DAVID Y. IGE
GOVERNOR

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AUG 08 2018

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

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OFC. OF ENVIRONMENTAL
QUALITY CONTROL

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

OFFICE OF THE SCHOOL FACILITIES AND SUPPORT SERVICES

July 16, 2018

Mr. Scott Glenn
Director, Office of Environmental Quality Control
Department of Health
235 South Beretania Street, 7th Floor
Honolulu, Hawaii 96813-2437

Re: Draft Environmental Assessment/Findings of No Significant Impact
Kauai High School New Gymnasium, DOE Job No. Q42000-12
Lihue, Kauai, Hawaii
Tax Map Key: (4) 3-3-003:007 and 015, and 3-2-005:010 and 011

Dear Mr. Glenn:

The State of Hawaii Department of Education (HIDOE) is submitting the required documents related to the Draft Environmental Assessment/Finding Of No Significant Impact (FONSI), for the Kauai High School New Gymnasium, DOE Job No. Q42000-12 in accordance to Chapter 343, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HAR) Title 11, DOH Chapter 200. The documents will be submitted by our consultant, Wilson Okamoto Corporation (WOC).

A FONSI is anticipated for this project. The basis for this determination is set forth in Chapter 6 of the Draft EA which follows the significance criteria under HAR Title 11, DOH Chapter 200, Environmental Impact Statement Rules, Section 12.

Please publish the notice of availability of the Draft EA in the August 8, 2018 issue of the *Environmental Notice*.

Should there be any questions, please call Mr. Arnold Fukunaga, Project Coordinator of the Facilities Development Branch, Project Management Section, at (808) 784-5131 or Mr. Keola Cheng of WOC at (808) 946-2277. Thank you for your assistance and support of our program.

Sincerely,

John C.H. Chung
Public Works Administrator
Facilities Development Branch

JCHC:af
Attachment

c: Keola Cheng, WOC
Facilities Development Branch

19-044

APPLICANT
PUBLICATION FORM

Project Name:	Kaua'i High School New Gymnasium
Project Short Name:	KHS New Gym
HRS §343-5 Trigger(s):	Use of State Lands/Funds
Island(s):	Kaua'i
Judicial District(s):	Līhu'e District
TMK(s):	(4) 3-3-003:007 and 015, 3-2-005:010 and 011
Permit(s)/Approval(s):	STATE: Enviornmental Assessment under Hawai'i Revised Statutes, Chapter 343, and Title 11, Chapter 200, Hawai'i Administrative Rules, Department of Health, State of Hawai'i COUNTY OF KAUA'I: Grading and Construction Plan Review, Class IV Zoning Permit
Proposing/Determining Agency:	State of Hawai'i Department of Education
Contact Name, Email, Telephone, Address	John C.H. Chung Public Works Administrator Facilities Development Branch P.O. Box 2360 Honolulu, Hawai'i 96804
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Wilson Okamoto Corporation
Contact Name, Email, Telephone, Address	Keola Cheng, kcheng@wilsonokamoto.com, 808-946-2277, 1907 South Beretania Street, Suite 400 Honolulu, Hawaii 96826

Status (select one)
_X_ DEA-AFNSI

Submittal Requirements
Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.

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

The State of Hawai'i Department of Education (DOE) is proposing to construct a new gymnasium facility at Kaua'i High School (KHS), in Līhu'e, County of Kaua'i, on the island of Kaua'i. The proposed gymnasium will provide KHS students, faculty, and the surrounding community access to a modern facility and space that will accommodate a wide range of educational, athletic, and cultural activities.

19-044

Kaua'i High School New Gymnasium

Draft Environmental Assessment

August 2018

Prepared For

State of Hawai'i

Department of Education

Prepared By

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

STATE OF HAWAI`I

DEPARTMENT OF EDUCATION

P.O. BOX 2360

HONOLULU, HAWAI`I 96804

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Should there be any questions, please call Mr. Arnold Fukunaga, Project Coordinator of the Facilities Development Branch, Project Management Section, at (808) 784-5131 or Mr. Keola Cheng of WOC at (808) 946-2277. Thank you for your assistance and support of our program.

Sincerely,

John C.H. Chung
Public Works Administrator
Facilities Development Branch

JCHC:af
Attachment

c: Keola Cheng, WOC
Facilities Development Branch

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Appendix B Soil and Hazardous Material Survey at Portables, Kaua'i High School, 3577 Lala Road, Līhu'e, Kaua'i, Hawai'i, December 2013

Appendix C Traffic Assessment Report

Appendix D Pre-Assessment Consultation Comment and Response Letters

PREFACE

This Draft Environmental Assessment (EA) / Anticipated Finding of No Significant Impact (FONSI) has been prepared pursuant to Chapter 343, Hawai‘i Revised Statutes (HRS), and Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR), Department of Health, State of Hawai‘i. The State of Hawai‘i Department of Education is proposing to construct a new gymnasium at Kaua‘i High School (KHS), within Līhu‘e in the County of Kaua‘i on the island of Kaua‘i. The proposed gymnasium will provide KHS students, faculty, and the surrounding community access to a modern facility and space that will accommodate a wide range of educational, athletic, and cultural activities. The project will utilize State land and funds and is, therefore, subject to the State environmental review process.

It is anticipated that a Finding of No Significant Impact (FONSI) will be issued and filed with the State Office of Environmental Quality Control (OEQC) by the proposing agency, the Hawaii Department of Education, following public review of the Draft EA.

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SUMMARY

Proposing Agency:	State of Hawai‘i Department of Education
Approving Agency:	State of Hawai‘i Department of Education
Location:	Līhu‘e, Kaua‘i, Hawai‘i
Tax Map Keys (TMKs):	(4) 3-3-003:007 and 015, and 3-2-005:010 and 011
Recorded Fee Owner:	County of Kaua‘i
Existing Use:	Public High School. Major physical facilities on the campus include six (6) classroom buildings, science building, library, homemaking building, cafeteria, administration building, music building, physical education building, weight room, swimming pool, athletic field, tennis and basketball courts, and various portable classroom structures
State Land Use Classification:	Urban
Development Plan Designation:	High School (State)
County Zoning Designation:	Residential (R-1) & Special Treatment District (ST-P)
Proposed Action:	The State of Hawai‘i Department of Education (DOE) is proposing to construct a new gymnasium facility at Kaua‘i High School (KHS), in Līhu‘e, County of Kaua‘i on the island of Kaua‘i. The proposed project will provide KHS students, faculty, and the surrounding community access to a modern facility and space that will accommodate a wide range of educational, athletic, and cultural activities.
Impacts:	Applicable construction and permanent best management practices and erosion control measures will be implemented to address potential soil erosion impacts. No significant impacts on flora and fauna are anticipated as a result of construction or operation of the project. Since there are several known historic sites in the study area and a potential for subsurface burials, archaeological monitoring is proposed in conjunction with any subsurface soil disturbance activities.

Air quality, noise and hazardous materials impacts will be mitigated by compliance with applicable Department of Health rules. Although enrollment is not expected to increase or decrease, students are expected to continue using public transportation, the provided bus service, or alternate modes of transportation (i.e., biking, walking, etc.) to travel to and from school. Traffic operations in the vicinity of the high school are expected to remain similar to conditions without the proposed project. As such, the implementation of the proposed project is not expected to have a significant impact on the surrounding roadways. No significant impacts regarding water, wastewater, drainage, electrical and communications systems are anticipated. However, further coordination with applicable agencies should occur prior to start of construction for each phase to ensure that no significant impacts occur.

Anticipated Determination: Finding of No Significant Impact (FONSI)

Parties Consulted During Pre-Assessment:

Federal Agencies
Environmental Protection Agency, Regional IX
U.S. Army Corps of Engineers
U.S. Department of the Interior, Fish and Wildlife Service

State Legislative Branch
Senator Ron Kouchi
Representative James Tokioka

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

County Council
Councilmember Mel Rapozo

County of Kaua'i Agencies
Department of Water
Department of Public Works
Department of Parks and Recreation
Planning Department
Office of Economic Development
Civil Defense Agency
County Transportation Agency
Kaua'i Fire Department
Kaua'i Police Department

Utility Companies
Kaua‘i Island Utility Cooperative
Hawaiian Telcom
Spectrum

1. INTRODUCTION

1.1 Background Information

The State of Hawai‘i Department of Education (DOE) is proposing to construct a new gymnasium facility at Kaua‘i High School (KHS), in Līhu‘e, County of Kaua‘i, on the island of Kaua‘i. The proposed gymnasium will provide KHS students, faculty, and the surrounding community access to a modern facility and space that will accommodate a wide range of educational, athletic, and cultural activities.

The proposed project site is located at 3577 Lala Road in Līhu‘e on the island of Kaua‘i (See Figure 1-1). KHS currently occupies an area of approximately 29 acres identified by Tax Map Keys (TMK) (4) 3-3-003:007 and 015, and 3-2-005:010 and 011 (See Figure 1-2). The campus is bounded by Lala Road to the north and Nāwiliwili Road to the south.

KHS was established on April 30, 1913 when Act 160 was signed by the Governor of the Territory of Hawai‘i. Act 160 authorized the conversion and renovation of the Old Nāwiliwili Courthouse into a Schoolhouse, and KHS opened its doors on September 14, 1914 as the fifth high school in the Territory of Hawai‘i and the first high school serving the island of Kaua‘i.

KHS serves students in grades 9-12, with a total enrollment of 1,128 students, and approximately 150 faculty and staff members for the 2018-2019 school year. Aside from the existing gymnasium, the major physical facilities on the campus include six (6) classroom buildings, science building, library, homemaking building, cafeteria, administration building, music building, physical education building, weight room, swimming pool, athletic field, tennis and basketball courts, and various portable classroom structures.

DOE is not expecting any significant increase or decrease, or any major changes to the projected school enrollment in the coming years and the proposed project is not expected to affect the school’s current or future enrollment status.

1.1.1 Surrounding Uses

KHS is located within the Līhu‘e Planning District and in an “Urban Center” designation on the Līhu‘e Land Use Map. The “Urban Center” designation is applied to urbanized areas that accommodate intensive urban uses and zoning. The Līhu‘e District is the County seat and one of the major regional centers of settlement and employment on the island. There are prominent residential and commercial centers, as well as employment activity surrounding KHS. A mix of long-term residents, newcomers and visitors populate the area. Kūhiō and Kaumuali‘i Highway serve as the main access routes through Līhu‘e. The region is important to the island’s economy because of its concentration of port facilities, resort uses, retail, recreation, and residential communities. The Līhu‘e District is planned to absorb approximately half of the island’s future growth to 2035.

The immediate surrounding area is oriented to Nāwiliwili Harbor. Nāwiliwili is a major port facility with an adjoining small boat harbor within an embayment protected by a 2,000 foot long breakwater. Landside of the harbor is a bustling maritime industrial and commercial area. Today the harbor serves as the main port and cruise ship terminal for the island.

KHS is located on a bluff overlooking Nāwiliwili Harbor. The surrounding land use designations around KHS are Transportation, Residential Community, Neighborhood Center, Parks and Recreation, and Resort. The immediately surrounding uses include the Banyan Harbor Resort,Garden Island Inn, and Nāwiliwili Cemetery to the east, Honsador Lumber, Kaua‘i Athletic Club and Nāwililwili Harbor to the south, and a number of residences front the campus across Lala Road to the north (See Figure 1-3). Other nearby uses includes Nāwililwili Park and Beach, located to the east of campus. Nāwiliwili Park is the main public open space in the area with access to a seawall and pedestrian promenade. At the mouth of Nāwiliwili Stream is a commercial center that serves the resorts and tourist market in the area.

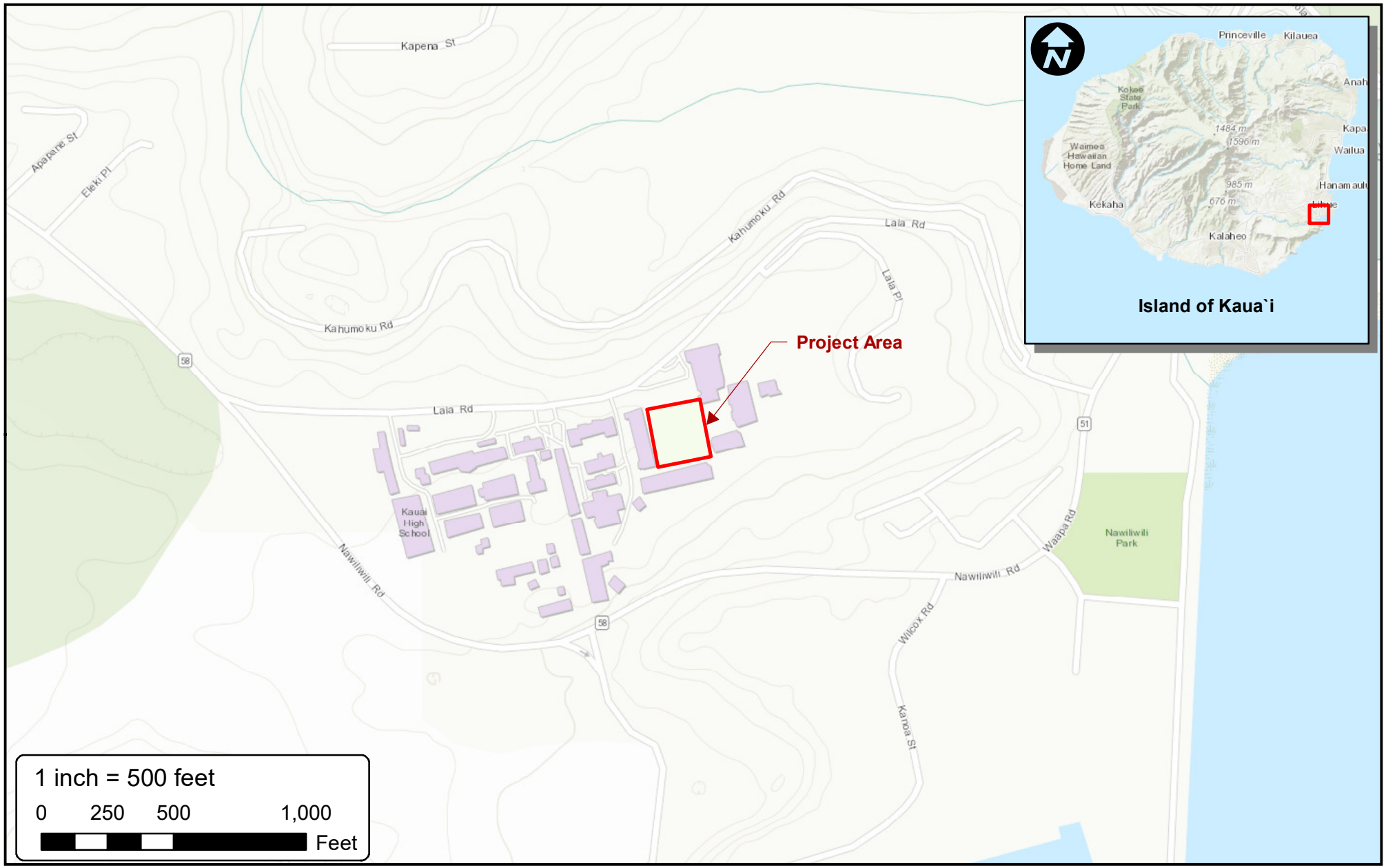

Figure 1-1

LOCATION MAP

Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua'i

WILSON OKAMOTO CORPORATION

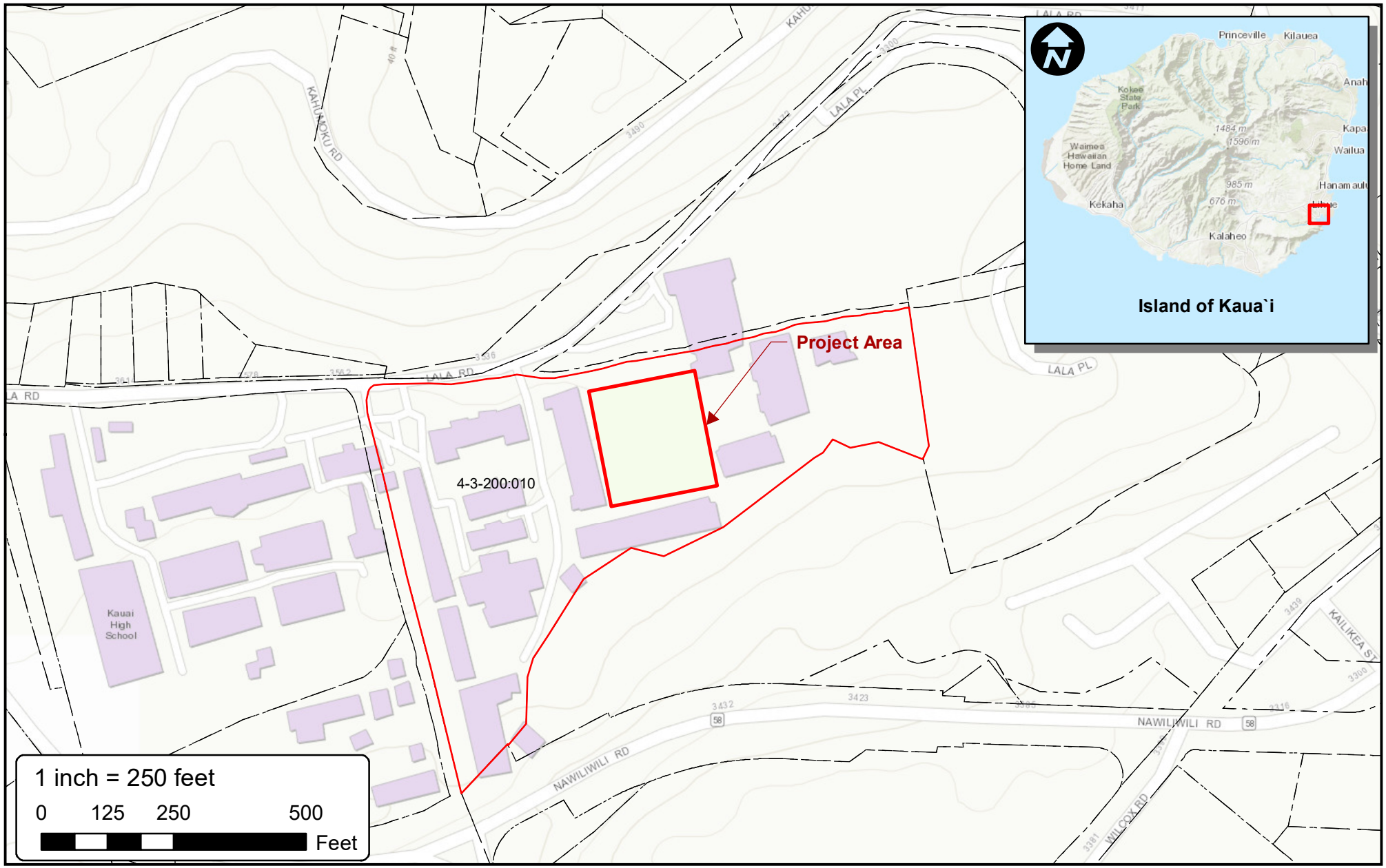

Figure 1-2

TMK MAP

Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua'i

WILSON OKAMOTO CORPORATION

Figure 1-3

Surrounding Uses Map

Kaua`i High School New Gymnasium
Līhu'e, Island of Kaua`i

WILSON OKAMOTO CORPORATION

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2. PROJECT DESCRIPTION

2.1 Project Purpose and Need

KHS is in need of a new gymnasium to support their physical education programs, intramural activities, interscholastic athletic teams, and other various school functions. Currently all activities and practices are held in the existing KHS gymnasium, a 75 year old wood frame structure built in 1939 that seats approximately 750-800 persons, which is approximately 70% of the school's current student enrollment. The facility is heavily utilized by the school for a variety of activities such as assemblies, basketball and volleyball games and practices, physical education classes, music, drama, band and chorus performances, graduation, and other school activities. Wrestling currently takes place in the cafeteria, where mats must be removed and stored on the side during the cafeteria's primary functions. In addition, the community also utilizes the gymnasium for a variety of activities including basketball and volleyball leagues and special events when school is not in session after school hours.

When the gymnasium was initially constructed, it was intended to serve a much smaller school enrollment. High school and community sports, and activities which utilize the gymnasium have expanded over the years in the greater Kaua'i community. Moreover, Title IX, and the consequent expansion of women's sports at the High School level has increased competition for use of the existing gymnasium over the past decades. Consequently, a new facility is needed to accommodate the school's and community's present and future needs.

Unable to accommodate all of the current KHS student body comfortably at one time, the existing gymnasium's seating capacity serves is also a constraint to the number of people that can attend community events. Thus, the proposed new gymnasium is envisioned as a larger facility that will correct the current inadequacies and satisfy the needed functional space to accommodate KHS's existing student enrollment, as well as forecast KHS enrollment levels for the foreseeable future.

The proposed new gymnasium will allow KHS to better accommodate their various JV and Varsity team practices, cheerleading, intramural after school activities, games, tournaments and numerous other activities.

2.2 Project Description

The new gymnasium is proposed to be located to the southwest of the existing gymnasium adjacent to Classroom Building A, the pool, and Classroom Building B (See Figure 2-1). The gymnasium would serve as a space for indoor sports as well as an auditorium. The new gymnasium structure would cover approximately 1.7 acres. The main interior court may be utilized for regulation basketball, volleyball, or other court games. Retractable bleachers are proposed with a seating capacity for 1,500 people. The bleachers can be retracted to provide space for two regulation interior courts laid out perpendicular to the main interior court. This provides additional floor space and multi-use capability which can accommodate varsity and junior varsity team practices, cheerleading, intramural after-school activities, games, tournaments, and various other uses. The dimensions of the interior court area and bleachers are approximately 13,750 square feet (110 feet by 125 feet).

An approximately 625 square foot (25 feet by 25 feet) wrestling room is proposed adjacent to the gymnasium. In addition, the proposed project includes boys' and girls' varsity and junior varsity locker rooms/showers, training room, AD/conference room, restrooms, a ticket office, concession space, electrical, mechanical, and storage space (See Figure 2-2 & 2-3).

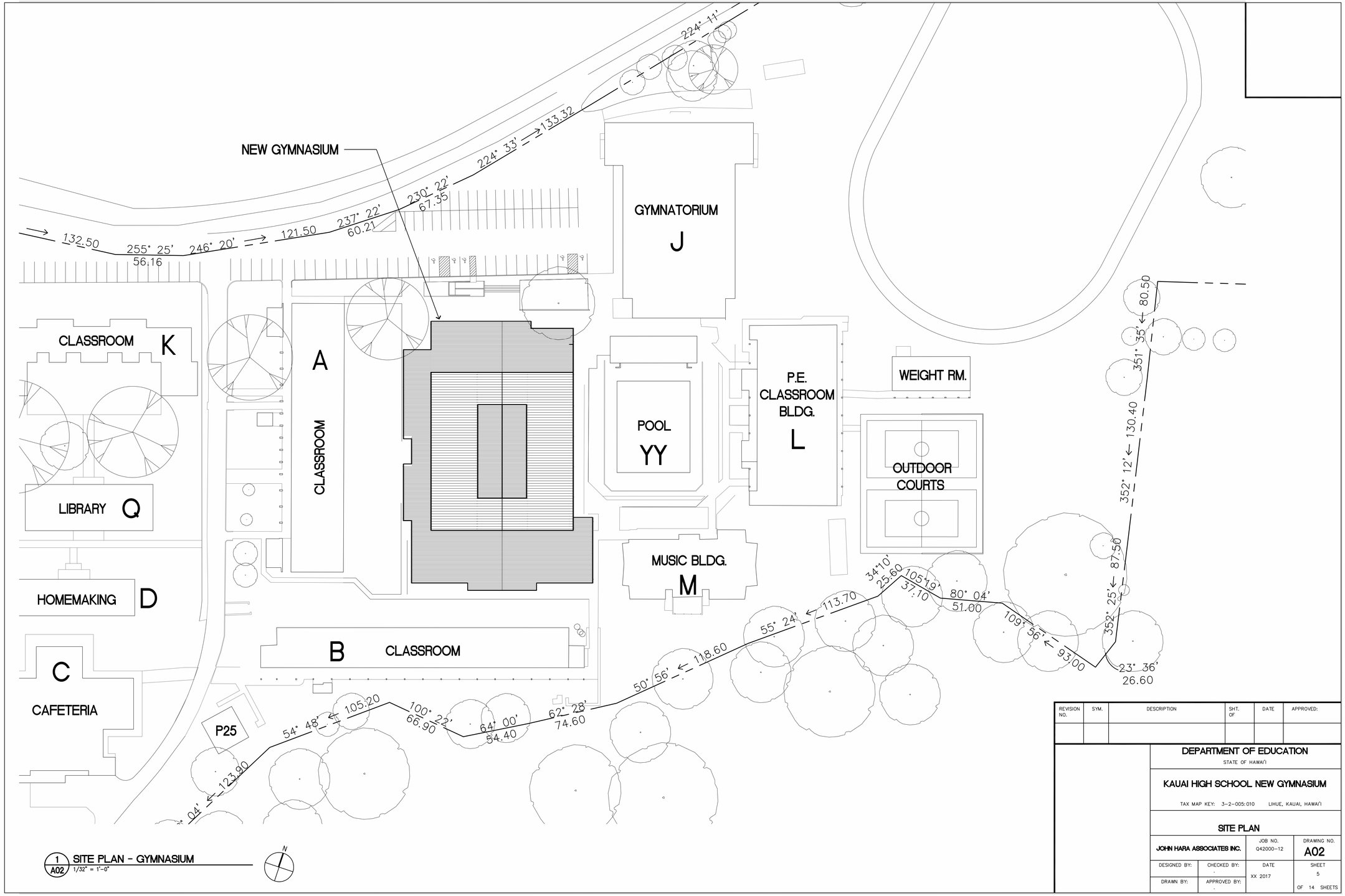
The structure is proposed to be a metal frame building with standing seam metal roofing. The new structure will also serve as an Enhanced Hurricane Protection Area for the community. The design features the use of louvered openings and clerestory windows to optimize the use of natural light and air. The proposed height of the gymnasium is approximately 45 feet (See Figures 2-4 & 2-5).

Several alternative locations for the proposed facility improvements were considered by the applicant. A detailed discussion of alternatives is included in Chapter 5.

2.3 Project Cost and Schedule

Since KHS is a fully developed site within an existing urban neighborhood and the school needs to be fully operable during the period of construction, several phases of construction are proposed. This is needed in order to minimize disruption to existing school instruction and activities. The projected implementation time frame for the school improvements is 2020-2021.

It is noted that the cumulative design and construction costs over a two year period are difficult to estimate to a precise degree. Based on the conceptual drawings of the proposed improvements, projected total construction costs are estimated at approximately $19.7 million.



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED:

DEPARTMENT OF EDUCATION
STATE OF HAWAI'I

KAUAI HIGH SCHOOL NEW GYMNASIUM

TAX MAP KEY: 3-2-005:010 LIHUE, KAUAI, HAWAI'I

SITE PLAN

JOHN HARA ASSOCIATES INC.		JOB NO. 042000-12	DRAWING NO. A02
DESIGNED BY:	CHECKED BY: -	DATE XX 2017	SHEET 5
DRAWN BY:	APPROVED BY: -		OF 14 SHEETS

FIGURE 2-1

SITE MAP

Kaua`i High School New Gymnasium
Līhu`e, Island of Kaua`i

WILSON OKAMOTO CORPORATION

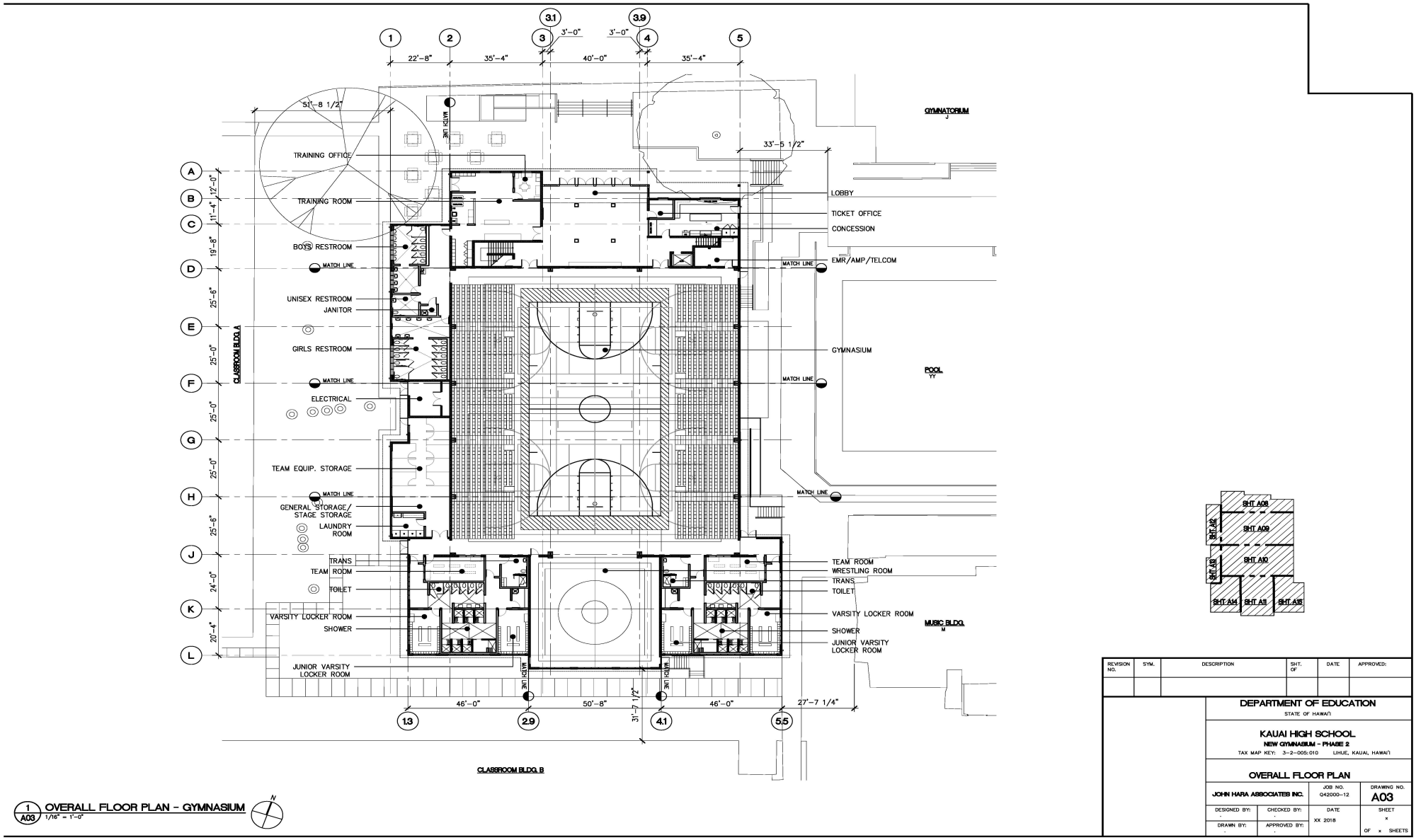


Figure 2-2

Overall Floor Plan

Kaua`i High School New Gymnasium
Līhu`e, Island of Kaua`i

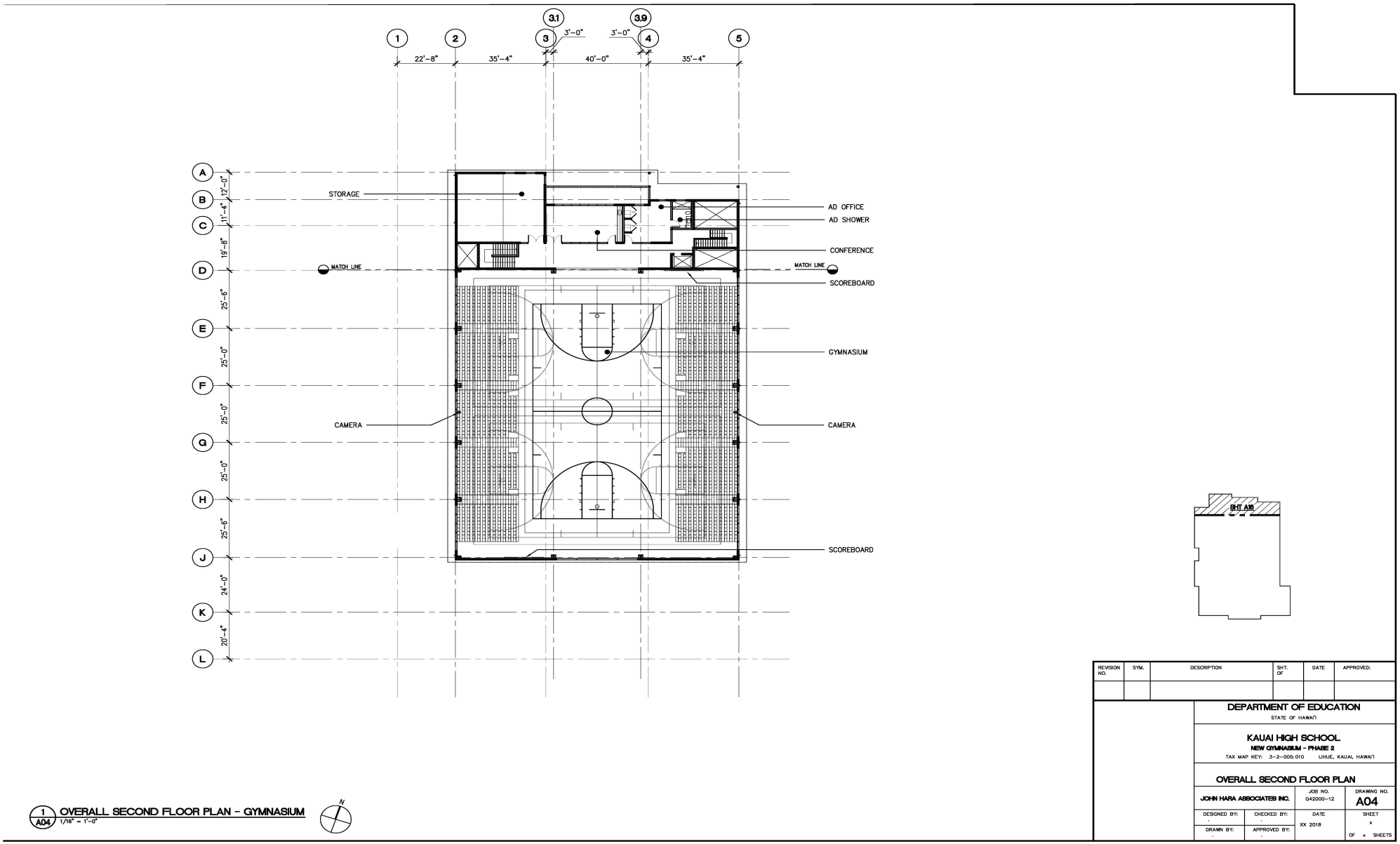
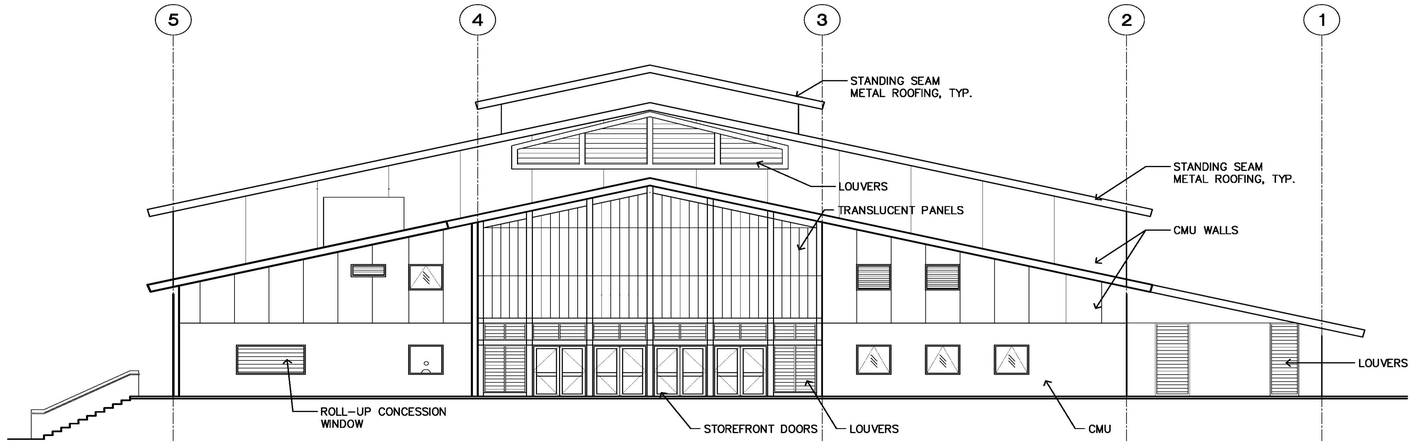


Figure 2-3

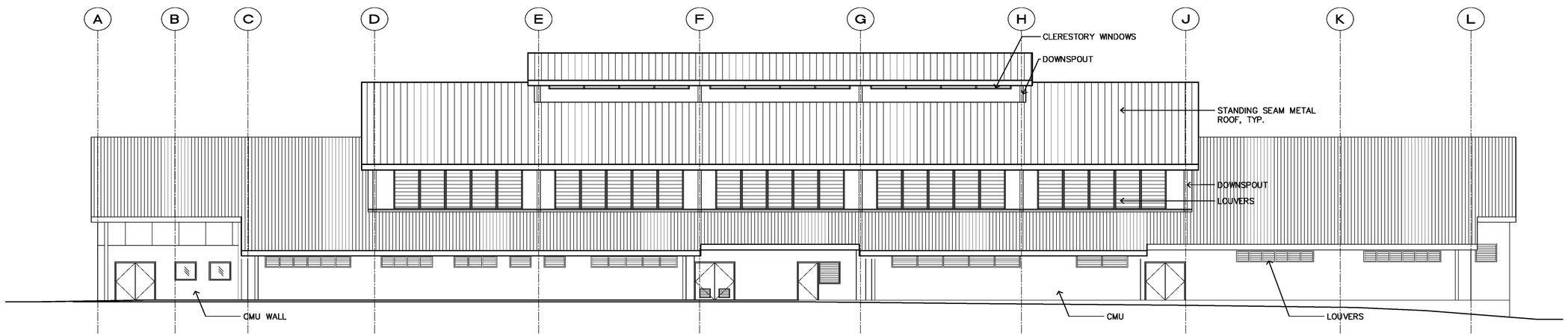
Overall Second Floor Plan

Kaua`i High School New Gymnasium
Līhu`e, Island of Kaua`i

WILSON OKAMOTO CORPORATION



1 A26 **NORTH EXTERIOR ELEVATION**
1/8" = 1'-0"



2 A26 **WEST EXTERIOR ELEVATION**
1/8" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED:

DEPARTMENT OF EDUCATION
STATE OF HAWAI'I

KAUAI HIGH SCHOOL
NEW GYMNASIUM - PHASE 2
TAX MAP KEY: 3-2-005:010 LIHUE, KAUAI, HAWAI'I

EXTERIOR ELEVATIONS

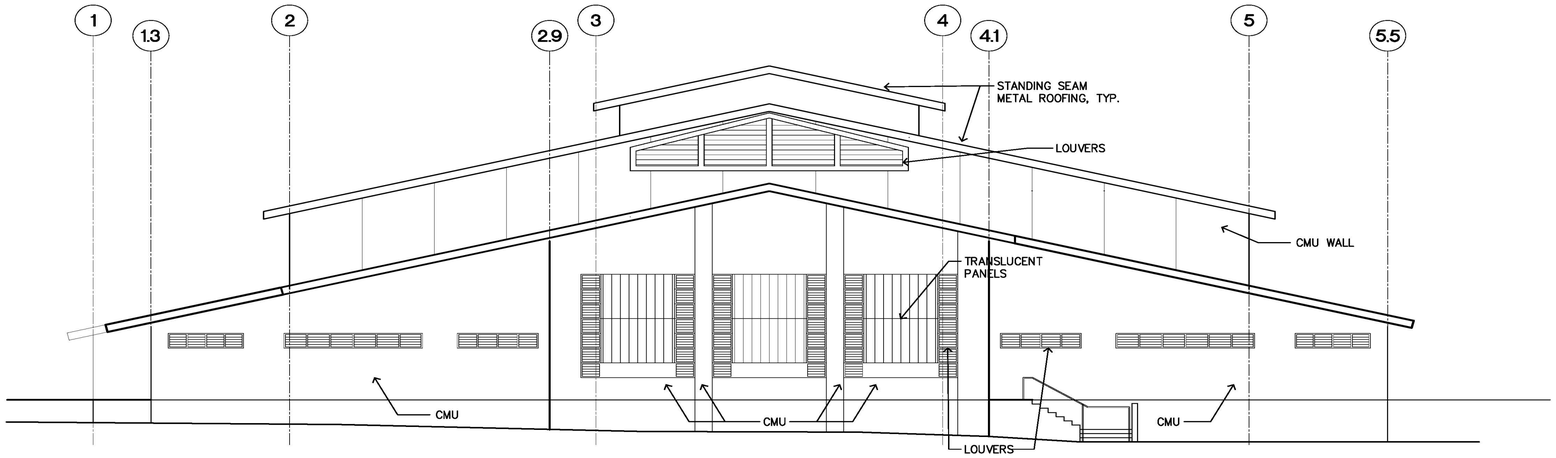
JOHN HARA ASSOCIATES INC.		JOB NO. G42000-12	DRAWING NO. A26
DESIGNED BY: -	CHECKED BY: -	DATE XX 2018	SHEET X
DRAWN BY: -	APPROVED BY: -		OF X SHEETS

FIGURE 2-4

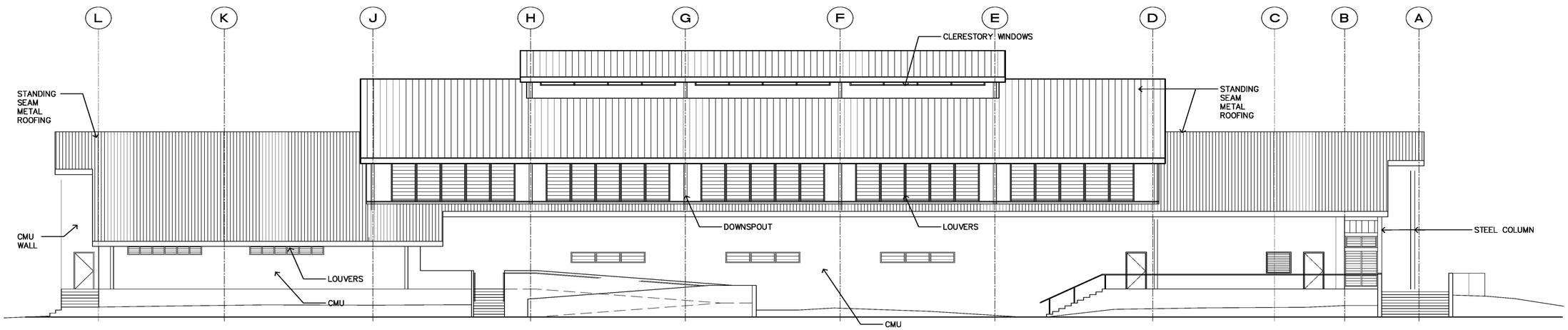
EXTERIOR ELEVATIONS

Kaua`i High School New Gymnasium
Līhu`e, Island of Kaua`i

WILSON OKAMOTO CORPORATION



1 A27 SOUTH EXTERIOR ELEVATION
1/8" = 1'-0"



2 A27 EAST EXTERIOR ELEVATION
1/8" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED:

DEPARTMENT OF EDUCATION
STATE OF HAWAI'I

KAUAI HIGH SCHOOL
NEW GYMNASIUM - PHASE 2
TAX MAP KEY: 3-2-005:010 LIHUE, KAUAI, HAWAI'I

EXTERIOR ELEVATIONS

JOHN HARA ASSOCIATES INC.		JOB NO. 042000-12	DRAWING NO. A27
DESIGNED BY: -	CHECKED BY: -	DATE XX 2018	SHEET X
DRAWN BY: -	APPROVED BY: -		OF X SHEETS

FIGURE 2-5

EXTERIOR ELEVATIONS

Kaua`i High School New Gymnasium
Līhu`e, Island of Kaua`i

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

The following is a description of the existing environment, assessment of potential impacts and proposed measures to mitigate potential adverse impacts resulting from the proposed project.

3.1 Climate

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

The project is located in the Līhu‘e area and is predominately warm with moderate rainfall throughout the year. The area is characterized by abundant sunshine, persistent tradewinds, relatively constant temperatures, moderate humidity, and the infrequency of severe storms. Variable Northeasterly tradewinds prevail throughout the year.

Temperatures on the island of Kaua‘i tend to have small seasonal variations between summer and winter months. The average annual mean temperature in the Līhu‘e Area is 73 degrees Fahrenheit (F) ranging between 71 and 80 degrees F. Prevailing trade winds flow from northeast to southwest except for occasional periods when “Kona” storms generate strong winds from the south. Rainfall on Kaua‘i is highly variable depending upon elevation and location with respect to the tradewinds. Average annual rainfall in the Līhu‘e area ranges between 40 to 60 inches.

The island of Kaua‘i, as well as the Līhu‘e district, is vulnerable to a variety of coastal hazards, including inundation, erosion, hurricanes, marine and terrestrial flooding, storms and tsunamis. All of these hazards are expected to be exacerbated by climate change and sea level rise (SLR). The state of Hawai‘i is already being impacted by a myriad of climatic changes through rising sea levels, an increase in ocean acidity, changing rainfall patterns, a decrease in stream base flow, changing wind and wave patterns, and changing habitats and species distribution. There is no consensus, however, about the exact nature, magnitude, and timing of how these changes will occur. Generally speaking, there is an expectation of a rise in air and sea surface temperatures, a decrease in the prevailing northeasterly trade winds, a decline in average rainfall resulting in the continued decline in stream base flow, an increase in ocean acidity, and SLR. There is an overall consensus that these climate changes are linked to global greenhouse gas (GHG) emissions from anthropogenic sources.

GHGs absorb and “trap” solar radiation instead of reflecting it back into space. Generally speaking, GHGs include carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons. The main sources of GHG emissions resulting from human activity are from the following sectors, in order from most emissions to least: fossil fuel power stations, industrial activity, transportation, agriculture, fossil fuel processing, residential and commercial activity, land use and biomass burning, and waste disposal and treatment. In 2007, the United States was responsible for approximately 20 percent of global carbon dioxide emissions. Within Hawai‘i,

O‘ahu emits about 80 percent of the state’s total carbon dioxide emissions. Hawai‘i’s GHG emissions encompass less than 1 percent of the national total, as of 2007.

Impacts and Mitigation Measures

No significant impacts on climate in the project area are anticipated. The construction and operation of the proposed project are not anticipated to affect temperatures, wind, or rainfall levels in the project area.

The exact nature of how the climate will change is unknown. New information will continually need to be incorporated within future assessments to identify where efforts should be focused when developing adaptation strategies to climatic changes.

The implementation of the proposed action will result in the short-term irrevocable release of GHGs from construction activity. This quantity, however, will be negligible. No mitigation is required or proposed.

3.2 Physiography

3.2.1 Geology and Topography

Kaua‘i is the oldest and most northwesterly of the eight primary Hawaiian Islands. The island is largely composed of the remains of a massive basaltic shield volcano. The central caldera of this volcano is considered to be one of the largest in the Hawaiian Islands. In the rough shape of an ovoid (egg-shape), the subject caldera is approximately 12 miles long northeast-southeast, and 10 miles long northwest-southwest. The island still has the roughly circular outline of the original circular dome, even though it has been profoundly affected by collapse, faulting, erosion, and later volcanism.

The island of Kaua‘i was formed by two major lava flows. The Waimea volcanic series refers to the flows that formed the original volcanic shield and caldera of the island. The Kōloa volcanic series refers to subsequent flows that overlaid much of the Waimea volcanic series formations on the lower slopes of the island. The rocks on Kaua‘i are all volcanic, except for minor amounts of sediments derived from volcanic materials by erosion, and a narrow, discontinuous fringe of calcareous reef and beach deposits.

The project site is generally flat with elevations ranging from 136 feet mean sea level (MSL) at the northwest corner to 127.5 feet MSL at the northeast corner. There is a small 3-foot bank (approximately 2:1) along the west border of the site.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on geology or topography are anticipated during construction or operation of the proposed project. KHS is a fully developed site within the urban center of Līhu‘e. The construction of the new gymnasium also involves utility work as well as foundation work. Construction of the proposed project, however, will not involve any major land disturbing activities involving mass grading or significant revisions to site contours. Applicable best management practices and erosion control measures will be implemented to ensure no adverse impact to the existing geology and topography.

