Kea/Lono ʻOhana, Prince Kuhio Hawaiian Civic Club, Van Horn Diamond/Olds ʻOhana, and Temple of Lono regarding the undertaking (see correspondence in Appendix B).

Archaeological Resources

No archaeological deposits or human skeletal remains were encountered during July 2020 subsurface testing within the APE and it is unlikely that they would be encountered during project activities under the Preferred Alternative. Archaeological monitoring will be conducted during ground disturbing activities in the event that previously unidentified historic properties or human skeletal remains are encountered during the proposed work. The work should be guided by an archaeological monitoring plan meeting the requirements of HAR §13-279-4 be prepared and submitted to the MCBH Cultural Resources Manager in advance of construction. If Native American Graves Protection and Repatriation Act (NAGPRA) cultural items including human remains are encountered during any ground disturbing activities associated with this undertaking, all work shall stop, and the finds will be secured and protected, and treatment will proceed under the authority of NAGPRA.

Architectural Resources

MCBH determined that the proposed undertaking (i.e., the Preferred Alternative) would result in an adverse effect on historic properties in accordance with the Section 106 Implementing Regulations at 36 CFR 800.5(a)(1) based on the demolition of buildings that are eligible for the NRHP (see Table 3-1 for list of eligible properties). MCBH is in the process of consulting with the consulting parties listed above in accordance with Section 106 Implementing Regulations at 36 CFR 800.6(a) to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties. MCBH also notified the Advisory Council on Historic Preservation of its adverse effect finding. HIDOE will also consult with the SHPD under its review requirements under HRS Chapter

6E Historic Preservation and anticipates a determination that the Proposed Action would have an Effect, with proposed mitigation commitments.

Appropriate mitigation for the adverse effect on historic properties is being developed in consultation with the consulting parties. With implementation of the agreed-upon mitigation, the Preferred Alternative would have insignificant impacts on historic properties.

Traditional Cultural Properties

No traditional cultural properties have been identified in or near the project area and none are expected to be impacted by the Preferred Alternative.

Cultural Impact Assessment

No specific Native Hawaiian or other traditional practices have been linked to the school site. The project area and vicinity have been drastically modified from their original form with grading and filling. The military base has constructed housing and infrastructure on the fill. Based on its current land use, there are no Native Hawaiian or other ethnic group's cultural customs and traditions exercised for subsistence, cultural or religious purposes known to be practiced within the project area at this time. Therefore, the Preferred Alternative would not impact traditional Hawaiian, or other ethnic group's, rights related to gathering, access, or other customary activities exercised for subsistence, cultural and religious purposes because construction activities. Construction period BMPs and adherence to NPDES permit conditions would avoid or minimize potential construction period impacts on water quality of downstream receiving waters (e.g., Kāneʻohe Bay, Nuʻupia Pond Complex). This would prevent or reduce the likelihood of impacts on traditional practices involving the use of resources in these water bodies. During the operational period, the site would return to pre-construction activities as an elementary school.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to cultural resources or practices.

3.4.3.3 Partial Reuse Alternative Potential Impacts

The APE for this alternative would be the same as the Preferred Alternative (see Figure 3-4).

The Partial Reuse Alternative would result in the same insignificant impacts to cultural resources as the Preferred Alternative. Subsurface archaeological deposits or human skeletal remains are not expected to be encountered during project construction. If any are encountered during any ground disturbing activities associated with this alternative, all work shall stop, and the finds will be secured and protected, and treatment will proceed under the authority of NAGPRA and NHPA.

Although it would retain existing NRHP-eligible buildings C, F, and J, this alternative would also result in an adverse effect to historic properties. This is because the demolition of most of the original campus buildings, and the proposed modifications to buildings C, F, and J, would detract from their integrity of design, setting, workmanship, materials, feeling, and association. It is presumed that, if this alternative were undertaken, consultation under Section 106 of the NHPA would occur, and appropriate mitigation would be implemented.

Therefore, implementation of the Partial Reuse Alternative would not result in significant impacts to cultural resources.

3.5 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal.

Within this EA, biological resources are divided into four major categories: (1) terrestrial vegetation and (2) terrestrial wildlife. Threatened, endangered, and other special status species are discussed in their respective categories.

3.5.1 Regulatory Setting

Special-status species, for the purposes of this assessment, are those species listed as threatened or endangered under the Endangered Species Act (ESA) and species afforded federal protection under the Migratory Bird Treaty Act (MBTA).

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat. Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the DoD where an Integrated Natural Resources Management Plan has been developed that, as determined by the Department of Interior or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation.

Birds, both migratory and most native-resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186 (Migratory Bird Conservation). Under the MBTA it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during authorized military readiness activities. The final rule authorizing the DoD to take migratory birds in such cases includes a requirement that the Armed Forces must confer with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the proposed action if the action will have a significant negative effect on the sustainability of a population of a migratory bird species.

See Section 6.1.1 for the discussion regarding the CZMA.

3.5.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under biological resources at Mōkapu ES on MCBH Kaneohe Bay. Threatened and endangered species are discussed in each respective section below with a composite list applicable to the Proposed Action provided in Table 3-3. A biological survey of the project area was conducted by LeGrande Biological Surveys on May 20, 2020; the survey report is included as Appendix A.

3.5.2.1 Terrestrial Vegetation

The majority of the survey area is characterized by landscaped ornamental trees and grassy maintained lawns with courtyard plantings of ornamental shrubs and food plants within the classroom building areas. There was a total of 79 plant species observed within the survey sites. Of these, 72 are alien (introduced) and the remaining 7 are indigenous (native to the Hawaiian Islands and elsewhere).

The main campus—currently occupied by building facilities, parking lots, and classrooms—is characterized by manicured grassy lawns with scattered ornamental tree and shrub plantings. Native plant habitat within the proposed project area has been highly modified by human activities, such as historical agricultural activities, road building, residential construction, school campus construction, and the intentional and accidental introduction of alien species. The overwhelming abundance of non-native plant species throughout the project area is in direct correlation to disturbance of the site over the last several hundred years.

The nature of the land and its present and historical disturbances limit the natural botanical resources anticipated to occur here. The results of the survey substantiate this. The rare frequency of native plant species is an indication that because of constant disturbances (geological, vehicular, invasive plant species), only species adapted to such conditions can survive, with few exceptions. The seven native plant species were observed during the survey were all indigenous (native to the Hawaiian Islands and elsewhere): *uhaloa* (*Waltheria indica*), *ʻaeʻae* (*Bacopa monnieri*), *milo (Thespesia populnea)*, *kipukai* (*Heliotropium curassavicum*), *akulikuli* (*Sesuvium portulacastrum*), *ʻakiʻaki* (*Sporobolus virginicus*), and *kaluha* (*Schoenoplectus californicus).* None of the plant species observed are listed as threatened or endangered under either federal or state of Hawaii endangered species statutes.

Cultivated tree species observed include monkeypod (*Samanea saman*), pink tecoma (*Tabebuia heterophylla*), kiawe (*Prosopis pallida*), Royal Poinciana (*Delonix regia*), Chinese banyan (*Ficus microcarpa*), milo (*Thespesia populnea*), and Cook pine (*Araucaria columnaris*). Opportunistic or weedy species observed within the survey area include, spiny amaranth (*Amaranthus spinosus*), owi (*Stachytarpheta australis*), slender mimosa (*Desmanthus pernambucanus*), little bell (*Ipomoea triloba*), Guinea grass (*Panicum maximum*), common sandbur (*Cenchrus echinatus*), octopus tree (*Schefflera actinophylla*), and pepperwort (*Lepidium virginicum*).

Ornamental and garden plantings around the existing school buildings include, ti (*Cordyline fruticosa*), sweet potato (*Ipomoea* sp.), hibiscus cultivars, fern species laua‘e (*Phymatosorus grossus*), crown flower (*Calotropis gigantea*), sugar cane (*Saccharum officinarum*), aloe (*Aloe vera*), and ginger species (*Zingiber* sp.).

The banks of the Mōkapu Central Drainage Channel harbored plants such as pickleweed (*Batis maritima*), silver buttonwood (*Conocarpus erectus*), red mangrove (*Rhizophora mangle*), and Indian fleabane (*Pluchea indica*). Most of the native plants observed within the project area were observed in this area; *ʻaeʻae* (*Bacopa monnieri*), *kipukai* (*Heliotropium curassavicum*), *ʻakulikuli* (*Sesuvium portulacastrum*), *ʻakiʻaki* (*Sporobolus virginicus*), and *kaluha* (*Schoenoplectus californicus*).

A full inventory of naturally occurring or established plant species observed within the survey areas is included in Appendix A, categorized by family and species.

3.5.2.2 Terrestrial Wildlife

Wildlife includes all animal species (i.e. insects and other invertebrates, freshwater fish, amphibians, reptiles, birds, and mammals) focusing on the species and habitat features of greatest importance or interest.

Avian Resources

The avian diversity and densities found in the avian survey are consistent with the highly manicured state of the study site and the urbanized nature of the facility as a whole. A total of 336 individual birds of 17 species, representing 12 separate families, were recorded during point counts. Three introduced species, Zebra Dove (*Geopilia striata*), Cattle Egret (*Bubulcus ibis*), and House Finch (*Haemorhous mexicanus*) accounted for 57-percent of the total number of birds recorded. Zebra Dove was the most commonly tallied species, which accounted for 35 percent of the birds recorded during point counts.

Two species, Great Frigatebird (*Fregata minor*) and Hawaiian Stilt (*Himantopus mexicanus knudseni*) recorded during the course of the survey are native: Great Frigatebird is an indigenous seabird and Hawaiian Stilts are an endemic endangered shorebird species. The remaining 15 species recorded are all established alien or feral species. Additionally, seven adult and five Mallard/Koloa hybrid ducks (*Anas platyrhynchos* X *A. wyvilliana*) were seen along the edge of the MCDC adjacent to the school yard fence. A full listing of the avian species observed during the survey is included in Appendix A.

Two of the species recorded Great Frigatebird (*Fregata minor*) and the endemic sub-species of the Black-necked Stilt (*Himantopus mexicanus knudseni*) are native. The frigatebird is a common indigenous seabird species regularly seen soaring over the MCBH Kaneohe Bay and adjacent islets. The stilt is listed as endangered under both federal and State of Hawaiʻi endangered species statutes, and is a common sight on the school yard grounds and within the wetlands found within MCBH Kaneohe Bay. The remaining 16 avian species recorded are common established alien species on the Island of Oʻahu.

No migratory shorebird species were recorded during the survey. However, this is not surprising as the indigenous migratory shorebird species usually present in the Hawaiian Islands nest in the high Arctic during the late spring and summer months, returning to Hawaiʻi and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawaiʻi for their trip back to the Arctic in late April or the very early part of May. They are widely distributed in the Hawaiian Islands during the winter month. It is expected that both Pacific Golden-Plover (*Pluvialis fulva*), and Ruddy Turnstone (*Arenaria interpres*) use resources within the school campus and surrounding MCBH Kaneohe Bay grounds during fall and winter months on an annual basis.

Although only one seabird species (Great Frigatebird) was detected during the survey of the study site, several species of seabird are known to use resources present at MCBH Kaneohe Bay. Furthermore, it is possible that the endangered Hawaiian Petrel (*Puffinus sandwichesis*) and the threatened Newell's Shearwater (*Puffinus newelli*) over-fly the project area between April and the middle of December each year in very small numbers. Newell's Shearwaters are not known to breed on the Island of Oʻahu, though recent acoustical surveys conducted on the island have recorded low numbers of this species calling over the higher reaches of the island (Young, et al., 2019). These authors also recorded one Hawaiian Petrel over the island. There is a Wedge-tailed Shearwater (*Ardenna pacifica*) colony of 750-900 nesting yearly on the eastern shoreline of MCBH Kaneohe Bay adjoining Kailua Bay and there is a permanent colony of approximately 2200 Red-footed Booby (*Sula sula rubripes*) in the Ulupaʻu Head Wildlife Management Area (WMA) on the MCBH Kaneohe Bay Range Training Facility (Bookless, 2020a). Additionally, other common seabird species known from MCBH Kaneohe Bay and the surrounding

waters and islets including Brown Booby (*Sula leucogaster*) Black Noddy (*Anous minutus*), Sooty Tern (*Onychoprion fuscatus),* Grey-backed Tern (*Onychoprion lunatus*) and White-tailed Tropicbird (*Phaethon lepturus*) likely overfly the site upon occasion on a seasonal and/or temporal basis—all resident seabird species present in the Hawaiian Islands are protected under the MBTA. There is no suitable nesting or roosting habitat for any of these seabird species within the study site.

The Oʻahu population of White-Tern (*Gygis alba*) is listed as an endangered species by the State of Hawaii; it is not listed under federal statute. This ephemeral species was not recorded during this survey, nor was it expected. The current resident population of White Terns on O'ahu is found on the leeward side of the Island concentrated in the Waikiki area (VanderWerf, 2003 in David and LeGrande, 2020).

No owl species were recorded during this survey. There are two resident owl species on Oʻahu the introduced Barn Owl (*Tyto alba*) and the indigenous endemic sub-species of the Short-eared Owl, or *Pueo* as it is locally known (*Asio flammeus sandwichesis*). This species has become increasingly scarce on the Island; the Oʻahu population is listed as an endangered species by the State of Hawaiʻi but it is not listed under federal statute. There are eight to ten resident *pueo* that live within the Nuʻupia Ponds WMA (Bookless, 2020 in David and LeGrande, 2020). This species is not habitat restricted on Oʻahu, though there certainly is less suitable nesting habitat than there once was. This species faces daunting odds on an Island as heavily populated as Oʻahu—they are a ground nesting diurnal species, the sheer number and densities of mammalian predator on the Island make it very difficult for this species to successfully nest except within protected areas that have a strong mammalian predator control program in place. There is a current study underway of Short-eared Owls within MCBH Kaneohe Bay (Lance Bookless, Personal communication with R. David, May 20, 2020). There is no suitable nesting habitat for this ground nesting raptor within the study site.

Mammalian Resources

The only mammal detected during the survey was one dog. Although no rodents were recorded during the course of this survey, it is likely that one or more of the other four established alien *Muridae* found on Oʻahu—i.e., European house mouse (*Mus musculus domesticus*), roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*)—use various resources found within the general project area on a seasonal basis. The Polynesian rat or Pacific rat (*Rattus exulans*) is commonly captured in traps around MCBH wetlands and is likely present in the MCDC area (Bookless, 2020b). It is also likely that small Indian mongoose (*Herpestes javanicus*) and cats (*Felis catus*) use resources in the general project area on a seasonal and/or temporal basis.

These human commensal species are drawn to areas of human habitation and activity. All of these introduced mammalian species are deleterious to native ecosystems and the native faunal species dependent on them.

No Hawaiian hoary bats were detected during the course of this survey. It is only in recent years that this species is being recorded on a regular basis on the Island of Oʻahu. The USGS is currently in the second year of a two-year study of the Hawaiian hoary bat on all MCBH Kaneohe Bay properties and have audio documentation of its presence in several locations on MCBH Kaneohe Bay (Bookless, 2020a).

Threatened and Endangered Species and Critical Habitat

As noted earlier, no protected plant species was observed in the project area. The only protected waterbird species recorded during the survey was Hawaiian Stilt, which is currently using the playfield as

a loafing site (see Table 3-3). There is no federally delineated Critical Habitat for any avian or mammalian species on, or close to the proposed project site. Thus, modifications of habitat on the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

Table 3-3 Threatened and Endangered Species Known to Occur or Potentially Occurring in Project Area

Common Name	*Scientific Name*	*Federal Listing Status*	*State Listing Status*	*Critical Habitat Present?*
Hawaiian Stilt	*Himantopus mexicanus knudseni*	FE	SE	no

Selections for Listing Status Column include: C = candidate species for federal ESA listing, FE = federal endangered, FT = federal threatened, NL = not listed, SE = State endangered, SSC = Species of Special Concern (State designation), ST = State threatened, SAT = Listed due to similarity of appearance to threatened species (These species are not biologically threatened or endangered and are not subject to ESA section 7 consultation.), X = present.

3.5.3 Environmental Consequences

This analysis focuses on wildlife or vegetation types that are important to the function of the ecosystem or are protected under federal or state law or statute.

3.5.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to biological resources. Therefore, no impacts to biological resources would occur with implementation of the No Action Alternative.

3.5.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

The study area for the analysis of effects to biological resources associated with the Preferred Alternative includes the Mōkapu ES campus.

Vegetation

Under the Preferred Alternative, most of the existing vegetation, including ornamental and shade trees and cultivated and food plantings would be removed during facility demolition and site preparation. Several existing monkeypod trees along the Mōkapu Road frontage may be retained if determined by the HIDOE Arborist to be appropriate. No other existing trees or palms are anticipated to be retained at their current locations. Some existing trees and palms may be relocated to the new campus as mutually determined prior to construction by the HIDOE Arborist, Mōkapu ES administration, MCBH, and the project landscape architect. Due to the lack of natural plant communities, the Preferred Alternative would have little effect on the natural plant communities within the MCDC. Best management practices to protect the channel from debris, sedimentation, and inputs of pollutants would help avoid or minimize impacts to channel biota. There would be no impacts to protected vegetation species as none are present at the project area. During project operations, landscaping on campus would include ornamental and native species of trees, shrubs, turfgrass, and groundcovers appropriate to the site conditions.

Terrestrial Wildlife

Construction activities would have short-term, temporary impacts to terrestrial wildlife that currently utilize the project area due to noise, dust, and the movements of construction equipment and vehicles. However, there are suitable alternate sites within MCBH Kaneohe Bay for avian species to utilize. In the long-term, new plantings of ornamental and shade trees are likely to be utilized by avian species. School activities would be similar to existing conditions and no long-term disturbances to terrestrial wildlife are anticipated.

Threatened and Endangered Species

Vegetation. No protected botanical resources were detected on or adjacent to the project area, nor were any expected given the current use of the property. The redevelopment of Mōkapu ES is not expected to result in deleterious impacts to any protected botanical resources.

Fauna. Temporary impacts on threatened and endangered terrestrial species could occur from noise and habitat disturbances associated with construction activities. However, threatened and endangered terrestrial species at MCBH Kaneohe Bay are already habituated to high levels of noise associated with ongoing activities, including school operations. Increases in noise levels from construction activities to the ambient noise environment would be negligible and temporary. Construction would occur on previously disturbed and cleared or developed areas. Therefore, habitat removal would be negligible and would not negatively impact habitat use by any threatened or endangered species. Construction activities would result in short-term impacts from disturbance to terrestrial wildlife including threatened and endangered species, but would not further threaten the existence of any protected species or critical/sensitive habitats. Additionally, installation personnel would continue to manage habitats according to the Integrated Natural Resources Management Plan, which is designed to protect and benefit threatened and endangered species.

Waterbirds. The only protected waterbird species recorded during this survey was the Hawaiian Stilt, which is listed as an endangered species under both federal and state of Hawaii endangered species statutes. This species is currently using the school playfield as a loafing site. Construction activities have the potential to disturb loafing stilts. Removal of the playfield will likely result in the stilts moving to another lawn area within the base; however, there is adjacent additional loafing and foraging habitat within the campus, and disturbance to the stilts will be of a temporary nature as a replacement playfield covered with turfgrass would be created on the south side of campus. The proposed drainage swale illustrated in Figure 2-1, designed to handle a 100-year storm event adjacent to the existing MCDC has the potential of being an attraction for endangered waterbirds when, and if it holds water. This modification to the site potentially will provide an additional opportunistic habitat during rain events large enough to fill the swale.

To ensure that construction activities do not result in adverse impacts to listed waterbirds, an Endangered Species Awareness field guide will be developed and briefed to construction personnel and contractors. In addition, appropriate construction period BMPs would be employed to avoid or minimize potential impacts to protected species. Potential avoidance, minimization, and conservation measures are listed in MCBH's October 28, 2020 ESA Section 7 informal consultation letter (see Appendix E).

Seabirds. The principal potential impact that the construction of the project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the proposed action during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds are if; a) during construction, if it is deemed expedient or

necessary to conduct night-time construction activities: currently no nighttime construction is anticipated; b) following build-out, the potential use of streetlights or other exterior lighting during the seabird fledging season which runs annually from September 15 through December 15. All exterior lights installed within the new school will be dark-sky compliant, additionally, no night-time construction is being proposed; therefore, is not expected that the proposed action will result in deleterious impacts to protected seabirds.

Short-eared owl (*Pueo*). The principal potential impact that the construction of the project might pose to Short-eared Owls would be during the clearing and grubbing phases of the project in areas where this state listed species nests. As there is no suitable nesting habitat within the project area, it is not expected that the construction of the project will result in deleterious impacts to this species.

Hawaiian hoary bat. The principal potential impact that construction could pose to bats is during the clearing and grubbing phase of the construction. The trimming or removal of foliage and/or trees within the construction areas may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, female carrying their pups may be less able to rapidly vacate a roost site while vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they themselves forage, and very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 15 feet between June 1 and September 15, the pupping season. The Preferred Alternative does not include barbed wire fencing that could entangle foraging Hawaiian hoary bats.

Critical Habitat. There is no federally delineated Critical Habitat for any avian or mammalian species on, or close to the proposed project site. Thus, modifications of habitat on the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

ESA Section 7. MCBH initiated informal consultation with U.S. Fish and Wildlife Service, Pacific Islands Office under Section 7 of the ESA for the Proposed Action's potential impacts to ESA-listed species (see Appendix E for correspondence). MCBH determined that the Proposed Action may affect, but is not likely to adversely affect four federally-listed Hawaiian waterbirds (Hawaiian duck, Hawaiian coot, Hawaiian gallinule and Hawaiian stilt) and requested concurrence by the USFWS.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to biological resources.

3.5.3.3 Partial Reuse Alternative Potential Impacts

The study area for the analysis of effects to biological resources associated with the Partial Reuse Alternative is the same as the Preferred Alternative.

Vegetation

The Partial Reuse Alternative would have similar insignificant impacts to vegetation as the Preferred Alternative. It would likely remove fewer ornamental and shade trees and other cultivated plantings. As in the Preferred Alternative, no impacts to protected botanical species is expected because none exist on the site.

Terrestrial Wildlife

Like the Preferred Alternative, construction activities in this alternative would have insignificant impacts to terrestrial wildlife. Short-term, temporary disturbances from construction noise, vehicle and equipment movement, and dust/debris may cause avian species to relocate to other areas on base. However, in the long term, additional shade and ornamental trees, along with other landscape vegetation could result in the return of displaced fauna. School activities would be similar to existing conditions and no long-term disturbances to terrestrial wildlife are anticipated.

Threatened and Endangered Species

The Partial Reuse Alternative would have similar insignificant impacts to protected species as the Preferred Alternative due to removal of vegetation and loafing areas, and construction noise and activities. Under this alternative, the construction period would be two to six years longer than the Preferred Alternative. Depending on the intensity of activity and noise, this may prolong temporary disturbances to protected species, although appropriate BMPs would be employed to avoid or minimize any impacts.

Therefore, implementation of this action alternative would not result in significant impacts to biological resources.

3.6 Transportation

This discussion of transportation includes all of the air, land, and sea routes with the means of moving passengers and goods. A transportation system can consist of any or all of the following: roadways, bus routes, railways, subways, bikeways, trails, waterways, airports, and taxis, and can be looked at on a local or regional scale. For the Proposed Action, the following land transportation systems are relevant and discussed below: roadways, bus routes, and bikeways.

3.6.1 Regulatory Setting

The Highway Capacity Manual is a publication by the Transportation Research Board, a division of the National Academies of Sciences, Engineering, and Medicine that provides research-based solutions to improve transportation. The Highway Capacity Manual (HCM) is a nationally-accepted reference for concepts, performance measures, and analysis techniques for evaluating the multimodal operation of streets, highways, freeways, and off-street pathways. It provides an integrated multimodal approach to the analysis and evaluation of urban streets from the points of view of automobile drivers, transit passengers, bicyclists, and pedestrians. It includes a methodology for evaluating the capacity and quality of service provided to road users traveling through signalized intersections.

Level of service (LOS) is a quantitative stratification of a performance measure or measures representing quality of service. The measures used to determine LOS for transportation system elements are called service measures. The HCM defines six levels of service, ranging from A to F, for each service measure or combination of service measures. LOS A represents the best operating conditions from the traveler's perspective and LOS F the worst. LOS F is used to define operations that have either broken down (i.e., demand exceeds capacity) or have reached a point that most users would consider unsatisfactory. For cost, environmental impact, and other reasons, roadways are typically designed not to provide LOS A conditions during peak periods but instead to provide some lower LOS that balances individual traveler's desires against society's desires and financial resources.

3.6.2 Affected Environment

3.6.2.1 Roadways

Motor vehicle traffic to MCBH Kaneohe Bay is controlled by two security gates. The main gate is located at the north end of H3 Freeway (see Figure 3-6). It has two inbound and two outbound lanes, and is normally open 24 hours a day, 7 days a week. The Mōkapu Gate is located on Mōkapu Road, it has one inbound and one outbound lane, and is open between 5:00 a.m. and 10:00 p.m.

Roadways in the vicinity of and within MCBH Kaneohe Bay are shown in Figures 1-1 and 3-6. Interstate Route H3 Freeway is the primary access between MCBH Kaneohe Bay and the rest of Oʻahu. It is a Hawaiʻi Department of Transportation (HDOT) principal arterial with two to three lanes in each direction; has a right-of-way (ROW) width that varies from 100 ft to 1,370 ft; and extends from Halawa, around Kāneʻohe, and to MCBH Kaneohe Bay. It has a posted speed limit that varies from 60 miles per hour (mph) to 25 mph near the main gate. HDOT data indicates the 2016 Annual Average Daily Traffic (AADT) on Interstate Route H-3 near MCBH Kaneohe Bay was 15,300 vehicles.

Mōkapu Road, between MCBH Kaneohe Bay and North Kalaheo Avenue, is a City and County of Honolulu collector road with two lanes in each direction and a posted speed limit of 25 mph. Mōkapu Road forms a cross intersection with Mōkapu Boulevard, Kāneʻohe Bay Drive, and North Kalaheo Avenue; and provides access to and from the neighboring Kāneʻohe and Kailua communities.

Mōkapu Boulevard is an HDOT principal arterial with two lanes in each direction; and has a ROW width that varies from 100 feet to 450 feet. It extends from North Kalaheo Avenue to Kaneohe, and has posted speed limits of 30 to 35 mph. HDOT data indicate the 2016 AADT on Route 65 near North Kalaheo Avenue is 11,600 vehicles.

Kāneʻohe Bay Drive is a City and County of Honolulu collector road with a 40-foot wide ROW with one lane in each direction and a posted speed limit of 25 mph.

North Kalaheo Avenue is a City and County of Honolulu collector road with a 40-foot wide ROW with one lane in each direction and a posted speed limit of 30 mph.

Internal roadways provide traffic circulation within MCBH Kaneohe Bay and are within the installation's jurisdiction, with a maximum speed limit of 25 mph. The main internal roads leading into the base include G Street and Mōkapu Road. G Street has two lanes in each direction between the main gate and 3rd Street and one lane in each direction between 3rd Street and Mōkapu Road. Mōkapu Road has one lane in each direction, with a center turn lane and single direction bicycle lanes on each side.

Figure 3-6 Roadways

3.6.2.2 Access to Mōkapu ES

In 2016, vehicular access to Mōkapu ES was only from Mōkapu Road which was a four-lane collector road at the time. Prior to start of school day and dismissal, vehicles would queue along Mōkapu Road waiting to enter the school. The vehicle queue affected westbound traffic as it blocked one lane. In the morning, the queue was caused by a large spike in traffic volume and occurred for approximately 10 minutes duration around the time of the opening bell at 7:50 a.m. In the afternoon, parents would arrive early before the 2:05 p.m. dismissal bell and the duration of queue was longer.

Traffic counts at Mōkapu ES driveways taken in February 2016 showed 259 vehicles entering the campus during the morning peak period (45 minutes from 7:30 AM to 8:15 AM) and 177 vehicles entering the campus during the afternoon peak period (45 minutes from 1:45 PM to 2:30 PM). Queues that back onto the street were reportedly 25 to 30 vehicles, with the back of the queue near the base chapel (Mōkapu Road at Cushman Avenue intersection).

Mōkapu Road has since been re-striped. It is presently a three-lane roadway with one travel lane in each direction, a center two-way left-turn lane, and a bike lane in each direction. Vehicle access to Mōkapu ES was also changed to address the queuing that was occurring along Mōkapu Road (Figure 3-7). An entrance only driveway to the school from Cushman Avenue is opened prior to school start and dismissal. Parents enter the school via the driveway which connects the north end of campus to Cushman Avenue. This driveway has one lane in each direction and is about 700 feet long. The school entrance driveway is one-way and about 800 feet long. In total, there is about 1,500 feet of storage length for vehicles to queue between the fire gate and Cushman Avenue.

The morning drop-off and afternoon pick-up routine is illustrated and described in Figure 3-7. It is based on discussions with school staff and observations of vehicle queue length taken on October 17, October 30, October 31, and November 18, 2019.

During the observations, the length of queuing extending from the cafeteria toward the back (north) entrance toward Cushman Avenue ranged from about 1,500 feet (about 40 vehicles) to about 2,100 feet long—extending to within 125 feet of Cushman Avenue. Queues were reduced within 12 minutes of school dismissal, and varied depending on the weather (i.e., queuing appeared to start earlier and was longer in length when there was heavy rainfall).

(map source: Google Maps)

Time Line	Typical MORNING Events (M thru F)
7:00	Back gate opens
	Parents park on grassed areas and walk to Staging Area to drop off students
	Fire gate opens
7:30	JPOs start
7:35	Block driveway entrance to cafeteria parking lot
	Parents park in 3rd Regiment parking lot until full
	When 3rd Regiment lot is full, block driveway.
7:50	Students in class (1st bell)
7:55	Tardy Bell (2nd bell)

Time Line	Typical AFTERNOON Events (M-T-Th-F)
12:30	Parents arrive at back gate
1:45	Back gate opens
	Parents queue along driveway
1:55	Fire lane gate opens
2:00	School dismissal
	Buses parked at cafeteria
	JPOs start
2:05	Block driveway entrance to cafeteria parking lot
	Students arrive at cafeteria for staging
	Parents park in 3rd Regiment parking lot until full
2:07 to 2:15	Bus leaves
2:15 to 2:20	JPOs end (sunny day)
2:30 to 2:40	JPOs end (rainy day)

Figure 3-7 Traffic Circulation Student Drop-Off and Pick-Up

Mōkapu ES currently has 89 parking stalls on-campus and also uses two off-campus lots for parents to park and walk their children to school or pick them up (Chapel/MCX and 3d Regiment parking lots). Parents also park and walk from the Family Housing Office parking lot, parking lots across Lawrence Road, and streets within the Hana Like neighborhood.

There are several bicycle and pedestrian access points to Mōkapu ES. In 2016, an estimated 200-300 (24-35% of the 850 enrollment) walked or biked to school. There are five main pedestrian and bicycle paths that access the campus from all directions: through gates at the back (north end), west (near the housing office, and east (adjacent housing area), as well as from the front (Mōkapu Road). The gates are opened for morning drop-off and afternoon pickup.

Enrollment has varied over the last 20 years from 750 students to 930 students. Enrollment in the 2019-2020 school year was 879 students of which 20 students were Geographic Exceptions. All residential areas within MCBH Kaneohe Bay are located within the service area of Mōkapu ES. Dependent children of military families living at MCBH Kaneohe Bay, Mōkapu ES staff, and those employed at MCBH Kaneohe Bay may enroll at Mōkapu ES.

3.6.2.3 Bus Routes

TheBus is the City and County of Honolulu's public bus transportation service. It includes a fleet of 542 fixed route buses serving approximately 101 fixed routes throughout the island. There are no bus routes serving MCBH Kaneohe Bay. There are several TheBus routes serving the Kailua community in the vicinity of the MCBH Kaneohe Bay, listed below. Each route runs on weekdays and weekends, at varying frequencies.

- 61 Kalihi – Kāneʻohe – Aikahi
- 66 Downtown - Kailua – Aikahi
- 674 Kailua – Aikahi

There are no bus stops within MCBH Kaneohe Bay. The nearest bus stop is located at Aikahi Park Shopping Center, which is about 3,000 feet from Mōkapu Gate (Figure 3-6). The distance from the bus stop to the nearest MCBH Kaneohe Bay residential quarters is about 8,400 feet (1.6 miles).

3.6.2.4 Bikeways

As of 2019, Oʻahu had about 211 miles of bikeways (City and County of Honolulu, 2019). The existing bikeway network is made up of three types of facilities: shared-use paths, bike lanes, and bike routes (shared roadways). Shared-use paths are completely separated travel-ways for the exclusive use of bicycles and pedestrians. A bike lane provides a striped lane for one-way bike travel on a street or highway; and include buffered bike lanes that provide a striped buffer zone increasing the distance between motor vehicles and bikes. Bike route provide for shared use with motor vehicle traffic, typically on lower volume roadways.

Bike facilities near MCBH Kaneohe Bay include a shared use path along the east side of H3 Freeway between Kāneʻohe Bay Drive and MCBH Main Gate and a shared roadway along Kāneʻohe Bay Drive between Mōkapu Road and H3 Freeway, which connect to other facilities within the Kailua community. Planned City bikeway improvements include a protected bike lane along Mōkapu Road from Kāneʻohe Bay Drive to MCBH Kaneohe Bay's Mōkapu Gate. In the vicinity of Mōkapu ES, striped bike lanes are provided on both sides of Mōkapu Road from G Street to Harris Avenue.

3.6.3 Environmental Consequences

Impacts to ground traffic and transportation are analyzed by considering the possible changes to existing traffic conditions and the capacity of area roadways from proposed increases in commuter and construction traffic.

3.6.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to transportation. Therefore, no impacts would occur with implementation of the No Action Alternative.

3.6.3.2 Preferred Alternative Potential Impacts

The Preferred Alternative consists of removing all existing Mōkapu ES facilities and constructing new facilities that meet current and projected facility requirements for a design enrollment of 975 students. The action is planned to begin construction in 2021, with the first phase completed by the 2023-2024 school year, and the last phase completed by the 2026-2027 school year. Under this alternative, the entrance driveway from Cushman Avenue will be used for pedestrians and bicycles only; effectively re-routing school traffic back to Mōkapu Road similar to school traffic conditions in 2016.

Roadways

Construction Period Impacts

The study area for construction traffic is the segment of the H3 Freeway between the Mōkapu Interchange and the MCBH Main Gate. Construction traffic would be required to enter and exit MCBH Kaneohe Bay through the main gate. As the following analyses show, the Preferred Alternative is not expected to have a significant impact because construction traffic generated by the action (which would be temporary) is estimated to be about one percent of the peak hour traffic along the segment of H3 Freeway near MCBH Kaneohe Bay, which is well within the historical variation in peak hour volumes.

Construction traffic was estimated based on the number of construction workers on-site at Mōkapu ES. The number of construction workers on-site was estimated based on studies published in the “Monthly Labor Review”, December 1981, by the Bureau of Labor Statistics in an article titled, “Employment created by construction expenditures,” by Robert Ball. Based on this methodology, the 2020 on-site employee hours was estimated to be 5.6 hours per $1,000 (adjusted to 2020 dollars). The construction cost of the new Mōkapu ES is estimated at $100,000,000 and construction is estimated to take four years to complete. Assuming an average of $25,000,000 of construction expenditure per year and 5.6 on-site hours per $1,000 of contract expenditure, that equates to 140,000 total onsite hours per year. Therefore, an estimated 68 construction workers will be on-site (68 full time equivalent on-site jobs per year ≈ 140,000 hours per year ÷ 2,080 full time hours per person per year).

The number of trips generated by construction work during the weekday morning and afternoon peak hour of adjacent street traffic (one hour between 6:15 to 8:15 a.m. and one hour between 3:30 to 5:30 p.m., respectively) was based on the number of employees on-site. In lieu of pertinent construction trip generation data for 68 employees, the trips generated are assumed to be 68 trips for the morning peak hour and 68 trips for the afternoon peak hour. The directional distribution is assumed to be 90% entering and 10% exiting trips during the morning (i.e., 61 entering and 7 exiting trips); and 10% entering and 90% exiting trips during the afternoon (i.e., 7 entering and 61 exiting trips). A review of traffic count data taken by the State Department of Transportation indicates the weekday commuter peak periods along the H3 Freeway near the main gate occur between 6:15 and 8:15 a.m. in the morning

and between 3:30 and 5:30 p.m. in the afternoon. The 2016 morning and afternoon peak hour traffic volumes are shown in Figure 3-8.

For future conditions without the Proposed Action, 2016 traffic volumes along H3 Freeway were increased by 12% to account for background growth in base population (including military personnel, dependents, and civilian employees) to 2025. The 2025 morning and afternoon peak hour traffic volumes without and with construction traffic are shown in Figure 3-8.

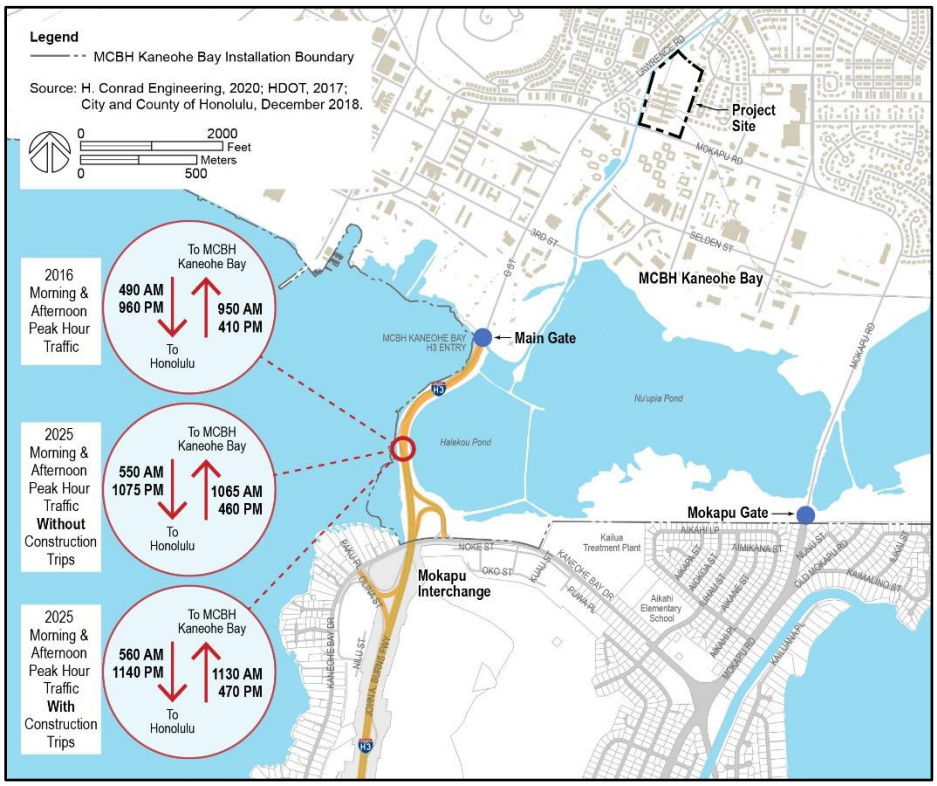


Figure 3-8 Morning and Afternoon Peak Hour Traffic without and with Project Construction Traffic

Application of the HCM multi-lane highway analysis procedure to the peak hour traffic on a segment of H3 Freeway near MCBH Kaneohe Bay indicated that there would be temporary impacts to traffic flow along that segment. As seen in Table 3-4, project construction may result in slightly higher densities (i.e., passenger car/mile/lane) on that segment of the H3 Freeway, but is not expected to decrease level-of-service due to the temporary increase in construction traffic (see Table 3-4). Because construction vehicles and equipment would be limited to entering the installation through the Main Gate and not Mōkapu Gate, it is unlikely that project construction would directly impact the off-base neighborhood near Mōkapu Gate.

Table 3-4 Results of Multi-Lane Highway Analysis

	To MCBH Kaneohe Bay		*To Honolulu*	
Peak 15-minute Period	***AM***	***PM***	***AM***	***PM***
2016 Traffic Conditions				
Volume to Capacity Ratio	0.27	0.12	0.16	0.31
Estimated Density (passenger car/mile/lane)	11	5	6	13
Level-of-Service	A	A	A	B
2025 Traffic without Construction Trips (2016 volumes + 12%)				
Volume to Capacity Ratio	0.30	0.14	0.18	0.35
Estimated Density (passenger car/mile/lane)	12	6	7	14
Level-of-Service	B	A	A	B
2025 Volume (2016 volumes + 12%) with Construction Trips				
Volume to Capacity Ratio	0.34	0.14	0.18	0.39
Estimated Density (passenger car/mile/lane)	14	6	7	16
Level-of-Service	B	A	A	B

Depending on the final route, traffic on local streets from Harris Avenue to Lawrence Road may be affected if offsite telecommunications construction activities require temporary street or sidewalk closures. The construction contractor would prepare and implement a traffic control plan to avoid or minimize adverse impacts to vehicles, pedestrians, and bicyclists who utilize the affected roadways and sidewalks. Although not anticipated, if construction-related vehicle traffic is found to cause excessive queuing at the MCBH Main Gate, MCBH will work with the contractor on a case-by-case basis to manage the situation.

An HDOT permit would be required to transport oversized equipment and overweight vehicles on State roadways, such as the H3 Freeway. According to HDOT, because no construction is proposed within the State right-of-way, no direct impacts to State roadways is anticipated (see HDOT letter dated April 14, 2020 in Appendix G).

Operational Period Impacts

Because the projected school enrollment would occur with or without the project, future traffic conditions are expected to be the same or similar with or without the project. In addition, peak school related traffic is confined to MCBH Kaneohe Bay, since students enrolled at Mōkapu ES either live on base or are dependents of school staff or base employees (i.e., Mōkapu ES students who live off base do not generate additional vehicle trips because their parents would already be traveling from their residences off base to MCBH Kaneohe Bay). Per discussion with school staff, geographic exceptions vary year to year, with 20 being on the upper end of the range.

A potential operational impact of re-routing school traffic back to Mōkapu Road is the possibility of vehicle queuing along Mōkapu Road. Parents are anticipated to continue drop-off and pick-up practices observed at the current and 2016 campus. This impact is local, confined to MCBH Kaneohe Bay; and affects the interests of students, parents, school staff, the Provost Marshal's Office, and base personnel since queuing onto Mōkapu Road would affect traffic flow and increase delays.

In 2016, the highest number of vehicles on-campus was 205, occurring in the afternoon. The design enrollment of 975 students is an increase of about 15% over the 2016 enrollment of 850 students. To account for this growth, possible variations in daily activity, and an expected higher proportion of

younger students, a factor of 1.25 was applied to 2016 traffic volumes and vehicle storage demands. The anticipated storage needed on-campus, therefore, would be (205 × 1.25 =) 256 vehicles (205 × 1.25 = 256).

In order to decrease the likelihood of queuing onto Mōkapu Road, the New Construction Alternative will provide 209 parking stalls on-campus, a 350-foot long drop-off area, and a 1,200-foot long driveway to queue vehicles within the school campus. The drop off area is estimated to be able to store 16 vehicles (at 22 feet per vehicle); and an additional 48 vehicles could be queued behind that (at 25 feet per vehicle). The New Construction alternative would provide adequate off-street queuing and parking stalls to meet the projected demand of 256 vehicles (256 < 273 = 209 stalls + 16 + 48) to minimize the on-street queuing; this is based on the assumption that current school practices for morning drop-off and afternoon pick-up of students are representative of future school practices. In general, current practices include opening the school gate sufficiently ahead of school start or dismissal to allow parents to queue or park on campus.

The Preferred Alternative is not expected to have a significant impact during the operational period because the new school would provide adequate off-street queuing and parking stalls to meet the projected queuing demand of 256 vehicles.

Bus Routes

The Preferred Alternative would not impact bus operations, routes, stops, and para-transit operations on City and State right-of-way during the construction or operational periods, since there are no bus routes within MCBH Kaneohe Bay.

Bikeways

During the construction period, no impacts are anticipated to bike facilities on City and State right-of-way. However, bicyclists who use Mōkapu Road in the vicinity of Mōkapu ES may be temporarily impacted in the vicinity of work areas when travel lanes are taken out of service for project construction. Bicyclists would be detoured around work zones along with motor vehicle traffic, if necessary. During the operational period the Preferred Alternative would have no impacts to bikeway facilities on- or off-base.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to transportation, including on State facilities during construction or operations.

3.6.3.3 Partial Reuse Alternative Potential Impacts

The study area for the analysis of effects to transportation associated with the Partial Reuse Alternative includes the access points to the school campus along Mōkapu Road and Cushman Avenue.

During the construction period, the Partial Reuse Alternative is not expected to have a significant impact because construction traffic generated by this alternative at any one time will likely be less than the Preferred Alternative since the construction will need to be phased in smaller increments. School related traffic is confined to MCBH Kaneohe Bay, since students enrolled at Mōkapu ES either live on base or are dependents of school staff or base employees.

During the operational period, the Partial Reuse Alternative would have similar less than significant impacts as the Preferred Alternative because the new school facilities would provide adequate off-street queuing and parking stalls to meet the projected demand of 256 vehicles.

Similar to the Preferred Alternative, this alternative would have less than significant construction and operational period impacts to bus routes and bikeway facilities because there are no bus routes within MCBH Kaneohe Bay and the same construction period BMPs would be implemented to route bicyclists around affected work zones, if necessary.

Therefore, implementation of the Partial Reuse Alternative would not result in significant impacts to transportation.

3.7 Natural Hazards

3.7.1 Affected Environment

3.7.1.1 Seismic

Over 90 percent of earthquake activity in Hawaiʻi is related to volcanic activity unlike other areas where the cause is shifts in tectonic plates. In addition, earthquakes may result from the underground movement of magma that comes close to the surface but does not erupt. In general, earthquakes in Hawaiʻi that are associated with volcanic activity are most common on Hawaiʻi Island, which experiences thousands of earthquakes per year. The risk of high seismic activity and degree of ground shaking diminishes with increased distance from the earthquake epicenter. Maui has also experienced numerous moderate to strong earthquakes, and the effects of earthquakes occurring on Hawaiʻi Island and Maui may be felt on Oahu (Geolabs, Inc., 2020). Based on the 2012 International Building Code, the project area may be subject to seismic activity. A 2020 geotechnical engineering exploration determined, based on subsurface conditions encountered, that there is no risk of potential soil liquefaction[3] at the site (Geolabs, Inc., 2020).

3.7.1.2 Tropical Cyclones

Passing tropical cyclones (hurricanes, tropical storms, and tropical depressions) are associated with damaging winds on Oahu. The greatest impact of these storms depends on their approach to the islands, as their counter-clockwise spin has different effects when approaching from the south than from the north. Localized microbursts and downdrafts may also cause higher wind speeds by their downslope acceleration as they descend over ridges (Fletcher, et al., 2004). Storm impacts on coastal lands, including Mōkapu Peninsula, may be severe depending on wind strength, storm diameter, timing, and proximity (Fletcher, et al., 2004). Climate change may cause a greater frequency or intensity of tropical cyclones in the Central Pacific region with long term increases in sea surface temperatures.

3.7.1.3 Tsunami

A tsunami is a series of great waves most commonly caused by violent movement of the sea floor. In coastal areas, a tsunami can flood inland areas and cause major damage and loss of life (Fletcher, et al., 2004). Damaging tsunamis in Hawaiʻi have been generated from distant Pacific Ocean locations as well as from local events, and 10 tsunamis with flood elevations greater than 3.3 feet have had damaging effects on Oahu in recorded history (Fletcher, et al., 2004). Much of the damage from tsunamis is from strong currents and floating debris they carry. According to tsunami evacuation maps prepared by the City and County of Honolulu, the area along MCDC is considered a tsunami evacuation zone, while the rest of the Mōkapu ES campus and surrounding areas are in the “extreme tsunami” evacuation zone

[3] A phenomenon during which loose, saturated, cohesionless soils acquire sufficient mobility to permit both horizontal and vertical movements, with significant deformations.

(City and County of Honolulu, 2015). When a tsunami warning (or extreme tsunami warning) is issued, persons within those respective zones should evacuate to safe zones. According to the tsunami evacuation maps, the closest safe zone to Mōkapu ES is in the area of Puʻu Hawaiʻiloa, about 200 feet west of campus. Another identified tsunami safe zone on base is located at Ulupaʻu Head, about 400 feet to the northeast. Off base, the nearest safe zone is south of Kāneʻohe Bay Drive, approximately 1,000 feet south of the campus.

3.7.1.4 Sea Level Rise

According to a report prepared in 2017 intended to provide a statewide assessment of Hawaii's vulnerability to sea level rise (SLR), sea level is rising at increasing rates due to global warming of the

Figure 3-9 Potential 3.2-Foot Sea Level Rise Exposure

atmosphere and oceans, and melting of glaciers and ice sheets (Hawaii Climate Change Mitigation and Adaptation Commission, 2017). The report presents results of modeling studies conducted to determine the potential future exposure of the main Hawaiian Islands to coastal hazards as a result of four future sea level rise scenarios: 0.5 feet, 1.1 feet, 2.0 feet, and 3.2 feet. These scenarios relate to global SLR predictions based on GHG emissions continuing at current levels of increase, and which published scenarios suggest could occur between 2060 and 2100. The 2017 Hawaiʻi Climate Change Mitigation and Adaptation Commission report uses 3.2 feet of SLR to depict hazards that may occur in the mid to latter half of this century. The SLR modeling indicates that areas in the vicinity of Mōkapu ES along MCDC may be exposed to potential chronic flooding in the 3.2 feet SLR scenario (see Figure 3-9). The modeling does not take into account the proposed drainage swale or other changes to topography at Mōkapu ES due to project construction.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the potential for natural hazards. Therefore, no impacts would occur with implementation of the No Action Alternative.

3.7.2.2 New Construction Alternative (Preferred Alternative) Potential Impacts

Under this alternative, neither construction or operations would have effects on seismic, tropical cyclone, tsunami, or sea level rise hazard frequency or severity at the project site or at Mōkapu Peninsula. The project would continue an existing use within the same property boundary and the intensity of the use (i.e., by the design enrollment of 975 students) would be the same with or without the project. The new facilities would be designed in accordance with appropriate seismic design considerations in the International Building Code (2012). The campus improvements design has taken into consideration SLR predictions and incorporates features to minimize risk of SLR impacts to school facilities and operations. The 3.2-foot SLR exposure modeled in the 2017 Hawaiʻi Climate Change Mitigation and Adaptation Commission report (shown in Figure 3-9) does not account for the effects of project's proposed drainage detention swale on the SLR footprint in the area. The proposed swale would contain the entire 3.2-foot SLR footprint that falls in the school property to within the MCDC and swale.

Therefore, implementation of the Preferred Alternative is not expected to have significant impacts to natural hazards.

3.7.2.3 Partial Reuse Alternative Potential Impacts

Like the Preferred Alternative, the Partial Reuse Alternative would not have impacts on the frequency or severity on seismic, tropical cyclone, tsunami, or sea level rise hazards. The new and renovated facilities would be designed to meet IBC 2012 seismic requirements. This alternative would also continue an existing use in its existing location. Existing and proposed new facilities would not be located in areas modeled to be affected by chronic flooding due to long-term SLR of 3.2 ft although some undeveloped portions of campus adjacent to MCDC may be affected. Therefore, implementation of the Partial Reuse Alternative is not expected to have significant impacts to natural hazards.

3.8 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. The primary goal is to identify and prevent potential accidents or impacts on the general public. Public health and safety within this EA discusses information pertaining to community emergency services, construction activities, operations, and environmental health and safety risks to children.

Community emergency services are organizations which ensure public safety and health by addressing different emergencies. The three main emergency service functions include police, fire and rescue service, and emergency medical service.

Public health and safety during construction, demolition, and renovation activities is generally associated with construction traffic, as well as the safety of personnel within or adjacent to the construction zones.

Operational safety may refer to the actual use of the facility or built-out proposed project, or training or testing activities and potential risks to inhabitants or users of adjacent or nearby land and water parcels. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations.

The AICUZ Program, which is discussed in the Land Use section, delineates accident potential zones (APZs), which are areas around an airfield where an aircraft mishap is most likely to happen. APZs are not predictors of accidents nor do they reflect accident probability. The DoD defines an APZ as a planning tool for local planning agencies. The APZs follow departure, arrival, and flight pattern tracks from an airfield and are based upon historical accident data.

Environmental health and safety risks to children are defined as those that are attributable to products or substances a child is likely to come into contact with or ingest, such as air, food, water, soil, and products that children use or to which they are exposed.

3.8.1 Regulatory Setting

Aircraft safety is based on the physical risks associated with aircraft flight. Military aircraft fly in accordance with Federal Aviation Regulations Part 91, *General Operating and Flight Rules*, which govern such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of tactical training and maintenance test flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. In addition, naval aviators must also adhere to the flight rules, air traffic control, and safety procedures provided in Navy guidance.

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to “make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.”

3.8.2 Affected Environment

Mōkapu ES is located within the boundaries of MCBH Kaneohe Bay, a secured DoD installation. MCBH Kaneohe Bay's Provost Marshal's Office is responsible for all matters relating to law enforcement and installation security on base, including emergency response, traffic enforcement, criminal and traffic accident investigation, installation access control, crime prevention, physical security, pet regulation enforcement, and coordination with local, state, federal and military law enforcement and security agencies. The Federal Fire Department provides fire protection, hazardous material response, airfield firefighting, water safety rescue, and emergency medical services at MCBH Kaneohe Bay.

3.8.3 Environmental Consequences

The safety and environmental health analysis addresses issues related to the health and well-being of military personnel and civilians living, working, or conducting authorized activities at MCBH Kaneohe Bay. Specifically, this section provides information on hazards associated with construction and operation of the Proposed Action. Additionally, this section addresses the environmental health and safety risks to children.

3.8.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to public health and safety. Therefore, no impacts would occur with implementation of the No Action Alternative.

3.8.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

Under the Preferred Alternative, construction activities and related short-term traffic increases to, from, and around the project area would pose the greatest hazard to public health and safety. Compliance with traffic control plans would minimize impacts and risks to pedestrians, bicyclists, and motorists during the construction period. Construction activities would take place during the academic term and instructional hours and could pose a safety risk to children in the area. However, the construction zone would be physically secured from and monitored for unauthorized entry, and appropriate measures would be employed to ensure that individuals are not able to gain access to the site during non-work hours. Construction areas for the offsite telecommunications infrastructure would similarly be secured and monitored and no trenches would be left open during non-work hours.

Because the new facilities would be designed and operated in accordance with applicable building codes, and federal and state regulations, school operations would not increase health and safety risks to Mōkapu ES students and staff, or other MCBH Kaneohe Bay community members. Therefore, MCBH has determined that there are no environmental health and safety risks associated with the Proposed Action that would disproportionately affect children.

Construction and operation of the Preferred Alternative is not expected to substantially increase the demand for police or fire protection services because construction activities would be carried out according to applicable OSHA requirements and school operations would be conducted in modern facilities meeting current building codes and regulations.

Accordingly, implementation of the Preferred Alternative would not result in significant impacts to public health and safety.

3.8.3.3 Partial Reuse Alternative Potential Impacts

Like the Preferred Alternative, the Partial Reuse Alternative would be constructed during the school term and during school hours. Although the new facilities would be constructed in closer proximity to existing Mōkapu ES classrooms in use, the construction zone would be physically secured and monitored to prevent unauthorized entry during work and non-work hours. The Partial Reuse Alternative would have the same insignificant construction and operational period impacts as the Preferred Alternative because renovation, new construction, and school operational activities would also be carried out according to applicable health and safety regulations. Because of this, the Partial Reuse Alternative would not result in environmental health and safety risks that would disproportionately affect children.

Therefore, implementation of this action alternative would not result in significant impacts to public health and safety.

3.9 Hazardous Materials and Wastes

This section discusses hazardous materials, hazardous waste, toxic substances, and contaminated sites.

3.9.1 Regulatory Setting

Hazardous materials are defined by 49 CFR section 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173." Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR part 273. Four types of waste are currently covered under the universal wastes regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps, such as fluorescent light bulbs.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act. Asbestos is also regulated by USEPA under the Clean Air Act, and the Comprehensive Environmental Response, Compensation, and Liability Act.

The DoD established the Defense Environmental Restoration Program (DERP) to facilitate thorough investigation and cleanup of contaminated sites on military installations (active installations, installations subject to Base Realignment and Closure, and formerly used defense sites). The Installation Restoration Program and the Military Munitions Response Program are components of the DERP. The

Installation Restoration Program requires each DoD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The Military Munitions Response Program addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. The Environmental Restoration Program is the Navy's initiative to address DERP.

3.9.2 Affected Environment

A limited hazardous materials survey of the Mōkapu ES structures was conducted in February and March 2020 to identify the presence of suspected hazardous materials that may be affected by the Proposed Action (EnviroServices & Training Center, LLC, 2020). The survey found ACM in 23 of 1,827 samples collected. Paint chips from 183 samples were collected to analyze for lead based paint. None were found to contain lead in excess of the USEPA/U.S. Department of Housing and Urban Development (HUD) guidelines for lead based paint (LBP). However, 54 of the 183 samples were found to contain detectable levels of lead that meet the classification limits of "lead containing paint" (LCP) (i.e., less than the EPA/HUD guideline, but greater than or equal to the reporting limit for LCP of 0.01 percent lead by weight). Soil samples collected at the property were evaluated for total lead, organochlorine pesticides, total chlordane, and arsenic. In some samples, arsenic, lead, chlordane, DDT, dieldrin, and endrin were detected above the laboratories' Method Reporting Limit. However, no samples were identified as containing contaminants above the Hawaii DOH's Environmental Action Levels.

As an educational facility, Mōkapu ES does not regularly generate substantial levels of hazardous waste. If and when any hazardous wastes are generated from school operations, they are stored, handled, and disposed of in accordance with RCRA, and applicable state and local requirements.

There are no known contaminated sites within the project area.

3.9.3 Environmental Consequences

The hazardous materials and wastes analysis contained in the respective sections addresses issues related to the use and management of hazardous materials and wastes as well as the presence and management of specific cleanup sites at Mōkapu ES.

3.9.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change associated with hazardous materials and wastes. Therefore, no impacts would occur with implementation of the No Action Alternative.

3.9.3.2 New Construction Alternative (Preferred Alternative) Potential Impacts

Under this alternative, all the current permanent and temporary structures at Mōkapu ES—with the exception of the sewage pump station—would be demolished and replaced with new school facilities and new below grade utility and infrastructure systems. Hazardous and regulated materials would be managed and/or removed by qualified personnel in accordance with applicable federal, state, and local regulations during demolition activities that may disturb these materials. Existing materials that are suspected to contain a hazardous contaminant but was not tested earlier would be tested prior to disturbance, and handled and disposed of in compliance with applicable federal, state, and local requirements. Hazardous materials disposal contractors will take appropriate measures to comply with applicable USEPA, OSHA, and state regulations.

During the operational period, Mōkapu ES would minimize its use of hazardous materials on campus, and handle, store, and dispose of hazardous or regulated materials and wastes in accordance with applicable regulations.

Therefore, implementation of the Preferred Alternative would not result in significant impacts with hazardous materials and wastes.

3.9.3.3 Partial Reuse Alternative Potential Impacts

Under the Partial Reuse Alternative, fewer existing structures would be demolished and replaced and some buildings with non-actionable levels of ACM and/or LCP would remain in use—similar to the No Action Alternative. As in the Preferred Alternative, prior to demolition, hazardous and regulated materials would be managed and/or removed by qualified personnel in accordance with applicable federal, state, and local regulations prior to demolition activities that may disturb these materials. Existing materials suspected of containing a hazardous contaminant but not previously tested would be tested prior to disturbance, and contractor personnel would comply with applicable USEPA, OSHA, and state regulations. Operational period activities would be the same as in the Preferred Alternative, and have the same anticipated effects.

Therefore, implementation of this action alternative would not result in significant impacts with hazardous materials and wastes.

3.10 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization

A summary of the potential impacts associated with each of the action alternatives and the No Action Alternative and impact avoidance and minimization measures are presented in Table 3-5.

Table 3-5 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
Air Quality	No impact	Less than significant impacts. The Preferred Alternative would have short-term, intermittent air quality impacts from construction activities. Best management practices would be implemented to control localized increases in dust and particulate matter. Handling and removal of hazardous materials prior to demolition activities would be conducted by qualified personnel, and contractors would comply with applicable federal and state regulations. Air monitoring will be conducted for lead dust and asbestos fibers, if applicable. Operational period impacts would be less than significant because no new sources of air pollutant emissions are included and school-related vehicle trips would be the same with or without the project. Limited, less than significant, greenhouse gas emissions are expected from the construction and operation of the Preferred Alternative.	Less than significant impacts. Partial Reuse Alternative would have similar short-term, intermittent construction period impacts as the Preferred Alternative, but with a longer duration and be located closer to existing school facilities. Construction period BMPs would be the same as for the Preferred Alternative. This alternative would have the same less than significant operational period impacts as the Preferred Alternative, as it would not include new sources of air pollutant emissions or cause significant delays in school-related vehicle congestion. This alternative would also result in less than significant GHG emissions.
Geological Resources	No impact	Less than significant impacts. The Preferred Alternative would not affect significant geological features. Construction period BMPs would be implemented to avoid and reduce erosion and sediments resulting from construction activities from reaching receiving waters. No prime or unique farmland would be affected. The design of stormwater facilities incorporation of LID features would improve the quality of stormwater generated at the site during the operational period.	Less than significant impacts similar to the Preferred Alternative, although taking place over a longer duration. Construction period BMPs would avoid or minimize erosion and sediments from being transported to downstream receiving waters.
Water Resources	No impact	Less than significant impacts. No impacts to drinking water sources. BMPs and NPDES permit conditions would be implemented to	Less than significant impacts, similar to the Preferred Alternative. BMPs and NPDES permit conditions would be implemented to

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
		avoid or minimize potential construction-related sediments and pollutants from being transported offsite to sensitive water resources. During the operational period, stormwater runoff would be directed to onsite drainage infrastructure that include water quality units. LID features would also improve stormwater runoff quality. With the construction of the proposed drainage detention swale, the new school structures would be located outside the 100-year floodplain, and also constructed two feet above the base flood elevation. The project will comply with Presidential EO 11988 Floodplain Management, including identifying measures to restore and preserve natural and beneficial values of the floodplain.	avoid or reduce construction period impacts to downstream water resources. This alternative would be designed to meet applicable requirements for collection and transmission of stormwater runoff and comply with EO 11988 Floodplain Management.
Cultural Resources	No impact	Less than significant impacts with implementation of mitigation measures for the demolition of historic buildings. No archaeological deposits or human skeletal remains are expected to be encountered during project activities. This alternative would have an adverse effect on properties eligible for NRHP listing. Consultation under NRHP Section 106 and HRS 6E is being conducted and appropriate mitigation will be identified in a MOA among HIDOE, MCBH, the Hawaiʻi State Historic Preservation Division, and other consulting parties. HIDOE will implement the mitigation actions according to the forthcoming MOA. No impacts to traditional cultural properties. No impacts to traditional Hawaiian, or other ethnic group's, rights related to gathering, access, or other	Less than significant impacts similar to the Preferred Alternative. Like the Preferred Alternative, no archaeological deposits or human skeletal remains are expected to be encountered in this alternative. This alternative would also have an adverse effect on historic buildings eligible for NRHP listing. Consultation under NRHP Section 106 and HRS 6E would be required and appropriate mitigation identified and implemented. Like the Preferred Alternative, this alternative would have no impacts to traditional cultural places or traditional cultural practices.

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
		customary activities exercised for subsistence, cultural and religious purposes.	
Biological Resources	No impact	Less than significant impacts. No impacts to protected vegetation species. Temporary impacts on threatened and endangered terrestrial species could occur from noise and habitat disturbances associated with construction activities. Endangered Species Act Section 7 consultation with the U.S. Fish and Wildlife Service was conducted for project impacts on threatened and endangered species. MCBH determined that the Preferred Alternative project may affect, but is not likely to adversely affect protected fauna species. BMPs and project design elements would be implemented to avoid or minimize impacts to protected species.	Less than significant impacts similar to the Preferred Alternative, although construction period impacts would occur over a longer period. BMPs and design features would avoid or minimize impacts to biological resources, including protected species.
Transportation	No impact	Less than significant impacts. Construction-related traffic would enter MCBH Kaneohe Bay through its Main Gate and avoid off-base neighborhoods along Mōkapu Road and result in no decrease in levels of service on the affected H3 Freeway segment. Operational period traffic conditions would be similar to future without project conditions.	Less than significant impacts similar to the Preferred Alternative, but construction period impacts would likely be less than the Preferred Alternative because the construction would extend over a longer period of time. Same operational period impacts as the Preferred Alternative
Natural Hazards	No impact	Less than significant impacts. No construction or operational period impacts on seismic, tropical cyclone, tsunami, or sea level rise frequency or severity.	Same less than significant impacts as the Preferred Alternative.
Public Health and Safety	No impact	Less than significant impacts. Compliance with construction period traffic control plans and the securing of construction areas would avoid or minimize the potential for construction period public health and safety hazards. No environmental health and safety risks	Same less than significant impacts as the Preferred Alternative.

Resource Area	*No Action Alternative*	*New Construction Alternative (Preferred Alternative)*	*Partial Reuse Alternative*
		associated with the Preferred Alternative that would disproportionately affect children are expected.	
Hazardous Materials and Wastes	No impact	Less than significant impacts. BMPs and standard operating procedures would be implemented to manage and/or remove hazardous and regulated materials according to applicable federal, state, and local regulations during demolition activities that may disturb these materials. During the operational period, Mōkapu ES would minimize its use of hazardous materials on campus, and handle, store, and dispose of hazardous or regulated materials and wastes in accordance with applicable regulations.	Same less than significant impacts as the Preferred Alternative.

This page intentionally left blank.

4 Secondary and Cumulative Impacts

4.1 Secondary Impacts

Secondary impacts are defined as "effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rates, and related effects on air and water and other natural systems, including ecosystems" (HAR Section 11-200-2). For example, a new housing development would have a secondary impact on nearby schools by increasing student enrollments.

The Proposed Action would not change the land use or intensity of activity that would occur at the project site in the future, as the projected student enrollment and staffing fluctuations would occur with or without the project. It is intended to address the physical inadequacies and modern infrastructure needs of the school and not expected to be growth-inducing. The Proposed Action would have short-term, temporary beneficial economic and fiscal impacts as construction spending flows through the state's economy in the form of wages and General Excise Taxes. The project does not include any residential or commercial development that could increase population on-base or in the civilian community, which could subsequently increase the demand for public facilities and services. Best management practices, adherence to environmental permit conditions, and design features intended to reduce off-site transport of stormwater-related pollutants would avoid or minimize downstream water quality effects to receiving waters.

Because there are no growth-inducing effects, no changes in the pattern of land use, and no increases in population density and growth associated with the Proposed Action, no adverse secondary impacts are expected.

4.2 Cumulative Impacts

This section (1) defines cumulative impacts, (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, (3) analyzes the incremental interaction the proposed action may have with other actions, and (4) evaluates cumulative impacts potentially resulting from these interactions.

4.2.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR section 1508.7 as "the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

To determine the scope of environmental impact analyses, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact analysis document.

In addition, CEQ and USEPA have published guidance addressing implementation of cumulative impact analyses—Guidance on the Consideration of Past Actions in Cumulative Effects Analysis and

Consideration of Cumulative Impacts in EPA Review of NEPA Documents. CEQ guidance entitled *Considering Cumulative Impacts Under NEPA* (1997) states that cumulative impact analyses should

"…determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative impacts of other past, present, and future actions...identify significant cumulative impacts…[and]…focus on truly meaningful impacts."

Cumulative impacts are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative impacts. To identify cumulative impacts, the analysis needs to address the following three fundamental questions.

- Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

4.3 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the study area delimits the geographic extent of the cumulative impacts analysis. In general, the study area will include those areas previously identified in Chapter 3 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the proposed action.

Another factor influencing the scope of cumulative impacts analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the proposed action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for EAs, management plans, land use plans, and other planning related studies.

4.4 Past, Present, and Reasonably Foreseeable Actions

This section focuses on past, present, and reasonably foreseeable future projects at or near the Proposed Action locale. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, using the first fundamental question included in Section 4.2, it was determined if a relationship exists such that the affected resource areas of the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative impacts analysis. In accordance with CEQ guidance, these actions considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the

meaningful actions relevant to informed decision-making. Projects included in this cumulative impacts analysis are listed in Table 4-1 and briefly described in the following subsections. Because of the limited geographical scope of the Proposed Action and its negligible potential for indirect and secondary impacts or to induce growth, the set of projects considered is limited to those at or immediately surrounding the project area.

Table 4-1 Cumulative Action Evaluation

Action	*Timing/Status*
Past Actions	
Waikulu Family Housing	Completed and operational
Hana Like Family Housing	Completed and operational
Present and Reasonably Foreseeable Future Actions	
Marine Corps Relocation from Okinawa	2027-2031/Planning in progress

4.4.1 Past Actions

Construction activities for these projects are completed and they are currently operational.

4.4.1.1 Waikulu Family Housing

The Waikulu neighborhood is an approximately 52-acre family housing area located to the west and north of the project area. Homes at Waikulu were originally constructed between 1941 and 1976 and redeveloped into 375 three- and four-bedroom duplexes and multiplexes between 2008 and 2018. Resource areas for potential cumulative impacts: Air quality, water resources, cultural resources.

4.4.1.2 Hana Like Family Housing

Originally constructed in 1992 as 276 two-bedroom units, the Hana Like neighborhood was redeveloped between 2016 and 2018 into 182 three- and four-bedroom duplexes and multiplexes. It was part of the sixth phase of the Navy's public-private venture regional housing project at MCBH Kaneohe Bay. Resource areas for potential cumulative impacts: Air quality, water resources.

4.4.2 Present and Reasonably Foreseeable Actions

4.4.2.1 Relocation of Marine Corps Units from Okinawa, Japan to Hawai‘i

Under its Defense Policy Review Initiative (DPRI), the DoD plans to realign its presence in the Asia-Pacific region, including the consolidation of Marine Corps bases in Okinawa, relocating 4,100 Marines to Guam, 2,700 to Hawai‘i, 800 to the continental U.S., and a rotational presence of 1,300 to Australia (U.S. GAO, 2017). The DoD expects relocation to Hawai‘i to occur between 2027 and 2031; however, training plans and infrastructure planning to support mission requirements are still in progress and environmental analyses of the relocation impacts are not yet available. The projects associated with DPRI are part of the USMC long-term planning horizon, but, at this time, are not sufficiently detailed for evaluation in this cumulative impacts analysis. Resource areas for potential cumulative impacts: Air quality, water resources, cultural resources.

4.5 Cumulative Impact Analysis

The following analysis of cumulative impacts is organized by resource area in the same order presented in Chapter 3. Only the resource areas that have the potential to have cumulative impacts resulting from the incremental effects of the Preferred Alternative or Partial Reuse Alternative are addressed. The Proposed Action is not anticipated to have incremental impacts in the following resource areas that would overlap temporally or spatially in a way that would be cumulatively significant with those of the past, present, and reasonably foreseeable actions identified in Section 4.4: geological resources, biological resources, transportation, natural hazards, public health and safety, and hazardous materials and waste.

The analyses show that, when considered with relevant past, present and reasonably foreseeable projects, the incremental effects of the Preferred Alternative and the Partial Reuse Alternative would not contribute to cumulative impacts on pertinent resource areas. Because it would not contribute any incremental effects, the No Action Alternative would not result in cumulative impacts on the relevant resource areas during the construction or operational periods.

4.5.1 Air Quality

4.5.1.1 Description of Geographic Study Area

The region of influence (ROI) for air quality is the areas of MCBH Kaneohe Bay installation on or directly adjacent to the Proposed Action project area. Construction of the Waikulu and Hana Like neighborhoods would have had short-term, temporary air quality impacts during construction. As they continued the same land uses and activities as the neighborhoods they replaced at the same sites, long-term significant adverse air quality impacts are not likely to have resulted from these projects. Potential air quality impacts from the DPRI projects (and their likely ROIs) have not yet been identified.

4.5.1.2 Relevant Past, Present, and Future Actions

Activities at Waikulu and Hana Like Family Housing neighborhoods may interact with the Proposed Action's air quality impacts during the project's construction and operational periods. Construction and operation of the DPRI projects may also interact with the Proposed Action's air quality impacts.

4.5.1.3 Cumulative Impact Analysis

Cumulative air quality impacts from past, present, and future actions within the ROI would be less than significant because construction period impacts would be avoided and/or minimized through implementation of project BMPs. Construction of the Waikulu and Hana Like neighborhoods is completed and there would be no temporal overlap with the Proposed Action's construction period air quality impacts. The timing of projects associated with the DPRI is unknown, but are unlikely to overlap temporally or geographically with the construction period of the Proposed Action. During the operational period, air pollutant emissions would not substantially change from existing conditions, as the school would operate with the same projected enrollment with or without the project. School-related vehicle traffic would be similar to existing conditions, and many students who reside in the adjacent Waikulu and Hana Like neighborhoods will continue to walk or bicycle to/from school; therefore, vehicle-related emissions would essentially not change. Although details of the DPRI projects are unknown, because the Proposed Action would not result in additional sources of air emissions or pollutants during its operational period, it is unlikely that its negligible air quality impacts would adversely interact with the air quality effects of the DPRI projects. Therefore, implementation of the

Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in cumulative air quality impacts within the ROI.

4.5.2 Water Resources

4.5.2.1 Description of Geographic Study Area

The ROI for water quality is the MCDC and its downstream receiving waters. Stormwater flows from the Waikulu and Hana Like neighborhoods are collected and discharged into the MCDC. Depending on their locations, stormwater runoff generated at DPRI project sites may also discharge into the MCDC in the future.

4.5.2.2 Relevant Past, Present, and Future Actions

Construction of the Waikulu and Hana Like neighborhoods may have had short-term, temporary water quality impacts during their construction periods from increased sedimentation entering the MCDC. They were completed several years ago and water quality in receiving waters has presumably returned to background levels or improved because of LID and water quality strategies incorporated into supporting infrastructure. Along with these projects, the DPRI projects may interact with the Proposed Action's water quality impacts during the operational period, as construction activities may occur within the area drained by MCDC.

4.5.2.3 Cumulative Impact Analysis

Cumulative water resources impacts from past, present, and future actions within the ROI would be less than significant because the construction period water quality effects of past and future actions would not temporally overlap with those of the Proposed Action. Project BMPs would avoid or minimize the transport of project-related sediments or pollutants from entering MCDC and being transported to downstream receiving water resources. During the operational period, project design elements, such as the inclusion of stormwater quality units and LID features, would reduce the potential for off-site transport of pollutants into receiving waters. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant water quality impacts within the ROI.

4.5.3 Cultural Resources

4.5.3.1 Description of Geographic Study Area

The ROI for cultural resources is the areas of MCBH Kaneohe Bay on or directly adjacent to the Proposed Action project area.

4.5.3.2 Relevant Past, Present, and Future Actions

The redevelopment of the Waikulu neighborhood resulted in demolition of four NRHP-eligible housing duplexes, which was an adverse effect on historic properties. Depending on the specifics of projects needed to support DPRI, it may also have adverse impacts to cultural resources.

4.5.3.3 Cumulative Impact Analysis

Cumulative impacts to cultural resources from past, present, and future actions within the ROI would be less than significant because the Proposed Action is not expected to adversely impact archaeological resources or cultural practices. Results of archaeological testing at the project area suggest that

archaeological finds are unlikely during construction. No traditional cultural properties have been identified in or near the project area. Mitigation for the Proposed Action's adverse effect on historic architectural resources would result in less than significant impacts to historic properties. The demolition of NRHP-eligible Waikulu housing duplexes was mitigated through Historic American Building Survey documentation. Neither the historic resources that were formerly at Waikulu nor the NRHP-eligible Mōkapu ES facilities are part of historic districts identified in MCBH Kaneohe Bay's internal cultural resources management plan. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to cultural resources within the ROI.

5 Conformance with State and County Plans, Policies and Controls

This chapter discusses the project's conformance with the State Land Use District regulations, the State Environmental Policy (Chapter 344, HRS), and the relevant plans and policies of the City and County of Honolulu, including the City's General Plan, Koʻolau Poko Sustainable Communities Plan, Special Management Area (Chapter 205A, HRS), and zoning.

5.1 State of Hawaiʻi

5.1.1 State Land Use Law

Pursuant to Chapter 205, HRS, all lands in the State of Hawaiʻi are classified into one of four major land use districts by the State Land Use Commission. The four land use districts are the Urban, Rural, Agricultural and Conservation Districts. Permitted uses within the State Land Use Districts are prescribed under Chapter 205, HRS and the State LUC's Administrative Rules (Title 13, Chapter 13, HAR).

Discussion. The project area is located within the State Land Use Urban District, which by definition generally includes "lands characterized by 'city-like' concentrations of people, structures, streets, urban level of services and other related land uses" (Chapter 15-15-18 (1), HAR). Permitted uses or activities within the Urban District are regulated by the ordinances and land use controls of the county within which the land is situated. On Oʻahu, the Urban District is regulated by the City and County of Honolulu. (The project is located within the Federal F-1 military and federal preservation zoning district [see Section 5.2.3 City and County Land Use Ordinance for discussion] where all military and federal uses and structures are permitted.) Figure 5-1 shows the State land use district boundaries in relation to the project site. The existing and proposed use of the property is consistent with Urban District provisions.

5.1.2 Chapter 344, HRS, State Environmental Policy

Chapter 344, HRS establishes the State of Hawaiʻi Environmental Policy. The purpose of Chapter 344 is to "establish a State policy to encourage productive and enjoyable harmony between people and their environment, promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, and enrich the understanding of the ecological systems and natural resources important to the people of Hawaiʻi" (Chapter 344-1, HRS). The following discussion addresses the proposed project's conformance and consistency with the policies and guidelines prescribed in Chapter 344, HRS.

5.1.2.1 Section 344-3(1)

"Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaiʻi."

Discussion. Project activities are not expected to have significant negative impacts on natural resources or natural environmental characteristics. The project site is currently developed and has been previously disturbed and is not associated with any significant natural habitats or resources. Construction period

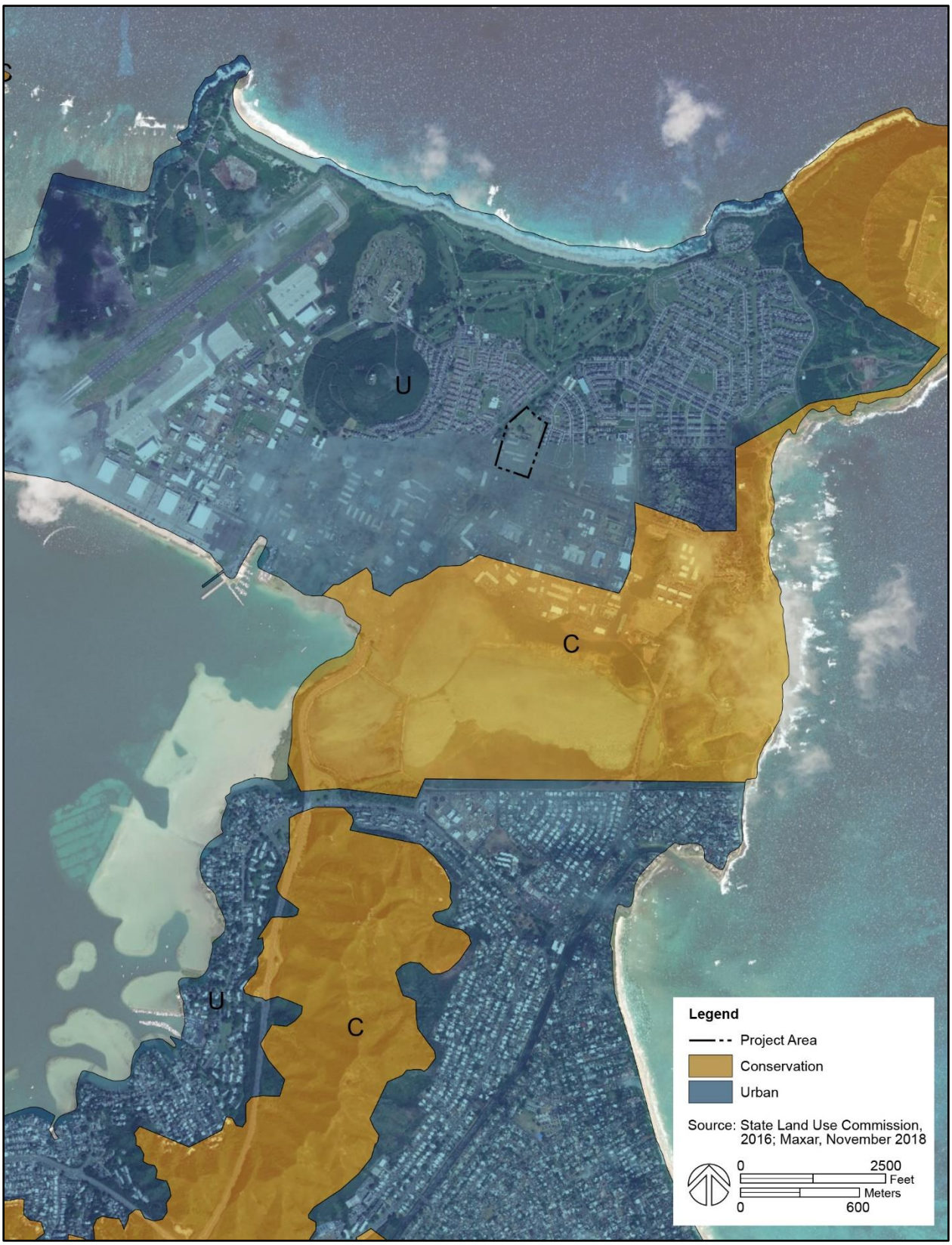


Figure 5-1 State Land Use Districts

BMPs, project design features such as stormwater quality units and LID, adherence to NPDES permit and other entitlement conditions, and compliance with applicable federal, state, and local regulations would avoid or minimize impacts to downstream natural resources such as Nuʻupia Ponds WMA, wetlands, and marine waters of Kāneʻohe Bay.

5.1.2.2 Section 344-3(2)

A) Setting population limits so that the interaction between the natural and artificial environments and the population is mutually beneficial;

B) Creating opportunities for the residents of Hawaiʻi to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments;

C) Establishing communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment which is uniquely Hawaiian; and

D) Establishing a commitment on the part of each person to protect and enhance Hawaiʻi's environment and reduce the drain on nonrenewable resources.

Discussion: The Proposed Action would have no impact on the state's population and would continue an existing elementary school use on the project area. It would improve the delivery of educational services to residents of Hawaiʻi through the provision of school facilities that meet current standards and technological needs. Mōkapu ES is the only public school at MCBH Kaneohe Bay and enhances quality of life for service members and their families assigned to MCBH Kaneohe Bay by providing public elementary education in close proximity to their homes. Given the reality that Mōkapu ES parents on active duty frequently deploy away from their families and Hawaiʻi for six months or more, its mission is to prepare children to become resilient life-long learners and responsible citizens. Among Mōkapu ES's Core Values is Hā: **B**elonging, **R**esponsibility, **E**xcellence, **A**loha, **T**otal Well-being, and **H**awaiʻi – "*HĀ provides a framework to develop the skills, behaviors and dispositions reminiscent of Hawaiʻi's unique context as well as, to honor the qualities and values of the indigenous language and culture of Hawaiʻi. Best of all, HĀ provides Mōkapu Elementary an opportunity to create an educational system of this place and relevant to the way in which we live in our island home.*"

5.1.2.3 Chapter 344-4, HRS Guidelines

1) Population

A) Recognize population impact as a major factor in environmental degradation and adopt guidelines to alleviate this impact and minimize future degradation;

B) Recognize optimum population levels for counties and districts within the State, keeping in mind that these will change with technology and circumstance, and adopt guidelines to limit population to the levels determined.

Discussion: The Proposed Action would have no impact on the state's population and would continue an existing elementary school use on the project area. As discussed in Chapter 4, no secondary or induced population impacts are anticipated because the projected school enrollment would be the same with or without the project. The project would improve the environment in which educational activities would occur.

2) Land, water, mineral, visual, air, and other natural resources.

A) Encourage management practices which conserve and fully utilize all natural resources;

B) Promote irrigation and waste water management practices which conserve and fully utilize vital water resources;

C) Promote the recycling of waste water;

D) Encourage management practices which conserve and protect watersheds and water sources, forest, and open space areas;

E) Establish and maintain natural area preserves, wildlife preserves, forest reserves, marine preserves, and unique ecological preserves;

F) Maintain an integrated system of state land use planning which coordinates the state and county general plans;

G) Promote the optimal use of solid wastes through programs of waste prevention, energy resource recovery, and recycling so that all our wastes become utilized.

Discussion: The Proposed Action would be designed and operated to meet LEED Silver certification, which includes water use reduction, construction and demolition waste management, storage and collection of recyclables, among other features. There are no sensitive habitats or natural areas within the project area. Construction and operational period stormwater flow would be subject to BMPs and design features such as stormwater quality units that would avoid or minimize the transport of sediments or pollutants generated at the site to sensitive downstream water resources or habitats. Landscape design would follow LEED guidelines and landscape plants would be appropriate for the site's climate conditions and maintenance limitations. Recycling by both military members and civilians at MCBH Kaneohe Bay is required per Marine Corps Order P5090.2, Base Order 4500.2, and the base operates an on-base recycling center for selected materials.

3) Flora and fauna

A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard;

B) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.

Discussion: The project area consists of previously developed areas that have been subjected to fill, grading, and landscaping. As described in Section 3.5, no protected plant species were observed in the project area and the only protected faunal species observed was the Hawaiian Stilt, which uses the school's playfield as a loafing site, as it is adjacent to the MCDC. Informal consultation under ESA Section 7 is being conducted with the USFWS (see Appendix E for correspondence). Construction period BMPs and conservation measures would avoid or minimize adverse impacts to ESA-protected species. A replacement turfgrass playfield would be established on the south side of the project area and other suitable Stilt loafing areas exist elsewhere on base. Therefore, MCBH determined that the Proposed Action may affect, but is not likely to adversely affect, protected species.

4) Parks, recreation, and open space

A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses;

B) Protect the shorelines of the State from encroachment of artificial improvements, structures, and activities;

C) Promote open space in view of its natural beauty not only as a natural resource but as an ennobling, living environment for its people.

Discussion: The Proposed Action would have no impact on existing parks, recreation, and open space either on- or off-base. It would continue an existing school use at the current Mōkapu ES site, although the locations of school facilities—including play areas, courts, and fields—within the campus would change. No traditional cultural practices are conducted at the project area.

5) Economic development

A) Encourage industries in Hawaiʻi which would be in harmony with our environment;

B) Promote and foster the agricultural industry of the State; and preserve and conserve productive agricultural lands;

C) Encourage federal activities in Hawaiʻi to protect the environment;

D) Encourage all industries including the fishing, aquaculture, oceanography, recreation, and forest products industries to protect the environment;

E) Establish visitor destination areas with planning controls which shall include but not be limited to the number of rooms; and

F) Promote and foster the aquaculture industry of the State; and preserve and conserve productive aquacultural lands.

Discussion: The Proposed Action would have short-term economic benefits from project construction by creating temporary jobs throughout the three- to four-year construction period. During the operational period, the Proposed Action is expected to have a negligible effect on long-term employment at the school because the projected enrollment would be the same with or without the project.

6) Transportation

A) Encourage transportation systems in harmony with the lifestyle of the people and environment of the State;

B) Adopt guidelines to alleviate environmental degradation caused by motor vehicles;

C) Encourage public and private vehicles and transportation systems to conserve energy, reduce pollution emission, including noise, and provide safe and convenient accommodations for their users.

Discussion: Because the Proposed Action would not impact Mōkapu ES's future enrollment (which would be the same with or without the project), it is not expected to affect school-related vehicle volumes. The new campus design includes several pedestrian connections to surrounding residential areas, including a new pedestrian walkway from the north, to facilitate pedestrian and bicycle modes of transportation to school. The on-site vehicle circulation pattern shown in Figure 2-1 would allow for sufficient queuing and avoid backing up onto surrounding roadways.

7) Energy

A) Encourage the efficient use of energy resources.

Discussion: The Proposed Action would be designed to achieve LEED Silver certification, and would include modernized utility systems meeting current standards for energy efficiency that encourage the conservation of natural resources. Sustainable building design elements and landscaping would also be incorporated to further minimize energy demand.

8) Community life and housing

A) Foster lifestyles compatible with the environment; preserve the variety of lifestyles traditional to Hawaiʻi through the design and maintenance of neighborhoods which reflect the culture and mores of the community;

B) Develop communities which provide a sense of identity and social satisfaction in harmony with the environment and provide internal opportunities for shopping, employment, education, and recreation;

C) Encourage the reduction of environmental pollution which may degrade a community;

D) Foster safe, sanitary, and decent homes;

E) Recognize community appearances as major economic and aesthetic assets of the counties and the State; encourage green belts, plantings, and landscape plans and designs in urban areas; and preserve and promote mountain-to-ocean vistas.

Discussion: The project site has been used as a school since 1960 and its continued use as a school would retain the general character of the surrounding neighborhood. It is conveniently located near and highly compatible with family housing areas to the west, north, and east. By relocating the school's playfield to the south, the Proposed Action would provide greater open space along the well-traveled Mōkapu Road.

9) Education and culture

A) Foster culture and the arts and promote their linkage to the enhancement of the environment;

B) Encourage both formal and informal environmental education to all age groups.

Discussion: Mōkapu ES provides elementary education for pre-Kindergarten through sixth grade students and includes education in art, music, and Hawaiiana in its curriculum.

10) Citizen participation

A) Encourage all individuals in the State to adopt a moral ethic to respect the natural environment; to reduce waste and excessive consumption; and to fulfill the responsibility as trustees of the environment for the present and succeeding generations; and

B) Provide for expanding citizen participation in the decision making process so it continually embraces more citizens and more issues.

Discussion: The EA review process provides opportunity for public input at various stages, including the pre-assessment consultation process and a Draft EA 30-day public comment period during which the public has an opportunity to provide their input on the project. Thirty-one agencies and organizations were consulted as part of the pre-assessment consultation, of which 11 agencies and organizations submitted written comments (see Chapter 10). Copies of the Draft EA will be distributed to various agencies and organizations, and notice of the Draft EA's availability will be published in OEQC's The Environmental Notice. Comment letters received from parties consulted during the pre-assessment consultation, together with the associated responses, are included in Appendix G.

5.1.3 Hawai‘i State Plan, Chapter 266 HRS

The Hawai‘i State Plan, codified under Chapter 226, HRS (as amended), serves as a guide for the future long-range development of the State. The State Plan provides a basis for determining priorities, allocating limited resources, and improving coordination of State and County plans, policies, programs, projects, and regulatory activities. The plan is divided into three parts: Part I identifies the State’s theme, goals, objectives, and policies; Part II establishes a statewide planning system which guides the coordination and implementation of the Plan; and Part III establishes priority guidelines to address areas of statewide concern.

State Plan objectives and policies focus on the general topic areas of population, economy, physical environment, facility systems, and socio-cultural advancement. The Proposed Action was reviewed in relation to the State Plan and the following sections were found to be relevant to the Proposed Action. A discussion of the project’s consistency with the relevant State Plan goals, objectives, policies, and priority guidelines is provided below. (Note: Because the proposed action involves replacing existing facilities for a public elementary school with new facilities serving the same school, most of the State Plan objectives and policies that do not specifically involve land use are not applicable or relevant to it.)

Section 226-9 Objectives and policies for the economy – federal expenditures

(a) Objective: Planning for the State’s economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai‘i’s economy.

Policy (b)(2) Promote Hawai‘i’s supportive role in national defense, in a manner consistent with Hawai‘i’s social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawai‘i’s economy.

Discussion:

The Proposed Action would allow the State of Hawai‘i to benefit from the availability of federal grant funding to redevelop an existing State of Hawai‘i public school and bring it up to modern standards for instruction, technology, and sustainability. The provision of quality educational services in highly functional spaces would support national defense by increasing quality of life for the Marines whose children attend Mōkapu ES.

Section 226-11 Objectives and policies for the physical environment—land-based, shoreline, and marine resources

Policy (a)(1) Prudent use of Hawaii's land-based, shoreline, and marine resources

(a)(2) Effective protection of Hawaii’s unique and fragile environmental resources

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

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

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

(b)(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes

Discussion: There are no natural or sensitive habitats on the project area. The Proposed Action may have temporary, short-term insignificant impacts to water quality and air quality during the construction period. However, BMPs and adherence to NPDES permit conditions would avoid or minimize these impacts to less than significant levels. The project's ESA Section 7 informal consultation found that the Proposed Action may affect, but is not likely to adversely affect ESA-protected fauna species. Although the federally- and state-listed Black-Necked Stilt may be found using the playfield as a loafing area, they would likely relocate to other suitable areas near the campus or elsewhere on base. The playfield would be relocated to the south end of campus, which may become a replacement loafing site for Stilt. BMPs, such as training construction personnel to identify and avoid protected species and avoiding the cutting of trees taller than 15 feet high between June 1 and September 15 (Hawaiian hoary bat pupping season), would be employed to further reduce potential adverse impacts.

Section 226-12 Objectives and policies for the physical environment—scenic, natural beauty, and historic resources

Policy (b)(1) Promote the preservation and restoration of significant natural and historic resources

(b)(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities

(b)(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features

(b)(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage

Discussion: The Proposed Action would have an adverse effect on historic properties eligible for the NRHP (i.e., existing Mōkapu ES school buildings) through demolition. Mitigation is being proposed to compensate for the project's adverse effects on historic resources. Appropriate mitigation actions are being determined by MCBH, HIDOE, SHPD, and consulting parties as part of a Memorandum of Agreement. Consultation with SHPD is in progress (see Appendix B).

Section 226-13 Objectives and policies for the physical environment—land, air, and water quality

Policy (b)(2) Promote the proper management of Hawai'i's land and water resources.

(b)(3) Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.

(b)(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.

(b)(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.

(b)(7) Encourage urban developments in close proximity to existing services and facilities.

Discussion: The Proposed Action has the potential to have short-term, temporary construction impacts to air quality and water quality in MCDC and downstream receiving waters from increased sedimentation or pollutants being transmitted via stormwater runoff. However, construction BMPs and adherence to NPDES permit conditions would avoid or minimize these impacts by retaining sediments and potential pollutants onsite. During the project's operational period, LID features and measures such as stormwater quality units and the drainage detention swale would reduce the offsite transport of sediments and pollutants. The detention swale would be regularly cleared and maintained. The

proposed detention swale along with the final elevation of the school facilities at two feet above the estimated base flood elevation would reduce the threat of flooding of the new campus buildings.

Section 226-21 Objective and policies for socio-cultural advancement—education

Policy (b)(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

Discussion: The Proposed Action would replace existing inadequate school facilities with new facilities designed to meet 21st century educational requirements and specific needs of students at Mōkapu ES.

5.1.4 State Functional Plans

The State Functional Plans identify priority issues, including statewide policies and guidelines within a specific field of activity. The Functional Plans are used as guidelines for funding and implementation by state and county agencies. State Functional Plans guide the implementation of state and county actions in the following areas: agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism, transportation and water resources development. Functional Plan issue areas, policies, and implementing actions relevant to the proposed action are discussed below.

5.1.4.1 Historic Preservation Functional Plan

Issue Area I. Preservation of Historic Sites

Objective A: Identification of Historic Properties

Objective B: Protection of Historic Properties

Discussion: As part of the EA process, 28 existing Mōkapu ES facilities (including portable buildings, sewer pump station, and electrical transformer room) were evaluated for their eligibility for inclusion on the NRHP and 20 were determined to be eligible for reasons described in Section 3.4 of this EA. The Proposed Action would have adverse effects on historic properties and appropriate mitigation for the adverse effect is being identified in consultation with SHPD and consulting parties.

5.1.4.2 Education Functional Plan

Goal A(4) Facilities and Services: Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

Implementing Action A(4): Pursue actions with other agencies which will ensure adequate and appropriate services and facilities on a timely basis.

Discussion: The Proposed Action is an excellent example of federal and state cooperation to provide modern, adequate HIDOE school facilities. The DoD-OEA grant will allow HIDOE to address Mōkapu ES's over-capacity conditions and facility deficits more quickly than if funding were to be solely provided by the State of Hawai‘i.

5.1.5 Hawai‘i Coastal Zone Management Program

The National Coastal Zone Management Program was created through passage of the Coastal Zone Management Act of 1972. Hawai‘i's CZM Program, adopted as Chapter 205A, HRS, provides a basis for protecting, restoring and responsibly developing coastal communities and resources. The objectives and policies of the Hawai‘i CZM Program encompass broad concerns such as impact on recreational

resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. A discussion of the project's consistency with the objectives and policies of the CZM Program follows.

(1) Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

(A) Improve coordination and funding of coastal recreational planning and management; and

(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(ii) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

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

(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 6-6, HRS.

Discussion: The Proposed Action would not affect existing coastal recreational resources or public access to shoreline areas. It would replace existing school facilities with new facilities at the same campus. The potential for construction or operational period transport of sediments or pollutants to be carried by stormwater runoff to reach recreational resources in Kāneʻohe Bay is low and would be avoided or minimized through construction period BMPs and operational period design features such as the installation of stormwater quality units and sustainable design features. The proposed drainage detention swale would allow stormwater to infiltrate into the unlined bottom of the swale over time and, combined with the other stormwater quality units and sustainable design features, would result in no net increase of offsite stormwater flows for the design storms.

(2) Historic Resources

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

Policies:

(A) Identify and analyze significant archaeological resources;

(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and

(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Discussion: There are no Native Hawaiian or other ethnic group's cultural customs and traditions exercised for subsistence, cultural or religious purposes known to be practiced within the project area at this time and none would be affected by the Proposed Action. MCBH determined that the Preferred Alternative (i.e., demolition of existing NRHP-eligible school buildings) would have an adverse effect on historic properties and consultation under Section 106 of the NHPA is underway. Appropriate mitigation for the project's adverse effect is being identified in the consultation and HIDOE will implement the mitigation in the appropriate timeframe. If during the performance of the project, historic properties, including archaeological sites and TCPs, are discovered or unanticipated effects are found, HIDOE will follow inadvertent discovery procedures.

(3) Scenic and Open Space Resources

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

Policies:

(A) Identify valued scenic resources in the coastal zone management area;

(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

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

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

Discussion: The Proposed Action would not affect scenic and open space resources in shoreline or other areas. The project would replace existing school facilities with modern facilities. Open space would be created at the south end of campus, along Mōkapu Road, a major east-west roadway through the installation.

(4) Coastal Ecosystems

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

Policies:

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

(B) Improve the technical basis for natural resource management;

(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The Proposed Action would not degrade coastal ecosystems or surface waters that flow into marine waters. During construction, BMPs would be implemented to avoid or minimize sediment flows into stormwater drains or surface waters during both the construction and operational periods. The project would require an NPDES permit; conditions of the permit would further reduce potential impacts to coastal water ecosystems.

(5) Economic Uses

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

Policies:

(A) Concentrate coastal dependent development in appropriate areas;

(B) Ensure that coastal dependent developments such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(i) Use of presently designated locations is not feasible;

(ii) Adverse environmental effects are minimized; and

(iii) The development is important to the State's economy.

Discussion: The Proposed Action is not a coastal dependent use and would continue an existing use in the same location. The project is valuable to the State's economy in that it obviates the need for the State to fully fund construction of the new campus facilities, as HIDOE will obtain 80 percent federal grant funding from DoD-OEA.

(6) Coastal Hazards

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

Policies:

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

(D) Prevent coastal flooding from inland projects.

Discussion:

The Proposed Action is located within a tsunami evacuation zone but would not increase tsunami risk to students because it is a continuation of a current use at the site. Results of geotechnical investigations for the project would be used in the project design to reduce hazards to the proposed infrastructure from erosion and subsidence; these coastal hazards are not anticipated to affect the proposed project. The proposed drainage detention swale would allow for the new school structures to be constructed outside the 100-year floodplain and comply with the Federal Flood Insurance Program. The surface parking and pedestrian walkways that would be located within the relocated floodplain boundary are not expected to be adversely affected by rare flooding events. MCBH is complying with the requirements of EO 11988.

(7) Managing Development

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

Policies:

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

(B) Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and

(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion:

The Proposed Action would replace existing elementary school facilities with new facilities in the same general location and does not represent a significant new coastal development. Public participation has and will take place through the HRS 343 EA. Relevant state and county agencies were notified of the project at an early stage and coordination among MCBH, HIDOE, and relevant agencies is ongoing.

(8) Public Participation

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

Policies:

(A) Promote public involvement in coastal zone management processes;

(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion:

Pre-assessment consultation for the project's HRS 343 EA was conducted in March 2020, in which 31 agencies, organizations and individuals were contacted for input on the scope of the EA. The Draft EA is undergoing a 30-day public review period under HRS 343. Public input is also being sought with respect to the project's NHPA Section 106 consultation (ongoing).

(9) Beach Protection

Objective: Protect beaches for public use and recreation.

Policies:

(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

(D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and

(E) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor;

Discussion:

The Proposed Action is not located near any public beach or shoreline; it does not include any above ground structures near any shoreline setback. It would not introduce any vegetation or erosion-control structures in any shoreline area, nor would it affect any beach transit corridor.

(10) Marine Resources

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

Policies:

(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

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

(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

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

Discussion:

The Proposed Action would not involve the use or development of marine or coastal resources. Because it would be located in an upland area and employ BMPs and design features to avoid or minimize downstream water quality impacts, it is not likely to affect marine resources (including marine life) through sediment or pollutant transport.

5.2 City and County of Honolulu

5.2.1 General Plan

The General Plan for the City and County of Honolulu, adopted in 1977 and last amended in 2002, identifies long term objectives and policies along with the strategies and actions to achieve them. The Plan is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of O‘ahu. The identified objectives contain statements of desirable conditions to be achieved in the long run, within an approximate 20-year timeframe. The broad policies are intended to facilitate the attainment of the objectives of the Plan. The Plan includes eleven subject areas which provide a framework of the City’s expression of public policy concerning the needs of the people and the functions of government. The eleven areas of concern include: population; economic activity; the natural environment; housing; transportation and utilities; energy; physical development and urban design; public safety; health and education; cultural and recreation; and government operations and fiscal management.

The General Plan is currently being updated and will focus on critical issues such as growth, development, economic health, tourism, affordable housing, agriculture, and sustainability. In support of the update, five trend reports, three economic discussions with key stakeholders, and a summary paper on the key planning issues have been completed. Key focus groups for agriculture, affordable housing, and tourism were created and involved participation from the public.

The objectives and policies of the General Plan that are relevant to the proposed project are as follows:

I. Population

Objective B: To plan for future population growth.

Policy 1: Allocate efficiently the money and resources of the City and County in order to meet the needs of O‘ahu’s anticipated future population.

Discussion: The Proposed Action would not affect future population, including by inducing growth. The projected future enrollment at Mōkapu ES is related to anticipated MCBH Kaneohe Bay population and

demographics, which are in part influenced by national security needs and national defense strategy. The Proposed Action would be funded through primarily federal resources, with the State funding a small percentage of the total cost; no funding by the City and County will be required for this capital investment project.

II. Economic Activity

Objective F: To increase the amount of federal spending on Oʻahu.

Policy 1: Take full advantage of Federal programs and grants which will contribute to the economic and social well-being of Oʻahu's residents.

Discussion: As noted above, the Proposed Action would be primarily funded through a grant from DoD-OEA, with the State funding a small percentage of the school's construction cost. The improved school facilities would contribute to the social well-being of families of U.S. military service members residing on Oʻahu.

III. Natural Environment

Objective A: To protect and preserve the natural environment.

Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water recharge areas, distinctive land forms and existing vegetation.

Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawaiʻi and the Island of Oʻahu.

Discussion: The Proposed Action was designed to address flood hazards at the project area. Because of the past fill, grading, and landscaping at the project area, there are no other natural features at the site that require special design considerations. Construction period BMPs and conservation measures would avoid or reduce adverse impacts to protected species now found at the project site (i.e., Black-necked Stilt). Consultation under ESA Section 7 is being conducted with the USFWS on MCBH's determination that the Proposed Action may affect, but is not likely to adversely affect protected species.

IX. Health and Education

Objective B: To provide a wide range of educational opportunities for the people of Oʻahu.

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

Discussion: The campus improvements were designed to support a 21st century learning environment, which provides exciting, engaging and flexible learning spaces that support a range of collaboration, informal breakout spaces that extend learning outside the classroom, common areas that support a range of activities; opportunities for outdoor learning activities, and specialty spaces such as a media center.

5.2.2 Koʻolau Poko Sustainable Communities Plan

The City and County of Honolulu provides a conceptual framework for implementing the objectives and policies of the General Plan though its Development Plan program. There are eight geographical development plan areas established on Oʻahu , which each have community-oriented plans intended to guide public policy and decision-making through a 25-year horizon.

Major growth in population and economic activity is directed into two of the eight planning areas, the Primary Urban Center and ʻEwa, and are guided under their respective Development Plans. The remaining six planning regions are considered Sustainable Communities Plans, and are envisioned to remain relatively stable.

The project area is located within the Koʻolau Poko Sustainable Communities Plan (SCP) area. The Koʻolau Poko SCP was adopted in 2017 and replaced the August 2000 SCP. It resulted from a community-based comprehensive review program and is intended to guide public policy, land use decision-making, and infrastructure investment for the region through 2035. The Koʻolau Poko SCP continues the vision to protect community resources, residential character, and the adoption of public improvement programs and development regulations that reflect a stable population. The Koʻolau Poko SCP vision for Koʻolau Poko's future is shaped around two principal concepts: (1) protection of natural, scenic, cultural, historic, and agricultural resources; and (2) improve and replace, as necessary, the region's aging infrastructure systems.

As seen in the Koʻolau Poko SCP Land Use Map, the project area is generally located within the Institutional land use type (Figure 5-2). The SCP's policies for Institutional Uses include:

- *Retain the open space character of existing institutional campuses*
- *Site and design campus facilities to respect the scenic context and adjacent residential areas*

Discussion: The design of the new school facilities provides the facilities needed for a 21st century learning environment while maintaining its current open space character. A large existing playfield is currently located on the north side of the campus. In the proposed campus layout, it will be relocated to the south, fronting Mōkapu Road—a main east-west roadway through the installation. This would make the open space character more visible to installation residents. The proposed campus design creates more formalized pedestrian and bicycle access points and facilities that connect to the adjacent residential areas to the north, east, and west.

5.2.3 City and County of Honolulu Land Use Ordinance

The Land Use Ordinance (LUO) of the City and County of Honolulu regulates land use in accordance with adopted land use polices from the General Plan and Development Plans. The provisions, also referred to as the Zoning Ordinance, of the LUO are intended to provide reasonable development and design standards. Under current LUO zoning, Mōkapu ES is located within the F-1 Military and Federal Preservation (see City and County Zoning and Special Management Area Map, Figure 5-3). Under the LUO, which was created to identify areas in military or federal government use and to permit the full range of military or federal government activities. Within an F-1 district, all military and federal uses and structures shall be permitted under the LUO.

5.2.4 City and County of Honolulu Special Management Area and Shoreline Setback

Established in 1975 with the enactment of Act 176, the Special Management Area (SMA) permit is also known as the Shoreline Protection Act. The SMA, conferred by HRS Chapter 205A, is designed to preserve, protect, and restore the natural resources of Hawaiʻi's coastal zone. Along the shoreline, special controls on development are necessary in order to avoid the permanent loss of valuable resources and insure adequate access to beaches, recreation areas, and natural reserves. Permissible land uses, allowed by various land use policies such as county general plans, are regulated through the

SMA permit. The SMA permit ensures that uses, activities, or operations on land, in water, or under water within the SMA comply with SMA guidelines, as well as the CZM objectives and policies.

SMA Use permits on Oʻahu are typically administered by the City and County of Honolulu Department of Planning and Permitting pursuant to Chapter 25, Revised Ordinances of Honolulu, as amended. The project area is within the SMA (see City and County Zoning and Special Management Area (Figure 5-3). HIDOE will submit a Major SMA Use Permit application to City and County of Honolulu DPP for processing and recommendation to the City Council at the appropriate time.

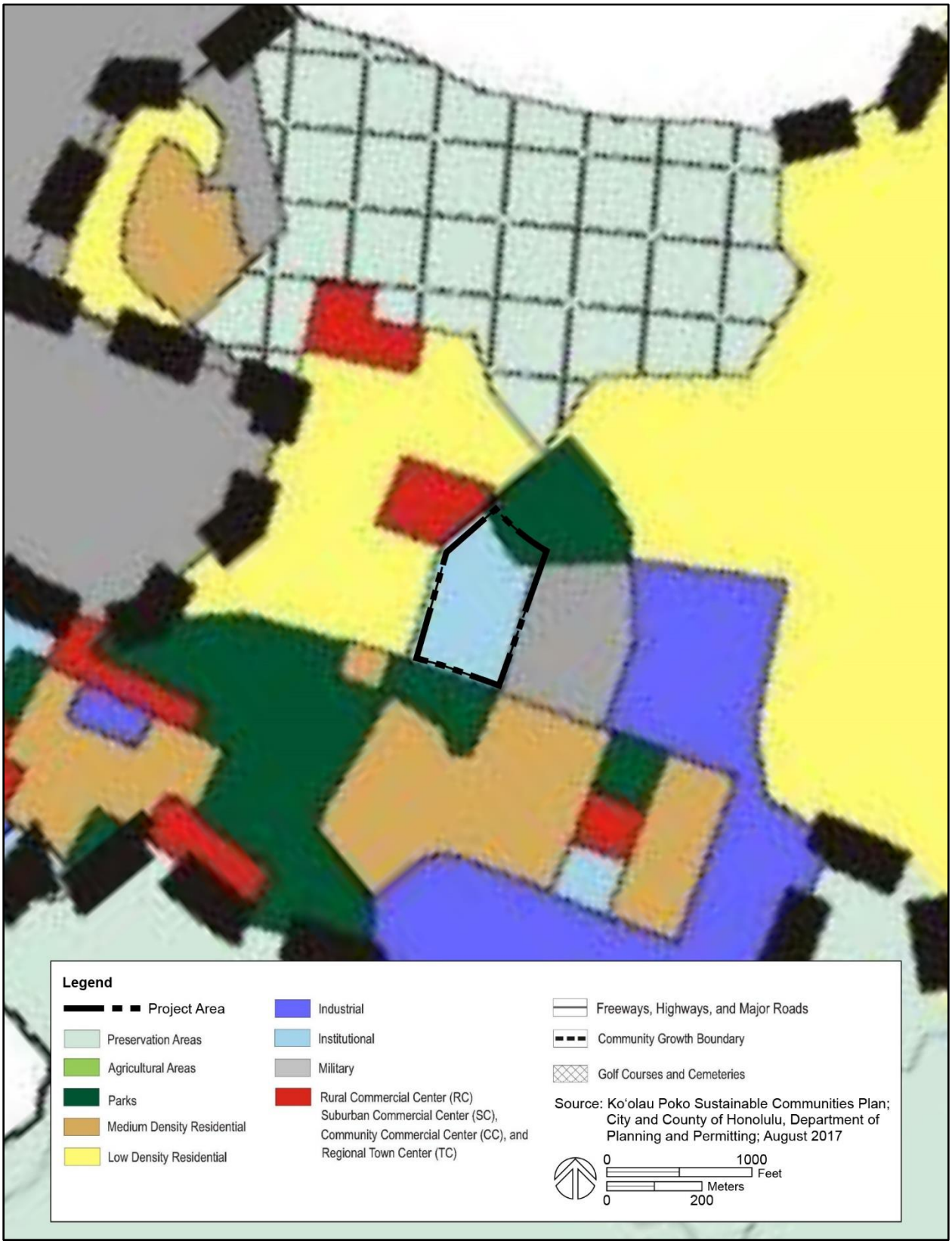


Figure 5-2 Ko'olau Poko Sustainable Communities Plan Land Use Map

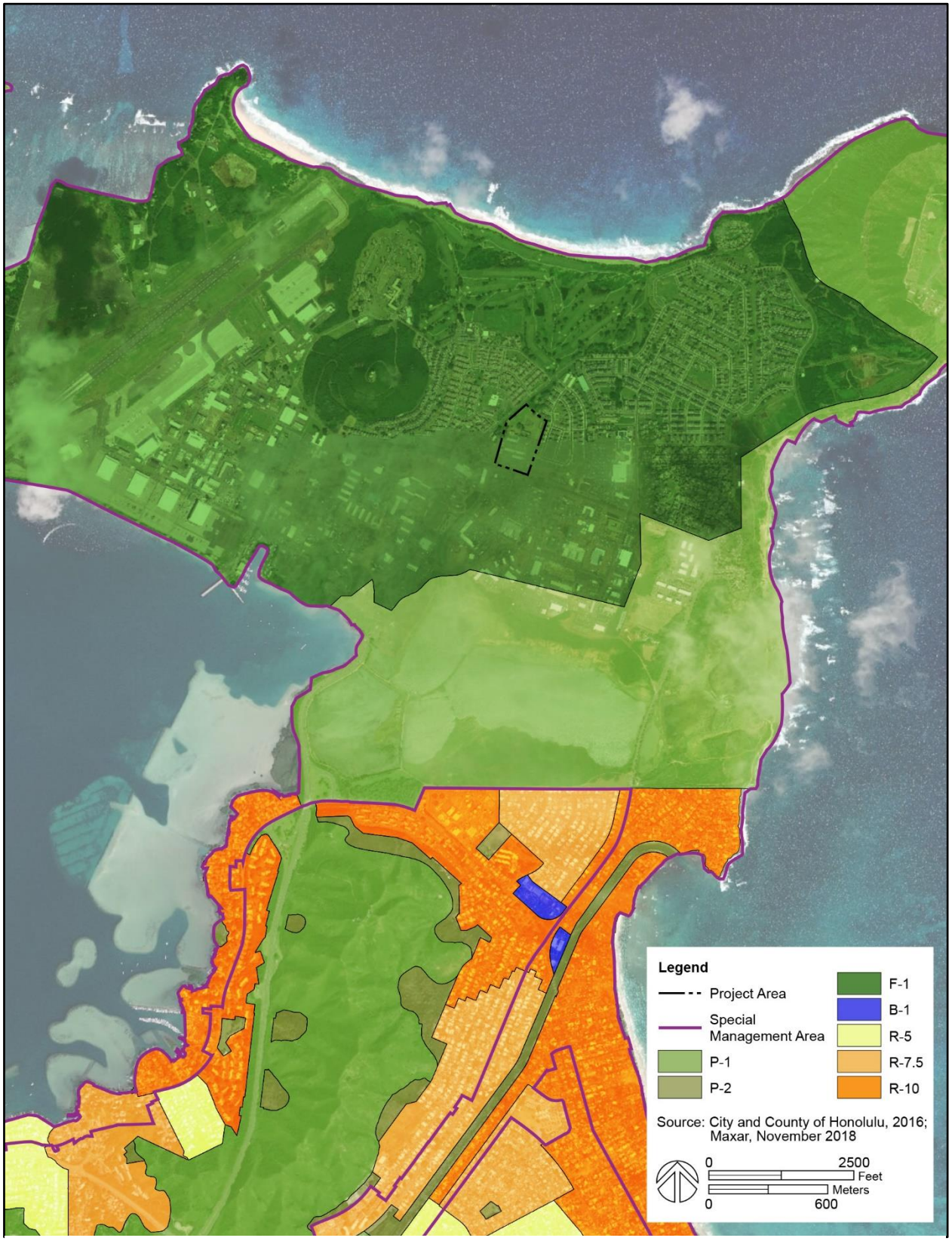


Figure 5-3 City and County Zoning / Special Management Area

6 Other Considerations Required by NEPA

6.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 CFR section 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 6-1 Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
National Environmental Policy Act (NEPA); CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA	In progress
Clean Air Act	Complies
Clean Water Act	NPDES permit to be obtained for construction activities
Rivers and Harbors Act	Not applicable (N/A)
Coastal Zone Management Act	Consultation forthcoming
National Historic Preservation Act	NHPA Section 106 consultation in progress
Endangered Species Act	ESA Section 7 consultation in progress
Magnuson-Stevens Fishery Conservation and Management Reauthorization Act	N/A
Marine Mammal Protection Act	N/A
Migratory Bird Treaty Act	Complies
Comprehensive Environmental Response and Liability Act	Complies
Emergency Planning and Community Right-to-Know Act	Complies
Resource Conservation and Recovery Act	Complies
Toxic Substances Control Act	Complies
Farmland Protection Policy Act	N/A
Executive Order 11988, Floodplain Management	Eight-step decision-making process is being conducted
Executive Order 12088, Federal Compliance with Pollution Control Standards	Complies
Executive Order 12114, Environmental Effects Abroad of Major Federal Actions (Department of Navy implementing regulation 32 CFR part 287)	N/A
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	Complies
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	Complies
Executive Order 13175, Consultation and Coordination with Indian Tribal Governments	N/A
Executive Order 13807 Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects	N/A

6.1.1 Coastal Zone Management

Through the Coastal Zone Management Act of 1972 (CZMA), Congress established national policy to preserve, protect, develop, restore, or enhance resources in the coastal zone. This Act encourages coastal states to properly manage use of their coasts and coastal resources, prepare and implement coastal management programs, and provide for public and governmental participation in decisions affecting the coastal zone. To this end, CZMA imparts an obligation upon federal agencies whose actions or activities affect any land or water use or natural resource of the coastal zone to be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of federally approved state coastal management programs. However, Federal lands, which are "lands the use of which is by law subject solely to the discretion of…the Federal Government, its officers, or agents," are statutorily excluded from the State's "coastal uses or resources" [16 U.S.C. § 1453(1)]. If, however, the proposed federal activity affects coastal uses or resources beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies. As a federal agency, the Navy is required to determine whether its proposed activities would affect the coastal zone. This takes the form of a consistency determination, a negative determination, or a determination that no further action is necessary.

By the exchange of letters dated June 1, 2009 and July 9, 2009, the Navy and the State of Hawaii's Department of Business, Economic Development and Tourism, Office of Planning respectively proposed and concurred that those activities listed on the "Navy/Marine Corps De Minimis Activities under CZMA" (De Minimis Activity List) would have insignificant direct or indirect (cumulative and secondary) coastal effects and not subject to further review by the Hawaii CZM Program when such an activity was conducted in compliance with the corresponding "Project Mitigation/General Conditions" (see Appendix F for correspondence) at MCBH Kaneohe Bay, along with other Navy/Marine Corps installations in Hawai'i. Because it would continue the existing elementary school use at the project site, the Proposed Action qualifies for De Minimis Activity List Usage No. 1: New Construction, which is:

> *"Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements."*

The relevant project mitigation/general conditions for New Construction actions are: 1, 3, 6, 8, 9, 10, 11, 13, 14, 16 (see Appendix F for list in June 1, 2009 DoN letter to Hawai'i Department of Business, Economic Development and Tourism, Office of Planning).

1. Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.