3.2.2 Soils

According to the U.S. Department of Agriculture, Natural Resource Conservation Service, soils within the project site are classified Līhu'e silty clay, 0 to 8 percent slopes (LhB)(See Figure 3-1). This soil is located on the tops of broad interfluves in the uplands. In a representative profile, the soil is dusky-red silty clay about 12 inches thick. The subsoil, more than 48 inches thick, is dark red and dark reddish-brown, compact silty clay that has sub-angular blocky structure. The substratum is soft, weathered rock. The surface layer is strongly acid while the subsoil is slightly acid to neutral.

The Detailed Land Classification – Island of Kaua'i published by the University of Hawai'i Land Study Bureau (LSB) classifies the overall quality and productive capacity of certain lands on the island for selected crops and their overall suitability for agricultural use. A five-class letter based productivity grading system is outlined by the LSB, with an "A" representing the class of highest productivity and "E" the lowest. These productivity ratings are defined by statewide standards of crop yields and management levels. The soils which lie under the project site are not classified by the LSB.

Impacts and Mitigation Measures

In the short- and long- term, no significant impacts on soils are anticipated during the construction or operation of the proposed project. The project would involve some fine grading for new construction activities. Utility and foundation work are also involved. Construction of the proposed project, however, will not involve any major land disturbing activities involving mass grading or significant revisions to site contours. Best Management Practices (BMP) will be implemented to prevent pollution and protect the environment. Temporary erosion control measures will be installed prior to any demolition and/or construction activities. Structural BMPs to be implemented may include silt fences, filter socks, stabilized construction ingress/egress points, a concrete wash-out area, and sediment control filters at drain inlets and catch basins.

Coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to soils and erosion. A National Pollutant Discharge Elimination System (NPDES) permit for storm water runoff from construction activities would be required for instances when more than one acre of land area will be cleared. Any discharges related to project construction or operation activities will comply with applicable State Water Quality Standards as specified in Hawai'i Administrative Rules, Chapter 11-54 and 11-55 Water Pollution Control, Department of Health. Excavation and grading activities will be regulated by applicable provisions of the County's grading ordinance.

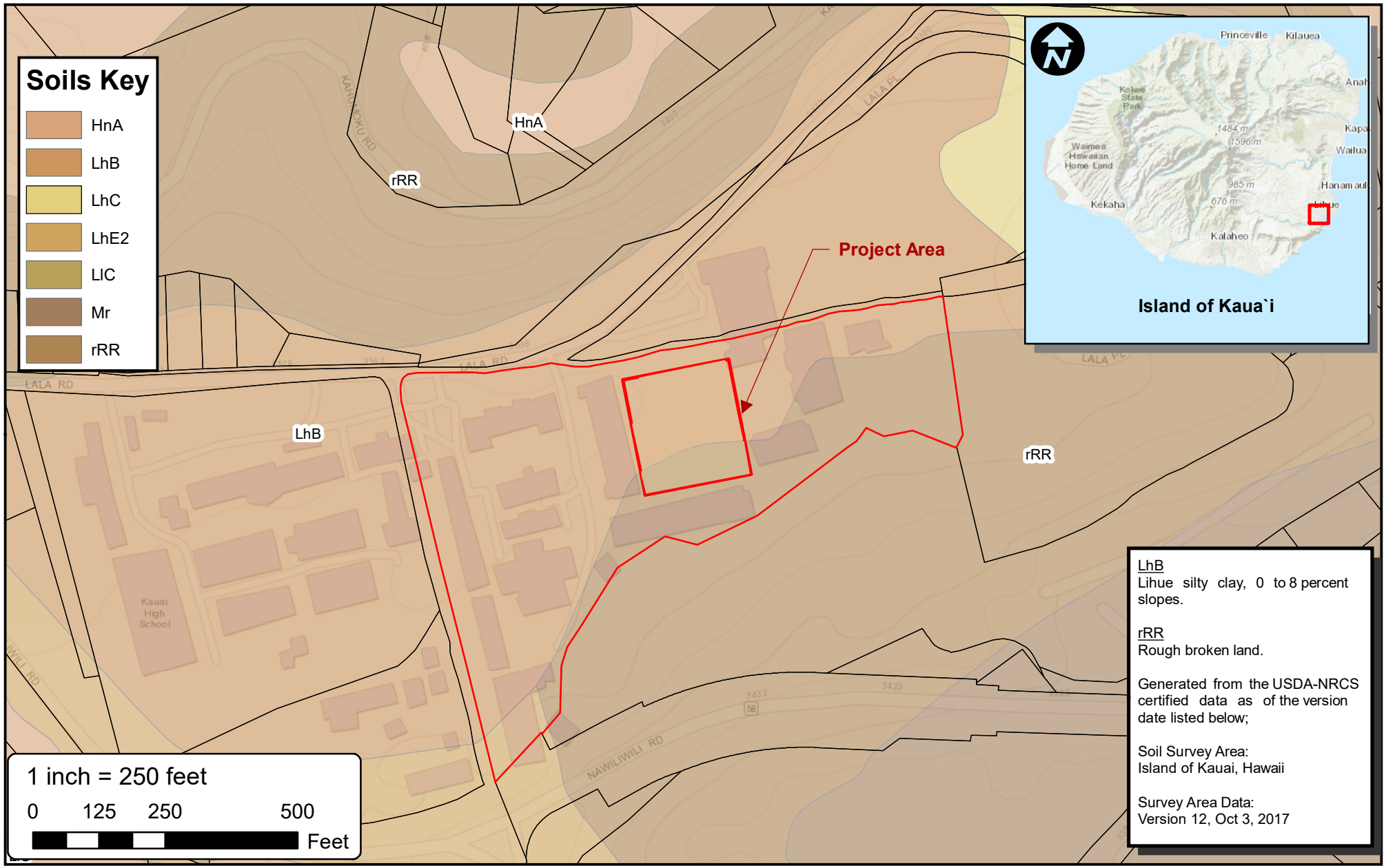

Figure 3-1

SOILS MAP

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Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua'i

3.3 Hydrology

3.3.1 Surface and Coastal Waters

There are no surface water resources within the project site.

The closest surface water resource is Nāwiliwili Stream, which is located approximately 700 feet to the north of the project site (See Figure 3-2). The Hawai‘i Stream Assessment identifies Nāwiliwili Stream as a perennial stream that flows in a generally southeasterly direction before discharging into Nāwiliwili Bay at the west end of Kalapaki Beach.

Pū‘ali Stream, another nearby stream, is located approximately 2,700 feet to the southwest of the project site. Pū‘ali Stream is also identified as a perennial stream with a discharge point near the boat ramp at Nāwiliwili Harbor.

Hulē‘ia Stream is located to the southwest of the project site and is also identified as a perennial stream. Hulē‘ia Streams discharges into Nāwiliwili Bay at a point within Nāwiliwili Harbor. The Hulē‘ia National Wildlife Refuge is located approximately 7,000 feet from the project site, and is considered part of the Hulē‘ia watershed.

According to the National Wetlands Inventory, the lower reaches of Nāwiliwili Stream are identified as Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded (R2UBH), Palustrine Scrub-Shrub Broad-Leaved Evergreen Seasonally Flooded (PSS3C), Palustrine Emergent Persistent Seasonally Flooded (PEM1C), and Palustrine Emergent Persistent Semi-permanently Flooded (PEM1F) wetlands. The Kalapaki Beach area is classified as Marine Intertidal Unconsolidated Shore Irregularly Flooded (M2USP) (See Figure 3-3).

Other wetland designated areas are located just to the west of Nāwiliwili Road approximately 1,500 feet from the project site. These are Palustrine Emergent Persistent Seasonally Flooded (PEM1C), Palustrine Forested Broad-Leaved Evergreen, Seasonally Flooded (PFO3C), and Palustrine Unconsolidated Bottom Permanently Flooded Excavated (PUBHx) wetlands.

Areas near the mouth of Pū‘ali Stream are Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded (R2UBH), Palustrine Scrub-Shrub Broad-Leaved Evergreen, Seasonally Flooded (PSS3C), Palustrine Emergent Persistent Seasonally Flooded (PEM1C), Palustrine Forested Broad-Leaved Evergreen, Seasonally Flooded (PFO3C), Palustrine Unconsolidated Bottom Permanently Flooded Excavated (PUBHx) wetlands.

Areas near the mouth of Hulē‘ia Stream are: Estuarine Intertidal Forested Broad-Leaved Evergreen Regularly Flooded (E2FO3N), Estuarine Intertidal Rocky Shore Regularly Flooded (E2RSN), and Estuarine Subtidal Unconsolidated Bottom Subtidal (E1UBL).

Nāwiliwili Stream Pū‘ali Stream and Hulē‘ia Stream all discharge into Nāwiliwili Bay. These waters are classified as Marine Subtidal Unconsolidated Bottom Subtidal wetland (M1UBL).

Pursuant to Hawai‘i Administrative Rules (HAR) Title 11, Chapter 54, Water Quality Standards, the coastal waters in the vicinity of the project site are classified as Class A

marine waters. Class A marine waters are recognized as waters to be used for "recreational purposes and aesthetic enjoyment to be protected. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class".

Impacts and Mitigation Measures

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

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

Figure 3-2

Stream Map

Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua`i

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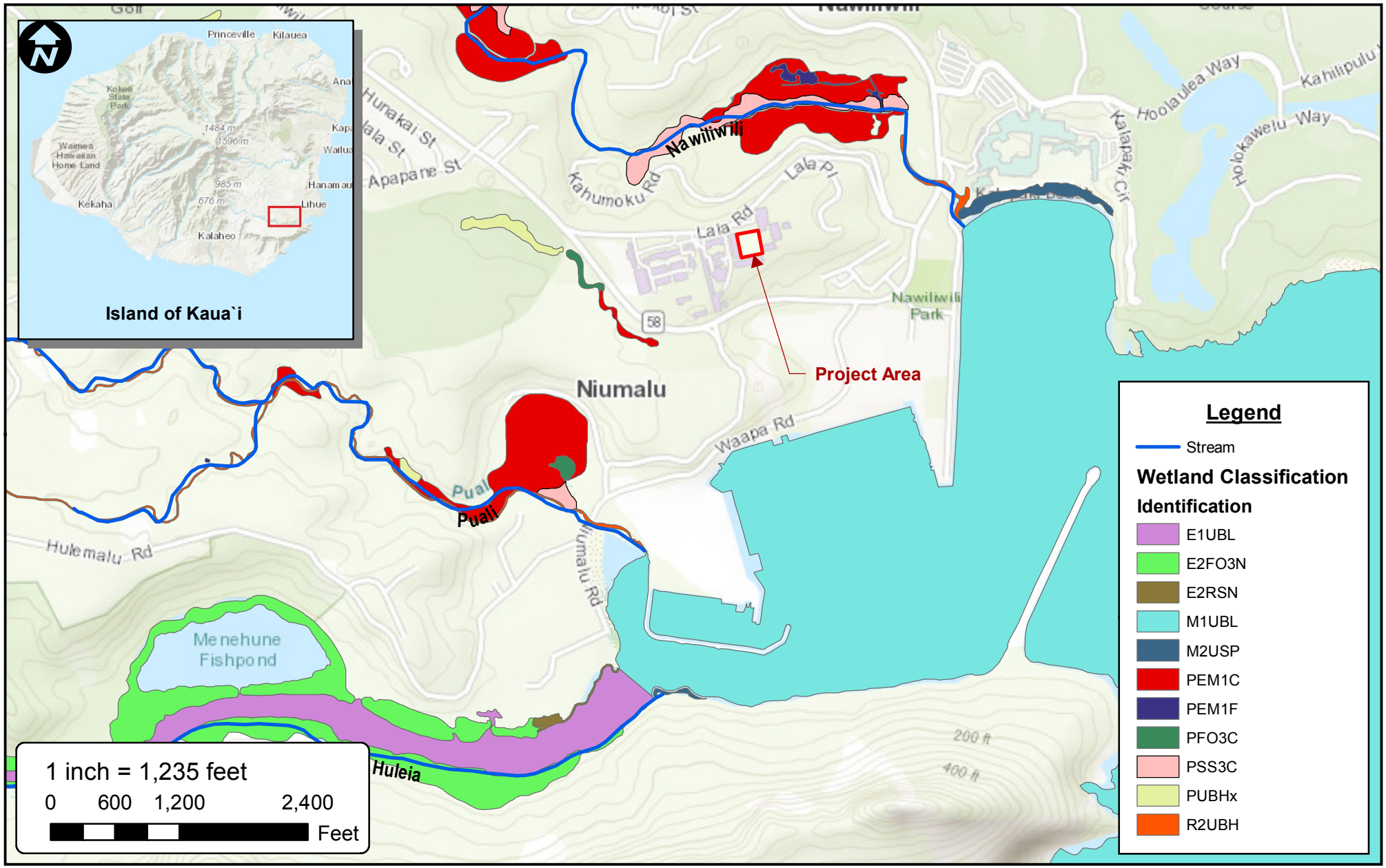

Figure 3-3

National Wetlands Survey Map

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Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua'i

3.3.2 Groundwater

The State Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM) has established a groundwater hydrologic unit and coding system for groundwater resource management. The proposed project site is located within the Līhu'e Sector Area which is comprised of five Aquifer System Areas identified as Kīlauea, Anahola, Wailua, Hanamā'ulu, Koloa. The project site is located within the Hanamā'ulu Aquifer System (20102) area which has an estimated yield of 36 million gallons per day (mgd).

Impacts and Mitigation Measures

No short- or long-term significant impacts on groundwater in the project vicinity are anticipated during construction or operation of the proposed project. The project is served by the County Department of Water's system. The proposed project is not anticipated to result in a significant increase to KHS's demand for water.

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

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

3.4 Natural Hazards

3.4.1 Flood and Tsunami Hazard

According to the Flood Insurance Rate Map (FIRM), (Community Panel Number 1500020328F) prepared by the Federal Emergency Management Agency (FEMA), the project site is designated Zone X, an area determined to be outside of the 0.2% annual chance floodplain. There are no base flood elevations or depths shown within this zone (See Figure 3-4).

According to the Tsunami Evacuation Zone maps for Kaua'i, the project site is not within the tsunami evacuation zone.

Impacts and Mitigation Measures

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

3.5 Natural Environment

3.5.1 Flora and Fauna

The project site is located in a highly altered urban environment. Lawn areas of the project site are a mixture of grass and weedy species. Other larger plant species on the project site include Monkeypod (*Samanea saman*), Koa haole (*Leucaena leucocephala*), Kiawe (*Prosopis pallida*), Kukui (*Aleurites moluccana*), Hibiscus (*Hibiscus brackenridgei*), Plumeria (*Plumeria rubra*), Hong Kong Orchid (*Bauhinia x blakeana*), Alexandra palm (*Archontophoenix alexandrae*), Manila palm (*Veitchia merrillii*), Pink Tecoma (*Tabebuia heterophylla*), and Brassia (*Schefflera actinophylla*).

Avifauna and fauna present at the project site have adapted to the urban environment. Feral cats, dogs, chickens and rodents are common to the Līhu'e region and are likely present at the project site.

No rare, threatened and/or endangered flora or fauna species are known to inhabit the project area. The endangered band-rumped petrel (*Oceanodroma castro)* and Hawaiian petrel (*Pterodroma sandwichensis),* the threatened Newell's shearwater *(Puffinus auricularis newelli),* and the State and Federally listed Hawaiian hoary bat *(Lasiurus cinereus semotus)* may occur in the project area or transit the project site. However, the presence of these species is anticipated to be limited due to the urban nature of the site and surrounding area.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on flora and fauna are anticipated as a result of the construction and operation of the proposed project. Implementation of the proposed project will not jeopardize the existence of any endangered species, or result in the destruction or adverse modification of existing habitats in the surrounding area. There are no designated critical habitats located within the vicinity of the project area.

It is noted that seabird species such as band-rumped petrel (*Oceanodroma castro), Hawaiian petrel (Pterodroma sandwichensis), Newell's shearwater (Puffinus auricularis newelli),* and Hawaiian hoary bat *(Lasiurus cinereus semotus)* may occasionally overfly the site. The most critical potential impact to flora and fauna identified at the project site is the danger to nocturnally flying seabirds posed by night lighting used during

nighttime construction. To mitigate the potential hazards to these seabirds, the proposed project will not involve any nighttime construction, and will be restricted to daytime hours.

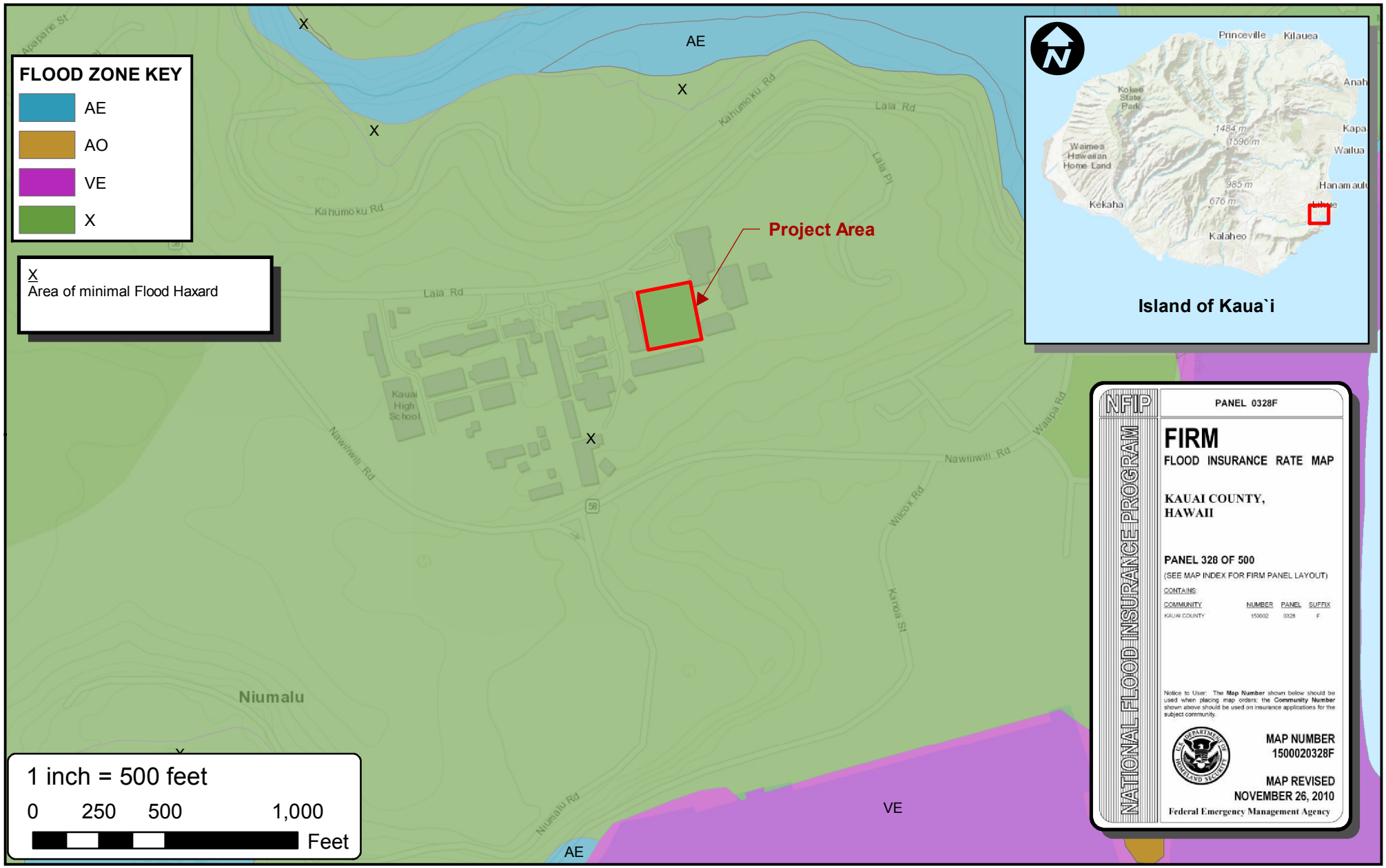

Figure 5

FLOOD MAP

WILSON OKAMOTO CORPORATION

Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua'i

3.6 Historic and Archaeological Resources

An Archaeological Monitoring Plan (AMP) was prepared to fulfill the requirements of HAR §13-13-279-4 in support of the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-13-275 (addressing governmental projects), as well as the project’s environmental review under HRS §343. The subject AMP was prepared by Cultural Surveys Hawai‘i in November 2014. This AMP is included herein as Appendix A, and is summarized below:

Līhuʻe (literally translated as “cold chill”) became the modern political name for the traditional *moku* of Puna. The name Līhuʻe was first applied by the Governor of Kauaʻi, Kaikioʻewa, in the 1830s. The subject project site is nestled in the ancient ahupuaʻa land division of Nāwiliwili.

In the pre-contact period, the valley floor through which Nāwiliwili Stream courses, particularly in its broader lower reaches would have been ideal for wetland taro cultivation. Land Commission Awards (LCA) indicate that the valley was exclusively used for taro cultivation, with three to four *lo‘i* per family. A small portion of the alluvial plain was reserved for *kula,* which was an essential part of the management of subsistence farming. The bay into which Nāwiliwili stream empties would have been an ideal canoe landing spot and fishing grounds. Most of the habitation sites appear to be along the shoreline, which is a typical settlement pattern for Hawaiian valleys. Located near the mouth of Hulē‘ia Stream at Nāwiliwili Bay is Alakoko Fishpond, which is approximately 39 acres, The site (SIHP # 50-30-11-0501) was placed on the National Register of Historic Places in 1973 and is said to have been constructed by the *Menehune*. Presently, the south end of the bay at the mouth of the Hulē‘ia River continues to be a well-known fishing ground.

During the 1830s, Kaikio‘ewa, established a church, a “straw palace”, and a village at Nāwiliwili, which would develop into Līhu‘e. However, due to modern developments in and around the harbor, little or no archaeological vestiges survive of what was once a well-populated, settled region. The coast of Nāwiliwili, due largely to its natural harbor, was the focus of commercial activity for the region. Most of the development surrounding Nāwiliwili Bay took place before archaeological surveys were common practice. The lower portion of the valley today is totally surrounded by urban Līhu‘e residential tracts but survives as a remnant of the former Hawaiian cultural environment.

Nonetheless, historic maps identify several *heiau* along the seashore and stream mouths of Nāwiliwili. The majority of all the *heiau* noted in historic records have since been completely destroyed by post-contact development.

After the Māhele of 1848, large tracts of land in the ahupuaʻa of Nāwiliwili were incorporated into the sugar plantations of the H.A. Pierce & Company, Grove Farm, and later, Līhuʻe Plantation and McBryde Sugar Company. Previously taro cultivated lands converted into rice cultivation. This shift was dictated by changes in the ethnic make-up of the islands’ population and economic demands. Over the years, the nearby Nāwiliwili Cemetery (SIHP # 50-30-11-6009), which borders KHS to the South, developed informally and, unlike most cemeteries, was not established by any particular individual or group such as a church, organization, or government body. The cemetery was known to be used by Japanese and Hawaiian families from 1882 and 1968, and divided the cemetery into two sections, the

Japanese and Hawaiian section. The cemetery was officially closed to future burials by the Hawai‘i State Department of Health in 1967 but, is maintained and open to the public for visitation.

In 1851, the bluff upon which KHS is situated became the setting of the Circuit Courthouse and one of the houses owned by Paulo Kanoa, the governor of Kaua‘i from 1847 to 1877. The original courthouse was destroyed by a gale in 1866, at which point the court was relocated to the governor’s house, where it remained until 1914 when a new courthouse was built in Līhu‘e. In 1894, the parcel adjacent to the courthouse, became the property of Judge Jacob Hardy and is commonly referred to as the Hardy Lot. Judge Hardy served as judge at the courthouse for a total of 43 years. The property largely overlaps the proposed gymnasium footprint. In the 1920s the courthouse land and the Hardy Lot were deeded to the state as the KHS Lot, along with three other adjoining parcels.

Several archaeological related studies have been conducted over the past several years in the vicinity of the project, as well on the KHS campus itself. The findings of these studies are summarized in the subject AMP, which is included herein as Appendix A.

Previous Archaeological Monitoring at Kaua‘i High School:
In 2006, the State of Hawai‘i Department of Education (DOE) entered into an agreement with the Environmental Protection Agency (EPA) to carry out improvements to existing wastewater systems at Hawai‘i’s public schools. The firm CH2M Hill was chosen to design and implement wastewater improvements at 49 schools located on five of the Hawaiian Islands. CSH worked with CH2M Hill to address historic preservation concerns with the SHPD. Eight Kaua‘i Island schools, including KHS, were included within the Hawai‘i Inter-Island DOE Cesspool project and within a study (Hammatt and Shideler 2006) that evaluated the potential for adverse impact to cultural resources from the proposed wastewater improvement work. KHS was recommended for an archaeological monitoring program and the SHPD agreed with the recommendation.

An archaeological monitor was present during all subsurface excavations associated with the KHS wastewater system project (Groza and Hammatt 2010). Excavation activities included the removal of cesspools and the installation of new sewer lines, seepage pits, and septic tanks. Excavation depths ranged from 1.5 m to a maximum of 4.3 m. Disturbance, including fill and fill materials, was present throughout the project area, ranging in depth from 38 cmbs (cm below surface) to 1.7 mbs (m below surface). Ground disturbance was attributed to the original installation of the cesspools, utilities, and drainage. Some of the disturbance may be associated with the construction of the school beginning in the 1920s. Fill materials, the majority of which were modern, included cement blocks and slabs, basalt gravel, wood, lead pipe fragments, PVC tubing, a soda can cap, tree limbs, discarded metal fragments, broken glass, wood cuttings, and cardboard boxes. The majority of observed fill sediments consisted of local soils that may have been excavated from other portions of the school property.

Although no cultural deposits were identified, fragments of human remains were inadvertently found in imported soils.

In 2014, CSH carried out an archaeological inventory survey study for the parking improvements portion of the Kaua‘i High School Improvements project, Nāwiliwili Ahupua‘a,

Līhu'e District, Kaua'i. The investigation was termed an archaeological assessment, per HAR §13-13-284-5, because no historic properties were identified within the project area. No historic properties were identified on the surface during the 100% pedestrian survey conducted for the project area. A total of 16 linear backhoe-assisted test excavations were completed within the project area. The trenches each measured approximately 6 m (20 ft) long and 0.6 m (2 ft) wide with various depths from 0.6 m to 1.8 m. The lack of any archaeological evidence associated with habitation, agricultural, or religious practices (i.e., cultural layer, features, burials or artifacts) during this subsurface testing gives no support for analysis of prior land use.

Archival research indicates that the subject project site lies within relative proximity to the Kuhiau Heiau, the Paulo Kānoa Home/former Court House, and the Judge Hardy Residence.

Impacts and Mitigation Measures

The proposed action is not anticipated to result in adverse impacts to identified historic properties. Nonetheless, given the proximity of the subject project site to several historic properties, the prospect of potential archaeological finds in the central and southern portions of the KHS campus is noted. Therefore, on-site archaeological monitoring will be undertaken during all excavation and ground disturbing work associated with the project. Monitoring will be conducted in compliance with the subject AMP (See Appendix A).

Hawai'i State historic preservation legislation governing archaeological monitoring programs requires that each monitoring plan discuss eight specific items (HAR 13-13-279-4). The monitoring provisions below address these eight requirements in terms of archaeological monitoring for the excavations within the current project area.

1) **Anticipated Historic Properties:**

Both pre-Contact and post-Contact traditional Hawaiian historic properties and/or human skeletal remains may be encountered within the central and southwestern portions of the KHS campus.

2) **Locations of Historic Properties:**

Archival research has indicated the relative proximity of Kuhiau Heiau, the Paulo Kanoa Home/former Court House, and the Judge Hardy home increases the prospect of significant archaeological finds in the central and southeastern portions of the KHS campus.

3) **Fieldwork**

On-site archaeological monitoring is recommended for excavations for the portables relocation and the gymnasium projects. Work within the northeastern parking area will be addressed with on-call archaeological monitoring based on the lack of finds during the intensive subsurface testing in that area. Any departure from this will occur only following consultation with and written concurrence from the SHPD.

The monitoring fieldwork will likely encompass the documentation of subsurface archaeological deposits (e.g., trash pits, structural remnants) and

will employ current standard archaeological recording techniques. This will include drawing and recording the stratigraphy of excavation profiles where cultural features or artifacts are exposed as well as representative profiles. These exposures will be photographed, located on project area maps, and sampled. Photographs and representative profiles of excavations will be taken even if no historically significant sites are documented. As appropriate, sampling will include the collection of representative artifacts, bulk sediment samples, and/or the on-site screening of measured volumes of feature fill to determine feature contents.

In the event of significant finds, the SHPD will be notified. If human remains are identified, construction activity in the vicinity will be stopped and no exploratory work of any kind will be conducted unless specifically requested by the SHPD. All human skeletal remains encountered during excavation will be handled in compliance with HAR §13-13-300 and HRS §6E-43.

4) **Archaeologist's Role**

The on-site archaeologist will have the authority to stop work immediately in the area of any findings so that documentation can proceed and appropriate treatment can be determined. In addition, the archaeologist will have the authority to slow and/or suspend construction activities in order to ensure the necessary archaeological sampling and recording can take place.

5) **Coordination Meeting:**

Before work commences on the project, an archaeologist shall hold a coordination meeting to orient the construction crew to the requirements of the archaeological monitoring program. At this meeting the monitor will discuss the procedures for both on-site and on-call monitoring. The archaeologist will also emphasize his or her authority to temporarily halt construction and state that all finds (including objects such as bottles) are the property of the landowner and may not be removed from the construction site. At this time it will be made clear that the archaeologist must be on-site during excavations for the portables relocation and the gymnasium.

6) **Laboratory Work:**

Laboratory work will be conducted in accordance with HAR §13-13-279-5(6). Laboratory analysis of non-burial related finds will be tabulated and standard artifact and midden recording will be conducted. Artifacts will be documented as to provenience, measurements, weight, type of material, and presumed function. Photographs of representative artifacts will be taken for inclusion in the archaeological monitoring report. Bone and shell midden materials will be sorted down to species, when possible, and then tabulated by provenience.

As appropriate, collected charcoal material obtained within intact cultural deposits will be analyzed for species identification. Charcoal samples ideal for dating analyses will be sent to Beta Analytic, Inc. for radiocarbon dating. If appropriate, artifacts may be sent to the University of Hawai'i-Hilo Geoarchaeology Lab for Energy-Dispersive X-ray Fluorescence (EDXRF)

analysis in order to identify and possibly geographically locate the source material. All analyzed samples, provenience information, and results will be presented in table form within the archaeological monitoring report.

7) **Report Preparation**
The report will contain sections on monitoring methods, archaeological results, stratigraphy, and results of laboratory analyses, and it will present a synthesis of these results. The report will address the requirements of a monitoring report (pursuant to HAR §13-13-279-5). Photographs of excavations will be included in the monitoring report even if no historically significant sites are documented. Should burial treatment be completed as part of the monitoring effort, a summary of this treatment will be included in the monitoring report.

Should burials and/or human remains be identified, CSH will provide all appropriate additional written documentation (e.g., letters, memos, reports) that may be requested by the SHPD.

8) **Archiving Materials:**
All burial materials will be addressed in accordance with SHPD directives. Materials not associated with burials will be temporarily stored at CSH’s Līhu‘e office until an appropriate curation facility is selected, in consultation with the landowner and the SHPD. All data generated will be stored at the CSH offices.

3.7 Air Quality

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

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

The State maintains one air quality monitoring station on the island of Kaua‘i. It is located in Niumalu approximately .8 mile to the southwest of the project site. The Niumalu Station monitors NO_2, SO_2, and $PM_{2.5}$. Air quality at this site is considered “Good” with an index value of 31. Index values between 0 to 50 indicate that air quality is “Good”.

Impacts and Mitigation Measures
In the short- and long-term, no significant impacts on air quality are anticipated as a result of the construction and operation of the proposed project. There are land

disturbing activities such as fine grading and foundation work, clearing and grubbing for landscaping purposes, and possible utility work. Fugitive dust will be controlled by methods such as dust fences, water spraying and sprinkling of loose or exposed soil or ground surface areas. As deemed appropriate, planting of landscaping will be done as soon as possible on completed areas to also help control dust. Respective contractors will be responsible to minimize air quality impacts during the various phases of construction.

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

3.8 Noise

Ambient noise in the vicinity of the Project site is predominantly attributed to vehicular traffic along adjacent roadways. Noise generated by the project will likely be due to construction related activities such as trucking, hauling and power equipment. It is anticipated that all construction will take place during daylight hours.

Impacts and Mitigation Measures

In the short-term, the potential for adverse noise impacts from short term construction activities exist, particularly during school classroom hours when construction activities occur. Construction noise levels are typically highest during earthwork (75 to 85 dBA at 100 feet). The use of sound attenuating barriers between the construction site and classroom buildings will be used during classroom hours, as appropriate. Also, temporary air conditioning will be provided to Classroom Buildings A and B to reduce construction noise impacts on classes.

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

Activities at the gymnasium will periodically generate high levels of crowd noise during sporting events and other school events. Typical sound levels in spectator areas are intermittent rather than continuous. The existing character of the surrounding area would not be significantly impacted by the proposed gymnasium, as the use of the facility would not represent an intensification of the existing use of the school's older facility. It is anticipated that the modern design and construction of the new gymnasium would better contain noise and reduce ambient exposure than the existing facility.

3.9 Hazardous Materials

Hawai‘i International Environmental Services, Inc (HIES) conducted a Soil and Hazardous Material Survey on December 23, 2014 to collect and analyze soil samples to determine whether the soil around the portables located in two areas (Area A and Area B) were impacted with organochlorine pesticides (OCP). During the survey, HIES also collected asbestos and lead surveys within the two portable areas. This survey is included herein as Appendix B, and is summarized below.

More than a dozen portables were spread out throughout the campus in 2014. Area A, located adjacent to Building T across the Westside Courtyard, was a long row of portables, which consisted of four externally connected portables. . Area B, the proposed location of the proposed new gymnasium, consisted of six individual portables, which were relocated to Area A after the portables at Area A were demolished.

Due to the age of the buildings at KHS, there is a concern that chlordane, a pesticide used to treat building foundations for termites, or other termiticides could be present in the soil at Area A and Area B.

HIES collected multi-increment samples outside the roof drip zone of each portable at a depth of 6 inches below the ground surface using an ESS Lock N’ Load disposable soil core sampler set to collect 5 grams of soil per increment. At both Area A and Area B, 36 increments were collected and were analyzed by ESN Pacific, Inc of Honolulu for OCP using Environmental Protection Agency (EPA) method 8081 mod.

Five OCP constituents (aldrin, technical chlordane, alpha-chlordane, gamma-chlordane, and dieldrin) were detected in the soil at Area B. All five chemicals are pesticides or the by-products of pesticides that were commonly used to treat building foundations for termites but are now banned in the United States due to the human health hazards they pose. Aldrin, dieldrin, and chlordane are also identified as persistent, bioaccumulative, and toxic (PBT) pollutants targeted by the EPA. The Hawai‘i Department of Health (DOH) has not listed Environmental Action Levels (EALs) for alpha- or gamma-chlordane, but EALs are listed for aldrin, dieldrin, and technical chlordane. The concentrations detected of these three OCPs were below applicable DOH Tier 1 EALs for unrestricted land use.

The presence of multiple similar compounds warrants the consideration of cumulative effects; however, all five OCPs were detected at levels well below the EALs for any of the OCPs analyzed, therefore, cumulative effects are unlikely to be hazardous to human health. One OCP (p,p’-DDD) was detected in the Area A soil. DDD is a former pesticide and a metabolite of the more well-known pesticide DDT. The use of either pesticide is banned in the United States. DDD is a probable human carcinogen, and is considered a PBT pollutant targeted by the EPA. However, the concentrations were below DOH Tier 1 EALs for unrestricted land use.

HIES also collected the bulk material samples to test for asbestos-containing building materials (ACBM) and lead-based paint (LBP) from the interior and exterior of Portables P8, P9, P10, and P11 (single portable located southwest of the property, Area A).

Exterior building material samples were collected from individual portables P5, P20, P21, P22, P23, and P24 (located at northeast of the property, Area B) that were planned to be relocated to Area A.

The portables at Area B, did not have any disturbance inside the structures, therefore samples were only collected from the exterior of the portables.

A total of 24 asbestos samples representing eight (8) homogenous areas were collected and a total of 21 lead-based paint samples were collected and sent to EMC Labs, Inc of Arizona, a National Voluntary Laboratory Accreditation Program (NVLAP) and a National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory, for analysis. Asbestos was detected in the six floor/tile mastic samples submitted for analysis from Portables P9 and P11 which was demolished. LBP was not found in any of the samples submitted for analysis. However, lead was detected in soil at Area A and Area B, but well below the DOH Tier 1 EALs. Portables P8 through P11 were originally planned to be demolished, however during construction, KHS determined that P8 and P9 would be demolished, but P10 and P11 would be reused and relocated outside of KHS. All asbestos containing floor tiles and black mastic and wood substrate was monitored and removed from all 4 Portables, P8 through P11.

Impacts and Mitigation

Lead was detected in Area A and Area B soil at low levels, well below the DOH Tier 1 EALs. Six OCPs were detected in the soil surrounding the portables in Areas A and B; however, all detected concentrations were below applicable DOH Tier 1 EALs for unrestricted land use. The potential of a cumulative effect of the five OCPs detected at Area B on human health is a slight concern. As a result, the following actions will be implemented to limit or avoid exposure to the potentially harmful compounds for construction crews conducting current and/or future activities at the Site:

- Wear gloves and protective clothing (long-sleeve shirt and pants) to reduce exposure
- Wear a protective paper mask if airborne dust is present
- Change clothes and shower after working in OC termiticide treated soils to prevent spreading dirt into vehicles and buildings
- Following construction activities, plant grasses/un-edible shrubs to minimize future soil contact
- Following any digging activities, cover soils with a six inch layer of clean soil or gravel to provide a barrier to direct contact
- Soil should be either re-used onsite or disposed of a t a regulated landfill
- If any soil under the buildings are removed or permanently exposed, then it should be tested for the sample chemicals (and an Environmental Hazard Management Plan should be prepared)

3.10 Traffic

A Traffic Assessment Report (TAR) was prepared by Wilson Okamoto Corporation in June of 2018 to identify and assess the traffic impacts that could result from the development of the proposed gymnasium at KHS. The findings of this report are summarized below, and included herein as Appendix C.

Area Roadway System

Nāwiliwili Road is a predominantly two-lane, two-way roadway generally oriented in the north-south direction between Kaumuali‘i Highway and Lala Road. However, Nāwiliwili Road transitions to an east-west roadway at Niumalu Road until its terminus at Wa‘apa Road.

Northwest of the project site, Nāwiliwili Road intersects with Lala Road. Lala Road, which is adjacent to the project site, is a predominantly two-lane, two-way roadway that begins at Nāwiliwili Road as an east-west roadway and transitions to a north-south roadway at Kahumoku Road until reaching its eastern terminus at Rice Street. At the unsignalized T-intersection of Nāwiliwili Road and Lala Road, Nāwiliwili Road’s southbound approach is comprised of a shared left-turn and through lane, while its northbound approach is comprised of one through lane. Along Nāwiliwili Road’s northbound approach, there is a sign indicating that right-turn movements are prohibited from this approach. Located between Nāwiliwili Road and Rice Street, Lala Road comprises the east leg of the intersection. The Lala Road approach of the intersection includes a stop-controlled right turn lane. At this approach, there is a sign prohibiting left-turn movements.

To the southeast of this intersection, Nāwiliwili Road intersects with Wilcox Road. At this unsignalized T-intersection, the eastbound approach of Nāwiliwili Road is comprised of one though land and an exclusive right-turn lane. The westbound approach of Nāwiliwili Road is comprised a through lane and an exclusive left-turn lane. Wilcox Road is a predominantly two-lane, two-way roadway generally oriented in the north-south direction and is comprised of two segments. The southern segment extends from Kanoa Road, while the northern segment extends from the intersection of Nāwiliwili Road and Wa‘apa Road that serves as the driveway to the adjacent Banyan Harbor Resort. At the intersection with Nāwiliwili Road, the northbound approach of Wilcox Road has one stop-controlled left-turn and right-turn lane.

East of the intersection with Wilcox Road, Nāwiliwili Road intersect with Wa‘apa Road and Wilcox Road’s northern segment. At this unsignalized intersection, the eastbound approach of Nāwiliwili is comprised of an exclusive left-turn lane and a shared through and right-turn lane. Wa‘apa Road is predominantly two-lane, two-way roadway that begins south of Nāwiliwili Road as a north-south roadway, transitioning to an east-west roadway at the intersection with Nāwiliwili Road, and returns to a north-south roadway at Lala Road where it transitions as Rice Street. The westbound approach of Wa‘apa Road comprises an exclusive left-turn lane and one shared through and right-turn lane. The northbound approach of Wa‘apa Road includes one stop-controlled lane that serves all traffic movements. The southbound approach of Wilcox Road includes one stop-controlled lane that serves all traffic movements.

Northeast of the intersection of Nāwiliwili Road and Wilcox Road, Wa‘apa Road intersects with Lala Road and Rice Street. As previously mentioned, this unsignalized intersection, Wa‘apa returns to a north-south roadway and transitions as Rice Street. The northbound approach of Wa‘apa is comprised of an exclusive left-turn lane and a shared through and right-turn lane. Rice Street is a predominantly four-lane, two-way roadway that is generally oriented in the north-south direction. The southbound approach of Rice Street includes an exclusive left-turn lane and a shared through and right-turn lane. The eastbound approach of the intersection is comprised of Lala Road which includes a stop-controlled shared left-turn and through lane, as well as a stop-controlled right-turn lane. The east leg of the intersection

exclusive left-turn lane and a shared through and right-turn lane. The eastbound approach of the intersection is comprised of Lala Road which includes a stop-controlled shared left-turn and through lane, as well as a stop-controlled right-turn lane. The east leg of the intersection is comprised of a one-way (southbound) driveway that serves the adjacent Anchor Cove Shopping Center.

Existing Traffic Conditions

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

Field investigations were conducted in April 2018 and consisted of manual turning movement count surveys during the morning peak hours between 6:00 AM and 9:00 AM, and the afternoon peak hours between 1:00 PM and 4:00 PM. It should be noted that a typical school day at KHS begins at 7:40 AM every day and ends at 2:00 PM on Mondays, 2:45 PM on Tuesdays and Thursdays, and 1:30 on Wednesdays and Fridays. These counts were taken at the following intersections:

- Nāwiliwili Road and Lala Road
  At the intersection with Lala Road, Nāwiliwili Road carries 248 vehicles northbound and 682 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is greater with 471 vehicles traveling northbound and 558 vehicles traveling southbound. The Lala Road approach of the intersection carries 187 vehicles westbound during the AM peak period and 281 vehicles during the PM peak period. The westbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively.

  Although a crosswalk is provided across Nāwiliwili Road on the north side of the intersection, there were no pedestrians observed crossing at this location during the AM peak period while only 3 pedestrians were observed crossing Nāwiliwili Road during the PM peak period.

- Nāwiliwili Road and Wilcox Road
  At the intersection with Wilcox Road, Nāwiliwili Road carries 302 vehicles eastbound and 348 vehicles westbound during the AM peak period. During the PM peak period, the traffic volumes are greater with 431 vehicles traveling eastbound and 552 vehicles traveling westbound. The Wilcox Road approach of the intersection carries 186 vehicles during the AM peak period and 180 vehicles during the PM peak period. The northbound approach operates at LOS "B" and "C" during the AM and PM peak periods, respectively.

  Although there are no crosswalks provided across this intersection, 4 pedestrians and 2 pedestrians were observed crossing Wilcox Road and Nāwiliwili Road, respectively, during the AM peak period.

the traffic volumes are greater with 508 vehicles traveling eastbound and 585 vehicles traveling westbound. The Wa'apa Road approach of the intersection carries 48 vehicles northbound and 42 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is lower with 55 vehicles traveling northbound and 20 vehicles traveling southbound. The northbound and southbound approaches operate at LOS "C" during the AM and PM peak periods.

Crosswalks are provided across Nāwiliwili Road on the east of the intersection and across Wa'apa Road on the south side of the intersection. During the AM peak period, 10 pedestrians were observed crossing Wa'apa Road, while 12 pedestrians were observed crossing Nāwiliwili Road. During the PM peak period, 8 pedestrians were observed crossing Wa'apa Road, while 10 pedestrians were observed crossing Nāwiliwili Road.

- Lala Road, Wa'apa Road, and Rice Street
  At the intersection with Wa'apa Road and Rice Street, Lala Road carries 243 vehicles and 209 vehicles eastbound during the AM and PM peak periods, respectively. The Wa'apa Road approach of the intersection carries 430 vehicles northbound during the AM peak period and 521 vehicles during the PM peak period. The Rice Street approach of the intersection carries 537 vehicles southbound during the AM peak period and 635 vehicles during the PM peak period. The eastbound approach operates at LOS "A" during both peak periods.

  Crosswalks are provided across Lala Road on the west of the intersection and across Rice Street located on the north side of the intersection. During the AM peak period, 20 pedestrians were observed crossing Lala Road, while 19 pedestrians were observed crossing Rice Street. During the PM peak period, 24 pedestrians were observed crossing Lala Road, while 11 pedestrians were observed crossing Rice Street.

Parking at Kaua'i High School
An existing parking lot fronts the campus on Lala Road, which serves as the main parking lot to the school. There are also parking lots adjacent to the football field at the east end of the campus.

Impacts and Mitigation Measures
During construction, all construction related parking will be accommodated on-site. The proposed development is expected to be completed and operating by the year 2021.

Total Traffic Volumes Without Project
Under year 2021 without project conditions, traffic operations in the vicinity of the proposed KHS gymnasium are generally expected to remain similar to existing conditions despite the anticipated ambient growth in traffic. Along Nāwiliwili Road, traffic operations at the intersection of Lala Road are expected to continue operating at LOS "B" or better and LOS "C" or better during the AM and PM peak periods, respectively, while traffic operations at the intersection with Wilcox road are expected to continue operating at LOS "B" or better and LOS "C" or better during AM and PM

peak periods, respectively. The remaining intersections included in the TAR are also expected to continue operating at levels of service similar to current existing conditions.

Total Traffic Volumes With Project

In the long-term, the proposed improvements are basically to replace an outmoded facility and not intended to accommodate significant increases in site function or staffing. The proposed gymnasium will add a major new facility to the school's infrastructure. The improvements are intended to serve the existing student body as well as any increase in enrollment at the high school that is anticipated to occur either with, or without the implementation of the proposed improvements. It is not anticipated that a significant increase in traffic generation in the vicinity of the existing school would occur as a result of the proposed project. Site-generated traffic related to KHS is assumed to remain similar to existing traffic conditions. The year 2021 cumlative AM and PM peak hour traffic conditions with the new gymnasium at KHS are summarized in table 3-1.

Table 3-1: Existing and Projected Year 2021 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach/	AM		PM	
		Exist	Year 2021 w/ Proj	Exist	Year 2021 w/ Proj
Nāwiliwili Rd/ Lala Rd	Westbound	B	B	C	C
	Southbound (LT)*	A	A	A	A
Nāwiliwili Rd/ Wilcox Rd	Westbound (LT)*	A	A	A	A
	Northbound	B	B	C	C
Nāwiliwili Rd/ Wa'apa Rd/ Wilcox Rd	Eastbound (LT)*	A	A	A	A
	Westbound (LT)*	A	A	A	A
	Northbound	C	C	C	C
	Southbound	C	C	C	C
Wa'apa Rd/ Lala Rd/ Rice St/	Eastbound	A	A	A	A
	Northbound (LT)*	A	A	A	A
	Southbound (LT)*	A	A	A	A

*LT) = Left-Turn

Recommendations and Conclusions

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

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways.

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

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

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

5. Prepare a Transportation Management Plan to identify strategies to minimize the impact of school-related activities on the surrounding roadways. This plan should address daily school traffic including issues related to drop-off/pick-ups along the adjacent public roadways as well as special events planned for the future gymnasium.

The proposed project entails the construction of new gymnasium at the existing KHS campus to address the inadequacies of the school's existing gymnasium. With the implementation of the proposed project, traffic operations in the vicinity of KHS are expected to remain similar to the existing conditions. As previously discussed, vehicular volumes are generally expected to remain similar to existing conditions as the proposed gymnasium is a replacement to an existing school facility and is not expected to affect KHS's current or future student enrollment. Although the proposed project is not expected to generate new vehicular trips to the surrounding roadways, the preparation of a Transportation Management Plan is recommended to identify strategies to minimize the impact of school-related activities on the surrounding roadways including student drop-off/pick-ups, as well as planned special events conducted after regular school hours. As such, with the implementation of the aforementioned recommendations, the KHS gymnasium is not expected to have a significant impact on traffic operations in the project vicinity.

3.11 Visual Resources

KHS is located in Līhu'e on Kaua'i. It is bounded by Lala Road, Nāwiliwili Road and Rice Street. Nāwiliwili Harbor accommodates cruise ship stopovers and cargo operations. Kalapaki Beach and adjacent shopping and restaurants are located nearby. Further mauka along Rice Street are the Kaua'i Marriott Hotel as well as the Kaua'i Lagoons Resort. Further to the southwest is Niumalu, a primarily residential village.