3. Turbidity and siltation from project related work will be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

6. No project-related materials (fill, revetment, rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).

8. No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.

9. Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms will be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
10. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
11. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).
13. Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the ESA.
14. The NEPA review process will be completed.
16. Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an EA.

The State CZM office was advised on October 19, 2020 of MCBH's usage of the De Minimis Activity List and the preparation of this EA and it acknowledged the notification on October 21, 2020 (see Appendix F for CZMA correspondence).

6.2 Irreversible or Irretrievable Commitments of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the Proposed Action would involve human labor; the consumption of fuel, oil, and lubricants for construction vehicles and equipment; and loss of cultural resources (i.e., demolition NRHP-eligible historic properties). Implementing the Proposed Action would not result in significant irreversible or irretrievable commitment of resources as mitigation for the adverse impacts to cultural resources would be implemented to the satisfaction of SHPD and other consulting parties.

6.3 Unavoidable Adverse Impacts

This EA has determined that the alternatives considered would not result in any significant impacts. Construction and demolition activities would comply with federal and state requirements and BMPs would reduce the potential for adverse impacts. Implementing the alternatives would result in the following unavoidable environmental impacts:

- Short-term, localized, construction period air quality impacts due to ground disturbance and the operation of construction vehicles and equipment
- Adverse impacts to historic properties from the demolition of NRHP-eligible buildings at Mōkapu ES. Mitigation would be implemented to offset the adverse impacts and documented in a

Memorandum of Agreement among NRHP Section 106 consulting parties (e.g., MCBH, HIDOE, SHPD).

6.4 Relationship between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short-term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Air quality and noise would be impacted in the short-term. In the long-term, the new Mōkapu ES facilities would be configured in a different layout than the existing buildings at the campus. The construction of the facility and operation would not significantly impact the long-term natural resource productivity of the area, as it is a previously disturbed site. Hawaiian stilt—a protected species that currently use a portion of the existing playfield for loafing—is likely to utilize other areas within MCBH Kaneohe Bay and potentially return to the site after construction is completed. The Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment because the project site is currently utilized as an elementary school.

7 Findings and Anticipated Determination

To determine whether a proposed action may have a significant impact on the environment, the State approving agency needs to consider all phases of the action, the expected primary and secondary consequences, cumulative effect, and the short- and long-term effects. The agency's review and evaluation of the proposed action would result in a determination of either: 1) the action would have a significant effect on the environment, and an Environmental Impact Statement Preparation Notice should be issued, or 2) the action would not have a significant effect and an anticipated Finding of No Significant Impact should be issued.

Based on the findings presented in this document, the Proposed Action is not expected to result in a significant impact on the environment. In accordance with Chapter 343, HRS and Chapter 11-200.1, HAR, it is anticipated that HIDOE (the approving agency) will determine that the proposed project will not have a significant environmental impact and an EIS will not be required. A Finding of No Significant Impact is anticipated.

The anticipated determination was based on review and analysis of the significance criteria specified in Section 11-200-12, HAR. An action shall be determined to have a significant effect on the environment if it meets any of the following criteria:

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

The project site encompasses lands that have been previously disturbed and have long been used for urban development. MCBH determined that the Proposed Action may affect but is not likely to adversely affect ESA-protected species, including the Hawaiian Stilt. There is no protected vegetation or critical habitat at the project site. The Proposed Action is not likely to impact archaeological resources as none are expected to be encountered during construction. Native Hawaiian or other ethnic groups' cultural practices would not be impacted. The Proposed Action would have an adverse effect on the NRHP-eligible facilities due to demolition. However, appropriate mitigation commitments will be carried out to mitigate the adverse effects to less than significant levels.

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

The proposed redevelopment allows for the continuation of the existing use on a previously developed site. The project site has a long association with public elementary education, and the proposed redevelopment would ensure that the property will continue to be used for this purpose, resulting in the positive long-term cultural and social benefits associated with this community support use. No significant adverse impacts to the natural environment would result from the proposed development. Construction and operation of the new facilities would be performed in accordance with applicable federal, state, and county requirements, thereby minimizing potential adverse environmental impacts.

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

The proposed project would be designed and constructed in conformance with appropriate environmental considerations, and is consistent with the State's long-term environmental policies established in Chapter 344, HRS. Consistency with the policies and guidelines specified in Chapter 344, HRS is demonstrated in Section 5.1.2.

4. Substantially affects the economic welfare, social welfare, and cultural practices of the community or State;

Constructing new Mōkapu ES facilities would not adversely affect economic, social welfare, or cultural practices at MCBH Kaneohe Bay or the State. Short-term direct and indirect economic benefits to the State and County would result from the generation of construction-related jobs and the induced effects of spending on the economy. Long-term benefits include modernized school facilities sized to meet current standards. This would reinforce the continued success and viability of Mōkapu ES, which would support the social welfare of the military families stationed at MCBH Kaneohe Bay. Because the use of the site and projected enrollment levels would be the same with or without the project, long-term economic and social impacts are not anticipated. There are currently no cultural practices by Native Hawaiian or other ethnic groups' taking place at the project area and those occurring at other locations would not be affected by the Proposed Action.

5. Substantially affects public health;

The proposed project would not substantially affect public health. There would be some typical short-term construction-related impacts (noise, air quality, and traffic) in the area, but these would be temporary. Construction BMPs would be employed to minimize the temporary impacts. No activities associated with increased public health risks would take place on the property. Compliance with applicable federal, state, and county regulations would ensure that public health concerns are addressed.

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

There would be no changes in current employment levels, island-wide population or population density as a result of the proposed Mōkapu ES campus improvements project. Because the school enrollment and operations would be generally the same with or without the project, the project is not expected to induce growth in the region or State. No foreseeable changes in the use and intensity of use, employment levels or school schedules are anticipated. Existing traffic patterns and volumes would be expected to continue, with the exception of minor short-term impacts construction period impacts. Since the project site is currently served by government-owned and commercial utilities and infrastructure, no significant impacts to public facilities are expected.

7. Involves a substantial degradation of environmental quality;

The proposed redevelopment would not substantially degrade environmental quality. Design and construction activities would be conducted in accordance with applicable development regulations. Long-term impacts to air and water quality, noise levels, and natural resources would be minimal or non-existent. The use of standard construction and erosion control best management practices would minimize anticipated construction-related short-term impacts (i.e., noise, air quality, water quality, solid waste generation and traffic). Proposed improvements, such as drainage improvements to manage stormwater runoff and the addition of native plants or those appropriate to the site, would enhance environmental quality at the site.

8. Is individually limited and cumulatively has considerable effect upon the environment or involves a commitment for larger actions;

The proposed project would not have a significant cumulative impact on the environment when considered collectively with future private and government actions planned in the area. The type of use and level of activity associated with the current school facilities would be similar with or without the project. The proposed project does not involve a commitment for larger actions.

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

The project site is an existing urbanized area that has been previously disturbed for development. There is no critical habitat at the project site. In its consultation with USFWS under Section 7 of the ESA, MCBH determined that the Proposed Action may affect, but is not likely to adversely affect ESA-protected fauna species (see Appendix E for correspondence).

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

The proposed project would not substantially affect air or water quality or ambient noise levels, as the uses associated with the school are not a significant source of air or noise pollutants. Temporary, short-term increases such as noise and dust would be expected during construction. Contractors would employ construction period BMPs to minimize construction-related impacts to air or water quality, and the project would comply with applicable federal, state, and county requirements. Drainage improvements would maintain the amount and rate of stormwater runoff from the site at or below current levels.

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

The project site is in a tsunami evacuation zone, but it would not increase tsunami risks as it continues an existing use that would continue at the site with or without the project. The proposed drainage detention swale and planned final elevation of the new structures two feet above the estimated base flood elevation would increase protections from flooding at the new campus buildings. Some surface parking and pedestrian walkways would be within the proposed 100-year floodplain; MCBH is complying with the requirements of EO 11988 Floodplain Management, which will be completed prior to implementing the Proposed Action There are no known erosion or subsidence problems, or geological hazards in the area.

12. Substantially affects scenic vistas and viewplanes identified in County or State plans or studies; or

The Proposed Action would not affect scenic vistas or viewplanes identified in County or State plans or studies.

13. Requires substantial energy consumption.

Modernized, upgraded utility systems and fixtures would promote the efficient use of energy. The Proposed Action would be designed and operated to meet LEED Silver certification, which requires the new buildings meet a minimum energy performance level.

This page intentionally left blank.

8 References

Allen, Jane and Timothy Reith. (2014). Archaeological Assessment for Environmental Assessment, Parking Apron/Infrastructure (Project P-907) and Hangar (Project P-908), Marine Corps Base (MCB) Hawaii, Kaneohe Bay, Oʻahu, Hawaiʻi, TMK 4-4-008-001, Prepared for U.S. Department of the Navy, Naval Facilities Engineering Command.

Barrera, William. (1981). Mōkapu Peninsula Archaeological and Ethno-Historic Reconnaissance and Assessment.

Bookless, Lance. (2020a). Comments on the Mōkapu ES EA Biological Survey Report (7/30/20). Lance Bookless, Senior Natural Resources Manager, MCBH Environmental Division.

Bookless, Lance (2020b). Personal communication. October 6, 2020.

Buck, P.H. (Te Rangi Hiroa). (1964). "Death and Burials: 571-571. Arts and Crafts of Hawaii," *B.P. Bishop Museum Special Publication 45*. B.P. Bishop Museum.

City and County of Honolulu. (2015). Tsunami Evacuation Map, Kailua to Kaneohe Bay, Map 7, Inset 1. Prepared April 2015.

City and County of Honolulu. (2019). Oʻahu Bike Plan 2019 Update. Prepared in cooperation with the Oʻahu Metropolitan Planning Organization and the U.S. Department of Transportation. Prepared by HHF Planners in association with Toole Design.

Cordy, Ross. (1984). Archaeological Monitoring, Dredging of Sand-Clogged Channel Between Paʻakai Pond and Kailua Bay, Marine Corps Air Station, Kaneohe Bay. Prepared for U.S. Marine Corps Air Station. Ross Cordy, Ph.D., Waipahu, Hawaiʻi.

Council on Environmental Quality. (1997). Considering Cumulative Effects Under the National Environmental Policy Act. Washington, DC.

David, Reginald E. and Maya LeGrande. (2020). Biological Surveys Conducted for Mōkapu Elementary School Campus Improvements Project, Mōkapu District, Island of Oʻahu. Prepared for Helber Hastert and Fee, Planners.

Devaney, Dennis M., Marion Kelly, Polly Jae Lee, and Lee S. Motteler. (1982). Kāneʻohe—A History of Change. Rev., updated.

Drolet, Robert P., Patricia A. Drolet, and Allan J. Schilz. (1996). Archaeological Inventory Survey of Pali Kilo and Ulupaʻu Crater Parcels, Marine Corps Base Hawaii Kaneohe Bay, Oʻahu, Hawaiʻi. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc.

EnviroServices & Training Center, LLC. (2020). Limited Hazardous Materials Survey Report, Mōkapu Elementary School. Prepared for Mitsunaga & Associates.

Fletcher, C.H., III, E.E. Grossman, B.M. Richmond, A.E. Gibbs. (2004). Atlas of Natural Hazards in the Hawaiian Coastal Zone. U.S. Geological Survey Geologic Investigations Series I-2761. https://pubs.usgs.gov/imap/i2761/.

Geolabs, Inc. 2020. Geotechnical Engineering Exploration, Mōkapu Elementary School Campus Improvements. Marine Corps Base Hawaii, Kaneohe Bay, Oʻahu, Hawaiʻi. March 31, 2020. Prepared for Mitsunaga & Associates, Inc.

Hawaii Climate Change Mitigation and Adaptation Commission. (2017). Hawaiʻi Sea Level Rise Vulnerability and Adaptation Report. Prepared by Tetra Tech, Inc. and the State of Hawaiʻi Department of Land and Natural Resources, Office of Conservation and Coastal Lands, under the State of Hawaiʻi Department of Land and Natural Resources Contract No. 64064.

International Archaeology, LLC. (2020). Final Archaeological Subsurface Testing in Support of Campus Improvements at Mōkapu Elementary School, Marine Corps Base Hawaii Kaneohe Bay, Oʻahu, Hawaiʻi. TMK (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion). Prepared by Summer Moore, Ph.D.

Graydon "Buddy," James R. Hollyer and Luisa Castro. (2007). Loko Iʻa: A Manual on Hawaiian Fishpond Restoration and Management, University of Hawaiʻi at Mānoa, College of Tropical Agriculture and Human Resources.

Lyons, C.J., and J.F. Brown. (n.d.). The Mōkapu Peninsula, Koolau, Oʻahu. Scale 1:12,000. Government Register Map 1073 on file at the Hawaiʻi State Survey Office, Honolulu.

MacCaughey, Vaughan. (1917). A Footpath Journey. Mid-Pacific Magazine 14(2):181-196.

Macdonald, Gordon A., and Agatin T. Abbott. (1970). Volcanoes in the Sea.

Maly, Kepā. (1995). Mōkapu Peninsula Oral History Study Puʻu Hawaiʻi Loa Family Housing Project Site, Marine Corps Base Hawaii Lands of Heʻeia and Kāneʻohe, Island of Oʻahu, Prepared for the Department of the Navy Pacific Division Naval Facilities Engineering Command, Contract No. 62472-93-D-0502.

Naval Facilities Engineering Command, Pacific (NAVFAC Pacific). (2017). Final Environmental Assessment Demolish Abandoned Pier, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii.

Naval Facilities Engineering Command, Pacific. (2018). Airfield Improvements and Building Demolition Environmental Assessment. Marine Corps Base Hawaii Kaneohe Bay, Oʻahu, Hawaiʻi.

Parker, P. L., and T. F. King. (1998). Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin 38. Electronic document, http://www.nps.gov/nr/publications/bulletins/pdfs/nrb38.pdf. Department of the Interior, National Park Service, Washington, DC.

Prishmont, Laura Ann, Jane Allen, and Stephan D. Clark. (2001). Archaeological Monitoring in Support of the Base Realignment and Closure (BRAC) Program Relocating Barbers Point Naval Air Station Operations to Marine Corps Base Hawaii Kaneohe Bay, Oʻahu Island, Hawaiʻi. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc.

Schilz, Allen, James Landrum, and Jane Allen. (1997). Archaeological Monitoring of KB-163MS, Repairs to Sanitary Sewer System (RESEW) at Marine Corps Base Hawaii Kaneohe Bay, Oʻahu, Hawaiʻi. Prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc..

Schoofs, R. (1978). Pioneers of the Faith: History of the Catholic Mission in Hawaii, 1827-1840, Rev. Fay Wren Midkiff, Ed. Louis Boeynaems.

Shun, Kanalei. (1991). Archaeological Subsurface Investigations for Proposed Family Housing Construction, Kaneohe Marine Corps Air Station, Koolaupoko District, Island of Oahu, Hawaii. Prepared for U.S. Army Engineer District, Honolulu, Corps of Engineers, Fort Shafter, Hawaiʻi.

State of Hawaiʻi. (2020). Annual Summary 2018 Air Quality Data.

State of Hawaiʻi Department of Transportation (HDOT). (2017). 2016 Program Count Summary, Site ID B720000H3-16 for February 4, February 5, December 13, and December 14, 2016. Run Date: August 8, 2017.

Steele, Staff Sergeant Al, USMC. (1965). Myths, Martyrs and Marines of Mōkapu, History and Museums Division, Headquarters, U.S. Marine Corps, Washington, D.C.

Tomonari-Tuggle, M. J. (2014a). The Making of Mōkapu: A Paradise on the Peninsula. Archival and Ethnohistoric Research of Mōkapu Peninsula. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. International Archaeological Research Institute, Inc.

Tomonari-Tuggle, M. J. (2014b). Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, Oʻahu, Hawaiʻi, 2014-2019. Prepared for Commanding General, Marine Corps Base Hawaii, Kāneʻohe, Hawaiʻi. Prepared for Department of Navy, Naval Facilities Engineering Command, Pacific Division, Pearl Harbor, Hawaii. International Archaeological Research Institute, Inc.

Tomonari-Tuggle, Myra and Tom Arakaki. (2014). Mōkapu: A Paradise on the Peninsula, Stories From Not So Long Ago, Prepared for Marine Corps Base Hawaii, Environmental Division.

Tuggle, H. David, and Robert J. Hommon. (1986). Historic Property Inventory, Marine Corps Air Station, Kaneohe Bay: History, Survey, and Site Descriptions. U.S. Navy, Pacific Division, Naval Facilities Engineering Command.

U.S. Government Accountability Office (GAO). (2017). "Marine Corps Asia Pacific Realignment: DOD Should Resolve Capability Deficiencies and Infrastructure Risks and Revise Cost Estimates." Report No. GAO-17-415. April 2017.

VanderWerf, E. A. (2003). Distribution, Abundance., and Breeding Biology of White Terns on Oahu, Hawaii. Wilson Bulletin. 115(3, 2003): 258-262.

Wagner, Warren L., Derral R. Herbst, and S. H. Sohmer. (1990). Manual of the Flowering Plants of Hawaiʻi. 2 vols.

Windward Marine. January 29, 1960. “Mōkapu School Plans Approved.”

Windward Marine. August 19, 1960, “Mōkapu Principal Says New School Won’t Be Ready.”

Windward Marine. November 25, 1960. “New School Opens Doors to Students.”

This page intentionally left blank.

9 List of Preparers

Contractors

Thomas A. Fee, AICP, LEED AP ND (HHF Planners)
B.A., Economics and Master of Urban and Regional Planning
Years of Experience: 39 years
Responsible for: Principal in charge; overall quality assurance/quality control

Gail Renard, LEED AP (HHF Planners)
B.A., International Relations
Years of Experience: 29 years
Responsible for: Primary author, purpose and need, proposed action and alternatives, air quality, geological resources, water resources, natural hazards, public health and safety, hazardous materials and wastes, secondary and cumulative impacts, conformance with State and County plans, policies, and controls, other considerations required by NEPA, findings and anticipated determination

Tina Bushnell (HHF Planners)
B.A. Anthropology-Geology
Years of Experience: 16 years
Responsible for: Cultural impact assessment

HHF Planners Subcontractors

Tim Rieth (International Archaeology, LLC)
M.A., Anthropology (focus Archaeology)
Years of Experience: 22 years
Responsible for: Archaeological Resources

Summer Moore (International Archaeology, LLC)
Ph.D., Anthropology
Years of Experience: 17 years
Responsible for: Archaeological Resources

Daniel Knecht (International Archaeology, LLC)
M.A., Geography
Years of Experience: 12 years
Responsible for: Archaeological Resources Geographic Information Systems

Phirum Kem (International Archaeology, LLC)
B.A., Archaeology
Years of Experience: 10 years
Responsible for: Archaeological Resources

Polly Tice (MASON)
M.S., Historic Preservation
Years of Experience: 17 years
Responsible for: Architectural Resources

Maya LeGrande (LeGrande Biological Surveys, Inc.)
B.S. Botanical Sciences; M.S. Botanical Sciences
Years of Experience: 20 years
Responsible for: Terrestrial Biological Resources

Reginald David (Rana Biological Consulting)
Years of Experience: 34 years
Responsible for: Terrestrial Biological Resources

Conrad Higashionna, P.E. (H. Conrad Engineering, LLC)
B.S. Civil Engineering
Years of Experience: 37 years
Responsible for: Transportation

10 Parties Consulted in the Preparation of the EA

10.1 Early Consultation

In accordance with HRS 343 and HAR Chapter 11-200.1, early consultation efforts were undertaken during the preparation of the Draft EA. Early consultation letters requesting comments on the proposed action were sent to the 31 agencies, companies, elected officials, and community organizations listed below. Eleven parties submitted written comments and are noted with an asterisk (*); the comments and responses are reproduced in Appendix G.

Federal

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- National Park Service

State of Hawaiʻi

- *Department of Accounting and General Services, Public Works Division
- *Department of Business, Economic Development, and Tourism, Office of Planning
- Department of Health, Environmental Health Administration
- Department of Land and Natural Resources, Land Division
- Department of Land and Natural Resources, State Historic Preservation Division
- *Department of Transportation
- Office of Hawaiian Affairs

City and County of Honolulu

- *Board of Water Supply
- *Department of Design and Construction
- Department of Environmental Services
- *Department of Facility Maintenance
- *Department of Planning and Permitting
- *Department of Transportation Services
- *Honolulu Fire Department
- *Honolulu Police Department

Utilities

- Hawaiian Electric Company, Inc.
- Hawaiian Telcom
- Charter Communications (Spectrum)

Elected Officials

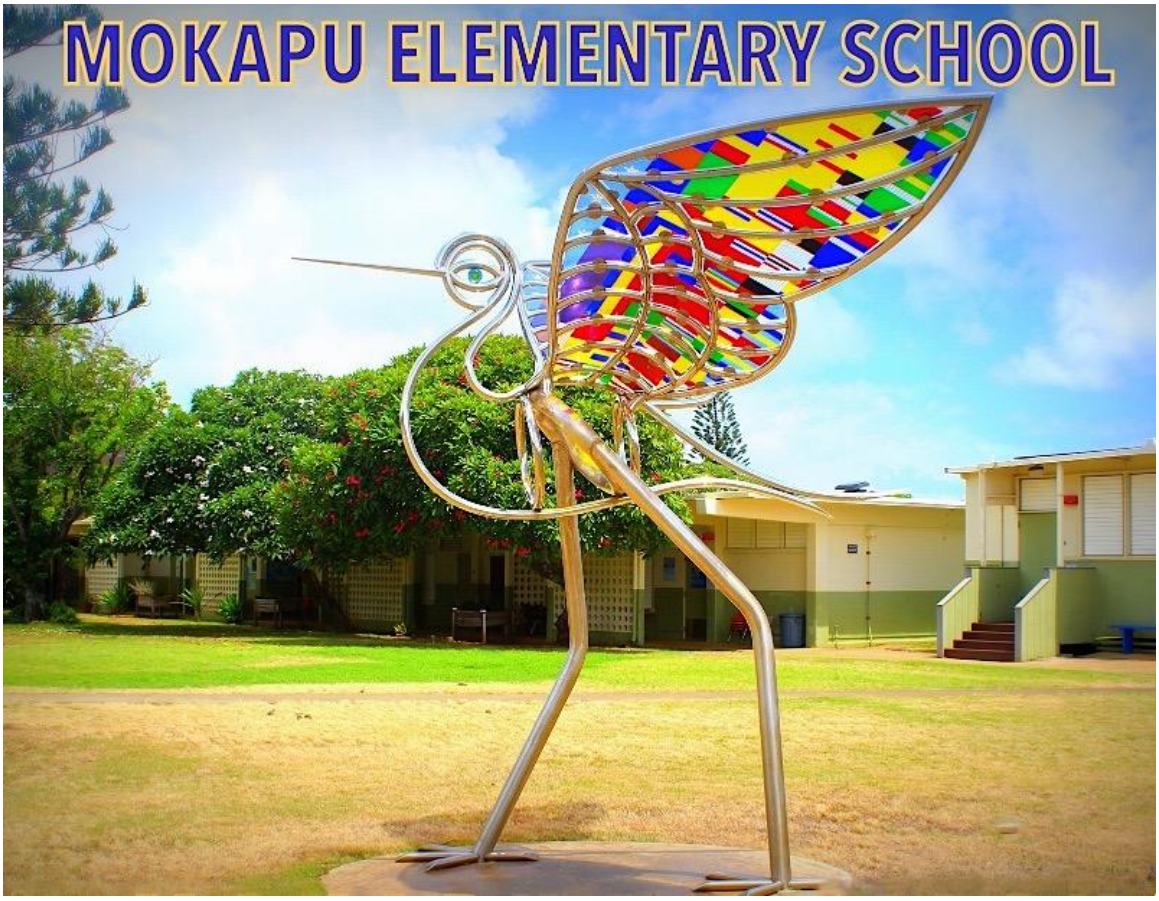
- The Honorable Senator Maizie Hirono
- The Honorable Senator Brian Schatz
- The Honorable Representative Tulsi Gabbard
- The Honorable Senator Jarrett Keohokalole, 24th Senatorial District
- The Honorable Cynthia Thielen, 50th Representative District
- The Honorable Ikaika Anderson, District 3, Honolulu City Council

Community Organizations

- Mōkapu Elementary School Parent Teacher Association
- Mōkapu Elementary School Community Council
- *Kailua Neighborhood Board No. 31

Appendix A
Biological Survey Report

Biological Surveys Conducted for Mōkapu Elementary School Campus Improvements Project, Mōkapu District, Island of O‘ahu



Prepared by:
Reginald E. David: davidr003@hawaii.rr.com
Maya LeGrande: maya.legrande@gmail.com

Prepared for:
Helber Hastert & Fee Planners
Bishop Street, Suite 2590
Honolulu, HI 96813

May 29, 2020 Revised 8/7/2020

Table of Contents

Introduction **3**
General Site Description 3

Methods and Results **10**
Botanical Survey Methods 10
Botanical Survey Results 10
Avian Survey Methods 15
Avian Survey Results 16
Mammalian Survey Methods 17
Mammalian Survey Results 18

Discussion **18**
Botanical Resources 18
Avian Resources 18
Mammalian Resources 20

Potential Impacts to Protected Species **21**
Botanical 21
Waterbirds 21
Seabirds 21
Short-eared Owl – Pueo 21
Hawaiian hoary bat 22

Critical Habitat **22**

Recommendations **22**

Glossary **23**

Literature Cited **24**

Introduction

The State of Hawaiʻi, Department of Education (HIDOE) proposes to redevelop Mōkapu Elementary School, which was originally constructed circa 1959 and located on a 14-acre site at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The land underlying the school is owned by the United States of America and is leased to the HIDOE for school use (Figures 1, 2 and 3).

The proposed action will provide approximately 162,000 square feet of floor area to include two and three-story classroom buildings, administration/library, cafeteria, covered playcourt, playfield, and parking lots. The redevelopment project will also include related on and off-site infrastructure improvements and utility connections. The project will be implemented in phases, over a three to four-year period, to minimize disruption to school activities and the learning environment.

This report describes the methods used, and the results of the botanical, avian and terrestrial mammalian surveys conducted within and adjacent to the proposed action area as part of the environmental disclosure process associated with the proposed project.

The primary purpose of the surveys was to determine if there are any biological species currently listed, or proposed for listing under either federal or State of Hawaiʻi endangered species statutes within or adjacent to the study area. The federal and State of Hawaiʻi listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998, 2014; U. S. Fish & Wildlife Service (USFWS) 2019). Fieldwork was conducted on May 20, 2020.

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text.

General Site Description

The study site is a school campus and an adjacent construction staging area. Existing school structures include an administration building, a library, a cafeteria, nine classroom buildings, and four restroom structures with a combined floor area of approximately 60,000 gross square feet. Nine portable classroom buildings, four playgrounds, two playcourts, two basketball courts, a dirt race track, paved parking areas and a sewer pump station are also located on the site (Figure 3). The school campus is bounded to the south by Mōkapu Road, Mōkapu Central Drainage Channel to the west and to the north and east by residential housing (Figure 2). The campus is relatively flat with little change in elevation. Soils are defined as Fill land (FL), Keaau clay (KmA), and Mamala cobbly silty clay loam (MnC) (USDA, 2020). As with most urban areas in the Hawaiian Islands, the natural habitat has been altered and is dominated by introduced plant species. The majority of the survey area is characterized by landscaped ornamental trees and grassy maintained lawns with courtyard plantings of ornamental shrubs and food plants within the classroom building areas. Land

uses in the surrounding area include family housing, recreational facilities, and headquarters, operations, logistics, and training facilities (Figures 4, 5, and 6).

Figure 1 – Project Vicinity Map MCBH

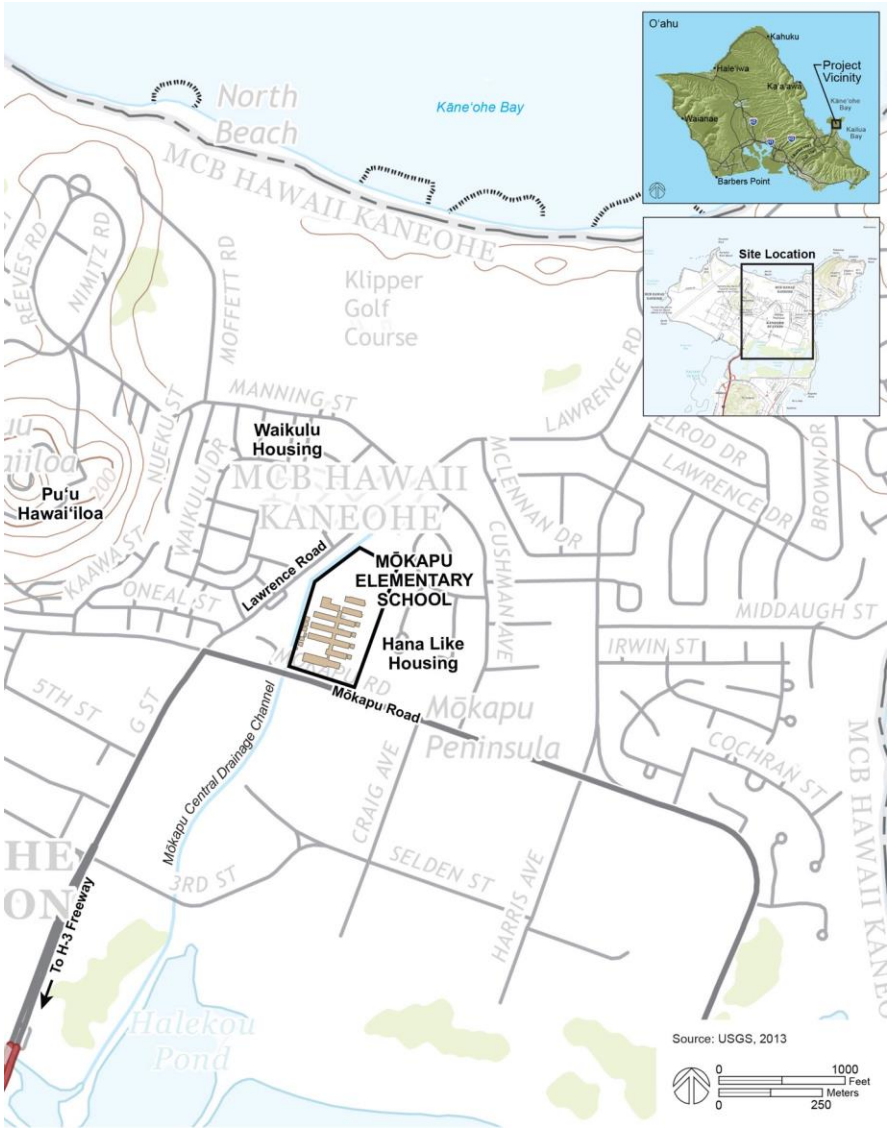


Figure 2 – Project Location Map

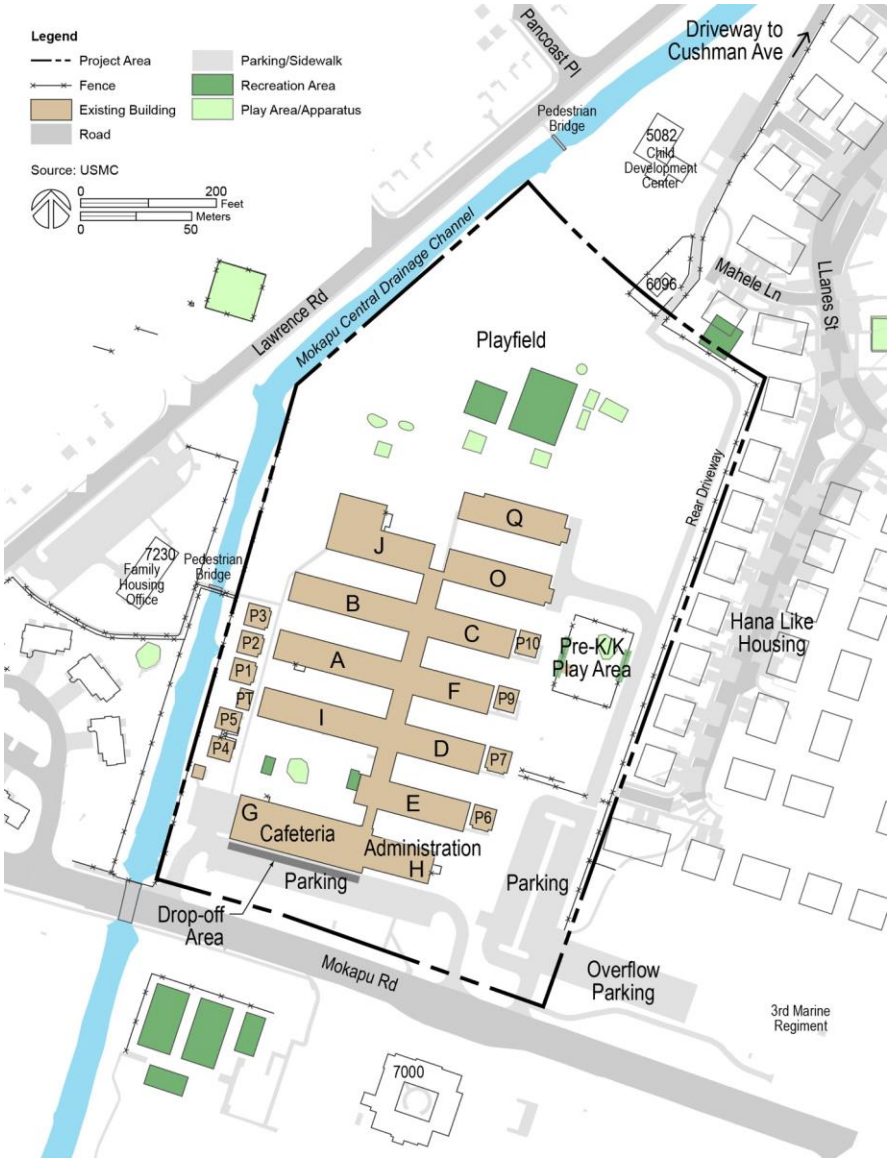


Figure 3 – Existing School Facilities

Figure 4 – Mōkapu Elementary Playground, showing mowed grass, and Hawaiian Stilts

Figure 5 – Mōkapu Elementary Playground, showing mowed grass and school buildings.

Figure 6. Mokapu Central Drainage Channel.

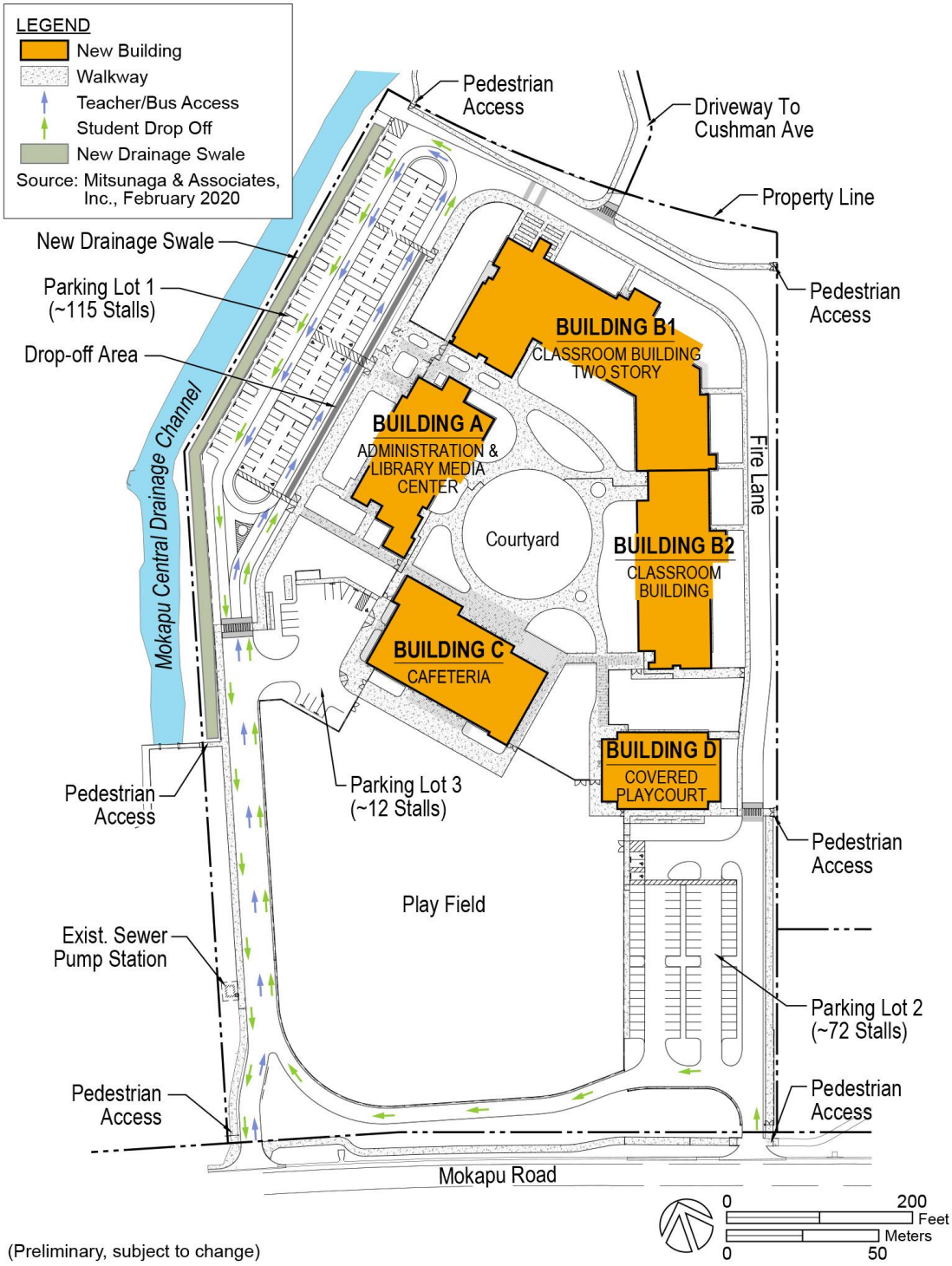


Figure 7. Preferred alternative site plan showing new drainage swale.

Methods and Results

Plant names follow *Hawai`i's ferns and fern allies* (Palmer, 2003) for ferns, *Manual of the Flowering Plants of Hawai'i* (Wagner et al. 1990, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples and Herbst, 2005) for ornamental plants. The avian phylogenetic order and nomenclature used in this report follows the AOU *Check-List of North and Middle American Birds* 2018 and the Sixtieth Supplement to the Check-list of North American Birds (Cheeser et al., 2018, 2019). Place names follow *Place Names of Hawaii* (Pukui et al., 1976).

Botanical Survey Methods

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other plant and animal studies conducted in the general area. Topographic maps were examined to determine terrain characteristics, access, boundaries, and reference points.

A pedestrian survey was carried out where the investigators walked all boundaries as well as transects throughout the survey area. Notes were made on plant associations and distribution, disturbances, topography, substrate types, exposure, drainage, etc. Plant identifications were made in the field; plants that could not be positively identified were photo documented for comparison with the recent taxonomic literature.

Botanical Survey Results

The survey area is characterized by open grassy lawns with scattered large shade trees and planted ornamentals surrounded at the boundaries by residential subdivisions. There was a total of 79 plant species observed within the survey sites. 72 are alien (introduced), and the remaining seven are indigenous (native to the Hawaiian Islands and elsewhere). An inventory of the naturalized species along with the well-established (large) trees are presented in the species list (Table 1). The obvious ornamental and food type plantings in and around the immediate classroom buildings are not included in the species list but are described in this section.

The main Campus, currently occupied by building facilities, parking lots, and classrooms is characterized by manicured grassy lawns with scattered ornamental tree and shrub plantings. Cultivated tree species observed include monkeypod (*Samanea saman*), pink tecoma (*Tabebuia heterophylla*), *kiawe* (*Prosopis pallida*), Royal Poinciana (*Delonix regia*), Chinese banyan (*Ficus microcarpa*), *milo* (*Thespesia populnea*), and Cook pine (*Araucaria columnaris*). Opportunistic or weedy species observed within the survey area include, spiny amaranth (*Amaranthus spinosus*), owi (*Stachytarpheta australis*), slender mimosa (*Desmanthus pernambucanus*), little bell (*Ipomoea triloba*), Guinea grass (*Panicum maximum*), common sandbur (*Cenchrus echinatus*), octopus tree (*Schefflera actinophylla*), and pepperwort (*Lepidium virginicum*).

Ornamental and garden plantings around the existing school buildings include, ti (*Cordyline fruticosa*), sweet potato (*Ipomoea* sp.), hibiscus cultivars, fern species laua` e (*Phymatosorus grossus*), crown flower (*Calotropis gigantea*), sugar cane (*Saccharum officinarum*), aloe (*Aloe vera*), and ginger species (*Zingiber* sp.).

The banks of the Mōkapu Central Drainage Channel harbored plants such as pickleweed (*Batis maritima*), silver buttonwood (*Conocarpus erectus*), red mangrove (*Rhizophora mangle*), and Indian fleabane (*Pluchea indica*). Most of the native plants observed within the project area were observed in this area; *`ae`ae* (*Bacopa monnieri*), *kipukai* (*Heliotropium curassavicum*), *`akulikuli* (*Sesuvium portulacastrum*), *`aki`aki* (*Sporobolus virginicus*), and *kaluha* (*Schoenoplectus californicus*).

An area being considered for offsite telecoms connection point is located between housing in the Hana Like duplexes. The path is vegetated with maintained grassy lawn and a single milo tree. Currently, the site planned for a construction laydown area would be in an overflow parking area to the east of campus along Mōkapu Road (See Fig. 3). There were weedy grasses and herbaceous species located in this area. The northern triangular area was surveyed between the campus fence line and Cushman Avenue. Along with maintained grassy areas there are some large *kiawe* and *milo* trees in the area.

PLANT SPECIES LIST

The following checklist is an inventory of all the naturally occurring or established plant species observed within the survey areas for the proposed Mōkapu Elementary Improvements Project. The plant names are arranged alphabetically by family and then by species into each of four groups: Gymnosperms, Pteridophytes, Monocots and Dicots. The taxonomy and nomenclature of the Ferns and Fern Allies follow Palmer (2002), flowering plants (Monocots and Dicots) are in accordance with Wagner *et al*. (1990), Wagner and Herbst (1999) and Staples and Herbst (2005). Recent name changes are those recorded in the Hawaii Biological Survey series (Evenhuis and Eldredge, eds., 1999-2002).

For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

A = Alien species introduced to the Hawaiian Islands by humans, intentionally or accidentally.
I = Indigenous species native to the Hawaiian Islands and also found elsewhere in the world.
E = Endemic species found only in the Hawaiian Islands.

Table 1 –Plant Species List – Mōkapu Elementary School May 2020		
SCIENTIFIC NAME	***COMMON NAME***	***STATUS***
	GYMNOSPERMS	
ARAUCARIACEAE		
Araucaria columnaris (G.Forst) D.Hooker	Cook Island Pine	A
	PTERIDOPHYTES	
NEPHROLEPIDACEAE		
Nephrolepis brownii (Desv.) Hovemkamp & Miyam.		A
THELYPTERIDACEAE		
Christella dentata (Forssk.) Brownsey & Jermy		A
POLYPODIACEAE		
Phymatosorus grossus (Langsd.& Fisch.) Brownlie	laua`e, maile-scented fern	A
	MONOCOTS	
AGAVACEAE		
Cordyline fruticosa (L.) A.Chev.	ti, ki	A
ARECACEAE		
Veitchia merrellii	manila palm	A
CYPERACEAE		
Cyperus involucratus Rottb.	umbrella sedge	A
Schoenoplectus californicus	kaluha	I?
MUSACEAE		
Musa xparadisica L.	bananana, mai`a	A
POACEAE		
Axonopus fissifolius (Raddi) Kuhlm.	Narrow-leaved carpetgrass	A
Cenchrus echinatus L.	common sandbur	A
Cynodon dactylon (L.) Pers	manienie grass	A
Eragrostis amabilis (L.) Wight&Arn. Ex Nees	lovegrass	A
Panicum maximum L.	Guinea grass	A
Paspalum fimbriatum Kunth	fimbriate paspalum	A
Sacciolepis indica (L.) Chase	glenwood grass	A
Sporobolus africanus (Poir.) Robyns & Tournay	smutgrass	A
Sporobolus virginicus L.	akiaki	I

DICOTS

ACANTHACEAE		
Asystasia gangetica (L.) T. Anderson	Chinese violet	A
AIZOACEAE		
Sesuvium portulacastrum (L.) L.	akulikuli	I
AMARANTHACEAE		
Alternanthera pungens Kunth	khaki weed	A
Amaranthus spinosus L.	spiny amaranth	A
APOCYNACEAE		
Plumeria obtusa	Singapore plumeria	A
ARALIACEAE		
Schefflera actinophylla (Endl.) Harms	octopus tree, umbrella tree	A
ASTERACEAE		
Bidens alba (L.) DC. var. *radiata* (Sch. Bip.) Ballard ex Melchert	beggar tick	A
Bidens pilosa L.	Spanish needle	A
Calyptocarpus vialis		A
Eclipta prostrate (L.) L.	false daisy	A
Emilia sonchifolia (L.) DC.	Flora's paintbrush	A
Pluchea indica (L.) Less.	Indian fleabane	A
Sphagneticola trilobata (L.) Pruski	wedelia	A
Synedrella nodiflora (L.) Gaertn.	nodeweed	A
Tridax procumbens L.	coat buttons	A
Youngia japonica (L.) DC.	oriental hawksbeard	A
BATACEAE		
Batis maritima L.	pickleweed, akulikuli kai	A
BIGNONIACEAE		
Tabebuia aurea	caribbean trumpet tree	A
Tabebuia heterophylla	pink tecoma	A
BORAGINACEAE		
Heliotropium curassavicum L.	kipukai	I
Heliotropium procumbens var. *depressum* (Cham.) Fosberg		A
BRASSICACEAE		
Lepidium virginicum L.	pepperwort	A
CARYOPHYLLACEAE		
Arenaria serpylifolia L.	thyme-leaved sandwort	A
Drymaria cordata var. *pacifica* M.Mizush.	pipili	A

COMBRETACEAE		
Conocarpus erectus L.	silver buttonwood, button mangrove	A
CONVOLVULACEAE		
Ipomoea obscura (L.) Ker Gaw		A
Ipomoea triloba L.	little bell	A
CUCURBITACEAE		
Coccinea grandis (L.) Voigt	ivy gourd	A
Momordica charantia L.	balsam pear	A
EUPHORBIACEAE		
Aleurites moluccana (L.) Willd.	kukui, candlenut	A
Chamaesyce hirta (L.) Millsp.	hairy spurge, garden spurge	A
Chamaesyce prostrata (Aiton) Small		A
Macaranga mappa (L.) Mull.Arg.	bingabing	A
FABACEAE		
Crotalaria pallida Aiton	smooth rattlepod	A
Delonix regia L.	Royal Poinciana	A
Desmanthus pernambucanus	slender mimosa	A
Desmodium triflorum (L.) DC.	tick clover	A
Indigofera hendecaphylla Jacq.	creeping indigo	A
Mimosa pudica L. var. *unijuga* (Duchass. & Walp.) Griseb.	sleeping grass, sensitive plant	A
Prosopis pallida Kunth	kiawe, mesquite	A
Samanea saman L.	monkeypod	A
MALVACEAE		
Malvastrum coromandelianum var. *coromandelianum* (L.) Garcke	false mallow	A
Sida ciliaris L.		A
Thespesia populnea L.	milo	I?
MORACEAE		
Ficus microcarpa L.f.	Chinese banyan	A
MYRTACEAE		
Psidium guajava L.	guava	A
NYCTAGINACEAE		
Boerhavia coccinea Mill.		A
NYMPHAEACEAE		
Nymphaea sp.	water lily	A
OXALIDACEAE		

Oxalis debilis var. *corymbosa* Kunth	pink wood sorrel	A
PORTULACACEAE		
Portulaca oleracea L.	pigweed	A
PLANTAGINACEAE		
Plantago lanceolata L.	narrow-leaved plantain	A
Plantago major L.	broad-leaved plantain	A
RHIZOPHORACEAE		
Rhizophora mangle L.	red mangrove	A
RUBIACEAE		
Morinda citrifolia L.	noni	A
Spermacoce assurgens Ruiz&Pav.	buttonweed	A
RUTACEAE		
Murraya paniculata (L.) Jack	mock orange	A
SCROPHULARIACEAE		
Bacopa monnieri (L.) Wettst.	`ae`ae	I
STERCULIACEAE		
Waltheria indica L.	uhaloa	I
VERBENACEAE		
Lanatana camara L.	lantana	A
Stachytarpheta australis Moldenke	owi	A
ZYGOPHYLLACEAE		
Tribulus terrestris L.	puncture vine	A

Avian Survey Methods

Five avian point count stations were sited roughly equidistant from each other within the project site and staging area. A single eight-minute avian point count was made at each count station. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. The point counts were conducted during morning hours, the period when birds are most active and vocal. Additionally, the Mōkapu Central Drainage Channel was walked as well as areas proposed for the telecommunications tie-in. Time not spent counting the point count stations was used to search the rest of the site for species and habitats not detected during the point counts.

Avian Survey Results

A total of 336 individual birds of 17 species, representing 12 separate families, were recorded during point counts. Two species, Great Frigatebird (*Fregata minor*) and Hawaiian Stilt (*Himantopus mexicanus knudseni*) recorded during the course of the survey are native: Great Frigatebird is an indigenous seabird and Hawaiian Stilts are an endemic endangered shorebird species. The remaining 15 species recorded are all established alien or feral species (Table 2). Additionally, seven adult and five Mallard/Koloa hybrid ducks (*Anas platyrhynchos* X *A. wyvilliana*) were seen along the edge of the Mōkapu Central Drainage Channel adjacent to the school yard fence.

Avian diversity and densities were in keeping with the location, vegetation, and use of the school site. Three introduced species, Zebra Dove (*Geopilia striata*), Cattle Egret (*Bubulcus ibis*), and House Finch (*Haemorhous mexicanus*) accounted for 57-percent of the total number of birds recorded. Zebra Dove was the most commonly tallied species, which accounted for 35 percent of the birds recorded during point counts.

Table 2 – Avian Species Detected During Point Counts – Mōkapu Elementary School May 2020

Common Name	***Scientific Name***	***ST***	***RA***
	ANSERIFORMES		
	ANATIDAE - Ducks, Geese & Swans		
	Anatinae - Ducks		
Mallard x Hawaiian Duck, koloa	*Anas platyrhynchos x A. wyvilliana*	**RB**	**I-12**
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Rock Pigeon	*Columba livia*	A	1.40
Spotted Dove	*Streptopelia chinensis*	A	0.80
Zebra Dove	*Geopelia striata*	A	23.40
	CHARADRIIFORMES		
	RECURVIROSTRIDAE - Stilts & Avocets		
Hawaiian Stilt, Ae`o	*Himantopus mexicanus knudseni*	**EE**	3.40
	SULIFORMES		
	FREGATIDAE - Frigatebirds		
Great Frigatebird, `Iwa	*Fregata minor*	**IB**	0.40
	PELECANIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Cattle Egret	*Bubulcus ibis*	A	7.80

Table 2 continued…

Common Name	*Scientific Name*	*ST*	*RA*
	PASSERIFORMES		
	PYCNONOTIDAE - Bulbuls		
Red-vented Bulbul	*Pycnonotus cafer*	A	1.40
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	1.00
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	6.00
	FRINGILLIDAE - Fringilline and Carduline Finches & Allies		
	Carduelinae - Carduline Finches and Hawaiian Honeycreepers		
House Finch	*Haemorhous mexicanus*	A	7.40
	PASSERIDAE - Old World Sparrows		
House Sparrow	*Passer domesticus*	A	4.40
	CARDINALIDAE - Cardinals & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	0.20
	THRAUPIDAE - Tanagers		
	Thraupinae - Core Tanagers		
Red-crested Cardinal	*Paroaria coronata*	A	0.80
Saffron Finch	*Sicalis flaveola*	A	0.80
	ESTRILDIDAE - Estrildid Finches		
Common Waxbill	*Estrilda astrild*	A	6.00
Scaly-breasted Munia	*Lonchura punctulata*	A	1.40
Chestnut Munia	*Lonchura atricapilla*	A	0.60

Key to table 1

ST Status

A Alien – Introduced to the Hawaiian Islands by humans

EE Endemic, endangered species

RB Resident breeding species

I**B** Indigenous breeding– Native but not restricted to the Hawaiian Islands, breeds in the Hawaiian Islands and elsewhere

RA Relative Abundance - Number of birds detected divided by the number of point counts (~5)

1-# Incidental observation, followed by the number of birds recorded

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *ʻōpeʻapeʻa* as it is known locally, all terrestrial mammals currently found on the Island of Oʻahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area during the time spent on the site.

Mammalian Survey Results

Only one terrestrial mammalian species was detected during the course of this survey. Several dogs (*Canis lupus familiaris*) were heard barking from areas outside of the study site, additionally, one dog was seen being walked on a leash along one of the roads adjacent to the study site.

No mammalian species currently proposed for listing or listed under either the federal or State of Hawai'i endangered species statutes was recorded on this site (DLNR 1998; USFWS, 2019).

Discussion

Botanical Resources

The fieldwork results represent a one-time snapshot of the plants inhabiting the survey area. However, when considered together with the results of historical surveys, they represent a reasonably accurate description of the environment and vegetation of the project area. Native plant habitat within the proposed project area has been highly modified by human activities, such as historical agricultural activities, road building, residential construction, school campus construction, and the intentional and accidental introduction of alien species. The overwhelming abundance of non-native plant species throughout the project area is in direct correlation to disturbance over the last several hundred years.

The nature of the land and its present and historical disturbances limit the natural botanical resources anticipated to occur here. The results of our survey substantiate this prediction. The rare frequency of native plant species is an indication that because of constant disturbances (geological, vehicular, invasive plant species), only species adapted to such conditions can survive, with few exceptions. Seven native plant species were observed during the survey, all indigenous (native to the Hawaiian Islands and elsewhere): *uhaloa* (Waltheria indica), *`ae`ae, milo, kipukai, akulikuli, `aki`aki,* and *kaluha*. None of the plant species observed are listed as threatened or endangered under either federal or state of Hawaii endangered species statutes.

The proposed rebuild project for the school should have little effect on the natural plant communities that are residual within the Mōkapu Channel. Certainly, protecting the canal during construction from dust and debris during construction work would help to limit the impact on the biota of that area.

Avian Resources

The findings of the avian survey are consistent with the highly manicured state of the study site and the urbanized nature of the facility as a whole. As previously mentioned, we recorded 18 species during the course of the current survey, 17 during point counts and an additional species immediately adjacent to the site while searching the adjacent property (Table 2). Two of the species recorded Great Frigatebird and the endemic sub-species of the Black-necked Stilt are native. The frigatebird is a common indigenous seabird species

regularly seen soaring over the MCBH and adjacent islets. The stilt is listed as endangered under both federal and State of Hawaiʻi endangered species statutes, and is a common sight on the school yard grounds and within the wetlands found within the MCBH. The remaining 16 avian species recorded are common established alien species on the Island of Oʻahu (Table 2).

We did not record any migratory shorebird species, this is not surprising as the indigenous migratory shorebird species usually present in the Hawaiian Islands nest in the high Arctic during the late spring and summer months, returning to Hawaiʻi and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawaiʻi for their trip back to the Arctic in late April or the very early part of May. They are widely distributed in the Hawaiian Islands during the winter month. It is expected that both Pacific Golden-Plover (*Pluvialis fulva*), and Ruddy Turnstone (*Arenaria interpres*) use resources within the school campus and surrounding MCBH grounds during fall and winter months on an annual basis.

Only one seabird species was detected during the survey of the study site. Several species of seabird are known to use resources present on the MCBH. Furthermore, it is possible that the endangered Hawaiian Petrel (*Puffinus sandwichesis*) and the threatened Newell's Shearwater (*Puffinus newelli*) over-fly the project area between April and the middle of December each year in very small numbers. Newell's Shearwaters are not known to breed on the Island of Oʻahu, though recent acoustical surveys conducted on the Island have recorded low numbers of this species calling over the higher reaches of the Island (Young, et al., 2019). These authors also recorded one Hawaiian Petrel over the Island. There is a Wedge-tailed Shearwater (*Ardenna pacifica*) colony of 750-900 nesting yearly on the eastern shoreline of MCBH adjoining Kailua Bay and there is a permanent colony of approximately 2200 Red-footed Booby (*Sula sula rubripes*) in the Ulupau Head Wildlife Management Area (WMA) on the KBay Range Training Facility (Bookless 2020). Additionally, other common seabird species known from the MCBH and the surrounding waters and islets including Brown Booby (*Sula leucogaster*) Black Noddy (*Anous minutus*), Sooty Tern (*Onychoprion fuscatus),* Grey-backed Tern (*Onychoprion lunatus*) and White-tailed Tropicbird (*Phaethon lepturus*) likely overfly the site upon occasion on a seasonal and/or temporal basis – all resident seabird species present in the Hawaiian Islands are protected under the Migratory Bird Treaty Act (MBTA). There is no suitable nesting or roosting habitat for any of these seabird species within the study site.

The primary cause of mortality in Hawaiian Petrels and Newell's Shearwaters and Wedge-tailed Shearwaters in Hawaii is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawaiʻi. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. Disoriented seabirds may collide with man-made structures and, if not killed outright, become easy targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003).

The Oʻahu population of White-Tern (*Gygis alba*) is listed as an endangered species by the State of Hawaii; it is not listed under federal statute. This ephemeral species was not recorded during this survey, nor was it expected. The current resident population of White Terns on O'ahu is found on the leeward side of the Island concentrated in the Waikiki area (VanderWerf, 2003).

No owl species were recorded during this survey. There are two resident owl species on Oʻahu the introduced Barn Owl (*Tyto alba*) and the indigenous endemic sub-species of the Short-eared Owl, or *Pueo* as it is locally known (*Asio flammeus sandwichesis*). This species has become increasingly scarce on the Island; the Oʻahu population is listed as an endangered species by the State of Hawaiʻi but it is not listed under federal statute. There are 8 to 10 resident *pueo* that live within the Nu`upia Ponds WMA (Bookless, 2020). This species is not habitat restricted on Oʻahu, though there certainly is less suitable nesting habitat than there once was. This species faces daunting odds on an Island as heavily populated as Oʻahu – they are a ground nesting diurnal species, the sheer number and densities of mammalian predator on the Island make it very difficult for this species to successfully nest except within protected areas that have a strong mammalian predator control program in place. There is a current study underway of Short-eared Owls within MCBH (Lance Bookless, Personal communication with R. David, May 20, 2020). There is no suitable nesting habitat for this ground nesting raptor within the study site.

Mammalian Resources

We were a little surprised to only detect one dog during the time spent at the study site. Although no rodents were recorded during the course of this survey, it is likely that one or more of the other four established alien Murida*e* found on Oʻahu - European house mouse (*Mus musculus domesticus*), roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), and black rat (*Rattus exulans hawaiiensis*) - use various resources found within the general project area on a seasonal basis. It is also likely that small Indian mongoose (*Herpestes javanicus*) and cats (*Felis catus*) use resources in the general project area on a seasonal and/or temporal basis.

These human commensal species are drawn to areas of human habitation and activity. All of these introduced mammalian species are deleterious to native ecosystems and the native faunal species dependent on them.

No Hawaiian hoary bats were detected during the course of this survey. It is only in recent years that this species is being recorded on a regular basis on the Island of Oʻahu. The USGS is currently in the 2nd year of a two-year study of the Hawaiian hoary bat on all MCBH properties and have audio documentation of its presence in several location on MCBH (Bookless, 2020).

Potential Impacts to Protected Species

Botanical

No protected botanical resources were detected on or adjacent to the study site, nor were any expected given the current use of the property. It is not expected that the redevelopment of the Mōkapu Elementary School will result in deleterious impacts to any protected botanical resources.

Waterbirds

The only protected waterbird species recorded during this survey was Black-necked Stilt. As previously mentioned this species is listed as an endangered species under both federal and state of Hawaii endangered species statutes. This species is currently using the playfield as a loafing site. Construction activities have the potential to disturb loafing stilts. Removal of the playfield will likely result in the stilts moving to another lawn area within the base – there is adjacent additional loafing and foraging habitat within the facility, and disturbance to the stilts will be of a temporary nature. The proposed drainage swale illustrated in [Figure 7], designed to handle a 100-year storm event adjacent to the existing Mōkapu Central Drainage Channel (MCDC) has the potential of being an attraction for endangered waterbirds when, and if it holds water. This modification to the site potentially will provide an additional opportunistic habitat during rain events large enough to fill the swale.

Seabirds

The principal potential impact that the construction of the project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the proposed action during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds are if; a) during construction, if it is deemed expedient or necessary to conduct night-time construction activities: currently no nighttime construction is anticipated; b) following build-out, the potential use of streetlights or other exterior lighting during the seabird fledging season which runs from September 15 through December 15th. All exterior lights installed within the new school will be dark-sky compliant, additionally, no night-time construction is being proposed; therefore, is not expected that the proposed action will result in deleterious impacts to protected seabirds.

Short-eared Owl – Pueo

The principal potential impact that the construction of the project might pose to Short-eared Owls would be during the clearing and grubbing phases of the project in areas where this state listed species nests. As there is no suitable nesting habitat within the Action Area it is not expected that the construction of the project will result in deleterious impacts to this species.

Hawaiian hoary bat

The principal potential impact that construction could pose to bats is during the clearing and grubbing phase of the construction. The trimming or removal of foliage and/or trees within the construction areas may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, female carrying their pups may be less able to rapidly vacate a roost site while vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they themselves forage, and very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15 feet) between June 1 and September 15, the pupping season.

Critical Habitat

There is no federally delineated Critical Habitat for any avian or mammalian species on, or close to the proposed project site. Thus, modifications of habitat on the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

Recommendations

To ensure that construction activities do not result in deleterious impacts to listed waterbirds it is recommended that a contractors Endangered Species Awareness training model be developed and that all construction personnel and managers should be trained before commencing construction activities on the site.

Glossary

Alien – Introduced to Hawaiʻi by humans
Commensal – Animals that share humans' food and lodgings, such as rats and mice.
Diurnal – Daytime, an animal that hunts and feeds during daylight hours, the opposite of nocturnal
Endangered – Listed and protected under the Endangered Species Act of 1973, as amended (ESA) as an endangered species
Endemic – Native to the Hawaiian Islands and unique to Hawaiʻi
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
Nocturnal – Night-time, after dark
ʻŌpeʻapeʻa – Endemic endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*)
Pelagic – An animal that spends its life at sea – in this case seabirds that only return to land to nest and rear their young
Phylogenetic – The evolutionary order that organisms are arranged by
Pueo - Short-eared Owl (*Asio flammeus sandwichensis*)
Threatened – Listed and protected under the ESA as a threatened species

DLNR – Hawaiʻi State Department of Land & Natural Resources
HIDOE – Hawaii State Department of Education
ESA – Endangered Species Act of 1973, as amended
MCBH - Marine Corps Base Hawaii
USFWS – United State Fish & Wildlife Service
WMA-Wildlife Management Area

Literature Cited

Ainley, D. G, R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, *in*: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna.* Studies in Avian Biology No. 22: Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. (Pg. 108-123).

Bookless, Lance. 2020. Comments to the Mokapu ES EA Biological Survey Report (7/30/20). Lance Bookless, Senior Natural Resources Mgr, Environmental Division.

Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V., Remsen, Jr., D. F. Stotz, B. M. Winger, and K. Winker. 2018. Check-list of North American Birds (online). American Ornithological Society. Available online at URL: http://checklist.aou.org/taxa.

Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V., Remsen, Jr., D. F. Stotz, B. M. Winger, and K. Winker. Sixtieth Supplement to the Check-list of North American Birds. The Auk Ornithological Advances, 136: 1-23.

Cooper, B. A and R. H. Day. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newells' Shearwaters at Power Lines on Kauai. Colonial Waterbirds, 21 (1): 11-19.

Day, R. H., B. Cooper, and T. C. Telfer. 2003. Decline of Townsend's (Newell's Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. The The Auk 120: 669-679.

Department of Land and Natural Resources (DLNR). 1998. Indigenous Wildlife, Endangered And Threatened Wildlife And Plants, And Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

_____. 2014. Hawaiʻi Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 5 Forestry and Wildlife, Part 2 Wildlife, Chapter 124, Indigenous Wildlife, Endangered and Threatened Wildlife, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife. Exhibit 1. November 1, 2014. 21 pp.

Evenhuis, N.L. and L.G. Eldredge, editors. 1999-2002. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 58-70.

Hadley, T. H. 1961. Shearwater calamity on Kauai. Elepaio 21:60.

Hue, D., C. Glidden, J. Lippert, L. Schnell, J. MacIvor and J. Meisler. 2001. Habitat Use and Limiting Factors in a Population of Hawaiian Dark-rumped Petrels on Mauna Loa, Hawaiʻi. , *in:* : Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna*. Studies in

Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas (Pg. 234-242).

Natural Resource Conservation Service (NRCS). 2020. Accessed May 21, 2020. http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Podolsky, R., D.G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. "Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kaua'i". Colonial Waterbirds 21:20-34.

Pukui , M. K., S. H. Elbert, and E. T. Mookini 1976. *Place Names of Hawaii*. University of Hawaii Press. Honolulu, Hawai'i. 289 pp.

Reed, J. R., J. L Sincock, and J. P. Hailman 1985. Light Attraction in Endangered Procellariform Birds: Reduction by Shielding Upward Radiation. The Auk 102: 377-383.

Simons, T. R., and C. N. Hodges. 1998. Dark-rumped Petrel (*Pterodroma phaeopygia*). *In* A. Poole and F. Gill (editors). The Birds of North America, No. 345. The Academy of Natural Sciences, Philadelphia, PA. and the American Ornithologists Union, Washington, D.C.

Sincock, J. L. 1981. Saving the Newell's Shearwater. Pages 76-78 in Proceedings of the Hawaii Forestry and Wildllife Conference, 2-4 October 1980. Department of Land and Natural Resources, State of Hawaii, Honolulu.

Telfer, T. C. 1979. Successful Newell's Shearwater Salvage on Kauai. 'Elepaio 39:71

Telfer, T. C. , J. L. Sincock, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: Conservation efforts and effects of moon phase. Wildlife Society Bulletin 15:406-413.

U.S. Fish & Wildlife Service (USFWS) 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.

_____. 2015. Hawaiian Islands Threatened and Endangered Plants and Animals: Updated February 2, 2015.

_____. (2019). USFWS Endangered Species. Available online at URL: https://www.fws.gov/endangered/; Last visited on September 18, 2019 and Environmental Conservation Online System (ECOS), online at URL: https://ecos.fws.gov/ecp/species-reports; last visited on May 19, 2020.

Wilson, D.E., and D. M. Reeder, (Editors), 2005. *Mammal species of the world: a taxonomic and geographic reference.* 3rd edition. 2 vols. John Hopkins University Press. Baltimore, Maryland. 2142 pp.

Department of Land and Natural Resources (DLNR). 1998. Indigenous Wildlife, Endangered

And Threatened Wildlife And Plants, And Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

_____. 2014. Hawaiʻi Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 5 Forestry and Wildlife, Part 2 Wildlife, Chapter 124, Indigenous Wildlife, Endangered and Threatened Wildlife, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife. Exhibit 1. November 1, 2014. 21 pp.

Pukui , M. K., S. H. Elbert, and E. T. Mookini 1976. *Place Names of Hawaii*. University of Hawaii Press. Honolulu, Hawaiʻi. 289 pp.

Young. L. C., E. A. VanderWerf, M. Mckown, P. Roberts, J. Schueter, A. Vorsino, and D. Sicho. 2019. Evidence of Newell's Shearwaters and Hawaiian Petrels on Oahu, Hawaii. The Condor Ornithological Applications, 121: 1-7.

VanderWerf, E. A. 2003. Distribution, Abundance., and Breeding Biology of White Terns on Oahu, Hawaii. Wilson Bulletin. 115(3, 2003): 258-262.

Appendix B
NRHP Section 106 Consultation Correspondence

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY, HAWAII 96863-3002

5090
LFE/112-20
18 Aug 20

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Dr. Downer:

SUBJECT: CONTINUED SECTION 106 CONSULTATION (ARCHITECTURE & ARCHAEOLOGY) REGARDING IDENTIFICATION OF HISTORIC PROPERTIES AND ASSESSMENT OF EFFECTS FOR MOKAPU ELEMENTARY SCHOOL CAMPUS IMPROVEMENTS ABOARD MARINE CORPS BASE HAWAII, DISTRICT OF KOʻOLAUPOKO, AHUPUAʻA OF KANEOHE, ON THE ISLAND OF OʻAHU, TMK 1-4-4-008:001.

Marine Corps Base Hawaii (MCBH) is continuing consultation with your office in compliance with Section 106 of the National Historic Preservation Act (NHPA) regarding the identification of historic properties and assessment of effects for Mokapu Elementary School (MES) Campus Improvements project aboard MCBH Kaneohe Bay. MCBH has determined that the proposed project is an undertaking as defined in 36 CFR §800.16(y). The proposed project is currently undergoing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA).

On 22 May 2020, we initiated consultation in our letter (LFE-074-20) pursuant to the NHPA Section 106 Implementing Regulations at 36 CFR 800.4 regarding the proposed scope of our efforts to identify historic properties within the area of potential effects (APE) associated with this undertaking. We received your response (Log:2020.01183/Doc:2006SH03), dated 3 June 2020, concurring on the architectural scope of identification and requesting modification of the archaeological field methods. This letter provides SHPD with the results of these identification efforts, including the evaluation of significance and proposed determination of effects.

AREA OF POTENTIAL EFFECTS

The area of potential effects (APE) has been determined to include the 14.2 acre MES Campus Improvements project as shown on enclosure 1. We will be providing an additional APE and description of any off-site utility work in support of this undertaking when a scope of work for the utilities hook ups has been determined.

IDENTIFICATION OF HISTORIC PROPERTY

Pursuant to 36 CFR 800.4(b), the identification of historic properties included background research, sample field investigation, field survey, as well as consultation. These studies were carried out by qualified preservation professionals as applicable to the type of resource and in accordance with the Secretary of the Interior’s Standards and Guidelines for Identification. Below are the results of these identification efforts for architecture and archaeology.

ARCHITECTURE

The following evaluation of significance was completed on 22 June 2020 by Mason Architects:

> The Mokapu Elementary School (MES) buildings built between 1960 and 1970 are evaluated as eligible for the Hawaii State and National Registers of Historic Places under Criteria A and C. The buildings constructed after 1970 are evaluated as not eligible. See Table 1: Inventory Survey Significance Evaluations for a list of all evaluated resources [enclosure 2].
>
> Under Criterion A, the MES campus is associated with both national and local events that "have made a significant contribution to the broad patterns of our history." MES is an intact representation of a program to build new elementary schools across the nation in the mid-twentieth century. The preceding Great Depression and World War II had impaired new school construction and building maintenance for decades and new elementary schools were needed to accommodate exploding enrollments, as the children of the Baby Boom generation (born 1946-1964) began to reach school age. These factors created a desperate situation for school districts nationwide, resulting in makeshift classrooms, "double-shift" programs at some schools, and the widespread use of temporary buildings. The architectural plans for MES were developed the same year that the Territory of Hawaii entered Statehood (1959). This period saw a tremendous growth in jet travel, tourism, and development of transportation infrastructure, hotel construction and related industries. This period was also marked by increased interest in the Pacific region by the U.S. military, as the U.S. navigated between the Korean War (1950-1953) and the Vietnam War (1961-1975). These national and local events resulted in a tremendous population growth in Hawaii, and highlighted the importance of new elementary schools.
>
> Under Criterion C, MES campus "embodies the distinctive characteristics of a type, period, or method of construction." This educational form was a departure from earlier models, which were typically expressed in classical or gothic styles. The MES' finger plan campus layout, with its one-story buildings or "fingers" arranged in parallel rows and connected to a central spine that functioned as a long, straight, covered walkway, had become one of just a few common plan types by the late 1940s nationwide. The origins of the finger plan model derived from influences of the Progressive Movement, a social and political reform era of the United States (1890-1920) that believed in the ability of education to improve the individual and society. In the finger plan model, each classroom could have fresh air and cross ventilation, natural light, and, as in Hawai'i, direct access to the outdoors via exterior doors. MES' intact original campus form with its concrete and CMU buildings separated by courtyards, and connected to a central, covered walkway, along with the buildings' modern architectural features (including; nearly flat roofs, decorative and functional breeze blocks grilles/screens, large expanses of jalousie windows, clerestory windows (at the Cafetorium), wide unadorned cantilevered eaves, and roof cut-outs/skylights), embody the characteristics of a Mid-Century Modern finger plan school.

ARCHAEOLOGY

The following end of field work letter for subsurface testing in support of campus improvements at MES was provided by International Archaeology, LLC (IA) on 5 August 2020:

> Archaeological fieldwork for the project was undertaken between July 16 and July 24, 2020. Toning for subsurface utilities was conducted on July 16, 2020, and the trenching was conducted between July 20 and 24, 2020. Fieldwork followed the subsurface testing plan approved by MCBH on June 23, 2020. All project work was undertaken in accordance with the project's scope of work and approved work plan (Moore 2020). The archaeological testing was meant to fulfill historic preservation obligations under the federal National Historic Preservation Act (NHRP) Section 106 and state Hawaii Revised Statues (HRS) 6E-8 and Hawaii Administrative Rules (HAR) §13-275. All work was conducted in compliance with the Antiquities Act of 1906, the Archaeological Resources Protection Act (ARPA) of 1979, ARPA-implementing regulations (32 Code of Federal Regulations Part 229), Department of Defense Instruction (DoDI) 4715.16, and Marine Corps Order (MCO) P5090.2A. Timothy M. Rieth, M.A., is the Project Manager, and Alex Morrison, Ph.D., is the Principal Investigator. Summer Moore, Ph.D., is the Project Director; she directed the fieldwork assisted by Phirum Kem, B.A.
>
> Project Background
>
> The U.S. government is the landowner with the Hawai`i State Department of Education (DOE) the lessee responsible for the elementary school. The DOE proposes the redevelopment of Mōkapu Elementary School, which was originally constructed ca. 1959 on a 14-acre site at MCBH. The project will be funded through a grant from the U.S. Department of Defense Office of Economic Adjustment and the State of Hawai`i. This action uses federal funds and occurs on federal land and is therefore an undertaking as defined under 36 CFR 800.16(y). Archaeological subsurface testing was conducted to identify the presence/absence of archaeological deposits and to contextualize the stratigraphic composition of the area as it relates to the potential for past land use.
>
> Project Fieldwork
>
> The project's work plan called for 11 backhoe trenches to be excavated across the project area, which includes the Mōkapu Elementary School grounds and two areas to the north of the schoolyard where pedestrian walkways are proposed (Moore 2020). Trench locations were initially determined based on recent orthoimagery and historical graphics. As such, Trenches 2-9 were placed within the school grounds around the perimeter of a former wetland as depicted on 1920s-era topographic maps and aerial photographs [Figure 1, enclosure 3]. The wetland was buried during the mid-20th century by fills and is no longer visible on the ground surface. Trench 10 was placed within the school grounds a few meters north of the former wetland. Trenches 1 and 11 were initially plotted within extensions of the area of potential effects (APE) outside the schoolyard; pedestrian walkways are planned in these areas (see Figure 1, enclosure 3). During pre-trenching toning for

utilities, trench locations were adjusted. Adjustments were made to avoid buried utilities, surface pavement, and large trees.

All 11 trenches were excavated during project fieldwork, with most trenches excavated at or near their original proposed locations [Table 1, enclosure 4]. Trench 7 was reoriented after excavations ruptured a 1-inch-diameter copper water pipe near the surface that was not marked during the toning; the new orientation was approved by the MCBH Cultural Resource Manager (CRM) via email on July 21, 2020. Likewise, the originally proposed location of Trench 11 was found during fieldwork to be within an asphalt-paved driveway that encompasses the width of the APE in this area. An alternative location was selected in the northern portion of the schoolyard near the southern extent of the proposed walkway; the new location was approved by the MCBH CRM via email on July 23, 2020.

Following the work plan, the trenches were 3-5 m long and 0.8 m wide, with depths dictated by findings. Generally, excavation in each trench was halted after it became clear that pre-human soils had been reached. To avoid unforeseen impacts to any potential archaeological deposits, mechanical trenching removed upper fills and was paused at the top of the natural soils. Shovel probes were then excavated at points along the length of the trench; once the absence of a cultural deposit was confirmed, mechanical trenching in 10-20 cm thick lifts was resumed. Each trench was photographed and a scaled stratigraphic profile was drawn. Each profile was accompanied by a complete set of soil descriptions following U.S. Soil Survey and Soil Conservation Service standards (Soil Science Division Staff 2017). The locations of all trenches were recorded with a professional-grade Trimble Geo7X GPS unit using the North American Datum of 1983 (NAD 83) in Universal Transverse Mercator Zone 4 North (UTM 4N); GPS data was differentially corrected for sub-meter accuracy following completion of the fieldwork.

Preliminary Results

No archaeological deposits or human skeletal remains were encountered during fieldwork. A small number of isolated artifacts, including primarily glass bottle and metal fragments, and one piece of non-archaeological animal bone, were collected from 20th-century fills in Trenches 2, 4, 6, 7, 9, and 11. Selected samples of natural sediments, preserved botanical remains, and natural marine shell were collected from the buried wetland layers in Trenches 1, 4, 6, 8, 9, and 11.

Laboratory Analyses

All artifacts recovered during trenching will be cleaned, sorted, and analyzed. Artifacts will be classified by material and form, and metric and non-metric characteristics will be recorded. Soil and botanical samples will be preserved for future scientific analysis if warranted. All materials collected during fieldwork will be processed and stored in the IA Archaeology Laboratory for return to MCBH upon completion of the project. Laboratory data will be recorded on standard laboratory forms and input into a spreadsheet. All analytic results will be presented in a coherent tabular format and discussed in the report text.

Report Preparation

The trenching and laboratory results will be presented in an archaeological subsurface testing report to be submitted by September 4, 2020. The report will provide detailed descriptions of each trench, including: (1) the final location of each trench and justification (if any) for altering the original location; (2) natural soil stratigraphy; and (3) any isolated artifacts or soil or botanical samples collected during fieldwork. As specified in the work plan, the report will also consider the depositional and soil-forming sequence for the Mōkapu Elementary School grounds and provide information on the characteristics and extent of the former wetland on the property.

In summary, the subsurface archaeological investigation of the 14.2-acre APE for the MES Campus Improvements project found no archaeological deposits or human skeletal remains, and a copy of the final report will be provided for your records after it is submitted by the archaeologist around September 4, 2020. With respect to architecture, as listed in Table 1 enclosure 2, the Mokapu Elementary School (MES) buildings built between 1960 and 1970 are eligible for the Hawaii State and National Registers of Historic Places under Criteria A and C, while the buildings constructed after 1970 are not eligible.

NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT (NAGPRA)

If Native American Graves Protection and Repatriation Act (NAGPRA) cultural items including human remains are encountered during any ground disturbing activities associated with this undertaking, all work shall stop, the finds will be secured and protected, and treatment will proceed under the authority of NAGPRA.

PUBLIC INVOLVEMENT

MCBH will make this information available to the public so the members of the public will have an opportunity to express their views on resolving adverse effects of the undertaking, pursuant to Section 106 Implementing Regulations at 36 CFR 800.6(a)(4). We will consider such views in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the effects on historic properties, confidentiality concerns, and the relationship of the Federal involvement to the undertaking. Such notice will be made available to the public via the State Office of Environmental Quality Control (OEQC) website prior to the Draft Environmental Assessment (EA) for this undertaking. In addition, public notice will be posted on the MCBH public information website and provided to the monthly neighborhood board meeting by the MCBH Public Affairs Officer (PAO).

DETERMINATION OF AFFECT

MCBH has determined that the proposed undertaking will result in an adverse effect on historic properties in accordance with the Section 106 Implementing Regulations at 36 CFR 800.5(a)(1) based on the following: 1) demolition of buildings that are eligible for the National Register as listed in enclosure 5. MCBH is forwarding copies of this letter to the consulting parties listed below, including Native Hawaiian Organizations (NHOs). We will be consulting

simultaneously with the SHPD and consulting parties listed below in accordance with Section 106 Implementing Regulations at 36 CFR 800.6(a) to develop and evaluate alternatives or modifications to this undertaking that could avoid, minimize or mitigate adverse effects on historic properties. MCBH is also notifying the Advisory Council on Historic Preservation (Council) of our adverse effect finding pursuant to 36 CFR 800.6(a)(1). We will be holding our initial meeting via teleconference at (**808) 448-2663, code 7134#, on Tuesday, 8 September 2020 at 9:00 am** to discuss resolving the adverse effect and executing a Memorandum of Agreement if agreement can be reached. If you have any questions, please contact the MCBH Cultural Resources Management staff, Dr. Wendy Wichman via email at wendy.wichman@usmc.mil, Ms. Arleen Garcia-Herbst via email at arleen.garciaherbst@usmc.mil, or Ms. June Cleghorn via email at june.cleghorn@usmc.mil.

Sincerely,

POCHOP.TIMOTHY.BOWES.1160589589 Digitally signed by POCHOP.TIMOTHY.BOWES.1160589589 Date: 2020.08.18 16:38:13 -10'00'

T. B. POCHOP
LtCol, U. S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commander

Enclosure:

1) Map showing the location and area of potential effects (APE) of the 14.2-acre Mokapu Elementary School Campus Improvements project aboard MCBH Kaneohe Bay.
2) Mason Architects, "Mokapu Elementary School, Table 1: Inventory Survey Significance Evaluations for a list of all resources," June 22, 2020.
3) International Archaeology LLC, Figure 1, End-of-Fieldwork Letter, "Archaeological Subsurface Testing in Support of Campus Improvements at Mōkapu Elementary School, Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu, Hawaiʻi, TMK (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion) [IA202010]," August 5, 2020.
4) International Archaeology LLC, Figure 2, End-of-Fieldwork Letter, "Archaeological Subsurface Testing in Support of Campus Improvements at Mōkapu Elementary School, Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu, Hawaiʻi, TMK (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion) [IA202010]," August 5, 2020.
5) Mason Architects, "Mokapu Elementary School, Table 2: Evaluation of Effect of Preferred Alternative on Historic Resources," June 22, 2020.

Copy to:

Chair, Oahu Island Burial Council (c/o Regina Hilo, SHPD)
Chair, Office of Hawaiian Affairs (OHA)
Ms. Elizabeth Merritt, National Trust for Historic Preservation
Ms. Kiersten Faulkner, Historic Hawaii Foundation (HHF)
Boyd ʻOhana, Ms. Na`u Kamali`i
Diamond ʻOhana, Ms. Ah Lan Diamond
Keko`olani ʻOhana, Ms. Terrilee Napua Kekoolani Raymond
Kekumano ʻOhana, Mr. Cy Harris
Keohokalole ʻOhana, Ms. Emalia Keohokalole

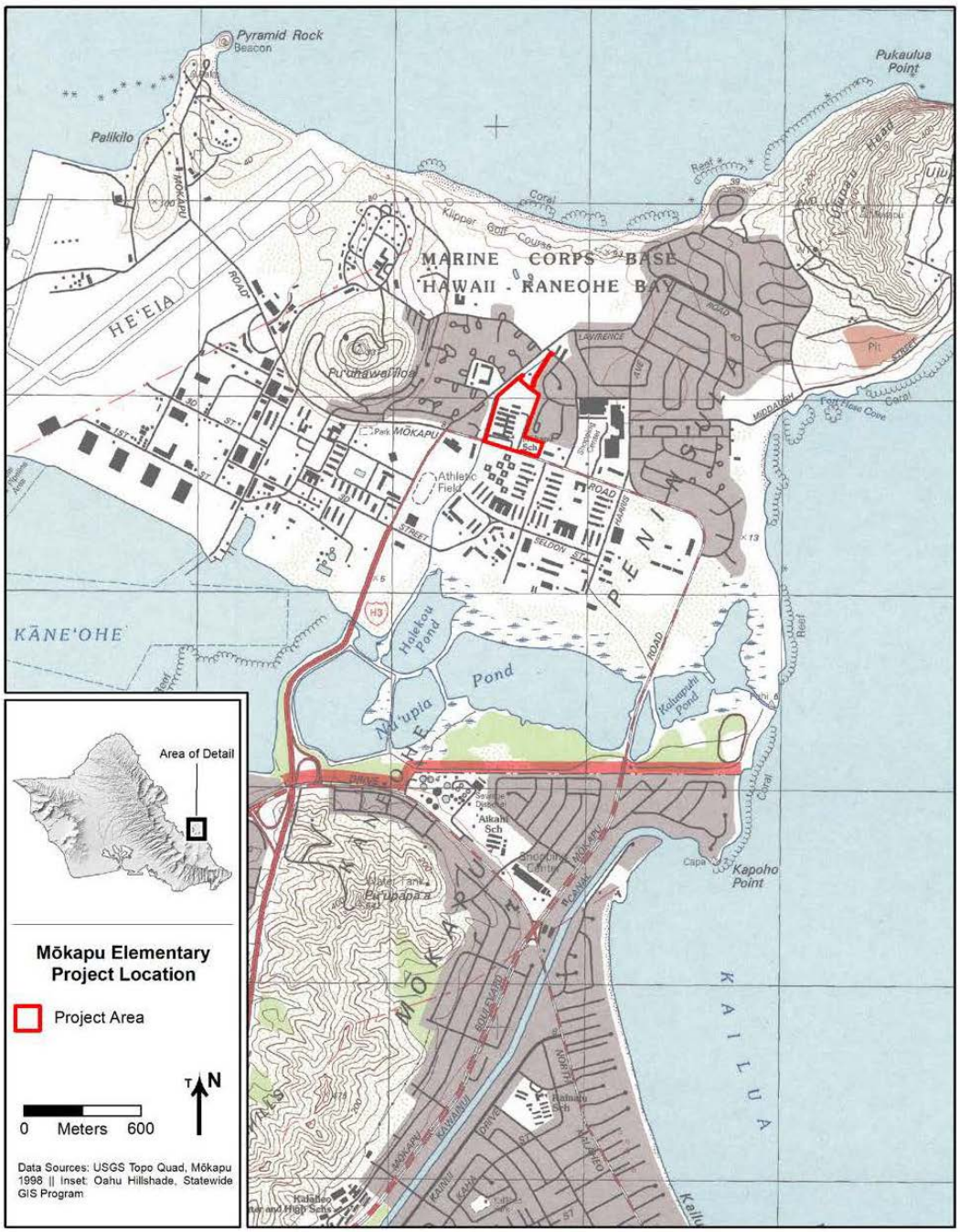
Ko`olauloa Hawaiian Civic Club, Ms. Cathleen Mattoon
Paik `Ohana
Paoa/Kea/Lono ‘Ohana, Ms. Donna Ann Camvel,
Prince Kuhio Hawaiian Civic Club, Mr. Norman Llanos
Van Horn Diamond/Olds `Ohana, Ms. Nalani Olds
Temple of Lono, Mr. Clive Cabral

Reference:

Mason Architects. *Mokapu Elementary School, Table 1: Inventory Survey Significance Evaluations*, June 22, 2020.

Mason Architects. *Mokapu Elementary School, Table 2: Evaluation of Effect of Preferred Alternative on Historic Resources,* June 22, 2020.

International Archaeology LLC. End-of-Fieldwork Letter, *Archaeological Subsurface Testing in Support of Campus Improvements at Mōkapu Elementary School, Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu, Hawaiʻi, TMK (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion) [IA202010]*, August 5, 2020.



Enclosure 1. Map showing location and area of potential effects (APE) of the 14.2-acre Mokapu Elementary School Campus Improvements project aboard MCBH Kaneohe Bay.

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
Classroom A	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom B	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom C	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom D	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom E	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Library/ Classroom F	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation. Originally served as the school's library, later converted to a classroom.	
G (Cafeteria)	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
H (Administration)	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Kindergarten Classroom/ I	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	

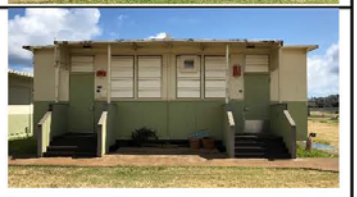
Enclosure 2. "Mokapu Elementary School, Table 1 (page 1 of 4): Inventory Survey Significance Evaluations" by Mason Architects, June 22, 2020.

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
Six Classroom Building (J)/ Library	ca. 1970	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet & Janitor Storeroom/ K	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet/ L	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet/ M	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet/ N	ca. 1970	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
O	ca. 1994	Not eligible. Although this building was added to the campus ca. 1994 in a compatible manner and design, it does not meet the exceptional importance threshold under National Register Criteria Consideration G for individual listing, nor is it eligible as a contributing element. (Properties less than 50 years in age are not eligible for listing on the Hawaii Register.)	
P1	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.	

Enclosure 2 continued.

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
P2	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.	
P3	ca. 1967	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation.	
P4	ca. 1988	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
P5	ca. 1988	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
P6	ca. 1973	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register. Should be re-evaluated in 2023, when it reaches 50 years.	
P7	ca. 1973	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register. Should be re-evaluated in 2023, when it reaches 50 years.	
PT-1	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.	

Enclosure 2 continued.

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
P9	ca. 1992	Not eligible. Does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
P10	ca. 1997	Not eligible. Does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
Q	ca.1994	Not eligible. Although this building was added to the campus ca. 1994 in a compatible manner and design, it does not meet the exceptional importance threshold under National Register Criteria Consideration G for individual listing, nor is it eligible as a contributing element. (Properties less than 50 years in age are not eligible for listing on the Hawaii Register.)	
Sewage Lift Station	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the Post-war period to meet the needs of the baby boom generation.	
Electrical Room/ Transformer vault	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the Post-war period to meet the needs of the baby boom generation.	

Enclosure 2 continued.

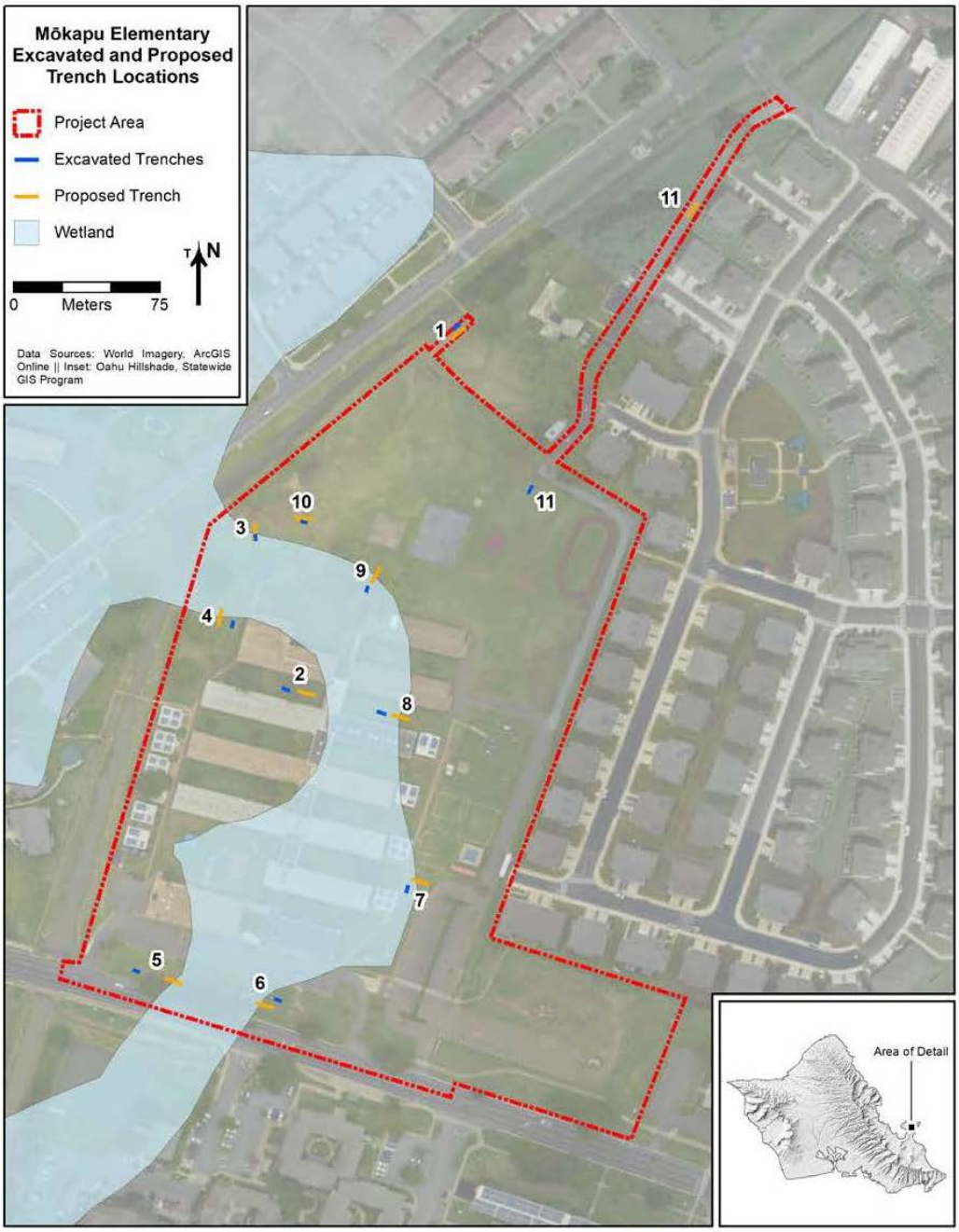


Figure 1. Trenches excavated during archaeological subsurface testing at Mōkapu Elementary School.

Enclosure 3. International Archaeology LLC, Figure 1, End-of-Fieldwork Letter, "Archaeological Subsurface Testing in Support of Campus Improvements at Mōkapu Elementary School, Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu, Hawaiʻi, TMK (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion) [IA202010]," dated August 5, 2020.

Table 1. Preliminary Results of Archaeological Test Trenching at Mōkapu Elementary School.

Trench No.	Justification	Status	Results
1	Within proposed pedestrian walkway to north of school grounds	Excavated as planned	Modern fill to approximately 60 cm below surface (cmbs), charcoal and shell collected from fill. Buried wetland soils. Trench excavated to 150 cmbs.
2	At margin of former wetland*	Location shifted to avoid unknown buried utility	Modern fill to approximately 115 cmbs, ceramic and metal fragments collected from fill. Buried wetland soils. Trench excavated to 210 cmbs.
3	At margin of former wetland	Excavated as planned	Modern fill to approximately 55 cmbs. Buried wetland soils. Trench excavated to 90 cmbs.
4	At margin of former wetland	Location shifted to avoid tree roots	Modern fill to approximately 80 cmbs, glass fragment and nail collected from fill. Buried wetland soils. Trench excavated to 215 cmbs.
5	At margin of former wetland	Location shifted to avoid tree roots and numerous nearby buried utilities	Modern fill to base of trench at approximately 80 cmbs. Halted trench excavations at buried water line.
6	At margin of former wetland	Location shifted to avoid tree roots and numerous nearby buried utilities	Modern fill to approximately 150 cmbs, glass fragments collected from fill. Buried wetland soils. Trench excavated to 215 cmbs.
7	At margin of former wetland	Reoriented north-south to avoid buried 1-inch waterline	Modern fill to approximately 135 cmbs, glass fragment collected from fill. Buried wetland soils. Trench excavated to 240 cmbs.
8	At margin of former wetland	Location adjusted to avoid tree roots	Modern fill to approximately 165 cmbs. Buried wetland soils, preserved wood and natural shells collected from wetland layer. Trench excavated to 300 cmbs.
9	At margin of former wetland	Excavated as planned	Modern fill to approximately 90 cmbs, charcoal, glass fragment, and animal bone collected from fill. Buried wetland soils. Trench excavated to 180 cmbs.
10	North of former wetland	Excavated as planned	Modern fill to 50 cmbs. Buried wetland soils. Trench excavated to 80 cmbs.
11	Within proposed pedestrian walkway north of school grounds	Original location in asphalt-covered driveway; moved to northern portion of schoolyard near planned walkway	Modern fill to 35 cmbs, charcoal and copper fragments collected from base of fill. Trench excavated to 120 cmbs**.

* As shown on early 20th-century aerial photographs and topographic maps.
**Buried wetland soils not encountered in Trench 11.

Enclosure 4. International Archaeology LLC, Figure 2, End-of-Fieldwork Letter, "Archaeological Subsurface Testing in Support of Campus Improvements at Mōkapu Elementary School, Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu, Hawaiʻi, TMK (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion) [IA202010]," dated August 5, 2020.

Table 2: Evaluation of Effect of Preferred Alternative on Historic Resources			
Original Name/ Subsequent Name	**Evaluation of Effect (Section 106)**	**Determination of effect to sig. historic properties (HRS 6E-8)**	**Notes**
Classroom A	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Classroom B	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Classroom C	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Classroom D	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Classroom E	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Library/ Classroom F	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
G (Cafeteria)	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
H (Administration)	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Kindergarten Classroom/ I	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Six Classroom Building (J)/ Library	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Toilet & Janitor Storeroom/ K	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Toilet/ L	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Toilet/ M	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Toilet/ N	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
P1	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
P2	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
P3	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
PT-1	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Sewage Lift Station	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.
Electrical Room/ Transformer vault	Adverse Effect.	Effect, with proposed mitigation commitments.	The demolition of the building is an adverse effect.

Enclosure 5. “Mokapu Elementary School, Table 2: Evaluation of Effect of Preferred Alternative on All Historic Resources,” by Mason Architects, June 22, 2020.

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

M. KALEO MANUEL
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

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

September 18, 2020

IN REPLY REFER TO:
Log No.: 2020.01919
Doc. No.: 2009SH09
Archaeology, Architecture

Lieutenant-Colonel Pochop, Director
Environmental Compliance and Protection Department
United States Marine Corps
Marine Corps Base Hawai‘i Box 63002
Kaneohe Bay, Hawai‘i 96863-3002
timothy.pochop@usmc.mil

Dear Lieutenant-Colonel Pochop:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review – Continued Consultation and Request for Concurrence with the Determination of Eligibility for Historic Properties**
Mokapu Elementary School Campus Improvements Aboard Marine Corps Base Hawai‘i
Ref. No. 5090 LFE/112-20
Kaneohe Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu
TMK: (1) 4-4-008:001

The State Historic Preservation Division (SHPD) received a letter dated August 18, 2020 from the Marine Corps Base Hawai‘i (MCBH) to continue Section 106 consultation and request the State Historic Preservation Officer's (SHPO's) concurrence with the determination of eligibility for historic properties associated with the Mokapu Elementary School Campus Improvements project at MCBH on the island of O‘ahu. The SHPD received this submittal on August 20, 2020.

MCBH initiated consultation for the proposed project in a letter dated May 22, 2020 (MCBH Ref. No. 5090 LFE/074-20; SHPD Log No. 2020.01183). The U.S. government is the landowner and the Hawai`i State Department of Education (DOE) is the lessee and responsible for the elementary school. The DOE proposes the redevelopment of Mōkapu Elementary School, which was originally constructed ca. 1959 on a 14-acre site at MCBH. The project will be funded through a grant from the U.S. Department of Defense Office of Economic Adjustment and the State of Hawai`i.

The subject letter provides the results of MCBH's identification efforts and the evaluation of significance for the historic properties identified within the Area of Potential Effects (APE). MCBH states that the APE has been determined to include the 14.2 acre MES Campus Improvements project but that when a scope of work for the utilities hook ups has been determined an additional area will be added to the APE along with a description of any off-site utility work in support of this undertaking.

MCBH states that between July 16 and July 24, 2020 archaeological subsurface testing was conducted to identify the presence/absence of archaeological deposits and to contextualize the stratigraphic composition of the area as it relates to the potential for past land use. Fieldwork followed the subsurface testing plan approved by MCBH. The project's work plan included 11 backhoe trenches excavated across the 14.2-acre project area, which includes the Mōkapu Elementary School grounds and two areas to the north of the schoolyard where pedestrian walkways are proposed (Moore 2020). No archaeological deposits or human skeletal remains were encountered during fieldwork. A small number of isolated artifacts, including primarily glass bottle and metal fragments, and one piece of non-

archaeological animal bone, were collected from 20th-century fills. The SHPD looks forward to receiving the archaeological report for review.

Mason Architects conducted an evaluation of architectural historic properties for their eligibility to be listed in the National Register of Historic Places (NRHP). The Mokapu Elementary School (MES) buildings (A-N, P1, P2, P3, PT-1, Sewage Lift Station, Electrical Room/ Transformer Vault) were built between 1960 and 1970 and were evaluated as eligible for listing in the Hawai‘i and National Registers of Historic Places under Criteria A and C. The School Buildings O, Q (1994); P4, P5 (1988); P6, P7 (1973); P9 (1992); and P10 (1997); were evaluated as not eligible to be listed in the NRHP under Criterion G for properties that have achieved significance within 50 years. Based on the information provided, **the SHPO concurs** with the evaluations of eligibility for the architectural historic properties identified within the APE.

MCBH has determined the proposed undertaking will result in an *adverse effect* based on the demolition of buildings that are eligible for the National Register. **The SHPO concurs** with the determination of effect and will consult with MCBH on the development of a MOA to resolve adverse effects.

The SHPO looks forward to continuing Section 106 consultation for the proposed project.

The MCBH is the office of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Julia Flauaus, Architectural Historian, at Julia.Flauaus@hawaii.gov regarding architectural resources, and Stephanie Hacker, Historic Preservation Archaeologist IV, at Stephanie.Hacker@hawaii.gov for matters regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Christopher Frantz, MCBH (christopher.drantz@usmc.mil)
June Cleghorn, MCBH (june.cleghorn@usmc.mil)
Wendy Wichman, MCBH (wendy.wichman@usmc.mil)
Arleen Garcia-Herbst, MCBH (arleen.garciaherbst@usmc.mil)

Appendix C
Archaeological Subsurface Testing Report

— Final —

Archaeological Subsurface Testing in Support of Campus Improvements at Mokapu Elementary School, Marine Corps Base Hawaii, Kaneohe Bay, O‘ahu, Hawai‘i

TMK: (1) 4-4-009:007, (1) 4-4-009:003 (Portion), and (1) 4-4-009:010 (Portion)

Prepared by:
Summer Moore

International Archaeology, LLC
2081 Young Street
Honolulu, Hawai‘i 96826

Prepared for:
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawai‘i 96813

October 2020

— FINAL —

ARCHAEOLOGICAL SUBSURFACE TESTING IN SUPPORT OF CAMPUS IMPROVEMENTS AT MOKAPU ELEMENTARY SCHOOL, MARINE CORPS BASE HAWAII, KANEOHE BAY, O‘AHU, HAWAI‘I

TMK: (1) 4-4-009:007, (1) 4-4-009:003 (PORTION), AND (1) 4-4-009:010 (PORTION)

Prepared by:
Summer Moore, Ph.D.

Prepared for:
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawai‘i 96813

International Archaeology, LLC
2081 Young Street
Honolulu, Hawai‘i 96826

October 2020

ABSTRACT

At the request of HHF Planners, International Archaeology (IA) conducted archaeological subsurface testing at 11 locations on and near the Mokapu Elementary School campus, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, Oʻahu Island, Hawaiʻi. The project area includes the elementary school property and two proposed pedestrian walkways extending northward from the school grounds. The Hawaiʻi State Department of Education is proposing to redevelop Mokapu Elementary School, which was originally constructed ca. 1959 on a 14-acre site near the center of Mokapu Peninsula. The U.S. government is the landowner with the Hawaiʻi State Department of Education the lessee responsible for the elementary school. This action uses federal funds and occurs on federal land and is therefore an undertaking as defined under 36 CFR 800.16(y). This report presents the results of the archaeological testing program.

Eleven backhoe trenches were excavated across the project area. Trench locations were originally determined based on recent orthoimagery and historical graphics. As such, Trenches 2-9 were placed within the school grounds around the perimeter of a former wetland as depicted on 1920s-era topographic maps and aerial photographs. The wetland was buried during the mid-20th century by fills and is no longer visible on the ground surface. Trench 10 was placed within the school grounds a few meters north of the former wetland. Trenches 1 and 11 were initially plotted within extensions of the area of potential effects (APE) outside the schoolyard where pedestrian walkways are planned. During pre-trenching toning for utilities, trench locations were adjusted to avoid buried utilities, surface pavement, and large trees.

No archaeological deposits, burials, or secondarily deposited human skeletal remains were encountered during fieldwork. Profiles exposed in the trenches included one or more layers of modern fill covering inundated terrigenous silty clay loam and a substratum of probable dune or beach sand or limestone bedrock. Gleyed layers and preserved botanical remains identified in some layers suggest an association with the wetland area that occupied part of the school grounds prior to mid-20th century land reclamation. A small number of isolated artifacts, primarily glass bottle and metal fragments, were collected from the modern fills during testing; samples of preserved botanical remains were collected from the buried wetland layers.

The proposed campus improvements at Mokapu Elementary School include ground-disturbing activities such as the demolition of existing buildings, the excavation of foundations for new buildings, the installation of underground utilities, and landscaping and grading. We recommend that archaeological monitoring be conducted during all ground-disturbing activities in the event that previously unidentified historic properties, or human skeletal remains, are encountered during the proposed work.

TABLE OF CONTENTS

ABSTRACT iii

LIST OF FIGURES vi

LIST OF PHOTOGRAPHS vii

LIST OF TABLES viii

I. INTRODUCTION 1
- Scope of Work 1
- Project Personnel and Logistics 5
- Disposition of Field Notes and Other Materials 5
- Organization of the Report 5

II. ENVIRONMENTAL AND CULTURAL BACKGROUND 7
- Physical Environment 7
- Legendary and Historical Summary 8
  - Traditional History 8
  - Historical Background 13
- Archaeological Background Information 16
  - Previous Archaeology Near the Project Area 16
  - Expectations 25

III. RESEARCH QUESTIONS 27

IV. PROJECT METHODS 29
- Subsurface Testing Methods 29
- Laboratory Procedures 30

V. FIELD AND LABORATORY RESULTS 31
- Description of Excavations 31
  - Soil Layers Across the Project Area 31
  - Trench Descriptions 36
- Synthesis of Laboratory Results 60
  - Artifacts 60
  - Botanical Samples 61

VI. DISCUSSION 63

VII. CONCLUSIONS AND RECOMMENDATIONS 65
- Summary of Results 65
- Recommendations 65

REFERENCES 67

GLOSSARY OF HAWAIIAN WORDS 75

APPENDIX A: TEST TRENCH LAYER DESCRIPTIONS AND INTERPRETATIONS 77

APPENDIX B: CATALOG LIST 83

LIST OF FIGURES

Figure 1. Project location, MCBH Kaneohe Bay 2
Figure 2. Existing facilities at Mokapu Elementary School 3
Figure 3. Site plan showing proposed campus improvements at Mokapu Elementary School 4
Figure 4. Mokapu Elementary School project area superimposed on a 1928 U.S. Geological Survey/U.S. Army Corps of Engineers aerial composite photograph of Mōkapu Peninsula 9
Figure 5. Mokapu Elementary School project area overlaid on 1928 topographic map of Mōkapu Peninsula 10
Figure 6. Mokapu Elementary School project area superimposed on a U.S. Department of Agriculture (USDA) soil survey map of O‘ahu 11
Figure 7. Mokapu Elementary School project area superimposed on a historic map (Donn 1902) showing the traditional land divisions of Mōkapu Peninsula 12
Figure 8. Mokapu Elementary School project area superimposed on a map depicting historical land use on Mōkapu Peninsula 15
Figure 9. Previous archaeological projects in the vicinity of Mokapu Elementary School project area 20
Figure 10. Archaeological sites documented in the vicinity of the Mokapu Elementary School project area 21
Figure 11. Mokapu Elementary School project area overlaid on zones of archaeological sensitivity at MCBH 22
Figure 12. Approximate locations of backhoe test trenches excavated by Shun (1991) 23
Figure 13. Representative profile reported by Shun (1991) 24
Figure 14. Excavated trench locations, Mokapu Elementary School 32
Figure 15. Profile of Trench 1, west wall 38
Figure 16. Profile of Trench 2, north wall 40
Figure 17. Profile of Trench 3, east wall 42
Figure 18. Profile of Trench 4, east wall 44
Figure 19. Profile of Trench 5b, north wall 48
Figure 20. Profile of Trench 6, north wall 49
Figure 21. Profile of Trench 7, north wall 51
Figure 22. Profile of Trench 8, north wall 54
Figure 23. Profile of Trench 9, west wall 56
Figure 24. Profile of Trench 10, south wall 57
Figure 25. Profile of Trench 11, east wall 58

LIST OF PHOTOGRAPHS

Photo 1. Trench 1, west wall profile, eastern end of trench 38
Photo 2. Trench 1, west wall profile, center of trench 39
Photo 3. Trench 1, west wall profile, southern end of trench 39
Photo 4. Trench 2, north wall profile, eastern end of trench 41
Photo 5. Trench 2, north wall profile, center of trench 41
Photo 6. Trench 3, east wall profile, southern end of trench 43
Photo 7. Trench 3, east wall profile, center of trench 43
Photo 8. Trench 4, east wall profile, southern end of trench 45
Photo 9. Trench 4, east wall profile, center of trench 46
Photo 10. Trench 5a, north wall profile, center of trench 47
Photo 11. Trench 5b, north wall profile, western end of trench 48
Photo 12. Trench 6, north wall profile, western end of trench 50
Photo 13. Trench 6, north wall profile, eastern end of trench 50
Photo 14. Trench 7, north wall profile, western end of trench 52
Photo 15. Trench 7, north wall profile, western end of trench 53
Photo 16. Trench 7, north wall profile, eastern end of trench 53
Photo 17. Trench 8, north wall profile, center of trench 55
Photo 18. Trench 9, west wall profile, northern end of trench 56
Photo 19. Trench 10, south wall profile, western end of trench 57
Photo 20. Trench 11, east wall profile, center of trench 59
Photo 21. Trench 11, east wall profile, southern end of trench 59

LIST OF TABLES

Table 1. Archaeological Projects Conducted in or near the Mokapu Elementary School Project Area (Listed Alphabetically by Author).....18
Table 2. Soils and Sediments Documented Across the Project Area 33
Table 3. Summary of Trenching Results 37
Table 4. Artifacts Collected During Testing.....60
Table 5. Botanical Samples Collected during Testing.....61

I. INTRODUCTION

Under contract to HHF Planners, International Archaeology, LLC (IA) completed a subsurface archaeological testing program in support of proposed campus improvements at Mokapu Elementary School, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, Oʻahu Island, Hawaiʻi (Figure 1). The Hawaiʻi State Department of Education (DOE) proposes the redevelopment of Mokapu Elementary School. The U.S. government is the landowner with the DOE the lessee responsible for the elementary school. The project will be funded through grants from the U.S. Department of Defense Office of Economic Adjustment and the State of Hawaiʻi. This action uses federal funds and occurs on federal land and is therefore an undertaking as defined under 36 CFR 800.16(y). All project work was undertaken in accordance with the project's scope of work and approved work plan (Moore 2020).

The archaeological testing was meant to fulfill historic preservation obligations under the federal National Historic Preservation Act (NRHP) Section 106 and state Hawaii Revised Statutes (HRS) 6E-8 and Hawaii Administrative Rules (HAR) §13-275. All work was conducted in compliance with the Antiquities Act of 1906, the Archaeological Resources Protection Act (ARPA) of 1979, ARPA-implementing regulations (32 Code of Federal Regulations Part 229), Department of Defense Instruction (DoDI) 4715.6, and Marine Corps Order (MCO) P5090.2A.

No archaeological deposits or human skeletal remains were encountered during fieldwork. A small number of isolated artifacts, including primarily glass bottle and metal fragments, were collected from 20th-century fills in several trenches. Selected samples of preserved botanical remains were also collected.

SCOPE OF WORK

The Hawaiʻi DOE is proposing to redevelop Mokapu Elementary School, which was built in its present location ca. 1959 on a 14-acre site within MCBH. Archaeological subsurface testing was conducted to identify the presence or absence of archaeological deposits and to contextualize the stratigraphic composition of the area as it relates to the potential for past land use. Existing school structures include an administration building, a library, a cafeteria, nine classroom buildings, and four restroom structures with a combined floor area of approximately 60,000 gross square feet (GSF) (Figure 2). Nine portable classroom buildings, four playgrounds, two play courts, two basketball courts, a dirt race track, paved parking areas, and a sewer pump station are also on the site at the present time.

The proposed redevelopment project will fully renovate the existing school campus to provide approximately 162,000 GSF of floor area. The new facilities will include two- and three-story classroom, administration, and library buildings; a cafeteria; a covered play court; a play field; and parking facilities. The proposed locations of the primary buildings, which will be arranged around an open-air courtyard, are shown in Figure 3. A corridor for pedestrian access will extend between the northeastern perimeter of the project area and Cushman Avenue; another proposed pedestrian walkway will extend between a gate at the northwestern edge of the property and a sidewalk east of a pedestrian bridge leading to Lawrence Road. The redevelopment will also include related on- and off-site infrastructure improvements and utility connections.

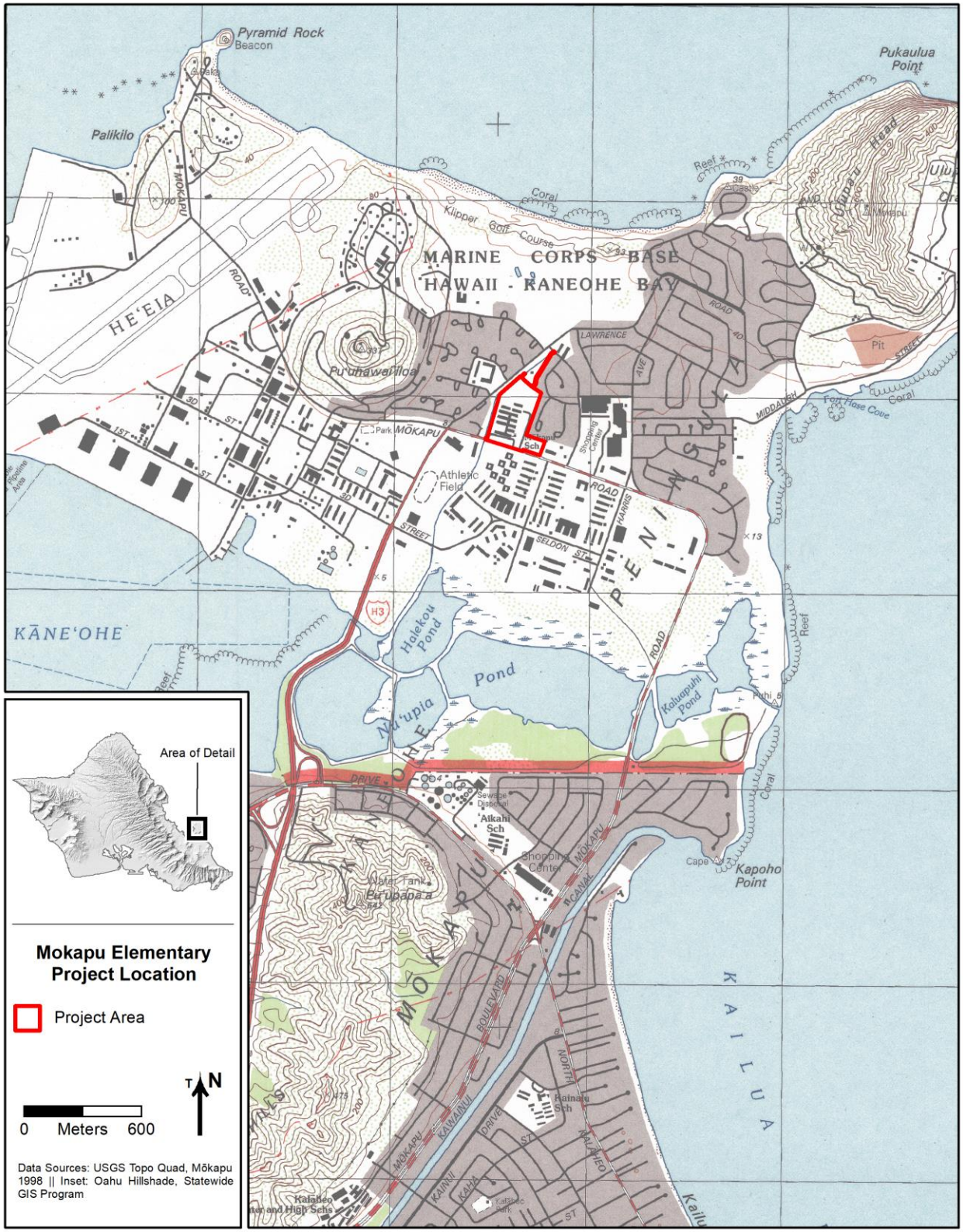


Figure 1. Project location, MCBH Kaneohe Bay (USGS Mokapu and Waimanalo Quadrangles 1999).

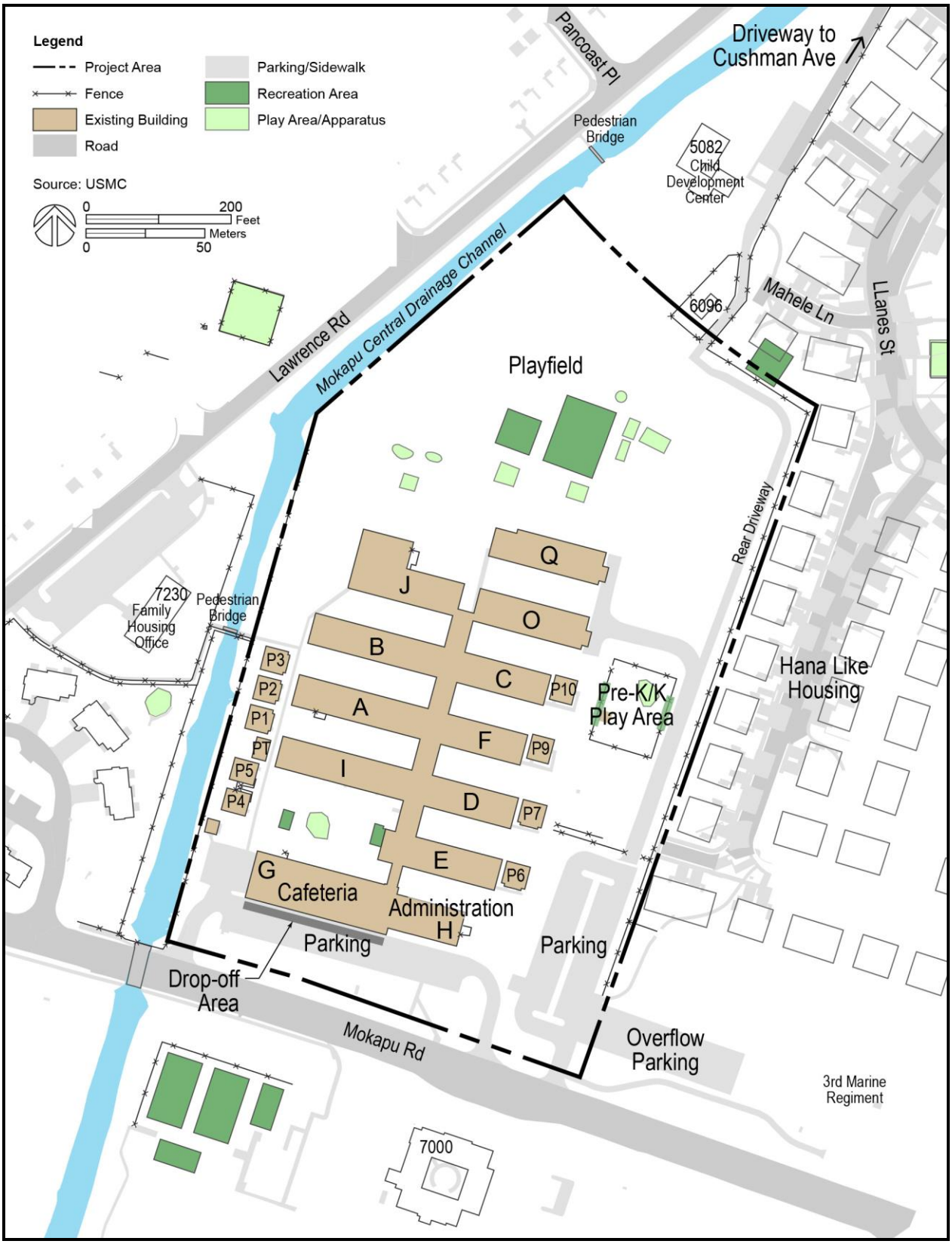


Figure 2. Existing facilities at Mokapu Elementary School. Image provided by HHF Planners.