Nāwiliwili Road and Rice Street are the main vehicular thoroughfares through the area. The Kaua'i High School campus is largely not visible from either of these roadways due to elevation, vegetation and landscaping. Lala Road is a lower volume roadway that provides direct access to the school.

Impacts and Mitigation Measures

The proposed project does not involve significant visual impacts resulting from its construction or operation. Once construction is complete, the exiting gymnasium will be demolished. Although in a different location, the new gymnasium will have a

comparable impact on views from existing roadways in the vicinity as its height is comparable to the existing gymnasium. The new gymnasium, however, will occupy more visual real estate because it is larger than the old, existing gymnasium.

3.12 Socio-Economic Characteristics

The project site is located within the Līhu‘e Census Designated Place (CDP). The following is a comparison of the Līhu‘e CDP and the County of Kaua‘i as shown in Table 3-2.

Table 3-2
Selected Demographic Characteristics of the Līhu‘e CDP and County of Kaua‘i

	Līhu‘e CDP	**County of Kaua‘i**
POPULATION		
Population, 2010	6,455	67,091
Persons under 5 years, percent, 2010	5.3%	6.5%
Persons under 18 years, percent, 2010	22.6%	22.3%
Persons 65 years and over, percent, 2010	19.0%	16.8%
RACE		
White persons alone, percent, 2010	22.2%	33.7%
Black persons alone, percent, 2010	0.4%	0.7%
Asian persons alone, percent, 2010	44.4%	31.3%
Native Hawaiian and Other Pacific Islander, alone, percent, 2010	7.0%	9.1%
Two or more races, percent, 2010	24.8%	24.6%
Hispanic or Latino, percent, 2010	8.5%	10.5%
SOCIAL CHARACTERISTICS		
Living in same house 1 year and over, 2009-2013	77.5%	87.5%
Foreign born persons, percent, 2009-2013	13.0%	15.1%
Language other than English spoken at home, pct age 5+, 2009-2013	18.0%	20.9%
High school graduates, percent of persons, age 25+, 2009-2013	88.3%	90.1%
Bachelor’s degree or higher, pct of persons age 25+, 2009-2013	27.4%	25.1%
Homeownership rate, 2009-2013	60.2%	62.6%
Housing units in multi-unit structures, percent, 2009-2013	28.7%	25.1%
Median value of owner-occupied units, 2009-2013	$463,800	$484,500
Persons per household, 2009-2013	3.03	2.99
Per capita money income in past 12 months (2013 dollars) 2009-2013	$27,815	$26,658

Median household income, 2009-2013	$67,448	$62,052
Persons below poverty level, percent, 2009-2013	13.5%	11.2%

Source: U.S. Census, State and County Quick Facts.

Based on 2010 Census figures, the Līhu‘e CDP contains 6,455 persons or 9.6% of the population within the County of Kaua‘i.

In terms of age distribution, the Līhu‘e CDP has slightly smaller percentages of persons under 5 years of age than the County of Kaua‘i as a whole. However, there are slightly greater percentages of persons 65 years and over in the Līhu‘e CDP (19.0%) than the County of Kaua‘i (16.8%) as a whole.

In terms of race characteristics, there are lower percentages of Whites in the Līhu‘e CDP (22.2%) than the County of Kaua‘i as a whole (33.7%). There are higher percentages of persons identified as Asian in the Līhu‘e CDP (44.4%) than the County as a whole (31.3%). Native Hawaiian and Other Pacific Islander categories as well as persons identified as Hispanic or Latino show slightly lower percentages in the Līhu‘e CDP than the County of Kaua‘i as a whole.

The Līhu‘e CDP (77.5%) has lower percentages of people living in the same house 1 year and over than the County as a whole (87.5%). Percentages of foreign born persons are slightly lower in the Līhu‘e CDP (13.0%) than the County of Kaua‘i as a whole (15.1%). The Līhu‘e CDP (18.0%) also has a slightly lower percentage of homes where a language other than English is spoken than the County of Kaua‘i (20.9%). In terms of educational attainment, there are slightly lower percentages of high school graduates age 25+ in the Līhu‘e CDP (88.3%) compared to the County of Kaua‘i as a whole (90.1%). However, there are slightly higher percentages of persons holding Bachelor’s degree or higher age 25+ in the Līhu‘e CDP (27.4%) compared to the County as a whole (25.1%).

Homeownership rates in the Līhu‘e CDP (60.2%) is slightly lower than the County of Kaua‘i (62.6%). Percentages of multi-unit structures are slightly higher in the Līhu‘e CDP (28.7%) than the County as a whole (25.1%). Median value of owner-occupied units is lower in the Līhu‘e CDP ($463,000) than the County of Kaua‘i as a whole ($484,500). Persons per household are slightly higher in the Līhu‘e CDP (3.03) than the County of Kaua‘i as a whole (2.99).

Per capita income is quite similar although median household income is higher in the Līhu‘e CDP ($67,448) than the County of Kaua‘i ($62,052). However, the Līhu‘e CDP has a slightly higher percentage (13.5%) of persons below poverty level compared to the County as a whole (11.2%).

Impacts and Mitigation Measures

The data suggest that socio-economic characteristics between the Līhu‘e CDP and the County of Kaua‘i are generally very similar. Age distribution of the population and most social characteristics are quite similar. However, some areas where there is some divergence in the data include race, median value of owner-occupied units and median household income.

In the short term, the project will confer positive economic benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy. Indirect economic benefits may include benefits to local retailing businesses resulting from construction activities.

In the long term, it is noted that KHS has been and will continue to be an integral part of the Kaua‘i community. It has a rich history of providing secondary educational opportunities over several generations. Over time, the physical plant needs upgrading and updating. The existing gymnasium is too small to accommodate all of the current KHS students comfortably at one time. Consequently, the new proposed facility is envisioned as a larger facility that will be capable of accommodating KHS's existing student enrollment, as well as forecast KHS enrollment levels for the foreseeable future.

The proposed new gymnasium will allow KHS to better accommodate their various JV and Varsity team practices, cheerleading, intramural after school activities, games, tournaments and numerous other school and community activities.

No adverse long-term socio-economic impacts are anticipated with the proposed project. The proposed project is not anticipated to induce growth in the Līhu‘e region nor spur significant increases or changes in travel behavior.

3.13 Public Services and Facilities

3.13.1 Police Fire, and Medical Services

Police protection services are provided by the County of Kaua‘i Police Department. The project site is part of the Līhu‘e Patrol District which extends from the area of the Maluhia Tree Tunnel (at about the 7 mile marker of Kaumuali‘i Highway) to Kukui Street in Kapa‘a Town. The Līhu‘e District office is located within the Kaua‘i Police Department Headquarters at 3990 Ka‘ana Street.

Fire protection services are provided by the County of Kaua‘i Fire Department. The project area is served by the Līhu‘e Fire Station which is located at 4444 Rice Street approximately 1.3 miles from the project site.

Situated in Līhu‘e proper, the project site is located within close proximity to Wilcox Memorial Hospital which is approximately 2 miles from the project site.

Emergency medical services in the Līhu‘e area are provided by American Medical Response.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts on police, fire, and medical services are anticipated.

In the long-term, the proposed project may require occasional police, fire and medical services, however the demand for these services would not represent a significant amount relative to the existing overall regional demand.

3.13.2 Education

The project site is located within the State Department of Education’s (DOE) Kaua‘i District. Chiefess Kamakahelei Middle School (grades 6-8 & ungraded) is the main feeder middle school to KHS. Elementary feeder schools (grades PK-5 & ungraded) in the Līhu‘e area include Elsie Wilcox Elementary School and King Kaumuali‘i Elementary School. Kawaikini Public Charter School is located along Nāwiliwili Road and serves grades K-12. Kanuikapono Learning Center is another public charter school serving grades K-12 in Anahola.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts or increased demand on schools are anticipated. KHS is already the largest high school in the Kaua‘i District in terms of enrollment. The proposed project will benefit the larger Kaua‘i community as well as current and future students by providing a needed new facility to meet demand for gym space at the KHS campus. The proposed project is not anticipated to induce population growth and is, therefore, not expected to affect student enrollment at public school facilities in the area.

3.13.3 Recreational Facilities

The County has several parks and recreational facilities in the project vicinity. Vidinha Stadium covers 34 acres and includes an athletic complex with a baseball field, football field, track, and soccer fields. Nāwiliwili Park is a 6.27 acre beach park located along Wa‘apa Road in Nāwiliwili. Līhu‘e County Park is 3.28 acres providing Little League and Pony fields, as well as soccer fields. Niumalu Park is a 3.41 acre beach park. Other neighborhood parks in the greater Līhu‘e area include the 3.59 acre Peter Rayno Park, the 2.28 acre Wiliko Park, the 2.59 acre Lau Kona Park, the 9.16 acre Isenberg Park, the 1.33 acre Kalena Park, the .63 acre Pua Loke Park, the 3.4 acre Puhi Park, the 4.37 acre Puhi Subdivision Park, the 4 acre Ulu Ko Park, and the 2 acre Hokulei Subdivision Park.

Impacts and Mitigation Measures

In the short- and long-term, no significant impacts or increased demand on recreational facilities in the project vicinity are anticipated. The proposed project is intended to support the existing and projected student and faculty population of KHS as well as provide a new facility which could be utilized by the larger Kaua‘i community. The project is not anticipated to induce population growth and associated demands on recreational facilities and parks.

3.13.4 Solid Waste Collection and Disposal

The County of Kaua‘i Department of Public Works (DPW) Solid Waste Division (SWD), is the agency responsible for properly managing and disposing of municipal solid waste (MSW) on the island of Kaua‘i. The existing Kekaha Municipal Solid Waste Landfill (MSWLF) is expected to reach capacity in the coming years. Consequently, the County of Kaua‘i is currently seeking a limited expansion of the existing Kekaha Landfill, expanding recycling and reuse programs to reduce waste, and is currently in the process of seeking and

analyzing alternative sites for a new landfill . Solid waste pickup for schools is provided by private refuse companies.

Impacts and Mitigation Measures

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

Construction of the proposed project will generate solid waste typical of building construction related activities over the short-term. The contractor will be required to remove all debris from the site, and properly dispose of it in conformance with County regulations.

Solid waste collection for the campus will be provided by a private hauler under contract with DOE. The project is not anticipated to significantly increase nor affect the County’s solid waste collection and disposal service.

3.13.5 Airport Facilities

Līhu‘e Airport is the primary Airport Facility that serves the Island of Kaua‘i. The proposed project is located approximately 1 mile from the end of Runway 21 and 1.5 miles from the end of Runway 35 of LIH. The Līhu‘e Airport occupies 943 acres on the southeast coast of Kaua‘i, situated approximately 1.5 miles east of Līhu‘e Town. The airport, which opened up in January 1950, provides passenger and aircraft facilities for domestic, overseas, and interisland carriers, commuter, air cargo, heliport, and general aviation. The airport facilities consist of two runways, taxiways, aprons, eight gates, navigational aids (ILS, VORTAC, DME and PAPI/VASI), airport traffic control tower, and helipads.

As the subject project is located within five (5) miles of the Līhu‘e Airport (LIH), it is subject to the State of Hawai‘i, Office of Planning, Technical Assistance Memorandum (TAM) relating to Federal Aviation Administration (FAA) Order 5190.6B that ensures land adjacent to, or in the immediate vicinity of, the airport is consistent with activities and purposes compatible with normal airport operations, including aircraft landing and takeoff.

Impacts and Mitigation Measures

The proposed project will not interfere with the Līhu‘e Airport operations and aviation safety. Photovoltaic (PV) panels are not being proposed on the roof of the structure so would not pose a glint/glare concern for overflying aircraft. The structure will have metal roofing, which will not be a glint/glare hazard. The proposed gymnasium will not attract wildlife such as birds that could pose a collision hazard to aircraft operating in the vicinity. Like the existing gymnasium, the proposed gymnasium would not penetrate the terminal or en-route obstacle clearance areas.

3.14 Infrastructure and Utilities

3.14.1 Water System

Water service for KHS is currently provided by the municipal water system of the County of Kaua‘i’s Department of Water Supply (DOW). The largest is the Puhi-Līhu‘e-Hanamā‘ulu water system which services most of the Līhu‘e Community Plan area, including KHS. DOW

record drawings and facility maps indicate an existing 8-inch water main and two existing fire hydrants running along Lala Road on the north side of KHS. The KHS campus, TMK 3-2-005:010, is served by a 4-inch domestic meter and 8-inch fire detector check meter. An existing 2-inch domestic meter is assigned to TMK: 3-2-005:11 and also provides service to TMKs 3-3-003:007 and 015.

Impacts and Mitigation Measures

The proposed domestic water connection is to an existing 6-inch on-site waterline which is connected to the 4-inch domestic meter located along the north border of the project site. Water connections to the existing DOW system will be finalized when the construction plans are submitted for review and approval.

It is anticipated that the proposed project will include 146.6 fixture units equivalent to 79 gpm. A 4-inch meter has a maximum capacity of 500 gpm. Existing water fixture unit information would be required to confirm existing water demand and determine is the existing water meter has enough additional capacity to accommodate the new facility. Depending on available capacity of the existing 4-inch meter, new meters may be required to provide adequate water service to the proposed gymnasium.

Today, the Puhi-Līhu'e-Hanamā'ulu water system's availability of water is a major consideration and potential barrier to new developments in the Līhu‘e District. The difficulty and expense of extracting and distributing water are limiting factors in providing water to service new developments. Water levels are affected by the combined effects of prolonged drought, withdrawals, and reduction of agricultural irrigation, as observed in the past by the community of Līhu‘e. If the proposed water demand exceeds the capacity of the existing 4-inch meter and the new meters, options would need to be considered to either reduce water demand for the new gymnasium or reduce demand from other parts of campus being served by the 4-inch meter. Installation of low-flow fixtures in the existing buildings is one option to reduce the water demand.

The installation of fire sprinklers in the gymnasium and wrestling room is required as they are classified as assembly areas with a capacity of over 300 people and encompass an area of more than 12,000 square feet. The two locker rooms will also include fire sprinklers since they are connected to the gymnasium. A fire department connection is proposed to be located fronting the gymnasium along the existing parking lot.

3.14.2 Wastewater System

There is no municipal sewer system serving the KHS property. Individual wastewater systems (IWS) provide wastewater treatment and disposal for campus facilities. The campus IWS consists of septic tanks and seepage pits.

There is one IWS within the vicinity of the gymnasium site which services nearby Building A. This IWS is located east of Building A and consists of a 5,000 gallon septic tank, grease interceptor, and five (5) seepage pits which are approximately 30-feet deep.

Impacts and Mitigation Measures

The proposed gymnasium and locker rooms will require its own IWS. The Department of Health (DOH) Wastewater Branch (WWB) was consulted regarding the design of a new IWS system for the proposed gymnasium.

The IWS will be sized to accommodate the designed occupancy of the gymnasium (1,550 seats) and the two locker room buildings. Preliminary calculations show that the facility will generate approximately 7,500 gallons per day (gpd) of wastewater.

This IWS is proposed to be located north of the proposed gymnasium within the existing asphalt concrete parking lot and will consist of gravity sewer lines, distribution boxes, manholes, a septic tank and seepage pits. A septic tank and multiple 30-foot± deep seepage pits will be required for wastewater treatment and disposal based on the requirements of Hawai'i Administrative Rules Title 11, Chapter 62 Wastewater Systems.

Chapter 62 on wastewater systems does not permit absorption trenches if the soils in question have percolation rates slower than sixty minutes per inch (1-in/hr); or if there is insufficient land area to install absorption trenches or beds; or if the slope of the finished elevation of the lot is greater than twelve percent and the use of absorption trenches or beds is not feasible. DOH will allow the construction of seepage pits only if the absorption trenches are shown to be infeasible.

Based on the IWS Certification of Construction for Building A, dated December 20, 2000 (IWS File No. 2769-A), initial computations were based on a percolation rate of twenty minutes per inch. However, the percolation tests conducted during construction found the percolation rate to be ten minutes per inch.

According to the UIC Injection Well Annual Status Report for KHS dated April 30, 2014 (UIC Permit No. UK-2704), seepage pits for the existing gymnasium (CP#15, CP#18, and CP#23) had percolation rates of 20.8, 0.5, and 22.7 respectively.

According to the U.S. Department of Agriculture Soil Conservation Service, the soil within the project limits consists of Līhu'e silty clay (LhC) with permeability ranging from 2.0-6.3 inches per hour.

With the above information, a percolation rate of thirty minutes (30) minutes per inch was selected for analysis. Percolation tests will be conducted to verify that seepage pits are feasible and determine the number of seepage pits required for wastewater disposal. Chapter 62 states that seepage pits shall not be constructed in soils having a percolation rate slower than ten minutes per inch (6-in/hr).

In order to ensure the structural integrity of the proposed gymnasium and avoid relocating the existing seepage pits servicing Building A, deep foundations are being considered along the portion of the building nearest to the existing seepage pits. If shallow foundations are selected for the gymnasium footing, the existing 30-foot± deep seepage pits servicing Building A will need to be relocated to the parking lot.

Further geotechnical and structural analysis is required to determine which option is feasible and cost effective.

3.14.3 Drainage System

The site is generally flat with elevations ranging from 136.0 feet at the northwest corner to 127.5 feet at the northeast corner. There is a small 3-foot bank (approximately a 2:1 slope) along the west border of the site. Runoff is split into two drainage areas totaling 2.44 acres. Runoff from the northwest portion of the site flows toward the south into an existing drain inlet north of Building B. The existing drain inlet conveys runoff via an underground 18-inch drain line below Building B discharging at an outfall into an unimproved vegetated area south of the school campus. The remaining runoff sheet flows toward the eastern portion of the campus.

Impacts and Mitigation Measures

Grading of the proposed project will maintain the existing drainage pattern. Given the majority of the existing site is unpaved, runoff from the developed project site will be more than the existing runoff quantity. Additional runoff generated by the gymnasium will be retained onsite, as required by the Kaua'i Department of Public Works. Per DPW, since areas downstream of the high school do not have sufficient capacity and are subject to flooding, new drainage improvements are required to maintain both the 2-year and 100-year 24-hour storm flows at or below predevelopment flow rates. Underground retention or storage tank(s) are proposed for this project due to the limited open space on-site.

The existing drain inlet fronting the existing Building B will remain and serve as an overflow for the underground storm water retention tank(s).

3.14.4 Electrical and Communications Systems

Electrical power on the island of Kaua'i is provided by the Kaua'i Island Utility Cooperative (KIUC), a not-for-profit generation, transmission and distribution cooperative owned and controlled by the members it serves. KIUC's energy portfolio includes a growing percentage of hydropower, photovoltaic, bio-fuel, and biomass.

Telephone service in the Līhu'e area is provided by Hawaiian Telcom.

Spectrum is the local CATV provider in the region.

Impacts and Mitigation Measures

In the short- and long-term, the proposed project is not anticipated to significantly impact or increase overall demand on electrical and communication systems in the area. No significant increase in enrollment is expected over the short and long term. However, since the existing electrical, telephone and cable infrastructure is aging, appropriate assessments, repairs, and upgrades may be necessary. Prior to the commencement of construction, Applicant will work with the appropriate agencies on improvements which may be required as a result of the proposed project.

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4. RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

This section discusses State of Hawai‘i and County of Kaua‘i land use plans, policies and controls and their relationship to the proposed project.

4.1 State Land Use Plans and Policies

4.1.1 Hawai‘i State Plan

The Hawai‘i State Plan, Chapter 226, HRS, provides and establishes the overall theme, goals, objectives, policies, and priorities for the statewide planning, guiding long-range growth and development in the State. The Hawai‘i State Plan also provides a basis for determining priorities, allocating limited resources, and improving coordination of State and County Plans, policies, programs, projects, and regulatory activities. The proposed project is consistent with the following applicable objectives and policies:

Section 226-4 State goals:

> *In order to guarantee, for present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:*
>
> > *(3) Physical, social, and economic well-being, for individuals and families in Hawai‘i, that nourishes a sense of community responsibility, of caring, and of participation in community life.*

Discussion: The proposed project will create a new gymnasium that will provide a space that will accommodate to a wide range of educational, athletic, and cultural activities for both KHS’s students and the community alike. The gymnasium will act as a gathering space for both social and sporting events, thus contributing to the social and physical well-being of its users enabling Kaua‘i citizens to participate more fully in community life.

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

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

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

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

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

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

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

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

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

Discussion: In the short- and long- term, no significant impacts on land-based, shoreline, and marine resources are anticipated during the construction or operation of the proposed project. Construction of the proposed project will not involve any major land disturbing activities. This involves clearing for building foundation work, utility repairs and upgrades, parking lot establishment, and clearing and grubbing for landscaping purposes. Applicable best management practices and erosion control measures will be implemented. These include but may not be limited to: stabilized construction vehicle entrance, grate inlet protection, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Excavation and grading activities will be regulated by the County's grading ordinance. For development done on the various phases, coordination will be undertaken with the appropriate agencies during permitting and construction in order to ensure that the proposed project will not result in significant impacts with regard to land-based, shoreline and marine resources.

Sec. 226-21 Objective and policies for socio-cultural advancement – education.

(a) Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement to the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.

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

(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.

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

Discussion: The proposed project will aid in the continuation of quality physical education programs and intramural activities that enhance personal development, physical fitness, and recreational pursuits of all groups as well as promote the overall academic excellence of KHS. The existing gymnasium was built in 1939 with a seating capacity of 800 persons. The facility is utilized by the school for various activities including assemblies, basketball and volleyball functions, physical education classes, music, drama, band, and chorus performances, and commencement activities. It is unable to accommodate all to the school's

programmatic needs. The proposed project will provide an adequate facility designed to meet the school's and community's needs.

4.1.2 State of Hawai'i – State Functional Plans

The Hawai'i State Plan is primarily guided by the State Functional Plans (Chapter 226, HRS) and implemented by the State Department of Budget and Finance and the LUC. State Functional Plans, prepared by various State agencies with citizen input, provide specific recommendations for action. The areas addressed by the plans are: agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism, and transportation. The following describes how the proposed project complies with applicable State Functional Plans**.**

Educational Functional Plan

The State Education Functional Plan serves as a mechanism for implementing the Hawai'i State Plan as it relates to the directions of the Board of Education and the programs of the Department of Education. The following policies form the basis of the plan: 1) academic excellence; 2) basic skills; 3) education workforce; 4) facilities and services; 5) alternatives for funding and delivery; 6) autonomy and flexibility; 7) increased use of technology; 8) personal development; 9) students with special needs; 10) early childhood education; 11) Hawai'i's cultural heritage; and 12) research programs and communication activities.

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

Discussion: The new gymnasium will support the educational achievements of Kaua'i's students individually and as a part of the student body, thus contributing to their role as fully contributing citizens in adult life.

4.1.3 State Land Use District

The State Land Use Law, Chapter 205, HRS, is intended to preserve, protect and encourage the development of lands in the State for uses that are best suited to the public health and welfare of Hawai'i's people. Under Chapter 205, HRS, all lands in the State of Hawai'i are classified by the State Land Use Commission (LUC) into one of four major categories of State Land Use Districts. These districts are identified as the Urban District, Agricultural District, Conservation District, and Rural District.

The LUC's Land Use District Boundary map for the Island of Kaua'i depicts the lands within the project area as being designated within the State Urban District (See Figure 4-1).

The Urban District generally includes lands characterized by "city-like" concentrations of people, structures and services. This district also includes vacant areas for future development. Jurisdiction of this district lies primarily with the respective counties. Generally, lot sizes and uses permitted in the district area are established by the respective county through ordinances or rules.

A school facility is a permitted use within the Urban District. A State Land Use District Boundary Amendment will not be required for construction of the new gymnasium.

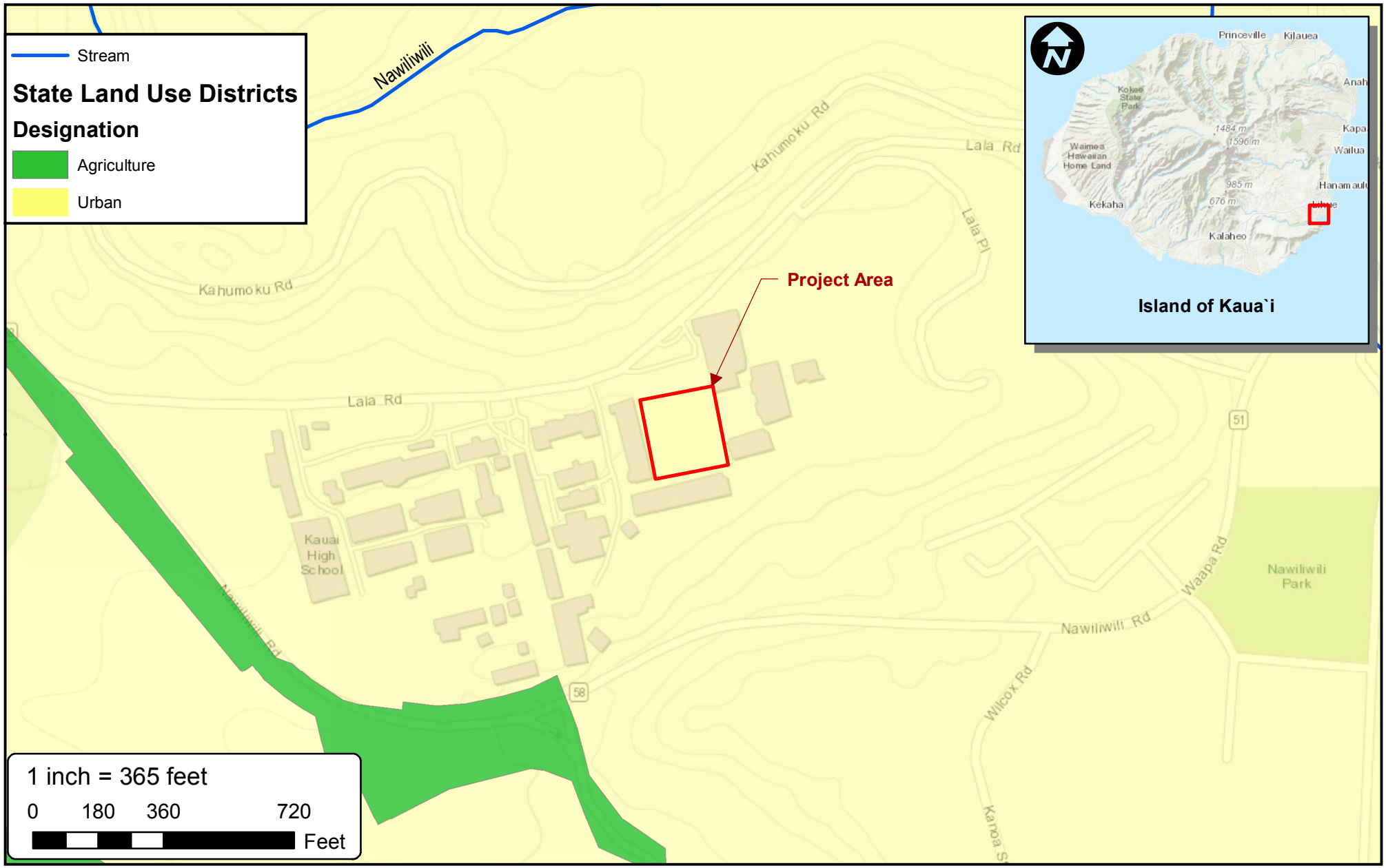

Figure 4-2

State Land Use Districts

Kaua`i High School New Gymnasium
Līhu'e, Island of Kaua'i

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

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

(1) Recreational Resources

<u>Objective</u>:
Provide coastal recreational opportunities accessible to the public.

<u>Policies</u>:

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

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

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

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

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

(v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources; Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.

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

(vii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

Discussion: The nearest public shoreline access is located at the Nāwiliwili Beach, located approximately 0.4 miles to the east of the proposed project site.

No short- or long-term significant impacts on surface and/or coastal waters in the project vicinity are anticipated during construction or operation of the proposed project. There are no streams or wetlands within the project site. The closest stream, Nāwiliwili Stream is approximately 700 feet to the north, and the closest wetland is approximately 1,500 feet to the west. Applicable erosion control measures and best management practices will be implemented in order to mitigate any possible adverse effects relating to runoff. As applicable for each phase, these may include but are not be limited to: temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, slope protection, stabilized construction vehicle entrance, grate inlet protection, truck wash down areas, and use of compost filter socks. Planting of landscaping also will be done as soon as possible on completed areas to help control erosion. Permanent sediment control measures will be used once construction is completed.

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

(2) Historic Resources

Objective:

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

Policies:

(A) Identify and analyze significant archaeological resources;

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

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

Discussion: Past archaeological investigation efforts for the subject project indicate that there are several historic properties in close proximity to the site. To fulfill the requirements set forth by HAR §13-276, the proposed project will comply with all recommendations made

under the AMP conducted in 2014. Consequently, the proposed project will avoid significant impacts on historic and archaeological resources.

(3) Scenic and Open Space Resources

Objective:

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

Policies:

(A) Identify valued scenic resources in the coastal zone management area;
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion: The proposed project is not anticipated to have significant impacts on notable view planes nor adversely affect important public viewing points or visual resources.

(4) Coastal Ecosystems

Objective:

(A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
(B) Improve the technical basis for natural resource management;
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The nearest coastal water offshore of the project site is Nāwiliwili Harbor, located approximately 0.36-miles to the south of the project site.

During construction of the various improvements, storm water runoff may carry increased amounts of sediment into the storm drain system due to erosion from soils exposed during excavation and grading activities. This runoff could potentially impact the water quality of

coastal waters in the area. However, excavation and grading activities associated with the construction of the proposed project will be regulated by the County's grading ordinance. Mitigation measures will be instituted in accordance with site-specific assessments, incorporating appropriate structural and/or non-structural BMPs such as minimizing time of exposure between construction and landscaping, and implementing erosion control measures such as silt fences and sediment basins. Following the associated construction activity, the excavated areas will be paved over or backfilled to its graded contours or re-vegetated to control erosion.

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

(5) Economic Uses

Objective:

(A) Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

(A) Concentrate coastal dependent development in appropriate areas;

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

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

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

(ii) Adverse environmental effects are minimized; and

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

Discussion: In the short-term, construction expenditures will provide positive benefits to the local economy. This would include creation of some construction and construction support jobs, and the purchase of materials from local suppliers, as well as indirect benefits to local retail businesses resulting from construction activities. In the long-term, the proposed gymnasium will allow for KHS's physical educational program and sport programs to expand, as well as community programs that use the facility.

(6) Coastal Hazards

Objectives:

(A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

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

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

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

(D) Prevent coastal flooding from inland projects.

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

According to the Tsunami Evacuation Zone maps for Kaua'i, the project site is not within the tsunami evacuation zone.

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

(7) Managing Development

Objective:

(A) Improve the development review process, communication, and public participation in the management of coastal resource and hazards.

Policies:

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

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

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

Discussion: The Hawai'i State environmental review process, HRS 343, requires project review by government agencies and affords the public the opportunity to provide comments on the proposed project. Applicable State and County requirements will be adhered to in the design and construction phases of the proposed improvements.

(8) Public Participation

Objective:

(A) Stimulate public awareness, education, and participation in coastal management.

Policies:

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

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

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

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

(9) Beach Protection

Objective:

(A) Protect beaches for public use and recreation.

Policies:

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

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

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

Discussion:
The proposed improvements do not involve the construction of improvements in the shoreline setback nor require any shoreline erosion-protection structures.

(10) Marine Resources

Objective:

(A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

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

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

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

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

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

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

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

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

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

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

4.2 County of Kaua‘i Land Use Plans and Policies

4.2.1 Kaua‘i County General Plan

The Kaua‘i County General Plan establishes priorities for managing growth and community development to help plan and improve the physical environment and quality of life for the people of Kaua‘i over a 20-year planning timeframe. The theme of the General Plan, Kaua‘i Kākou, recognizes that Kaua‘i's strength lies in its strong diverse community and the ability to work together for a better future. This document also outlines the County's vision for the island and establishes the strategies to help achieve that vision.

Sector: V. Shared Spaces
The public realm belongs to all and must be planned and designed in consideration of all users' needs from keiki to kūpuna. Shared spaces, also known as "civic space", are the areas used for everyday community acitivities such as shopping, recreation, and socializing. Kaua‘i's most important shared spaces are its town centers, streets, beaches, and parks.

Sector: X. Opportunity & Health For All
The General Plan's goals include Kaua‘i being a place with healthy and resilient people, and to be an equitable place with the opportunity for all. These goals mutually reinforce and are essential to the overall 2035 Vision.

General Plan Objectives

> *6. To increase overall community health through design that supports safe and accessible parks, streets, and other shared spaces*
>
> *32. To provide a variety of quality and accessible parks and recreational facilities*
>
> *45. To prepare for the impacts of climate change on the natural and built environments*
>
> *47. To support educational programs that foster cultural knowledge, employability, and civic participation of local residents.*

Discussion: The new proposed gymnasium will serve as an additional venue for community gatherings and meetings for Kaua‘i's citizens during non-school hours and weekends. The gymnasium will provide a quality recreational and educational space for KHS's student body and community to actively engage in healthy physical activities contributing to their overall well-being Moreover, the new gymnasium is envisioned as a metal frame building with standing seam metal roofing, serving as an Enhanced Hurricane Protection Area for the community to take refuge.

4.2.2 Līhuʻe Community Plan (LCP)

The Līhuʻe Community Plan (LCP) translates community input into policies and plans to guide the future development of the Līhuʻe District. The LCP outlines the uniqueness and special qualities of the different communities and places that make up the District. The LCP is a result of the community-driven process that integrates current best planning practices

with recent Kaua'i County planning efforts highlighting core values of smart growth and sustainability.

Discussion: The subject project is aligned with the policies and goals outlined within the LCP and are not contrary to the Plan.

4.2.3 Kaua'i County Zoning

The zoning designation for the project site is R-1 Residential and ST-P Special Treatment District (See Figure 4-2).

Discussion: Article 3 of the Kaua'i County Code defines residential density districts. The R-1 Residential District density allows for one dwelling unit per acre of land. Article 11 of the Code defines Special Treatment Districts as those allowing public and quasi-public facilities, other than commercial, including schools, churches, cemeteries, hospitals, libraries, police and fire stations, government buildings, auditoriums, stadiums, and gymnasiums, which are used by the general public or which tend to serve as gathering places for the general public; and those areas which because of their unique locations are suited for such public and quasi-public uses.

The proposed facility improvements, are considered a permitted use in the residential district and as a recognized use as a public gathering place, are in conformance with the current county zoning of R-1 and Special Treatment District.

4.2.4 Kaua'i County Comprehensive Zoning Ordinance

The County's Comprehensive Zoning Ordinance (CZO) establishes procedures for the division of the County into land use districts, and creates regulations for the types, size, placement, and control of structures within various zoning district classifications. The CZO also delineates the respective types of permitted uses and the development that can take place in those zoning districts.

Discussion: The new proposed facility improvements are permitted within existing County zoning and thus are in compliance with the CZO.

4.3 Permits and Approvals

The following is a list of permits, approvals, and reviews that may be required prior to construction and operation of the proposed project.

State of Hawai'i

Department of Land and Natural Resources

- Chapter 6E, HRS, State Historic Preservation Law

Department of Health

- National Pollutant Discharge Elimination System

County of Kaua'i

Planning Department

- Class IV Zoning and Use Permit

Department of Transportation Services

- Street Usage Permit

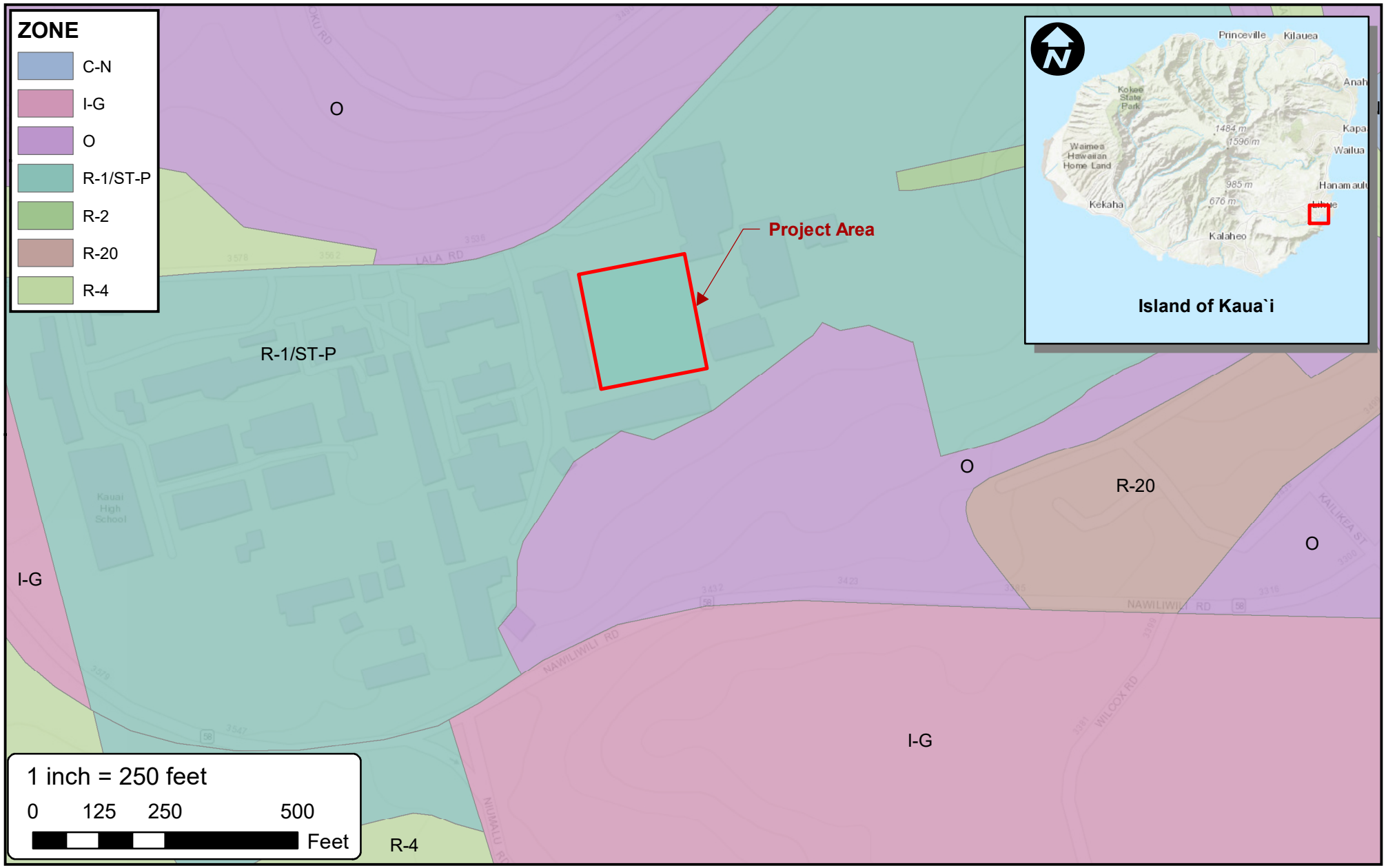

Figure 4-2

COUNTY OF KAUA`I ZONING MAP

Kaua`i High School New Gymnasium

Līhu'e, Island of Kaua'i

WILSON OKAMOTO CORPORATION

5. ALTERNATIVES

Under Hawai‘i Administrative Rules, Title 11, Chapter 200, Environmental Impact Statement Rules, Section 11-200-10(6), the alternatives to the proposed action considered are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. The feasible alternatives must also address the project's economic characteristics while responding to the surrounding land uses that will be impacted by the project. In conformance with applicable regulations, the following alternatives, including alternative sites and uses of the property, have been identified and investigated.

5.1 No Action Alternative

Under the No Action Alternative, the proposed project would not be constructed. This alternative would fail to address Kaua‘i High School’s existing facility needs. This alternative is unacceptable in terms of maintaining standards for scholarship and education and is therefore rejected.

5.2 Alternative Locations on Campus

Five alternative sites on campus were selected for evaluation. Four were clustered toward the south end of the campus, while one was located on the northern portion of campus.

Option A was in the same location as the existing gymnasium. This option would require the demolition of the existing gymnasium, leaving KHS without a gym to use for its current functions. All school assemblies and other activities that the gymnasium is used for would need to be addressed during the construction period until the new gymnasium was completed.

Option B was just north of the existing gymnasium. This option would result in the displacement of the existing track at KHS.

Option C was located in the same area of the existing weight room and outdoor courts. This option would require the demolition of the existing weight room and outdoor courts. KHS would be unable to use these facilities until the construction of the new gymnasium was completed. This area is in close proximity to Nāwiliwili Cemetery and has a higher potential to uncover burial sites.

Option D, the selected location, is located between to Classrooms A and the pool. The site was occupied by six (6) portable buildings and two (2) modular trailers. The site is bounded by a parking lot and Lala Road to the North, an existing swimming pool to the east, Classroom B to the south, and Classroom A to the west. This site required the demolition of the condemned Portables P8, P9, P10, and P11 on the west campus, and the relocation of 6 portables at the project site, to the area where P8-11 were located.

Option E was located on the norther portion of campus, adjacent to the track and parking lot. This option would displace the track and is located away from the entrance and main facilities used on campus. This option is also in close proximity to the historic Nāwiliwili Cemetery and has a higher potential to uncover burial sites.

The site selection process evaluated each site's pros and cons, taking into account site topography, drainage and sewer challenges, possible burial finds, options for relocating portables, the demolition and replacement of the existing gymnasium, and other issues. Options A, C, and E were eliminated from further consideration by the Principal and administrative staff of KHS on the basis that each would require the displacement of facilities in active use and would require other associated site improvements and easements. Consequently, Options B and D were carried forward for further design study. Ultimately, Option D was selected over Option B for its superior compatibility with existing utility infrastructure, its proximity to related facilities, and the potential for its location to create an identity, entrance and "face" for KHS.

6. ANTICIPATED DETERMINATION OF FONSI

The proposed project involves the following improvements:

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

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

There are no known significant natural resources on the subject property.

No destruction or loss of any significant, endangered, or threatened botanical, faunal, geological, or other natural resources is anticipated to result from the construction and operation of the proposed project. The proposed project site is not located within a Federally Delineated Critical habitat. Consequently, the construction and operation of the proposed project will not result in any impacts to federally designated Critical Habitats.

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

The proposed project will not curtail the beneficial uses of the environment as the project site is located within a fully developed high school campus. Construction and operation of the new facilities will be performed in accordance with Federal, State and County regulations, thereby minimizing potential impacts to air and water quality and ambient noise levels.

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

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

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

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

In the long-term, the proposed project will provide the opportunity for KHS to continue to offer its students a range of opportunities which can help to boost academic achievement.

(5) Substantially affects public health;

No significant adverse short- or long-term impacts on public-health are anticipated to result from the construction and operation of the proposed project. Typical short-term construction-related impacts (e.g., noise and air quality) are anticipated, however, but will be temporary in nature and will comply with State and County regulations. Standard construction and permanent best management practices will be followed to mitigate substantial impacts on public health. Land disturbing activities include demolition, foundation work, utility repairs and upgrades, and parking lot construction. Public health benefits include enhanced wellness for those who make use of the athletic facilities.

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

Substantial impacts to public facilities are not anticipated to result from the construction and operation of the proposed project. Moreover, the proposed project is not anticipated to induce population growth in the area or region. Existing public water, wastewater, drainage, and utility infrastructure has served the region for many years, and has ample capacity to serve project demands. The project will coordinate with applicable review agencies with jurisdiction over their respective infrastructure systems to comply with applicable requirements.

(7) Involves a substantial degradation of environmental quality;

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

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

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

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

There will be no destruction or loss of any significant, endangered, or threatened botanical, faunal, geological, or other natural resources. There are no federally delineated Critical Habitat within or close to the project corridor, thus construction and operation of the proposed project will not result in any impacts to federally designated Critical Habitats.

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

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

Land disturbing activities include demolition, foundation work, and potential utility repairs and upgrades. Construction and operation of the new facilities will be performed in accordance with Federal, State and County regulations, thereby minimizing potential impacts to air and water quality.

In the short-term, noise from construction activities such as demolition, clearing and paving will be unavoidable. The increase in noise level will vary according to the particular phase of construction. Noise may also increase as a result of operating power equipment during the construction period.

Construction noise impacts will be mitigated by compliance with provisions of the State DOH Administrative Rules, Title 11, Chapter 46, "Community Noise Control" regulations. These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the DOH Administrative Rules. It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels within regulatory limits.

In the long-term, no significant noise impacts are anticipated once the construction of the proposed project has been completed. Since the project is not expected to significantly increase roadway capacity or travel demand, ambient noise levels in the vicinity attributable to the project should not change significantly.

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

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

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

According to the Tsunami Evacuation Zone maps for Kaua'i, the project site is not within the tsunami evacuation zone.

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

The proposed project will not result in significant impacts to view planes identified in county or state plans or studies.

(13) Requires substantial energy consumption.

The construction and operation of the proposed project will not require a significant level of energy consumption.

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7. CONSULTATION

7.1 Pre-Assessment Consultation

The following agencies and organizations were consulted during the preparation of the Draft EA. Of the 16 parties that formally replied during the pre-assessment period, some had no comments while others provide substantive comments as indicated by the ✓ and ✓✓, respectively. All written comments are reproduced in Appendix D.

Federal Agencies

Environmental Protection Agency, Regional IX
U.S. Army Corps of Engineers
✓✓ U.S. Department of the Interior, Fish and Wildlife Service

State Legislative Branch

Senator Ron Kouchi
✓✓ Representative James Tokioka

State Agencies

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

County Council

Councilmember Mel Rapozo

County of Kaua'i Agencies

✓✓ Department of Water
Department of Public Works
Department of Parks and Recreation
Planning Department
Office of Economic Development
Civil Defense Agency

- ✓ County Transportation Agency
  Kaua'i Fire Department
  Kaua'i Police Department

Utility Companies

Kaua'i Island Utility Cooperative
Hawaiian Telcom
Spectrum

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APPENDIX A:

Archaeological Monitoring Plan (AMP) for the
Kauaʻi High School Improvements Project,
Nāwiliwili Ahupuaʻa, Līhuʻe District, Kauaʻi
TMK: [4] 3-2-005:011 (por.)

Final

Archaeological Monitoring Plan for the Kaua‘i High School Improvements Project, Nāwiliwili Ahupua‘a, Līhu‘e District, Kaua‘i TMK: [4] 3-2-005:011 (por.)

Prepared for
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Management Summary

Reference	Archaeological Monitoring Plan for the Kaua‘i High School Improvements Project, Nāwiliwili Ahupua‘a, Līhu‘e District, Kaua‘i TMK: [4] 3-2-005:011 (por.) (Hammatt and Shideler 2014)
Date	November 2014
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: NAWILIWILI 20
Investigation Permit Number	CSH presently operates under Hawai‘i State Historic Preservation Division (SHPD) permit number 14-04, issued per Hawai‘i Administrative Rules (HAR) §13-13-282. The indicated on-site archaeological monitoring may well progress under this permit and/or a subsequent permit to be issued in 2015.
Project Area Locations	The three proposed project areas are on the grounds of Kaua‘i High School (KHS), a 21.1-acre campus at 3577 Lala Road just south of Līhu‘e Town in southeast Kaua‘i. KHS is located approximately 450 m northwest of Nāwiliwili Harbor and Kalapakī Beach. The three project areas are discrete portions of the east, central, and southwest KHS campus.
Land Jurisdiction	State of Hawai‘i Department of Education (DOE)
Agencies	SHPD
Project Description	The KHS improvements will effectively take place in three project areas: 1. The construction of an off-site parking area. While the project area is on the KHS campus, it is outside (northeast) of the developed core campus area and is hence referred to as “off-site” in some project documents. The project area is situated east of a gated parking area and abuts the east edge of Lala Road 2. The relocation of gym portables involves moving six portable classroom buildings (designated P-5, P-20, P-21, P-22, P-23, and P-24) from their present location at the proposed new gymnatorium location in the central portion of the campus to the southwestern portion of the campus. 3. A new gymnatorium is to be constructed in the central portion of the campus immediately south of the existing gymnasium (which is to remain).

Project Area Acreage	There are basically three project areas within the KHS campus with acreage as follows: 1. Off-site parking area of 0.36 hectare (0.9 acre) 2. Relocation of gym portables area of 0.24 hectares (0.6 acres) 3. New gymnatorium area of 0.68 hectares (1.7 acres) The total area for all three project areas is 1.29 hectares (3.2 acres).
Historic Preservation Regulatory Context	This Kaua‘i High School Improvements project archaeological monitoring plan was prepared to fulfill the requirements of HAR §13-13-279-4 governing archaeological monitoring plans. This document is intended to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-13-275 (addressing governmental projects), as well as the project’s environmental review under HRS §343. An archaeological monitoring plan for this project was specifically requested in an SHPD §6E-8 Historic Preservation Review dated 30 May 2014 (Log No.: 2014.02044, Doc. No.: 1405GC12; included in this AMP in Appendix A)
Mitigation Recommendation	On-call archaeological monitoring is recommended for future ground altering activities within the footprint of the off-site parking area. This recommendation is deemed appropriate as no significant cultural material remains or deposits were encountered during the archaeological inventory survey/archaeological assessment of that project area (Kamai et al. 2014) and is consistent with the SHPD §6E-8 Historic Preservation Review dated 6 August 2014 (Log No.: 2014.02523, Doc. No.: 1408MN01; included in this AMP in Appendix A). On-site archaeological monitoring is recommended for all ground disturbance associated with the relocation of the gym portables and construction of the new gymnatorium.