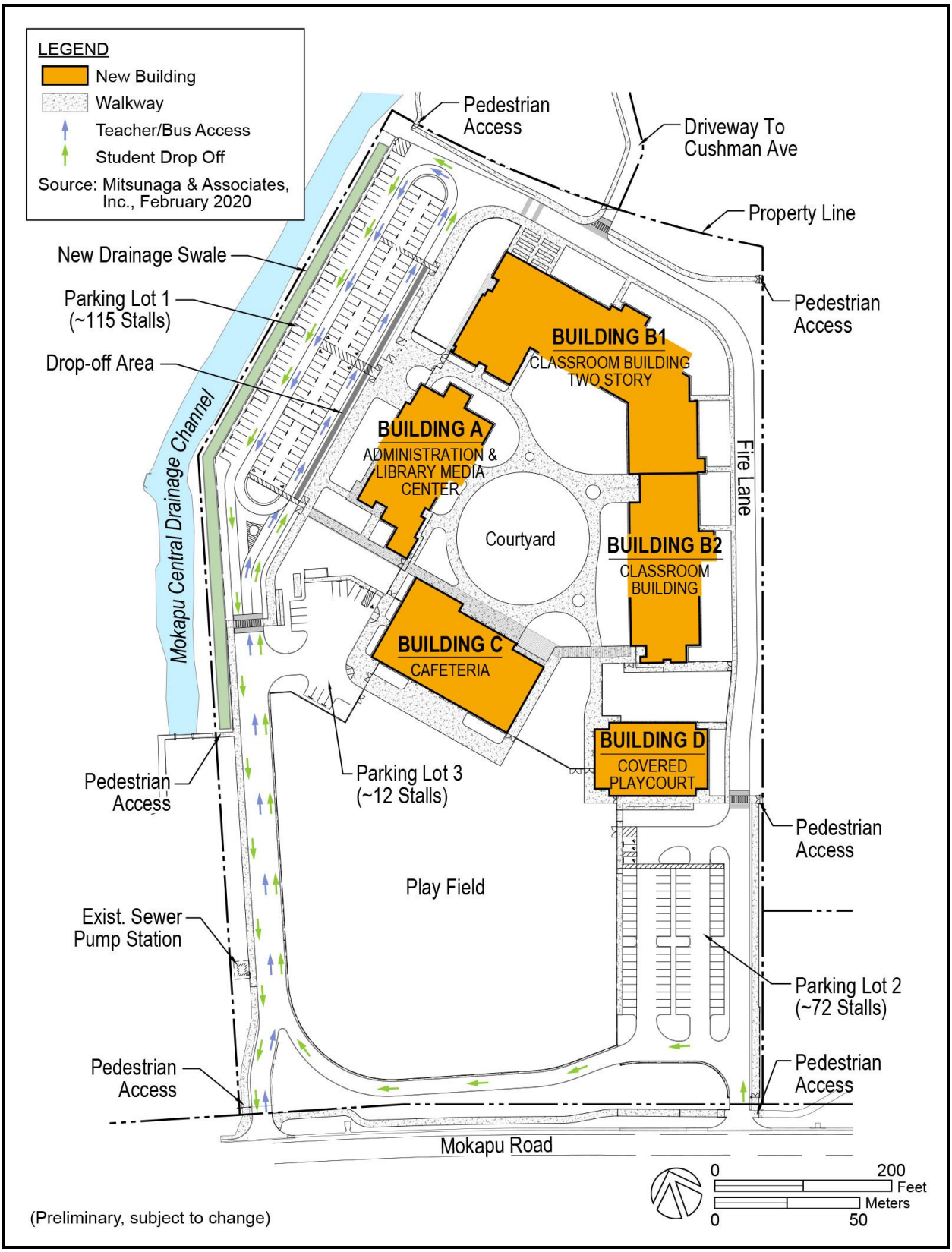


Figure 3. Site plan showing proposed campus improvements at Mokapu Elementary School. Image provided by HHF Planners.

PROJECT PERSONNEL AND LOGISTICS

Timothy M. Rieth, M.A., was the Principal Investigator for the project and was responsible for overall management, ensuring that appropriate research standards were maintained, and providing research direction and oversight. Summer Moore, Ph.D., was the Project Director (PD). The PD directed the fieldwork and was assisted in the field by Phirum Kem, B.A.

Archaeological fieldwork for the project was undertaken between July 16 and July 24, 2020. Toning for subsurface utilities was conducted by Hawaii Geophysical, Inc., on July 16, 2020, and the trenching was conducted between July 20 and 24, 2020. The backhoe subcontractor was Norm's Tractor Service, Inc.

DISPOSITION OF FIELD NOTES AND OTHER MATERIALS

Project field and laboratory notes, electronic files, and archaeological materials recovered during fieldwork are temporarily stored at the IA facility in Honolulu. At the conclusion of the contract, these materials will be returned to the MCBH Environmental Office for long-term curation. Materials will be returned in archival-quality boxes and packaging.

ORGANIZATION OF THE REPORT

Section I is the introduction to the project. Section II summarizes the physical environmental characteristics and important cultural information for the project area, as well as previously identified archaeological sites. Section III presents the research problems, and Section IV describes the field methods and laboratory procedures followed during the completion of the project. Section V presents the results of field and laboratory work. Section VI discusses the project results in relation to the history of the project area and larger questions relating to O‘ahu and archipelago-wide research issues. Section VII presents the project conclusions and recommendations for further archaeological work. All references cited in the body of the report are presented after Section VII, followed by a glossary of Hawaiian words used in the text. Appendix A describes and interprets the stratigraphy encountered in the trenches. Appendix B provides a catalog list of artifacts and botanical samples collected during testing.

II. ENVIRONMENTAL AND CULTURAL BACKGROUND

This section provides information on the physical environment, legendary and historical summaries, and previous archaeological investigations relevant to the Mokapu Elementary School project. The text is modified from Rieth and Filimoehala (2015) and Filimoehala et al. (2013) with additional information from Tomonari-Tuggle (2014b).

PHYSICAL ENVIRONMENT

The Mōkapu Peninsula consists of 2,951 acres situated between Kāneʻohe and Kailua Bays on the windward coast of Oʻahu. Geologically, Mōkapu Peninsula is formed by four Pleistocene cinder cones and associated lavas and a younger Pleistocene limestone bench (Macdonald and Abbott 1970:206, 354). Major landforms on the peninsula include Ulupaʻu Crater to the northeast (194 m above sea level [asl]), Puʻu Hawaiʻiloa in the center (103 m asl), Pali Kilo and Pyramid Rock to the northwest, extensive dunes along the north coast, and wetlands and shallow ponds formed by an extensive fishpond complex consisting of Nuʻupia Pond, Halekou Pond, and Kaluapuhi Pond along the southeastern edge pf the peninsula. Access to Mōkapu Peninsula is controlled by MCBH, which occupies the entire peninsula.

The Mokapu Elementary School project area is located on a flat plain in the central portion of the peninsula, approximately 450 m southeast of Puʻu Hawaiʻiloa and 690 m northeast of the present extent of Halekou Pond. Prior to extensive mid-20th century land reclamation, the project area encompassed an area of former marshland extending north from Halekou Pond (Figure 4 and Figure 5). Except for the northern perimeter of Halekou Pond, the wetlands between the pond and the project area have since been filled and leveled; the Mokapu Central Drainage Channel on the west edge of the project area is a channelized remnant of the marshland.

Several soil units have been defined within the project area (Foote et al. 1972). The northern portion of the project area is characterized by Keaau clay (KmA), 0 to 2 percent slopes (Figure 6). The representative soil profile for Keaau clay consists of very dark grayish-brown and dark brown mottled clay above a white to very pale brown reef limestone or consolidated coral sand (Foote et al. 1972:65). The southeastern portion is characterized as Mamala stony silty clay loam (MnC), 0 to 12 percent slopes. Mamala stony silty clay loam has a dark reddish brown stony silty clay loam surface stratum capping a reddish brown silty clay loam subsoil. Stone inclusions, particularly coral, are common (Foote et al. 1972:93). The southwestern section of the project area, roughly coincident with the former wetland, is described as fill land, mixed (FL).

Recent geotechnical boring in the project area (Geolabs, Inc. 2020) offers detailed information about the current status of fills and natural sediments in the project area. Twelve borings on the Mokapu Elementary School property demonstrated that it is covered with between 0.46 m (1.5 ft.) and 2.4 m (8 ft.) of fill, which includes clayey silt, sandy silt, sandy clay, and silty sand, to basalt cobbles and calcareous sand. In the southwestern portion of the project area, i.e., the area of the former marshland, the bores encountered terrigenous, grayish-brown clayey silt below the fill at 2.1 m (7 ft.) below surface. Based on the boring results, it is reasonable to interpret this layer of clayey silt as representing buried wetland deposits.

Mean annual rainfall for Mōkapu Peninsula is between 1,000 and 1,500 mm. Following the pattern elsewhere on Oʻahu, summers tend to be significantly drier than winters (Giambelluca et al. 2013). While the peninsula today lacks permanent surface water sources, in limestone areas rainwater

percolates downward through the porous rock to an underground lens. Springs are also known to have existed in volcanic areas, including Pu‘u Hawai‘iloa; a historically recorded brackish water well was located in the western portion of the peninsula, likely at the northern end of Runway 4/22 (Tomonari-Tuggle 2014b:II-10).

The project area and surrounding area have been altered by development and modern landscaping. However, wood charcoal assemblages from various excavations on the peninsula suggest that it once supported a dryland vegetation complex, including *kī* (*Cordyline fruticosa*), *kulu‘ī* (*Nototrichium* sp.), *‘āheahea* (*Chenopodium oahuense*), *kukui* (*Aleurites moluccana*), *‘akoko* (*Euphorbia* spp.), *‘ilima* (*Sida fallax*), and *milo* (*Thespesia populnea*) (Roberts et al. 2002:45; cited in Tomonari-Tuggle 2014b:II-10). Athens (2002:5) notes that modern vegetation surrounding the peninsula’s ponds includes the indigenous wetland plant *‘ākulikuli* (*Sesuvium portulacastrum*), along with the introduced species *koa haole* (*Leucaena glauca*), ironwood (*Casuarina equisetifolia* L.), and *pluchea* (*Pluchea indica*).

LEGENDARY AND HISTORICAL SUMMARY

Mōkapu Peninsula is within the traditional *moku* of Ko‘olaupoko, divided between two *ahupua‘a*: in the east, approximately three-quarters of the peninsula is part of Kāne‘ohe Ahupua‘a, and the remaining one-quarter in the west is part of He‘eia Ahupua‘a. Since many *ahupua‘a* included a wide range of forest and marine resources that ideally permitted economic self-sufficiency, the peninsula was probably divided to allow the communities of both *ahupua‘a* access to the area’s fisheries (Tuggle and Hommon 1986:3). The two *ahupua‘a* include much larger areas on the O‘ahu mainland extending to the Ko‘olau Range. The Mokapu Elementary School project area is within Kāne‘ohe Ahupua‘a (Figure 7). Although most of the project area is within Kuwa‘aohe ‘Ili, a small portion on the southeast perimeter extends into Ulupa‘u ‘Ili.

The name Mōkapu has been defined in several ways, stemming from variable readings of the prefix *mo*, which has no clear meaning (Andrews 1865:392). Pukui and Elbert (1986) interpret *mo* as short for *moku*, or district, and that when combined with the word *kapu*, meaning sacred or taboo, forms Mōkapu, or sacred district. *Mo* may alternatively refer to the word *mo‘o*, literally meaning “lizard,” but also figuratively suggesting “ridge,” which can be allusively compared to “a lizard’s back” (Tuggle and Hommon 1986:13). Handy and Handy (1991:456) accept this interpretation when defining Mōkapu as “sacred ridge,” which Tuggle and Hommon (1986:15, 40-47) agree describes the western portion of the peninsula featuring the Pali Kilo ridge, and which also once contained a *heiau*, a fishing shrine, and other religious sites. In fact, as used in historical land records, the name Mōkapu described only the *‘ili* of He‘eia in the western portion of the peninsula; the name was not formally applied to the entire peninsula until more recently (Tuggle and Hommon 1986:13). Like other place names in Hawai‘i, the name Mōkapu may even be a play-on-words intended to have multiple meanings (Tuggle and Hommon 1986:14), describing both a prominent landmark of Mōkapu ‘Ili, and its significance as a sacred area deliberately installed at one end of Kāne‘ohe Bay, like Kualoa to the northwest (Tuggle and Hommon 1986:3).

TRADITIONAL HISTORY

Mōkapu Peninsula’s religious and political importance, implied by these names, is further espoused by accounts ascribing mythological and historical events to the area. The peninsula is important in legends of Hawaiian origins as the place where the gods Kāne, Kū, and Lono made the first man and woman (Beckwith 1970:45-46). Some historical sources describe the peninsula as associated with *ali‘i*, notably Peleioholani and Kamehameha (Fiddler 1956:12; Kamakau 1992:75; Tuggle and Hommon 1986:28-29).

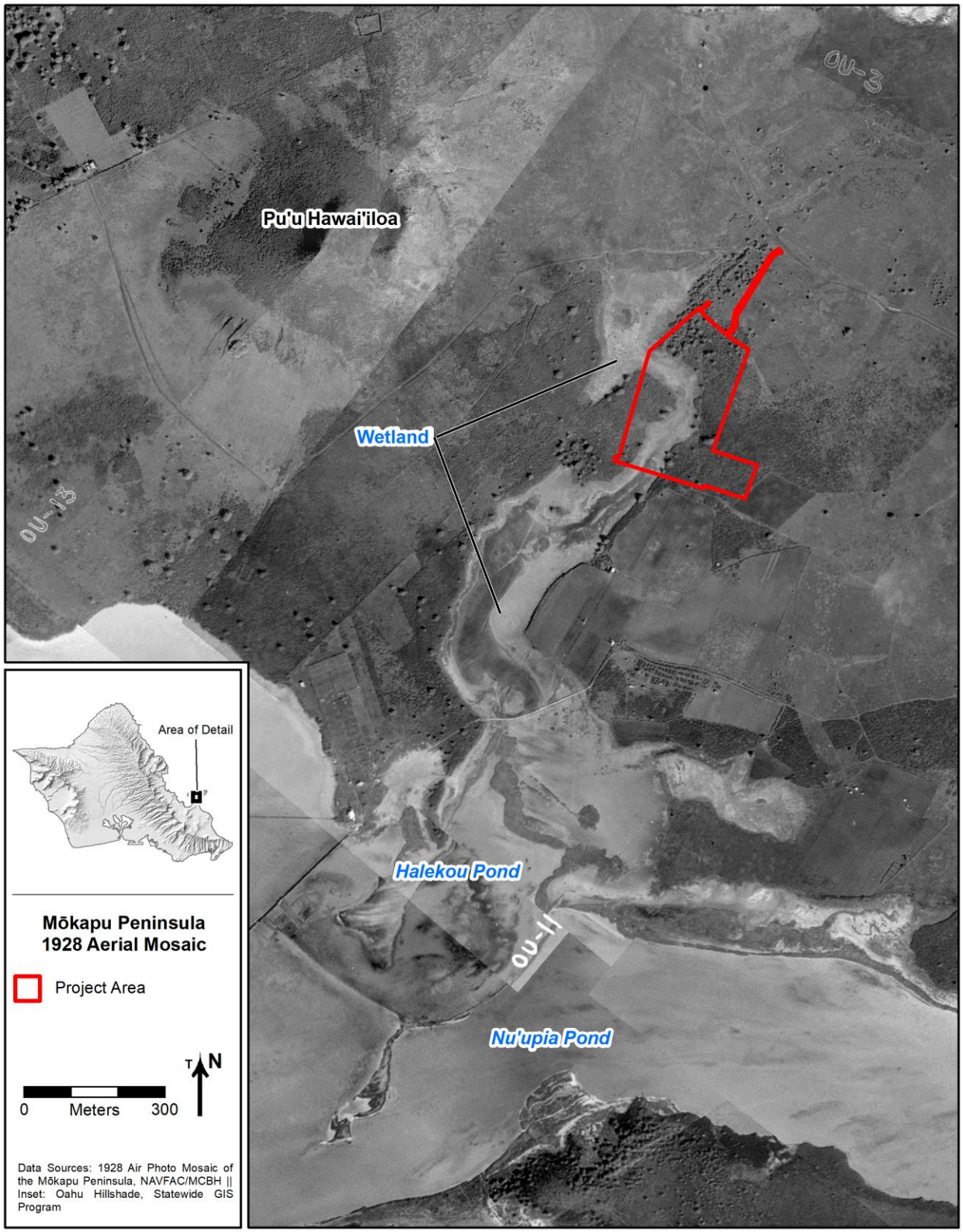


Figure 4. Mokapu Elementary School project area superimposed on a 1928 U.S. Geological Survey/U.S. Army Corps of Engineers aerial composite photograph of Mōkapu Peninsula.

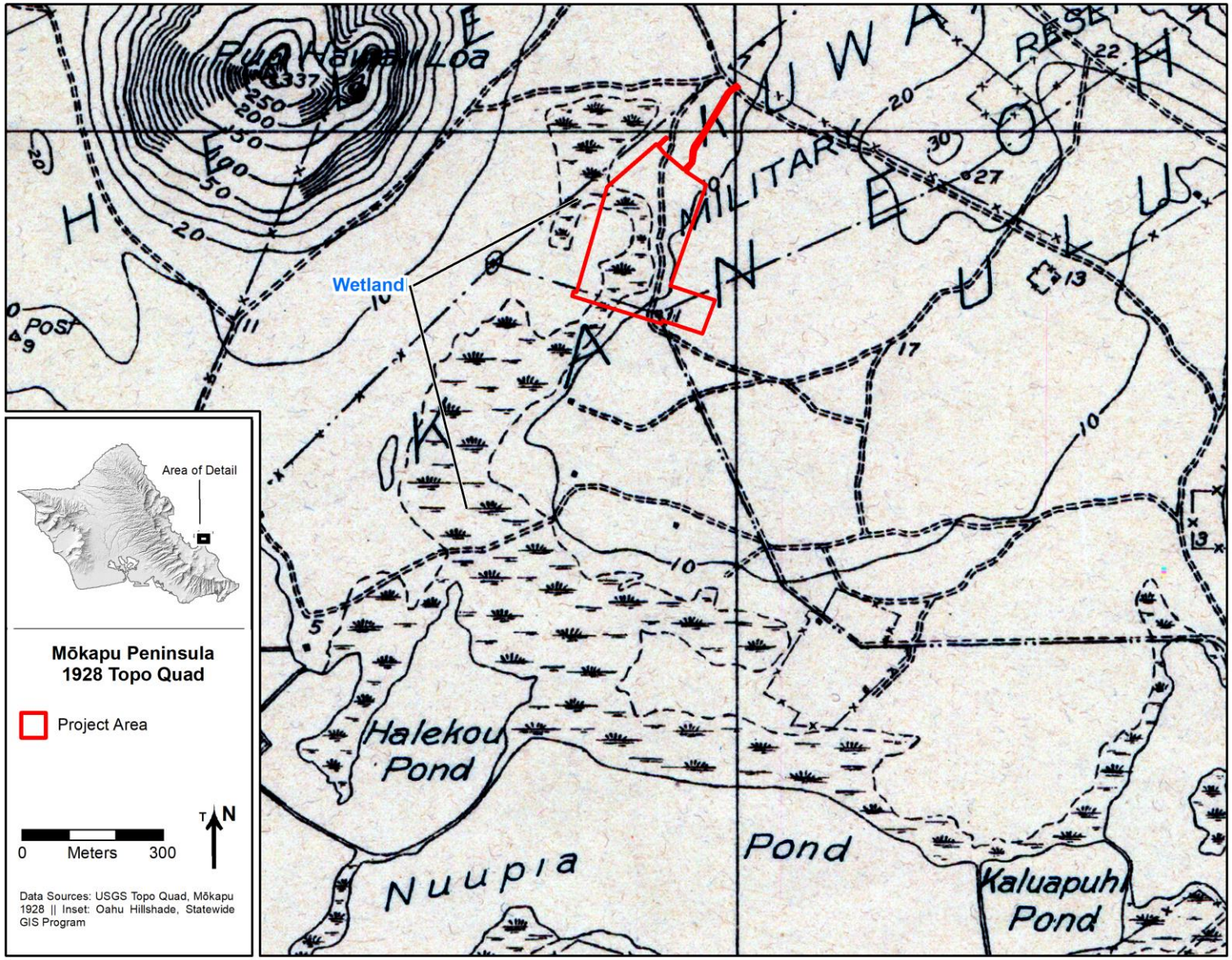


Figure 5. Mokapu Elementary School project area overlaid on 1928 topographic map of Mōkapu Peninsula.

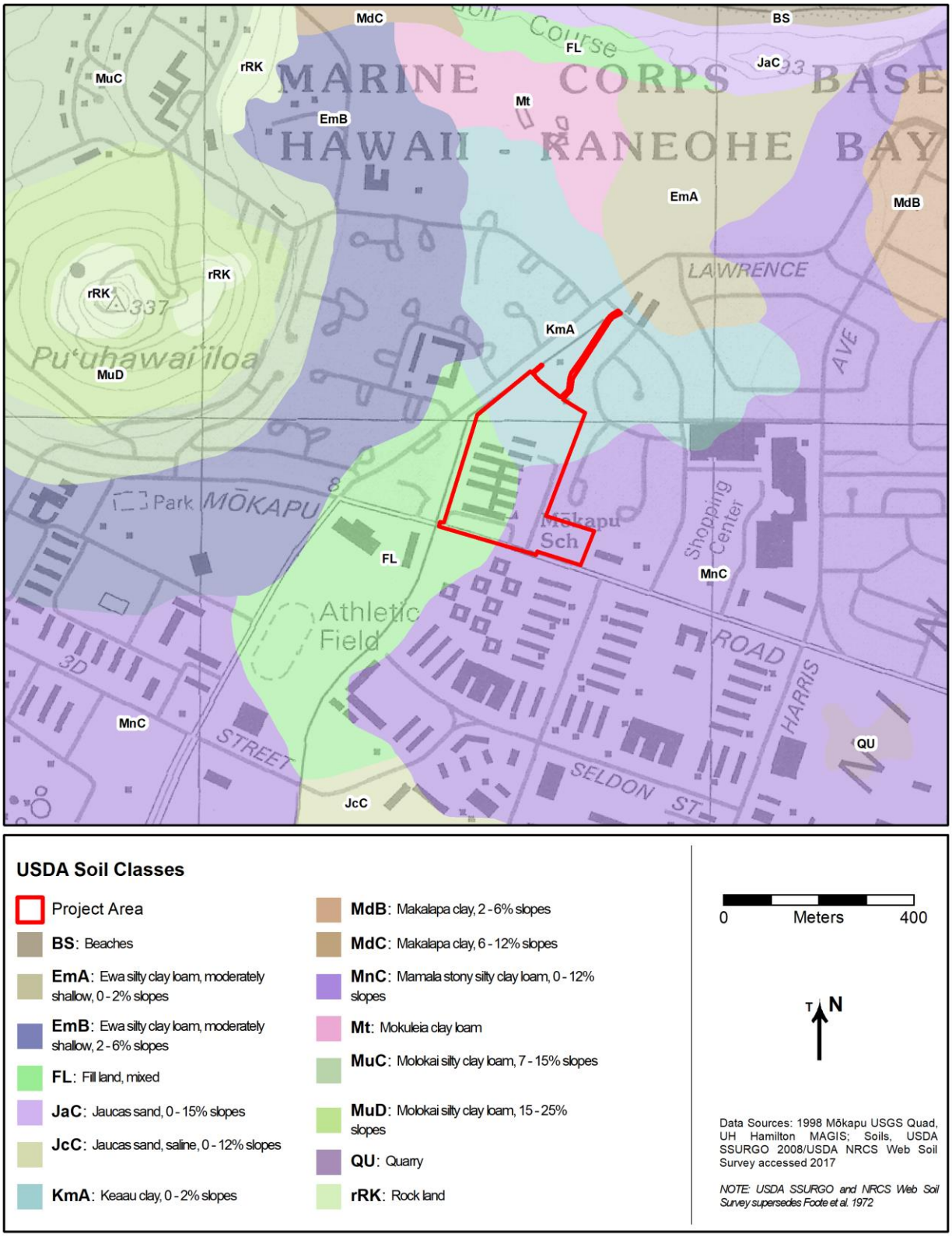


Figure 6. Mokapu Elementary School project area superimposed on a U.S. Department of Agriculture (USDA) soil survey map of O‘ahu.

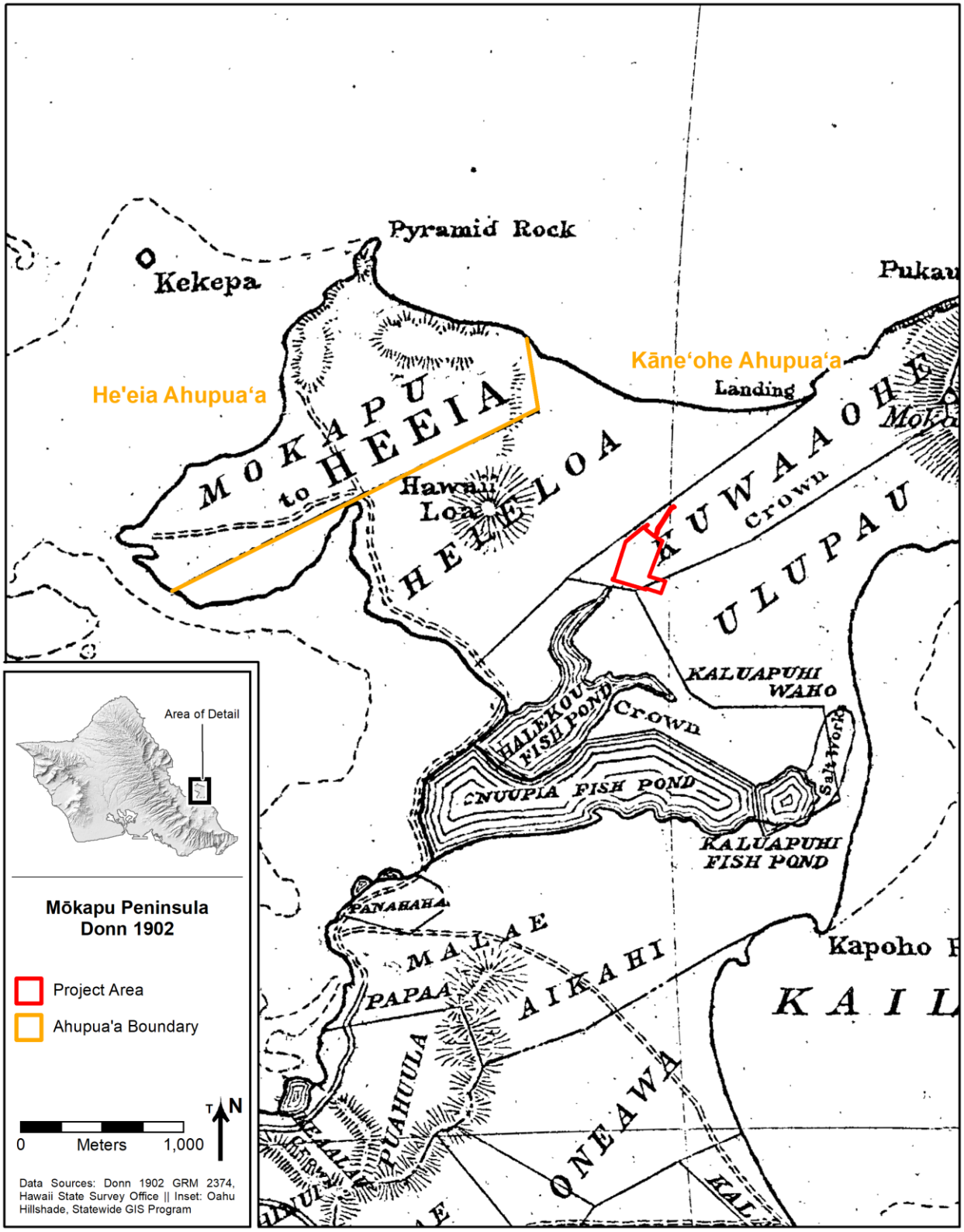


Figure 7. Mokapu Elementary School project area superimposed on a historic map (Donn 1902) showing the traditional land divisions of Mōkapu Peninsula.

Tuggle and Hommon (1986), however, cast doubt on the accuracy of these historical accounts by emphasizing their lack of corroboration with other traditional sources, their internal inconsistencies, and their contradiction of generally accepted historical facts. For example, Peleioholani was an 18th—not 16th (as stated by Fiddler)—century chief who probably lived in Kailua Ahupuaʻa, the established residence of Koʻolaupoko chiefs in traditional times (Tuggle and Hommon 1986:6, 29). Kamakau (1992:71-72) links Peleioholani and Mōkapu Peninsula only tangentially: when Peleioholani and his rival Alapaʻinui met at Naonealaʻa in Kāneʻohe for a peace settlement, the canoes of Alapaʻinui's forces are described as "lined up from Kiʻi at Mokapu to Naonealaʻa," along the north and west shores of the peninsula. Likewise, there is no evidence that Kamehameha used Mōkapu Peninsula in any significant fashion, dwelling instead primarily in Waikīkī or Honolulu during his stay on Oʻahu (Tuggle and Hommon 1986:29). Finally, although Fornander includes the Mōkapu Peninsula creation myth—first recorded by Kamakau in 1869—as part of his definitive collection of traditional "Kumuhonua" legends published in 1878, more recent reassessments of this corpus (Barrera 1982:Appendix X, citing Barrère 1969 and Emory 1969) conclude that the "legends" are more likely 19th-century reinventions of Old Testament stories recast in ancient Hawaiian settings, in an attempt to demonstrate through distortion or invention "'affinities' between Hawaiian and Christian beliefs and customs" (Barrera 1982:16, Appendix X). Therefore, despite subsequently influencing both local and foreign interpretations of traditional Hawaiian beliefs, the Kumuhonua legends, including the Mōkapu Peninsula creation story, should not be considered of pre-Contact origin (Tuggle and Hommon 1986:28).

HISTORICAL BACKGROUND

Hawaiians on the peninsula practiced rain-fed (and possibly limited wetland) agriculture, presumably with associated pig and/or dog husbandry, as well as fishing and marine resource collection. The fishponds at the southeast end of the peninsula would have been restricted to *aliʻi* (Kikuchi 1973). By the later pre-Contact period, permanent residences focused on subsistence activities were established at multiple locations.

Traditional small-scale subsistence farming, fishing, and salt collection continued on the peninsula through the 19th and early 20th centuries (Cordy 1984), while post-Contact influences were reflected by the addition of a Catholic Church in the late 1830s or early 1840s on the shore adjoining Kāneʻohe Bay (Drolet et al. 1996). According to Tomonari-Tuggle (2014b:II-13), after the mid-19th century Mahele and Kuleana Act (the redistributions of lands), more than 25 commoners made claims to properties but none were subsequently awarded. Portions of the peninsula were used to grow *hala* (*Pandanus tectorius*) trees and crops including sweet potato (*ʻuala*, *Ipomoea batatas*), gourds (*ipu*, *Lagenaria siceraria*), and musk melon (*Cucumis melo*) (Devaney et al. 1982:23; Wagner et al. 1990:570). Commercial agricultural and ranching activities expanded on Mōkapu Peninsula in the second half of the 19th century, extensively denuding and eroding much of the peninsula by the early 20th century (MacCaughey 1917:187; Devaney et al. 1982).

In the Māhele, Queen Kalama (wife of Kamehameha III) received the *ahupuaʻa* of Kāneʻohe as LCA 4452, encompassing 9,500 acres, including the peninsular *ʻili* of Heleloa and Ulupaʻu, as well as Nuʻupia Pond (Devaney et al. 1982:26). The *ʻili* of Kuwaʻaohe and two fishpond tracts, Halekou and Kaluapuhi, were designated Crown lands (Devaney et al. 1982:Table 28; Lyons and Brown n.d.; Tuggle and Hommon 1986:31).

During the last decades of the 19th century, most of the peninsula was used as grazing land for cattle (*Bos taurus*) and horses (*Equus caballus*), possibly including the project area. In 1865, Queen

Kalama went into partnership with Charles Coffin Harris[1] in the Kaneohe Sugar Company. After Kalama's death in 1870, Harris acquired her Kāneʻohe holdings, including fishponds, fishing rights, and livestock (Bureau of Conveyances Liber 34:52; cited in Tomonari-Tuggle 2014b:II-13.

Circa 1890, Harris's daughter, Nannie Rice, inherited the Kāneʻohe lands and leased a portion, including Mōkapu Peninsula, to J.P. Mendonça for cattle ranching. Mendonça bought Angus cattle from J.I. Dowsett and established Kaneohe Ranch (Devaney et al. 1982:72; Prishmont et al. 2001:26). All portions of the peninsula except Kuwaʻaohe, Halekou Fishpond, and Kaluapuhi Fishpond (a tract that includes the current project area) were now in foreign hands. When the monarchy was overthrown in 1893, these three land units became Government lands.

In 1907, James B. Castle bought stock in Kaneohe Ranch. In 1917, his son, Harold K. Castle, bought Nannie Rice's property (including Heleloa, Ulupaʻu, and Nuʻupia) (Devaney et al. 1982:72). Arthur H. Rice, Senior, secured a lease of Heleloa from Harold Castle and also managed land in the Heʻeia portion of the peninsula; he kept his cattle on the peninsula during the winter (Wilcox and Maly 1997:Appendix II-20, citing information from Arthur H. Rice, Jr.). By the early 20th century, much of the peninsula was denuded as a result of grazing. In 1916 or 1917, MacCaughey (1917:187), hiking north from the fishponds, first crossed the "brackish flats of Kuwaaohe" (likely an apt description of the current project area), then a band a bit higher where grass grew, and finally "the pasture-land proper": "The treeless pasture is crossed by numerous cattle trails, and we could see here and there in the distance herds of cattle and bands of horses and mules." On the plain near Puʻu Hawaiʻiloa, MacCaughey saw many walls he considered village ruins; these are also shown on the Lyons and Brown map of about 1872 (n.d.). These walls were investigated by Rieth and Filimoehala (2015) as part of Site 50-80-11-7411.

In 1918, through Executive Order 2900, President Woodrow Wilson designated 322 acres in the central portion of Mōkapu Peninsula as the U.S. Army's Kuwaaohe Military Reservation (Fort Kuwaaohe). The Army began dredging areas of Kāneʻohe Bay to clear areas for piers, boat landings, and wharves. Kuwaaohe Military Reservation was deactivated at the end of World War I and subsequently leased as ranch lands (Devaney 1982:115; Tuggle and Hommon 1986:31, Fig. 23).

In 1921, the Territorial Game Farm was established by the Territory of Hawaii on approximately 350 acres that included Halekou and Kaluapuhi Ponds. The northern boundary of the game farm abuts the southern perimeter of the current project area (Figure 8). Assigned to the Fish and Game Commission, its purpose was to produce and establish game birds throughout the territory (Steele 1975). In addition to the game farm, the Territorial Fish and Game Commission set aside Halekou and Kaluapuhi Ponds to conduct "experiments in the various phases of fish culture" (Hawaiian Forestry and Ag. 1930:190, quoted in Devaney et al. 1982:125). The facility was destroyed in the Japanese attack in 1941 (Devaney et al. 1982:95-97, Fig. 57; Fiddler 1956:12-13).

Grazing continued in many parts of the peninsula until the 1930s, as did the cultivation of truck farms. Based on land use data from the 1920s and 1930s compiled by Tomonari-Tuggle (2014a), there is no evidence for cultivation within the project area during the early 20th century, although there were multiple farm plots adjacent to the project area (Figure 8). A road cuts diagnostically through the project area from southeast to northwest, possibly skirting the edge of the wetland area.

[1] Charles C. Harris had served in the Hawaiian legislature in the 1850s and in several high capacities in the governments of Kamehameha IV, Kamehameha V, and Kalākaua. His last position before his death was chief justice of the Hawaiian Supreme Court.

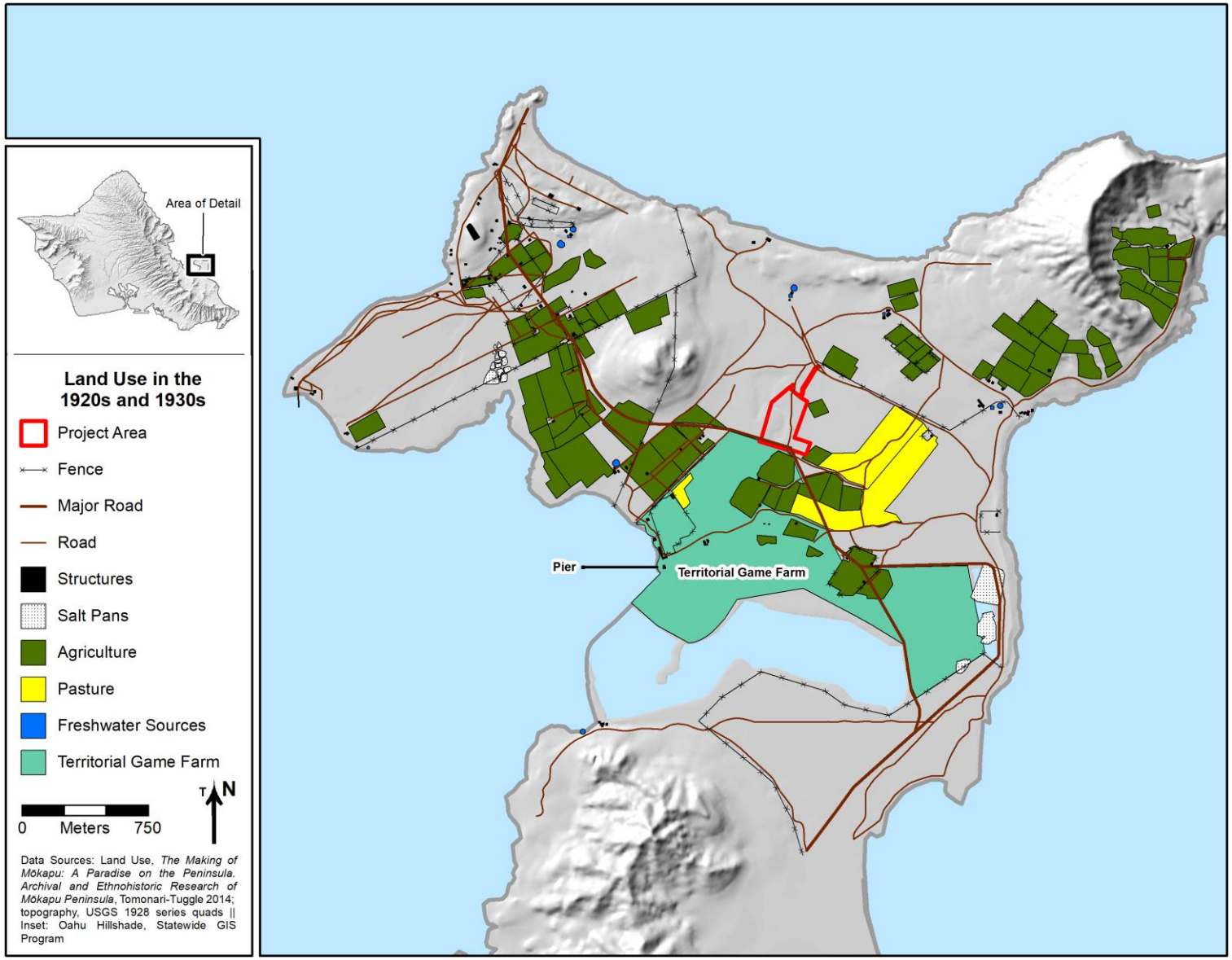


Figure 8. Mokapu Elementary School project area superimposed on a map depicting historical land use on Mōkapu Peninsula.

Rising global tensions in the late 1930s drove continued military development of the peninsula. In 1939, the Army reactivated Fort Kuwaaohe, expanding it to the north and southeast. The fort became Camp Ulupau in 1939 and, in 1942, Fort Hase, the headquarters for harbor defense in Kāneʻohe Bay. The Navy also established Kaneohe Naval Air Station (NAS) as a seaplane base on non-Army land along the west side of the peninsula. With the onset of World War II, the entire peninsula became U.S. military land, and at this time the mission of the Navy's seaplane base was expanded. Between 1939 and 1945, huge volumes of bay-bottom sediments were dredged by the Navy, creating channels at least 9 m deep. The landfills produced were used as part of a widespread land reclamation effort to build an airfield and fill large shoreline areas in the south and west (Devaney et al. 1982:115-118). In addition, sand was collected from the peninsula dunes to use as fill in various construction projects, including utility line excavations and building foundations (Tomonari-Tuggle 2014b:II-20).

Development on the peninsula continued to rise and fall in line with geopolitical events. In 1948, NAS Kaneohe was decommissioned, and the Navy made the land available for lease. However, the ensuing Korean War caused its re-activation as Marine Corps Air Station (MCAS) Kaneohe in 1952; the Marine Corps also acquired the eastern portion of the peninsula formerly known as Fort Hase. Numerous barracks and administration buildings were built in the following two years. Following the conclusion of the Cold War, in 1994, the Marine Corps installations and landholdings in Hawaiʻi were consolidated and placed under a single command, Marine Corps Base Hawaii, with its headquarters at the MCBH Kaneohe Bay installation.

ARCHAEOLOGICAL BACKGROUND INFORMATION

The initial settlement date for Mōkapu Peninsula is uncertain, though occupation by AD 1450-1650 is unambiguous. Earlier settlement has not been confirmed, and requires the dating of short-lived charcoal samples collected from secure archaeological proveniences. With a few exceptions, the peninsula's traditional Hawaiian archaeological record consists of buried deposits representing general occupation with a focus on marine resource procurement.

PREVIOUS ARCHAEOLOGY NEAR THE PROJECT AREA

Table 1 lists the previous archaeological projects conducted within and near (i.e., within 0.25 km) the project area at Mokapu Elementary School. Figure 9 displays their locations, while Figure 10 highlights the locations of known archaeological sites and inadvertent discoveries of human skeletal remains. Several projects covering the entirety of the peninsula (e.g., Barrera 1982; Tuggle and Hommon 1986) are not further discussed here.

The project area has been classified as having a low to moderate sensitivity for archaeological finds (Figure 11). Consistent with this categorization, previous archaeology projects near Mokapu Elementary School have yielded relatively few archaeological finds. The scarcity of archaeological discoveries is likely due to the highly developed nature of this portion of the peninsula; it may also reflect pre-Contact and post-Contact patterns of local land use. Archaeologists have documented the presence of several distinctive modern fills in the vicinity.

Two archaeological monitoring projects in the immediate vicinity of the Mokapu Elementary School project area yielded no archaeological finds. Monitoring of the installation of Valve Pit B along Mokapu Road immediately south of the project area encountered no cultural remains (Prishmont et al. 2001); similarly, monitoring of dredging along Lawrence Road to the west of the project also produced negative results (Schilz et al. 1996a).

Shun (1991) conducted backhoe test trenching in advance of the construction of a family housing complex immediately north and east of the Mokapu Elementary School property. Thirty-two trenches averaging 3.8 m long and 1.7 m deep were excavated across a 32-acre project area, and some of the trenches abut the current project area (Figure 12). The trenches encountered natural soil strata overlain by various types of fill. No archaeological materials or human skeletal remains were identified. According to Shun (1991:14), "the typical stratigraphy exposed in the trenches exhibited basalt substrate overlain by *in situ* developed deposits of clayey soils." Some trenches encountered a layer described as "limestone bedrock" (e.g., Shun 1991:19), which may be analogous to the coral formation exposed during recent geotechnical boring. A layer of modern fill was encountered near the surface, which contained "very sparse historic period artifacts of glass and rusted metal" (Shun 1991:16). A representative trench profile is shown in Figure 13.

A line of backhoe trenches excavated near the northeastern perimeter of the Mokapu Elementary School project area encountered clayey soils possibly associated with the former wetland shown in Figure 4. BT-19, for example, was excavated to a depth of 174 cm below surface (cmbs). This trench exposed several natural layers of clay beneath a 10-cm layer of clay fill. Trenching encountered the water table at 88 cmbs. At 106 cmbs, the trench exposed a layer of mottled clay with weathered limestone cobbles and "sparse non-carbonized organic material" (Shun 1991:34).

Only two archaeological sites have been recorded within 0.25 km of the project area. Rosendahl (1999) documented State Inventory of Historic Places (SIHP) Site 50-80-11-5736, a buried cultural deposit, in one side of a sewer trench along Cushman Avenue. Site 5736, interpreted as a temporary habitation site, was encountered in natural terrigenous soil below an asphalt parking lot. The cultural deposit contained oxidized soil, charcoal, and marine shell. One sample of unidentified wood charcoal was submitted for accelerated mass spectrometer (AMS) dating. The sample yielded a radiocarbon date of 230 ± 40 BP[2] (Beta-128089), which has a calibrated range of AD 1521-1921[3] at 95.4% confidence. Site 5736 was nominated for the National Register of Historic Places (NRHP) as part of the Mōkapu Peninsula Archaeological Area Multiple Property Listing (Nickelsen and Kirkendall 2008).

Site 50-80-11-7172 is a stone-lined depression identified during construction of the Waikulu Neighborhood to the northwest of the current project area (McIntosh et al. 2012). Site 7172, interpreted as a "historic water hole or catchment" installed by cattle ranchers, was built into natural clay soils below sand fill (McIntosh et al. 2012:41). A test unit excavated to investigate the feature revealed no formal construction beyond a simple stone facing.

While the area near the current APE has yielded few intact archaeological finds, several nearby projects have encountered displaced human skeletal remains in sand fill transported from other portions of the peninsula. Monitoring of the construction of the Mololani Housing Area to the northeast of the Mokapu Elementary School project area identified numerous displaced human skeletal remains (Allen 2010; Allen et al. 2012; Allen et al. 2013). Nearly all were recovered from fill, primarily sand fill in house pads or utility trenches. Based on differences in sand grain size, Allen (2010:58) suggests the fill was obtained from at least two distinct locations on the peninsula. Of the dispersed human skeletal remains encountered during construction of the Mololani Housing Area, 13 finds fall within 0.25 km of the current project area.

---

[2] δ13C not available.

[3] The radiocarbon determination was calibrated using Oxcal v4.3.2 (Bronk Ramsey 2017) and the IntCal13 Northern Hemisphere curve (Reimer et al. 2013).

Additional displaced human skeletal remains, all recovered from sand fill, were identified during the construction projects in the Waikulu Neighborhood (McIntosh et al. 2012) and the nearby Marine Corps Community Services New Youth Center (Sholin et al. 2011). Eleven finds of dispersed human skeletal remains were identified during the Waikulu Neighborhood construction, and 16 finds of dispersed human skeletal remains in 12 separate locations were made during construction of the new Youth Center.

Table 1. Archaeological Projects Conducted in or near the Mokapu Elementary School Project Area (Listed Alphabetically by Author).

Authors	Type of Investigation	Location	Archaeological Findings*
Allen (2010)	Monitoring	Mololani Housing Area	Displaced human skeletal remains
Allen et al. (2012)	Monitoring	Mololani Housing Area	Displaced human skeletal remains
Allen et al. (2013)	Monitoring	Mololani Housing Area	Displaced human skeletal remains
Anderson et al. (2001)	Testing	Kaneohe Klipper Golf Course	None
Charvet-Pond and Rosendahl (1992)	Monitoring	Two locations southeast of Pu‘u Hawai‘iloa	None
Erkelens and Gordon (1997)	Testing	Kaneohe Klipper Golf Course	None
Hammatt and Colin (1995)	Assessment	Mololani Housing Area	None
Jiminez et al. (1998)	Monitoring	Corridor from Kāne‘ohe Bay to vicinity of Klipper Golf Course	None
Jordan and Rieth (2011)	Monitoring	Selden, Harris, and MacLachlan Streets	None
Kaschko (1996)	Monitoring	Various locations across peninsula	None
Klem and Lauer (2019)	Monitoring	Mokapu Road and Cushman Avenue	None
Lauer and Rieth (2008)	Monitoring	Four locations across peninsula	None
Lebo et al. (2011)	Monitoring	McLennan Drive and Harris Avenue	None
McIntosh et al. (2012)	Monitoring	Waikulu Neighborhood	Site 50-80-11-7172, historical stone-lined depression; displaced human skeletal remains
Prishmont et al. (2001)	Monitoring	Various locations across peninsula	None

Authors	Type of Investigation	Location	Archaeological Findings*
Rieth and Jordan (2012)	Monitoring	Mokapu Road, Harris Street, and Cushman Avenue	None
Roberts et al. 2002	Monitoring	Cable trenches across peninsula	None
Rosendahl (1999)	Monitoring	One section of sewer line across peninsula	Site 50-80-11-5736: cultural deposit
Schilz and Allen (1996)	Monitoring	Water mains across peninsula	None
Schilz et al. (1996a)	Monitoring	Corridor from Kāneʻohe Bay to vicinity of Klipper Golf Course	Modern military hardware in fill
Schilz et al. (1996b)	Monitoring	Corridor from Kāneʻohe Bay to vicinity of Klipper Golf Course	None
Schilz et al. (1997)	Monitoring	Lawrence Road and G Street	Mid-20th-century glass beverage bottles and ceramic containers in fill
Sholin et al. (2011)	Monitoring	Lawrence Road	Displaced human skeletal remains
Shun (1991)	Testing	Cushman Avenue	Sparse fragments of glass and metal in fill
Yeates et al. (2012)	Monitoring	Lawrence Road and Mokapu Road	None

* Only archaeological finds in a 0.25-km buffer zone outside the current project area are included in these results.

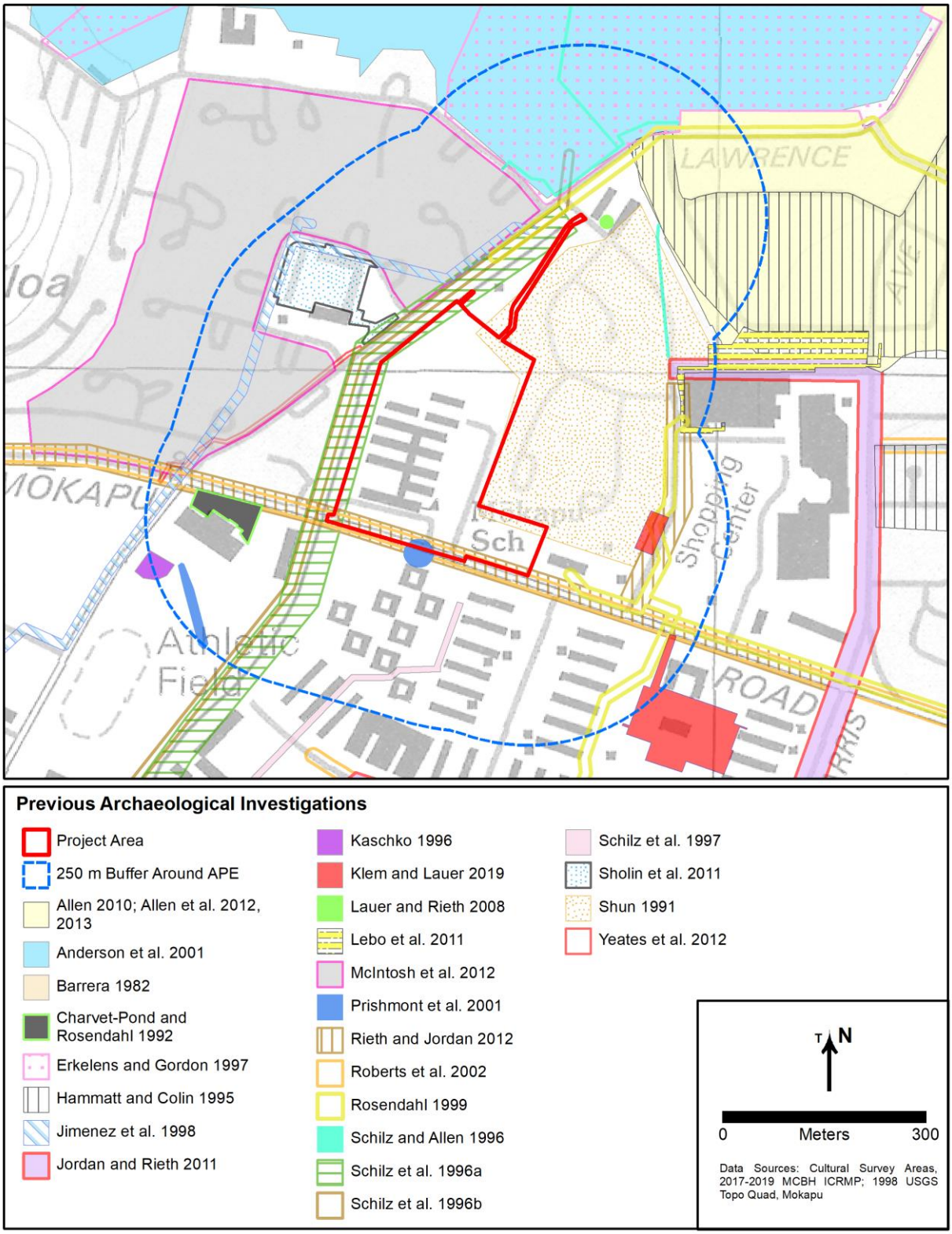


Figure 9. Previous archaeological projects in the vicinity of Mokapu Elementary School project area.

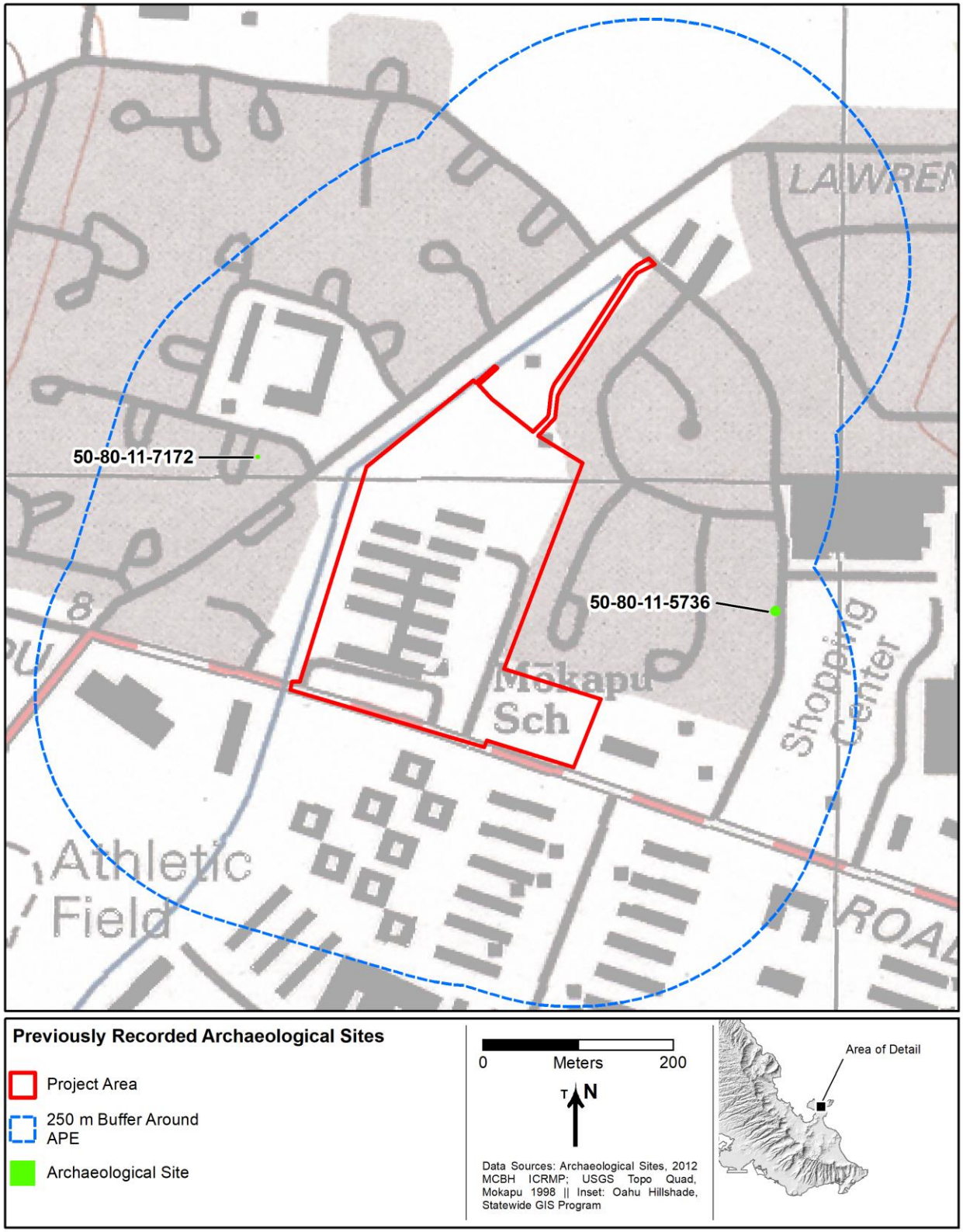


Figure 10. Archaeological sites documented in the vicinity of the Mokapu Elementary School project area.

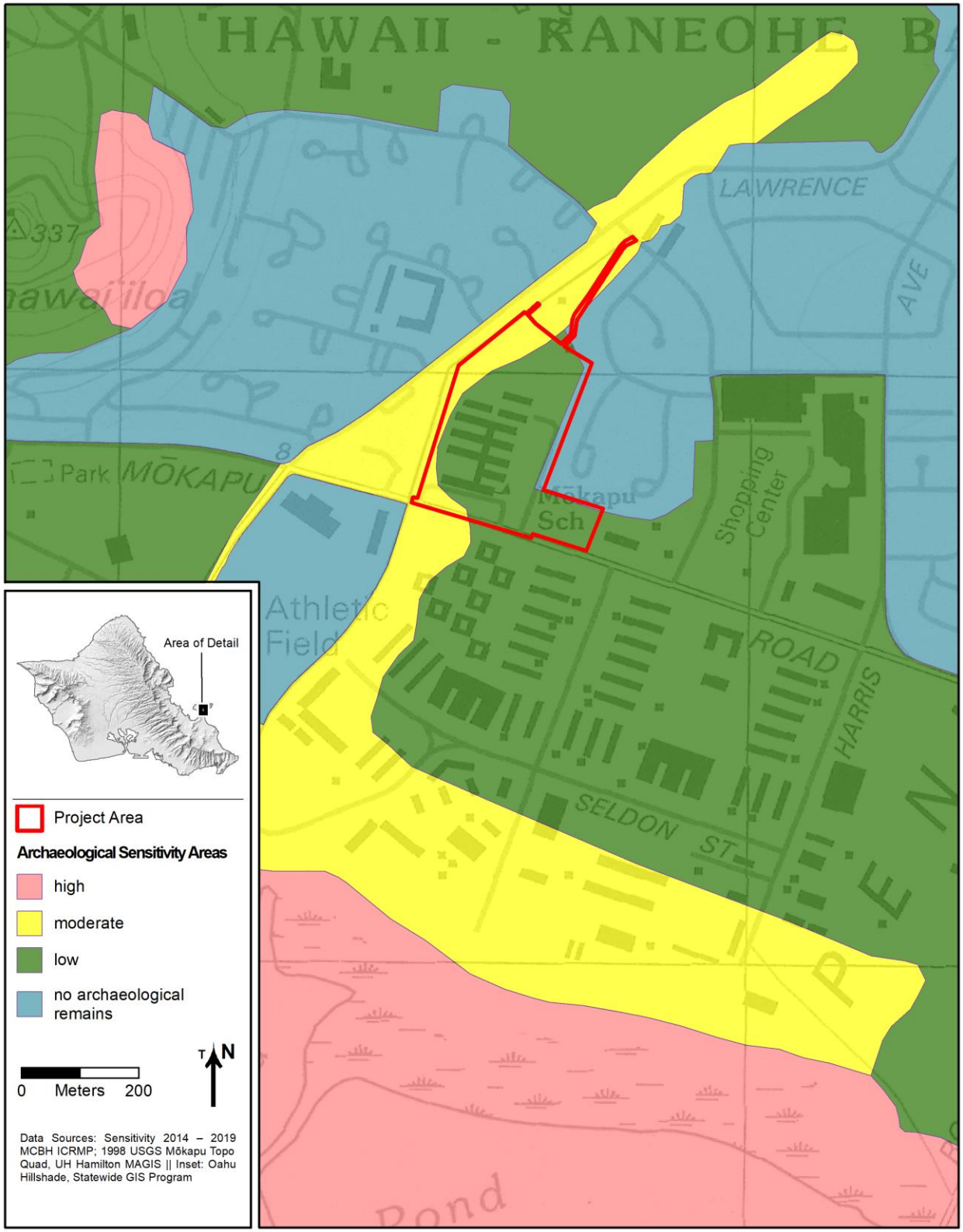


Figure 11. Mokapu Elementary School project area overlaid on zones of archaeological sensitivity at MCBH (adapted from Tomonari-Tuggle 2014b).

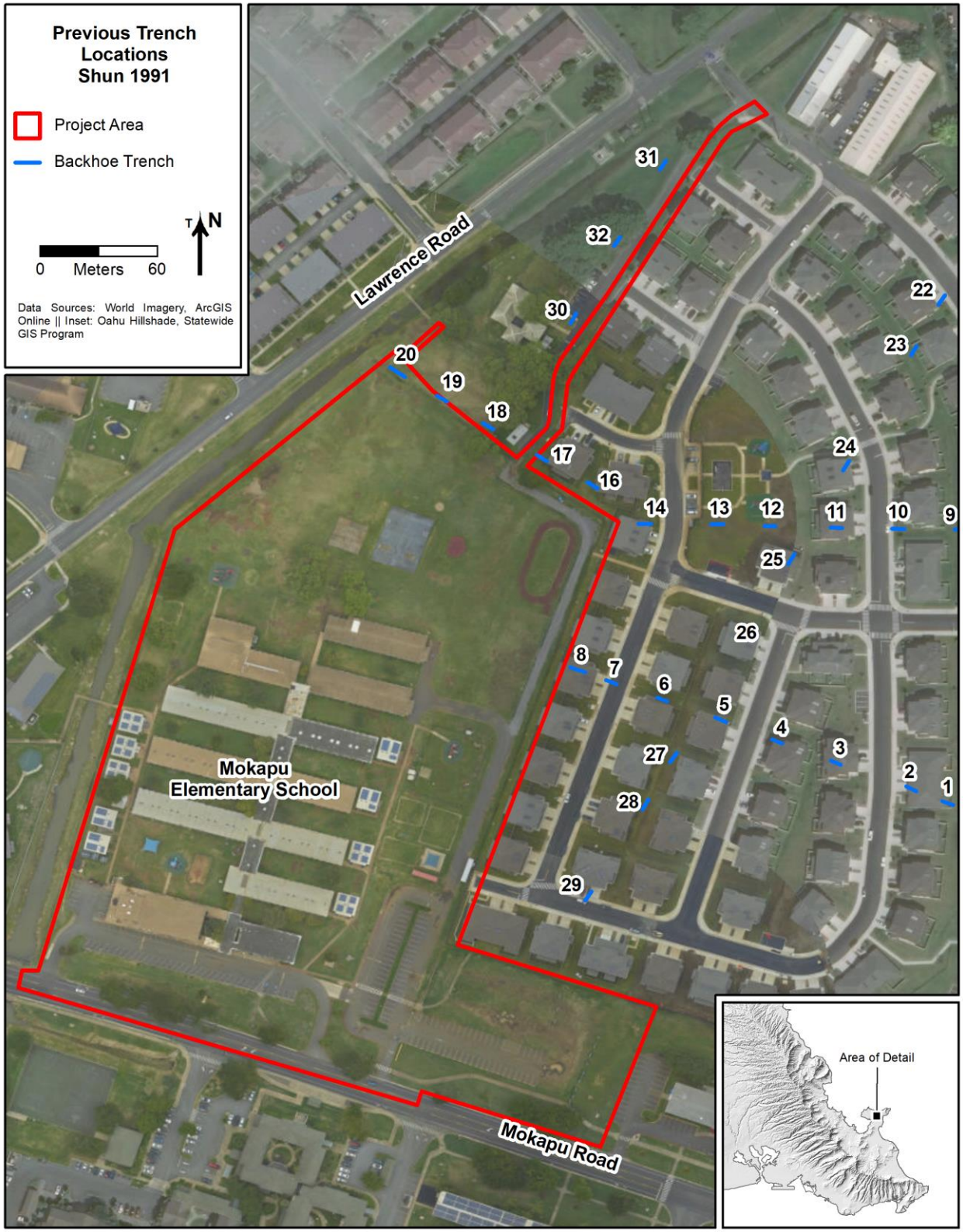


Figure 12. Approximate locations of backhoe test trenches excavated by Shun (1991). Trench locations georeferenced from testing results report (Shun 1991:Figure 9).

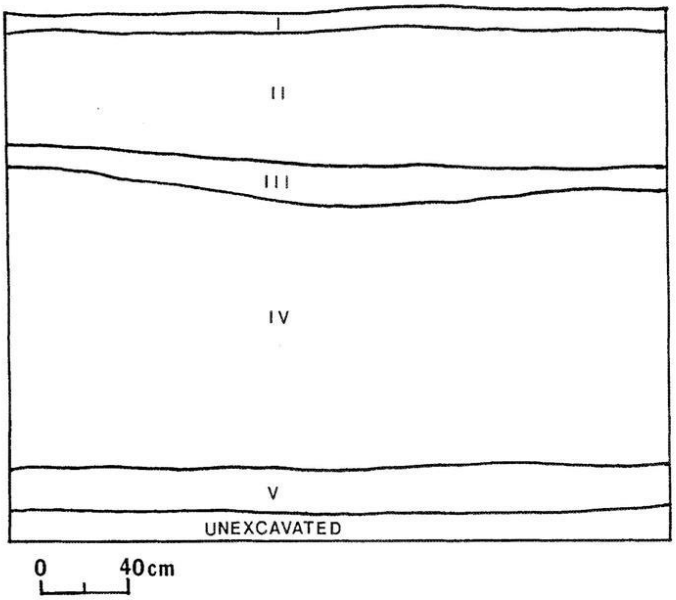


Figure 12. BT-10, East Profile.

Table 2.

Soil Descriptions of BT-10

Layer	Thickness (cm)	Description
I	8	10YR4/2-3/2, dry; clay loam; strong, fine-to-medium, subangular blocky; extremely hard, very plastic, slightly sticky; many, very fine-to-fine, vesicular roots; few weathered limestone cobbles and pebbles; very abrupt, smooth boundary.
II	62	10YR2/2, dry; clay; strong, fine-to-medium, angular blocky; extremely hard, very plastic, sticky; common, very fine-to-fine, vesicular roots; abrupt, wavy boundary.
III	18	10YR4/4-4/6, dry; laminated and granular weathered basalt; massive, fine, subangular blocky; extremely hard, nonplastic, nonsticky; abrupt, wavy boundary.
IV	119	10YR5/3-4/3, dry; saprolitic basalt; massive, platy; extremely hard, nonplastic, nonsticky; abrupt, smooth boundary.
V	19+	10YR3/6, dry; weathered basalt; massive, granular; slightly hard, nonplastic, nonsticky.

Figure 13. Representative profile reported by Shun (1991). Reproduced from Figure 12 and Table 2 in testing report (Shun 1991).

EXPECTATIONS

Based on the foregoing information, it was expected that subsurface testing within the Mokapu Elementary School project area would encounter natural sediments below 20th century fill at varying depths. Results of the geotechnical boring indicate that surface fill in the south and west portions of the project area is particularly deep, i.e., up to 2.4 m (8 ft.) below the surface. The fill is underlain by brown to grayish-brown clayey silt near the former wetland and elsewhere by coral limestone or natural coralline sand deposits (Geolabs, Inc. 2020). Similarly, test trenching within the adjacent housing development revealed natural clay deposits overlying limestone or weathered basalt across much of the property. In the area of the former wetland, trenching was halted in clay below the modern water table (Shun 1991).

Most of the planned trenches were near the former wetland, as shown on early 20th century maps and aerial photos. In the southern portion of the project area, it was considered likely that trenches near the former wetland would expose fill overlying natural clayey silt at approximately 1-2 m below surface. The depth of fill was expected to decrease in the northern portion of the project area. Away from the wetland area, trenching was expected to encounter limestone, coralline sands, or weathered basalt substrate below fill or natural clayey sediment.

While the age of the various sediment layers on the property is as yet unclear, the exposure of a pre-Contact cultural deposit near the project area at Site 50-80-11-5736 in terrigenous sediments below modern fill suggests that at least limited potential exists for intact archaeological finds on the Mokapu Elementary School grounds. The former wetland may have been attractive to past inhabitants for its subsistence resources (e.g., mollusks, fish, waterfowl, and plant foods); the placement of the test trenches along the margins of the wetland is intended to expose any related archaeological deposits. Additionally, sedimentological information pertaining to the pre-land reclamation/development landscape was expected to be obtained. If sand fill was encountered, it was thought possible that it might contain displaced human skeletal remains.

III. RESEARCH QUESTIONS

The research problems that guided the archaeological monitoring are discussed in this section, which is taken from the project work plan (Moore 2020).

1) What is the depositional and soil-forming sequence for the project areas? Strata will be assessed as to depositional agents and modes of deposition, what soils are present and how they formed, and the condition of the deposits. The uppermost deposits are expected to be fills applied by heavy equipment during mid-20th century construction. Grading prior to or during fill applications may have removed portions of original soils. Observations of natural strata underlying 20th century fills may provide information on prior landforms, deposits/modes of deposition, and cultural activities. For the current project, this information may include data on the characteristics and extent of the former wetland on the property.

2) Are cultural deposits present? The proximity of Sites 50-80-11-5736 and 7172 raises the possibility that traditional Hawaiian or early historic archaeological deposits relating to the ranching period may be identified. Traditional Hawaiian use of the former wetland area may have extended to temporary habitation, agriculture, or the procurement of specialized resources such as mollusks, fish, waterfowl, or wetland plants. Such deposits may contain midden, traditional artifacts, and charcoal; cultural features related to cooking or water diversion are also possible.

3) Are burials or displaced human skeletal remains present? Previous inadvertent discoveries of displaced human skeletal remains in sand fill during construction of the Mololani and Waikulu housing areas near the project area raise the possibility that displaced human skeletal remains may be present on the Mokapu Elementary School property. While less likely, the possibility exists that natural sediments on the property may contain human burials.

IV. PROJECT METHODS

This section discusses project logistics, the field methods that were employed, and the laboratory procedures that were conducted.

SUBSURFACE TESTING METHODS

Subsurface testing entailed the mechanical excavation of 11 trenches within the Mokapu Elementary School project area. The trenches were located to coincide with the edges of the former wetland area shown on early 20th century aerial photographs and maps and now covered by fill, and in two extensions of the APE northeast of the existing school area. Previous geotechnical boring on the Mokapu Elementary School property (GeoLabs, Inc. 2020) encountered a layer of clayey silt near the location of the former wetland that we interpret as a possible buried remnant of the wetland. All trenches were excavated with a backhoe under the supervision of the PD and Field Technician. Trench locations were toned for utilities prior to trenching, with the placement of trenches adjusted to avoid buried infrastructure, surface pavement, and large trees.

Trenching was conducted over the course of five days. Trenches were 3-5 m long by 0.8 m wide, with depths dictated by findings. Generally, excavation in each trench was halted after it became clear that pre-human deposits had been reached. No trenches were left open overnight; the backfilled surfaces of the excavations were made as level as possible after each trench was complete. The location of each trench was recorded using a professional-grade Trimble Geo7X Global Positioning System (GPS) unit using the North American Datum of 1983 (NAD 83) in Universal Transverse Mercator Zone 4 North (UTM 4N). GPS data was differentially corrected for sub-meter accuracy following completion of the fieldwork.

Scaled stratigraphic profiles were drawn for at least one long sidewall of each trench and all cultural deposits. Soils were described following U.S. Soil Survey and Soil Conservation Service standards (U.S.D.A. Soil Science Division Staff 2017). Munsell (2000) soil color characterizations were completed for all profiles. Each profiled trench exposure was photographed, and the photographs have been curated with the other archaeological project records.

IA personnel entered the trenches up to depths of approximately 1-1.2 m to clean trench sidewalls and inspect strata (adhering to Occupational Safety and Health Administration regulations). Once trenches were excavated to greater depths, IA personnel refrained from entering due to safety concerns. All exposed sediments below 1-1.2 m were inspected from the trench edges in plan and profile views and through examination of backdirt piles. All artifacts encountered during excavation were collected.

To avoid unforeseen impacts to any potential archaeological deposits, hand-excavated shovel probes supplemented mechanical trenching. Under the supervision of the PD and Field Technician, the backhoe removed the modern A-horizon and 20th century fills. Once a natural stratum was encountered, mechanical excavation was paused while the IA archaeologists inspected the undisturbed soil and used shovel probes at points along the length of the trench to test for the presence of archaeological material. Soil from the shovel probes was passed through 1/8-inch mesh screen. After the archaeologists determined that archaeological material was not present, mechanical excavation resumed with soil removed in 10-20 cm thick lifts. Excavated soil was examined for archaeological material as it was removed and after placement in the backdirt pile. When mechanical excavation exceeded the depth of the shovel probes and the trench was at a safe depth for entry, the IA archaeologists conducted a second

round of shovel probes. This process was continued until excavations in each trench were completed, i.e., when a conclusively pre-human deposit was documented.

LABORATORY PROCEDURES

All collected artifacts were cleaned, photographed, catalogued, and analyzed using comparisons with materials in available collections and published sources. Artifacts were classified by material and form, and metric and non-metric characteristics were recorded. Vertebrate and invertebrate remains were identified to the lowest possible taxonomic level. Soil and botanical samples collected during testing will be preserved for future scientific analysis if warranted.

Archaeological materials were processed and stored in the IA Archaeology Laboratory for return to MCBH on completion of the project. Standard archival boxes were used for storage, and each box was accessioned and labeled. Field notes and forms have also been electronically stored at the IA office for return to MCBH. Laboratory data were recorded on standard laboratory forms and input into a spreadsheet. All analysis results have been presented in coherent tabular format in the report and discussed in the text.

V. FIELD AND LABORATORY RESULTS

No significant archaeological deposits or human skeletal remains were encountered during fieldwork. A small number of isolated artifacts, including primarily glass bottle and metal fragments, were collected from 20th century fill in Trenches 2, 4, 6, 7, 9, and 11. Selected samples of preserved botanical remains were collected from the buried wetland layers in Trenches 4 and 11.

DESCRIPTION OF EXCAVATIONS

Eleven backhoe trenches were excavated across the project area. Figure 14 shows the proposed locations of the trenches per the project work plan (Moore 2020) and the trench locations as they were actually excavated. The trenches were mechanically excavated, ranging in length from 10-22 m by 0.8 m wide, with depths dictated by findings. Trench locations were initially determined based on recent orthoimagery and historical graphics. As such, Trenches 2-9 were placed within the school grounds around the perimeter of a former wetland as depicted on 1920s-era topographic maps and aerial photographs. The wetland was buried during the mid-20th century by fills and thus is no longer visible on the ground surface. Trench 10 was placed within the school grounds a few meters north of the former wetland. Trenches 1 and 11 were initially plotted within extensions of the APE outside the schoolyard; pedestrian walkways are planned in these areas. During pre-trenching toning for utilities, several trench locations were adjusted. Adjustments were made to avoid buried utilities, surface pavement, and large trees.

All 11 trenches were excavated during project fieldwork, with most trenches excavated at or near their original proposed locations. Trench 7 was reoriented after excavations ruptured a 1-inch-diameter copper water pipe not marked during toning; the new orientation was approved by the MCBH Cultural Resource Manager (CRM) via email on July 21, 2020. Likewise, the originally proposed location of Trench 11 was found during fieldwork to be within an asphalt-paved driveway that encompasses the width of the APE in this area. An alternative location was selected in the northern portion of the schoolyard near the southern extent of the proposed walkway; the new location was approved by the MCBH CRM via email on July 23, 2020.

SOIL LAYERS ACROSS THE PROJECT AREA

Eight primary layers (Layers I-VIII) were documented in the test trenches. Table 2 presents the descriptions of these layers and interpretations about their deposition, followed by text descriptions. General consistencies in stratigraphy were noted across the project area, although some specific substrata were restricted to a smaller area. Individual trench soil and sediment descriptions and summaries are presented in Appendix A. In contrast to measurements of distance and trench length in meters, measurements of excavated depths are given in centimeters below surface (cmbs) to allow consistency for measurements less than and greater than 1.0 m when discussing the results of excavations in a single trench.

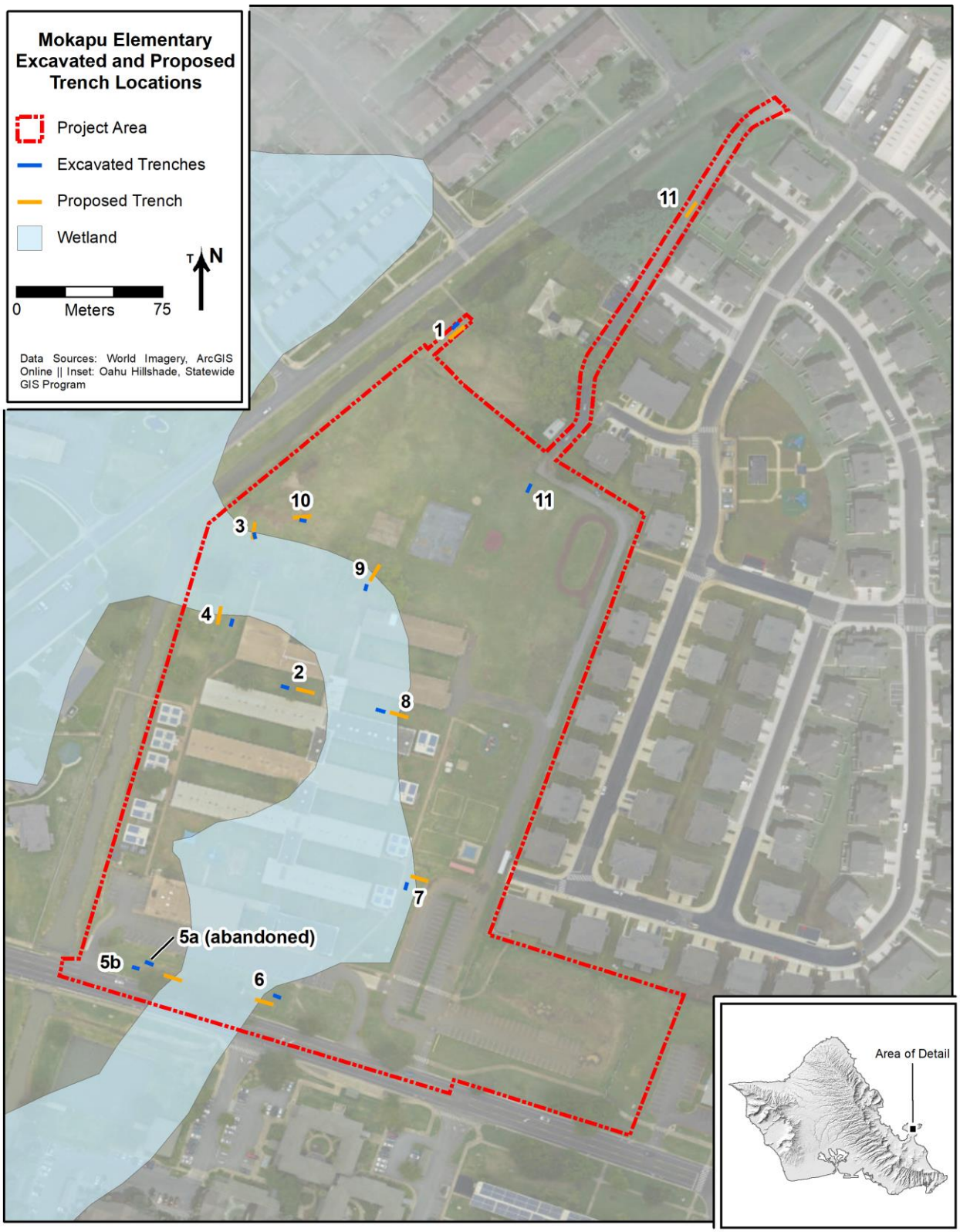


Figure 14. Excavated trench locations, Mokapu Elementary School.

Table 2. Soils and Sediments Documented Across the Project Area.

Layer	Trenches	Description	Interpretation
Ia	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Dark brown (7.5YR 3/2, moist) to brown (7.5YR 4/3) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky to sticky and slightly plastic to plastic when wet; many, fine to medium roots; 15-35% gravels and cobbles; occasional coral and asphalt inclusions	Surface fill
Ib	2, 3	Brown (7.5YR 4/4, moist) sandy loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; sand is medium in size, subrounded to subangular; 35-60% gravels, cobbles, and boulders; clear, subrounded to subangular	Buried fill
Ic	8	Brown (7.5YR 4/3, moist) loamy sand; weak fine or thin single-grain structure; loose consistence; nonsticky and nonplastic when wet; sand is fine in size, subrounded to subangular; 60-90% gravels, cobbles, and boulders, subrounded to subangular	Buried fill
Id	9	Brown (10YR 4/3, moist) sand; calcareous; weak fine or thin single-grain structure; loose consistence; nonsticky and nonplastic when wet; sand is fine to medium in size, subrounded to subangular	Buried fill
Ie	10	Yellow (10YR 7/6, wet) loamy sand, moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky to slightly plastic when wet; sand is fine in size, subrounded to subangular	Buried fill
If	4	Brown (10YR 4/4, moist) sandy loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; sand is fine to medium in size, subrounded to subangular	Buried fill
Ig	4	Very pale brown (10YR 7/4, moist) sand; coralline; weak fine or thin single-grain structure; loose consistence; nonsticky and nonplastic when wet; sand is fine to medium in size, subrounded to subangular; 35-60% cobbles and boulders, subrounded to subangular	Buried fill
II	11	Dark reddish brown (2.5YR 3/4, moist) silty clay loam; durable, medium to very coarse blocky to subangular blocky; hard when dry; friable when moist; sticky and slightly plastic when wet; strong brown (7.5YR 5/6) many medium prominent mottles	Alluvial deposit
IIIa	1, 2, 3, 6, 7, 8, 9, 10	Dark brown (7.5YR 3/3) to brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky to sticky and slightly plastic to plastic when wet; mottles in various colors, few to many, fine to coarse, distinct to prominent	Alluvial deposit

Layer	Trenches	Description	Interpretation
IIIb	4, 8	Dark brown (7.5YR 3/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; mottles in various colors, few to common, fine to coarse, distinct to prominent; preserved botanical remains	Alluvial deposit (saturated or inundated)
IV	1	Very dark brown (7.5YR 2.5/2, moist) sandy clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and plastic when wet	Illuvial deposit
V	1	Strong brown (10YR 5/6, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and very plastic when wet; light olive brown (2.5Y 6/6) many, fine distinct mottles	Alluvial deposit
VIa	8	Greenish gray (GLEY 1 6/1, moist) sandy clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and very plastic when wet; sand is fine in size; preserved botanical remains	Alluvial deposit (saturated or inundated)
VIb	8	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; light greenish gray (GLEY 1 7/1) few coarse prominent mottles; very dark gray (10YR 3/1) few coarse distinct mottles	Alluvial deposit
VIIa	2, 6, 7	Yellow (10YR 7/6 to 10YR 7/8, moist) loamy sand; calcareous; fine or thin single-grain structure; loose consistency; slightly sticky to slightly plastic when wet; sand is fine to medium in size	Probable dune/beach deposit
VIIb	9	Light greenish gray (GLEY 1 7/1, moist) loamy sand; calcareous; fine or thin single-grain structure; loose consistency; slightly sticky to slightly plastic when wet; sand is fine to medium in size	Probable dune/beach deposit (saturated or inundated)
VIII	2, 3, 10, 11	Coral limestone	Limestone bedrock

Each of the trenches excavated below the fill layer exposed modern fill to a depth of at least 35 cmbs; in several trenches, two distinct fill layers are present. The fill overlies loamy deposits of terrigenous sediment of alluvial origin to depths of between 35 and 120 cmbs, some of which are interpreted as representing parts of the former wetland observed on early 20th century topographic maps and aerial photographs. Several trenches encountered substrates of possible dune or beach sand or coral limestone at depths of 80 cmbs and lower. Natural soils below the level of the fill are generally inundated by groundwater and possibly also by moisture from a canal running along the western edge of the project area. Excavations generally encountered groundwater between 78 and 290 cmbs.

Layer I

Layer I consists of several types of fills found in various contexts in the project area. The depth of fill varies greatly across the project area, ranging from 35 to 165 cmbs. Layer Ia includes the ground surface across the project area and extends to as deep as 165 cmbs. The surface fill is generally gravelly or cobbly brown to dark brown silty clay loam. The ground surface is generally covered by grassy turf, with roots visible in the upper portion of each profile to depths of approximately 5-10 cmbs. Despite the presence of grass and roots near the ground surface, no developed A-horizon is present. The absence of an A-horizon is most likely due to the short period of time (i.e., a few decades) since the development of the school grounds in the 1950s.

Layers Ib, Ic, Id, Ie, If, and Ig are buried fills encountered between 50 and 165 cmbs. These buried fills are comprised of sandy loam, loamy sand, and sand. Buried fills in Trenches 4 and 8 contain large boulders with diameters as large as approximately 1.0 m; in Trench 8, this extremely bouldery fill layer extended to a depth of 150 cmbs. A few 20th century artifacts, primarily modern glass and metal fragments, were collected from Layer I.

Layer II

Layer II is an alluvial deposit of dark reddish brown silty loam encountered immediately beneath the modern fill (Layer I). This layer was encountered only in Trench 11 between 35 and 60 cmbs.

Layer III

Layer III is comprised of alluvial deposits of brown to very dark brown silty clay loam encountered immediately beneath the modern fill (Layer I). Layers IIIa and IIIb, exposed in the trenches at depths between 60 and 240 cmbs, are brown to very dark brown silty clay loam. Most exposures of Layer III sediments had mottles in various colors and sizes. Layer IIIb, exposed only in Trenches 4 and 8 between 165 and 240 cmbs, is heavily mottled with light greenish gray (gley) and reddish brown mottles and contains preserved botanical material; these characteristics are consistent with former inundation or saturation by groundwater. Layer IIIb is interpreted to represent part of the wetland that once covered part of the school grounds.

Layer IV

Layer IV is a thin layer of dark gray sandy loam that likely represents an illuvial deposit. This layer was encountered only in Trench 1 between 90 and 100 cmbs, where it was overlain by Layer IIIa and underlain by Layer V.

Layer V

Layer V is a layer of alluvium encountered below Layer IV in Trench 1. This layer was encountered between 100 and 150 cmbs.

Layer VI

Layer VI is comprised of buried alluvial deposits encountered in Trench 8 between 240 and 300 cmbs. Layer VIa is greenish gray (gley) sandy clay loam overlain by Layer IIIb and underlain by Layer VIb. Layer VIb is brown silty clay loam with light greenish gray (gley) and dark gray mottles. Layer VIa and Layer VIb sediments contain preserved botanical remains; both are interpreted as representing a portion of the former wetland known to have been on the school property prior to the mid-20th century.

Layer VII

Layer VII includes calcareous sand exposed below the Layer II terrigenous soils in Trenches 2, 6, 7, and 9. Layer VII sediments were generally encountered between 160 and 240 cmbs and were typically moist to wet. Some Layer VII sand contains coral inclusions. Layer VIIa is yellow in color, and Layer VIIb, exposed only in Trench 9, is lightly gleyed.

Layer VIII

Layer VIII consists of consolidated coral or limestone bedrock encountered below the Layer II terrigenous soils in Trenches 3, 10, and 11, and below Layer VIIa sand in Trench 2. Excavations were generally halted at contact with embedded limestone, which was encountered at a minimum depth of 60 cmbs. In Trench 11, the top of the limestone was fully exposed by the backhoe; this excavation revealed a wavy surface ranging in depth from 60 to 120 cmbs.

TRENCH DESCRIPTIONS

Eleven trenches were mechanically excavated as part of the archaeological subsurface testing (see Figure 14). The trenches are summarized in Table 3. The trenches were 3-5 m long and 0.8 m wide, with depths dictated by findings. The trenches were generally excavated into deposits inferred to be pre-human in origin.

Trench 1

Trench 1 was excavated in a narrow extension of the APE where a pedestrian walkway is proposed between a gate in the schoolyard fence and a sidewalk leading toward a pedestrian bridge. The sidewalk and pedestrian bridge provide access from the Hana Like Neighborhood to Lawrence Avenue. The location of Trench 1 is approximately 6.0 m southeast of the canal running along the western boundary of the school property and 20.4 m southeast of Lawrence Avenue. The trench is north of Mokapu Elementary School on the grounds of the Children and Youth Programs facility (Building 5082).

The trench was 5.0 m long and 0.8 wide (Figure 15; Photo 1, Photo 2, Photo 3). It was excavated from the ground surface to a depth of 155 cmbs and halted within alluvial deposits in Layer V. The water table was encountered at 150 cmbs. Four strata were exposed in profile.

One layer of modern fill (Layer Ia) consisting of dark brown silty clay loam mixed with loose pieces of coral extends from the surface to approximately 60 cmbs. Below the fill, excavations exposed an alluvial deposit (Layer IIIa) of brown silty clay loam with reddish yellow mottles between 60 and 90 cmbs. Layer IIIa overlies an apparent thin band of illuvium (Layer IV) comprised of very dark gray sandy clay loam between 90 and 100 cmbs. Beneath Layer IV is Layer V, an alluvial deposit of silty clay loam with light olive brown mottles. Layer V was exposed between 100 and 155 cmbs.

Table 3. Summary of Trenching Results.

Trench No.	Justification	Status	Length (m)	Depth (cm)	Results
1	Within proposed pedestrian walkway to north of school grounds	Excavated as planned	5.0	154	None.
2	At margin of former wetland	Location shifted west to avoid unknown buried utility	5.0	300	Ceramic fragment, nail, shell casing collected from Layer Ia (fill).
3	At margin of former wetland	Excavated as planned	4.0	90	None.
4	At margin of former wetland	Location shifted east to avoid tree roots	4.0	215	Nail and glass fragment collected from Layer Ia (fill). Preserved botanical remains collected from Layer IIIb.
5a	At margin of former wetland	Location shifted east to avoid tree roots and buried utilities	4.0	36	None.
5b	At margin of former wetland	Location shifted east to avoid tree roots and buried utilities	4.0	80	None.
6	At margin of former wetland	Location shifted northeast to avoid tree roots and buried utilities	4.0	230	Glass fragments collected from Layer Ia (fill).
7	At margin of former wetland	Reoriented north-south to avoid buried 1-inch irrigation pipe	4.0	240	Glass fragment collected from Layer Ia (fill).
8	At margin of former wetland	Location shifted wet to avoid tree roots	4.0	300	Samples of preserved botanical remains collected from Layer IIIb and Layer VIa.
9	At margin of former wetland	Excavated as planned	4.0	180	Glass fragment collected from Layer Id (fill).
10	North of former wetland	Excavated as planned	4.0	80	None.
11	Within proposed pedestrian walkway to north of school grounds	Moved to northern portion of schoolyard near planned walkway to avoid asphalt-covered driveway	5.0	138	Metal fragments collected from fill (Layer Ia).

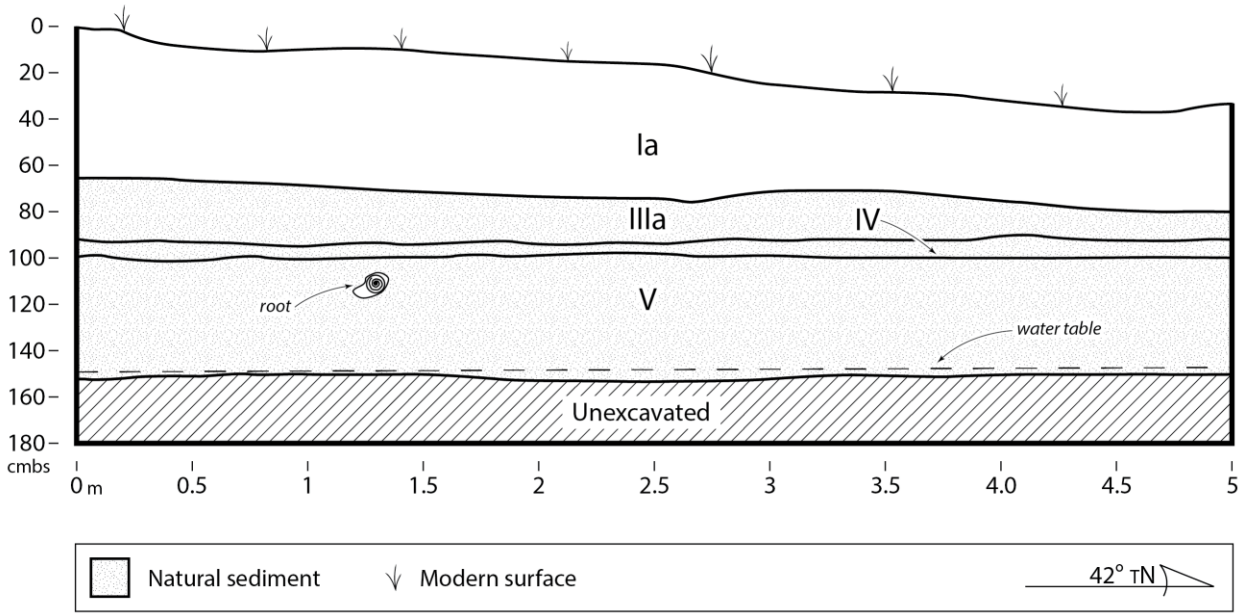


Figure 15. Profile of Trench 1, west wall.

Photo 1. Trench 1, west wall profile, eastern end of trench.

Photo 2. Trench 1, west wall profile, center of trench.

Photo 3. Trench 1, west wall profile, southern end of trench.

Trench 2

Trench 2 was excavated on the school grounds between Buildings B and J. The location of the trench was shifted approximately 3 m west to avoid an unknown buried utility identified during toning that intersected the originally proposed location. The trench location was 5.3 m northeast of Building B and 7.6 m southwest of Building J. It was 17.0 m west of the reconstructed wetland perimeter.

The trench was 5.0 m long and 0.8 m wide (Figure 16; Photo 4, Photo 5). It was excavated from the ground surface to the top of a layer of embedded coral limestone (Layer VIII) exposed at 210 cmbs. The water table was encountered at 200 cmbs. Four strata were exposed in profile.

Two layers of modern fill extend from the surface to 140 cmbs; the upper fill layer (Layer Ia) is gravelly dark brown silty clay loam extending from the surface to 115 cmbs, and the lower fill layer (Layer Ib) is very bouldery brown sandy loam between 115 and 140 cmbs. A small number of artifacts, including a ceramic fragment, a nail, and a shell casing, were collected from Layer Ia between 85 and 100 cmbs. Underlying the Layer Ib modern fill is an alluvial layer (Layer IIIa) of brown silty clay loam between 140 and 175 cmbs. Beneath Layer IIIa is a layer of yellow calcareous loamy sand (Layer VIIa) between 175 and 210 cmbs; this may represent a portion of a former beach or dune deposit.

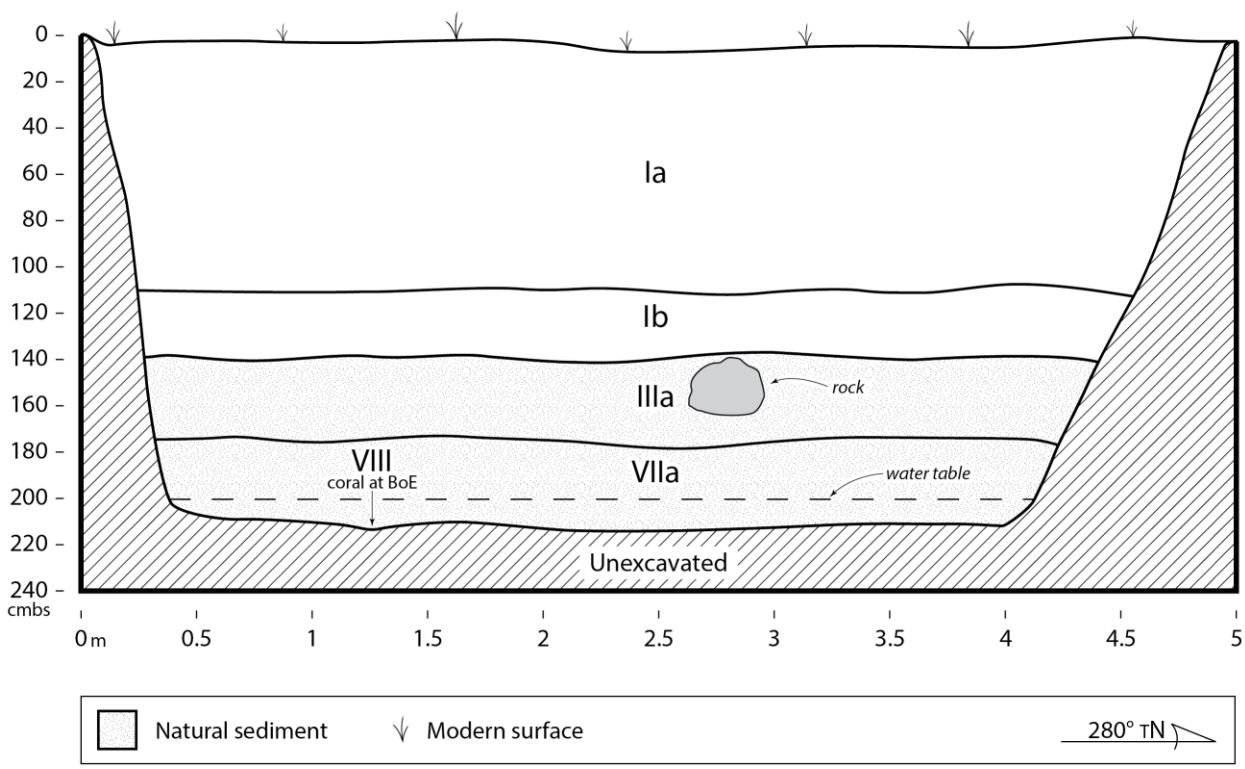


Figure 16. Profile of Trench 2, north wall.

Photo 4. Trench 2, north wall profile, eastern end of trench.

Photo 5. Trench 2, north wall profile, center of trench.

Trench 3

Trench 3 was excavated near the western edge of the school property near Lawrence Avenue. The trench is in an open area 23.5 m southeast of the canal and 8.8 m northwest of a small play area. The trench lies at the edge of the former wetland perimeter.

The trench was 4.0 m long and 0.8 m wide (Figure 17; Photo 6, Photo 7). It was excavated from the ground surface to the top of a layer of coral limestone (Layer VIII) exposed at 90 cmbs. The water table was encountered at 88 cmbs. Three strata were exposed in profile.

Two layers of modern fill extend to 70 cmbs. The upper fill layer (Layer Ia) is brown gravelly silty clay loam from the surface to 55 cmbs, and the lower fill layer (Layer Ie) is yellow loamy sand between 55 and 70 cmbs. Underlying the Layer Ib modern fill is an alluvial layer (Layer IIIa) of dark brown silty clay loam between 70 and 90 cmbs.

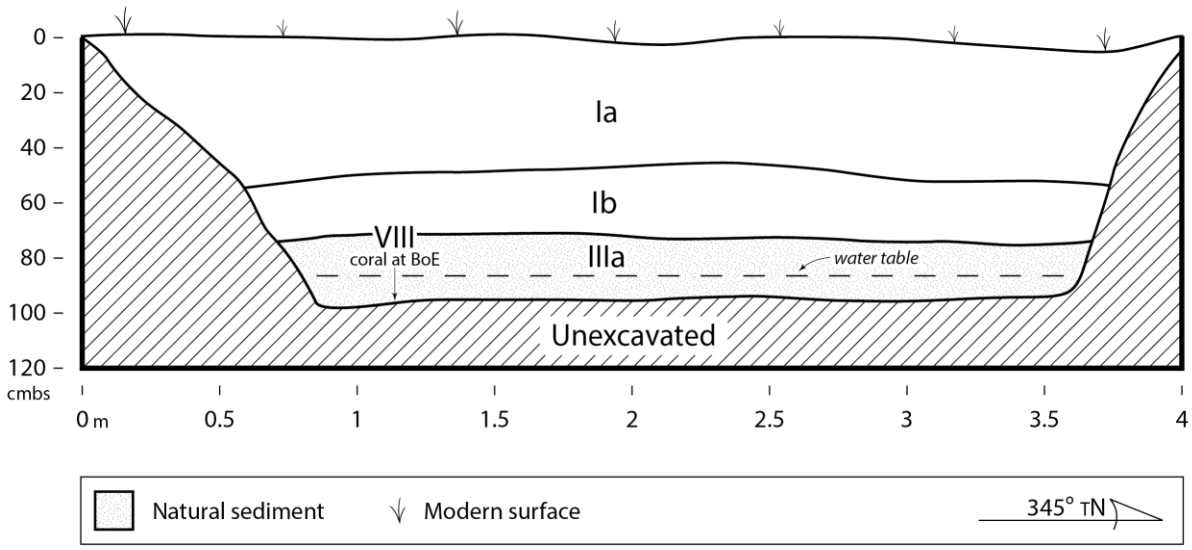


Figure 17. Profile of Trench 3, east wall.

Photo 6. Trench 3, east wall profile, southern end of trench.

Photo 7. Trench 3, east wall profile, center of trench.

Trench 4

Trench 4 was excavated near the western edge of the school grounds between Building J and Lawrence Avenue. The trench location was shifted approximately 6.4 m east to avoid roots associated with a large banyan tree. The trench was 31.4 m east of the canal and 6.6 m west of Building J. The excavated trench was 1.8 m south of the reconstructed wetland perimeter.

The trench was 4.0 m long and 0.8 m wide (Figure 18; Photo 8, Photo 9). It was excavated from the ground surface to a depth of 215 cmbs within alluvial deposits associated with Layer IIIb. The water table was encountered at 200 cmbs. Four strata were exposed in profile.

Three layers of modern fill extend from the surface to 100 cmbs. The upper fill layer (Layer Ia) comprises gravelly dark brown silty clay loam between the surface and 85 cmbs. Two artifacts, including a wire nail and a glass fragment, were collected from Layer Ia at a depth of 57 cmbs. The second fill layer (Layer If) is cobbly sandy loam between 85 and 100 cmbs. Below Layer If is a third fill layer consisting of large boulders within a calcareous sand matrix (Layer Ig). Layer Ig, which contained boulders as large as 1.0 m in diameter, is between 100 and 165 cmbs. Underlying the Layer Ig modern fill is an alluvial deposit (Layer IIIb) of dark brown silty clay loam with greenish gray (gley) and reddish brown mottles between 165 and 215 cmbs. Layer IIIb contains well-preserved botanical remains, of which a representative sample was collected. The proximity of the former wetland to Trench 4 and the presence of preserved botanical remains suggest this trench may have exposed deposits associated with the wetland.

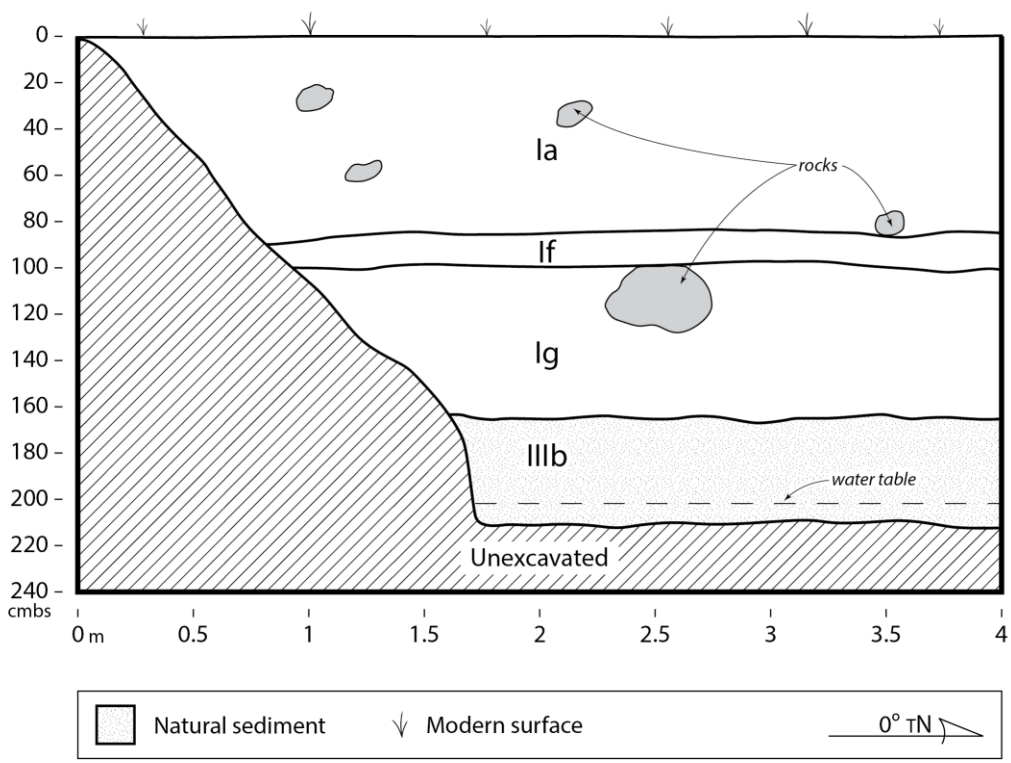


Figure 18. Profile of Trench 4, east wall.

Photo 8. Trench 4, east wall profile, southern end of trench.

Photo 9. Trench 4, east wall profile, center of trench.

Trench 5a

Trench 5a was excavated near the western end of a grassy area between the main school parking lot and Mokapu Road. The location of Trench 5a was approximately 7.1 m east of the proposed location for Trench 5; it was shifted to avoid a large monkeypod tree and several buried utilities marked during toning. The trench was 9.7 m north of Mokapu Road and 8.0 m south of the parking lot. Trench 5a was 11.0 m northwest of the reconstructed wetland perimeter.

The trench was 4.0 m long and 0.8 m wide (Photo 10). Excavations in Trench 5a encountered a buried concrete slab at 36 cmbs and thus could not be continued. Only one layer, modern fill (Layer Ia) consisting of gravelly, dark brown silty loam, extends from the ground surface to the base of the trench. Based on the shallow obstruction encountered in Trench 5a, a second trench in this location, Trench 5b, was excavated 4.6 m to the southwest.

Photo 10. Trench 5a, north wall profile, center of trench.

Trench 5b

Trench 5b was excavated near the western end of a grassy area between the main school parking lot and Mokapu Road. The location of Trench 5b was approximately 4.6 m southwest of Trench 5a, which was halted at a shallow depth when excavations exposed a buried concrete slab. Trench 5b was situated to avoid several nearby buried utilities identified during toning at the front of the property. The trench was 6.1 m north of Mokapu Road and 12.1 m south of the parking lot. Trench 5b was 16.3 m west of the reconstructed wetland perimeter.

The trench was 4.0 m long and 0.8 m wide (Figure 19; Photo 11). Excavations in Trench 5b encountered a buried metal valve at 80 cmbs and thus were halted to avoid damage to the buried water line. While the valve is clearly part of a buried utility, likely a water line, no such line was marked on MCBH facility maps and no buried utilities were identified in this location during toning. Only one layer, modern fill (Layer Ia) consisting of gravelly, dark brown silty loam extends from the ground surface to the base of the trench.

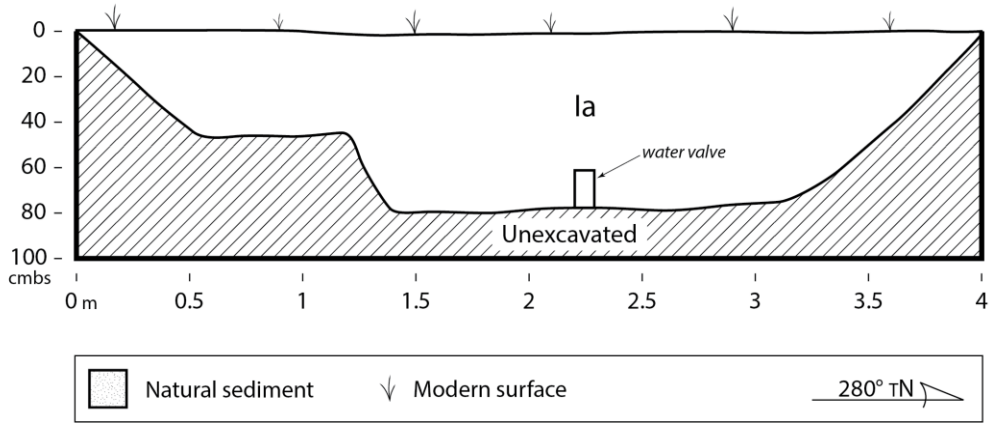


Figure 19. Profile of Trench 5b, north wall.

Photo 11. Trench 5b, north wall profile, western end of trench.

Trench 6

Trench 6 was excavated near the western end of a grassy area between the main school parking lot and Mokapu Road. The location of the trench was shifted approximately 4.7 m northeast of the proposed location to avoid the roots of a large monkeypod tree and several buried utilities identified during toning. The trench was 13.2 m north of Mokapu Road and 8.6 m south of the parking lot. The excavated trench was 3.3 m east of the reconstructed wetland perimeter.

The trench was 4.0 m long and 0.8 m wide (Figure 20; Photo 12, Photo 13). It was excavated from the ground surface to a depth of 230 cmbs in Layer VIIa, a calcareous sand deposit. The water table was encountered at 225 cmbs. Three strata were exposed in profile.

One layer of modern fill (Layer Ia) consisting of gravelly dark brown silty clay loam extends between the surface and 150 cmbs. Two glass fragments, including the finish and partial neck of a possible soda bottle, were collected near the base of Layer Ia at approximately 150 cmbs. Below the Ia modern fill is an alluvial deposit (Layer IIIa) of brown silty clay loam between 150 and 215 cmbs. Layer IIIa overlies a layer of yellow loamy sand mixed with coral (Layer VIIa) that may represent a possible dune or beach deposit.

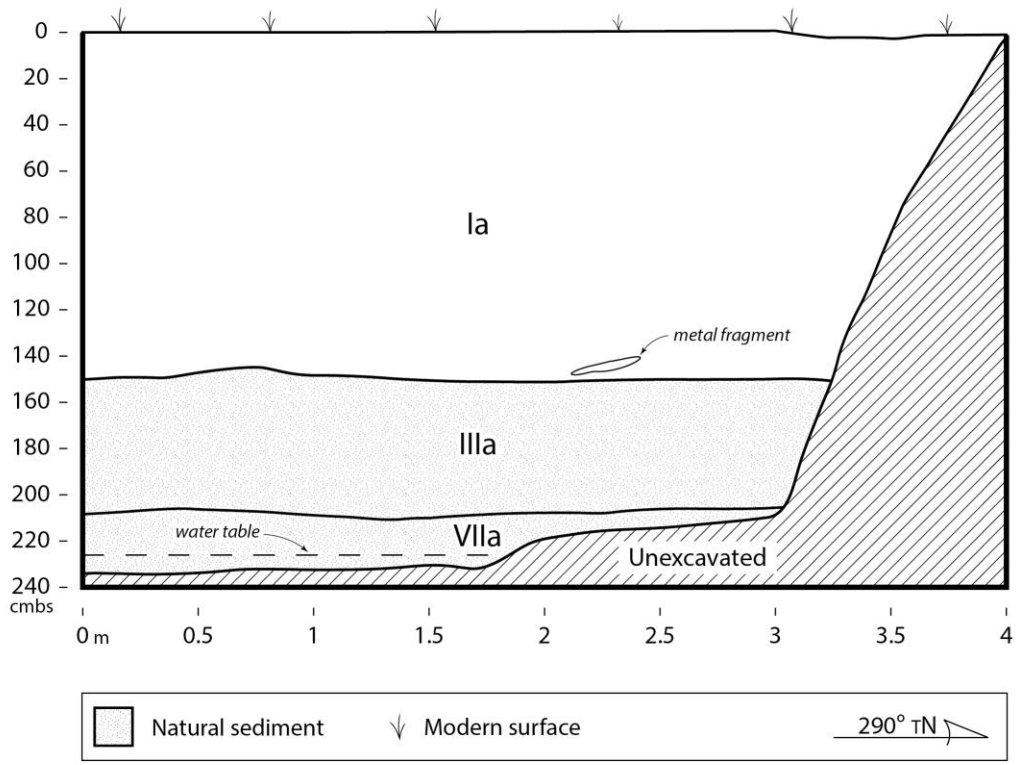


Figure 20. Profile of Trench 6, north wall.

Photo 12. Trench 6, north wall profile, western end of trench.

Photo 13. Trench 6, north wall profile, eastern end of trench.

Trench 7

Trench 7 was excavated between a supplementary parking area along the eastern edge of the property and Building P7. Building P7 is a temporary building adjacent to Building D. The location of the trench was shifted after excavations ruptured a 1-inch irrigation pipe that was not identified during toning. The trench location was moved 3.4 m to the southwest and reoriented to run roughly north-south to avoid the buried utility. The new location was approved by the MCBH CRM via email on July 21, 2020. The trench was 9.6 m northwest of the parking lot and 3.3 m east of Building P7. The excavated trench lay 4.2 m inside the reconstructed wetland boundary.

The trench was 4.0 m long and 0.8 m wide (Figure 21; Photo 14, Photo 15, Photo 16). It was excavated from the ground surface to a depth of 240 cmbs in Layer VIIa, a calcareous sand deposit. The water table was encountered at 220 cmbs. Three layers were exposed in profile.

One layer of modern fill (Layer Ia) consisting of gravelly, dark brown silty clay loam extends between the surface and 135 cmbs. A glass fragment was collected from Layer Ia at approximately 50 cmbs. Underlying the Layer Ia modern fill is an alluvial deposit of brown silty clay loam (Layer IIIa) between 135 and 200 cmbs. Beneath Layer IIIa is a layer of yellow calcareous loamy sand with chunks of coral (Layer VIIa) between 200 and 240 cmbs; this may represent a possible dune or beach deposit.

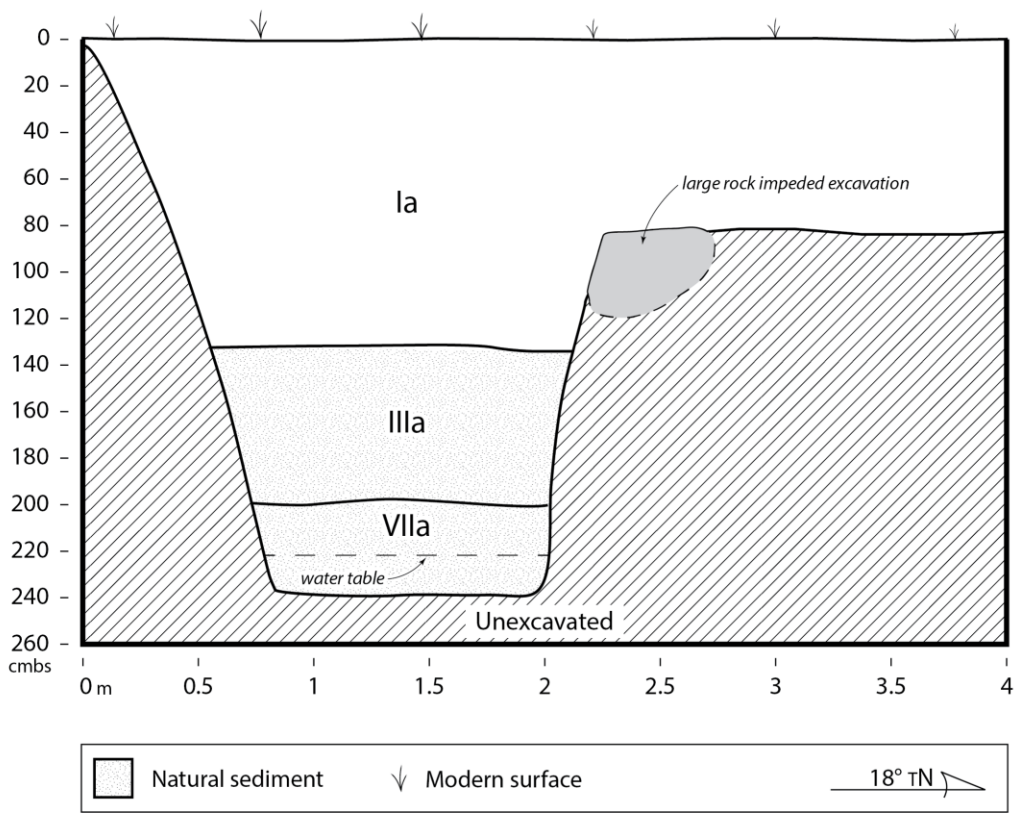


Figure 21. Profile of Trench 7, north wall.

Photo 14. Trench 7, north wall profile, western end of trench.

Photo 15. Trench 7, north wall profile, western end of trench.

Photo 16. Trench 7, north wall profile, eastern end of trench.

Trench 8

Trench 8 was excavated between Buildings C and O. The location of the trench was shifted 2.1 m west in order to avoid the roots of a monkeypod tree. The trench location was 5.1 m north of Building C and 8.0 m south of Building O. The excavated trench was 6.2 m inside the perimeter of the former wetland.

The trench was 4.0 m long and 0.8 m wide (Figure 22; Photo 17). It was excavated from the ground surface to a depth of 300 cmbs in Layer VIb, an alluvial deposit with wetland characteristics. The water table was encountered at 290 cmbs. Five strata were exposed in profile.