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Section 1 Introduction

1.1 Project Background

At the request of Wilson Okamoto Corporation, and on behalf of the State of Hawai‘i Department of Education, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological monitoring plan (AMP) for the Kaua‘i High School (KHS) Improvements Project at the KHS campus, Nāwiliwili Ahupua‘a, Līhu‘e District, Kaua‘i TMK: [4] 3-2-005:011 (por.). The three proposed project areas are on the grounds of KHS, a 21.1-acre campus at 3577 Lala Road just south of Līhu‘e Town in southeast Kaua‘i. KHS is located approximately 450 m northwest of Nāwiliwili Harbor and Kalapakī Beach. Nāwiliwili Stream flows just to the north and east, and Ho‘inakāunalehua Stream flows to the west and south.

The three specific project areas are depicted on a portion of the 1998 U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), tax map plats (Figure 2 and Figure 3), and on a 2012 aerial photograph (Figure 4). Client-provided site and utility plan maps (Figure 5 through Figure 7) depict each of the three proposed projects.

The KHS Improvements project involves three components:

1. The construction of an off-site parking area. While the project area is on the KHS campus, it is outside (northeast) of the developed core campus area and is hence referred to as “off-site” in some project documents. The project area is situated east of a gated parking area and abuts the east edge of Lala Road (Figure 1 through Figure 4). The off-site parking is currently in use as an unimproved overflow parking area for KHS. A site and utility plan for the parking area and a related detention basin is provided in Figure 5. The off-site parking improvements and related detention basin area is approximately 0.36 hectare (0.9 acre).
2. The relocation of gym portables involves moving six portable classroom buildings (designated P-5, P-20, P-21, P-22, P-23, and P-24) from their present location at the proposed new gymnatorium location in the central portion of the campus to the southwestern portion of the campus (Figure 1 through Figure 4). This is understood to involve certain utility hook-ups. A site and utility plan for the relocation of gym portables is provided in Figure 6. The relocation area of this project is approximately 0.24 hectares (0.6 acres).
3. A new gymnatorium is to be constructed in the central portion of the campus immediately south of the existing gymnasium (which is to remain) (Figure 1 through Figure 4). A footprint map for the new gymnatorium is provided in Figure 7 (final design plans for the new gymnatorium are still in progress). The approximate area of the new gymnatorium project is 0.68 hectares (1.7 acres).

The total area for all three project areas is approximately 1.29 hectares (3.2 acres).

This Kaua‘i High School Improvements project archaeological monitoring plan was prepared to fulfill the requirements of Hawai‘i Administrative Rules (HAR) §13-13-279-4 governing archaeological monitoring plans. This document is intended to support the proposed project’s historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-13-275

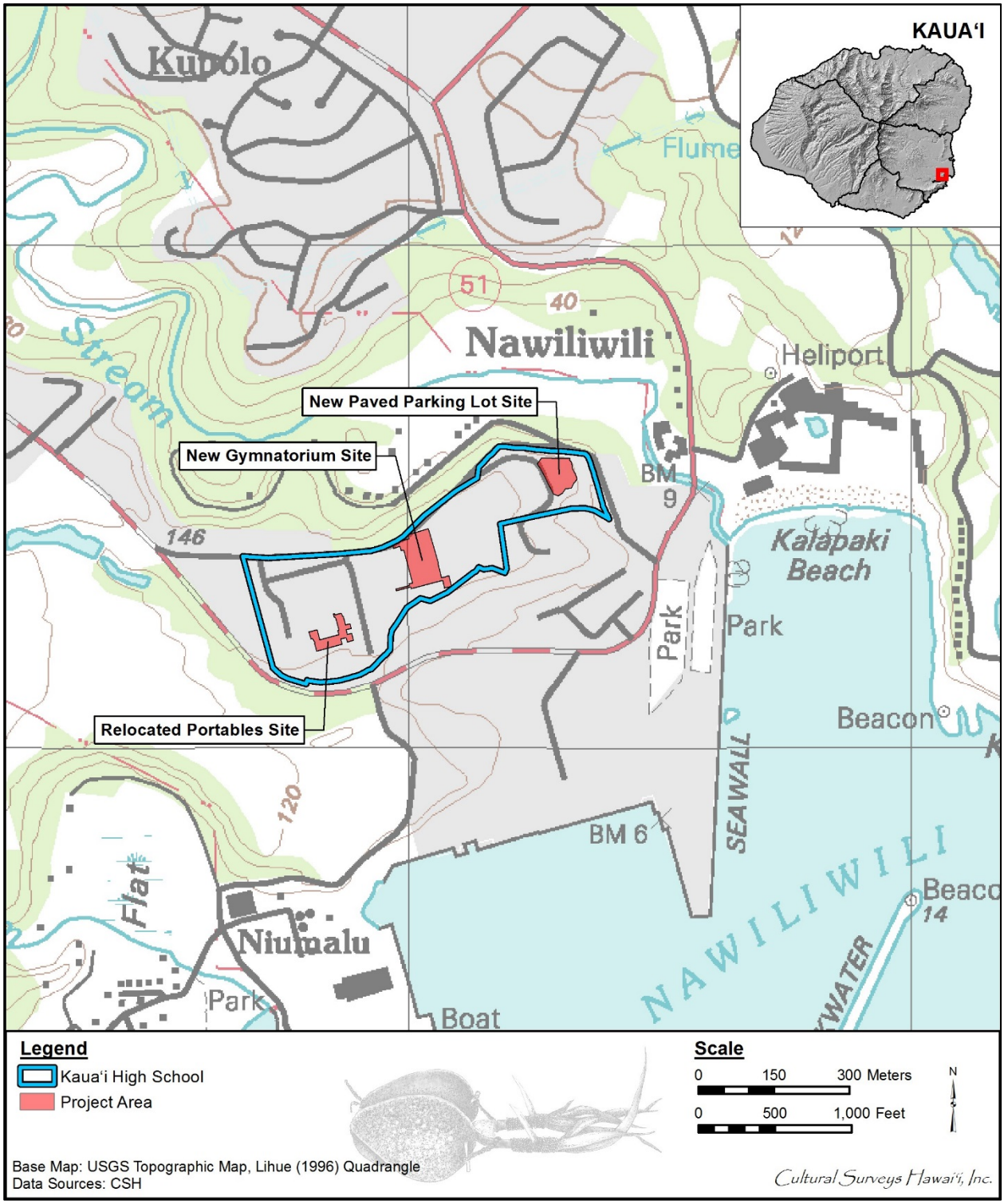

Figure 1. Portion of 1998 Lihue USGS topographic quadrangle, showing the proposed project areas within the Kaua‘i High School campus

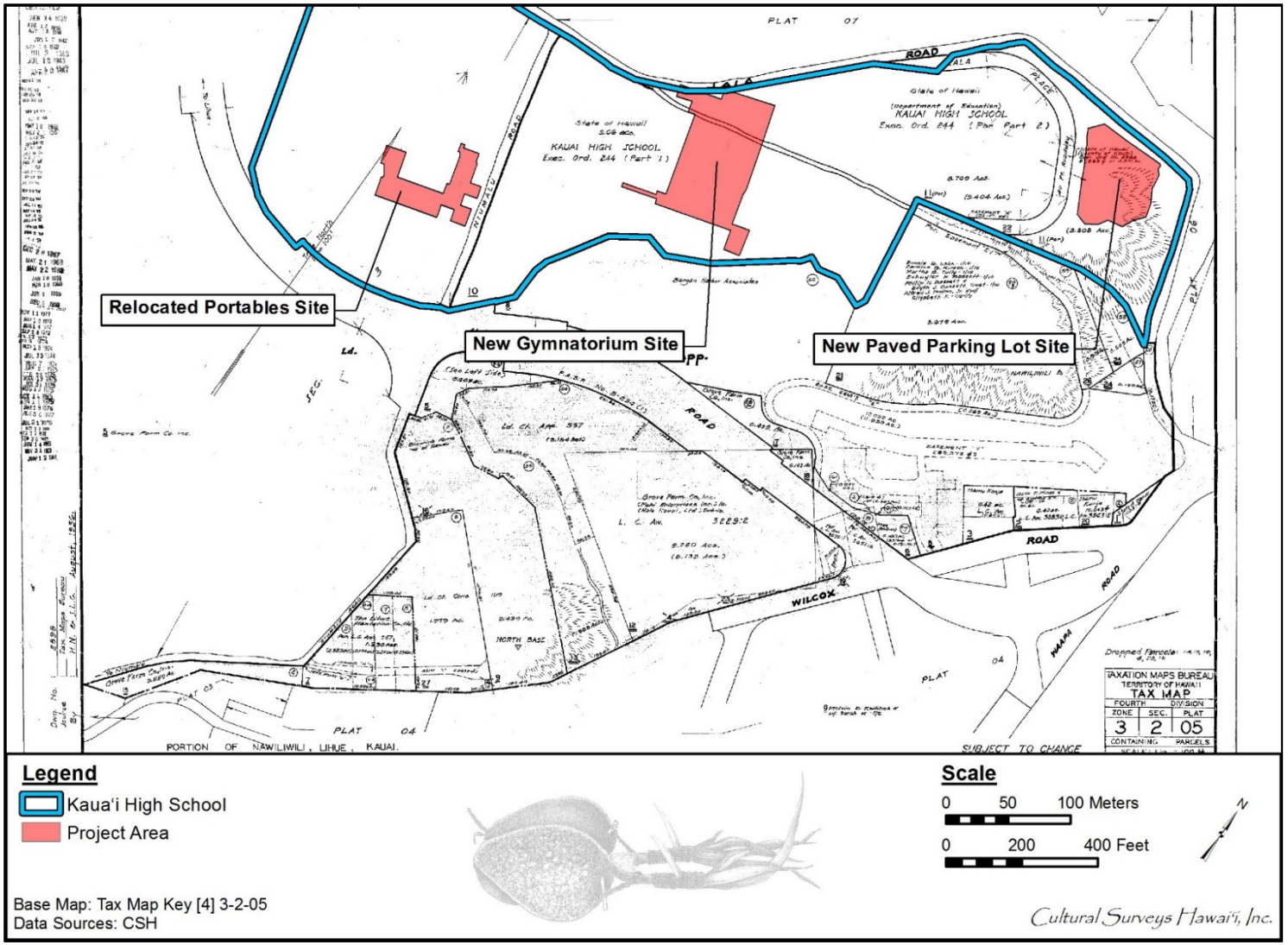

Figure 2. Tax Map Key (TMK) [4] 3-2-005 showing the proposed project areas within the Kaua‘i High School campus (Hawai‘i TMK Service 1984)

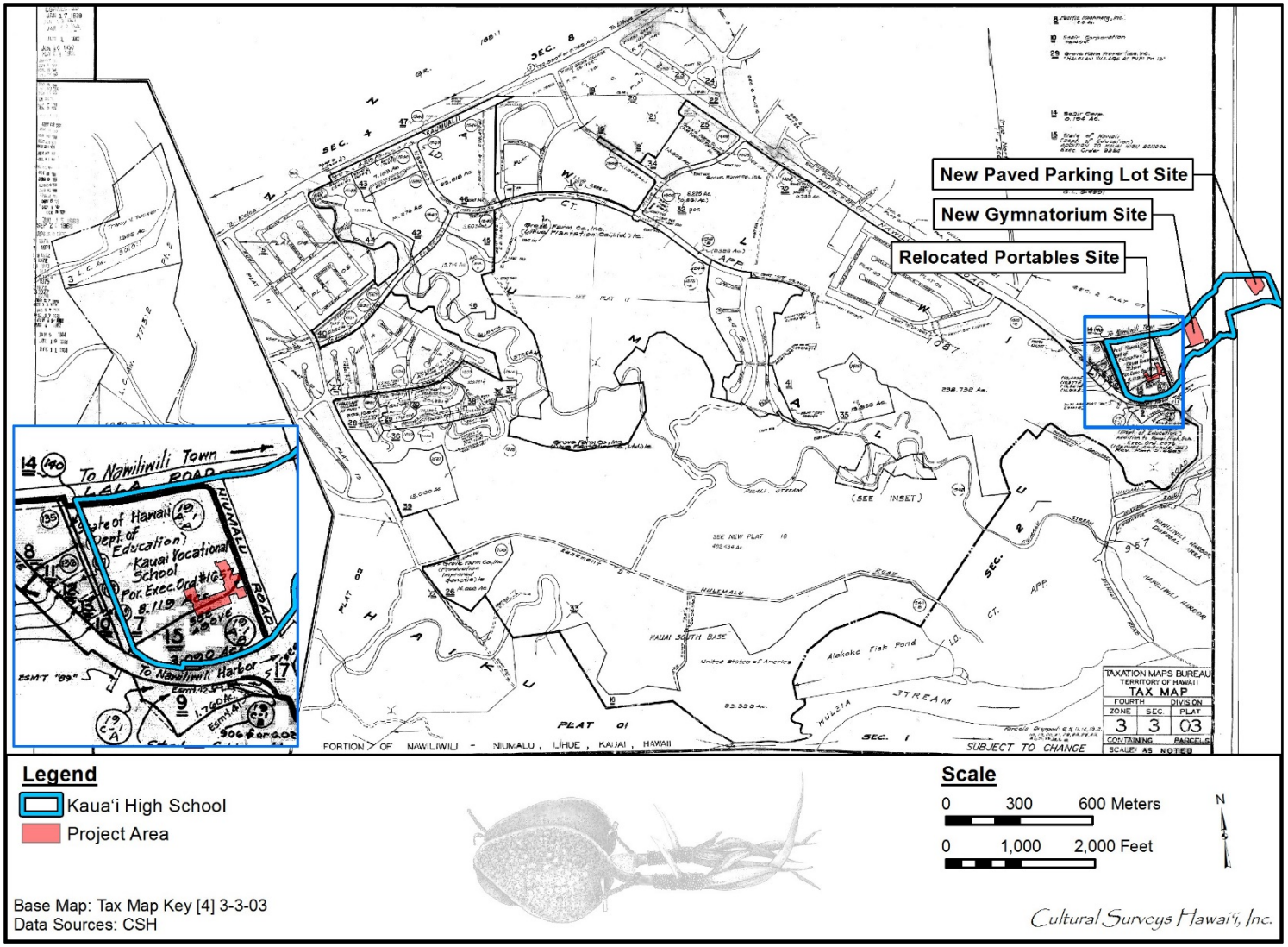

Figure 3. TMK: [4] 3-3-003 showing the proposed project areas within the Kaua‘i High School campus (Hawai‘i TMK Service 1984)

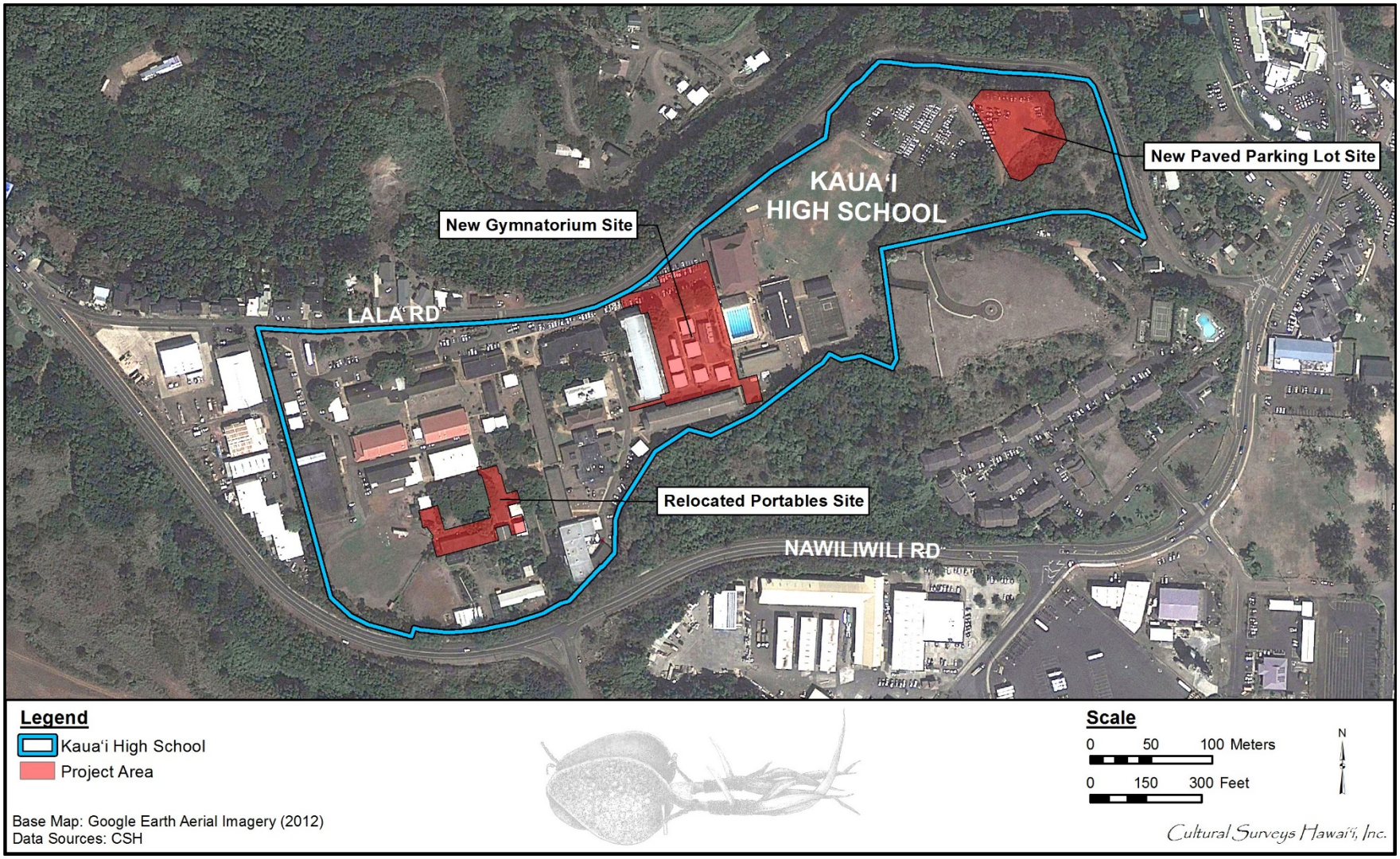

Figure 4. Google Earth aerial photograph (2012) showing the proposed project areas within the Kaua‘i High School campus

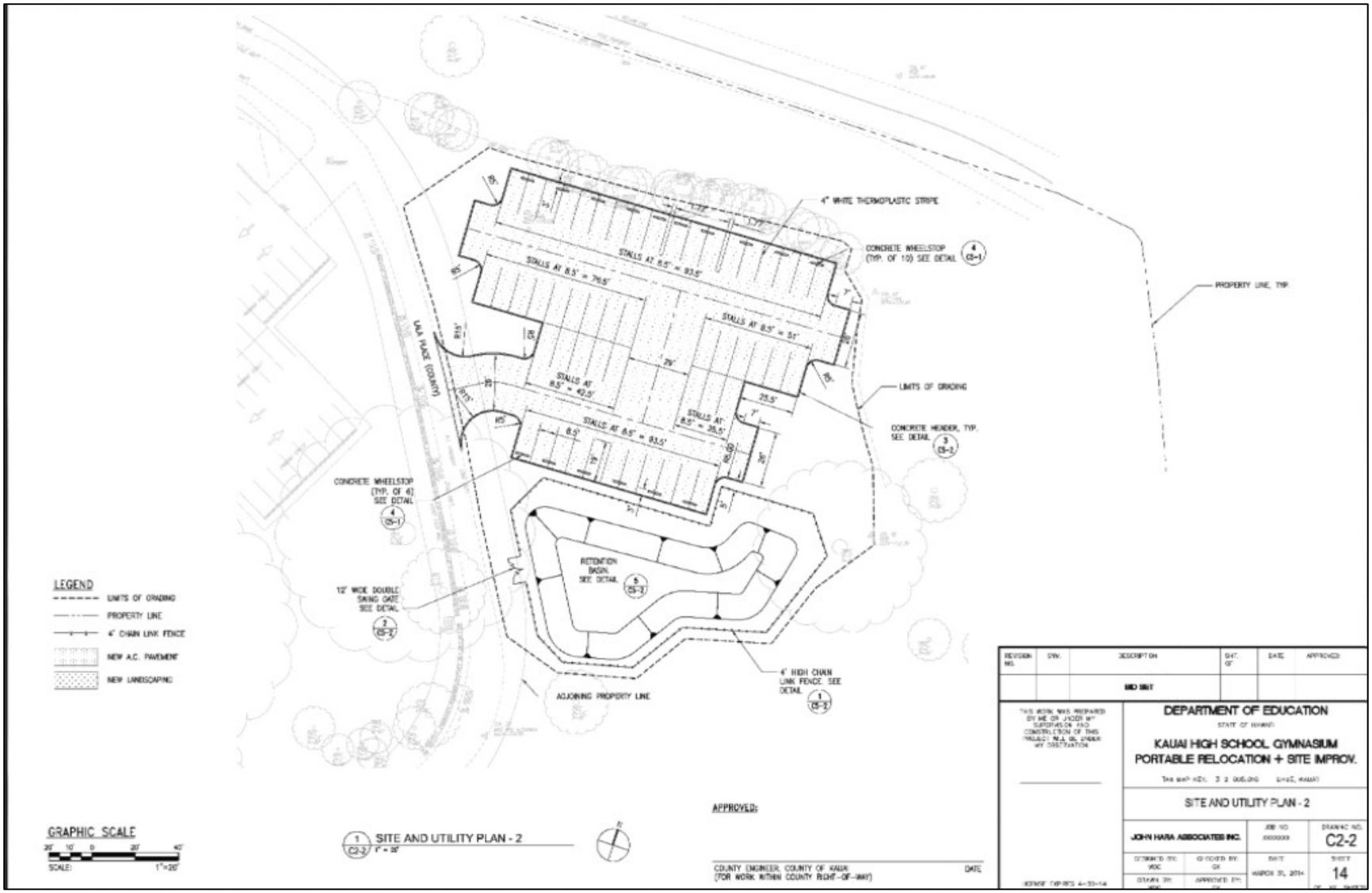

Figure 5. Site and utility plan map of Kaua‘i High School parking improvements at east end of campus (courtesy of client)

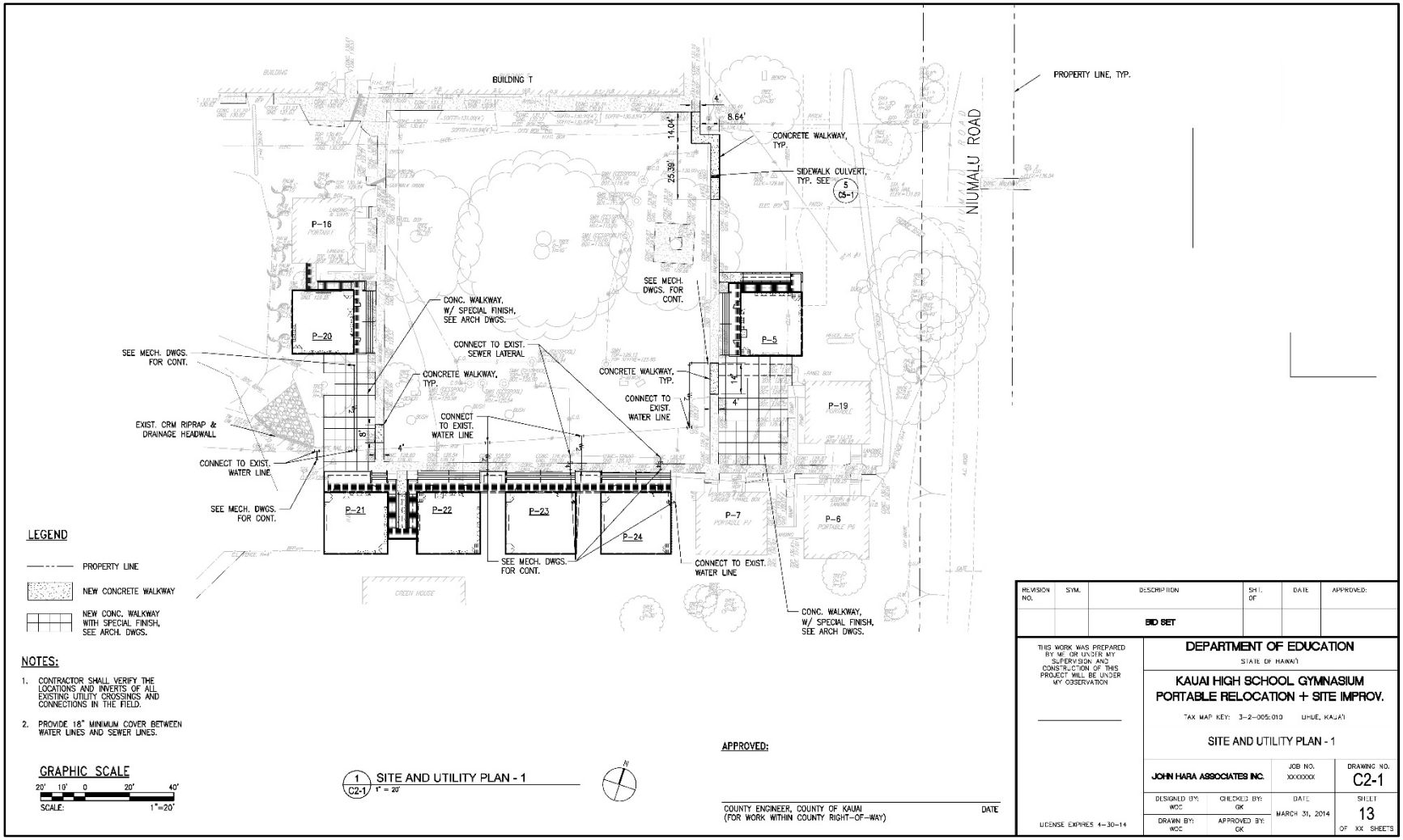

Figure 6. Site and utility plan map of Kaua‘i High School Gymnasium portables relocation and site improvements in the southwestern portion of the campus (courtesy of client)

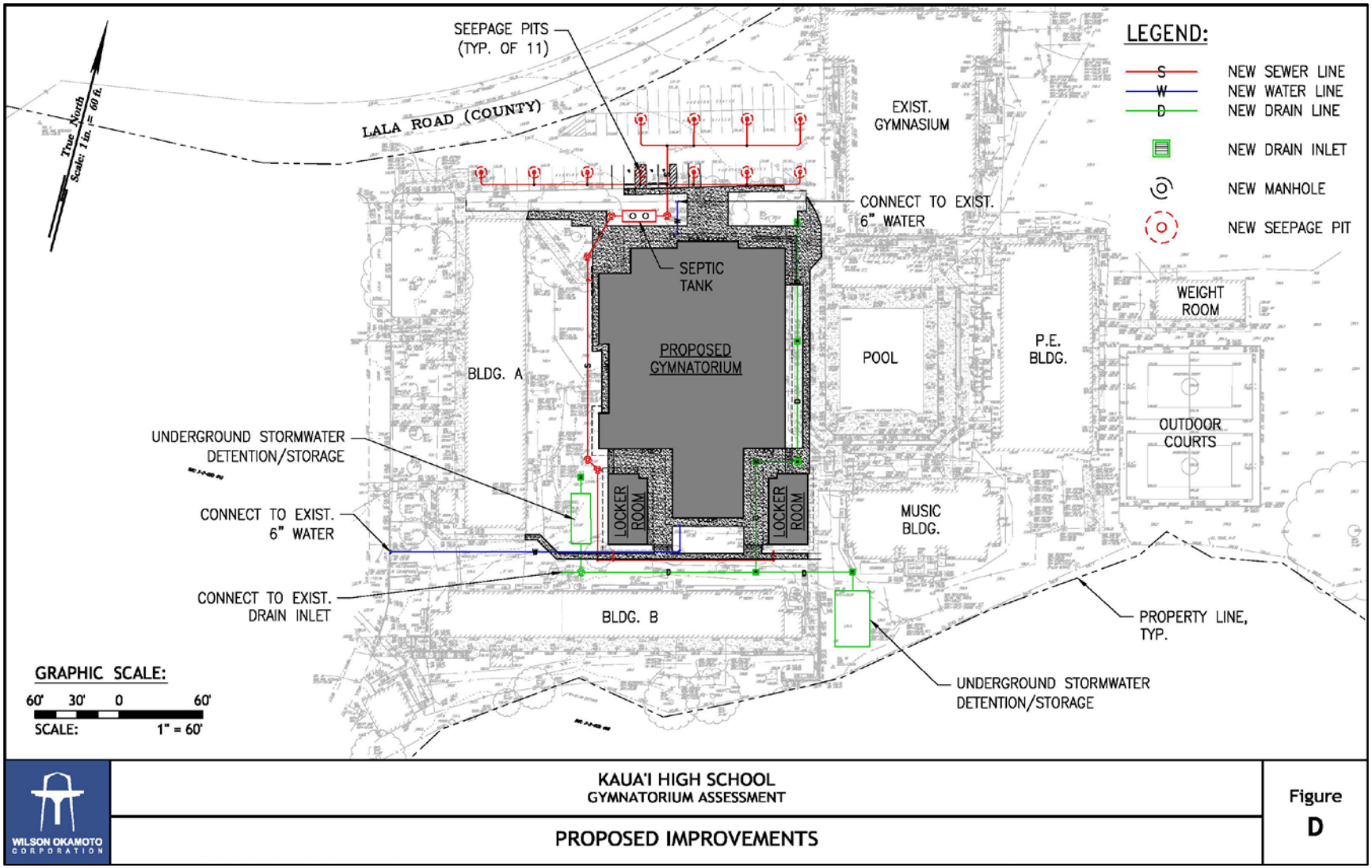

Figure 7. Proposed Kaua‘i High School Gymnasium demolition and relocation footprint map in the north central portion of the campus

(addressing governmental projects), as well as the project’s environmental review under HRS §343.

1.2 Environmental Setting

1.2.1 Natural Environment

The approximately, 21.1-acre KHS campus is located in coastal southeast Kaua‘i Island just southeast of Līhu‘e. KHS is located in Nāwiliwili Ahupua‘a, approximately 450 m northwest of Nāwiliwili Harbor and Kalapakī Beach. Nāwiliwili Stream flows just to the north and east, and Ho‘inakāunalehua Stream flows to the west and south. The vicinity receives between 1,000 and 1,500 mm (30 to 45 inches) of rain per year (Giambelluca et al. 1986).

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area’s soils consist of Lihue silty clay, 0 to 8% slopes (LhB), Lihue silty clay, 8 to 15% slopes (LhC), and Rough broken land (rRR) (Figure 8).

Lihue silty clay, 0 to 8% slopes (LhB) soil is described as follows:

> Lihue silty clay, 0 to 8 percent slopes IlhB).—This soil is on the tops of broad interfluves in the uplands. Included in mapping were small areas of a soil that has a very dark grayish-brown surface layer and a mottled subsoil . . . Permeability is moderately rapid. Runoff is slow, and the erosion hazard is no more than slight. The available water capacity is about 1.5 inches per foot of soil. In places roots penetrate to a depth of 5 feet or more. [Foote et al. 1972:82]

Lihue silty clay, 8 to 15% slopes (LhC) soil is described as follows:

> Lihue silty clay, 8 to 15 percent slopes (LhC). —On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, and homesites. (Capability classification Hie, irrigated or unirrigated; sugarcane group 1; pineapple group 6; pasture group 5; woodland group 5). [Foote et al. 1972:83]

Rough broken land (rRR) soil is described as follows:

> Rough broken land (rRR) consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. It occurs in gulches and on mountainsides on all the islands except Oahu. The slope is 40 to 70 percent. Elevations range from nearly sea level to about 8,000 feet. The local relief is generally between 25 to 500 feet. Runoff is rapid, and geologic erosion is active. The annual rainfall amounts to 25 to more than 200 inches. [Foote et al. 1972:119]

1.2.2 Built Environment

The project areas are located in the northeast, central, and southwest portions of the KHS campus. KHS was the first public high school on the island of Kaua‘i and serves students from ninth through twelfth grades. In addition to classrooms and administration offices, KHS includes an athletic field, gym, and swimming pool.

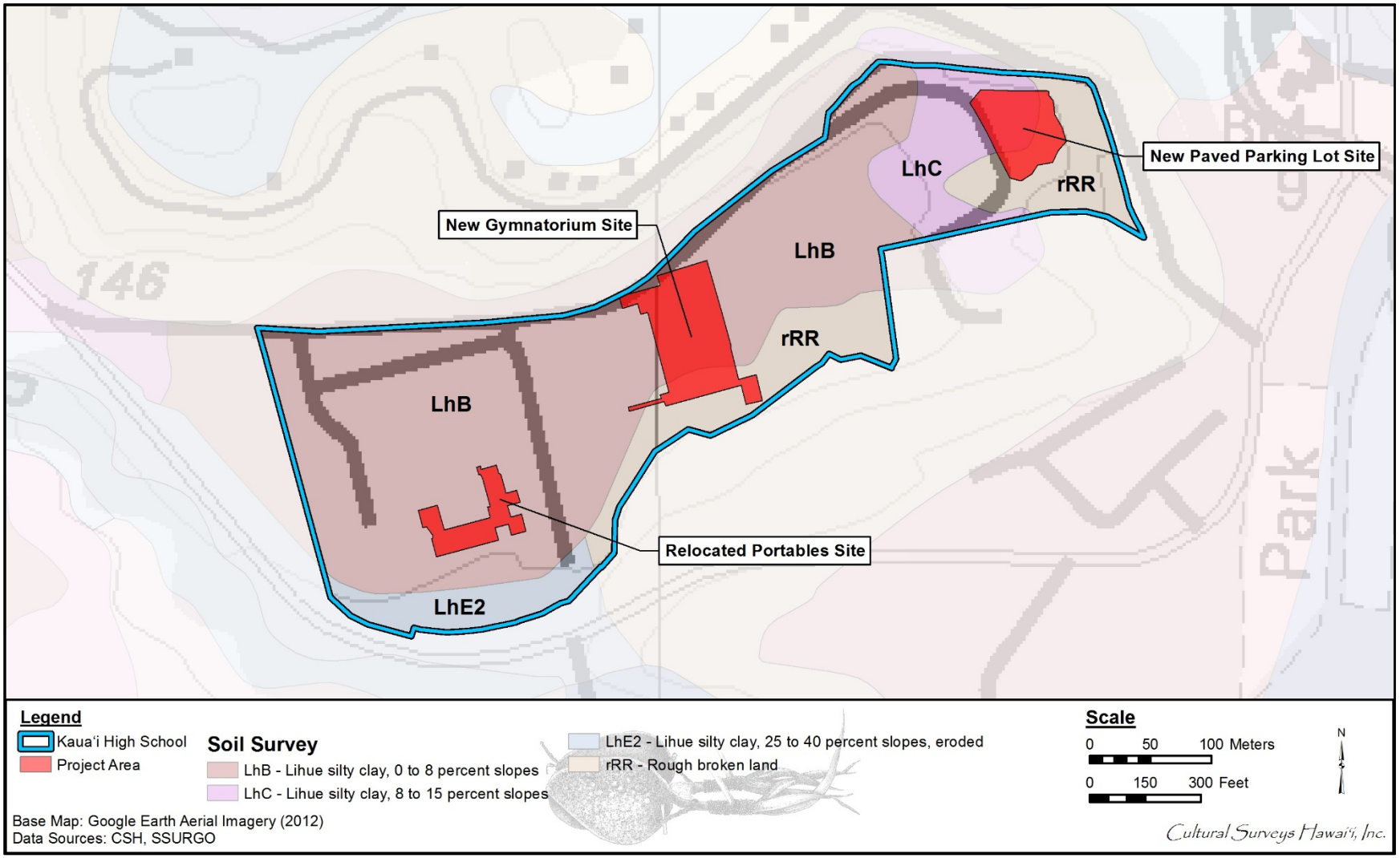

Figure 8. 2012 Google Earth aerial photo, overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating sediment types at the proposed project areas within the Kaua‘i High School campus

The off-site parking project area is adjacent to and east of the northeast corner of the football field, approximately 20 m down from the gate opening and 3 m into the vegetation from the 6-ft high fence separating dense vegetation from the football field. A parking area is directly north of the proposed parking project area. The off-site parking area consists of a “hard pan like area” that covers approximately 90% of the current project area and the remaining 10% consists of guinea grass, *haole koa*, Java plum, lantana, ironwood, a mango tree, and *Wedelia* species.

The portables relocation area in the southwest portion of the campus is in an area of school lawn, shade trees, and existing portable classrooms.

The new gymnatorium area is in the central core portion of the KHS campus in an area of classrooms and physical education facilities including the pool and the existing gymnasium.

1.3 Regulatory Context

This Kaua‘i High School Improvements project archaeological monitoring plan was prepared to fulfill the requirements of HAR §13-13-279-4 governing archaeological monitoring plans. This document is intended to support the proposed project’s historic preservation review under HRS §6E-8 and HAR §13-13-275 (addressing governmental projects), as well as the project’s environmental review under HRS §343.

An archaeological monitoring plan for this project was specifically requested in an SHPD §6E-8 Historic Preservation Review dated 30 May 2014 (Log No.: 2014.02044, Doc. No.: 1405GC12; included in this AMP in Appendix A). The recommendations for on-call monitoring of the parking area are consistent with the SHPD §6E-8 Historic Preservation Review dated 6 August 2014 accepting the archaeological assessment (Kamai et al.) for that area (Log No.: 2014.02523, Doc. No.: 1408MN01; included in this AMP in Appendix A).

Section 2 Traditional Background

2.1 Traditional Landscape

In ancient times, Kaua‘i was divided into five traditional *moku* (districts), Halele‘a, Ko‘olau, Puna (present-day Līhu‘e), Kona, and Nā Pali. Much of the Puna District is a flat plain nestled between the Hā‘upu mountain range to the south and the Makaleha mountain range on the north. Puna is fed by four main water sources, the Hulē‘ia River, the Hanamā‘ulu River, Keālia River, and the Wailua River. Some stories say that the district of Puna was settled by the chief Punanuikaianaina, who came to Hawai‘i from the Marquesas around AD 1000–1100 (Fornander 1969:45–46).

2.2 Place Name Meanings and *Mo‘olelo* (Stories)

Līhu‘e (literally translated as “cold chill”; Pukui et al. 1974:132) became the modern political name for the traditional *moku* of Puna. The name Līhu‘e was first applied to this area by Kaikio‘ewa, Governor of Kaua‘i in the 1830s, perhaps after Kaikio‘ewa’s upcountry residence on the island.

Boundary points with known meanings in the previous section include Kamoenakukaua, “the mat rain coat” (Soehren 2012). Kalapakī Ahupua‘a is described as a land division and a beach in Pukui et al. (1974:75), but no meaning is presented. Pukui and Elbert (1986:122) define the word *kalapakī* (with a small “k”) as “double-yolked egg” (used on Kaua‘i).

Nāwiliwili Ahupua‘a takes its name from the *wiliwili* tree (*nā* is the plural article, as in “the *wiliwili* trees” or “place of the *wiliwili* trees”). According to Pukui and Elbert (1986:385), the *wiliwili* (*Erythrina sandwicensis*) is a native leguminous tree whose flowers and pods are used for lei (garlands), and whose light wood was once used for surfboards, outriggers, and net floats. Handy (1985:67) suggests a *kaona* (hidden meaning) for the name Nāwiliwili based on a duplication of the word *wili*, which means “twisted,” as in the meandering Nāwiliwili Stream. Wichman (1998:58) states the area was named for a famous *wiliwili* grove, and that the full name is Nāwiliwilipaka‘āwaiilau‘ililua, “the wiliwili trees upon which raindrops fall, twisting the leaves so the rain touches both sides.”

Claims for house lots and agricultural patches were made in 21 *‘ili ‘āina* (small land divisions) in Nāwiliwili Ahupua‘a:

- Ka‘ākauloko;
- Kahala;
- Kaholo, meaning “the running” **(**Pukui et al. 1974);
- Kalamanui, the big *kalama* (*kalama* can mean “the torch” or “the lama tree”) (Soehren 2012);
- Kaleihao;
- Kauluolono, “the inspiration of Lono” (Soehren 2012);
- Kawailoa, “the long water” (Pukui et al. 1974);

- Keana, “the cave” (Pukui et al. 1974);
- Kuainiho;
- Kuape‘e;
- Kukuikahea;
- Mālamalama, “enlightened” (Pukui et al. 1974);
- Maulua, “difficult, hard” (Soehren 2012);
- Moa‘ula, “red chicken” (Pukui et al. 1974);
- Nāluahine, “the old women” (Soehren 2012);
- Niu, “coconut” (Soehren 2012);
- Pakalana, “the Chinese violet” (Soehren 2012);
- Papālina, “cheek” (Soehren 2012);
- Pāpālinahoa;
- Pūali‘i;
- and Wailā‘au, meaning either “sap of plants” or “liquid medicine” (Soehren 2012).

The *menehune*, a legendary race of small people, were known to live in the Nāwiliwili area:

> It was one of the favorite playgrounds of the tribe of Menehune, the little brown work-people who played as hard as they worked. And again it is William Hyde Rice, who, more than any other teller of stories, has kept for us old tales of this happy playground . . . [Damon 1931:395–396]

The *mauka* boundary point for both Nāwiliwili and Kalapakī Ahupua‘a was a hill on the eastern slope of Kilohana Crater**,** which was a famous nesting place of *‘uwa‘u* (*Pterodroma phaeopygia sandwicensis*), the dark-rumped petrel, a chiefly delicacy. Kilohana is also associated with the *menehune*, being one of their favorite places to play (Damon 1931:395–396).

> One of their favorite play places was the little hill of Po-po-pii, Rounded-for climbing-up. This they had themselves built on the top of Kilohana and never were they more delighted than when they could climb it over and over again for the sheer fun of rolling down its sides, frolicking and laughing as they rolled. It was such a sport that their gleeful shouts carried clear across the Kauai channel to the southeast and startled birds at Kahuku on the island of Oahu.
>
> Once, a Menehune called Ka-uki-uki, the-man-of-wrath, boasted that he could climb to the top of this hill at Kilohana and snare the legs of the moon. Ridiculed by his fellow tribesmen, he valiantly attempted to make good his boast, and was turned into a stone when he failed of achievement. For many years this stone was recognized by Hawaiians as a kupua, or demigod, and offerings of lehua-blossoms and fragrant maile leaves were laid upon it in passing, that rain and fog might not hinder the errand which carried the people into the mountains. [Damon 1931:396]

An old, but dangerous, trail led by the crater, as told in this *‘ōlelo no‘eau*, or poetical saying: “*O Kilohana ia, he ‘awe‘awe moku*” (that is the Kilohana of the broken bundle cords). Said of Kilohana, above Līhu‘e, on Kaua‘i: “An old trail went by here, leading from Kona to Ko‘olau. Robbers hid there and waylaid lone travelers or those in small companies and robbed them of their bundles” (Pukui 1983:269).

2.3 Fishponds

The most famous fishpond in the area was the coastal Alakoko Fishpond. This fishpond, also called Alekoko, Niumalu, or the Menehune Fishpond, is today placed in Niumalu Ahupua‘a; however, in older sources it is placed in Nāwiliwili Ahupua‘a. Alakoko Fishpond is located along the Hulē‘ia Stream, near its mouth at Nāwiliwili Bay. Kikuchi (1973, 1987) considered it a *loko wai* (freshwater pond or lake) class fishpond because of its inland location along a meander of the Hulē‘ia Stream; other sources (perhaps inaccurately) consider it a *loko kuapā* (a seawall pond, fronting the ocean) (Ching et al. 1973:66). The overall size (area) of the pond is approximately 39 acres (Ching et al. 1973:62). The site, (SIHP # 50-30-11-0501), was placed on the National Register of Historic Places in 1973. The SHPD website indicates the fishpond was never placed on the Hawai‘i Register (SHPD 2014).

This fishpond is associated with the *mo‘olelo* (story) of the brother and sister shark guardian spirits named Alekoko and Kalalalehua, who were said to have given the task of construction to the *menehune* (Ching et al. 1973:28). According to Rice (1977:42), it is said the *menehune* failed to completely finish their task, thus leaving a small opening (gap) that was later finished by people who did an inferior job of it, this inferior stone-work being still visible in historic times. Kikuchi (1973:233) said that the shark *‘aumakua* (spirit guide) of the pond was called Alekoko, and the guardian of the pond was called Puhi‘ula.

According to Kikuchi (1973:234–236), Nāwiliwili was home to at least five other fishponds. The names of three are known: Kalalalehua**,** named for the *mo‘o* (guardian spirit) of the same name; Lokoponu; and Pāpālinahoa**,** named after the *mo‘o* Pāpālinahoa. Lokoponu and the two nameless ponds were managed by a *konohiki* (land manager) named Oleloa for the *ali‘i* (chief) Kakuanaoa. Land Commission Award documents identify the *konohiki* for Nāwiliwili at the time of the Māhele as Daniela Oleloa; in testimony and register documents, claimants and their witnesses trace the right to live and work the lands from the *konohiki*.

2.4 Heiau

Several historic maps show multiple *heiau* along the seashore and stream mouths of Nāwiliwili. For the most part, all physical evidence of these *heiau* has been obliterated by historic and modern activities. However, many people still appreciate the sacred nature of the landscapes in and around these *heiau*, especially near the rocky coastal points at Kūki‘i, Ninini, and Ahukini.

Lt. George G. Jackson’s 1881 map of Nāwiliwili Harbor (Figure 9) shows two major *heiau*, one on either side of the mouth of Nāwiliwili Stream. On the east side, in Kalapakī Ahupua‘a, Jackson’s map depicts “remnants of ancient heiau” near Kūki‘i Point (well east of KHS and not shown on the portion of the Jackson map shown in Figure 9). On the west side of the bay, in Nāwiliwili Ahupua‘a, there is an area labeled “Kuhiau” near the old Court House. This is understood as the previous location of Kuhiau Heiau (Bennett 1931:124–125; Thrum 1906:40).

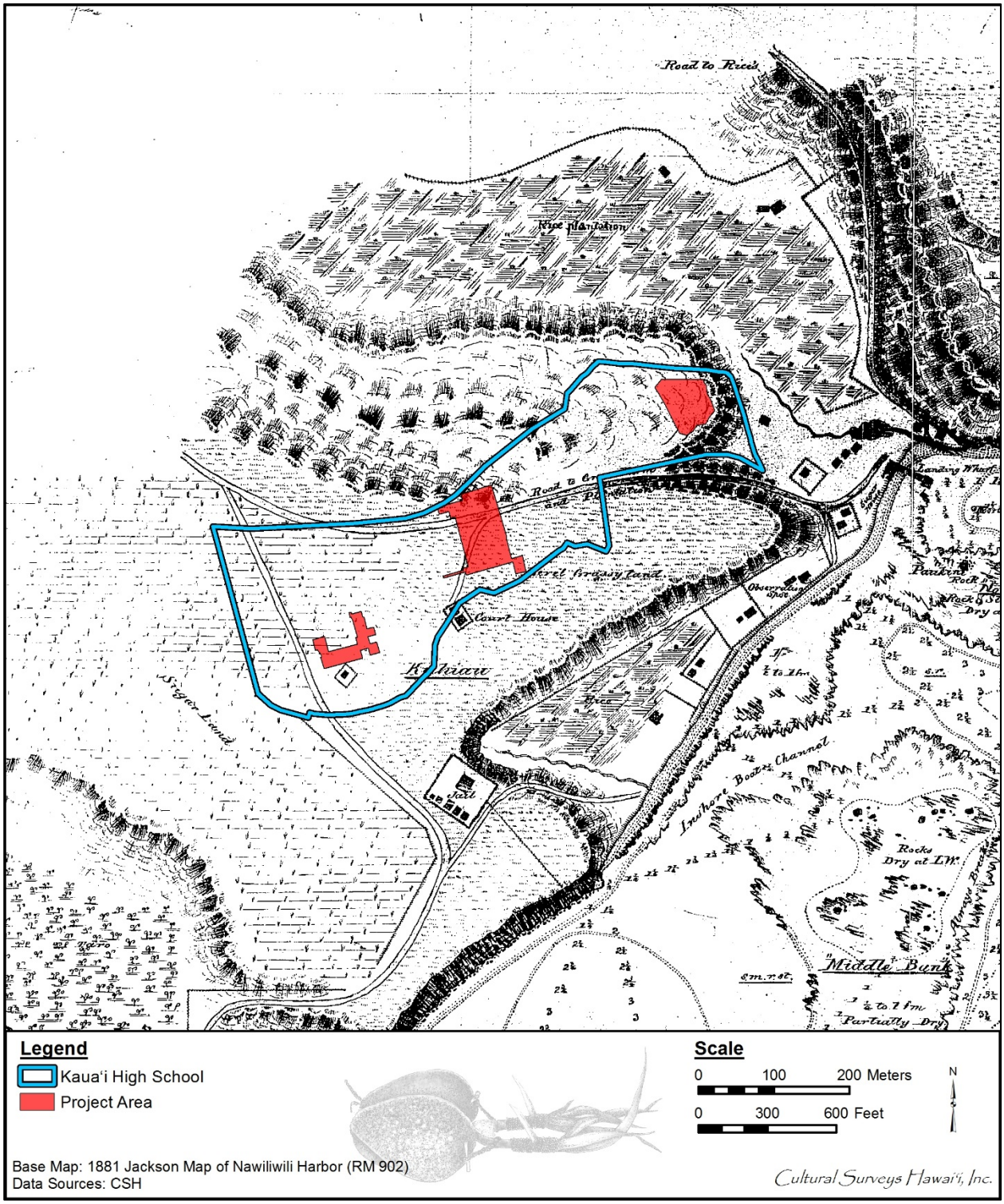

Figure 9. 1881 Jackson map of Nāwiliwili Bay, showing the general location of Kuhiau Heiau near the old courthouse, and showing an overlay of the approximate boundaries of proposed project areas within the Kaua‘i High School campus

What appears to be a rectangular house within a fenced or walled enclosure is shown west of the “Kuhiau” place name and it is possible the structure depicted was related to Kuhiau Heiau but it seems more likely the structure depicted was indeed just a house within an enclosure and that Jackson was approximating the *heiau* location where he placed the name “Kuhiau.” Kuhiau Heiau would still have been within 200 m or so of the area for the portables relocation and given its indicated size (4 acres) may have extended significantly closer.

Thomas Thrum (1906:36–47) presented information on over 115 *heiau* sites throughout the island of Kaua‘i. He briefly described Kuhiau Heiau in Nāwiliwili and Ahukini, Ninini, and Pohako‘ele‘ele in Kalapakī (Thrum 1906:40). In the late 1920s, Wendell Clarke Bennett (1931) conducted a survey of important archaeological sites on the island of Kaua‘i. One of his tasks involved trying to confirm and detail the *heiau* Thrum had recorded some 20 years earlier. Bennett’s (1931:124–125) archaeological survey documented Kuhiau Heiau, located at Nāwiliwili near the site of the old courthouse.

Almost two decades before Bennett’s work, this *heiau* had already been described as “long since destroyed” (Bennett 1931:124). Thrum (1906:40) described it as “A large paved heiau, whose enclosure covered an area of about four acres.”

Above Nāwiliwili Bay, on the bluff where Kaua‘i High School is located, Damon recounts the following:

> [There] was once the large paved *heiau* called Kuhiau, extending over about four acres of ground. It was in its day the largest and most far-famed temple on the island. Below it, in the bay, is still the rock called Paukini, which was said to be its companion or sister heiau, and was probably also the home of the kahuna, or priest, of Kuhiau. In ancient times this rock was connected with the shore near the site of the former boat landing. All the dredging and filling in for the modern wharves have not yet touched this old rock of Paukini, the sole remnant of the famous heiaus of Nawiliwili Bay. For almost no traces even of the great Kuhiau temple, are now to be found; and of the three small heiaus in the neighboring *ahupua‘a* of Kalapaki, those of Ninini, Ahukini and Pohako-eleele, little more than the names survive. [Damon 1931:398]

.

Section 3 Historical Background

3.1 Pre-Contact Period

In the pre-Contact period, the valley floor through which Nāwiliwili Stream courses, particularly in its broader lower reaches, would have been ideal for the cultivation of wetland taro. The bay into which the stream empties would have been an ideal canoe landing and fishing grounds. Up to the present, the south end of the bay at the mouth of the Hulē‘ia River has been well known as a rich fishing place.

Because of modern developments in and around the harbor, little or no archaeological vestiges survive of what must have been a well-populated area. The coast of Nāwiliwili, because of its natural harbor, was the focus of commercial activity from an early date. Most of the development surrounding Nāwiliwili Bay took place before archaeological surveys were a common practice.

3.2 Early Historic Activities

Nāwiliwili Bay was early recognized as virtually the only natural harbor for sailing ships on Kaua‘i. Waimea Bay and Kōloa, however, were actually preferred anchorages because Nāwiliwili opened directly to the tradewinds. Gales were known to blow ships onto the rocks. During the whaling era, Kōloa, which was home to the earliest major commercial operations in the Hawaiian Islands, was the preferred anchorage because of the ready supply of nearby food stuffs for resupplying ships. Forty to 60 whaling ships would call at Kōloa in one season (Smith 1991:77).

During the late 1830s, Kaikio‘ewa, Governor of Kaua‘i, established a church, a “straw palace,” and a village at Nāwiliwili that developed into Līhu‘e (Joesting 1984:153). By 1830, the sandalwood trade had waned and the whaling industry was just beginning. At the same time, commercial agriculture was being established on Kaua‘i. When the first crop of sugarcane was harvested at Kōloa, the king himself commanded that portions of his private land be planted in cane, and so Kaikio‘ewa began farming the slopes of Nāwiliwili Bay, where there was more rain than at Kōloa (Dorrance and Morgan 2000). He built a house and church in the *ahupua‘a* of Nāwiliwili and named the area Līhu‘e.

An account of the United States Exploring Expedition, which passed through Līhu‘e in 1840, notes the following:

> At noon they reached Lihui, a settlement lately undertaken by the Rev. Mr. Lafon, for the purpose of inducing the natives to remove from the sea-coast, thus abandoning their poor lands to cultivate the rich plains above. Mr. Lafon has the charge of the mission district lying between those of Koloa and Waioli. This district was a short time ago formed out of the other two.
>
> The principal village is Nawiliwili, ten miles east of Koloa. This district contains about forty square miles, being twenty miles long by two broad. The soil is rich: it produces sugar-cane, taro, sweet-potatoes, beans, &c. The only market is that of Koloa. The cane suffers somewhat from the high winds on the plains.
>
> Mr. and Mrs. Lafon are very industrious with their large school, to which some of the children come a distance of five miles. Our gentlemen were much pleased with

> what they saw, and were satisfied that good would be effected by their manner of treating the natives.
>
> The temperature of Lihui has much the same range as that of Koloa, and the climate is pleasant: the trade-winds sweep over it uninterruptedly, and sufficient rain falls to keep the vegetation green throughout the year.
>
> As yet there is little appearance of increase in industry, or improvement in the dwellings of the natives. There are no more than about seventy pupils in this district, who are taught by natives. There are two houses of worship, and about forty communicants. No decrease is apparent in the population within a few years.
>
> On the fertile places, although the pasturage was good, yet no cattle were to be seen. [Wilkes 1856:67-68]

The exact location of the “village of Nawiliwili” mentioned in the above account is uncertain. It may refer to a community along the shoreline of Nāwiliwili Bay. The references to Nāwiliwili and Līhu‘e during this period are somewhat confusing since the name Līhu‘e is not used consistently until the establishment of the sugar plantation.

With the death of Kaikio‘ewa, governorship of Kaua‘i was transferred for a brief period to his widow, Keaweamahi. Then followed the brief tenure of Chiefess Kekau‘ōnohi and her husband, Keali‘iahonui (son of King Kaumuali‘i), after which the governorship passed to Paulo Kanoa in 1848.

Kanoa had two houses overlooking Nāwiliwili Bay with his official home as the governor “on a nearby hill” (Joesting 1984:154). Ethel Damon provides clarification in her account: “[T]he courthouse built near the site of the old heiau of Kuhiau overlooking Nawiliwili Harbor. This was also the official home of Paul Kanoa, then governor of Kauai” (Damon 1931:440).

The Jackson (1881) map (see Figure 9) shows the “Court House” located in the immediate vicinity of the place named “Kuhiau.” Additionally, the court house is located partially within the southwestern boundary of Kauai High School. The current project area is also located within the boundaries of Kauai High School, but it is approximately 300 m to the northwest of the court house, indicating the low likelihood of encountering cultural deposits related to the court.

3.3 The Māhele

The mid-nineteenth century brought great changes to Līhu‘e, including private and public land ownership laws known as the Māhele (literally “to divide” or “to section”), ranching, and commercial sugarcane agriculture, which firmly established Līhu‘e’s place in local and global economic markets.

In the mid-nineteenth century, during the time of Kamehameha III, a series of legal and legislative changes were brought about in the name of “land reform” (see Chinen 1958, 1961 for details). Following the enactment of new laws from the mid-1840s to the mid-1850s, all land in the Hawaiian Kingdom was divided into three main types: government (or Crown) land; *ali‘i* (chiefly) lands; and *kuleana* (commoner) lands, which *maka‘āinana* (commoners) could in principle obtain in fee simple, following passage of the Kuleana Act in 1850. This act allowed *maka‘āinana* to own the land parcels on which they were currently residing and/or actively

cultivating. Of the hundreds of thousands of acres set aside as potential *kuleana* parcels, only about 10,000 claimants ultimately obtained some 30,000 acres, while 252 chiefs, for example, divided up about a million acres, leaving most Hawaiians disenfranchised.

Victoria Kamāmalu, daughter of one-time O‘ahu governor Mataio Kekūanao‘a and sister of Kamehameha IV and Kamehameha V (Day 1984:66), was awarded over 2,000 acres of Nāwiliwili Ahupua‘a, along with much of Niumalu, Ha‘ikū and Kīpū as well as Kalapakī and Hanamā‘ulu as part of her large Konohiki Award (LCA 7713) during the Māhele. Twenty LCA claims were awarded to commoners in Nāwiliwili.

The proposed project area is located within a portion of Land Commission Award 7713. In 1852, the award was issued to Victoria Kamāmalu. After her death in 1866, her father inherited her entire estate (Probate No. 2409), and after his death in 1868, half of the estate went to his son, Lota Kapuāiwa, then reigning as Kamehameha V, and the other half went to his daughter, Ruta Ke‘elikōlani, the half-sister of Lota and Victoria (Probate No. 2060). After Lota died intestate in 1872, Ruta Ke‘elikōlani petitioned for and received his entire estate (Probate No. 2412) the following year (Kelly 1984:46 in Kame‘eleihiwa 1992:309). In 1883, a relative of Victoria’s through marriage named Paul P. Kanoa (stepson of Paulo Kanoa, the governor at that time) bought a portion of Ke‘elikōlani’s estate, including the *ahupua‘a* of Nāwiliwili and Niumalu (worded in the deed as “those portions in the said *ahupua‘a* not yet sold to anyone else”) (deed dated 23 January 1883). Following Kanoa’s death in 1895, the estate passed to his wife Kaleipua Kanoa, who joined her late husband just two years later (Probate No. 2955). In her will, Kaleipua established the “Kanoa Estate” (Probate No. 3135), the administration of which has continued under a series of trustees through to the present (Equity No. 2012, Original Certificate of Title 12298; Transfer Certificate of Title [T.C.T.] 12763; and current T.C.T 107851) (original documents in Appendices A, B, C, and D of Hammatt and Folk 1995a).

Numerous Land Commission Awards, summarized below in Table 1, were located along the lower reaches of Nāwiliwili and Ho‘inakāunalehua Streams.

3.4 Settlement Patterns Indicated by Land Commission Awards

The narrow but fertile alluvial plain of Nāwiliwili Valley was used almost exclusively for wetland taro cultivation, with three to four *lo‘i* per family. A small portion of the alluvial plain was reserved for *kula*, which appear to have been an essential part of the management of the subsistence farming.

There were a few scattered habitation sites in the higher portions of the valley floor and along the lower slopes bordering the *lo‘i* and *kula*. However, most of the habitation sites appear to be along the shoreline with a pattern of clustering in villages. This is a typical settlement pattern for Hawaiian valleys. The valley floor in Nāwiliwili narrows considerably *mauka* of the present alluvial plain to a width of a few hundred feet. The *lo‘i* almost certainly continued upstream to occupy even small areas of level valley floor.

The establishment of an anchorage and a Protestant Mission Station at Nāwiliwili (ca. 1839 according to Joesting 1984:153), as well as the sugar plantation in Līhu‘e (the mill was started in1851 according to Joesting 1984:173), all served to reinforce clustered settlement of the bay shoreline and of the upper reaches of the drainage at Līhu‘e. The lower portion of the valley today

Table 1. Land Commission Awards along Lower Reaches of Nāwiliwili and Ho‘inakāunalehua Streams

LCA #	Claimant	*‘Ili*	Land Use
238S	Kuali‘i	Nui Nāwiliwili	Three *lo‘i* with a pasture in Niu 1; 1.75 acres
238T	Kaainakahi	Kaholo and Papalinahoa Nāwiliwili	One *lo‘i* House lot not awarded
238U	Kanakanui	Malawalumaikai Nāwiliwili	Eleven *lo‘i*; 3 acres
579	Ahukai, *wahine*	Nāwiliwili	House lot (and three house lots at Waimea and one at Waioli) not awarded
3208	Umiumi	Keana Kuweliweli Nāwiliwili	One *lo‘i*; one house lot on the shore not awarded
3229	Opunui, Eke	Papalinahoa Nāwiliwili	Four or seven *lo‘i* (and lands at Kōloa and Huleia); awarded 5 acres
3248	Hanare (Hanale)	Naluahine Moaula Nāwiliwili	Three *lo‘i* Six *lo‘i*; 4 acres
3250	Halalo	Papalinahoa Nāwiliwili	Four (or three) *lo‘i* and a *kula*; 0.50 acres
3259B	Kapau	Nāwiliwili	*Lo‘i* and/or *kula*; 2 acres
3263	Luka Kaainakahi	Kaholo Papalinahoa Nāwiliwili	Four *lo‘i* House lot not awarded
3283	Waikahu (Waikahue)	Nāwiliwili	Three (or five) *lo‘i* and a *kula*, and a house lot on the shore
3320	Moki	Puali‘i Nāwiliwili	Six to eight *lo‘i* not under cultivation; 2.25 acres
3321	Makaikeau	Kuape‘e 2 Nāwiliwili	Ten *lo‘i*; not awarded
3366	Nika	Maulua Nāwiliwili	Three *lo‘i* and a *kula*
3370	Nu‘uanu	Waila‘au Nāwiliwili	Three *lo‘i* cultivated (and five *lo‘i* uncultivated) and a *kula*
3389B	Nahula	Kuape‘e 2 Nāwiliwili	Twelve *lo‘i*; not awarded
3393B	Kuali‘i	Niu Nāwiliwili	See award 238S

is totally surrounded by urban Līhu‘e residential tracts but survives as a remnant of the former Hawaiian cultural environment.

3.5 Lihue Plantation

As a direct result of the availability of large tracts of land for sale during the Māhele, in 1849 Lihue Plantation “was established on the site Kaikioewa had chosen, and the cluster of homes and stores around it was the start of the town of Līhu‘e” (Donohugh 2001:94). In 1849, during the tenure of Governor Kanoa, H.A. Pierce visited Kaua‘i and observed the fertility of the uplands around Nāwiliwili. The plantation was started by Henry A. Pierce, Judge Wm. Little Lee, chairman of the Land Commission, and Charles Reed Bishop, doing business as Henry A. Pierce and Company (Damon 1931:409). The name was changed to the Lihue Plantation in 1859.

The first land acquired was 1,870 acres in Hulēia, granted to Victoria Kamāmalu in the Māhele of 1848. Excluded from use were the governor’s taro patches and small *kuleana* holdings. Also, Kamehameha III retained his rights for pasturage (Damon 1931:412). Nāwiliwili Stream was the southern boundary of this large purchase. A small parcel fronting Nāwiliwili Bay was also acquired to gain access to a shipping area. In 1851, an additional 500 acres were incorporated into the plantation lands. In the same year, the plantation sold 4 acres in Nāwiliwili to the government for construction of a harbor and road (Damon 1931:413). An additional 300 acres were purchased in Ahukini in 1866 (Figure 10).

The Lihue Plantation became the most modern plantation at that time in all Hawai‘i. It featured a steam-powered mill built in 1853—the first use of steam power on a Hawaiian sugar plantation—and the 10-mile long Hanamaulu Ditch built in 1856 by plantation manager William H. Rice, the first large-scale irrigation project for any of the sugar plantations (Moffatt and Fitzpatrick 1995:103).

Large tracts of Nāwiliwili and neighboring *ahupua‘a* were incorporated into the sugar plantations of the H.A. Pierce & Company, Grove Farm, and later, Lihue Plantation and McBryde Sugar Company. This occurred both through the sale and lease of lands to the sugar companies and their owners. George N. Wilcox, who bought the Grove Farm plantation in 1870 (Joesting 1984:221), was actively engaged in the purchase, sale, and lease of Nāwiliwili lands from the 1870s to the 1920s. By 1933, Lihue Plantation had merged with Makee Sugar Company and had already acquired Ahukini Railway Company, East Kauai Water Company, Nawiliwili Transportation Company, Princeville Ranch, Waiahi Electric Company, and pineapple lands leased to Hawaiian Canneries (Hawaiian Sugar Planters’ Association 2004).

3.6 Taro and Rice Cultivation

Māhele records indicate that taro continued to be cultivated in Nāwiliwili Valley through the mid-nineteenth century. However, later in the century much of the *kalo* land in Nāwiliwili was converted to rice cultivation (see Figure 9, Figure 11, and Figure 12). This shift was dictated by changes in the ethnic make-up of the islands’ population and economic demands. Little is known of the rice industry in Nāwiliwili; however, an 1881 map of Nāwiliwili Bay shows the *makai* (seaward) portion of Nāwiliwili Valley under rice cultivation (see the extensive area called out as under rice cultivation in the 1881 Jackson map shown in Figure 9).

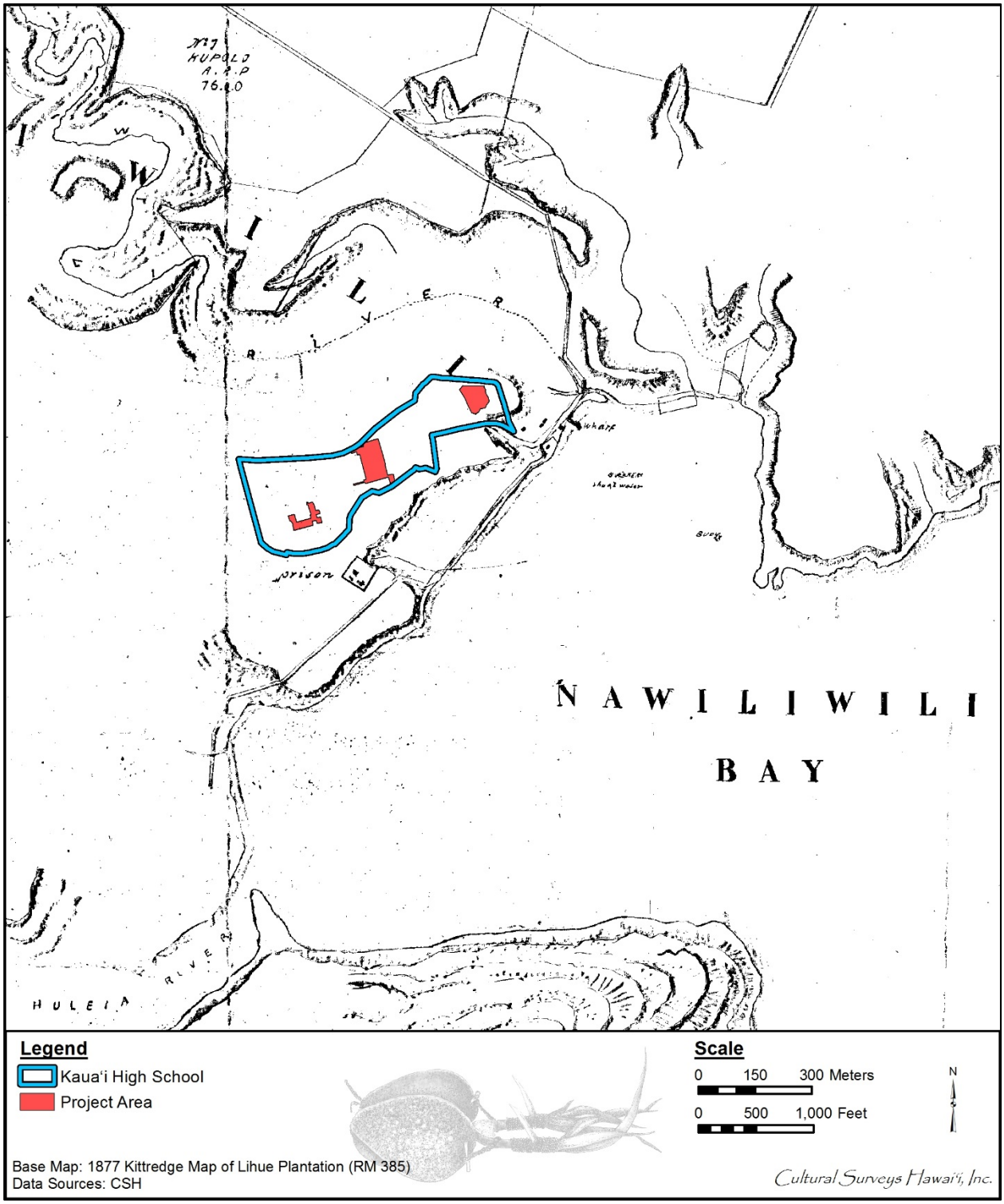

Figure 10. 1877 Kittredge map of Lihue Plantation showing the proposed project areas within the Kaua‘i High School campus

Figure 11. Ca. 1880 photograph of Nāwiliwili Bay showing extensive rice cultivation (Kaua‘i Historical Society 1880)

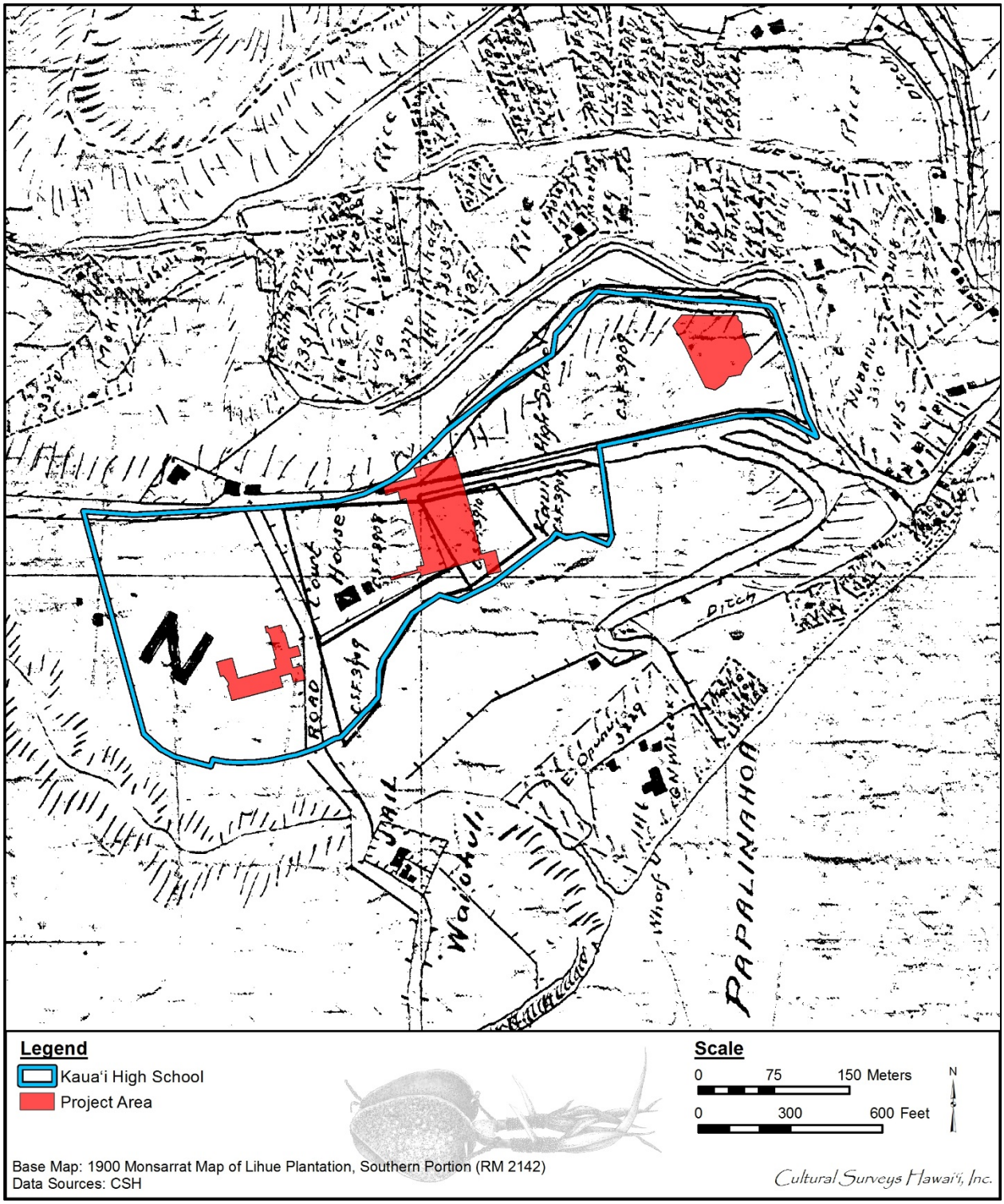

Figure 12. 1900 Monsarrat map of Lihue Plantation, showing rice cultivation north of the proposed project areas within the Kaua‘i High School campus

Limited taro cultivation continued in Nāwiliwili Valley well into the twentieth century, as noted in E.S. Craighill Handy’s account of 1935, which also mentions cotton and garden plots:

> For 3 miles inland from the sea the Nawiliwili River twists (*wiliwili*) through a flat valley bottom which was formerly all in terraces. Inland, just above the bay, three Hawaiian taro planters cultivate wet taro in a few small terraces. Most of the land is in pasture. There are one small cotton plantation and several small garden plots. For about a half mile below and a half mile above the mill the valley is mostly filled with plantation camp and other structures, with many small clumps of bananas, some garden plots, a few old breadfruit trees. The old terrace area extended half a mile up into the small valley that opens out northwest just above the mill. Approximately the last mile of flat valley bottom, before the river bed becomes a narrow gulch, used to be in terraces but is now pasture and ranch land. [Handy 1985:67]

3.7 Nāwiliwili Cemetery

Nāwiliwili Cemetery (SIHP # 50-30-11-6009) developed informally over the years and, unlike most cemeteries, was not established by any particular individual or group such as a church, ethnic organization, or government body. As far as we know there was no formal relationship between the Nāwiliwili Cemetery and Lihue Plantation or any other plantation. The earliest record of the cemetery’s use comes from verbal records made by multiple people living in the area, suggesting it had been used to bury deceased prisoners from the nearby jail built in the 1850s (Hammatt and Folk 1995a:17). The cemetery was later known to be used from 1882 and 1968 by Japanese and Hawaiian families as well as Japanese immigrants who divided the cemetery into two sections, the Hawaiian section and the Japanese section (Hammatt and Folk 1995a:18). The land that eventually came to be the Nāwiliwili Cemetery is a portion of what is known today as Lot 2-A-3 of Land Court Application 957, also referred to as Parcel 21 on the tax map key (Figure 13). The land upon which the cemetery was located (being a part of what is described in deeds as “those portions of the *ahupua‘a* of Nawiliwili not previously leased or sold”) changed hands numerous times (e.g., between P.P. Kanoa and Wilcox [mortgage dated 22 July 1887; lease dated 26 November (1892), K. Kanoa and Wilcox [mortgage deed dated 27 March 1896], Kanoa Estate and Wilcox [lease dated 1 March 1907]; cancellation of lease dated 20 January 1914) but ultimately ownership was retained by the Kanoa Estate until 1968 (original documents in Appendices A, B, C, and D of Hammatt and Folk 1995b). Although the cemetery land was often included in the parcels sold or leased to Wilcox or his company, the Grove Farm, it seems to have never been used for sugarcane cultivation or other plantation-related use.

3.8 Late Nineteenth Century and Early Twentieth Century Development of the Kaua‘i High School Bluff

As early as 1851, the bluff upon which Kaua‘i High School is situated became the setting of the Circuit Courthouse and one of the houses owned by Paulo Kanoa, governor of Kaua‘i from 1847 to 1877 and the stepfather of P.P. Kanoa. The land for the courthouse and the governor’s house was deeded by Victoria Kamāmalu’s father, M. Kekūanao‘a (probably acting as her guardian) to Keoni Ana, the Minister of the Interior in 1851 (Deed [in Hawaiian] dated 10 February

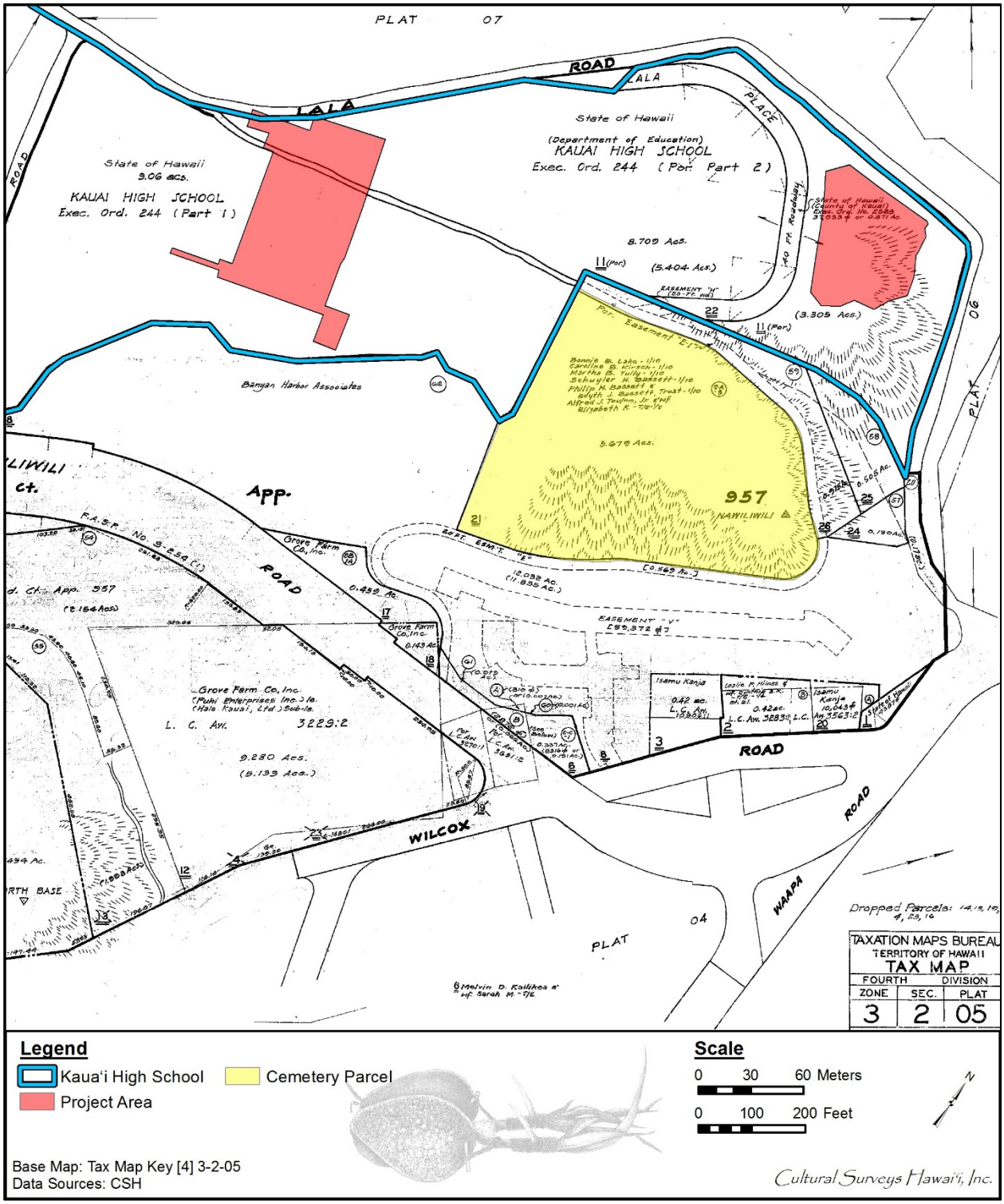

Figure 13. TMK: [4] 3-2-005 showing location of cemetery parcel 021, adjacent to Kaua‘i High School (to northwest and northeast) in relation to the present project area (Hawai‘i TMK Service 1984

1851). It appears the courthouse and the governor’s house were built between 1850 and 1852. In *Reminiscences of John Cook, Kamaaina and Forty-Niner*, John Cook, who arrived on Kaua‘i in 1850, recalled that he “took a contract from Dr. Judd to build the first courthouse on the bluff at Nawiliwili, and also a one story and a half house for Paul Kanoa at Niumalu under the bluff” (Cook 1927:23). There are also Privy Council Resolutions that refer to the construction of two small cottages “for the courthouse and Governor’s house” (P.C. [Privy Council Resolution] dated 6 November 1850) and the costs associated with that construction, “amounting to eight hundred and fifty six and 64/100 dollars” (P.C. dated 19 August 1851) (original documents in Appendices A, B, C, and D of Hammatt and Folk 1995b). The courthouse was destroyed by a gale in 1866, at which time the court was relocated into the governor’s house, where it remained until 1914 when a new courthouse was built in Līhu‘e (Damon 1931:928). The courthouse is still called out on a 1910 USGS map (Figure 14). The former courthouse appears to have been about midway between the proposed new gymnatorium footprint and the portables relocation area.

Another parcel located on the bluff (adjacent to the courthouse parcel) became the property of Judge Jacob Hardy in 1894 and is referred to as the Hardy Lot on the 1919 and 1932 maps (Figure 15 and Figure 16). This parcel was sold to Hardy by P.P. Kanoa in that year, and the deed of sale also included a mortgage release by George N. Wilcox, who at that time was the mortgagee (deed and release dated 14 June 1894). Hardy served as judge at the courthouse for a total of 43 years, having served eight years as a young man and returning in 1877 for another 35 years of uninterrupted service (Damon 1931:927). Judge Hardy eventually sold this parcel of land to Wilcox in 1899 (deed dated 2 February 1899) (original documents in Appendices A, B, C, and D of Hammatt and Folk 1995b). The Judge Hardy property largely overlaps the proposed gymnatorium footprint.

By the 1920s, the courthouse land and the Hardy Lot had been deeded to the state (i.e., the Territory of Hawaii) as the Kaua‘i High School Lot, and three other adjoining parcels were acquired by the state from the Kanoa Estate through condemnation for an addition to the High School Lot (Copy Survey Furnished [CSF] 3908; CSF 3909; CSF 3910) (original documents in Appendices A, B, C, and D of Hammatt and Folk 1995b). The maps from the 1920s accompanying these documents are the earliest found in the documentary record that identify the cemetery (labeled as “Japanese Cemetery,” Figure 17). It seems probable the parcel was excluded from the school’s expansion of the 1920s because the area was known to be a cemetery. The cemetery parcel thus remained the only privately held piece of land on the bluff.

Although not on the bluff, the Government Jail was located near the courthouse (Figure 18), and it has been suggested by several local residents (Hammatt and Folk 1995a:9) that deceased prisoners from the jail were buried in the Nāwiliwili Cemetery (SIHP # -6009). It is presumed the construction and use of the jail was contemporaneous with the construction and use of the courthouse. Although little documentation could be found on the history of the jail site, it is mentioned in Privy Council Resolutions as early as January 1852, when the keeper and an assistant were nominated (P.C. dated 19 January 1852). Government survey documents from 1931 refer to the parcel as “Being Exclusion 15 of Land Court Application 957” (CSF 5954), suggesting the jail site parcel was, like the courthouse land, deeded to the state at an early date. The jail site is indicated on maps from 1881 to 1931 (see Figure 9, Figure 12, Figure 15, and Figure 19) but is absent from subsequent maps. By the 1920s, all the parcels on the bluff except for the cemetery

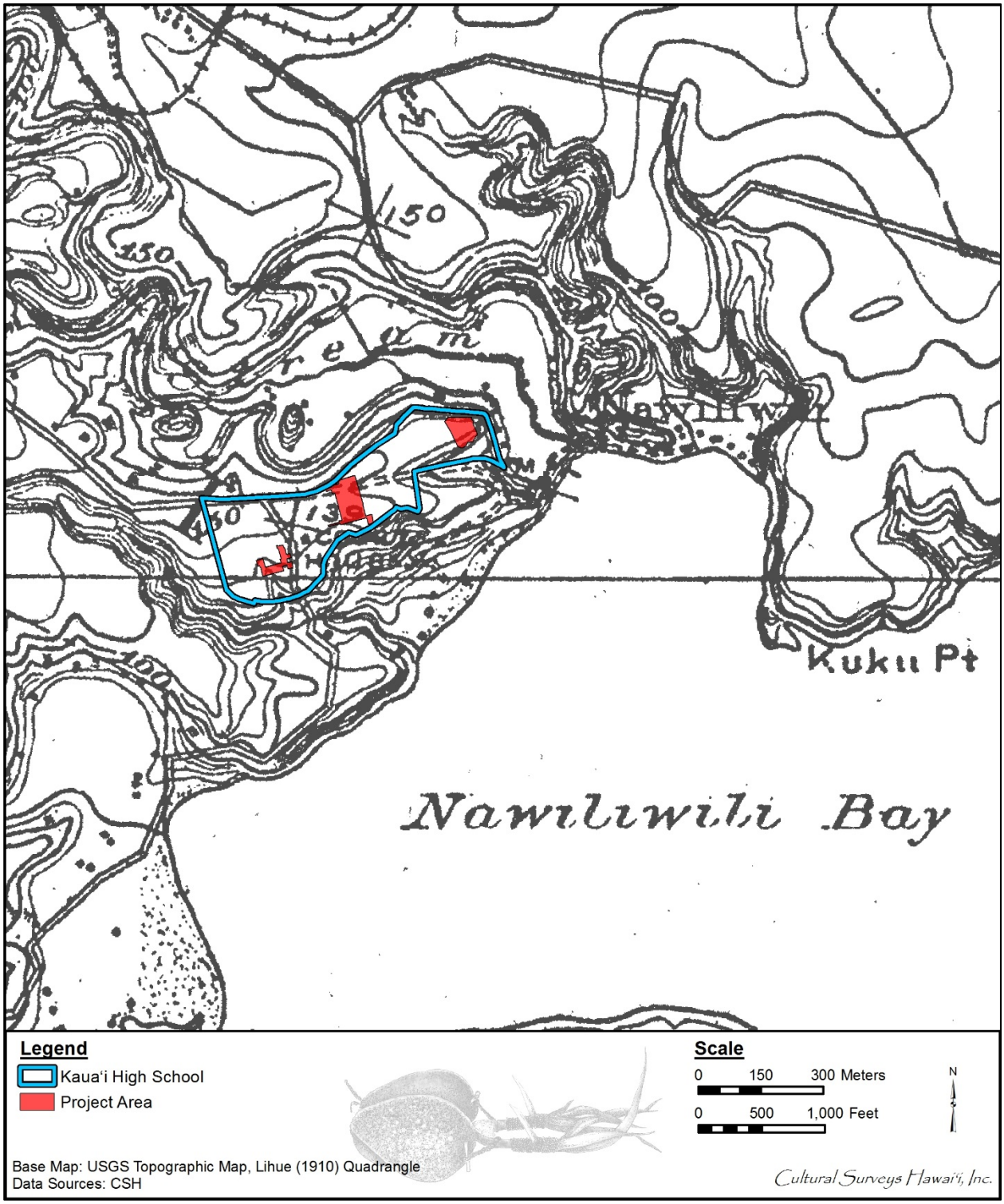

Figure 14. Portion of the 1910 Lihue USGS topographic quadrangle, showing the proposed project areas within the Kaua‘i High School campus

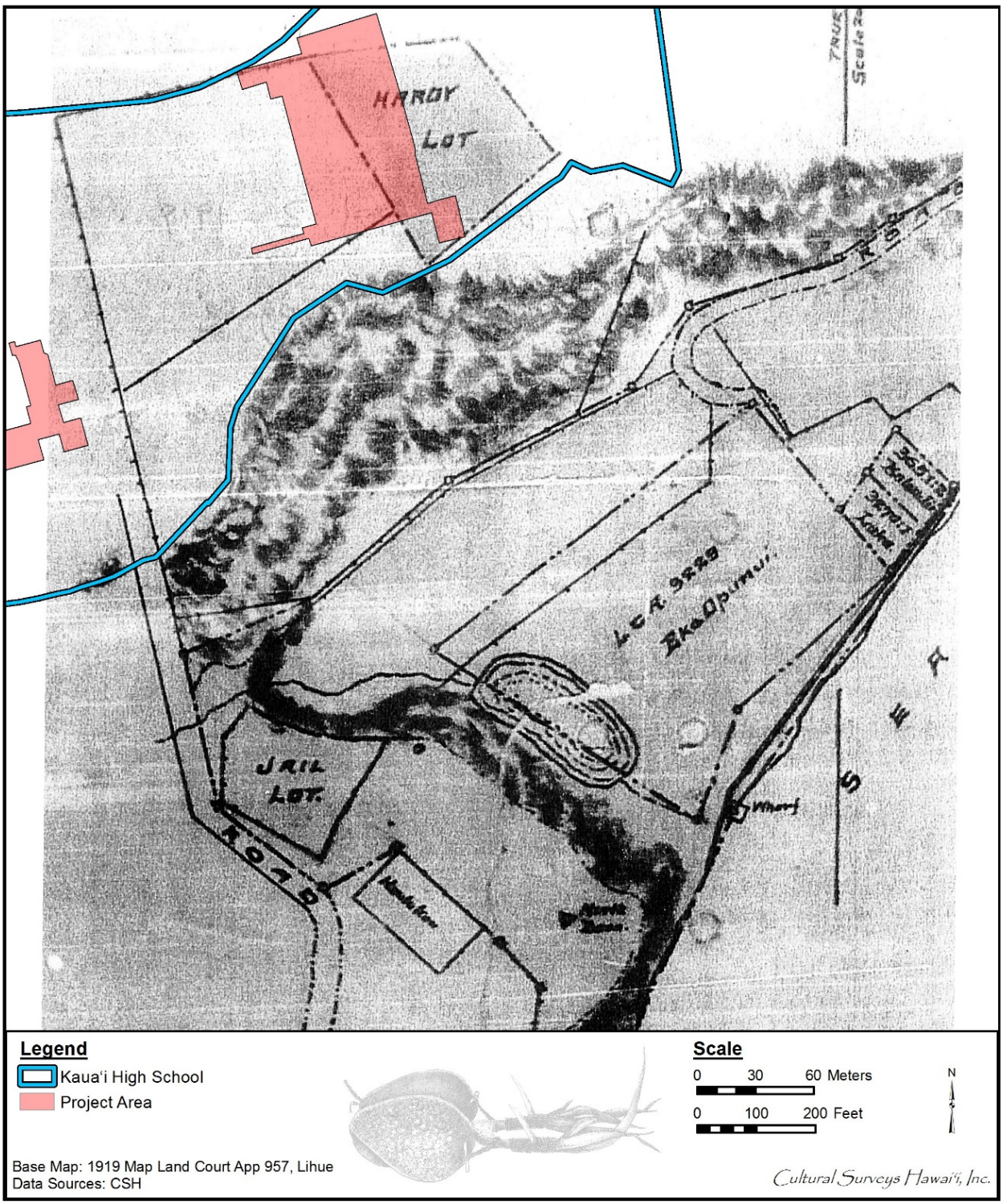

Figure 15. 1919 map from Land Court Application 957, showing Judge Jacob Hardy Lot and Jail Lot (Former court house [ca. 1851] lot is understood as adjacent to west side of judge’s property, with both lying within present Kaua‘i High School lands)

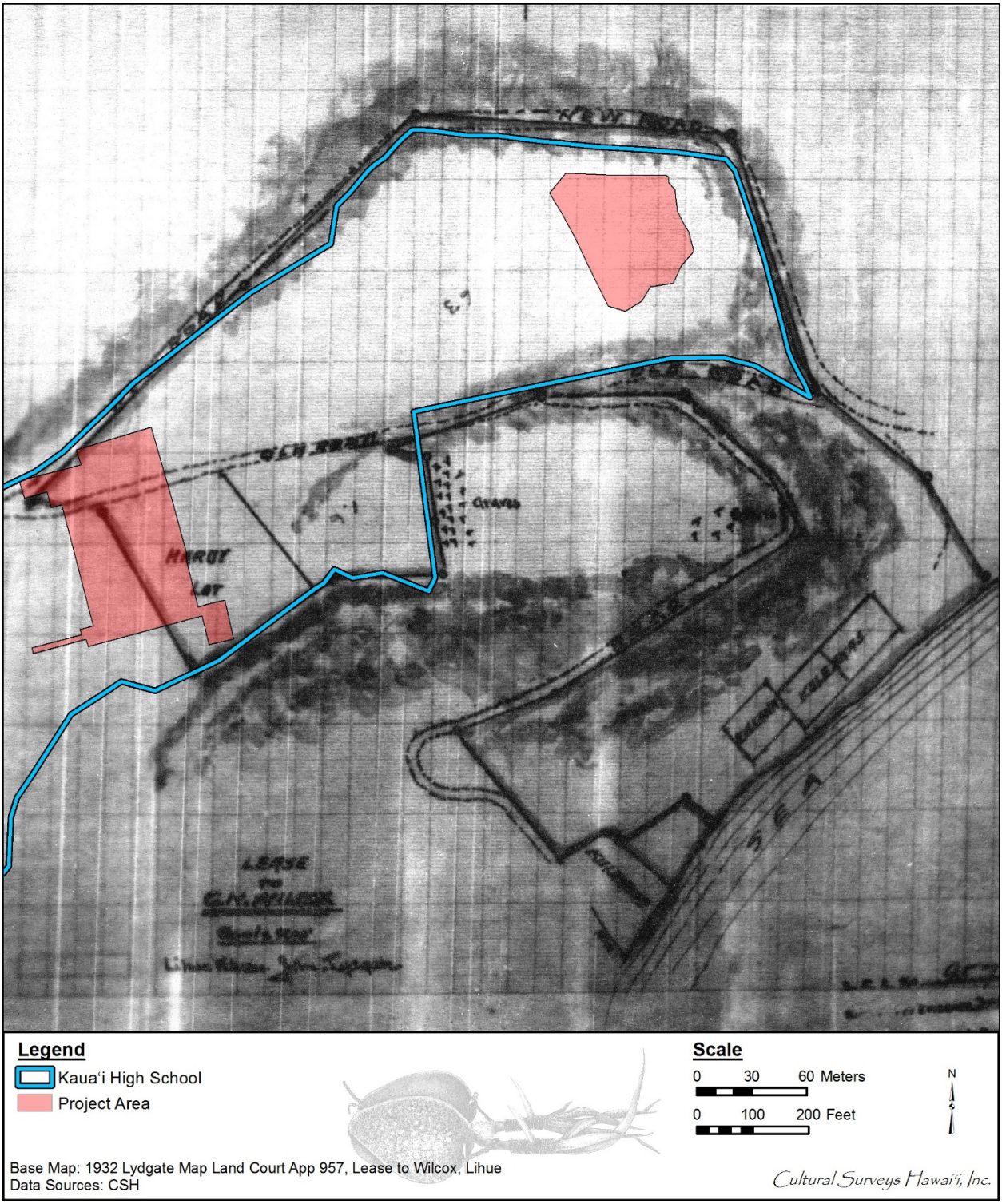

Figure 16. 1932 map from Land Court Application 957, showing Judge Jacob Hardy Lot (within central portion of present Kaua‘i High School lands) and gravesites