Two layers of modern fill extend between the surface and 165 cmbs. The upper fill layer (Layer Ia) is brown silty clay loam, and the lower fill layer (Layer Ic) comprises extremely bouldery loamy sand. Boulders within Layer Ic were as large as 1.0 m in diameter. Below the Layer Ic modern fill, excavations encountered an alluvial deposit (Layer IIIb) of dark brown silty clay loam with reddish brown and yellowish brown mottles between 165 and 240 cmbs. Layer IIIb contains preserved botanical remains, and representative samples of these remains were collected at 225 and 235 cmbs. Underlying Layer IIIb is a layer of greenish gray (GLEY 1 6/1) sandy clay loam (Layer VIa) between 240 and 275 cmbs. Layer VIa also contains preserved botanical remains, of which a sample was collected from approximately 240 cmbs. Beneath Layer VIa is Layer VIb, a layer of brown silty clay loam with light greenish gray (GLEY 1 7/1) and very dark gray mottles. The proximity of the former wetland to Trench 8 and the presence of preserved botanical remains suggest that these deposits were associated former wetland covering a portion of the school grounds.

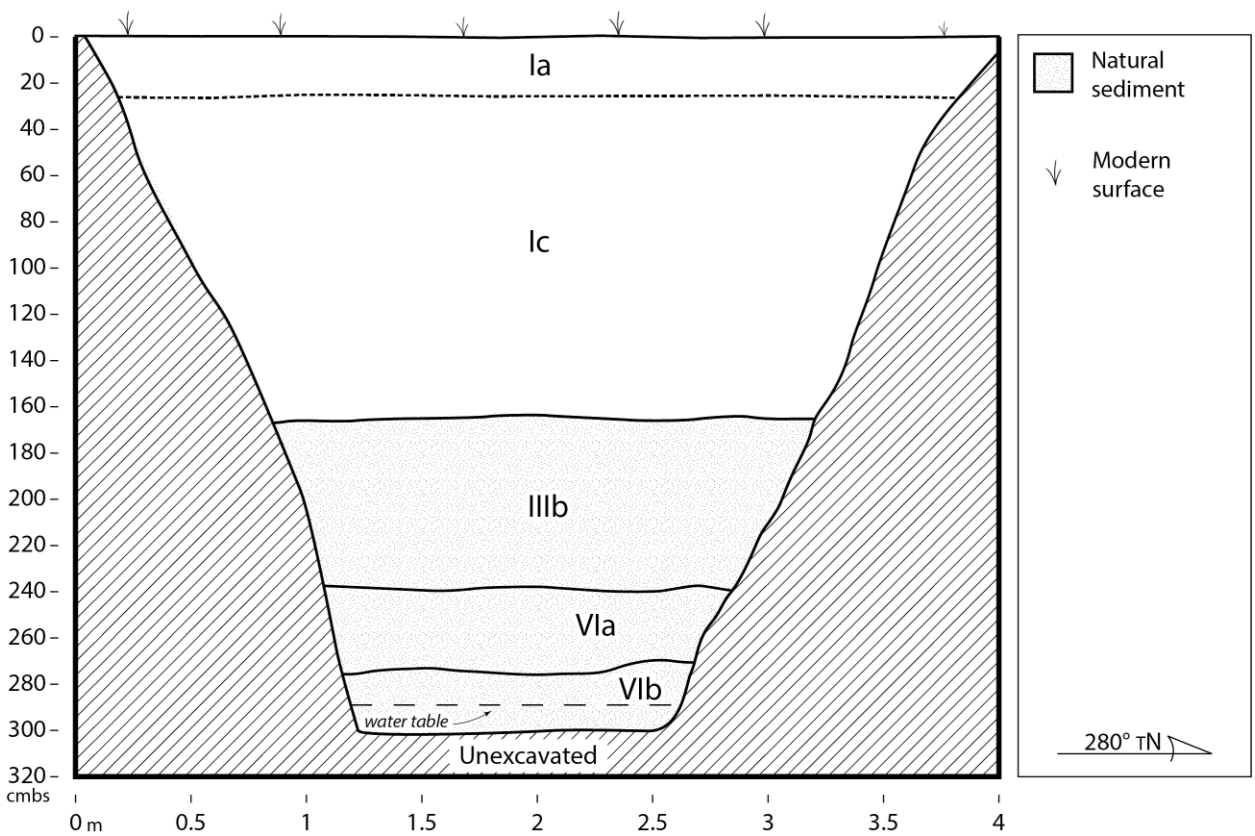


Figure 22. Profile of Trench 8, north wall.

Photo 17. Trench 8, north wall profile, center of trench.

Trench 9

Trench 9 was excavated in an open area to the north of Building Q. A group of playfields depicted near this location on recent maps were no longer extant at the time of the fieldwork. The trench was 9.1 m north of Building Q. The trench location was 5.9 m within the reconstructed perimeter of the former wetland.

The trench was 4.0 m long and 0.8 m wide (Figure 23; Photo 18). It was excavated between the ground surface and a depth of 190 cmbs in Layer VIIb, a gleyed calcareous sand deposit. The water table was encountered at 170 cmbs. Four strata were exposed in profile.

Two layers of modern fill extend between the surface and 100 cmbs. The upper fill layer (Layer Ia) was brown silty clay loam between the surface and 90 cmbs, and the lower fill layer (Layer Id) was brown loamy sand between 90 and 100 cmbs. A glass fragment was collected from Layer Id at 95 cmbs. Underlying the modern fill, excavations encountered an alluvial deposit of dark brown silty clay loam (Layer IIIa) between 100 and 160 cmbs. Beneath Layer IIIa was a layer of light greenish gray (GLEY 1 7/1) loamy sand between 160 and 190 cmbs. The gleyed color of Layer VIIb suggests that this deposit may have been associated with the former wetland on school grounds.

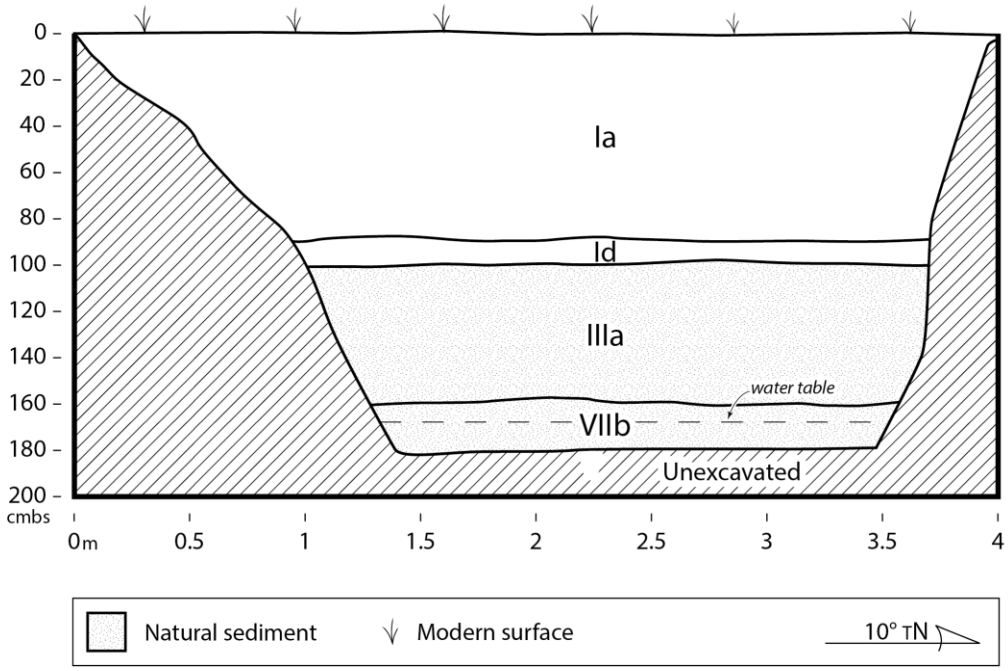


Figure 23. Profile of Trench 9, west wall.

Photo 18. Trench 9, west wall profile, northern end of trench.

Trench 10

Trench 10 was excavated in an open area along the western edge of the school property near Lawrence Avenue. The trench was 29.3 m southeast of the school fence and 23.8 m northeast of a small jungle gym or play area. The trench is 11.3 m north of the edge of the former wetland as shown on early 20th century maps and photographs.

The trench was 4.0 m long and 0.8 m wide (Figure 24; Photo 19). It was excavated between the ground surface and the top of a layer of coral limestone (Layer VIII) at 80 cmbs. The water table was encountered at 78 cmbs. Four strata were exposed in profile.

Two layers of modern fill extend between the surface and 57 cmbs. The upper fill layer (Layer Ia) is gravelly dark brown silty clay loam between the surface and 50 cmbs, and the lower fill layer (Layer Ie) is yellow loamy sand between 50 and 57 cmbs. Below the Layer Ie modern fill is an alluvial deposit of dark brown silty clay loam (Layer IIIa) between 57 and the base of excavation at 80 cmbs.

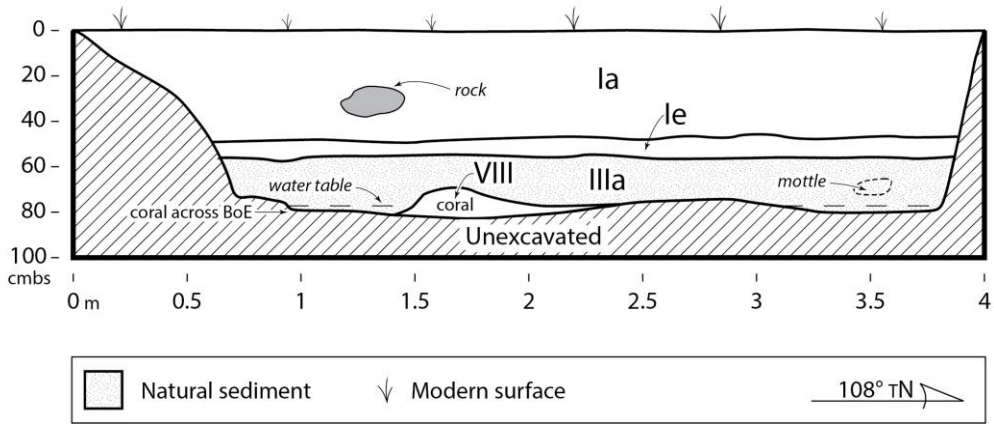


Figure 24. Profile of Trench 10, south wall.

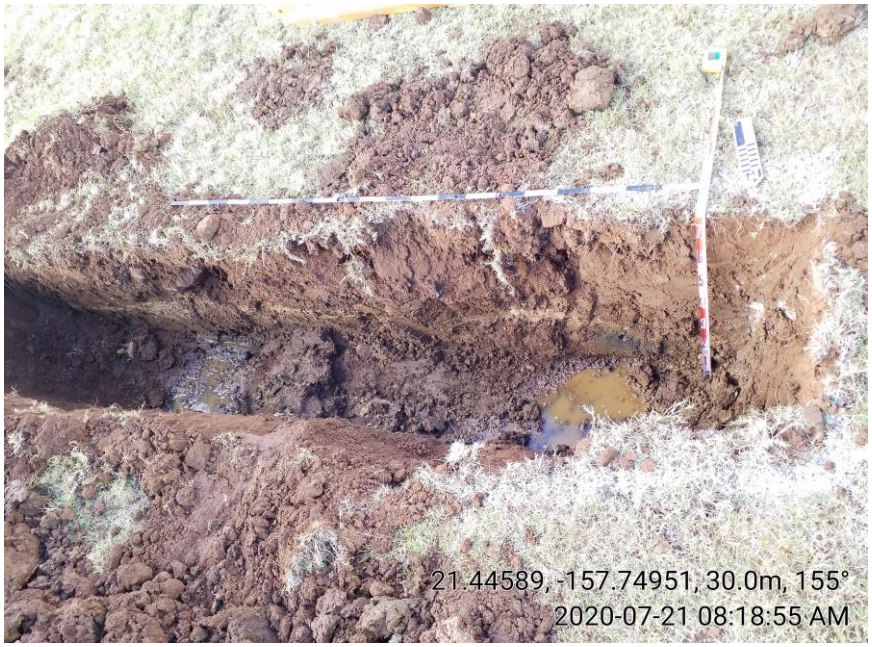


Photo 19. Trench 10, south wall profile, western end of trench.

Trench 11

Trench 11 was excavated on the school grounds along the northeastern edge of the school property. The originally proposed location of Trench 11 was in a narrow extension of the APE that includes a proposed pedestrian walkway along a driveway between the school grounds and Cushman Avenue; this location was found during toning to be within an asphalt-paved driveway that encompasses the width of the APE in this area. An alternative location for the trench was identified within the school grounds near where the proposed walkway enters the school grounds and toned for subsurface utilities. The new location of the trench was approved by the MCBH CRM via email on July 23, 2020. The new location is 4.8 m southeast of the fence that separates the school grounds from a gravel driveway running along the eastern edge of the school property.

The trench was 5.0 m long and 0.8 m wide (Figure 25; Photo 20, Photo 21). It was excavated between the ground surface and the top of a layer of coral limestone (Layer VIII) at 120 cmbs. Three strata were exposed in profile.

One layer of modern fill (Layer Ia) was encountered between the surface and 35 cmbs. One iron fragment and a piece of wire were collected from Layer Ia between 10 and 35 cmbs. Underlying the Layer Ia modern fill was Layer II, an alluvial deposit of dark reddish brown silty loam with strong brown mottles. Layer II was encountered between 35 and 60 cmbs. Beneath Layer II is another apparent alluvial deposit of brown silty loam (Layer IIIa) with dark red mottles. This layer extends between 60 and 120 cmbs. Coral limestone (Layer VIII) was first encountered at the southern end of the trench around 60 cmbs. The top of the limestone was uncovered along the length of the trench, showing a depression in the buried layer that was filled with Layer IIIa sediments.

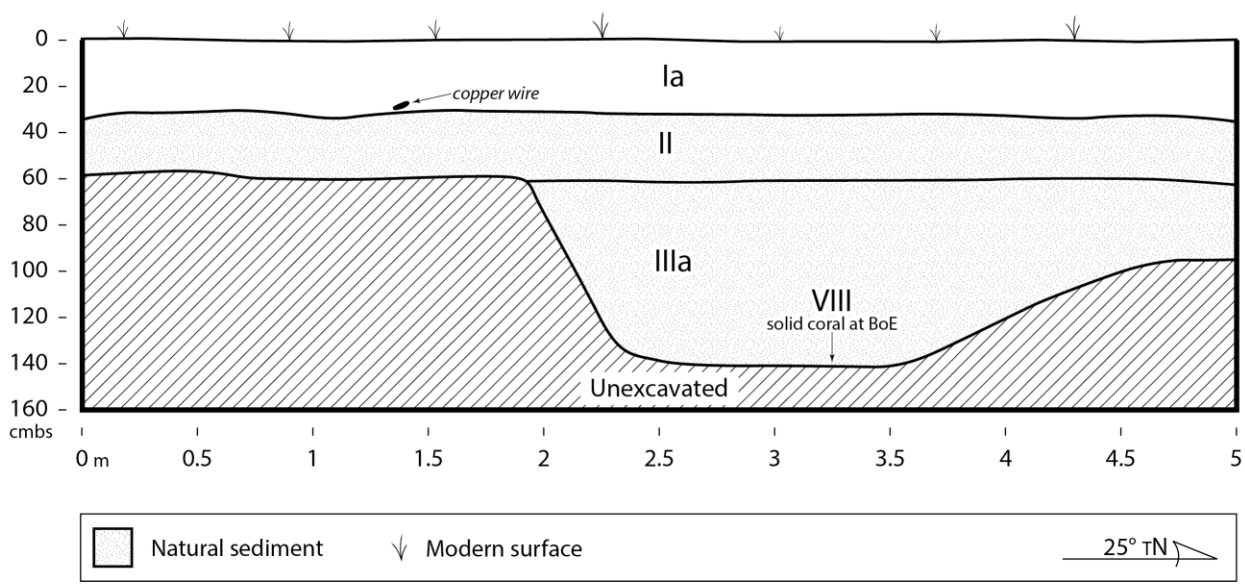


Figure 25. Profile of Trench 11, east wall.

Photo 20. Trench 11, east wall profile, center of trench.

Photo 21. Trench 11, east wall profile, southern end of trench.

SYNTHESIS OF LABORATORY RESULTS

This section summarizes the artifacts and botanical samples collected during test trenching. The artifacts comprise 20th century refuse recovered from surface fill within the project area, while the botanical remains include wood preserved in anaerobic conditions within a remnant of a former wetland within the project area.

ARTIFACTS

Eleven artifacts were collected during testing (Table 4). These items, which were recovered exclusively from the surface fill dating to the mid-20th century, include glass, metal, and ceramic fragments, along with a centerfire shell casing, two nails, and a small length of copper wire. Several glass fragments are identifiable as bottle fragments, likely from beer and soda; one flat glass fragment is also present. One clear finish and partial neck fragment from a crown top bottle, possibly a soda bottle, has a seam from manufacture on an automatic bottling machine. Bottles produced on automatic bottling machines are generally dated to 1905 or later (Miller et al. 2000:14). The artifacts likely represent mid-20th-century refuse that became intermixed with the surface fill during land reclamation or later ground disturbance.

Table 4. Artifacts Collected During Testing.

Trench	Layer	Depth (cmbs)	Artifact Description	Count	Date	Reference
2	Ia	85-100	Ceramic vessel fragment, porcelain, base	1	-	-
2	Ia	85-100	Shell casing, centerfire	1	mid-19th c. to present	Miller et al. 2000:14
2	Ia	85-100	Nail fragment, unknown	1	-	-
4	Ia	57	Glass bottle fragment, amber	1	-	-
4	Ia	57	Nail, wire	1	late 19th-early 20th c. to present	Nelson 1968:7
6	Ia	150	Glass bottle fragment, amber	1	-	-
6	Ia	150	Glass bottle fragment, finish and partial neck, clear, crown top, automatic bottling machine	1	1905-present	Miller and Sullivan 1984:14
7	Ia	50	Glass fragment, flat, clear	1	-	-
9	Id	95	Glass fragment, amber	1	-	-
11	Ia	10-35	Copper wire	1	-	-
11	Ia	10-35	Iron fragment	1	-	-

BOTANICAL SAMPLES

Four botanical samples were collected from Layer IIIb in Trenches 4 and 8 and Layer IVa in Trench 8 (Table 5). Three of the botanical samples include tree trunk or branch fragments likely preserved by anaerobic conditions in saturated or inundated deposits associated with the former wetland. A fourth sample from Layer III in Trench 8 includes sediment mixed with fragmented wood.

Table 5. Botanical Samples Collected during Testing.

Trench	Layer	Depth (cmbs)	Sample Type
4	IIIb	160-165	Botanical remains (wood)
4	IIIb	225	Botanical remains (wood)
8	IIIb	235	Botanical remains (wood)
8	IVa	240	Sediment with botanical remains (wood)

VI. DISCUSSION

Three general research questions, which were outlined in Section III, guided the field and laboratory investigations and analyses. This chapter addresses these questions using data generated by the current project.

1) What is the depositional and soil-forming sequence for the project areas?

Like much of Mōkapu Peninsula, the testing revealed that the school grounds have been subjected to extensive land reclamation activities, as evidenced by the deposition of multiple layers of landfill. This fill was deposited after the 1920s, when both topographic maps and aerial photographs show the school grounds contained the northernmost tip of a wetland area extending northward from Halekou Pond and Nuʻupia Pond. Approximately 35 to 165 cm of fills were deposited across the project area as part of the land reclamation process, which presumably also significantly modified the topography and local landforms. Near the school buildings, especially in Trenches 4 and 8, buried fills contained extremely large boulders measuring as much as 1.0 m in diameter.

The fill was deposited immediately on top of alluvial deposits consisting primarily of silty clay loam. Signatures of saturation or inundation, including preserved botanical remains and gleyed sediments, were identified within the alluvial deposits encountered in Trenches 4 and 8. Because these trenches are near the perimeter of the reconstructed wetland, the presence of these signatures strongly suggests that additional buried wetland deposits are present beneath the surface fill. A substratum of either coral limestone or calcareous sand intermixed with silt and coral was exposed beneath the alluvial deposits in several excavations. This stratum exhibited similar characteristics across the project area; notably, it exhibited a gleyed color pattern in Trench 9 that suggests an association with the former wetland. The sand is interpreted as possible dune or beach deposits; both the sand and coral layers were likely formed during a Holocene high stand pre-dating the onset of alluvial deposition in this part of the peninsula.

2) Are cultural deposits present?

No cultural deposits or isolated artifacts from the pre-fill layers were identified during testing. It is possible that the uppermost natural soils were disturbed during filling; alternatively, it is possible that traditional Hawaiian use of the project area, if it existed, was too ephemeral to leave significant archaeological deposits. Because the test trenching covered only a small sample of the APE, it is possible that cultural deposits may exist beneath the modern fill elsewhere within the project area.

3) Are burials or displaced human skeletal remains present?

Neither burials nor displaced human skeletal remains were encountered during the testing. While several subsurface sand fills were encountered, these fills do not clearly represent relocated beach sands likely to contain displaced human skeletal remains. However, it is possible that burials or fills containing secondarily deposited human skeletal remains might be present in other portions of the project area.

VII. CONCLUSIONS AND RECOMMENDATIONS

Under contract to HHF Planners, International Archaeology LLC completed subsurface testing in support of campus improvements at Mokapu Elementary School. The primary goal of the project was to investigate the potential for archaeological deposits, burials, or human skeletal remains; a secondary aim was to investigate the depositional sequence of soils and sediments within the project area, to aid in better understanding the relative ages of soil units on and near the school grounds and their potential to contain archaeological deposits or human skeletal remains.

The testing project entailed the excavation of 11 backhoe trenches, several of which were situated along the perimeter of a former wetland identified on early 20th century topographic maps and aerial photographs. The backhoe trenches were between 3-5 m long and 0.8 m wide, ranging between 0.4 and 3.0 m deep; they were generally excavated into sediments considered to pre-date human occupation of the peninsula.

SUMMARY OF RESULTS

No archaeological deposits were identified; neither burials nor secondarily deposited human skeletal remains were encountered during testing. The typical profile exposed in the trenches included one or more layers of modern fill covering inundated terrigenous soils of sandy clay loam or silty clay loam. Terrigenous soils in several of the trenches demonstrated hydric soil reactions or preserved botanical remains likely associated with the former wetland. In the trenches reaching below the terrigenous soils, these soils were found to be underlain by either loamy sand or limestone bedrock. A small number of isolated artifacts, including primarily glass bottle and metal fragments, were collected from modern fill. Samples of preserved botanical remains were collected from the buried wetland layers.

RECOMMENDATIONS

The proposed campus improvements at Mokapu Elementary School include ground-disturbing activities such as the demolition of existing buildings, the excavation of foundations for new buildings, the installation of underground utilities, and landscaping and grading. While the testing encountered no archaeological deposits, burials, or secondarily deposited human skeletal remains, previous archaeological finds and inadvertent discoveries in the vicinity of Mokapu Elementary School raise the possibility that historic properties could be encountered. The proximity of Site 50-80-11-5736 suggests that traditional Hawaiian archaeological deposits might be encountered below modern fill on the Mokapu Elementary School property. Such deposits might contain midden, traditional artifacts, and charcoal, and cultural features relating to cooking or water diversion are also possible. The nearness of Site 50-80-11-7172 suggests that early historical archaeological deposits relating to the ranching period could also be encountered. Several finds of secondarily displaced human skeletal remains in modern fill have also been encountered in the vicinity of the project area.

The test trenching encountered 20th century fills between the ground surface and a minimum depth of 35 cm (14 inches). While most historic properties, i.e., intact archaeological deposits or burials, will only be encountered below the modern fill, there is a possibility that fill within the project area could contain secondarily deposited human skeletal remains. We recommend that archaeological monitoring be conducted during all ground-disturbing activities in the event that historic properties, or human skeletal remains, are encountered during the proposed work. The work should be guided by an archaeological

monitoring plan meeting the requirements of HAR §13-279-4 be prepared and submitted to the MCBH CRM and SHPD in advance of construction.

REFERENCES

Allen, Jane

2010 *Archaeological Monitoring and Screening, Mololani and Ulupaʻu Housing Areas, Hawaii Public-Private Venture (PPV) Phase IV, Marine Corps Base Hawaii (MCB Hawaii), Kāneʻohe Bay, Oʻahu, Hawaiʻi. Tax Map Key 4-4-009:003. First Annual Report (May 5-December 31, 2008)*. Prepared for Forest City Hawaii Construction Management LLC, Honolulu. International Archaeological Research Institute, Inc., Honolulu.

Allen, Jane, Robert Pacheco, and Malina Reveal

2012 *Archaeological Monitoring and Screening, Mololani Housing Area, Hawaii Public-Private Venture (PPV) Phase IV, Marine Corps Base Hawaii (MCB Hawaii), Kāneʻohe Bay, Oʻahu, Hawaiʻi. Tax Map Key 4-4-009:003. Annual Report for 2010*. Prepared for Forest City Hawaii Construction Management LLC, Honolulu. International Archaeological Research Institute, Inc., Honolulu.

Allen, Jane, Robert Pacheco, and Malina Reveal

2013 *Archaeological Monitoring and Screening, Mololani Housing Area, Hawaii Public-Private Venture (PPV) Phase IV, Marine Corps Base Hawaii (MCB Hawaii), Kāneʻohe Bay, Oʻahu, Hawaiʻi. Tax Map Key 4-4-009:003. Annual Report for 2011-2012*. Prepared for Forest City Hawaii Construction Management LLC, Honolulu. International Archaeological Research Institute, Inc., Honolulu.

Anderson, Lisa, Stephen D. Clark, and Mary F. Riford

2001 *Archaeological Monitoring of Excavations Within Mōkapu Burial Area and Sand Dune Deposits Associated with the Klipper Golf Course Improvement, MCBH Kaneohe Bay, Oʻahu, Hawaiʻi*. Ogden Environmental and Energy Services Co., Inc., Honolulu. (Not seen.) Cited, U.S. Army Corps of Engineers 2006:Fig. B-5, references (no client's name listed).

Andrews, Lorrin

1865 *A Dictionary of the Hawaiian Language*. Henry M. Whitney, Honolulu.

Athens, J. Stephen

2002 *Archaeological Coring and Augering, Halekou Fishpond, Nuʻupia Ponds Wildlife Management Area, U.S. Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu Island, Hawaiʻi*. Prepared for U.S. Army Engineer District, Honolulu, Fort Shafter, Hawaiʻi. International Archaeological Research Institute, Inc., Honolulu.

Barrera, William, Jr.

1982 *Mokapu Peninsula (Marine Corps Air Station, Kaneohe Bay): Archaeological and Ethnohistoric Reconnaissance and Assessment.* Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Chiniago, Honolulu.

Beckwith, Martha

1970 *Hawaiian Mythology*, University of Hawaii Press, Honolulu.

Bronk Ramsey, Christopher
2017 Oxcal 4.2.3. http://c14.arch.ox.ac.uk/oxcal.

Charvet-Pond, Ann, and Paul H. Rosendahl
1992 *Archaeological Monitoring Southwest Periphery of Nuupia Pond and Lawrence Road, Third Street, and Selden Street, Marine Corps Air Station, Kaneohe Bay, TMK 4:4:08; Land of Kaneohe, Koolaupoko District, Island of Oahu.* Prepared for Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Hilo, Hawai‘i.

Cordy, Ross
1984 *Archaeological Monitoring, Dredging of Sand-Clogged Channel Between Pa‘akai Pond and Kailua Bay, Marine Corps Air Station, Kane‘ohe Bay.* Prepared for U.S. Marine Corps Air Station. Ross Cordy, Ph.D., Waipahu, Hawai‘i.

Devaney, Dennis M., Marion Kelly, Polly Jae Lee, and Lee S. Motteler
1982 *Kāne‘ohe—A History of Change*. Rev., updated. Bess Press, Honolulu.

Donn, John
1902 *Oahu, Hawaiian Islands*. Hawaii Territory Survey. Map Scale 1:5,000. Government Registered Map 2374 on file at Hawai‘i State Survey Office, Honolulu.

Drolet, Robert P., Patricia A. Drolet, and Allan J. Schilz
1996 *Archaeological Inventory Survey of Pali Kilo and Ulupa‘u Crater Parcels, Marine Corps Base Hawaii Kaneohe Bay, O‘ahu, Hawai‘i.* Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Erkelens, Conrad L., and Elizabeth A. Gordon
1997 *Archaeological Testing at the Klipper Golf Course, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, O‘ahu, Hawai‘i*. Environmental Planning Division, Naval Facilities Engineering Command, Pacific Division, Pearl Harbor.

Fiddler, Frank
1956 *Mokapu: A Study of the Land.* U.S. Marine Corps, O‘ahu. Copy on file, International Archaeology, LLC, Honolulu.

Filimoehala, Christopher, Timothy M. Rieth, and Robert Pacheco
2013 *Archaeological Monitoring and Testing in Support of the Geotechnical Survey for the MV-22 Hangar Site Investigation, Marine Corps Base Hawaii, Kaneohe Bay, O‘ahu, Hawai‘i: TMK: (1) 4-4-008:001*. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. International Archaeological Research Institute, Honolulu.

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

Fornander, Abraham
1878 *An Account of the Polynesian Race, Its Origin and Migrations, and the Ancient History of the Hawaiian People to the Times of Kamehameha I*. Trübner & Co., London.

Geolabs, Inc.
2020 *Report, Mokapu Elementary School Campus Improvements Geotechnical Boring*. Geolabs, Inc., Honolulu. Copy on file, International Archaeology, LLC, Honolulu.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte
2013 Online Rainfall Atlas of Hawai‘i. *Bulletin of the American Meteorological Society* 94:313-316, doi:10.1175/BAMS-D-11-00228.1.http://rainfall.geography.hawaii.edu (accessed May 5, 2019).

Hammatt, Hallett H., and Brian L. Colin
1995 *An Archaeological Assessment of 150.08 Acres for Proposed Family Housing Construction, Kane‘ohe Marine Corps Base Hawai‘i, Mōkapu Peninsula, Ko‘olaupoko District, Island of O‘ahu, Hawai‘i*. Prepared for R.M. Towill Corporation. Cultural Surveys Hawai‘i, Kailua, Hawai‘i.

Handy, E.S. Craighill, and Elizabeth Green Handy
1991 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Bernice P. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.

Jimenez, Joseph A., Thomas R. Wolforth, Robert B. Rechtman, and Alan E. Haun
1998 *Archaeological Monitoring of Trench Excavations for Phase II (KB356MS) Repairs to Sanitary Sewer System, Marine Corps Base Hawaii Kaneohe Bay, O‘ahu.* Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Inc., Hawai‘i Island, Hawai‘i.

Jordan, Nichole, and Timothy Rieth
2011 *Archaeological Monitoring in Support of Water Line Replacement, Water Lines H10707M and H10709M, Marine Corps Base Hawaii, Kāne‘ohe, O‘ahu, Hawai‘i; Tax Map Key 4-4-008*. Prepared for Department of the Navy. International Archaeological Research Institute, Inc., Honolulu.

Kamakau, Samuel M.
1992 *Ruling Chiefs of Hawaii*. Revised edition. Kamehameha Schools Press, Honolulu.

Kaschko, Michael
1996 *Archaeological Monitoring for Soils Investigation Work (Soils Borings) FY96 BRAC Project P-268T Aircraft Apron, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii*. Prepared for SSFM Engineers, Inc., Honolulu. Scientific Consultant Services, Inc., Honolulu.

Kikuchi, William
1973 *Hawaiian Aquacultural Systems*. Ph.D. Dissertation, University of Arizona, Tucson.

Klem, Jonathon, and Adam J. Lauer
2019 *Archaeological Monitoring Report, MILCON P-778 Army Addition and Renovation, Marine Corps Base Hawaii, Kāne‘ohe Bay, O‘ahu, Hawai‘i*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor. International Archaeology, LLC, Honolulu.

Lauer, Adam, and Timothy Rieth
2008 *Archaeological Monitoring in Support of Fiber Optic Cable Installation at Four Locations (FTD 3, FTD 5, FTD 6 and a Site for Two Hand-Holes) at Marine Corps Base Hawaii, Kaneohe Bay, Oʻahu, Hawaiʻi. TMK 4-4-008:001; 4-4-009:003*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor. International Archaeological Research Institute, Inc., Honolulu.

Lebo, Susan A., Carly R. Antone, and Stephen A. Lohse
2011 *Archaeological Monitoring in Support of Marine Corps Base (MCB) Hawaii Child Development Center Construction, Kāneʻohe Bay, Kāneʻohe Ahupuaʻa, Koʻolaupoko District, Oʻahu, Hawaiʻi*. TMK (1) 4-4-008:001. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor. Southeastern Archaeological Research, Inc. (SEARCH), Honolulu.

Lyons, C.J., and J.F. Brown
n.d. *The Mokapu Peninsula, Koolau, Oahu*. Scale 1:12,000. Government Register Map 1073 on file at the Hawaiʻi State Survey Office, Honolulu.

MacCaughey, Vaughan
1917 A Footpath Journey. *Mid-Pacific Magazine* 14(2):181-196.

Macdonald, Gordon A., and Agatin T. Abbott
1970 *Volcanoes in the Sea*. University of Hawaii Press, Honolulu.

McIntosh, James, Caleb Fechner, Kimberley Mooney, and Paul L. Cleghorn
2012 *Archaeological Monitoring and Data Recovery for the Hawaii Public-Private Venture (PPV) Phase II Waikulu Neighborhood Housing Replacement, Marine Corps Base Hawaii, Kāneʻohe Bay, Island of Oʻahu. [TMK (1) 4-4-008:001 (por.)]*. Prepared for Mason Architects, Honolulu. Pacific Legacy, Inc., Kailua, Hawaiʻi.

Miller, George L., Patricia M. Samford, Ellen Shlasko, and Andrew Madsen
2000 Telling Time for Archaeologists. *Northeast Historical Archaeology* 29(1):1-22.

Miller, George L., and Catherine Sullivan
1984 Machine-Made Glass Containers and the End of Production for Mouth-Blown Bottles. In *Approaches to Material Culture Research for Historical Archaeologists: A Reader from Historical Archaeology*, edited by David R. Brauner, pp. 161-174. The Society for Historical Archaeology, Tucson, Arizona.

Moore, Summer
2020 *Archaeological Subsurface Testing Plan in Support of Campus Improvements at Mokapu Elementary School, Marine Corps Base Hawaii, Kāneʻohe Bay, Oʻahu, Hawaiʻi*. Prepared for HHF Planners. International Archaeology, LLC, Honolulu, Hawaiʻi.

Munsell Color
2000 *Munsell Soil Color Charts*. Rev. washable ed. Munsell Color, GretagMacbeth, New Windsor, New York.

Nelson, Lee H.
1968 *Nail Chronology as an Aid to Dating Old Buildings*. History News Technical Leaflet 24-1, American Association for State and Local History, Nashville, Tennessee.

Nickelsen, Cordelia, and Melissa Kirkendall
2008 National Register of Historic Places Registration Form, Site 50-80-11-5736. Prepared by Pacific Legacy, Inc., Honolulu. Copy on file, International Archaeology, LLC, Honolulu.

Prishmont, Laura Ann, Jane Allen, and Stephan D. Clark
2001 *Archaeological Monitoring in Support of the Base Realignment and Closure (BRAC) Program Relocating Barbers Point Naval Air Station Operations to Marine Corps Base Hawaii Kaneohe Bay, Oʻahu Island, Hawaiʻi.* Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Pukui, Mary Kawena, and Samuel H. Elbert
1986 *Hawaiian Dictionary*. Revised edition. University of Hawaii Press, Honolulu.

Reimer, P.J., E. Bard, A. Bayliss, J.W. Beck, P.G. Blackwell, C. Bronk Ramsey, C.E. Buck, H. Cheng, R.L. Edwards, M. Friedrich, P.M. Grootes, T.P. Guilderson, H. Haflidason, I. Hajdas, C. Hatté, T.J. Heaton, A.G. Hogg, K.A. Hughen, K.F. Kaiser, B. Kromer, S.W. Manning, M. Niu, R.W. Reimer, D.A. Richards, E.M. Scott, J.R. Southon, C.S.M. Turney, and J. van der Plicht
2013 IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0-50,000 Years cal BP. *Radiocarbon* 55(4). DOI: 10.2458/azu_js_rc.55.16947.

Rieth, Timothy M., and Christopher W. Filimoehala
2015 *Remnants of a Traditional Hawaiian Village on Mōkapu Peninsula: Archaeological Investigations at Site 50-80-11-7411, Marine Corps Base Hawaii, Kaneohe Bay, Oʻahu, Hawaiʻi; TMK: (1) 4-4-008:001*. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. International Archaeological Research Institute, Inc., Honolulu.

Rieth, Timothy, and Nichole Jordan
2012 *Archaeological Monitoring in Support of Water Line Replacement, Water Line H10708M, Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi. Tax Map Key 4-4-008*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division, Pearl Harbor. International Archaeological Research Institute, Inc., Honolulu.

Roberts, Alice K. S., Katharine S. Brown, and Eric W. West
2002 *Archaeological Monitoring and Sampling for Outside Cable Rehabilitation (OSCAR) Project, Marine Corps Base Hawaii (MCBH-KB), Kaneohe Bay, Koʻolaupoko District, Island of Oʻahu, Hawaiʻi.* Prepared for U.S. Army Corps of Engineers, Honolulu District, Fort Shafter. Garcia and Associates, Kailua, Oʻahu.

Rosendahl, Paul H.
1999 Archaeological Monitoring of Trench Excavations and Testing for Phase III (KB357MS) Repairs to Sanitary Sewer System, Marine Corps Base Hawaii, Kaneohe Bay, Oʻahu. Lands of Kāneʻohe and Heʻeia, Koʻolau Poko District, Island of Oʻahu. Prepared for Commander, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawaiʻi.

Schilz, Allan J., and Jane Allen

1996 *Archaeological Monitoring for Negation of Adverse Effect of KB-038M, Replace Potable Water Mains, and Site 50-80-11-4933, Marine Corps Base Hawaii Kaneohe Bay, Hawai'i*. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services, Inc., Honolulu.

Schilz, Allen, James Landrum, and Jane Allen

1996a *Archaeological Monitoring for Negation of Adverse Effect of a Grading, Dredging, and Drainage Control ("Dredging") Project, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, O'ahu, Hawai'i*. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

1996b *Archaeological Monitoring for the Negation of Adverse Effect of KB-975MS Repair of Effluent Irrigation System (REEF), Marine Corps Base Hawaii Kaneohe Bay, Island of O'ahu, Hawai'i.* Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Schilz, Allen, James Landrum, and Jane Allen

1997 *Archaeological Monitoring of KB-163MS, Repairs to Sanitary Sewer System (RESEW) at Marine Corps Base Hawaii Kaneohe Bay, O'ahu, Hawai'i.* Prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Sholin, Carl E., Kekapala P. Dye, and Thomas S. Dye

2011 *Archaeological Monitoring Report for the Marine Corps Community Services New Youth Center at Marine Corps Base Hawaii, Kāne'ohe Bay, Kāne'ohe, Ko'olaupoko, O'ahu Island, Hawai'i. TMK: (1) 4-4-008:001*. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. T.S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

Shun, Kanalei

1991 *Archaeological Subsurface Investigations for Proposed Family Housing Construction, Kaneohe Marine Corps Air Station, Koolaupoko District, Island of Oahu, Hawaii*. Prepared for U.S. Army Engineer District, Honolulu, Corps of Engineers, Fort Shafter, Hawai'i.

Steele, Staff Sergeant Al, USMC

1975 *Myths, Martyrs and Marines of Mōkapu*. Reprint. History and Museums Division, Headquarters, U.S. Marine Corps, Washington, D.C.

Tomonari-Tuggle, M. J.

2014a *The Making of Mōkapu: A Paradise on the Peninsula. Archival and Ethnohistoric Research of Mōkapu Peninsula*. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. International Archaeological Research Institute, Inc., Honolulu.

2014b *Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, Oʻahu, Hawaiʻi, 2014-2019.* Prepared for Commanding General, Marine Corps Base Hawaii, Kāneʻohe, Hawaiʻi. Prepared for Department of Navy, Naval Facilities Engineering Command, Pacific Division, Pearl Harbor, Hawaii. International Archaeological Research Institute, Inc., Honolulu.

Tuggle, H. David, and Robert J. Hommon
1986 *Historic Property Inventory, Marine Corps Air Station, Kaneohe Bay: History, Survey, and Site Descriptions.* U.S. Navy, Pacific Division, Naval Facilities Engineering Command,

U.S.D.A. Soil Science Division Staff (C. Ditzler, K. Scheffe, and H.C. Monger, eds.)
2017 *Soil Survey Manual*. U.S. Department of Agriculture. U.S. Government Printing Office, Washington, D.C.

Wagner, Warren L., Derral R. Herbst, and S. H. Sohmer
1990 *Manual of the Flowering Plants of Hawaiʻi.* 2 vols. University of Hawaii and Bishop Museum Presses, Honolulu.

Wilcox, Bruce A., and Kepā Maly
1997 *Review of Cultural and Natural Historic Information for Integrated Resources Management Planning at Marine Corps Base Hawaii, Kaneohe Bay.* Draft report prepared for Environmental Department, MCB Hawaii. Under contract to Geo InSight International, Inc., Ojai, California.

Yeates, Kelly R., Carl E. Sholin, and Thomas S. Dye
2012 *Archaeological Monitoring Report for the Youth Center Fiber Optic Cable Installation, Marine Corps Base Hawaiʻi, Kāneʻohe Ahupuaʻa, Koolaupoko District, Oʻahu Island, TMK: (1) 4-4-008:001*. Prepared for Department of Navy, Naval Facilities Engineering Command, Pacific Division, Pearl Harbor, Hawaiʻi. T.S. Dye & Colleagues, Archaeologists, Honolulu.

GLOSSARY OF HAWAIIAN WORDS

Hawaiian Spelling*	Definition
ahupua‘a	land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*pua‘a*), or because a pig or other tribute was laid on the altar as tax to the chief
ali‘i	chief, chiefess, officer, ruler, monarch, peer, headman, noble, aristocrat, king, queen, commander
heiau	temple, shrine
‘ili	traditional land unit, a subdivision of an *ahupua‘a*
kapu	sacred or taboo
moku	district; island
mo‘o	lizard; also narrow strip of land, smaller than an *‘ili*

* Adapted from Mary K. Pukui and Samuel H. Elbert, 1986, *Hawaiian Dictionary*, University of Hawaii Press, Honolulu, unless otherwise noted.

APPENDIX A:
TEST TRENCH LAYER DESCRIPTIONS AND INTERPRETATIONS

Trench	Layer	Layer Depth (cmbs)	Description	Interpretation
1	Ia	0-60	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; common, fine to medium roots; coral inclusions; clear, wavy lower boundary	Surface fill
1	IIIa	60-90	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and plastic when wet; reddish yellow (7.5YR 6/6) many, fine distinct mottles; abrupt, smooth lower boundary	Alluvial deposit
1	IV	90-100	Very dark brown (7.5YR 2.5/2, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and plastic when wet; abrupt, smooth lower boundary	Illuvial deposit
1	V	100-155 (BoE)	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and very plastic when wet; light olive brown (2.5Y 6/6) many, fine distinct mottles	Alluvial deposit
2	Ia	0-115	Dark brown (7.5YR 3/3, dry) silty clay loam; moderate, medium blocky to subangular blocky structure; slightly hard when dry; friable when moist; sticky and very plastic when wet; common, fine to medium roots; 15-35% pebbles and cobbles, subrounded to subangular; clear, wavy lower boundary	Surface fill
2	Ib	115-140	Brown (7.5YR 4/4, moist) sandy loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; sand is medium in size, subrounded to subangular; 35-60% gravels, cobbles, and boulders; clear, subrounded to subangular; clear, wavy lower boundary	Buried fill
2	IIIa	140-175	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; clear, wavy lower boundary	Alluvial deposit
2	VIIa	175-210	Yellow (10YR 7/6, moist) loamy sand; calcareous; fine or thin single-grain structure; loose consistency; slightly sticky to slightly plastic when wet; sand is fine to medium in size	Probable beach/dune deposit
2	VIII	210 (BoE)	Coral limestone	Limestone bedrock
3	Ia	0-55	Dark brown (7.5YR 3/3, dry) silty clay loam; moderate, medium blocky to subangular blocky structure; slightly hard when dry; friable when moist; sticky and very plastic when wet; sand is fine in size, subrounded to subangular; common, fine to medium roots; 15-35% granules and gravels, subrounded to subangular; clear, wavy lower boundary	Surface fill
3	Ie	55-70	Yellow (10YR 7/6, wet) loamy sand, moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky to slightly plastic when wet; sand is fine in size, subrounded to subangular; clear, wavy lower boundary	Buried fill

Trench	Layer	Layer Depth (cmbs)	Description	Interpretation
3	IIIa	70-90	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; clear, wavy lower boundary	Alluvial deposit
3	VIII	90 (BoE)	Coral limestone	Limestone bedrock
4	Ia	0-85	Dark brown (7.5YR 4/4, moist) sandy loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; sand is medium, subrounded to subangular; 35-60% subrounded to subangular gravels, cobbles, and boulders; clear, wavy lower boundary	Surface fill
4	If	85-100	Brown (7.5 4/4, moist) sandy loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; sand is medium in size, subrounded to subangular; 35-60% gravels, cobbles, and boulders, subrounded to subangular; abrupt, wavy lower boundary	Buried fill
4	Ig	100-165	Very pale brown (10YR 7/4, moist) sand; weak fine or thin single-grain structure; loose consistence; nonsticky and nonplastic when wet; sand is fine to medium in size, subrounded to subangular; 35-60% cobbles and boulders, subrounded to subangular; abrupt, wavy lower boundary	Buried fill
4	IIIb	165-215 (BoE)	Dark brown (7.5YR 3/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; greenish gray GLEY 1 6/1) few coarse prominent mottles; reddish brown (2.5YR 5/4) few coarse distinct mottles; preserved botanical remains	Alluvial deposit (saturated or inundated)
5a	Ia	0-36 (BoE)	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; sand is medium, subrounded to subangular, 15-35% gravels, subrounded to subangular gravels	Surface fill
5b	Ia	0-80 (BoE)	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; sand is medium, subrounded to subangular, 15-35% gravels, subrounded to subangular gravels	Surface fill
6	Ia	0-150	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium angular blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; sand is medium in size, subrounded to subangular; 35-60% gravels, subrounded to subangular; large chunks of asphalt present throughout; coral inclusions	Surface fill
6	IIIa	150-215	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet	Alluvial deposit

Trench	Layer	Layer Depth (cmbs)	Description	Interpretation
6	VIIa	215-230 (BoE)	Yellow (10YR 7/8, moist) loamy sand; moderate, calcareous; fine or thin single-grain structure; loose consistency; slightly sticky to slightly plastic when wet; sand is fine to medium in size; coral inclusions	Possible dune/beach deposit
7	Ia	0-135	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium angular blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; sand is medium in size, subrounded to subangular, 35-60% subrounded to subangular gravels; coral inclusions; clear, wavy lower boundary	Surface fill
7	IIIa	135-200	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; clear, wavy lower boundary	Alluvial deposit
7	VIIa	200-240 (BoE)	Yellow (10YR 7/6, moist) loamy sand; moderate, calcareous; fine or thin single-grain structure; loose consistency; slightly sticky to slightly plastic when wet; sand is fine to medium in size; coral inclusions	Possible dune/beach deposit
8	Ia	0-25	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; 15-30% cobbles and boulders; clear, wavy lower boundary	Surface fill
8	Ic	25-165	Brown (7.5YR 4/3, moist) loamy sand; weak fine or thin single-grain structure; loose consistence; nonsticky and nonplastic when wet; sand is fine in size, subrounded to subangular; 60-90% gravels, cobbles, and boulders, subrounded to subangular	Buried fill
8	IIIb	165-240	Dark brown (7.5YR 3/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and very plastic when wet; reddish brown (2.5YR 5/4) common, medium prominent mottles; yellowish brown (10YR 5/4) few fine distinct mottles; preserved botanical remains; clear, wavy lower boundary	Alluvial deposit (saturated or inundated)
8	VIa	240-275	Greenish gray (GLEY 1 6/1, moist) sandy clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and very plastic when wet; sand is fine in size; preserved botanical remains; clear, wavy lower boundary	Alluvial deposit (saturated or inundated)
8	VIb	275-300 (BoE)	Brown (7.5YR 4/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; light greenish gray (GLEY 1 7/1) few coarse prominent mottles; very dark gray (10YR 3/1) few coarse distinct mottles	Alluvial deposit (saturated or inundated)
9	Ia	0-90	Brown (7.5YR 4/3, dry) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; 15-30% cobbles and boulders; clear, wavy lower boundary	Surface fill

Trench	Layer	Layer Depth (cmbs)	Description	Interpretation
9	Id	90-100	Brown (10YR 4/3, moist) silty clay loam; weak fine or thin single-grain structure; loose consistence; nonsticky and nonplastic when wet; sand is fine in size, subrounded to subangular; clear, wavy lower boundary	Buried fill
9	IIIa	100-160	Dark brown (7.5YR 3/3, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; sticky and plastic when wet; clear, wavy lower boundary	Alluvial deposit
9	VIIb	160-190 (BoE)	Light greenish gray (GLEY 1 7/1, moist) loamy sand; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; sand is fine to medium in size, subrounded to subangular	Probable beach/dune deposit (saturated or inundated)
10	Ia	0-50	Dark brown (7.5YR 3/3, dry) sandy clay loam; moderate, medium blocky to subangular blocky structure; slightly hard when dry; friable when moist; sticky and very plastic when wet; sand is fine in size, subrounded to subangular; 15-35% gravels and cobbles, subrounded to subangular; clear, wavy lower boundary	Surface fill
10	Ie	50-57	Yellow (10YR 7/6, wet) loamy sand, moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky to slightly plastic when wet; sand is fine in size, subrounded to subangular; clear, wavy lower boundary	Buried fill
10	IIIa	57-80	Dark brown (7.5YR 3/2, moist) silty clay loam; moderate, medium blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; clear, wavy lower boundary	Alluvial deposit
10	VIII	80 (BoE)	Coral limestone	Limestone bedrock
11	Ia	0-35	Dark brown (7.5YR 3/2, dry) silty clay loam; moderate, medium angular blocky to subangular blocky structure; friable when moist; slightly sticky and plastic when wet; sand is medium in size, subrounded to subangular; 15-35% gravels, subrounded to subangular; clear, wavy lower boundary	Surface fill
11	II	35-60	Dark reddish brown (2.5YR 3/4, dry) silty loam; durable, medium to very coarse blocky to subangular blocky; hard when dry; friable when moist; sticky and slightly plastic when wet; strong brown (7.5YR 6/5) many medium prominent mottles; abrupt, wavy lower boundary	Alluvial deposit
11	IIIa	60-120	Brown (7.5YR 4/3, moist) silty clay loam, moderate, medium blocky to subangular blocky; friable when moist; slightly sticky and slightly plastic when wet; dark red (2.5YR 3/4) many coarse distinct mottles	Alluvial deposit
11	VIII	120 (BoE)	Coral limestone	Limestone bedrock

APPENDIX B:
CATALOG LIST

Cat. No.	Trench No.	Provenience	Contents	Count
1	9	Layer Id (95 cmbs)	Glass fragment, amber	1
2.1	4	Layer Ia (57 cmbs)	Glass bottle fragment, amber	1
2.2	4	Layer Ia (57 cmbs)	Nail, wire	1
4	4	Layer IIIb (160-165 cmbs)	Botanical remains (wood)	-
5	8	Layer IIIb (225 cmbs)	Botanical remains (wood)	-
6	8	Layer IIIb (235 cmbs)	Botanical remains (wood)	-
9	8	Layer VIIa (240 cmbs)	Botanical remains (wood) intermixed with wetland sediment	-
14.1	2	Layer Ia (85-100 cmbs)	Porcelain vessel fragment, base	1
14.2	2	Layer Ia (85-100 cmbs)	Shell casing, centerfire	1
14.3	2	Layer Ia (85-100 cmbs)	Nail fragment, unknown	1
15	6	Layer Ia (150 cmbs)	Glass bottle fragment, amber	1
16	6	Layer Ia (150 cmbs)	Glass bottle fragment, finish and partial, neck, clear, 20th c.	1
19	7	Layer Ia (50 cmbs)	Glass fragment, flat, clear	1
20.1	11	Layer Ia (10-35 cmbs)	Copper wire	1
20.2	11	Layer Ia (10-35 cmbs)	Iron fragment	1

Appendix D
Architectural Inventory Survey Significance Evaluations

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
Classroom A	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom B	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom C	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom D	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Classroom E	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Library/ Classroom F	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation. Originally served as the school's library, later converted to a classroom.	
G (Cafeteria)	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
H (Administration)	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Kindergarten Classroom/ I	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
Six Classroom Building (J)/ Library	ca. 1970	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet & Janitor Storeroom/ K	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet/ L	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet/ M	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
Toilet/ N	ca. 1970	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century modern finger-plan elementary school developed in the post-World War II period to meet the needs of the baby boom generation.	
O	ca. 1994	Not eligible. Although this building was added to the campus ca. 1994 in a compatible manner and design, it does not meet the exceptional importance threshold under National Register Criteria Consideration G for individual listing, nor is it eligible as a contributing element. (Properties less than 50 years in age are not eligible for listing on the Hawaii Register.)	
P1	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.	

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
P2	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.	
P3	ca. 1967	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation.	
P4	ca. 1988	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
P5	ca. 1988	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
P6	ca. 1973	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register. Should be re-evaluated in 2023, when it reaches 50 years.	
P7	ca. 1973	Not eligible. Less than 50 years in age, so it does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register. Should be re-evaluated in 2023, when it reaches 50 years.	
PT-1	ca. 1965	Eligible under Criteria A and C as an added, but contributing element of an intact mid-century elementary school developed to meet the needs of the baby boom generation. Built on site by Hicks Construction Co.	

Table 1: Inventory Survey Significance Evaluations

Original Name/ Subsequent Name	Year Built	Significance Evaluation	Photo
P9	ca. 1992	Not eligible. Does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
P10	ca. 1997	Not eligible. Does not meet the exceptional importance threshold under National Register Criteria Consideration G. Properties less than 50 years in age are not eligible for listing on the Hawaii Register.	
Q	ca.1994	Not eligible. Although this building was added to the campus ca. 1994 in a compatible manner and design, it does not meet the exceptional importance threshold under National Register Criteria Consideration G for individual listing, nor is it eligible as a contributing element. (Properties less than 50 years in age are not eligible for listing on the Hawaii Register.)	
Sewage Lift Station	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the Post-war period to meet the needs of the baby boom generation.	
Electrical Room/ Transformer vault	1960	Eligible under Criteria A and C as a contributing element of an intact mid-century modern finger-plan elementary school developed in the Post-war period to meet the needs of the baby boom generation.	

Appendix E
ESA Section 7 Consultation Correspondence

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

5090
LFE/066-20

MAY 1 4 2020

Katherine Mullett
Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Office
300 Ala Moana Boulevard
Room 3-122, Box 50088
Honolulu, Hawaii 96850

SUBJECT: REQUEST FOR TECHNICAL ASSISTANCE FOR MŌKAPU ELEMENTARY SCHOOL CAMPUS IMPROVEMENT PROJECT AT MARINE CORPS BASE HAWAII, KANEOHE BAY, HAWAII

Dear Ms. Mullett,

In accordance with our obligations under Section 7(a)(2) of the Endangered Species Act (ESA), Marine Corps Base Hawaii (MCBH) requests concurrence on the federally-listed species potentially occurring within or near the proposed Mokapu Elementary School campus project (Figure 1). The State of Hawai'i, Department of Education (DOE) proposes redevelopment of the Mōkapu Elementary School (MES) , which was originally constructed in circa 1959 and located on a 14-acre site at Marine Corps Base Hawaii (MCBH) Kaneohe Bay (Figures 1, 2). The land underlying the school is owned by the United States of America and is leased to the State of Hawai'i, Department of Education (DOE) for school use.

Figure 1. Project location of the Mokapu Elementary School campus project.

Figure 2. Footprint of the Mokapu Elementary School campus project.

The proposed project will redevelop the existing school campus to provide approximately 162,000 square feet of floor area to include 2- and 3-story classroom, administration/library buildings; cafeteria; covered playcourt; playfield; and parking facilities. The redevelopment also includes related on- and offsite infrastructure improvements and utility connections. The project will be implemented in phases over an approximately 3-4-year period to minimize disruption to school activities and the learning environment. New construction would occur first, followed by demolition, once "swing space" is no longer needed. The project is in close proximity to the MCBH's Mokapu Central Drainage Channel (MCDC), a waterway that bisects the base.

MCBH requests concurrence on the following ESA listed species that occur or have the potential to occur within the proposed action area:

Common Name	**Scientific Name**
Hawaiian duck	*Anas wyvilliana*
Hawaiian stilt	*Himantopus mexicanus knudseni*

MCBH also requests technical assistance from the U.S. Fish and Wildlife Service Consultation to discuss the Mōkapu elementary school campus improvement project, potential impacts to ESA listed species and any applicable conservation measures or best management practices that could minimize effects of the action. A biological evaluation will be prepared and submitted to detail our analysis of the proposed action's impacts to ESA listed species.

5090
LFE/066-20

We look forward to receiving your concurrence with our species list and request your technical assistance in support of this project. If you need additional information, please contact Lance Bookless, MCBH (lance.bookless1@usmc.mil) at (808) 257-7000.

Sincerely,

T. B. POCHOP
Lieutenant Colonel, U.S. Marine Corps
Director, Environmental Compliance and Protection
Division, Facilities Department
By direction of the Commanding Officer

Copy to: Gail Renard, HHF Planners
Brenda Lowrey, State of Hawaii Department of Education

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2020-SL-0278

June 3, 2020

Lt. Colonel T.B. Pochop
U.S. Marine Corps
Director, Environmental Compliance and Protection Division,
Facilities Department
Marine Corps Base Hawaii
Box 63002
Kaneohe Bay, Hawaii 96863-3002

Subject: Species List and Technical Assistance for Mokapu Elementary School Campus Improvement Project, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii

Dear Lt. Colonel Pochop:

The U.S. Fish and Wildlife Service received your email, dated May 18, 2020, requesting a species list and technical assistance for the proposed Mokapu Elementary School Campus redevelopment project that will provide approximately 162,000 square feet of floor area to include 2- and 3-story classroom, administration/library buildings; cafeteria; covered playcourt; playfield and parking facilities. The project will be implemented in phases over an approximately 3- to 4-year period with new construction occurring first. The project is in close proximity to the MCBH's Mokapu Central Drainage Channel, a waterway that bisects the base.

This letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.), as amended (ESA). Based on this authority, we offer the following comments for your consideration. We have reviewed the information you provided and pertinent information in our files, as it pertains to listed species and designated critical habitat in accordance with section 7 of the ESA. There is no federally designated critical habitat within the immediate vicinity of the proposed project.

Our data indicate the following federally listed species may occur or transit through the vicinity of the proposed project area: endangered Hawaiian stilt (*Himantopus mexicanus knudseni*); endangered Hawaiian gallinule (*Gallinula chloropus sandvicensis*); endangered Hawaiian coot *Fulica alai*); endangered Hawaiian duck (*Anas wyvilliana)*; endangered Hawaiian hoary bat (*Lasiurus cinereus semotus)*; endangered Hawaiian petrel (*Pterodroma sandwichensis*); threatened Newell's shearwater (*Puffinus auricularis newelli*); and, endangered Hawaii distinct population segment (DPS) band-rumped storm petrel (*Oceanodroma castro*). Please see the

enclosed list of recommended avoidance, minimization, and conservation measures for these listed species and best management practices for work in aquatic environments (Enclosures).

We appreciate your efforts to conserve threatened and endangered species and their habitats. If you have questions regarding this response, please contact James Kwon, Fish and Wildlife Biologist (phone: 808-792-9433, email: James_Kwon@fws.gov). When referring to this project, please include this reference number: 01EPIF00-2020-SL-0278.

Sincerely,

DARREN LEBLANC Digitally signed by DARREN LEBLANC Date: 2020.06.03 07:19:29 -10'00'

Darren LeBlanc
Planning and Consultation Team Leader

Enclosures

Enclosure 1. Avoidance, Minimization, and Conservation Measures for Listed Animals

Endangered Hawaiian waterbirds (Hawaiian stilt, *Himantopus mexicanus knudseni*; Hawaiian coot, *Fulica alai*; Hawaiian gallinule, *Gallinula galeata sandvicensis*; Hawaiian duck, *Anas wyvilliana*): Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards.

Based on the project details provided, our information suggests that your project may result in standing water or the creation of open water, thus attracting Hawaiian waterbirds to the site. In particular, the Hawaiian stilt is known to nest in sub-optimal locations (e.g. any ponding water), if water is present. Hawaiian waterbirds attracted to sub-optimal habitat may suffer adverse impacts, such as predation and reduced reproductive success, and thus the project may create an attractive nuisance. Therefore, we recommend you work with our office during project planning so that we may assist you in developing measures to avoid impacts to listed species (e.g., fencing, vegetation control, predator management).

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following applicable measures into your project description:

- In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see Enclosure 2).
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Endangered Hawaiian petrel (*Pterodroma sandwichensis*), Threatened Newell's shearwater (*Puffinus auricularis newelli*), and Endangered Hawaii DPS of the band-rumped storm petrel (*Oceanodroma castro*): Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased

mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following applicable measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

Endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*): The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away. Additionally, Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

Enclosure 2. U.S. Fish and Wildlife Service Recommended Standard Best Management Practices for Working in Aquatic Environments

The U.S. Fish and Wildlife Service (USFWS) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the USFWS, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the USFWS Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.

2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.

3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see http://www.haccp-nrm.org/Wizard/default.asp) can help to prevent attraction and introduction of non-native species.

5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.

6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.

7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEOHE BAY HAWAII 96863-3002

IN REPLY REFER TO:
5090
LFE/125-20
28 Oct 20

Ms. Katherine Mullet
Field Supervisor
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, Hawaii 96850-5000

Dear Ms. Mullet:

Subject: SECTION 7 ENDANGERED SPECIES ACT INFORMAL CONSULTATION FOR THE MŌKAPU ELEMENTARY SCHOOL CAMPUS REDEVELOPMENT PROJECT AT MARINE CORPS BASE HAWAII, KANEOHE BAY, HAWAII.

Pursuant to Section 7(a)(2) of the Endangered Act (ESA) and its implementing regulations [50 CFR Part 402], Marine Corps Base Hawaii (MCBH) and as identified in previous correspondence USFWS Log # 01EPIF00-2020-SL-0278, MCBH requests informal Section 7 consultation related to the State of Hawaii, Department of Education (DOE) proposal to redevelop the Mōkapu Elementary School, which was originally constructed circa 1959 and located on a 14-acre site on Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The land underlying the school is owned by the United States of America and is leased to the State of Hawaii Department of Education for school use.

MCBH has developed this Biological Evaluation (BE) to assess potential impacts to endangered Hawaiian stilt (*Himantopus mexicanus knudseni*); endangered Hawaiian gallinule (*Gallinula chloropus sandvicensis*); endangered Hawaiian coot (*Fulica alai*); endangered Hawaiian duck (*Anas wyvilliana*); endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); endangered Hawaiian petrel (*Pterodroma sandwichensis*); threatened Newell's shearwater (*Puffinus auricularis newelli*); and, endangered Hawaii distinct population segment (DPS) band-rumped storm petrel (*Oceanodroma castro*).

Based on the evaluation presented in this BE, MCBH has made the determination that construction of the proposed Mokapu Elementary School redevelopment may affect, but is not likely to adversely affect (NLAA) the endangered Hawaiian waterbirds and seabirds, and the Hawaiian hoary bat. MCBH requests your concurrence with our finding based on the provided BE.

Please direct correspondence regarding this matter to Lance Bookless, MCBH Senior Natural Resource Manager at lance.bookless1@usmc.mil, (808) 257-7000.

Sincerely,

POCHOP.TIMOTHY.BOWES.1160589589

Digitally signed by POCHOP.TIMOTHY.BOWES.1160589589
Date: 2020.10.28 09:13:33 -10'00'

T. B. POCHOP
Lieutenant Colonel, U.S. Marine Corps
Director, Environmental. Compliance and
Protection Division, Facilities Department
By direction of the Commanding Officer

Enclosure: 1. Biological Evaluation of the MCBH Mokapu Elementary School Redevelopment Project

Biological Evaluation for the Marine Corps Base Hawaii
Mokapu Elementary School Redevelopment Project, Kaneohe Bay, Oahu.

Prepared by:
Marine Corps Base Hawaii
Environmental Compliance and Protection Division
Facilities Department

October 2020

ENCLOSURE (1)

Table of Contents

1.0 Introduction…….. 3
1.1 Description of the Action Area…… 3
1.2 Species Addressed in the Biological Evaluation……. 4
1.3 Species eliminated from the detailed analysis……. 5
2.0 Details of the Proposed Action……..... 5
3.0 Description of the Species and Baseline Conditions……... 6
3.1 Hawaiian duck (Anas wyvilliana)……... 7
3.2 Hawaiian coot (Fulica alai)……. 7
3.3 Hawaiian stilt (Himantopus mexicanus knudseni)……. 8
3.4 Hawaiian gallinule (Gallinula chloropus sandvicensis)……..... 8
4.0 Critical Habitat…… 9
5.0 ESA Effects Analysis..... 9
5.1 Equipment and Human Activity ……... 10
5.2 Noise..... 10
5.3 Tree removal..... 10
5.2 Fencing..... 10
5.3 Standing water..... 10
6.0 Conservation Measures..... 10
7.0 Works Cited..... 11

1.0 Introduction

The purpose of the Proposed Action is to provide State of Hawai‘i Department of Education (HIDOE) public school facilities that meet current and projected functional and space requirements and offer a supportive learning environment for pre-kindergarten through sixth grade students at MCBH Kaneohe Bay. Mōkapu Elementary School is located on a 14-acre site owned by the federal government at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The action would essentially replace or upgrade the existing school with a modern equivalent school on the same site that would meet 21st century design and technology standards. Construction is planned to commence in 2021, with the first phase completed by the start of the 2023-2024 school year. Facility Condition Assessments of Mokapu Elementary School (Mokapu ES) facilities were conducted by the Department of Defense Education Activity (DoDEA) in 2011 and updated in 2018. Although the assessments found that the school was well maintained and provided a good learning environment, it also determined that the school was in poor condition based on school capacity, spatial adequacy, and technology readiness. In addition, multiple buildings were determined to have exceeded their effective service life. Accordingly, Mōkapu ES was placed on a prioritized list of schools at military installations that were eligible for funding and in need of facility improvements.

The project is needed to remedy existing over-capacity conditions and facility deficiencies at Mōkapu ES, accommodate its projected enrollment, and provide infrastructure capacity to meet modern technology and climate control requirements. An analysis of permanent building floor area showed that Mōkapu ES is 42% below HIDOE’s program requirement for instructional area. The DoDEA’s 2018 condition assessment rated the school as being in “poor condition,” which resulted in Mōkapu ES being ranked as the 33rd highest priority among schools on U.S. military installations by the DoD-OEA.

1.1 Description of the Action Area

The project site is the 14 acre Mokapu Elementary School campus (Figure 1) located in the center of Marine Corps Base Hawaii (MCBH). Existing school structures include an administration building, a library, a cafeteria, nine classroom buildings, and four restroom structures with a combined floor area of approximately 60,000 gross square feet. Nine portable classroom buildings, four playgrounds, two play courts, two basketball courts, a dirt race track, paved parking areas and a sewer pump station are also located on the site (Figure 2). The school campus is bounded to the south by Mōkapu Road, Mōkapu Central Drainage Channel to the west and to the north and east by residential housing. The campus is relatively flat with little change in elevation. As with most urban areas in the Hawaiian Islands, the natural habitat has been altered and is dominated by introduced plant species. The majority of the project area is characterized by landscaped ornamental trees and maintained lawn area with courtyard plantings of ornamental shrubs and food plants within the classroom building areas. Land uses in the surrounding area include family housing, recreational facilities, and headquarters, operations, logistics, and training facilities.

Figure 1. Location of the Mokapu Elementary School campus project on MCBH

Figure 2. Current footprint of the Mokapu Elementary School campus project.

1.2 Species Addressed in the Biological Evaluation

The endangered species known to be within the action area and covered in the scope of this BE are listed below.

Table 1. Species and affects determination covered under this consultation.

Common Name	Scientific Name	ESA Status	Affects Determination
Hawaiian duck	*Anas wyvilliana*	Endangered	May affect, not likely to adversely affect
Hawaiian coot	*Fulica alai*	Endangered	May affect, not likely to adversely affect
Hawaiian gallinule	*Gallinula chloropus sandvicensis*	Endangered	May affect, not likely to adversely affect
Hawaiian stilt	*Himantopus mexicanus knudseni*	Endangered	May affect, not likely to adversely affect

Our determination of may affect, but not likely to adversely affect (NLAA) for the above identified waterbird species was based on our effects determination that the action is discountable and the effects will not reach the scale in which take would occur. We also determined there will be "no effect" on the hoary bat as there is no suitable habitat nearby or within the project footprint to attract bats.

1.3 Species eliminated from detailed analysis

MCBH requested concurrence on a prepared species list on May 14, 2020. The USFWS concurred with the species list (document # 01EPIF00-2020-SL-0278) on June 3, 2020 and included the endangered Hawaiian petrel (*Pterodroma sandwichensis*), threatened Newell's shearwater (*Puffinus auricularis newelli*), and Hawaii distinct population of endangered band-rumped storm petrel (*Oceanodroma castro*). MCBH has reviewed the suggested additional species and has made a "no effect" determination for these three species.

MCBH's determination of "no effect" for the Hawaiian petrel (*Pterodroma sandwichensis*), the Newell's shearwater (*Puffinus auricularis newelli*), and Hawaii distinct population of endangered band-rumped storm petrel (*Oceanodroma castro*) is based on three decades of multiple yearly bird counts. MCBH natural resources collects and records data on waterbirds, seabirds, and shorebirds annually (State of Hawaii bi-annual waterbird counts, Hawaiian Audubon Society Christmas Bird count), including wedge-tailed shearwater fallout data during fledging season. We also require researchers given access to our wetlands and wildlife management areas to document any unusual or unfamiliar avian species observed. MCBH has not collected or documented the presence of Hawaiian petrels, Newell's shearwaters, or Band-rumped storm petrels on the installation in over 30 years of bird surveys on the Mokapu peninsula. Therefore, these species are not considered in this consultation.

2.0 Details of the Proposed Action

The proposed action will provide approximately 162,000 square feet (sq ft) of floor area in new facilities that meet current and projected facility requirements for a design enrollment of 975 students. The school will be built just north of its current location in what is now an open lawn play field (Figure 3). The conceptual plan envisions five new permanent buildings would be constructed (this number could change in the design process) in two major phases in the north half of the site, generally over the existing playfield. The new buildings would include two classroom buildings, 2-story and 3-story, with 56 classrooms (Buildings B1), an administration/library/media center (Building A), cafeteria (Building C), and covered play court

(Building 27 D). The existing 16 permanent school buildings (including library, cafeteria, and administration buildings) and 10 temporary buildings would be demolished, and a large playfield, driveway, and expanded surface parking would be established in their place at the south end of the site along the Mōkapu Road. The redevelopment project will also include related on- and off-site infrastructure improvements and utility connections. The project will be implemented in phases over a three, to four-year period, to minimize disruption to school activities and the learning environment. Construction is planned to begin in 2021, with the first phase completed by the 2023-2024 school year.

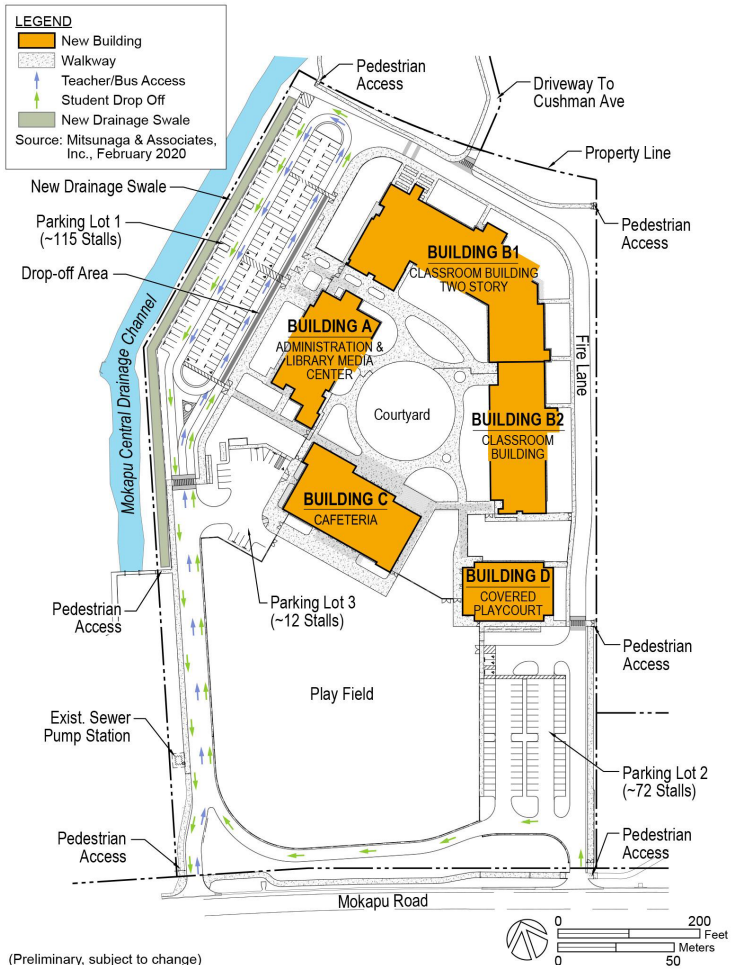


Figure 3. Preferred new site plan

3.0 Description of the Species and Baseline Conditions

While four federally listed-species, the Hawaiian duck, Hawaiian coot, Hawaiian gallinule and Hawaiian stilt may occur either within the Mokapu Central Drainage Channel (MCDC) that borders the project site to the west or the open lawn area located within the vicinity of the proposed action area; the more commonly found listed species are the Hawaiian duck and Hawaiian stilt. Species status are descripted below.

3.1 Hawaiian duck (*Anas wyvilliana*)

The Hawaiian duck was listed as endangered 1967 (USFWS 2011). Hawaiian ducks are known to occur on all the main Hawaiian Islands except for Lanai and Kahoolawe (USFWS 2011). Both sexes resemble a dark female mallard, mottled brown with blue wing bars bordered on both sides by white. Males have darker head and neck feathers, an olive colored bill, bright orange feet and legs. Females have a more orange or gray colored bill with a dark mark on the upper ridge, feet and legs that are dull orange, and are smaller in size. Data indicate that there has been extensive hybridization between Hawaiian ducks and feral mallards on Oahu. There is often difficulty distinguishing genetically pure Hawaiian ducks (*Anas wyvilliana*) from true mallards (*Anus platyrhynchos*) and Hawaiian duck mallard hybrids, although mallards and hybrids tend to be larger. Hawaiian ducks occupy coastal wetlands, freshwater pools, bogs, streams, and marshy areas. They prefer shallow water with nearby dense cover (MCBH 2017).

Threats

Currently, the largest threat to Hawaiian duck populations is hybridization with non-native mallards. This is especially problematic on O‘ahu where most individuals are hybrids. In addition, feral pigs (*Sus scrofa*) significantly reduce the suitability of nesting habitat for Hawaiian ducks (DLNR 2015).

Population Status

The estimated Oahu population is 300 individuals including Hawaiian duck hybrids (USFWS 2011). From 2007 to the present, an average of 95 Hawaiian duck-mallard hybrids have been observed during the MCBH base-wide waterbird counts (MCBH 2017 INRMP). During the August 2020 state waterbird count, 38 Hawaiian duck-mallard hybrids were observed in the wetlands next to the project footprint (MCBH unpublished data 2019).

3.2 Hawaiian coot *(Fulica alai*)

The Hawaiian coot was listed as endangered in 1970 (USFWS 2011). The Hawaiian coot is a small waterbird with a black head, a solid grayish-black body, a white bill, a prominent white frontal shield and white tail feathers that are easily seen when the bird is swimming or displaying. Feet are lobed (not webbed) and are greenish-gray. Hawaiian coots occur on all of the main Hawaiian Islands except Kahoolawe, which lacks suitable wetland habitat. Hawaiian coots generally occur in lowland freshwater wetland habitats consisting of a mixture of emergent plant growth with open water. Occasionally they use brackish and saltwater habitats. They typically forage in shallow water (less than 12 inches), but will dive in water up to 48 inches deep (MCBH 2017). Nesting occurs year round but prime nesting season is between March and September (MCBH 2017).

Threats

The decline in Hawaiian coots has been contributed to being preyed on by a large number of introduced predators, including cats, dogs, mongooses, rats, fish such as the large-mouth bass (Micropterus sp.), bullfrogs (Rana catesbeiana), and possibly cattle egrets (Bubulcus ibis) (Shallenberger 1977, Berger 1981, Brisbin et al. 2002). The indigenous black-crowned night

heron (Nycticorax nycticorax) may also be a serious predator of Hawaiian coot chicks (Brisbin et al. 2002). The alteration of wetland plant communities due to invasion by non-native plants can greatly reduce the usefulness of wetland areas for native waterbirds.

Population

The Oahu population of Hawaiian coots fluctuates between 500 and 1,000 birds (USFWS 2011). Up until Dec 2018, average HACO yearly count numbers on MCBH averaged 20-25 waterbirds. During the August 2020 state waterbird count, 175 coots were observed in the Nu'upia Ponds complex. The largest part of the coot population resides in Pa‘akai and Kaluapuhi ponds (MCBH unpublished data 2019). Opportunistic sightings of HACO in the Mokapu Central Drainage Channel near the project site have only occurred once or twice in the past 30 years.

3.3 Hawaiian stilt (*Himantopus mexicanus knudseni*)

The Hawaiian stilt was listed as endangered in 1970. They are known to occur on all the main Hawaiian Islands except for Kahoolawe (USFWS 2011). Hawaiian stilts utilize fresh, brackish and coastal waters. They use little vegetation for nesting or feeding and breed in marshland, mudflats, shallow open water, flooded fields, borders of salt ponds, mangrove swamps, coastal wetlands and ephemeral wetlands. They require low-growing vegetation with specific water depths of around five inches for optimal foraging (MCBH 2017).

Threats

The decline in Hawaiian stilt has been contributed to predators of that include mongooses, black rats (Rattus rattus), at-large cats, feral dogs, black-crowned night herons, cattle egrets, Hawaiian short-eared owl or pueo (Asio flammeus sandwichensis), and common mynas (Acridotheres tristis) (Coleman 1981, Robinson et al. 1999). The alteration of wetland plant communities due to invasion by non-native plants can greatly reduce the usefulness of wetland areas for native waterbirds. A significant amount of Hawai`i's wetlands have been filled or otherwise modified and are now occupied by hotels, housing developments, golf courses, shopping centers, landfills, military installations, highways, and industrial sites.

Population

The DLNR Statewide bi-annual waterbird surveys from 1998 through 2007 has counted an average of 1,484 stilts with fluctuations between 1,100 and 2,100 birds. The population has recovered to the point that it is being considered for down-listing to threatened status.

At MCBH, an average of 100 stilts have been counted during annual waterbird surveys conducted in the wetlands of MCBH. Stilts are frequently seen foraging in open lawn areas to include the Mokapu Elementary School grounds and along the adjoining Mokapu Central Drainage Channel (L. Bookless, Pers Obs).

3.4 Hawaiian gallinule (*Gallinula galeata sandvicensis*)

The Hawaiian gallinule was listed as endangered 1967 (USFWS 2011). Gallinules are generally found on Kauai and Oahu only, with some occurrences on Hawaii Island (USFWS 2011).

The Hawaiian gallinule is black on the top portion of its body with dark slate blue below and a white stripe on the flanks. They have a red frontal shield over their red and yellow tipped bill and their feet are lobed rather than webbed. They are found in freshwater marshes, wetland agricultural areas, reservoirs, wet pastures, and occasionally brackish water. Nesting habitat is restricted to areas of standing freshwater less than two feet deep with dense emergent vegetation. Nesting occurs year round, but mainly takes place during spring and summer months. Floating nests are constructed in dense vegetation (MCBH 2017).

Threats

The decline in Hawaiian gallinules has been contributed to agricultural development, along with residential and recreational development, adversely affected the Hawaiian common moorhen through modifications of channel and shorelines, increased siltation, filling of wetlands, stabilizing water levels in some areas and causing fluctuations or flooding in other areas.

Population

The Department of Land and Natural Resources (DLNR) Statewide waterbird survey has counted an average of 287 gallinules over 10 years from 1998 to 2007 (USFWS 2011). Gallinules are widely distributed across Oahu and prevalent across the northern and eastern shoreline form Haleiwa to Waimanalo. Small numbers exist in Pearl Harbor and Lualualei Valley.

At MCBH, up until December 2019, the average count of gallinules during annual waterbird surveys is 15-20 birds with the largest population occurring in the Klipper Golf Course ponds. A small number of gallinules are found within the Nu'upia Ponds Wildlife Management Area in the northeastern portion of Nu‘upia Ekolu, Wai Puna, and the northwestern edge of Pa‘akai. In 2020, gallinules were observed in Base wetlands not previously seen before; however, it is unclear if these are birds simply moving around the base or they indicate an increase in numbers of gallinules – future bird surveys and a Hawaiian coot and gallinule study that will be contracted in FY2021 may provide an answer this question.

4.0 <u>Critical Habitat</u>. All areas on MCBH Kaneohe Bay have been precluded from designation as Critical Habitat for all endangered species on MCBH due to the conservation measures included in the MCBH INRMP and based on those areas being managed in a way that provides a benefit to the various federally-listed species.

5.0 ESA Effects Analysis

In analyzing effects to ESA-listed species, we considered the project's effects from construction activity on the four endangered waterbird species and their habitat and the re-installation of fencing around the school campus. The proposed project area represents an insignificant portion of the geographic range of all four species – Hawaiian stilt, Hawaiian duck, Hawaiian coot and Hawaiian gallinule. The project is being constructed far from the known foraging and breeding habitat of these waterbirds. The area around the project site is only used for opportunistic foraging. Displaced ESA species will likely move across the street from the project site where there is open lawn or along the drainage channel that adjoins the project site. The only waterbirds

that frequently forage on or near the school grounds are the Hawaiian stilt and duck. The area is too open and busy to attract the secretive Hawaiian coot and gallinule.

5.1 Equipment and Human Activity

Equipment and human activity would disturb loafing and foraging Hawaiian stilts which are commonly present on the playfield within the campus grounds and Hawaiian ducks that forage in the adjoining MCDC, as well the lawn area and cause them to displace. Possible injury by construction equipment could occur as the open areas may attract foraging stilts and ducks; however, the construction contractor will be educated through educational literature and a briefing regarding how to address this situation and the appropriate response. It will be the contractor's responsibility to act responsibly and with caution when operating around foraging birds. There is no suitable nesting habitat for any of the federally-listed species within the project footprint or expected to be following build-out and operation of the school. Bird counts conducted over the last 30 years never discovered any nesting activity. There is ample suitable habitat for foraging and breeding within the bases many wetlands to include the 517 acre Nu'upia Ponds Wildlife Management Area (WMA).

5.2 Noise

Noise disturbance will be temporary and of short duration.

5.3 Tree removal

Several mature invasive trees will be removed during the construction of the school. No trees on the project site 15 feet or taller will be removed between June 1 and 15 Sep to avoid potential disturbance during pupping season to the endangered hoary bat.

5.4 Fencing

None of the fencing, being re-installed around the campus grounds or newly installed as a protective safety measure around the drainage swale developed to capture storm water, will have barbed wire installed on top of it.

5.5 Standing water

The proposed project will be clearing open lawn area. As a result, construction operations could create depressions that could retain water, which would become an attractive nuisance to endangered waterbirds. During Hawaii's winter season when rains are more frequent, puddles of standing water could unintentionally attract waterbirds to the site for nesting or foraging. As such, the contractor will take all reasonable actions to rid the construction area of standing pools of water as soon as they are discovered.

6.0 Conservation Measures

To summarize, the following avoidance, minimization, and conservation measures are consistent with the Marine Corps Base Hawaii Integrated Natural Resources Management Plan and are proposed to reduce construction-related effects associated with the Mokapu ES redevelopment:

- A qualified biological monitor, who has the requisite natural resources background, will develop an Endangered Species Awareness field guide that identifies the listed species that

could occur within the general project areas, distribute it to those involved in the project, and will provide a brief to the project personnel and contractors. The brief will include but not be limited to describing the federally-listed species within and adjacent to the project site, identify precautions to take when operating machinery around foraging birds, identify who to notify in the event of an injury or death of one of the species of concern, and describe actions to take to reduce attracting birds to the construction site to ensure that construction activities do not result in adverse impacts to listed species.

- The contractor will quickly eliminate standing water found on the construction site.

- No trees on the project site 15 feet or taller will be removed between June 1 and Sep 15 to avoid potential disturbance during pupping season to the endangered hoary bat.

Based on the impact analysis and with implementation of the proposed avoidance and minimization measures, MCBH has made the determination that the redevelopment of the Mokapu Elementary School **may affect, but is not likely to adversely affect (NLAA)** the four federally-listed Hawaiian waterbirds - the Hawaiian duck, Hawaiian coot, Hawaiian gallinule and Hawaiian. MCBH requests concurrence with these determinations.

7.0 Works Cited

Department of Land and Natural Resources (DLNR). 2015. Hawaii's State Wildlife Action Plan. Prepared by H.T. Harvey & Associates, Ecological Consultants, Honolulu, Hawaii. http://dlnr.hawaii.gov/wildlife/files/2015/07/SWAP-2015-Pub-draft.pdf

Gon, S.M. III, L. Honingman, D. Zevin, W. Fulks, and R.E. David. 1993. Vertebrate Inventory Surveys at the Multipurpose Range Complex, Pohakuloa Training Area, Island of Hawaii.

Gorresen et al. 2013. A Five-Year Study of Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) Occupancy on the Island of Hawaii. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo. U.S. Geological Survey, Pacific Island Ecosystem Research Center, Kilauea Field Station.

Koob, A. Gregory. 2012. "Farmers Can Help our Hawaiian Hoary Bats." Hanai Ai/The Food Provider.

LeGrande Biological Surveys, Inc. 2020. Biological Surveys Conducted for Mōkapu Elementary School Campus Improvements Project, Mōkapu District, Island of O'ahu

Marine Corps Base Hawaii. 2017. Marine Corps Base Hawaii Integrated Natural Resources Management Plan Update (2017-2021). Prepared by Sustainable Resources Group International, Inc.

U.S. Fish and Wildlife Service (USFWS). 1998. Recovery for the Hawaiian Hoary Bat. U.S. Fish and Wildlife Service, Portland, OR. 50 pp.

U.S. Fish and Wildlife Service (USFWS). 2010. Biological Opinion for Formal Endangered Species Section 7 Consultation on the US Department of Energy Federal Load Guarantee to Kahuku Wind Power. U.S. Fish and Wildlife Service, Honolulu, HI.

U.S. Fish and Wildlife Service (USFWS). 2011. Recovery for Hawaiian Waterbirds, Second Revision. U.S. Fish and Wildlife Service, Portland, OR.,233pp.

Appendix F
CZMA Correspondence

DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR, HAWAII 96860-5101

5090
Ser N4/ 04163
01 JUN 2009

CERTIFIED MAIL NO. 7007 2560 0002 0326 9580

Mr. Abbey Mayer
Office of Planning
Department of Business, Economic
Development and Tourism
P. O. Box 2359
Honolulu HI 96804

Dear Mr. Mayer:

SUBJECT: REQUEST FOR CONCURRENCE WITH MODIFICATIONS TO THE DEPARTMENT OF THE NAVY DE MINIMIS ACTIVITIES UNDER THE COASTAL ZONE MANAGEMENT ACT (CZMA)

This letter is to request your concurrence with the attached list of Navy/Marine Corps de minimis activities under the CZMA. The attached de minimis list will amend the current de minimis list which was established on April 2, 2007. The new de minimis list will include the Marine Corps, and will cover areas in the Pearl Harbor Naval complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station Pacific, Pacific Missile Range Facility on Kauai, Kaneohe Marine Corps Base Hawaii, Camp Smith and all associated installations/facilities/equipment located outside of those Navy/Marine Corps properties.

The Navy and Marine Corps have determined that the listed Proposed Actions have insignificant direct or indirect (cumulative and secondary) coastal effects and should therefore be categorized as de minimis in accordance with the Department of Commerce, National Oceanic and Atmospheric Administration, CZMA Federal Consistency Regulations 15 CFR part 930.33 (3). With the corresponding mitigation and conditions applied, these actions would be exempt from a negative determination or a consistency determination from the State of Hawaii.

Should you have any questions, please contact Mr. Brian Yamada at 472-1449, by facsimile transmission at 474-5419, or by email at brian.yamada@navy.mil.

Sincerely,

E. J. D'ANDREA
Lieutenant Commander, CEC, U. S. Navy
Assistant Regional Engineer
By direction of the
Commander

Enclosure: 1.Navy De minimis Activities Under CZMA

Navy/Marine Corps De Minimis Activities Under CZMA

***covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF), Kaneohe Marine Corps Base Hawaii, Camp Smith, and all associated installations/facilities/equipment located outside of these Navy/Marine Corps properties**

No.	Proposed Action	Description	Mitigation / Conditions
1	New Construction	Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.	1, 3, 6, 8, 9, 10, 11, 13, 14, 16
2	Utility Line Activities	Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.	1, 10, 11, 12, 14, 16
3	Repair and Maintenance	Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.	12, 14, 16
4	Aids to Navigation	Includes buoys, beacons, signs, etc. placed within Navy/Marine Corps controlled coasts and navigable waters as guides to mark safe water.	2, 5, 14, 16
5	Structures in Fleeting and Anchorage Areas	The installation of structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels within Navy/Marine Corps controlled property.	2, 5, 14, 16
6	Oil Spill and Hazardous Waste Cleanup	Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy/Marine Corps controlled property.	1, 8, 14, 16
7	Maintenance Dredging	Excavation and removal of accumulated sediment for maintenance to previously authorized depths.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
8	New Dredging	Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy/Marine Corps controlled property. This does not include dredging or degradation through coral reefs.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
9	Scientific Measuring Devices	The installation of devices which record scientific data (staff gages, tide gages, water recording devices, water quality testing and improvement devices and similar structures) on Navy/Marine Corps controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.	1, 2, 14, 16
10	Studies and Data Collection and Survey Activities	Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.	2, 3, 6, 8, 9, 11, 12, 13, 14, 16
11	Demolition	Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.	1, 11, 12, 14, 16
12	Military Testing and Training	Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.	9, 13, 14, 15, 16
13	Real Estate/Property Transfer	Real estate acquisitions or outleases of land involving new ingrants/outgrants and/or 50 acres or more where existing land use will change.	14, 16

ENCLOSURE(1)

14	Mission Changes	Mission changes, base closures/relocations/consolidations, and deployments that would cause long term population increases or decreases in affected areas.	14, 16
15	Limitation of Access to Property	Permanent closure or limitation of access to any areas that were open previously to public use, such as roads or recreational purposes (provided the access is not required by established agreements with State of Hawaii, private industry, etc.)	14, 16
16	Environmental Management Activities	Environmental management activities within Navy/Marine Corps controlled areas including, but not limited to, activities such as vegetation and mangrove removal, ditch clearing, sediment removal, invasive species removal, construction related to protecting endangered species and wildlife, and actions prescribed by the Integrated Natural Resources Management Plan (INRMP)	2, 13, 14, 16
17	Towers	Installation, operation, and maintenance of towers (such as communication towers, cellular phone antennas, wind-energy towers) within Navy/Marine Corps controlled areas.	1, 2, 6, 8,9 , 12, 13, 14, 16
18	Alternative Energy Research	Installation, operation, replacement, and removal of alternative energy research structures/equipment taking place within Navy/Marine Corps controlled areas.	1, 2, 3, 5, 6, 12, 13, 14, 16
19	Army Corps Nation Wide Permits	Work subject to an Army Corps of Engineers Nationwide permit (which are applicable to Hawaii)	16

Project Mitigation / General Conditions

1) Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.
2) If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.
3) Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
4) Dredging/filling in the marine/aquatic environment shall be scheduled to avoid coral spawning and recruitment periods.
5) All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
6) No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
7) All debris removed from the marine/aquatic environment shall be disposed of at an upland site or EPA approved ocean disposal site, and Best Management Practices shall be followed.
8) No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.
9) Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
10) Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
11) Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hyrdroseeding, etc.).
12) Section 106, of the National Historic Preservation Act (NHPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.
13) Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.
14) The National Environmental Policy Act (NEPA) review process will be completed.
15) The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
16) Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA). Notification can be sent via email: to JNakagaw@dbedt.hawaii.gov

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12644

July 9, 2009

Lieutenant Commander E. J. D'Andrea
Assistant Regional Engineer
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Attention: Mr. Brian Yamada

Dear Lt. Commander D'Andrea:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Concurrence with Modifications to the Department of the Navy De Minimis Activities in Hawaii under the Coastal Zone Management Act (CZMA)

The Hawaii CZM Program has completed the federal consistency review of the proposed modifications to the list of Department of the Navy de minimis activities under the CZMA, including changes to various activity categories, adding new activity categories, and expanding the coverage to Marine Corps Base Hawaii Kaneohe Bay and Camp Smith. The CZM Program conducted a thorough review of the request and a public notice of the CZM review was published in the State of Hawaii Office of Environmental Quality Control's publication, *The Environmental Notice*, on June 23, 2009. The public was provided an opportunity to participate in the review through July 7, 2009. There were no public comments received.

We concur that the activities identified on the modified list entitled, "Navy/Marine Corps De Minimis Activities Under CZMA" are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects, and should not be subject to further review by the Hawaii CZM Program on the basis and condition that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions."

The Hawaii CZM Program reserves the right to review, amend, suspend, and/or revoke the "Navy/Marine Corps De Minimis Activities Under CZMA" list whenever it finds that a listed activity or activities will have reasonably foreseeable coastal effects. CZM consistency

concurrence does not convey approval with any other regulations administered by any State or County agency.

Modifying and expanding the list of Navy de minimis activities under the CZMA was a cooperative effort between our Office and Mr. Brian Yamada from the Department of the Navy, who interned with the Hawaii CZM Program in September 2008. We appreciate the efforts of Mr. Yamada in working with our CZM staff. The de minimis activities list will result in more efficient compliance with CZMA federal consistency requirements for both the Navy and the Hawaii CZM Program.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch (w/ copy of de minimis list)
Ms. Rebecca Hommon, Region Counsel, Navy Region Hawaii

From:	Bomar CIV Jacquelyn C
To:	john.d.nakagawa@hawaii.gov
Cc:	Frantz CIV Christopher T
Subject:	Notification of Proposed Mōkapu Elementary School Campus Improvements Project as Navy/Marine Corps De Minimis Activities under CZMA
Date:	Monday, October 19, 2020 9:28:00 AM

Aloha Mr. Nakagawa,

The US Marine Corps along with the State of Hawaiʻi Department of Education (HIDOE) as a cooperating agency are preparing an Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality regulations and Navy regulations for implementing the National Environmental Policy Act and Hawaiʻi Revised Statutes Chapter 343 in accordance with the requirements of Chapter 343, Hawaiʻi Revised Statutes (HRS), as amended, and Hawaiʻi Administrative Rules, Title 11, State of Hawaiʻi Department of Health (DOH).

HIDOE proposes to construct campus improvements at Mōkapu Elementary School (Mōkapu ES), located on a 14-acre site owned by the federal government at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The action would essentially replace or upgrade the existing school with a modern equivalent school on the same site that would meet 21st century design and technology standards. Construction is planned to commence in 2021, with the first phase completed by the start of the 2023-2024 school year.

The Preferred Alternative would replace all existing Mōkapu ES facilities with approximately 162,000 square feet (sq ft) of floor area in new facilities that meet current and projected facility requirements for a design enrollment of 975 students. The conceptual plan envisions five new permanent buildings would be constructed (this number could change in the design process) in two major phases in the north half of the site, generally over the existing playfield. The new buildings would include two classroom buildings with 56 classrooms (Buildings B1 [2-story] and B2 [[3-story]), an administration/library/media center (Building A), cafeteria (Building C), and covered play court (Building D). The existing 16 permanent school buildings (including library, cafeteria, and administration buildings) and 10 temporary buildings would be demolished, and a large playfield, driveway, and expanded surface parking would be established in their place at the south end of the site along the Mōkapu Road frontage. Because the new classroom buildings would be constructed on a section of campus that has no existing buildings, this alternative would allow the existing school to remain operational during the approximately three- to four-year construction period.

The Proposed Action falls within the Navy/Marine Corps De Minimis Activities Under CZMA, Item #1, New Construction:

"Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements".

The relevant project mitigation/general conditions under the De Minimis agreement for New Construction actions are: 1, 3, 6, 8, 9, 10, 11, 13, 14, 16:

1. Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.

3. Turbidity and siltation from project related work will be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

6. No project-related materials (fill, revetment, rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).

8. No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.

9. Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms will be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.

10. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

11. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).

13. Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the ESA.

14. The NEPA review process will be completed.

16. Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an EA.

Please contact me if you have any questions by email or call.

V/R,

Jackie Bomar
NEPA Program Manager
Environmental Compliance and Protection Division
MCBH Kaneohe Bay
Cell (due to teleworking): 336-202-2525

Jacquelyn.bomar@usmc.mil

From:	Nakagawa, John D
To:	Bomar CIV Jacquelyn C
Cc:	Frantz CIV Christopher T; Nihipali, Justine W
Subject:	[Non-DoD Source] Re: Notification of Proposed Mōkapu Elementary School Campus Improvements Project as Navy/Marine Corps De Minimis Activities under CZMA
Date:	Wednesday, October 21, 2020 8:39:47 AM

Ms. Bomar:

Notification received.

John Nakagawa
Hawaii Coastal Zone Management Program

From: Bomar CIV Jacquelyn C
Sent: Monday, October 19, 2020 9:28 AM
To: Nakagawa, John D
Cc: Frantz CIV Christopher T
Subject: [EXTERNAL] Notification of Proposed Mōkapu Elementary School Campus Improvements Project as Navy/Marine Corps De Minimis Activities under CZMA

Aloha Mr. Nakagawa,

The US Marine Corps along with the State of Hawaiʻi Department of Education (HIDOE) as a cooperating agency are preparing an Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality regulations and Navy regulations for implementing the National Environmental Policy Act and Hawaiʻi Revised Statutes Chapter 343 in accordance with the requirements of Chapter 343, Hawaiʻi Revised Statutes (HRS), as amended, and Hawaiʻi Administrative Rules, Title 11, State of Hawaiʻi Department of Health (DOH).

HIDOE proposes to construct campus improvements at Mōkapu Elementary School (Mōkapu ES), located on a 14-acre site owned by the federal government at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The action would essentially replace or upgrade the existing school with a modern equivalent school on the same site that would meet 21st century design and technology standards. Construction is planned to commence in 2021, with the first phase completed by the start of the 2023-2024 school year.

The Preferred Alternative would replace all existing Mōkapu ES facilities with approximately 162,000 square feet (sq ft) of floor area in new facilities that meet current and projected facility requirements for a design enrollment of 975 students. The conceptual plan envisions five new permanent buildings would be constructed (this number could change in the design process) in two major phases in the north half of the site, generally over the existing playfield. The new buildings

would include two classroom buildings with 56 classrooms (Buildings B1 [2-story] and B2 [[3-story]), an administration/library/media center (Building A), cafeteria (Building C), and covered play court (Building D). The existing 16 permanent school buildings (including library, cafeteria, and administration buildings) and 10 temporary buildings would be demolished, and a large playfield, driveway, and expanded surface parking would be established in their place at the south end of the site along the Mōkapu Road frontage. Because the new classroom buildings would be constructed on a section of campus that has no existing buildings, this alternative would allow the existing school to remain operational during the approximately three- to four-year construction period.

The Proposed Action falls within the Navy/Marine Corps De Minimis Activities Under CZMA, Item #1, New Construction:

"Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements".

The relevant project mitigation/general conditions under the De Minimis agreement for New Construction actions are: 1, 3, 6, 8, 9, 10, 11, 13, 14, 16:

1. Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.

3. Turbidity and siltation from project related work will be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

6. No project-related materials (fill, revetment, rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).

8. No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.

9. Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms will be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.

10. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

11. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).

13. Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the ESA.

14. The NEPA review process will be completed.

16. Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an EA.

Please contact me if you have any questions by email or call.

V/R,

Jackie Bomar
NEPA Program Manager
Environmental Compliance and Protection Division
MCBH Kaneohe Bay
Cell (due to teleworking): 336-202-2525
Jacquelyn.bomar@usmc.mil

Appendix G
HRS 343 Early Consultation Comments and Responses

DAVID Y. IGE
GOVERNOR

CURT T. OTAGURO
COMPTROLLER

AUDREY HIDANO
DEPUTY COMPTROLLER

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

(P)20.039

MAR 30 2020

Ms. Gail Renard
Senior Associate
HHF Planners
753 Bishop Street, Suite 2590
Honolulu, HI 96813

Dear Ms. Renard:

Subject: Early Consultation for Draft Environmental Assessment
Mokapu Elementary School Campus Improvements
Marine Corp Base Hawaii, Kaneohe, Oahu, Hawaii
Tax Map Key (1) 4-4-009:007

Thank you for the opportunity to review the subject project during this early consultation period. We have no comments to offer as the project does not impact any of our facilities or projects and we do not need to be consulted in the future.

If there are any questions, please have your staff call Mr. Brian Isa of the Planning Branch at 586-0484.

Sincerely,

CHRISTINE L. KINIMAKA
Public Works Administrator

BI:jl

HHF PLANNERS
places for people since 1980

October 27, 2020

Ms. Christine Kinimaka, Administrator
Department of Accounting and General Services
State of Hawai‘i
P.O. Box 119
Honolulu, HI 96810-0119

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāne‘ohe, O‘ahu, Hawai‘i
TMK: (1) 4-4-009: 007

Dear Ms. Kinimaka,

On behalf of the State of Hawai‘i Department of Education (HIDOE), thank you for your letter dated March 30, 2020 responding to the Draft Environmental Assessment (EA) Early Consultation for the subject project. We note that you have no comments and do not need to be consulted in the future. We will remove your agency from the Draft EA distribution.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

OFFICE OF PLANNING
STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS 202004141423HE

April 16, 2020

Ms. Gail Renard
Senior Associate
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

Subject: Mokapu Elementary School Campus Improvements
Draft Environmental Assessment, Early Consultation
Marine Corps Base Hawaii, Kaneohe, Oahu, Hawaii
TMK: (1) 4-4-009: 007

Thank you for the opportunity to provide comments for the preparation of a Draft Environmental Assessment (Draft EA) for proposed improvements to the Mokapu Elementary School Campus. The pre-consultation review material was transmitted to our office via letter dated March 19, 2020.

It is our understanding that the State of Hawaii Department of Education (DOE) proposes to redevelop Mokapu Elementary School, located at Marine Corps Base Hawaii (MCBH).

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. <u>The Hawaii State Planning Act</u>
   The Hawaii Revised Statutes (HRS) Chapter 226, serves as a guide for long-term development for the State. It provides 1) goals, objectives, and policies; 2) the allocation of resources through planning coordination and implementation efforts; and 3) priority guidelines for the State. The Draft EA should include a discussion on the provisions of Hawaii Revised Statutes (HRS) Chapter 226, as they pertain to the Mokapu Elementary School redevelopment project.

2. <u>Hawaii Coastal Zone Management (CZM) Program</u>
   The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (HRS § 205A-1).

In implementing the objectives and supporting policies of the Hawaii CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As this project is proposed by the DOE, the Draft EA should include analysis on the project's consistency with the objectives and supporting policies of the Hawaii CZM Program, HRS § 205A-2, as amended. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. Special Management Area (SMA)
According to the pre-consultation request, the project is proposed by the DOE, and the land is leased to the DOE from MCBH. Please consult with the Department of Planning and Permitting as to whether the project site is located within the SMA designated by the City and County of Honolulu, and for potential requirements of SMA use.

4. Climate Change / Sea Level Rise (SLR)
To assess any potential impacts of SLR on the proposed redevelopment of Mokapu Elementary School, OP suggests the Draft EA refer to the findings of the Hawaii SLR Vulnerability and Adaptation Report 2017, accepted by the Hawaii Climate Change Mitigation and Adaptation Commission.

The Report, and Hawaii SLR Viewer at: https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/ identifies a 3.2-foot sea level rise exposure area across the main Hawaiian Islands. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the property area, and consider site-specific mitigation measures, including elevations and shoreline setbacks, to respond to the potential impacts from SLR on the proposed development.

5. Stormwater Runoff, Erosion, and Water Resources
Pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-18(d)(7) – identification and analysis of impacts and alternatives considered; to ensure that nearshore marine resources along the windward coast remain protected, the negative effects of stormwater inundation and sediment loading surrounding the proposed project site should be evaluated.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, potential vulnerability of water resources, the shoreline, and examining any increase of permeable surfaces in the area. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200.1-18(d)(8).

To assist in the development of stormwater runoff strategies, OP has developed guidance documents on this subject. We recommend consulting these stormwater evaluative tools when developing mitigation approaches for polluted runoff. They offer useful techniques to

keep land-based pollutants and sediment in place, while considering the management practices best suited for the topography of the area and the types of contaminants potentially affecting nearby water resources. The evaluative tools can be used during the design process of stormwater mitigation strategies include:

- Stormwater Impact Assessments can be used to identify and analyze information on hydrology, sensitivity of coastal and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area. http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf.; and

- Low Impact Development (LID), A Practitioners Guide covers a range of structural BMPs for stormwater control management, onsite infiltration techniques, and water reuse methods that minimize negative environmental impacts. http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

Mahalo,

Mary Alice Evans

Mary Alice Evans
Director

HHF PLANNERS
places for people since 1980

October 27, 2020

Ms. Mary Alice Evans, Director
Office of Planning
State of Hawai‘i
P.O. Box 2359
Honolulu, HI 96804

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāne‘ohe, O‘ahu, Hawai‘i
TMK: (1) 4-4-009: 007

Dear Ms. Evans,

On behalf of the State of Hawai‘i Department of Education (HIDOE), thank you for your letter dated April 16, 2020 (DTS 202004141423HE) providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. The Draft EA will address the issues enumerated in your letter, as appropriate.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai‘i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Director
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

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

IN REPLY REFER TO:
STP 20-018
HWY-PS 2.2789

April 14, 2020

Ms. Gail Renard
Senior Associate
HFF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

Subject: Request for Comments
Early Consultation
Draft Environmental Assessment
Mokapu Elementary School Improvements
Marine Corps Base Hawaii
Kaneohe, Hawaii
Tax Map Key: (1) 4-4-009:007

Thank you for your letter dated March 19, 2020, requesting our comment on the subject project. The applicant, Hawaii Department of Education is proposing to redevelop Mokapu Elementary School, located on federal land. The aging school facilities are in poor physical condition and lack the capacity for existing enrollment. Complete redevelopment of the 14-acre site is preferred over relocation or partial reuse of existing facilities. The existing 60,000 gross square feet (GSF) of floor area would increase to 162,000 GSF. Both State and federal funds and environmental impact regulations are applicable to the project. The project construction would be in phases and concurrent with school operations.

Based on a review of the project description, the Hawaii Department of Transportation (HDOT) highways has the following comments relative to State highways:

1. No significant adverse impact to State highways is anticipated during construction or operations.

2. No construction is proposed within the State right-of-way; therefore, no direct impact to State roadways is anticipated.

3. An HDOT permit is required to transport oversized equipment and overweight vehicles on HDOT roadways, such as Interstate H-3.

4. Although the capacity of the school does not appear to be increasing, there is a potential for indirect and cumulative effects to State roadways, if there are existing traffic delays. The Draft Environmental Assessment should include a qualitative traffic impact assessment that describes the following:

   a. Current, full build-out, and construction phase trip generation at peak traffic hours.

   b. Location of access driveways and anticipated traffic routes to/from the site.

   c. Description of existing and proposed multimodal routes to school.

   d. An assessment of current school-related traffic conditions (e.g., level of service and safety) on roadways in the vicinity. Include the closest State roadway intersection in the study area. Assess the potential school-related impact on traffic conditions in the vicinity with and without the project during construction and full build-out. Recommend mitigation as warranted.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PS 2020-051.

Sincerely,

JADE T. BUTAY
Director of Transportation

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Jade Butay, Director
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāne'ohe, O'ahu, Hawai'i
TMK: (1) 4-4-009: 007

Dear Mr. Butay,

On behalf of the State of Hawai'i Department of Education (HIDOE), thank you for your letter dated April 14, 2020 (Ref: STP 20-018, HWY-PS 2.2789) providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. We have reviewed your comments and offer the following responses.

The Draft EA will note that the project is not anticipated to have significant impacts on transportation, including on State facilities. The Draft EA will also note that a State of Hawai'i Department of Transportation (HDOT) permit would be required to transport oversized equipment and overweight vehicles on State roadways.

The Draft EA will include a qualitative assessment of traffic impacts expected from the proposed project, with quantitative level of service estimates along the State roadway segment within an appropriate study area.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawai'i 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com

BOARD OF WATER SUPPLY

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

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
KAY C. MATSUI
RAY C. SOON
MAX J. SWORD

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

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

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

April 8, 2020

Ms. Gail Renard
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

Subject: Your Letter Dated March 19, 2019 Requesting Early Consultation Comments on the Proposed Draft Environmental Assessment for the Proposed Mokapu Elementary School Campus Improvement Within the Marine Corps Base Hawaii in Kaneohe, Oahu, Hawaii
Tax Map Key: 4-4-009: 007

Thank you for your letter regarding the proposed Mokapu Elementary School Campus Improvement.

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

The proposed Environmental Assessment shall include existing water demands and proposed future water demands at the Mokapu Elementary School. Should the proposed improvements call for an increase in water demands and/or fixture units, the applicant may be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

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

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

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

Very truly yours,

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

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Ernest Lau, P.E.
Manager and Chief Engineer
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96813

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Mr. Lau,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated April 8, 2020 providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. We have reviewed your comments and offer the following responses.

We acknowledge that the existing water system is adequate to accommodate the proposed development but that your agency's final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

The HIDOE and its project designers are currently coordinating water demand, service, and system design with the appropriate Marine Corps Base Hawaii department. Information on water demand will be provided when available.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

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

KIRK CALDWELL
MAYOR

MARK YONAMINE, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

April 14, 2020

HHF Planner
ATTN: Gail Renard
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard,

Subject: Mokapu Elementary School Campus Improvements Draft Environmental Assessment Early Consultation Marine Corps Base Hawaii, Kaneohe, Hawaii
TMK: (1) 4-4-009: 007

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 further questions, please call me at 768-8480.

Sincerely,

For Mark Yonamine, P.E.
Director

MY:ms(807995)

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Mark Yonamine, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Mr. Yonamine,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated April 14, 2020 responding to the Draft Environmental Assessment (EA) Early Consultation for the subject project. We note that you have no comments at this time.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

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

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 20-170

April 2, 2020

Ms. Gail Renard
HHF Planners
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

Subject: Mokapu Elementary School Campus Improvements
Draft Environmental Assessment Early Consultation
Marine Corps Base, Kaneohe
TMK: (1) 4-4-009:007

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 easement on the subject project.

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

Sincerely,

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

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Ross Sasamura, P.E.
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluʻohia Street, Suite 215
Kapolei, HI 96707

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Mr. Sasamura,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated April 14, 2020 responding to the Draft Environmental Assessment (EA) Early Consultation for the subject project. We note that you have no comments at this time.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

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

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

April 20, 2020

2020/ELOG-590(ST)

Ms. Gail Renard
Senior Associate
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

SUBJECT: Early Consultation for Environmental Assessment
Chapter 343, Hawaii Revised Statutes (HRS)
Mokapu Elementary School Campus Improvements
Kaneohe Marine Corps Base Hawaii
Tax Map Key 4-4-009: Portion of 007

This is in response to your letter dated March 19, 2020, requesting input on the forthcoming Draft Environmental Assessment for the proposed redevelopment of the subject school campus.

The Mokapu Elementary School is located on Federal Land within the Kaneohe Marine Corps Base (KMCB), which is leased to the State Department of Education (DOE) for school use. It is zoned within the F-1 Military and Federal District, where all military and federal uses and structures are permitted under the Land Use Ordinance, Chapter 21, Revised Ordinances of Honolulu (ROH). Although the school and KMCB are mapped by the City as being located within the Special Management Area (SMA) established by Chapter 25, ROH, by definition, land which is held solely to the discretion of, or which is held in trust by the Federal Government, is excluded from the Coastal Zone pursuant to the Federal Coastal Zone Management Act (16 U.S.C. Section 1453).

However, insofar as the DOE is preparing an Environmental Assessment for the redevelopment of the school campus, pursuant to Chapter 343, HRS, we presume that an application of a Major SMA Use Permit will subsequently be submitted to the Department of Planning and Permit for processing and recommendation before the City Council.

Should you have any questions, please contact Steve Tagawa, of our staff, at 768-8024.

Very truly yours,

FOR Kathy K. Sokugawa
Acting Director

HHF PLANNERS
places for people since 1980

October 27, 2020

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

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Ms. Sokugawa,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated April 20, 2020 (Ref. 2020/ELOG-590(ST)) providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. We have reviewed your comments and offer the following responses.

We acknowledge that Mōkapu Elementary School is on land zoned F-1 Military and Federal District and within the City's Special Management Area (SMA), and that lands under Federal control are excluded from the Coastal Zone. We also acknowledge that HIDOE plans to submit an application for a Major SMA Use Permit for the proposed campus improvements at the appropriate time.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

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 • web: www.honolulu.gov

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP4/20-808678

April 16, 2020

HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

ATTN: Gail Renard

Dear Ms. Renard:

SUBJECT: Mokapu Elementary School Campus Improvements
Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kaneohe, Oahu, Hawaii
TMK: (1) 4-4-009:007

Thank you for the opportunity to provide comments on the proposed campus improvements to the Mokapu Elementary School. In response to your letter dated March 19, 2020, we recommend the area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc. be kept apprised of the details and status throughout the project and of the impacts that the project may have on the adjoining local street area network. Additionally, construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on adjoining streets.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Virginia Sosh, of my staff, at 768-5461.

Very truly yours,

Wes Frysztacki
Director

HHF PLANNERS
places for people since 1980

October 27, 2020

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

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Mr. Frysztacki,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated April 16, 2020 providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. We have reviewed your comments and offer the following responses.

Your recommendation that area stakeholders, organizations, and agencies be kept apprised of the project are acknowledged and have been forwarded to the project owner for coordination with its construction contractor. Your recommendation on off-peak transport times for construction materials and equipment are also acknowledged and have been provided to the project owner. The EA will address potential traffic impacts on the local streets adjacent to the project area.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

April 8, 2020

Ms. Gail Renard
Senior Associate
HHF Planners
Pacific Guardian Center
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

Subject: Draft Environmental Assessment Early Consultation
Mokapu Elementary School Campus Improvements
1193 Mokapu Road
Kailua, Hawaii 96734
Tax Map Key: 4-4-009: 007

In response to your letter dated March 19, 2020, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information 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 (46 meters) 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; 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 (15 meters) 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; 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 (45,720 millimeters) 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; 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; 2012 Edition, Sections 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,

JASON SAMALA
Assistant Chief

JS/TC:bh

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Jason Samala, Assistant Chief
City and County of Honolulu
Honolulu Fire Department
636 South Street
Honolulu, HI 96813-5007

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Chief Samala,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated April 8, 2020 providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. We have reviewed your comments and offer the following responses.

Thank you for the information on fire protection requirements; your comments have been forwarded to the DOE to incorporate into project design. Civil drawings will be submitted to HFD for review and approval at the appropriate time in the design process.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

KIRK CALDWELL
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
CLYDE K. HO
DEPUTY CHIEFS

OUR REFERENCE EO-TS

March 30, 2020

Ms. Gail Renard
Senior Associate
HHF Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Ms. Renard:

This is in response to your letter of March 19, 2020, requesting comments on an Early Consultation, Draft Environmental Assessment, for the proposed project to redevelop Mokapu Elementary School within the Marine Corps Base Hawaii located in Kaneohe.

The Honolulu Police Department would like to recommend that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the construction phase, as well as adequate notification be made to any affected areas regarding pedestrian and vehicular traffic issues.

If there are any questions, please call Major Crizalmer Caraang of District 4 (Kaneohe) at 723-8639.

Thank you for the opportunity to review this project.

Sincerely,

ALLAN T. NAGATA
Assistant Chief
Support Services Bureau

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Allan Nagata, Assistant Chief
Support Services Branch
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, HI 96813

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Chief Nagata,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your letter dated March 30, 2020 providing comments on the Draft Environmental Assessment (EA) Early Consultation for the subject project. We have reviewed your comments and offer the following responses.

Your recommendations regarding construction period safety equipment and transportation issues are acknowledged and have been forwarded to DOE for coordination with its construction contractor.

Your letter and this response will be included in the Draft EA. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

Gail Renard

From: billhicksknb@gmail.com
Sent: Tuesday, March 24, 2020 7:14 PM
To: Gail Renard
Cc: 'Donna Wong'
Subject: Mokapu Elementary School Draft EA

[This message was sent from an outside source.]
Aloha Gail…

Mahalo for keeping us informed of your intent to develop a draft EA for subject project. We look forward to seeing the draft EA when it becomes available. Unfortunately, the Kailua Neighborhood Board does not currently have the technical means or authorization to conduct meetings electronically, so all of our meetings are currently suspended.

Aloha,
Bill Hicks
Chairman, Kailua Neighborhood Board

HHF PLANNERS
places for people since 1980

October 27, 2020

Mr. Bill Hicks, Chairman
Kailua Neighborhood Board No. 31
923 Akumu Street
Kailua, HI 96734

Mōkapu Elementary School Campus Improvements
HRS 343 Draft Environmental Assessment Early Consultation
Marine Corps Base Hawaii, Kāneʻohe, Oʻahu, Hawaiʻi
TMK: (1) 4-4-009: 007

Dear Mr. Hicks,

On behalf of the State of Hawaiʻi Department of Education (HIDOE), thank you for your email message dated April 14, 2020 responding to the Draft Environmental Assessment (EA) Early Consultation for the subject project. We note that no specific comments regarding the project or forthcoming EA were included in your email message.

Your message and this response will be included in the Draft EA and a copy of the EA will be made available to your organization. Please contact me by telephone (457-3167) or email (grenard@hhf.com) if you have questions or require additional information. Thank you for participating in the environmental review process.

Sincerely,
HHF PLANNERS

Gail Renard
Senior Associate

cc: Brenda Lowrey, Facility Planner, DOE
Mitch Tamayori, Project Management Section, DOE

Pacific Guardian Center | 733 Bishop Street, Suite 2590 | Honolulu, Hawaiʻi 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | email: info@hhf.com