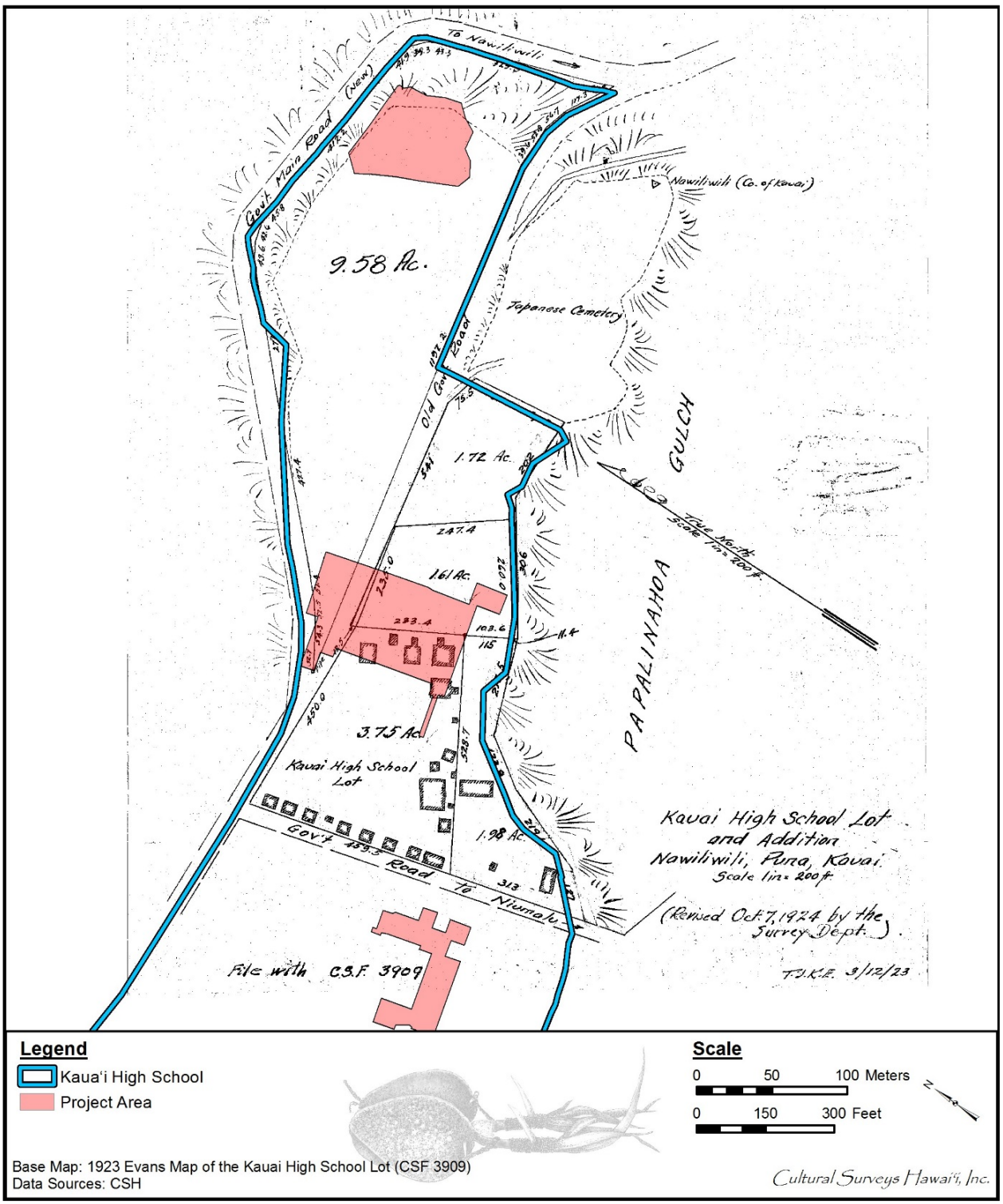

Figure 17. 1923 Government Survey map of “Kaua‘i High School Lot and Addition,” showing relationship to “Japanese Cemetery”

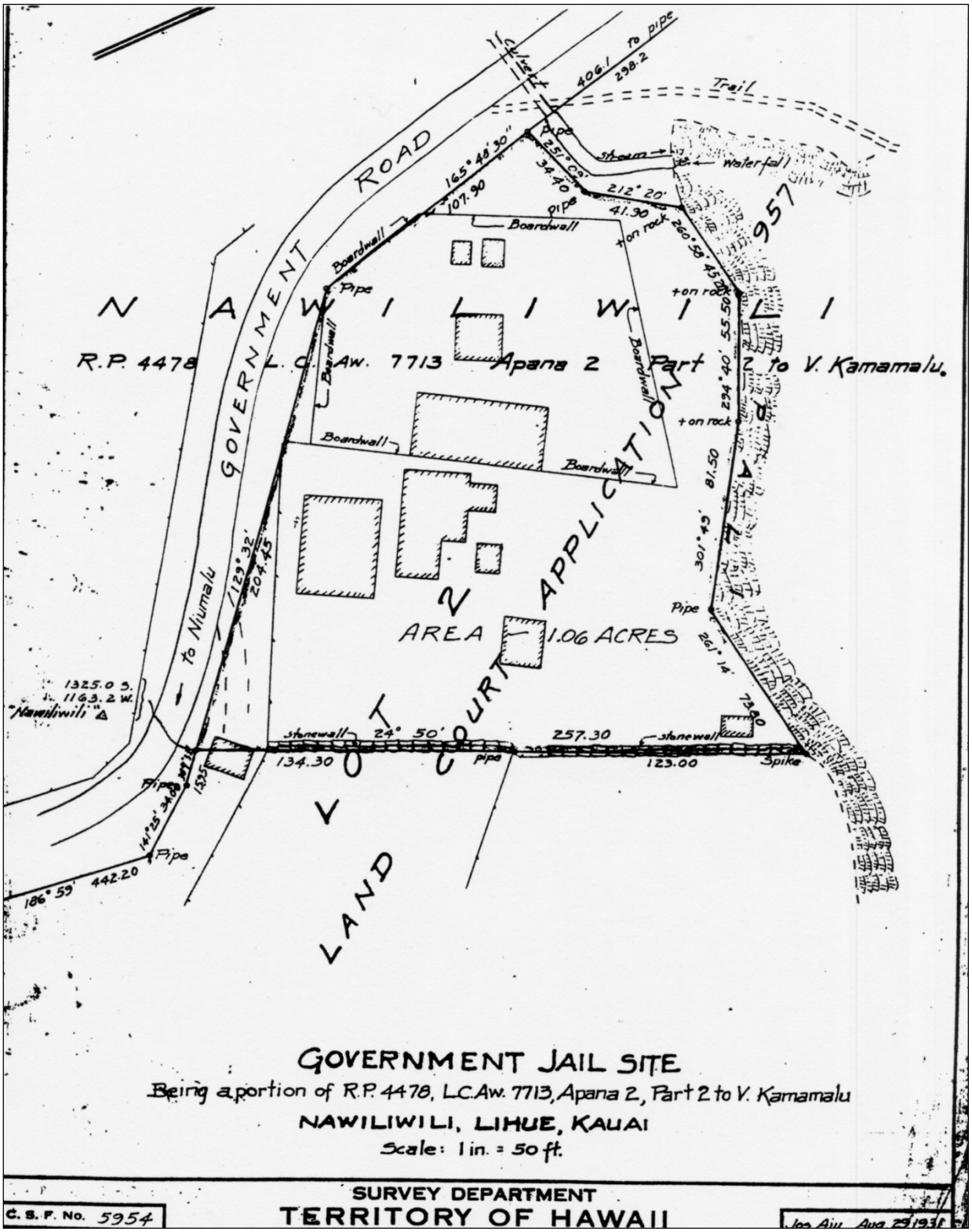

Figure 18. 1931 Territory of Hawaii survey map (CSF 5954), showing government jail (Kaua‘i High School lands adjacent at right)

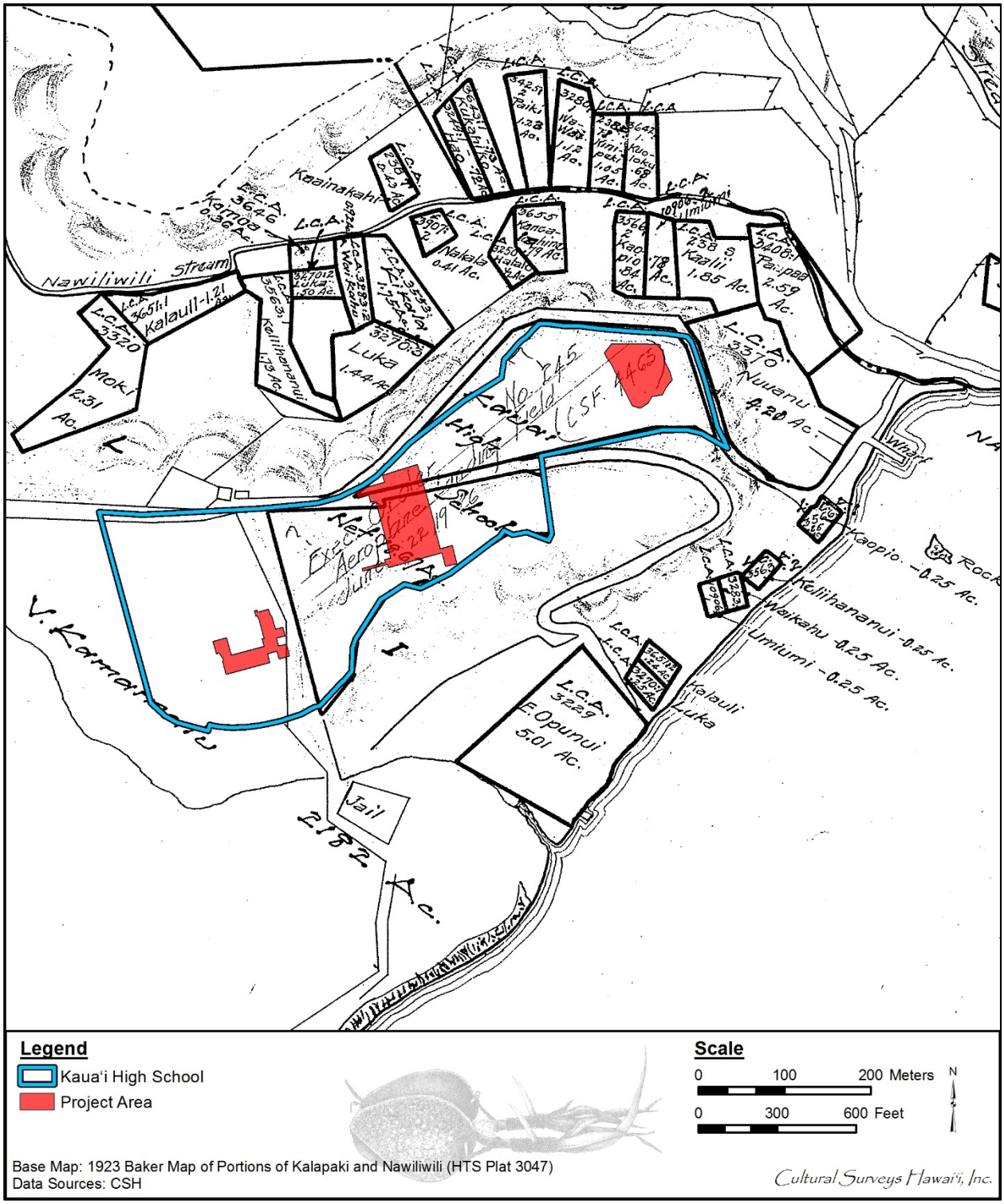

Figure 19. 1923 Baker map of Kalapaki and Nawiliwili (HTS Plat 3047) showing the proposed project areas within the Kaua‘i High School campus

land were incorporated into the Kaua‘i High School lot. By 1963 the Kaua‘i High School lot was quite developed (Figure 20).

3.9 The Development of Nāwiliwili Harbor

The River and Harbor Act of 2 March 1919 authorized the construction of a modern harbor at Nāwiliwili. The selection of Nāwiliwili as Kaua‘i’s Federal harbor had been preceded by years of debate between advocates of Hanapēpē and Nāwiliwili for the harbor site. The specifications for the harbor included support from local government and business interests:

> Upon completion of a rubble-mound breakwater 2,450 feet long along the reef dividing the inner and outer harbors, the entrance channel would be dredged to a depth of 35 feet, a minimum width of 400 feet, and a length of 2,400 feet. Also included in the estimated cost of $1,086,000 was a harbor basin 35 feet deep, 1,025 feet wide, and averaging 2,000 feet in length. The same act provided an initial appropriation of $250,000 for construction of the harbor. Local interests were to assure eventual railroad connections between Nāwiliwili and the southern part of the island in reasonable time, while the Territory of Hawaii or the County of Kauai was to give the Secretary of War $200,000 toward the project. [van Hoften 1970:12]

The dredged material would be used as fill for the proposed wharf areas.

Construction of the breakwater, the initial phase of the harbor project, began in October 1921. By 1924, a total of 1,454 ft of breakwater had been set in place. However, dredging within the now semi-protected bay could not begin until the Territorial Legislature appropriated the $200,000 promised to the project. Action by the legislature was delayed as the sugar companies on west Kaua‘i continued to press for Port Allen at Hanapēpē as the island’s major harbor facility and threatened to boycott the Nāwiliwili Harbor after its completion. The Legislature finally approved its share of the funding in 1925, and the breakwater was completed in March 1926. Development of the harbor continued apace:

> . . . the Territory took over the Federal camp and equipment and began construction of a concrete wharf. As soon as the Government dredge A. Mackenzie finished [dredge work] at Hilo she began work at Nawiliwili in fiscal year 1929, and dredging was completed in July 1930. The official opening of the $1.3 million harbor on 12 July inaugurated an entrance channel 600 feet wide, 2,400 feet long, and 35 feet deep, a harbor basin 1,100 feet wide, 2,000 feet long, and 35 feet deep; and a rubblemound breakwater 2,150 feet long. [van Hoften 1970:18-19]

The Nāwiliwili Harbor development of the early 1920s radically transformed the coastline of Nāwiliwili (Figure 21) into the shoreline much as it appears today (Figure 22).

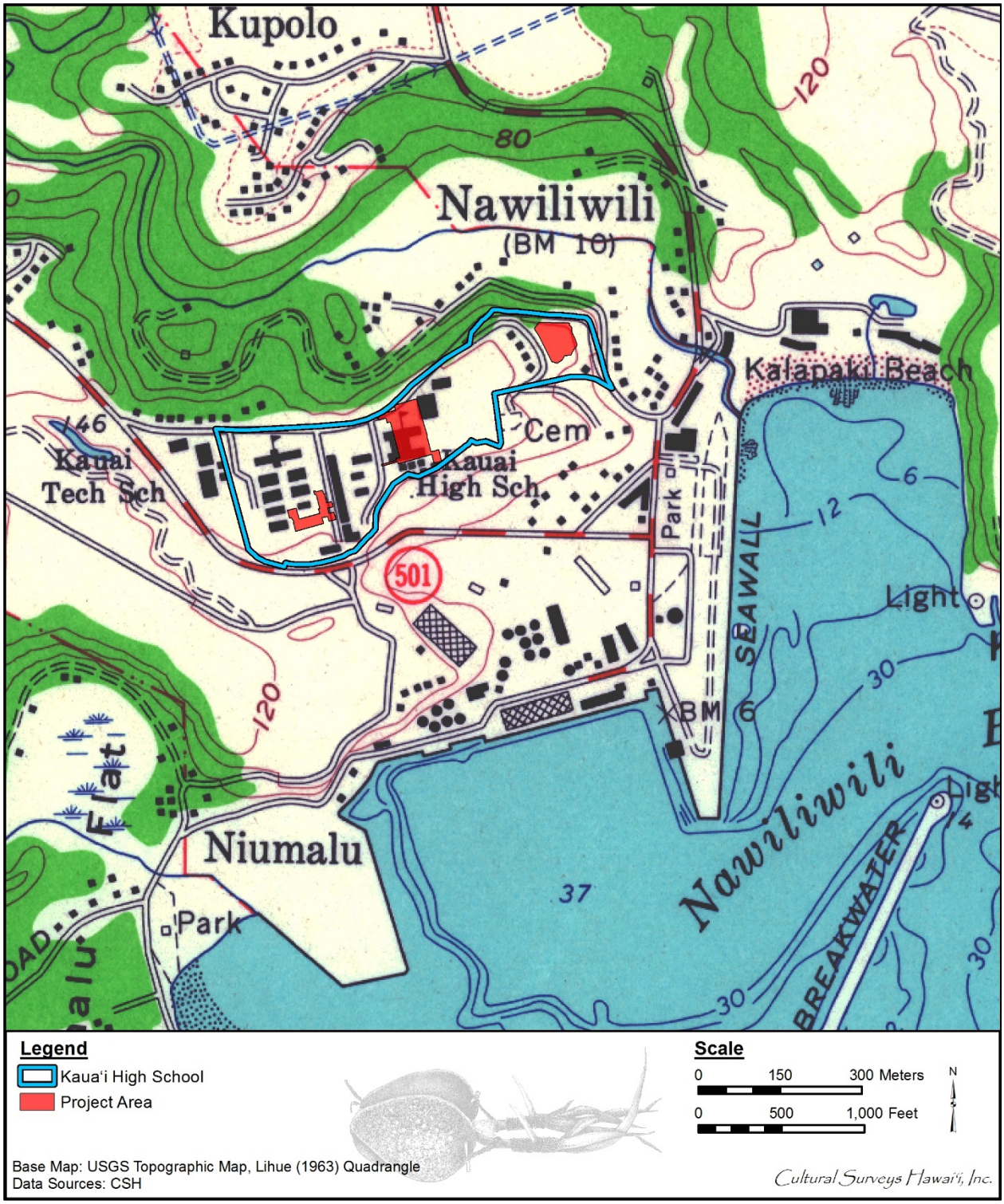

Figure 20. Portion of the 1963 Lihue USGS topographic quadrangle showing the proposed project areas within the Kaua‘i High School campus

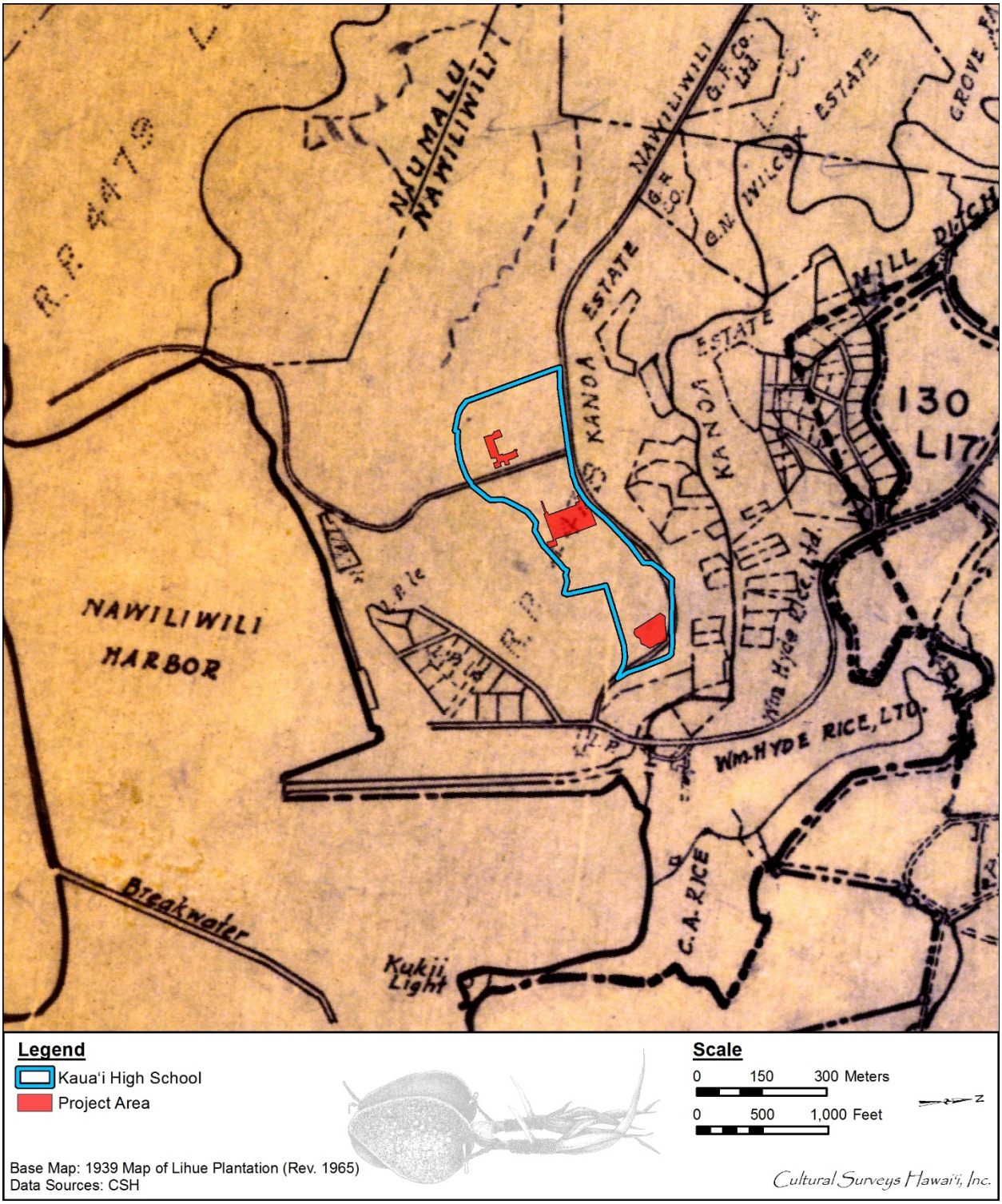

Figure 21. 1939 map of Lihue Plantation (revised 1965) showing the proposed project areas within the Kaua‘i High School campus

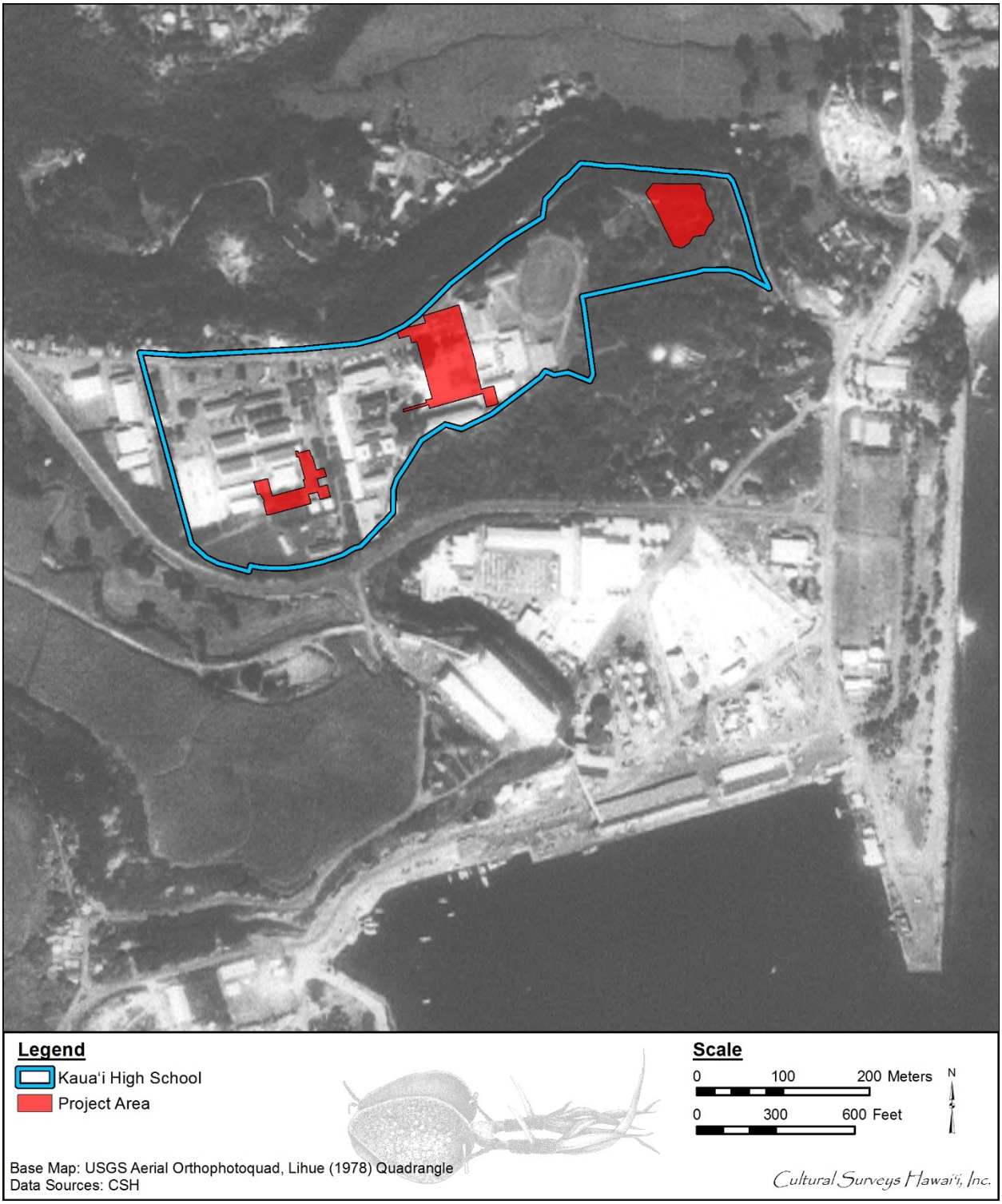

Figure 22. 1978 USGS Aerial Orthophotoquad, Lihue Quadrangle showing the proposed project areas within the Kaua‘i High School campus

Section 4 Previous Archaeological Research

The following discussion briefly considers previous archaeological studies in Nāwiliwili within approximately 1 km of the present project area.

4.1 Insights from Archaeological Studies in the Vicinity

Archaeological studies in the vicinity are summarized in Table 2 and shown on Figure 23. Previously identified historic properties are summarized on Table 3 and shown on Figure 24. Particularly noted are the studies of unmarked graves associated within Nāwiliwili Cemetery (Hammatt et al. 1993; Hammatt and Folk 1995a; Rosendahl and Walker 1990; Walker and Rosendahl 1991) documenting the disinterment and reinterment of multiple burials within the cemetery.

In 1972, under pressure for development, an unrecorded number of graves in Nāwiliwili Cemetery were disinterred by D. Dilworth (Walker and Rosendahl 1991:20). When interest in development reemerged in 1989, testing was performed under various permits (Use Permit U-90-12, Variance Permit V-90-7, Class IV Zoning Permit Z-IV-90-19) which, at the request of SHPD, called for archaeological investigations to be conducted prior to any ground disturbance or construction activity. The excavations conducted by Hammatt et al. (1993) and Hammatt and Folk (1995a) aimed to find and confirm all the intact and partially intact burials previously identified and left in place during the Rosendahl and Walker (1990) and Walker and Rosendahl (1991) studies, as well as any other burials not yet located. The burials were relocated to a new 0.6-acre official cemetery at the east end of the parcel.

Table 2. Archaeological Studies near the Proposed Project Areas

Source	Nature of Study	Location	Results (SIHP # 50-30-11)
Neller and Palama 1973	Archaeological reconnaissance survey	Hulēia River area, from Niumalu to Kīpū Ahupua‘a	Thirty sites documented: SIHP #s -93, -94, -98, -3000 through -3013, and -3022 through -3034 (not included in Figure 24; outside the depicted area)
Ching et al. 1973	Archaeological reconnaissance survey	Niumalu Ahupua‘a	Nine archaeological features or feature complexes documented: SIHP #s -98, ‘Alekoko (Menehune) Fishpond, a *loko kuapā*; -3027 and -0328, two *loko wai* fishponds; -3029 and -3030, two *‘auwai*; and -3031 through -3034, four *lo‘i* agricultural complexes
Kido 1986	Archaeological reconnaissance survey	‘Alekoko (Menehune) Fishpond and Hule‘ia Estuary, Niumalu Ahupua‘a	Study of Menehune Fishpond documenting prevailing conditions; documented mangrove encroachment on pond wall, breaks in wall, and rubbish used to fortify wall

Source	Nature of Study	Location	Results (SIHP # 50-30-11)
Haun 1987	Archeological field inspection	Niumalu Bluffs Subdivision	Pedestrian survey confirmed one of project area’s three previously recorded historic properties, SIHP # -3029 (*‘auwai*); unable to confirm two other historic properties, SIHP #s -3033 and -3034 (two *lo‘i*)
Ching 1988	Archaeological reconnaissance	Proposed subdivision Nāwiliwili, Puna, Kaua‘i TMK: [4] 3-2-008:001	Project site had been bulldozed completely; no finds, no further work recommended
Walker and Rosendahl 1988	Archaeological surface and subsurface inventory survey	Grove Farm Līhu‘e/Puhi project area, lands of Nāwiliwili, etc. 450-acre parcel	Twenty test trenches yielded no cultural remains; identified SIHP #s -0503, a Japanese cemetery 1.4 km west, and -9390, a historic residence 1.1 km northwest of Kaua‘i High School (not included in Figure 24; outside the depicted area)
Ching 1989	Supplement to archaeological letter report of November 1988	Proposed subdivision Nāwiliwili, Puna, Kaua‘i TMK: [4] 3-2-008:001	Documents five test pits; no finds
Rosendahl 1989	Addendum archaeological inventory survey	Eight additional small survey areas Grove Farm Līhu‘e/Puhi project area, lands of Nāwiliwili, etc.	No new sites identified; discusses SIHP # -3168 (not included in Figure 24; outside the depicted area), North Niumalu Complex comprised of fishponds (-3027 and -3028), *‘auwai* (-3029 and -3030) and taro fields (-3031 through -3034)
Hammatt 1990	Archaeological assessment	Kaua‘i Lagoons Resort, Kalapaki	No archaeological sites within backshore portion of property; five sites recorded in shoreline area
McMahon 1990	Archaeological field check	Three parcels in Līhu‘e Judiciary District: possible locations for a new Kaua‘i Judiciary Building, Nāwiliwili, TMK: [4] 3-3-003:025, Location 1	In the Nāwiliwili study area, identified two historic residence sites (SIHP #s -9390 and -9401) 1.5 km northwest of proposed project area

Source	Nature of Study	Location	Results (SIHP # 50-30-11)
Rosendahl and Walker 1990	Archaeological inventory survey and related consultant services	Kalapaki Point Subdivision, land of Nāwiliwili	Thirty-one backhoe trenches; identified 24 burials; indications of many more
Folk and Hammatt 1991	Archaeological inventory survey	Kanoa Estate lands, Niumalu Ahupua‘a	Documented two sites previously identified by Ching et al. (1973): SIHP #s -3027 (Kanoa’s Fishpond) and -3028 (Kiowai Fishpond); identified a component of -3027, a *pani wai* (dam, sluice, dike) (these sites not included in Figure 24; outside the depicted area)
Hammatt 1991	Letter report archaeological survey	Nāwiliwili; 44,000 sq ft TMK: [4] 3-2-006:013	No finds (not included on Figure 23)
Walker et al. 1991	Archeological inventory survey	Areas in Hanamā‘ulu, Kalapakī, Nāwiliwili, Niumalu, and Wailua	Ten sites consisting of 14 component features including a habitation complex with cultural deposits (SIHP #s 50-30-08-1838a and -1838b), a complex with wall and terrace (-1839a and -1839b), a retaining wall (-1840), a road (-1841), a wall (-1842), a complex with concrete foundation, road, and concrete wall (-1843a, -1843b, and -1843c), a historic cemetery (1844), a railroad bridge (-1845), a concrete bridge (-1846), and a river valley (-1847) (these sites not included in Figure 24; outside the depicted area)
Walker and Rosendahl 1991	Archeological inventory survey	Kalapakī Point	Documented 34 intact burials, nine other burials, and 44 previously exhumed pits–likely from initial 1972 exhumations performed by D. Dilworth (Walker and Rosendahl 1991:20)
Hammatt and Creed 1993	Archaeological inventory survey	61.6 acres in Nāwiliwili TMKs: [4] 3-2-006:005 and 3-2-007:016 and 018	Four sites identified: SIHP #s -491 (*‘auwai*), -492, (historic remnants), -493 (*‘auwai* section and terrace), and -494 (possible burial marker)

Source	Nature of Study	Location	Results (SIHP # 50-30-11)
Hammatt et al. 1993	End of fieldwork report	Kalapakī Point development area Nāwiliwili TMK: [4] 3-2-005:021	Interim study documented disinterment of 48 burials at Nāwiliwili Cemetery and their reinterment in newly defined 0.6-acre cemetery at west end of parcel
Henry et al. 1993	Archaeological inventory survey	Grove Farm Līhu‘e/Puhi project area, lands of Nāwiliwili; 590 acres	Identified two sites: SIHP #s -503 (historic cemetery for Japanese and Hawaiian workers at Grove Farm) and -9390 (historic residence) (these sites not included in Figure 24; outside the depicted area)
Hammatt and Folk 1995a, b	Burial treatment study	Nāwiliwili Cemetery treatment	Field excavations identified 26 known burials and 22 additional intact burials at Nāwiliwili (Japanese) Cemetery, designated SIHP # -6009
Hammatt and Chiogioji 2001	Archaeological historical and cultural assessment	Harbor improvement project at Nāwiliwili Harbor	Developed data on significance of coastal Nāwiliwili, importance in pre-Contact period, and large population through the 1930s
Bell et al. 2006	Archaeological inventory survey	Līhu‘e Airport, Hanamā‘ulu and Kalapakī Ahupua‘a	Identified SIHP # -3958, comprised of two features: plantation-era concrete enclosures and foundation remnants that likely functioned as a piggery (not included in Figure 24; outside the depicted area)
Hammatt and Shideler 2006	Archaeological literature review and field check	Eight DOE Schools on Kaua‘i, including Kaua‘i High School	Five schools (Anahola Elementary, ‘Ele‘ele Elementary, Kalāheo Elementary, Kapa‘a High, and Kīlauea Elementary) recommended for no further work; two schools (Kaua‘i High and Kōloa Elementary) recommended for monitoring program; one school (Kekaha Elementary School) recommended for inventory survey
Groza and Hammatt 2010	Archaeological monitoring	Kaua‘i High School cesspool conversion project	No cultural deposits identified, but fragments of human remains identified in imported sand soils
Kamai et al. 2014	Archaeological assessment	Kaua‘i High School eastern parking improvements area	A total of 16 linear backhoe-assisted test excavations completed; no historic properties identified

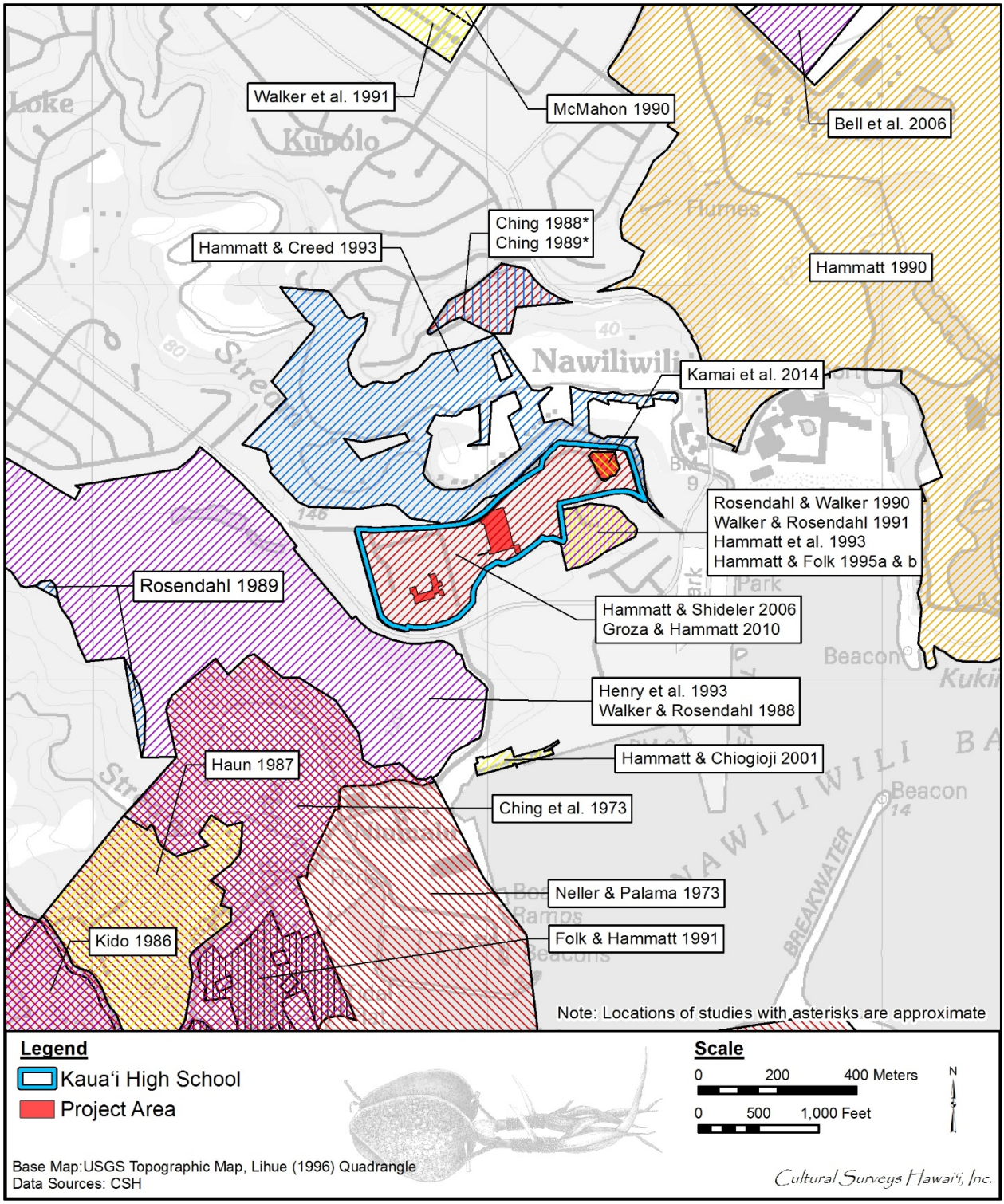

Figure 23. 1998 Lihue USGS topographic quadrangle, showing location of previous archaeological studies at Nāwiliwili in relation to the project areas within the Kaua‘i High School campus

Table 3. Previously Identified Historic Properties in the Vicinity of the Project Areas

SIHP # (50-30-11-)	**Nature of Site**	**General Location**	**Source**
99	Kuhiau Heiau (indicated as covering 4 acres)	Central KHS campus or SE on edge of bluff ?	Bennett 1931
491	*‘Auwai* (pre-Contact)	250 m NW of KHS	Hammatt and Creed 1993
492	Historic structure (post-Contact)	250 m NW of KHS	Hammatt and Creed 1993
493	*‘Auwai* (pre- and post-Contact)	250 m NW of KHS	Hammatt and Creed 1993
494	Rock marker (undetermined age)	250 m NW of KHS	Hammatt and Creed 1993
3029	*‘Auwai* (pre-Contact)	800 m SW of KHS	Ching et al. 1973
3030	*‘Auwai* (pre-Contact)	800 m SW of KHS	Ching et al. 1973
3031	*Lo‘i* (pre-Contact)	800 m SW of KHS	Ching et al. 1973
3032	*Lo‘i* (pre-Contact)	800 m SW of KHS	Ching et al. 1973
3033	*Lo‘i* (pre-Contact)	800 m SW of KHS	Ching et al. 1973
3034	*Lo‘i* (pre-Contact)	800 m SW of KHS	Ching et al. 1973
6009	Cemetery (post-Contact)	Adjacent to SE	Rosendahl and Walker 1990, Walker and Rosendahl 1991, Hammatt et al. 1993, Hammatt and Folk 1995a, b
(No SIHP # assigned)	Nāwiliwili Stream, bridges	200 m east of KHS	Spencer Mason Architects 1989
(No SIHP # assigned)	Human bones in imported sand at KHS	Central KHS campus	Groza and Hammatt 2010

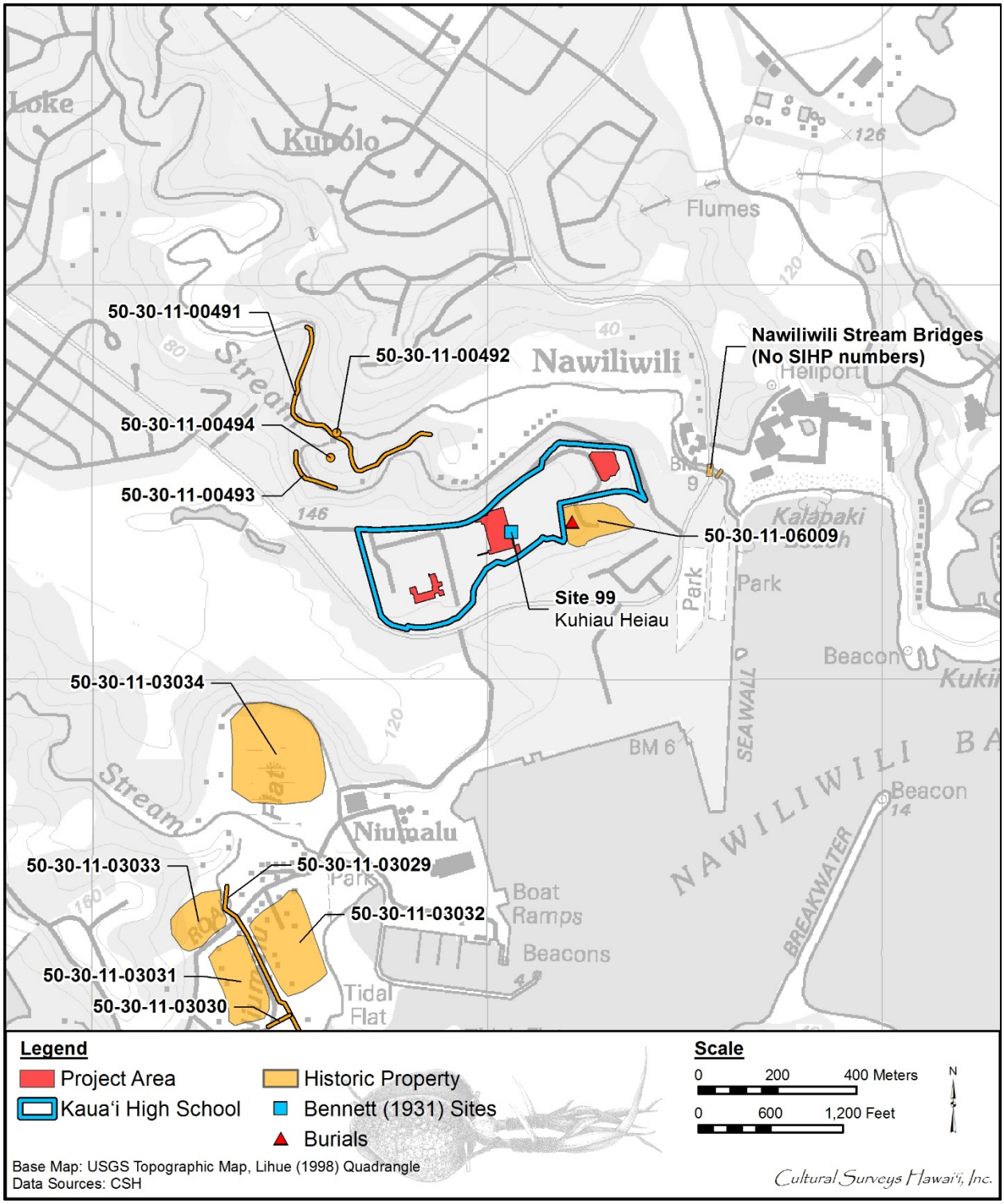

Figure 24. Previously identified archaeological sites in relation to the project areas within the Kaua‘i High School campus

4.1.1 Neller and Palama 1973

Neller and Palama (1973) carried out an archaeological reconnaissance of the lower portion of the Hulē‘ia River and vicinity, recording a number of historic properties (30). The archaeological richness of the area from the “Menehune Fishpond” downstream and near the crest of the trail to Kīpū Kai is clear. The 30 documented sites include Site 93, house sites or *heiau*; Site 94, house sites; Site 98, ‘Alekoko (Menehune) Fishpond; SIHP #s -3000, habitation enclosure; -3001, cave and terraces; -3002, habitation enclosure; -3003, habitation complex; -3004, Kipu Kai Trail; -3005, wall; -3006, house platform; -3007, *alaea* pit; -3008, agricultural terraces and house sites; -3009, agricultural complex; -3010, habitation complex; -3011, habitation complex and platforms; -3012, enclosures; -3013, Pepeawa Fishpond; -3022, wall; -3023, enclosure; -3024, enclosure; -3025, walls; -3026, house platform; -3027, *loko wai* fishpond; -3028, *loko w*ai fishpond; -3029, *‘auwai*; -3030, *‘auwai*; -3031, *lo‘i* complex; -3032, *lo‘i* complex; -3033, *lo‘i* complex; and -3034, *lo‘i* complex.

4.1.2 Ching et al. 1973

In 1973, Archaeological Research Center Hawaii (ARCH) conducted detailed research on ‘Alekoko (Menehune) Fishpond and its vicinity in Niumalu Ahupua‘a (Ching et al. 1973). Nine archaeological features and feature complexes were identified and documented: SIHP #s -98 (Bennett Site 98), ‘Alekoko (Menehune) Fishpond, a *loko kuapā*; -3027 and -0328, two *loko wai* fishponds; -3029 and -3030, two *‘auwai*; and 3031 through -3034, four *lo‘i* agricultural complexes.

4.1.3 Kido 1986

In 1986, Michael H. Kido performed further work at the ‘Alekoko Fishpond (Site 98) and Hule‘ia Estuary. He noted mangrove encroachment on a pond wall, breaks in a wall, and rubbish used to fortify a wall. He recommended a more comprehensive survey.

4.1.4 Ching 1988; Ching 1989

In 1988 Francis Ching conducted an archaeological reconnaissance of a parcel located on the north slope of Nāwiliwili Valley, downslope of Kupolo Tract and Rice Street. This parcel is a steep eroded slope that had been previously bulldozed (Ching 1988). Subsurface testing on this parcel later the same year confirmed no archaeological sites were present (Ching 1989).

4.1.5 Walker and Rosendahl 1988; Rosendahl 1989; Henry et al. 1993

Walker and Rosendahl (1988) conducted an archaeological surface and subsurface inventory survey of the 450-acre Grove Farm, Līhu‘e/Puhi, extending from Puhi Town, south of Kaumuali‘i Highway and nearly to Nāwiliwili Bay. A total of two historic properties were identified: a historic Japanese cemetery, SIHP # -503, and a historic residence, SIHP # -9390.

The following year, Paul Rosendahl (1989) produced an addendum report covering eight additional separate small adjacent areas. No historic properties or cultural material were identified.

Henry et al. (1993) covered the same project area for the final archaeological inventory survey for this area. Between 1988–1991, a crew from Paul H. Rosendahl, Ph.D., Inc. (PHRI), surveyed and conducted limited testing on a 590-acre portion of Grove Farm, a former sugar plantation, in the *ahupua‘a* of Nāwiliwili, Niumalu, and Ha‘ikū (Henry et al. 1993). Two sites were identified during the survey. SIHP # -503 was a historic cemetery for the Japanese and Hawaiian workers at

Grove Farm, in use up to around 1961 (Henry et al. 1993:B-10). SIHP # -9390, a historic residence, was once the home of Charles Henry Wilcox, a manager at Grove Farm. It was built in 1913 and was in fair to poor condition in 1991. It sustained major damage in 1992 when Hurricane ‘Iniki touched down on the island of Kaua‘i (Henry et al. 1993:19; B-10).

4.1.6 McMahon 1990

In 1990, Nancy McMahon surveyed three possible locations for a new Kaua‘i Judiciary Building in Nāwiliwili. Three previously identified historic residential sites (SIHP #s -9390, -9401, and -9402) were recorded. SIHP # -9390 is the Grove Farm manager’s house; SIHP # -9401 and -9402 are two other plantation-era residences.

4.1.7 Rosendahl and Walker 1990; Walker and Rosendahl 1991

Rosendahl and Walker (1990) began conducting an archaeological inventory survey and related consultant services at the Kalapaki Point Subdivision. A total of 31 backhoe trenches were excavated, identifying 24 burials with indications that many more burials were located nearby. Excavations were halted after 20 intact burials were encountered (one possibly intact and three partially disinterred burials were also encountered), in compliance with the use permit to stop work upon discovery of the twentieth burial. The trenches were backfilled after their locations and the burial locations were marked. A letter report was generated, stating that the inventory survey testing was unable to be completed.

In 1991, PHRI performed additional fieldwork to complete the archaeological inventory survey started by Rosendahl and Walker (1990) for the Kalapakī Point Development project (Walker and Rosendahl 1991). The surface survey of the project area identified two mounds and a few eco-factual remains and portable artifacts, while the subsurface testing program identified remnants of the Japanese or Nāwiliwili Cemetery (SIHP # -503), totaling 34 intact burials, nine “other” burials, and 44 previously disinterred burials.

4.1.8 Folk and Hammatt 1991

In 1991, CSH conducted an archaeological survey and subsurface testing at Kanoa Estate Lands in Niumalu Ahupua‘a (Folk and Hammatt 1991). Two sites previously identified by Ching et al. (1973) were documented: SIHP #s -3027 (Kanoa’s Fishpond) and -3028 (Kiowai Fishpond). Folk and Hammatt also identified a component of -3027, a *pani wai*.

4.1.9 Hammatt 1991

In 1991, CSH conducted subsurface testing for the proposed Kapa‘a sewer line to run along Kūhiō Highway in Wailua, Olohena, Waipouli, and Kapa‘a Ahupua‘a (Hammatt 1991). Buried cultural layers containing shell midden, charcoal, bone, and soil features were encountered in three sections of their project area.

4.1.10 Walker et al. 1991

In 1991, Walker, Kalima, and Goodfellow conducted an archaeological inventory survey of lands in Hanamā‘ulu, Kalapakī, Nāwiliwili, Niumalu, and Wailua Ahupua‘a. Ten sites consisting of 14 component features were identified within or immediately adjacent to that project area. Findings included a habitation complex with cultural deposits (SIHP #s 50-30-08-1838a and -1838b), a complex with wall and terrace (SIHP #s 50-30-08-1839a and -1839b), a retaining wall

(SIHP # 50-30-08-1840), a road (SIHP # 50-30-08-1841), a wall (SIHP # 50-30-11-1842), a complex with concrete foundation, road, and concrete wall (SIHP #s 50-30-08-1843a, -1843b, and -1843c), a historic cemetery (SIHP # 50-30-08-1844), a railroad bridge (SIHP # 50-30-08-1845), a concrete bridge (SIHP # 50-30-08-1846), and a river valley (SIHP # 50-30-11-1847).

The survey area for the 1,550-acre Līhu‘e/Puhi/Hanamā‘ulu Master Plan archaeological inventory survey (Walker et al. 1991) was divided into eight sections, one on a *mauka* section of Niumalu/Kalapakī, and seven along the coastal portions of Kalapakī, Nāwiliwili, Hanamā‘ulu, and Wailua. The report states that

> Areas in sugar cane were only sampled . . . [and] were not generally surveyed . . . because areas altered by sugar cane cultivation are unlikely to contain archaeological features, and because sugar cane cultivation within the present project area does not occur in low swale or alluvial flat areas that may contain buried cultural deposits. [Walker et al. 1991:7]

4.1.11 Walker and Rosendahl 1991

In 1991, PHRI performed an archaeological inventory survey for the Kalapakī Point Development project (Walker and Rosendahl 1991). The surface survey of the project area identified two mounds and a few eco-factual remains and portable artifacts, while the subsurface testing program identified remnants of the Japanese or Nāwiliwili Cemetery (SIHP # -503).

4.1.12 Haun 1987

In 1987, PHRI performed an archaeological field inspection of portions of the proposed Niumalu Bluffs Subdivision (Haun 1987). The field inspection area consisted of two small sections on the north and south sides of a ridge, and included portions of a marshy flood plain. The project consisted of a pedestrian survey, primarily with the purpose of confirming previously identified sites. Large amounts of disturbance associated with quarrying and new roads were observed. Only one of the three previously recorded historic properties was able to be confirmed, SIHP # -3029 (*‘auwai*). The two other historic properties, SIHP #s -3033 and -3034 (two *lo‘i*), were unable to be confirmed.

4.1.13 Hammatt and Creed 1993

From 1990–1991, CSH conducted an archaeological inventory survey of 61.6 acres in Nāwiliwili Ahupua‘a, within 100 m north of the proposed project area (Hammatt and Creed 1993). Four archaeological sites were documented: SIHP #s -491, a pre-Contact *‘auwai* with historic use over 600 m long; -492, historic-era collapsed sheds and a U-shaped mortared structure; -493, a pre-Contact *‘auwai* with historic use, a soil terrace, and a low soil and rock mound; and -494, a possibly historic-era lava rock marker. Two of the sites, -491 and -493, were considered significant and preservation was recommended.

4.1.14 Hammatt, Masterson, and Folk 1993; Hammatt and Folk 1995 a, b

In 1993, CSH performed the disinterment and reinterment at the Nāwiliwili, or Japanese, Cemetery of 34 human burials previously identified in 1990–1991 (Rosendahl and Walker 1990; Walker and Rosendahl 1991) (Hammatt et al. 1993). The cemetery was designated SIHP # -6009 and was probably in use during the latter half of the nineteenth century, although it was never recorded or registered as a cemetery in official records. Its official closure by the Hawai‘i State

Department of Health occurred in 1967. Excavations were performed in two phases. Phase I consisted of the disinterment of 23 previously identified burials, for which there were no known lineal descendants. Phase II included the disinterment of a total of 11 burials (eight previously identified and three newly identified) burials for which the lineal descendants were known. This separate phase approach was to ensure that the wishes of the descendants would be respected in the treatment and disposition of the remains. All of the remains were relocated to a newly defined 0.6-acre cemetery at the west end of the parcel

From 1993 to 1994, CSH performed additional field excavations, osteological studies, and documentary research as part of an additional phase (Phase III) for the Nāwiliwili, or Japanese, Cemetery (Hammatt and Folk 1995). The purpose of the project was to find and relocate 42 burials, previously identified in 1990–1991 (Rosendahl and Walker 1990; Walker and Rosendahl 1991) as well as any additional burials located within the project area. Testing was to be conducted “in specific areas including proposed house lots in the central southern portion of the bluff top where burials had not previously been found, and beneath a sprawling growth of bougainvillea at the northeast end of the bluff top” (Hammatt and Folk 1995:38). During field excavations, 26 of the known burials and 22 additional intact burials were discovered and relocated to the newly defined 0.6-acre cemetery at the west end of the parcel.

4.1.15 Hammatt and Chiogioji 2001

Hammatt and Chiogioji (2001) carried out historical research and oral history interviews on a coastal Nāwiliwili project for harbor improvements 700 m southwest of the proposed project area. This study emphasizes the importance of the area in the pre-Contact period and points out that a large population continued to live there well into the twentieth century. Informant James Burgess estimated over 100 families lived in the area in the 1930s (Hammatt and Chiogioji 2001:16).

4.1.16 Bell et al. 2006

In 2006, CSH conducted an archaeological inventory survey for the proposed Līhu‘e Airport Improvements (Bell et al. 2006). A single cultural resource/historic property was identified, SIHP # 50-30-08-3958, which consists of two early twentieth century features: plantation-era concrete enclosures (-3958a) and foundation remnants that likely functioned as a piggery (-3958b).

4.1.17 Hammatt and Shideler 2006

In 2006, CSH conducted an archaeological literature review and field check for eight Kaua‘i Island schools scheduled for wastewater improvements in order to determine what, if any, cultural resource measures were appropriate (Hammatt and Shideler 2006). For five of the eight schools (Anahola Elementary, ‘Ele‘ele Elementary, Kalāheo Elementary, Kapa‘a, High, and Kīlauea Elementary), no further work was recommended. Two schools (Kaua‘i High and Kōloa Elementary) were recommended for an archaeological monitoring program, and one school (Kekaha Elementary) was recommended for an archaeological inventory survey.

Hammatt and Shideler (2006) noted that the Kaua‘i High School area was very active for habitation and wetland agriculture in traditional Hawaiian times and it is in the vicinity of the Nāwiliwili (Japanese) Cemetery.

4.1.18 Groza and Hammatt 2010 (Previous Archaeological Monitoring at Kaua‘i High School)

In 2006, the State of Hawai‘i Department of Education (DOE) entered into an agreement with the Environmental Protection Agency (EPA) to carry out improvements to existing wastewater systems at Hawai‘i’s public schools. The firm CH2M Hill was chosen to design and implement wastewater improvements at 49 schools located on five of the Hawaiian Islands. CSH worked with CH2M Hill to address historic preservation concerns with the SHPD. Eight Kaua‘i Island schools, including Kaua‘i High School, were included within the Hawai‘i Inter-Island DOE Cesspool project and within a study (Hammatt and Shideler 2006) that evaluated the potential for adverse impact to cultural resources from the proposed wastewater improvement work. Kaua‘i High School was recommended for an archaeological monitoring program and the SHPD agreed with the recommendation.

An archaeological monitor was present during all subsurface excavations associated with the Kaua‘i High School wastewater system project (Groza and Hammatt 2010). Excavation activities included the removal of cesspools and the installation of new sewer lines, seepage pits, and septic tanks. Excavation depths ranged from 1.5 m to a maximum of 4.3 m. Disturbance, including fill and fill materials, was present throughout the project area, ranging in depth from 38 cmbs (cm below surface) to 1.7 mbs (m below surface). Ground disturbance was attributed to the original installation of the cesspools, utilities, and drainage. Some of the disturbance may be associated with the construction of the school beginning in the 1920s.

Fill materials, the majority of which were modern, included cement blocks and slabs, basalt gravel, wood, lead pipe fragments, PVC tubing, a soda can cap, tree limbs, discarded metal fragments, broken glass, wood cuttings, and cardboard boxes. The majority of observed fill sediments consisted of local soils that may have been excavated from other portions of the school property.

Although no cultural deposits were identified, fragments of human remains were inadvertently found in imported soils.

4.1.19 Kamai et al. 2014 (Archaeological Assessment at KHS off-site parking area)

At the request of Wilson Okamoto Corporation, CSH carried out an archaeological inventory survey study for the parking improvements portion of the Kaua‘i High School Improvements project, Nāwiliwili Ahupua‘a, Līhu‘e District, Kaua‘i. Because no historic properties were identified within the project area during the study, this investigation is termed an archaeological assessment, per HAR §13-13-284-5. The project comprises TMK: [4] 3-2-005:011 (por.) and consists of the construction of an off-site parking area located at the northeasternmost portion of the Kaua‘i High School property. The project area is situated east of a gated parking area and abuts the east edge of Lala Road. The off-site parking is already in use as an (unimproved) overflow parking area for teachers, students, and staff.

The purpose of the inventory was 1) to identify surface historic properties, 2) to search for and evaluate the prospect for subsurface historic properties, and 3) to collect stratigraphic information as may inform future development.

No historic properties were identified on the surface during the 100% pedestrian survey conducted for the current project area. It should be noted that although no historic properties were

identified, the general area had been previously used as an illegal dump site with the presence of modern trash scattered throughout the vegetated portion of the project area.

A total of 16 linear backhoe-assisted test excavations were completed within the project area. The trenches each measured approximately 6 m (20 ft) long and 0.6 m (2 ft) wide with various depths from 0.6 m to 1.8 m.

Out of the 16 trenches excavated, 15 revealed very similar stratigraphy. The uppermost strata within the project area consisted of varying layers of modern A horizons and historic fill designated Stratum I and sub-designated alphabetically (a and b). The modern A horizons were typically in areas of vegetation (weeds) and where modern trash was observed on the surface prior to vegetation removal. The fill layers were typically associated with prior road construction, previous subsurface disturbance due to utility lines, and modern landscaping fill. Fill layers within the project area were easily distinguishable by clear lower sediment boundaries. Stratum II consisted of culturally sterile soil.

The lack of any archaeological evidence associated with habitation, agricultural, or religious practices (i.e., cultural layer, features, burials or artifacts) during this subsurface testing gives no support for analysis of prior land use.

Since no historic properties were identified during the inventory survey of the Kaua‘i High School Improvements project for off-site parking, no significance assessments were needed.

4.1.19.1 Pedestrian Inspection Results

A 100% coverage pedestrian inspection of the project area was undertaken for the purpose of historic property identification and documentation. The project area consisted of an open “hard pan like” surface that covered approximately 90% of project area. The remaining 10% consisted of a strip of vegetation on the southern end of the project area that was covered through a single systematic sweep spaced 2 m apart.

4.1.19.2 Test Excavation Results

A program of subsurface investigation was conducted as part of the project’s effort to satisfy the Hawai‘i State requirements for archaeological inventory surveys (HAR §13-276 and §13-275/284). This subsurface testing was carried out by the use of small excavator to aid in determining if a cultural layer was present.

A total of 16 representative profiles are provided below, documenting the stratigraphy exposed during excavations associated with the Kaua‘i High School Improvements project for off-site parking (Figure 25 and Figure 26). Table 4 describes the profiles by trench number. In general, the stratigraphy observed throughout the project area remained consistent with observations and stratigraphy documented during the archaeological monitoring associated with the Kaua‘i High School wastewater system project (Groza and Hammatt 2010).

4.1.19.3 Profile Documentation

The subsurface testing program at the off-site parking area included the excavation of 16 test excavations strategically placed throughout the entire project area. In general, linear trenches measuring approximately 6 m (20 ft) long and 0.6 m (2 ft) wide were excavated within the subject area (Figure 25 and Figure 26).

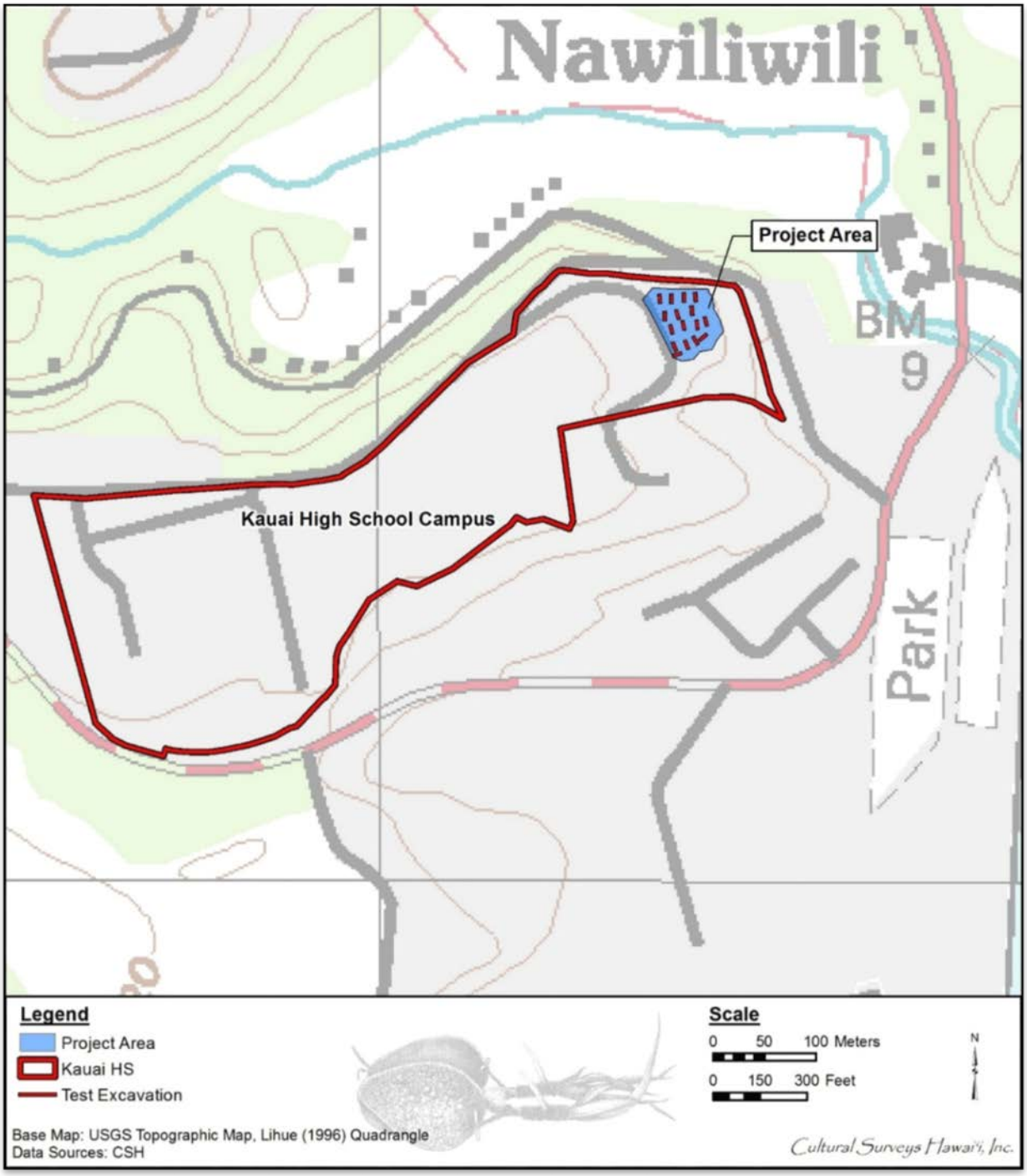

Figure 25. 1996 Lihue USGS quadrangle showing trench locations for off-site parking area

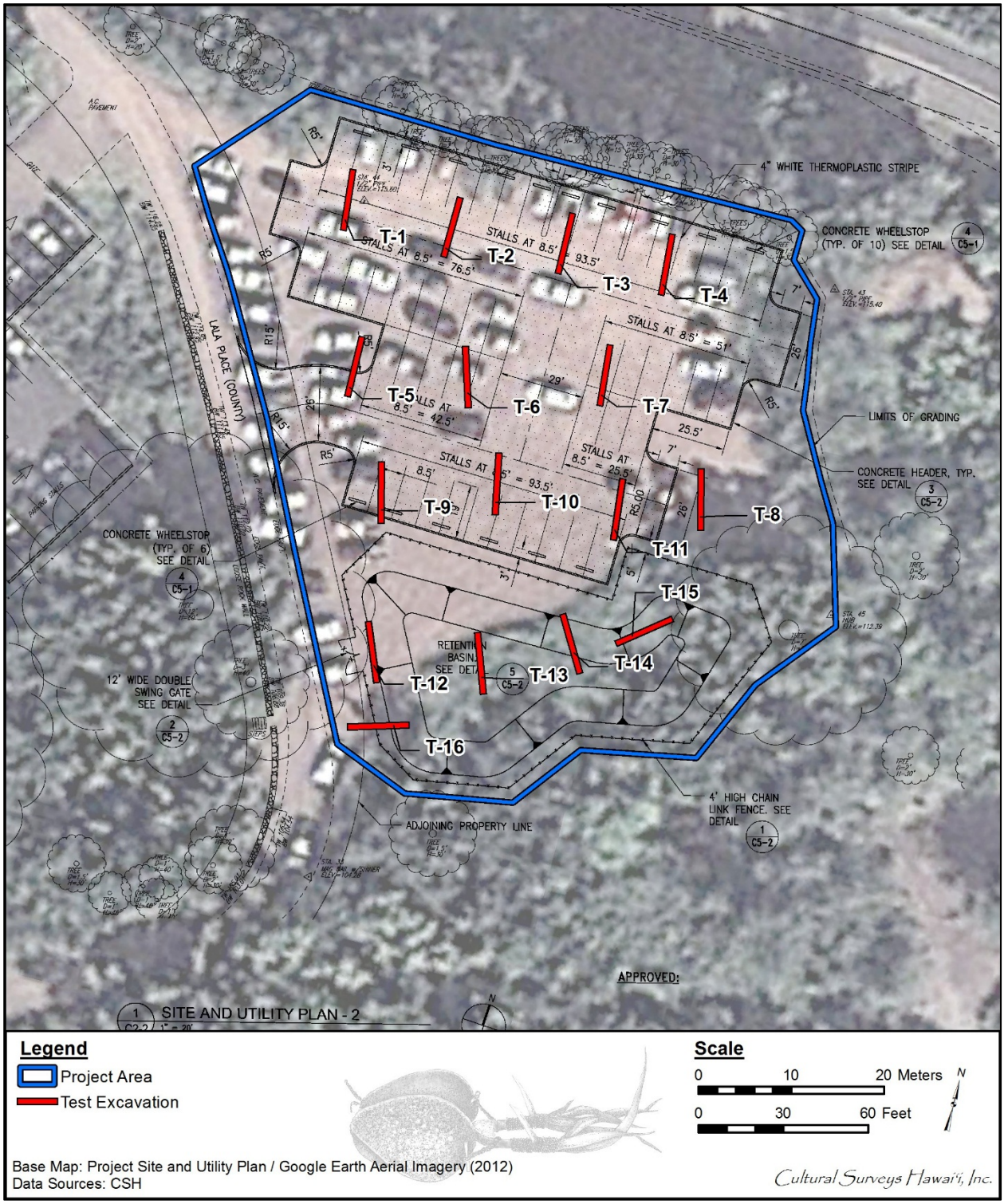

Figure 26. 2012 Google Earth aerial map with trench locations for off-site parking area

Table 4. Table Summarizing the Profile Descriptions at the Off-Site Parking

Trench	Date Profiled	Stratigraphic Sequence	Comments
1	19 Mar 2014	Sandy clay loam, Clay loam	Str. I contains a crushed coral lens; Str. II–culturally sterile soil
2	18 Mar 2014	Sandy clay loam, Clay loam	Str. I has lens of crushed coral; Str. II–culturally sterile soil
3	18 Mar 2014	Sandy clay loam, Clay loam	Str. I contains some crushed coral and disturbed A horizon material; Str. II has carbonized root inclusions–dark gray to black
4	18 Mar 2014	Sandy clay loam, Clay loam	Str. I has a well-defined lens of crushed coral/sand 1.0 m at N end of trench; it is a mix of A horizon, fill, and crushed coral; generally disturbed by traffic; Str. II–saprolytic material
5	18 Mar 2014	Sandy clay loam, Clay loam	Str. I mixed material; Str. II–culturally sterile soil
6	18 Mar 2014	Clay loam	Str. I–cast iron pipe fragment observed; concrete slab at bottom of entire trench; 60 cmbs
7	18 Mar 2014	Sandy clay loam, Clay loam	Str. I–fill material; Str. II–culturally sterile soil
8	18 Mar 2014	Sandy clay loam, Clay loam	Str. I–disturbed material, mixed with crushed coral; Str. II–culturally sterile soil with a few dark gray to black carbonized root inclusions
9	18 Mar 2014	Sandy clay loam, Clay loam	Str. Ia–mixed soil with crushed coral/sand and quarry gravel; Str. Ib–crushed coral; Str. II–culturally sterile soil
10	19 Mar 2014	Sandy clay loam, Clay loam	Str. I–fill material; Str. II–culturally sterile soil
11	19 Mar 2014	Sandy clay loam, Clay loam	Str. I–fill material; Str. II–culturally sterile soil
12	19 Mar 2014	Sandy clay loam, Clay loam	Str. Ia–modern A horizon mix with crushed coral; Str. Ib–fill material with some mixing with Str. II near boundary; Str. II–culturally sterile soil
13	19 Mar 2014	Sandy clay loam, Clay loam	Str. I–modern A horizon mixed with crushed coral/sand; Str. II–culturally sterile soil
14	19 Mar 2014	Sandy clay loam, Clay loam	Str. I–modern A horizon mixed with crushed coral/sand; Str. II–culturally sterile soil
15	19 Mar 2014	Sandy clay loam, Clay loam	Str. I–modern A horizon mixed with crushed coral/sand; Str. II–culturally sterile soil
16	19 Mar 2014	Clay loam	Str. I–modern A horizon; Str. II fill material heavily mixed with 2.5YR 4/4 material

The uppermost strata within the project area consisted of varying layers of modern and historic fill designated Stratum I and sub-designated alphabetically (a–z). The fill layers were typically associated with road construction, previous subsurface disturbance due to utility lines, and modern landscaping fill. Fill layers within the project area were easily distinguishable and generally consisted of clear lower sediment boundaries.

With the exception of Trench 16 (T-16), culturally sterile clay loam material designated Stratum II was observed underlying the subsurface cultural layer to the base of excavation (BOE) over most of the project area.

4.2 Human Remains (reported in Groza and Hammatt 2010)

On 27 May 2009, during the course of archaeological monitoring, human cranium fragments were found in imported soils during subsurface construction activities, approximately 400 m southwest of the current proposed project area (Figure 27 and Figure 28).

The skeletal fragments consisted of one cranial fragment broken into three pieces by the excavator. The human remains appeared to have been in a matrix of sandy imported soil utilized as bedding material for the existing water line. Each of the three cranium fragments had freshly broken edges and was covered with sand, indicating it had been buried within the sandy imported soil. The find did not constitute a site since the remains were likely imported from elsewhere.

CSH archaeologists collected the human remains and excavated around the location of the remains to check for additional skeletal remains and cultural material. They screened the soil removed around the skeletal fragments and the back dirt pile to ensure the removal of all skeletal fragments. No other remains or associated cultural material were identified.

The remains were believed to be almost certainly more than 50 years old. While the remains may well have been Native Hawaiian, in the virtual absence of context the ethnicity was uncertain.

The fragmentary remains were temporarily curated on-site at Kaua‘i High School in a locked construction trailer. Our understanding is that the remains were informally interred at the Lihi Park reinterment site near Kapa‘a but we have no paper trail from SHPD to this effect.

4.1 Stratigraphy in the Core KHS Campus (reported in Groza and Hammatt 2010)

The on-site archaeological monitors completed stratigraphic profiles in order to obtain a representative stratigraphic sequence of the areas under excavation during the DOE Cesspool project as shown on Figure 30. The profiles include depth, width, and U.S. Department of Agriculture (USDA) standard soil descriptions.

As previously mentioned, locally excavated sediments used as fill were present throughout the wastewater system project area. Profile 1 shows the representative stratigraphy generally observed throughout the project area (Figure 29 through Figure 32 and Table 4 through Table 6). The upper 107 cm consist of fill sediments. Profile 2 contained the cranium fragments found during probe testing, and consists of fill sediments to 92 cmbs. The majority of soil within the project area was locally obtained fill sediments consisting of silty clay, which agrees with the USDA soil data (Lihue silty clay) for the area (Foote et al. 1972).

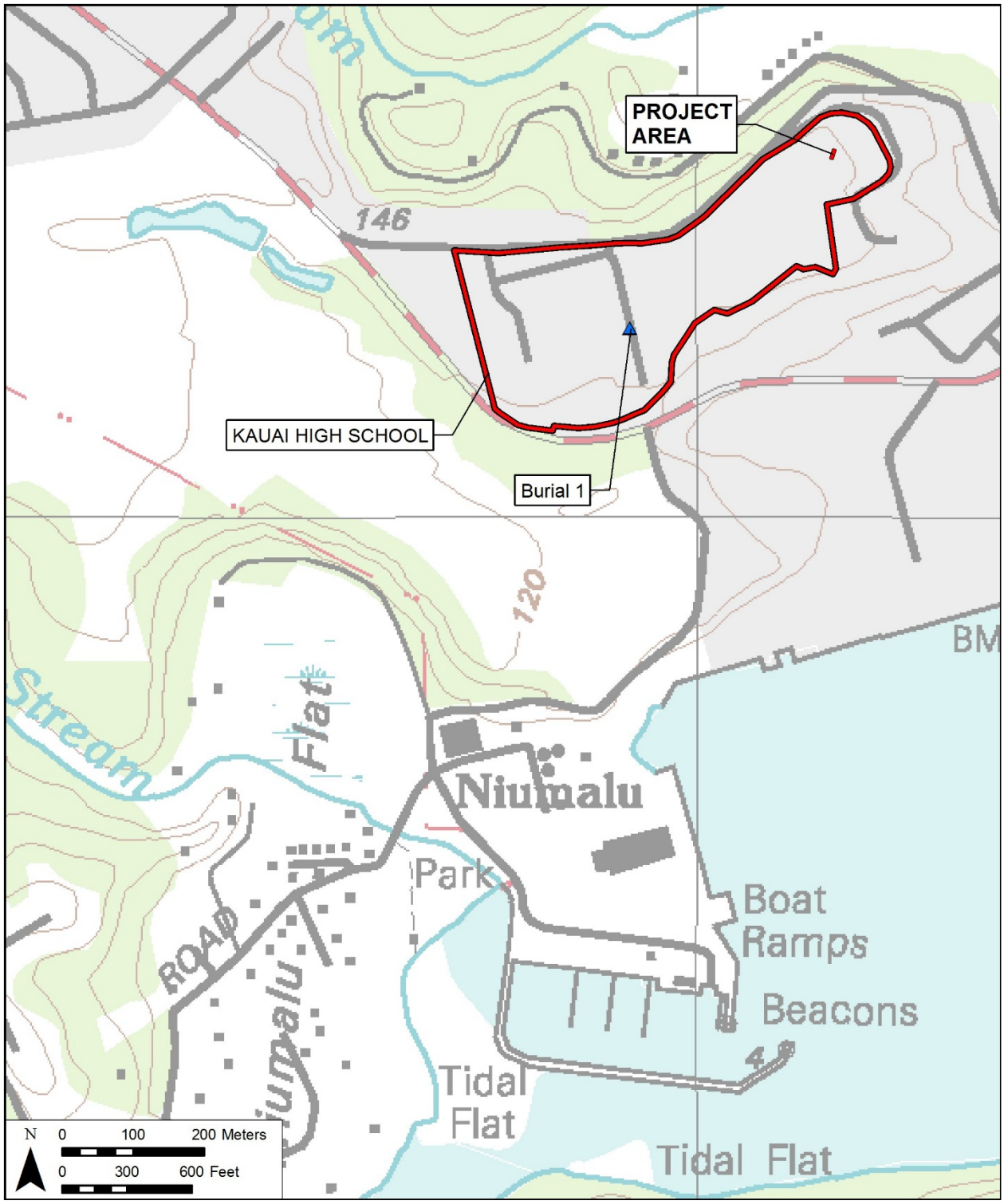

Figure 27. Portion of USGS map, showing location of Burial 1 from DOE Cesspool project (Groza and Hammatt 2010:31)

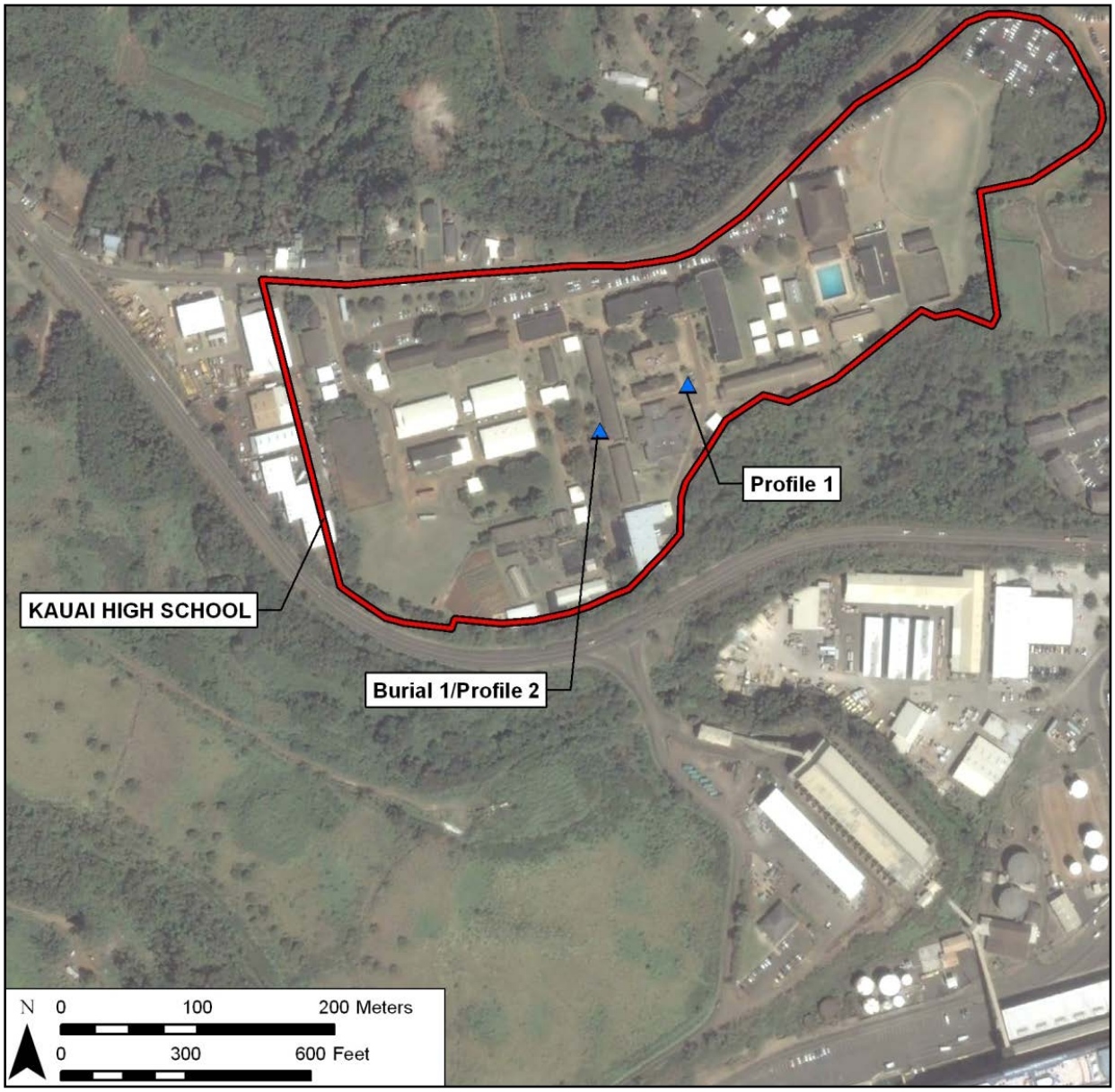

Figure 28. Aerial photograph showing Burial 1 location and stratigraphic profile locations from DOE Cesspool project (Groza and Hammatt 2010:32)

Figure 29. Photograph of Profile 1, representative profile showing typical stratigraphy observed throughout from DOE Cesspool project, view to west (Groza and Hammatt 2010:34)

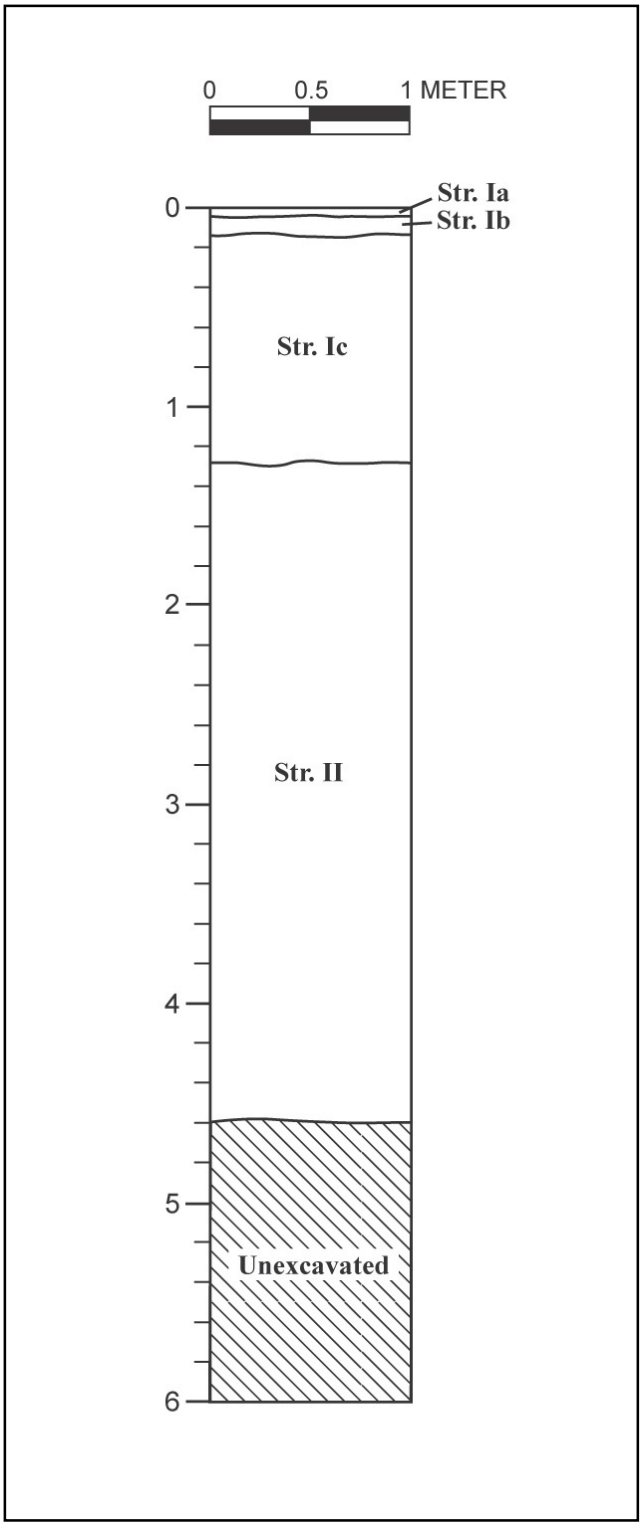

Figure 30. Representative stratigraphic profile for Profile 1 from DOE Cesspool project (Groza and Hammatt 2010:33)

Table 5. Stratigraphy Descriptions for Representative Profile from DOE Cesspool Project (Groza and Hammatt 2010:34)

Strata	Depth (cmbs)	Description
Ia	0–4	Asphalt surface
Ib	4–14	Fill, crushed coral base
Ic	14–107	Fill; 7.5 YR 3/4, dark brown; clay loam; moderate, medium crumb structure; friable, moist consistence; slightly plastic; weakly cementated; very abrupt, smooth lower boundary; clean, old fill
II	107–460	B horizon; 7.5 YR 3/3, dark brown; clay loam; moderate, medium granular structure; firm, moist consistence; slightly plastic; strongly cemented; base of excavation

Figure 31. Photograph of Profile 2 showing stratigraphy for Burial 1, view to east (Groza and Hammatt 2010:37)

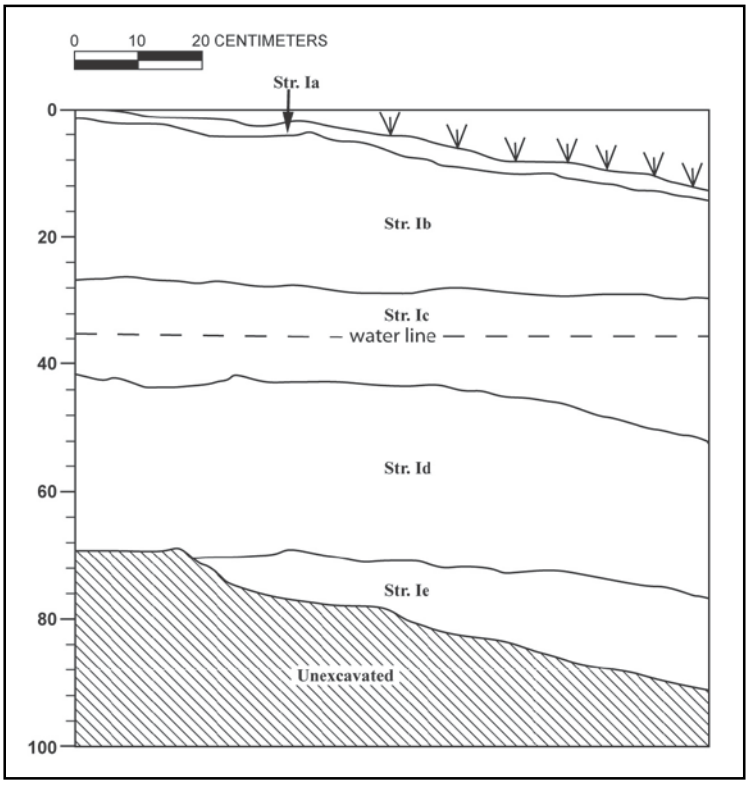

Figure 32. Stratigraphic profile for area containing cranium fragments, Profile 2 from DOE Cesspool project (Groza and Hammatt 2010:35)

Table 6. Stratigraphy Descriptions for Area Containing Cranium Fragments, Profile 2 from DOE Cesspool Project (Groza and Hammatt 2010:36)

Strata	Depth (cmbs)	Description
Ia	0–14	7.5 YR 5/8, strong brown; sandy loam; weak, medium crumb structure; weakly coherent, dry consistence; non-plastic; weak cementation; abrupt, irregular lower boundary; fill
Ib	2–30	7.5 YR 3/3, dark brown; silty clay; moderate, medium crumb structure; weakly coherent, dry consistence; slightly plastic; weak cementation; very abrupt, broken lower boundary; fill
Ic	29–52	7.5 YR 6/4, light brown; fine sand; weak, fine, single-grain structure; loose, dry consistence; non-plastic; no cementation; very abrupt, smooth lower boundary; fill for water line/human cranium fragments in water line bedding
Id	42–78	7.5 YR 3/3, dark brown; silty clay; moderate, medium crumb structure; weakly coherent, dry consistence; slightly plastic; weak cementation; very abrupt, wavy lower boundary; fill
Ie	70–92	7.5 YR 6/4, light brown; fine sand; weak, fine, single-grain structure; loose, dry consistence; non-plastic; no cementation; base of the excavation; fill for sewer line

Section 5 Archaeological Monitoring Provisions

This monitoring program is warranted by the mitigation recommendations in an SHPD §6E-8 Historic Preservation Review dated 30 May 2014 (LOG NO.: 2014.02044, DOC NO.: 1405GC12; included in this AMP in Appendix A). The recommendations for on-call monitoring of the parking area are consistent with the SHPD §6E-8 Historic Preservation Review dated 6 August 2014 accepting the archaeological assessment (Kamai et al. 2014) for that area (LOG NO.: 2014.02523, DOC NO.: 1408MN01; included in this AMP in Appendix A).

Under Hawai‘i State historic preservation legislation, “Archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities, which may adversely affect historic properties” (HAR §13-13-279-3).

Hawai‘i State historic preservation legislation governing archaeological monitoring programs requires that each monitoring plan discuss eight specific items (HAR §13-13-279-4). The monitoring provisions below address these eight requirements in terms of archaeological monitoring for the excavations within the current project area.

1) Anticipated Historic Properties:

   Both pre-Contact and post-Contact traditional Hawaiian historic properties and/or human skeletal remains may be encountered within the central and southwestern portions of the KHS campus.

2) Locations of Historic Properties:

   Archival research has indicated the relative proximity of Kuhiau Heiau, the Paulo Kanoa Home/former Court House, and the Judge Hardy home increases the prospect of significant archaeological finds in the central and southeastern portions of the KHS campus.

3) Fieldwork:

   On-site archaeological monitoring is recommended for excavations for the portables relocation and the gymnatorium projects. Work within the northeastern parking area will be addressed with on-call archaeological monitoring based on the lack of finds during the intensive subsurface testing in that area (Kamai et al. 2014). Any departure from this will occur only following consultation with and written concurrence from the SHPD.

   The monitoring fieldwork will likely encompass the documentation of subsurface archaeological deposits (e.g., trash pits, structural remnants) and will employ current standard archaeological recording techniques. This will include drawing and recording the stratigraphy of excavation profiles where cultural features or artifacts are exposed as well as representative profiles. These exposures will be photographed, located on project area maps, and sampled. Photographs and representative profiles of excavations will be taken even if no historically significant sites are documented. As appropriate, sampling will include the collection of representative artifacts, bulk sediment samples, and/or the on-site screening of measured volumes of feature fill to determine feature contents.

In the event of significant finds, the SHPD will be notified. If human remains are identified, construction activity in the vicinity will be stopped and no exploratory work of any kind will be conducted unless specifically requested by the SHPD. All human skeletal remains encountered during excavation will be handled in compliance with HAR §13-13-300 and HRS §6E-43.

4) Archaeologist’s Role:

The on-site archaeologist will have the authority to stop work immediately in the area of any findings so that documentation can proceed and appropriate treatment can be determined. In addition, the archaeologist will have the authority to slow and/or suspend construction activities in order to ensure the necessary archaeological sampling and recording can take place.

5) Coordination Meeting:

Before work commences on the project, an archaeologist shall hold a coordination meeting to orient the construction crew to the requirements of the archaeological monitoring program. At this meeting the monitor will discuss the procedures for both on-site and on-call monitoring. The archaeologist will also emphasize his or her authority to temporarily halt construction and state that all finds (including objects such as bottles) are the property of the landowner and may not be removed from the construction site. At this time it will be made clear that the archaeologist must be on-site during excavations for the portables relocation and the gymnatorium.

6) Laboratory Work:

Laboratory work will be conducted in accordance with HAR §13-13-279-5(6). Laboratory analysis of non-burial related finds will be tabulated and standard artifact and midden recording will be conducted. Artifacts will be documented as to provenience, measurements, weight, type of material, and presumed function. Photographs of representative artifacts will be taken for inclusion in the archaeological monitoring report. Bone and shell midden materials will be sorted down to species, when possible, and then tabulated by provenience.

As appropriate, collected charcoal material obtained within intact cultural deposits will be analyzed for species identification. Charcoal samples ideal for dating analyses will be sent to Beta Analytic, Inc. for radiocarbon dating. If appropriate, artifacts may be sent to the University of Hawai‘i-Hilo Geoarchaeology Lab for Energy-Dispersive X-ray Fluorescence (EDXRF) analysis in order to identify and possibly geographically locate the source material. All analyzed samples, provenience information, and results will be presented in table form within the archaeological monitoring report.

7) Report Preparation:

The report will contain sections on monitoring methods, archaeological results, stratigraphy, and results of laboratory analyses, and it will present a synthesis of these results. The report will address the requirements of a monitoring report (pursuant to HAR §13-13-279-5). Photographs of excavations will be included in the monitoring report even if no historically significant sites are documented. Should burial treatment be completed as part of the monitoring effort, a summary of this treatment will be included in the monitoring report.

Should burials and/or human remains be identified, CSH will provide all appropriate additional written documentation (e.g., letters, memos, reports) that may be requested by the SHPD.

8) Archiving Materials:

All burial materials will be addressed in accordance with SHPD directives. Materials not associated with burials will be temporarily stored at CSH’s Līhu‘e office until an appropriate curation facility is selected, in consultation with the landowner and the SHPD. All data generated will be stored at the CSH offices.

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Section 7 SHPD Correspondence

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DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

May 30, 2014

Mr. Stanford Iwamoto, Acting Chief
Department of Public Works
County of Kaua‘i, Engineering Division
4444 Rice Street, Suite 175
Lihue, Hawaii 96766-1340

LOG NO: 2014.02044
DOC NO: 1405GC12
Archaeology

Dear Mr. Iwamoto,

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Clearinghouse Application No. CL-2014-015
Proposed Construction Grading Plans for Kaua‘i High School
Kaua‘i High School Gymnasium Portable Relocation and Site Improvements
Nāwiliwili Ahupua‘a, Līhu‘e District, Island of Kaua‘i
TMK: (4) 3-2-005:010 and 011, 3-3-003:005 and 007

Thank you for the opportunity to review this clearinghouse application (No. CL-2014-014) for construction grading and site improvements to portions of the Kaua‘i High School campus (see above parcels). We received this submittal on May 5, 2014. The 29.52-acre project area is owned by the State of Hawai‘i, Department of Education (DOE). The proposed improvements will involve (1) relocation of approximately seven portable buildings; (2) demolition of existing landscaping, concrete sidewalks, stairs and concrete landings; (3) construction of a new parking lot; (4) construction of a new catch basin; and (5) installation of new utility lines and connecting to existing lines. It also includes grading (1.44 acres), excavating (1,554 cubic yards), and embankment work (10 cubic yards).

Our records indicate that in 2006, Cultural Surveys Hawaii, Inc. (CSH) conducted an archaeological literature review and field inspection for eight DOE schools on Kauai in advance of proposed wastewater improvements at the schools. Based on their findings, CSH recommended archaeological monitoring at Kaua‘i High School. SHPD concurred with this recommendation and accepted the literature review and field inspection report (July 13, 2006; Log No. 2006.2352, Doc No. 0607NM48). During monitoring human remains were found within imported (fill) sediments during probing to locate existing water and sewer lines. The remains were collected and re-interred elsewhere and a burial treatment plan was prepared (June 8, 2010; Log No. 2010.2085, Doc No. 1006PC004). Subsequently, in October 2013, CSH submitted an archaeological monitoring plan for the proposed installation of a Wireless Network System/Monopole Project at Kaua‘i High School. The plan was reviewed and accepted by SHPD (October 11, 2013; Log No. 2013.5449, Doc No. 1310SL12). CSH recommended archaeological monitoring based on the potential of encountering historic properties, including human burials.

We believe potential exists for additional human skeletal remains to be present within the fill sediments which were described as occurring throughout the Kaua‘i High School project area. Due to the extensive amount of ground disturbing activities associated with the proposed undertaking, **we recommend archaeological monitoring** be conducted by a qualified archaeologist. In addition, we request that the applicant submit an archaeological monitoring plan to our office for review and approval. The plan should include all information as specified in Hawaii Administrative Rule §13-279-4. We will notify your office when the plan has been approved and work may proceed.

Mr. Stanford Iwamoto
May 30, 2014
Page 2

Please contact me at (808) 692-8019 or at Susan.A.Lebo@hawaii.gov if you have any questions or concerns regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Oahu Lead Archaeologist

cc: Lance Delos Reyes (COK-DPW) ldelosreyes@kauai.gov
Laura Mau (Wilson Okamoto) lmau@wilsonokamoto.com
Paul Togioka (COK-DPW) ptogioka@kauai.gov
MaryJane Naone (SHPD) maryjane.naone@hawaii.gov

NEIL ABERCROMBIE
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Department of Land and Natural Resources
State of Hawaii

STATE OF HAWAII 1959

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

August 6, 2014

Hallett H. Hammatt, Ph.D., Principal Investigator
Cultural Surveys Hawai'i, Inc.
Via email to: leegreig@csh.com

LOG NO: 2014.02523
DOC NO: 1408MN01
Archaeology

Aloha Dr. Hammatt:

SUBJECT: **Chapter 6E-8 Historic Preservation Review-**
Draft Archaeological Inventory Survey, Kaua'i High School Off-Site Parking Improvements
Nāwiliwili Ahupua'a, Līhu'e District, Island of Kaua'i
TMKs: (4) 3-2-005:011 (por.)

Thank you for submitting the subject draft plan entitled *Archaeological Assessment Report for the Kaua'i High School Improvements Project for Off-Site Parking, Nāwiliwili Ahupua'a, Līhu'e District, Kaua'i TMK: [4] 3-2-005:011 (por)* Nancine "Missy" Kamai, David W. Shideler, M.A., and Hallett H. Hammatt, Ph.D. The submittal was received in the Oahu office June 4, 2014. At the request of Wilson Okamoto Corporation, the archaeological inventory survey was conducted to document historic properties prior to improvements to the off-site parking lot at Kaua'i High School. The parking area totals 0.9 acres. The Department of Education is the landowner, and no federal funding is anticipated for this project. As no subsurface cultural deposits or historic properties were identified through pedestrian survey or subsurface testing, the survey report is classified as an archaeological assessment in accordance with Hawaii Administrative Rule (HAR) §1 3-284-5 (A).

Previous archaeological research documented significant sites within the vicinity of the project area, including the Nāwiliwili Cemetery, SIHP 50-30-11-6009 and site 99, Kuhiau Heiau. The Kuhiau Heiau, which has been documented as destroyed, is represented by a single large boulder. The 46 burials from within the cemetery, formerly located centrally within the Kaua'i High School campus, were exhumed and relocated by Cultural Surveys Hawaii in 1993 and 1994 to the present location on the west end of the property. Human cranium fragments were found in imported fill during monitoring for wastewater improvements on the property in 2009. No site number was assigned. The fragments were collected, the surrounding fill screened, and the remains were reinterred. The reinterment site, new cemetery site, and Heiau site are all outside of the project area.

Cultural Surveys Hawaii (CSH) conducted a 100% pedestrian survey of the project area and excavated 16 backhoe trenches. Based on the negative results of the subsurface testing, CSH has determined that no historic properties will be affected by the proposed improvements and recommends no further archaeological work in the project area.

The State Historic Preservation Division concurs with this recommendation. **The archaeological assessment meets the criteria set forth in HAR § 13-276-5 and is accepted as final.** Please send one hard copy of the document, clearly marked FINAL, along with a text-searchable PDF version on CD to the Kapolei office, attention SHPD library. Please send one hard copy to the Kaua'i office, as well. Please contact Kaua'i archaeologist Mary Jane Naone at (808) 271-4940 or Maryjane.Naone@hawaii.gov if you have any questions regarding this letter.

Mahalo,

Morgan E. Davis
Lead Archaeologist, Maui Section

APPENDIX B:

Soil and Hazardous Material Survey at Portables, Kauaʻi High School, 3577 Lala Road, Līhuʻe, Kauaʻi, Hawaiʻi

HAWAI'I INTERNATIONAL ENVIRONMENTAL SERVICES, INC.

A WOMAN-OWNED SMALL BUSINESS
Earth Scientists and Environmental Engineers
Hawaii Contractors License No. AC-21139
Japan Environmental Registry No. KAAN2003-2-98
70 Kihapai Street, Kailua, Hawaii 96734 Office (808) 263-4787 Fax (808) 263-0860
www.hiesinc.com

13025

January 20, 2014

John Hara Associates Inc. Architects
1018 Kemole Lane
Honolulu, HI 96826

Attention: Ms. Lori Takeyama-Goshi, AIA

Subject: Letter Report – Soil and Hazardous Materials Survey at Portables, Kauai High School, 3577 Lala Road, Lihue, Kauai, Hawaii.

Project: Kauai High School Gymnasium

Reference
- John Hara Associates Inc. Meeting Agenda dated August 30, 2013
- Proposal to Conduct Limited Hazardous Material Survey at Portables, Kauai High School, 3577 Lala Road, Lihue, Kauai, Hawaii.
- HDOH 2011a, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2011): Hawai'i Department of Health, Hazard Evaluation and Emergency Response

Ms. Takeyama-Goshi,

This letter report documents activities related to the soil and hazardous materials survey at the portables located in two areas (Area A and Area B; Figure 1) at Kauai High School, 3577 Lala Road, Lihue, Kauai, Hawaii, hereinafter referred to collectively as the "Site". The soil sampling was conducted by Hawaii International Environmental Services, Inc. [HIES] on December 23, 2013. Conclusions and recommendations based on laboratory analytical results are included in this report.

The purpose of this project was to collect and analyze soil samples and to determine whether soils around the portables are impacted with organochlorine pesticides [OCP]. Asbestos and lead surveys within the Area A and Area B portables were conducted by HIES simultaneously, and the results are also presented in this report. These surveys were needed prior to demolition of the portables currently located in Area A (P8, P9, P10, and P11) and subsequent relocation of the portables located in Area B (P5, P20, P21, P22, P23, and P24) to Area A.

A sample location map is included in Figure 1. Photographic Documentation is included in Appendix A. The laboratory analytical report and Chain of Custody [CoC] are included in Appendix B.

1.0 BACKGROUND AND SITE HISOTRY

On September 14, 1914, Kauai High School opened its doors in the renovated courthouse as the fifth high school of the Territory of Hawai'i and the first high school on the island of Kaua'i. The original school building was torn down in 1931 and the gym was built in 1939. In the 1970s they built the cafeteria, library, administration building, K-building and the swimming pool. In 2003, the campus was given a face lift. (http://www.kauaihigh.org/, http://en.wikipedia.org/wiki/Kauai_High_School)

More than a dozen portables are spread throughout the campus (Figure 1). Area A is a long row of portables which consists of four externally connected portables located at the rear of the campus across the Westside Courtyard. These portables are scheduled for demolition in 2014. Area B consists of six individual portables located between the pool and YMCA trailer and the A-Building. Area B is the proposed location of a new gymnasium, so the Area B portables are scheduled to be relocated to Area A after the Area A portables have been removed.

The planned demolition and relocation of portables will require installation of utility lines, landscaping, and irrigation, all of which will disturb the soil surrounding each portable. Due to the age of the buildings, there is concern that chlordane, a pesticide used to treat building foundations for termites, or other termiticides could be present in the soil surrounding the portables.

Geology

The portables in Areas A and B are installed over unpaved ground and surrounded by unpaved grass-covered area with some patches of bare soil. The soil on which Kauai High School campus lies is classified as *Lihue silty clay*. This soil type is part of the *Lihue series* and is characteristically comprised of a dusky-red silt clay layer about 12 inches thick with an underlying subsoil layer greater than 48 inches thick of dark-red to reddish-brown, compact silty clay with a subangular block structure. The substratum is soft, weathered rock. The surface layer is strongly acidic, and the subsoil is slightly acidic to neutral. This soil is moderately permeable and runoff is slow. The erosion hazard is considered to be no more than slight. This soil type is prime farmland when irrigated (United States Department of Agriculture Soil Conservation Service, 1972, “Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii”).

Hydrology

Kauai High School is located in the Hanamaulu aquifer system in the Lihue aquifer sector. The area is classified as a potential drinking water source and an ecologically important water resource. The water resource is considered to be irreplaceable and to have a moderate to high vulnerability to contamination (Mink and Lau, 1992, “Aquifer Identification and Classification for Kauai: Groundwater Protection Strategy for Hawaii”).

2.0 SOIL SAMPLING AND TESTING FOR ORGANOCHLORINE PESTICIDES

2.1 Multi-Incremental sampling

On December 23, 2013, HIES collected soil samples to evaluate potential hazards associated with organochlorine pesticides [OCP] contamination. The multi-increment samples were collected outside the roof drip zone of each portable at a depth of 6 inches below the ground surface using an ESS Lock N' Load™ disposable soil core sampler set to collect 5 grams of soil per increment. To prevent cross-contamination, a new disposable soil core sampler was used at each sample area. The Area A sample comprised of 36 individual increments collected at approximately equal intervals around the four-portable-long row. All 36 increments were combined in one ziplock bag and labeled "KHS-Demo-M01". The Area B sample comprised of 6 individual increment samples collected at approximately equal intervals around each of the 6 portables located at Area B for a total of 36 individual increments. All 36 increments were combined in one ziplock bag and labeled "KHS-REL-M01".

The soil samples were stored in a cooler on ice until transported to the laboratory. A Chain of Custody [CoC] form accompanied the samples and included all pertinent information related to sample collection. The samples were analyzed by ESN Pacific, Inc. of Honolulu for OCP using Environmental Protection Agency [EPA] method 8081 mod.

2.2 Soil Sample Analytical Results

Table 2.1 summarizes the analytical results. Five OCP constituents (aldrin, technical chlordane, alpha-chlordane, gamma-chlordane, and dieldrin) were detected in the Area B soil (KHS-REL-M01). All five chemicals are pesticides or the by-products of pesticides that were formerly, commonly used to treat building foundations against termites. The use of these five chemicals in the United States has been banned since the 1980s due to the human health hazards they pose. Aldrin, dieldrin, and chlordane are also identified as persistent, bioaccumulative, and toxic (PBT) pollutants targeted by the EPA. Hawaii Department of Health [DOH] has not listed Environmental Action Levels [EALs] for alpha- or gamma-chlordane, but EALs are listed for aldrin, dieldrin, and technical chlordane. The concentrations detected of these three OCPs were below applicable DOH Tier 1 EALs for unrestricted land use. The presence of multiple similar compounds warrants the consideration of cumulative effects; however, all five OCPs were detected at levels well below the EALs for any of the OCPs analyzed, so cumulative effects are unlikely to be a hazardous to human health.

One OCP (p,p'-DDD) was detected in the Area A soil (KHS-Demo-M01). DDD is a former pesticide and a metabolite of the more well-known pesticide DDT. The use of either pesticide is banned in the United States. DDD is a probable human carcinogen, and it is considered a PBT pollutant targeted by the EPA. Although, p,p'-DDD was detected in Area A soil, concentrations were below DOH Tier 1 EALs for unrestricted land use.

Table 2.2 summarizes the analytical results for soil lead contamination. Lead was detected at low levels in both the Area A (KHS-Demo-M01) and Area B (KHS-REL-M01) samples. The concentrations of lead in these samples were well below the DOH Tier 1 EAL for lead.

Table 2.1
Soil Sample Analytical Results for OCP
(December 23, 2013)
Soil Survey – Kauai High School Portables

Constituent	Units	Sample ID			EAL
		KHS-REL-M01	KHS-REL-M01 Duplicate	KHS-Demo-M01	
Alpha-BHC	mg/kg	ND	ND	ND	NA
Beta-BHC	mg/kg	ND	ND	ND	NA
Gamma-BHC (Lindane)	mg/kg	ND	ND	ND	0.075
Delta-BHC	mg/kg	ND	ND	ND	NA
Heptachlor	mg/kg	ND	ND	ND	0.11
Aldrin	mg/kg	0.015	0.018	ND	0.92
Heptachlor epoxide	mg/kg	ND	ND	ND	0.05
Gamma-Chlordane	mg/kg	0.011	0.010	ND	NA
Endosulfan = Endosulfan I + Endosulfan II + Endosulfan sulfate	mg/kg	ND	ND	ND	18
Alpha-Chlordane	mg/kg	0.022	0.023	ND	NA
Dieldrin	mg/kg	0.151	0.177	ND	1.5
p,p'-DDE	mg/kg	ND	ND	0.015	1.4
Endrin = Endrin + Endrin aldehyde + Endrin ketone	mg/kg	ND	ND	ND	3.7
p,p'-DDD	mg/kg	ND	ND	ND	2
p,p'-DDT	mg/kg	ND	ND	ND	1.7
Methoxychlor	mg/kg	ND	ND	ND	16
Chlordane (technical)	mg/kg	0.083	0.095	ND	16
Toxaphene	mg/kg	ND	ND	ND	0.44

DOH TIER 1 EAL-Department of Health Environmental Action Level for unrestricted land use. Fall 2011; rev Jan 2012.
(Groundwater is current or potential source of drinking water, Distance to nearest surface water body: >150m)
mg/kg milligrams per kilogram
OCP: organochlorine pesitcides
BHC- benzene hexachloride
DDE- Dichlorodiphenyldichloroethylene
DDD- Dichlorodiphenyldichloroethane
DDT- Dichlorodiphenyltrichloroethane
ND-Not Detected
NA-EAL not listed by DOH

Table 2.2
Soil Sample Analytical Results for Lead
(December 23, 2013)
Soil Survey – Kauai High School Portables

Constituent	Units	Sample ID			EAL
		KHS-REL-M01	KHS-Demo-M01	KHS-Demo-M01 Duplicate	
Lead	mg/kg	35	34	34	200

DOH TIER 1 EAL-Department of Health Environmental Action Level for unrestricted land use. Fall 2011; rev Jan 2012.
(Groundwater is current or potential source of drinking water, Distance to nearest surface water body: >150m)
mg/kg milligrams per kilogram

3.0 HAZARDOUS MATERIALS SURVEY

On December 23 2013, HIES collected bulk material samples for asbestos and lead-base paint from the interior and exterior of Portables P8, P9, P10 and P11 (single portable located southwest of the property, Area A) which is planned for demolition.

Exterior building material samples were collected from individual portables P5, P20, P21, P22, P23, and P24 (located at northeast of the property, Area B) that were planned to be relocated to Area A.

Samples were collected to test for asbestos-containing building materials [ACBM] and lead-based paint [LBP].

3.1 Building Description

Portables P-8 thru P-11 comprised a single story structure. The structure was constructed primarily from wood. A single wood deck and several stairs were attached on the north side of the structure to access the entry doors. The flat roof was constructed using rolled asphalt roofing sheets over a wood substrate.

Portables P5, P20, P21, P22, P23, and P24 were separate individual wood structures and wood decks. Stairs were attached to each unit to access the entry doors.

3.2 Asbestos Sampling

Area A Portables P-8 thru P-11 were planned to be demolished. Two of the four units, P-8 and P-10, could not be accessed during this survey due to locked doors. According the facility personnel, the inaccessible rooms were DOE storage spaces and could not be unlocked during this survey. All accessible suspect building materials from the interior and exterior were sampled

for analysis. Suspect materials included floor tiles and mastic, ceramic tile, ceramic tile grout, ceramic tile mortar, green chalkboard, exterior anti-slip deck coating, and roofing materials.

Area B Portables P5, P20, P21, P22, P23, and P24 were planned to be relocated to Area A. Since no disturbance was anticipated inside the structures, samples were collected only from the exterior of the portables. The only suspect material encountered was the anti-slip deck coating.

A total of 24 asbestos samples representing eight (8) homogeneous areas were collected and submitted for analysis. According to Hawaii Administrative Rules Title 11-501, a minimum of three samples were collected from each homogeneous area.

The samples were submitted to EMC Labs, Inc. of Arizona, a National Voluntary Laboratory Accreditation Program [NVLAP] accredited laboratory, for analysis. The samples were analyzed by polarized light microscopy [PLM] using the method outlined in 40 CFR 763, Appendix E to Subpart E, Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/R-93/116).

3.3 Asbestos Sampling Results

Asbestos was detected in the six floor tile/mastic samples submitted for analysis from accessible Portables P-9 and P-11. Since the floor tiles and associated mastic cannot be separated, both are considered ACBM. The inaccessible portables in Area A are presumed to also contain floor tiles. If tiles are found in these spaces, they are assumed ACBM until further testing can prove otherwise.

Table 3.1 below presents the asbestos survey analytical results. The laboratory report is included in Appendix B.

Table 3.1
Asbestos Analytical Results
(December 23, 2013)
Kauai High School Portables

Description	Material Type	Friable (Yes or No)	Condition	Sample Location	Sample# (HA)	Type/Asbestos (%)	Estimated Amount Sq ft
12x12 floor tile, off white/gray pattern, black mastic	M	No	Good	Unit P-9 and P-11	KHS DEMO-01 KHS DEMO-02 KHS DEMO-03	5 to 10% Chrysotile	750 Sq ft
12x12 floor tile, red/brown mottled pattern, black mastic	M	No	Good	P-11	KHS DEMO-04 KHS DEMO-05 KHS DEMO-06	10% Chrysotile	600 Sq ft
Floor tile ceramic	M	No	Good	P-9	KHS DEMO-07 KHS DEMO-08 KHS DEMO-09	ND	—
Wall tile ceramic	M	No	Good	P-9	KHS DEMO-10 KHS DEMO-11 KHS DEMO-12	ND	—
Chalkboard, green	M	No	Good	P-11	KHS DEMO-13 KHS DEMO-14 KHS DEMO-15	ND	—
Deck coating, textured anti-slip	S	Yes	Fair	Exterior	KHS DEMO-16 KHS DEMO-17 KHS DEMO-18	ND	—
Roof core, built up rolled asphalt	M	No	Good	Exterior	KHS DEMO-19 KHS DEMO-20 KHS DEMO-21	ND	—
Deck coating, textured anti-slip	M	No	Good	Exterior	KHS-REL-22 KHS-REL-23 KHS-REL-24	ND	—
Floor tile ceramic additional layers	M	No	Good	P-9	KHS DEMO-07 KHS DEMO-08 KHS DEMO-09	ND	—

ND: None Detected
HA: Homogeneous Area
Asbestos Type/%: the ranges of percentage are from the results of all layers.
Material Type: Surfacing (S), Thermal System Insulation (TSI), Miscellaneous (M)

3.2 Lead-based Paint Chip Sampling

On December 23 2013, HIES collected paint chip samples from the interior and the exterior of the Portables P-8 thru P-11structure (Area A).

HIES collected paint chip samples only from the exterior of the portables since no disturbance was anticipated inside the structures of Portables P5, P20, P21, P22, P23, and P24 (Area B).

A total of 21 paint chip samples were collected and submitted for lead analysis. All of the samples were submitted to EMC Labs in Phoenix, Arizona, a National Lead Laboratory Accreditation Program [NLLAP]-accredited laboratory. The samples were analyzed by flame atomic absorption spectroscopy [FAAS] using the EPA SW-846 Method 7420.

3.3 Lead-based Paint Chip Sampling Results

EPA and U.S. Department of Housing and Urban Development [HUD] defines LBP as any paint or other surface coating that contains lead equal to or in excess of 1.0 mg/cm^2, 5,000 mg/kg, 5,000 ppm, or 0.5 percent (%) by weight (HUD, 1995). Lead containing paint [LCP] is paint containing lead in any concentration.

LBP was not found in any samples submitted for analysis from Portables P-8 thru P-11. However, LCP was found in five out of eight samples.

LBP or reportable lead content was not found in any of the samples submitted for analysis from Portables P5, P20, P21, P22, P23, and P24.

Table 3.2 below presents the positive Lead survey analytical results. The laboratory report is included in Appendix B.

Table 3.2
Lead Analytical Results
(December 23, 2013)
Kauai High School Portables

Area A - Demolition

Sample #	Room	Component	Substrate	Color Layer1/Layer2	Condition	% Pb by Weight
KHS-DEMO-L01	Interior P-11	Door Frame	Wood	Brown/White	Fairr	BRL
KHS-DEMO-L02	Interior P-11	Wall	Wood	Cream/Cream	Good	**0.039**
KHS-DEMO-L03	Exterior	Wall	Wood	Cream/Cream	Good	**0.320**
KHS-DEMO-L04	Exterior	Window Sill	Wood	Brown/Brown	Good	**0.055**
KHS-DEMO-L05	Exterior	Handrail	Wood	Brown/Gray Green	Good	BRL
KHS-DEMO-L06	Exterior	Jalousie panels	Wood	Tan/Tan	Good	**0.057**
KHS-DEMO-L07	Exterior	Stair Riser	Wood	Medium Brown	Fair	BRL
KHS-DEMO-L08	Exterior	Soffit	Wood	Cream	Fair	**0.342**

Area B -Relocation

Sample #	Room	Component	Substrate	Color Layer1/Layer2	Condition	% Pb by Weight
KHS-REL-L09	Exterior P-5	Wall	Wood	Cream	Good	BRL
KHS-REL-L10	Exterior P-5	Handrail	Wood	Brown/Tan	Good	BRL
KHS-REL-L11	Exterior P-5	Support Flashing	Metal	Brown/Tan	Good	BRL
KHS-REL-L12	Exterior P-20	Wall	Wood	Cream	Good	BRL
KHS-REL-L13	Exterior P-20	Handrail	Wood	Brown	Fair	BRL
KHS-REL-L14	Exterior P-20	Wall	Wood	Cream	Good	BRL
KHS-REL-L15	Exterior P-21	Door	Wood	Brown	Fair	BRL
KHS-REL-L16	Exterior P-21	Wall	Wood	Cream	Good	BRL
KHS-REL-L17	Exterior P-22	Handrail	Wood	Brown	Fair	BRL
KHS-REL-L18	Exterior P-23	Wall	Wood	Cream	Good	BRL
KHS-REL-L19	Exterior P-23	Lattice	Wood	Brown	Poor	BRL
KHS-REL-L20	Exterior P-24	Wall	Wood	Cream	Good	BRL
KHS-REL-L21	Exterior P-21	Deck	Wood	Brown	Poor	BRL

Pb: Lead
BRL: Below Reportable Limit or <0.010 % lead by weight
Bold: lead-containing paint (LCP)

4.0 CONCLUSIONS AND RECOMMENDATIONS

Soil

Lead was detected in Area A and Area B soil at low levels, well below the DOH Tier 1 EALs. Six OCPs were detected in the soil surrounding the portables in Areas A and B; however, all detected concentrations were below applicable DOH Tier 1 EALs for unrestricted land use. The potential of a cumulative effect of the five OCPs detected at Area B on human health is a slight concern. As a result, the following actions are recommended to limit or avoid exposure to the potentially harmful compounds for construction crews conducting current and/or future activities at the Site:

- Wear gloves and protective clothing (long-sleeve shirt and pants) to reduce exposure.
- Wear a protective paper mask (N-95 type with elastic straps) if airborne dust is present.
- Change clothes and shower after working in OC termiticide treated soils to prevent spreading dirt into vehicles and buildings
- Following construction activities, plant grasses/un-edible shrubs to minimize future soil contact.
- Following any digging activities, cover soils with a six inch layer of clean soil or gravel to provide a barrier to direct contact.
- Soil should be either re-used onsite or disposed of at a regulated landfill.
- If any soil under the buildings are removed or permanently exposed, then it should be tested for the sample chemicals (and an Environmental Hazard Management Plan should be prepared)

Asbestos

Asbestos was detected in the six floor tile/mastic samples from Portables P-9 and P-11 (Area A Demolition). The inaccessible portables P-8 and P-10 in Area A are presumed to also contain floor tiles. If tiles are found in these spaces, they are assumed ACBM until further testing can prove otherwise.

An Asbestos Hazard Abatement Plan should be prepared and implemented in removing and disposing of the ACBM floor tiles and mastic. The ACBM should be removed by a State of Hawaii licensed asbestos abatement contractor under the supervision of State certified Project Monitor.

Lead

LBP was not found in any samples from Area A or B. However, LCP was identified on components in Area A including: cream colored exterior & interior wall ceramic wall tiles, brown colored exterior window sill, tan colored exterior jalousie panels and cream colored soffit. OSHA rules require workers be protected from exposure to lead particles. Appropriate worker training, engineering controls and use of personal protective equipment is required when the LCP is disturbed in such a way as to make the paint become airborne and respirable (i.e. through welding, sanding, grinding, or cutting).

HIES is pleased to have this opportunity to work with John Hara Associates Inc. Please contact us at 263-4787 if there are any questions regarding this report.

Sincerely yours,

Prepared by

Amanda McCutcheon
Environmental Scientist

Edward Yoshinaga
Asbestos Inspector/Project Monitor
Hawaii Asbestos Number: HIASB- 2791
Expiration Date: 07/14/2014

Approved by

Mayumi Randall
Project Manager
Hawaii Asbestos Number: HIASB-0873
Expiration Date: 07/16/2014
Hawaii Lead Number: PB-0034
Expiration Date: 03/17/2015
Hawai'i International Environmental Services, Inc.

Attachements:

- Figure 1: Sample Location Map
- Appendix A: Photographic Documentation
- Appendix B: Laboratory Analytical Reports

Figure 1
Sample Location Map

KAUAI HS HAZMAT SURVEY

Sample Location Map (DEC 23, 2013)

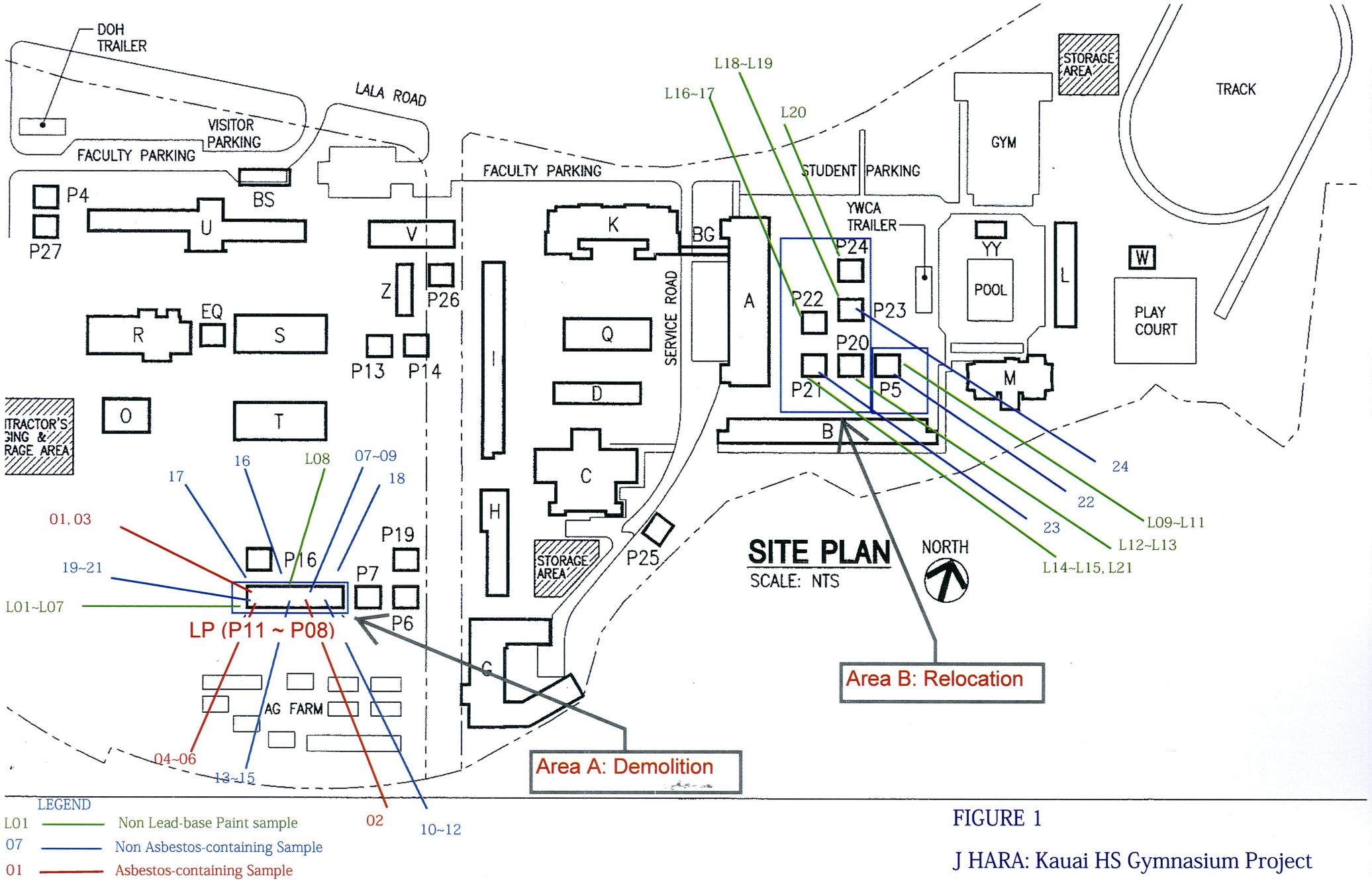

FIGURE 1

J HARA: Kauai HS Gymnasium Project

HIES: 13025

Appendix A
Photographic Documentation

Photo 1: View of demolition portable P-11 (right two doors in the photo).

Photo 2: Sample ID KHS-DEMO-01 off-white floor tile and black mastic collected from inside Unit P-11. ACM.

Photo 3: Sample ID KHS-DEMO-04 floor tile and black mastic collected from inside Unit P-11. ACM.

Photo 4: Sample ID KHS-DEMO-L08 lead containing paint collected from the exterior soffit from the demolition portables.

Appendix B
Laboratory Analytical Reports

Environmental Services Network

January 10, 2014

Mayumi Randall
HIES
70 Kihapai St.
Kailua, HI 96734

SUBJECT: DATA REPORT – 13025 – Kauai HS

ESN Project # D1312240542

Mrs. Randall:

Please find enclosed a data report for the samples analyzed from the above referenced project for HIES. The samples were received intact. Applicable detection limits, QA/QC data, and any issues encountered during analysis are included in the report.

The following tests were conducted:

- Multi-increment sample processing by Hawaii DOH Method.
- Analyses for organochlorine pesticides by EPA 8081 mod.
- Analyses for total Pb by EPA 6020.

ESN appreciates the opportunity to have provided analytical services to HIES on this project. If you have any further questions relating to the data or report, please do not hesitate to contact us.

Sincerely,

Karen Carvallo

Karen Carvallo
Operations Manager

ESN Pacific
2020-B Kahai Street
Honolulu, HI 96819

Ph: (808) 847-0067
esn@esnpacific.com

ESN PACIFIC'S CHAIN-OF-CUSTODY RECORD

CLIENT: HIES, Inc.

ADDRESS: 70 Kihapai Street, Kailua HI 96734

PHONE: 808-263-4787 FAX: 808-263-0860

EMAIL: mayumi@hiesinc.com

CLIENT PROJECT #: 13025 Project Manager: mr

TAT (circle one): 24-hr. 48-hr. 5-day or Other: 1 wk

DATE: 24-Dec-13

ESN PROJECT #: D131224054 2

LOCATION/PROJECT NAME: Kauai HS

COLLECTOR EY Ed Yoshinaga 23-Dec-13

	Sample ID#	Depth	Time	Sample Type	Container Type	8260 HVOC ext 5035? Y N	8260 VOC ext 5035? Y N	8260 BTEX ext 5035? Y N	8260 MtBE ext 5035? Y N	8015 Fuel Scan only	8015 TPH-Gas ext 5035?	8015 TPH-Diesel	8015 TPH-Oil	8081 Chlor. Pesticides	8082 PCB	8270 PAH DOH-4	8270 PAH EPA-16	8270 SVOC	1010 FlashPoint (Ignitibility)	RCRA 8 Metals	Total Metals Pb	TCLP _ Chlordane				MI Sample Prep	Comments	# of Containers
1	KHS-REL-M01			Soil	Plastic bag									X							(*)						MIS	1
2	KHS-Demo-M01			Soil	Plastic bag									X							(*)						MIS	1
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												
13																												
14																												
15																												
16																												
17																												
18																												
19																												
20																												

RELINQUISHED BY:(Signature) DATE/TIME 12/24/13

RECIEVED BY (Signature) DATE/TIME 1020 12/24/13

RELINQUISHED BY:(Signature) DATE/TIME

RECIEVED BY (Signature) DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS: ____ ESN @ $5.00/sample or ____ Return to Client

SAMPLE RECEIPT:

TOTAL # OF CONTAINERS 2

COC SEALS Y / N / NA

SEALS INTACT Y / N / NA

RECEIVED TEMP:

LABORATORY NOTES:

(*) added 1/3 by email

2020-B Kahai Street
847-0067

Environmental Services Network

NON-VOLATILE
MULTI-INCREMENT PREPARATION

DATE: 12/27/2013

PREPARED BY: N. Kippen

ESN PROJECT: D1312240542

HIES personnel collected multi-increment samples in the field for analysis. The samples were delivered to ESN's lab for preparation and analyses, according to DOH's Multi-Increment Sampling Plan (HEER TGM, Section 4.2).

(Dry weights)

Sample ID#	Sample Weight (g)
KHS-REL-M01	278.7
KHS-Demo-M01	221.6

SAMPLE PREP PROCESS SUMMARY:

- Each sample was emptied from their containers on to its own clean, flat baking pan. The sample was spread out evenly across the pan no more than 1" high in thickness.
- Sample trays were placed on separate oven racks and air-dried until no significant moisture remained as determined by appearance.
- Sample trays were removed and weighed to determine sample's total dry weight (see above table).
- Sieved entire dried sample through a #10 mesh sieve rendering particles less than two-millimeters in size. Clumps of dirt were crushed until able to pass through the sieve, rocks and other debris were set aside.
- Sieved samples were spread out evenly on flat baking pans.
- A small flat spatula was used to randomly scoop up 30 to 50 small increments to fill sample containers. Care was taken during this step to ensure that samples contained a good distribution of particle sizes. If duplicate or triplicate analysis is requested, additional samples are collected at this time. Remaining sample was returned to resealable (i.e. Zip-Loc) bags.
- Extractions of minimum twenty-grams were prepared for all analysis.

Environmental Services Network

ESN Pacific Inc.

HIES - Hawaii International Environmental Services, Inc. PROJECT #13025
Kauai HS

ESN Project #D1312240542

ORGANOCHLORINE PESTICIDES ANALYSES OF SOILS BY EPA 8081A MODIFIED

SAMPLE NUMBER	Method Blank	KHS-REL-M01	KHS-REL-M01 Dup	KHS-Demo-M01	PQL	MDL
DATE SAMPLED	-	12/23/2013	12/23/2013	12/23/2013		
DATE EXTRACTED	12/27/2013	12/27/2013	12/27/2013	12/27/2013		
DATE ANALYZED	12/27/2013	12/27/2013	12/27/2013	12/27/2013		
Alpha-BHC	nd	nd	nd	nd	0.005	0.002
Beta-BHC	nd	nd	nd	nd	0.005	0.003
Gamma-BHC (Lindane)	nd	nd	nd	nd	0.005	0.002
Delta-BHC	nd	nd	nd	nd	0.005	0.002
Heptachlor	nd	nd	nd	nd	0.005	0.002
Aldrin	nd	0.015	0.018	nd	0.005	0.002
Heptachlor epoxide	nd	nd	nd	nd	0.005	0.002
Gamma-Chlordane	nd	0.011	0.010	nd	0.005	0.002
Endosulfan I	nd	nd	nd	nd	0.005	0.002
Alpha-Chlordane	nd	0.022	0.023	nd	0.005	0.002
Dieldrin	nd	0.151	0.177	nd	0.010	0.003
p,p'-DDE	nd	nd	nd	0.015	0.010	0.003
Endrin	nd	nd	nd	nd	0.010	0.003
Endosulfan II	nd	nd	nd	nd	0.010	0.005
p,p'-DDD	nd	nd	nd	nd	0.010	0.003
Endrin aldehyde	nd	nd	nd	nd	0.010	0.006
Endosulfan sulfate	nd	nd	nd	nd	0.010	0.005
p,p'-DDT	nd	nd	nd	nd	0.010	0.005
Endrin ketone	nd	nd	nd	nd	0.010	0.005
Methoxychlor	nd	nd	nd	nd	0.010	0.009
Chlordane (technical)	nd	0.083	0.095	nd	0.050	0.020
Toxaphene	nd	nd	nd	nd	0.050	0.010
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
FLAGS						
SURROGATE RECOVERY (%)	103%	101%	66%	104%		

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (TCMX): 65%- 135%

QA/QC DATA - LABORATORY CONTROL SPIKE ANALYSES

	Laboratory Control Spike		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Beta-BHC	0.050	0.045	89.6%
p,p'-DDE	0.100	0.091	90.9%
Endrin ketone	0.100	0.103	102.6%

QA/QC DATA - MATRIX SPIKE ANALYSES
Sample Name: KHS-REL-M01
*Any hits in sample spiked for MS/MSD are subtracted before reported as measured concentration.

	Matrix Spike			Matrix Spike Duplicate				
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	RPD (%)	FLAGS
Beta-BHC	0.050	0.049	97.6%	0.050	0.050	100.0%	2.4%	
p,p'-DDE	0.100	0.094	93.5%	0.100	0.089	89.4%	4.5%	
Endrin ketone	0.100	0.101	100.8%	0.100	0.100	100.2%	0.6%	

% Recovery LIMITS: 80% TO 120%
RPD LIMIT: 20%

ANALYSES PERFORMED AND REVIEWED BY : K. Carvallo

ESN NORTHWEST CHEMISTRY LABORATORY

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

HIES, Inc.
KAUAI HS PROJECT
Project # 13025
ESN Project #D1312240542
Hawaii

Analysis of Total Lead in Soil by Method 6020A/3050B

Sample Number	Date Prepared	Date Analyzed	Lead (Pb) (mg/kg)
Method Blank	1/8/2014	1/10/2014	nd
KHS-REL-M01	1/8/2014	1/10/2014	**35**
KHS-Demo-M01	1/8/2014	1/10/2014	**34**
KHS-Demo-M01 Duplicate	1/8/2014	1/10/2014	**34**
Reporting Limit			5.0

"nd" Indicates not detected at listed detection limits.

QA/QC Data - Analysis of Total Metals in Soil by Method 6020A/3050B

Sample Number: QC Batch	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Lead (Pb)	94.3	91.5	97.0	93.5	88.5	94.7	2.48

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead (Pb)	100	98.9	98.9

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 35%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0135586

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0135586-001 KHS-DEMO-01	P-11 CLASSRM	LAYER 1 12"x12" Floor Tile, White/ Off White	Yes	Chrysotile	5%		
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	95%
		LAYER 2 Mastic, Black	Yes	Chrysotile	8%	Cellulose Fiber	2%
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	90%
0135586-002 KHS-DEMO-02	P-9 IT/STORAGE	LAYER 1 12"x12" Floor Tile, White/ Off White	Yes	Chrysotile	5%		
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	95%
		LAYER 2 Mastic, Black	Yes	Chrysotile	10%		
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	90%
0135586-003 KHS-DEMO-03	P-11 CLASSRM	LAYER 1 12"x12" Floor Tile, White/ Off White	Yes	Chrysotile	5%		
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	95%
		LAYER 2 Mastic, Black	Yes	Chrysotile	5%	Cellulose Fiber	1%
						Carbonates	
						Gypsum	
						Binder/Filler	94%

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	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0135586-004 KHS-DEMO-04	P-11 BEDRM	LAYER 1 12"x12" Floor Tile, Red/ Brown	No	None Detected		Carbonates Quartz Binder/Filler	100%
		LAYER 2 Mastic, Black	Yes	Chrysotile	10%	Carbonates Gypsum Binder/Filler	90%
0135586-005 KHS-DEMO-05	P-11 OFFICE	LAYER 1 12"x12" Floor Tile, Red/ Brown	No	None Detected		Carbonates Quartz Binder/Filler	100%
		LAYER 2 Mastic, Black	Yes	Chrysotile	10%	Carbonates Gypsum Binder/Filler	90%
0135586-006 KHS-DEMO-06	P-11 OFFICE	LAYER 1 12"x12" Floor Tile, Red/ Brown	No	None Detected		Carbonates Quartz Binder/Filler	100%
		LAYER 2 Mastic, Black	Yes	Chrysotile	10%	Carbonates Gypsum Binder/Filler	90%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0135586-007 KHS-DEMO-07	P-9 STORAGE	LAYER 1 Ceramic Floor Tile, Dk. Green	No	None Detected			
						Gypsum Quartz Binder/Filler	100%
		LAYER 2 Grout, Green	No	None Detected		Cellulose Fiber	<1%
						Carbonates Gypsum Quartz Binder/Filler	99%
		LAYER 3 Leveler, White/ Off White	No	None Detected			
						Carbonates Gypsum Quartz Binder/Filler	100%
		LAYER 4 Mastic, White/ Yellow	No	None Detected		Cellulose Fiber	<1%
						Gypsum Carbonates Binder/Filler	99%

Please see EMC Labs Sample Number 0135586-025 for Additional Layers

EMC LABS, INC.

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Laboratory Report
0135586

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0135586-008 KHS-DEMO-08	P-9 STORAGE	LAYER 1 Ceramic Floor Tile, Dk. Green	No	None Detected			
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 2 Grout, Green	No	None Detected		Synthetic Fiber	1%
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	99%
		LAYER 3 Leveler, White/ Off White	No	None Detected			
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 4 Mastic, White/ Yellow	No	None Detected			
						Gypsum	
						Carbonates	
						Binder/Filler	100%

Please see EMC Labs Sample Number 0135586-026 for Additional Layers

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
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Laboratory Report
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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

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Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0135586-009 KHS-DEMO-09	P-9 STORAGE	LAYER 1 Ceramic Floor Tile, Dk. Green	No	None Detected	Gypsum Quartz Binder/Filler	100%
		LAYER 2 Grout, Green	No	None Detected	Cellulose Fiber	<1%
					Carbonates Gypsum Quartz Binder/Filler	99%
		LAYER 3 Leveler, White/ Off White	No	None Detected	Carbonates Gypsum Quartz Binder/Filler	100%
		LAYER 4 Mastic, White/ Yellow	No	None Detected	Cellulose Fiber	1%
					Gypsum Carbonates Binder/Filler	99%
		Please see EMC Labs Sample Number 0135586-027 for Additional Layers				
0135586-010 KHS-DEMO-10	P-9 STORAGE	LAYER 1 Ceramic Wall Tile, White/ Off White	No	None Detected	Gypsum Quartz Binder/Filler	100%
		LAYER 2 Grout, Gray	No	None Detected	Gypsum Quartz Carbonates Binder/Filler	100%
		LAYER 3 Mortar, White/ Off White	No	None Detected	Carbonates Quartz Binder/Filler	100%
		LAYER 4 Texture, White/ Off White	No	None Detected	Carbonates Quartz Binder/Filler	100%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0135586

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0135586-011 KHS-DEMO-11	P-9 STORAGE	LAYER 1 Ceramic Wall Tile, White/ Off White	No	None Detected			
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 2 Grout, Gray	No	None Detected			
						Gypsum	
						Quartz	
						Carbonates	
						Binder/Filler	100%
		LAYER 3 Mortar, White/ Off White	No	None Detected			
						Carbonates	
						Quartz	
						Binder/Filler	100%
0135586-012 KHS-DEMO-12	P-9 STORAGE	LAYER 1 Ceramic Wall Tile, White/ Off White	No	None Detected			
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 2 Grout, Gray	No	None Detected			
						Gypsum	
						Quartz	
						Carbonates	
						Binder/Filler	100%
		LAYER 3 Mortar, Lt. Gray	No	None Detected			
						Carbonates	
						Quartz	
						Binder/Filler	100%
0135586-013 KHS-DEMO-13	P-11 CLASSRM	Particle Board, Brown/ Green	No	None Detected		Cellulose Fiber	90%
						Gypsum	
						Binder/Filler	10%
0135586-014 KHS-DEMO-14	P-11 CLASSRM	Particle Board, Brown/ Green	No	None Detected		Cellulose Fiber	90%
						Gypsum	
						Binder/Filler	10%

EMC LABS, INC.

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Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0135586-015 KHS-DEMO-15	P-11 CLASSRM	Particle Board, Brown/ Green	No	None Detected	Cellulose Fiber	90%
					Gypsum Binder/Filler	10%
0135586-016 KHS-DEMO-16	EXTERIOR	Coating, White/ Brown	No	None Detected		
					Gypsum Carbonates Quartz Binder/Filler	100%
0135586-017 KHS-DEMO-17	EXTERIOR	Coating, White/ Brown	No	None Detected		
					Gypsum Carbonates Quartz Binder/Filler	100%
0135586-018 KHS-DEMO-18	EXTERIOR	Coating, White/ Brown	No	None Detected		
					Gypsum Carbonates Quartz Binder/Filler	100%
0135586-019 KHS-DEMO-19	EXTERIOR	LAYER 1 Roofing, Black	No	None Detected	Fibrous Glass	30%
					Gypsum Quartz Binder/Filler	70%
		LAYER 2 Roofing, Black	No	None Detected	Fibrous Glass	30%
					Gypsum Carbonates Quartz Binder/Filler	70%
		LAYER 3 Roofing, Black	No	None Detected		
					Gypsum Binder/Filler	100%

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Laboratory Report
0135586

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0135586-020 KHS-DEMO-20	EXTERIOR	LAYER 1 Roofing, Black	No	None Detected		Fibrous Glass	30%
						Carbonates Quartz Binder/Filler	70%
		LAYER 2 Roofing, Black	No	None Detected		Fibrous Glass	30%
						Gypsum Carbonates Quartz Binder/Filler	70%
		LAYER 3 Roofing, Black	No	None Detected		Gypsum Binder/Filler	100%
0135586-021 KHS-DEMO-21	EXTERIOR	LAYER 1 Roofing, Black	No	None Detected		Fibrous Glass	30%
						Gypsum Quartz Binder/Filler	70%
		LAYER 2 Roofing, Black	No	None Detected		Fibrous Glass	30%
						Gypsum Carbonates Quartz Binder/Filler	70%
		LAYER 3 Roofing, Black	No	None Detected		Gypsum Binder/Filler	100%
0135586-022 KHS-REL-22	EXTERIOR	Coating, White/ Brown	No	None Detected		Gypsum Quartz Binder/Filler	100%
0135586-023 KHS-REL-23	EXTERIOR	Coating, White/ Brown	No	None Detected		Gypsum Perlite Carbonates Binder/Filler	100%

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Laboratory Report
0135586

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0135586-024 KHS-REL-24	EXTERIOR	Coating, White/ Brown	No	None Detected		
					Gypsum	
					Carbonates	
					Quartz	
					Binder/Filler	100%
0135586-025 KHS-DEMO-07	P-9 STORAGE - ADDITIONAL LAYERS	LAYER 1 Ceramic Floor Tile, Lt. Green	No	None Detected		
					Gypsum	
					Quartz	
					Binder/Filler	100%
		LAYER 2 Grout, Gray	No	None Detected	Cellulose Fiber	<1%
					Carbonates	
					Gypsum	
					Quartz	
					Binder/Filler	99%
		LAYER 3 Thin Set, Lt. Gray	No	None Detected		
					Carbonates	
					Gypsum	
					Quartz	
					Binder/Filler	100%
		LAYER 4 Leveler, White/ Yellow	No	None Detected		
					Carbonates	
					Gypsum	
					Quartz	
					Binder/Filler	100%

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Laboratory Report
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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0135586-026 KHS-DEMO-08	P-9 STORAGE - ADDITIONAL LAYERS	LAYER 1 Ceramic Floor Tile, Lt. Green	No	None Detected		
					Gypsum Quartz Binder/Filler	100%
		LAYER 2 Grout, Gray	No	None Detected		
					Carbonates Gypsum Quartz Binder/Filler	100%
		LAYER 3 Thin Set, Lt. Gray	No	None Detected		
					Carbonates Gypsum Quartz Binder/Filler	100%
		LAYER 4 Leveler, White/ Yellow	No	None Detected		
					Carbonates Quartz Gypsum Binder/Filler	100%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	HAWAII INT'L ENV. SVCS, INC.	Job# / P.O. #:	13025
Address:	70 KIHAPAI ST.	Date Received:	12/27/2013
	KAILUA HI 96734	Date Analyzed:	01/06/2014
Collected:	12/23/2013	Date Reported:	01/06/2014
Project Name:	HARA KAUAI DOE PORTABLES	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	ED YOSHINAGA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0135586-027 KHS-DEMO-09	P-9 STORAGE - ADDITIONAL LAYERS	LAYER 1 Ceramic Floor Tile, Lt. Green	No	None Detected		
					Gypsum	
					Quartz	
					Binder/Filler	100%
		LAYER 2 Grout, Gray	No	None Detected		
					Carbonates	
					Gypsum	
					Quartz	
					Binder/Filler	100%
		LAYER 3 Thin Set, Lt. Gray	No	None Detected		
					Carbonates	
					Gypsum	
					Quartz	
					Binder/Filler	100%
		LAYER 4 Leveler, White/ Yellow	No	None Detected	Cellulose Fiber	<1%
					Carbonates	
					Quartz	
					Gypsum	
					Binder/Filler	99%

Analyst - Kurt Kettler

Signatory - Lab Manager - Ken Scheske

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicated or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. These reports are for the exclusive use of the addressed client and that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of thirty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method for asbestos. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Polarized Light Microscopy may not be consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials.

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135586
3-5day
DEC 27 A.M.

LAB#:
TAT:
Rec'd:
EMC USE ON

Company Name:	Hawaii International Environmental Services, Inc.	
Bill to:	70 Kihapai St.	
	Kailua, HI 96734	
Contact:	Mayumi Randall	
Phone/Fax:	808-263-4787	808-263-0860
Email:	mayumi@hiesinc.com	

Complete Items 1-4:

1 TURNAROUND TIME: [4 hr. rush] [8 hr. rush] [1 day] [2 days] **[3 days] [5 days]** [6-10 days]
2 TYPE OF ANALYSIS: **[Bulk PLM]** [Air PCM] [Lead] [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]
3 DISPOSAL INSTRUCTIONS: **[Dispose of Samples]** [Return Samples to me at my expense]

4 **HIES Project Name: Hara Kauai DOE Portables**

P.O. Number: **HIES Project Number: 13025**

	EMC Sample ID	Sample No.	Unit #.	Room function	Description of Material
1	1	KHS DEMO-01	P-11	Classroom	12"x12" flr tile, off-white/gray patterned
2	2	KHS DEMO-02	P-9	IT/Storage	12"x12" flr tile, off-white/gray patterned
3	3	KHS DEMO-03	P-11	Classroom	12"x12" flr tile, off-white/gray patterned
4	4	KHS DEMO-04	P-11	Bedroom	12"x12" flr tile, red brown mottled
5	5	KHS DEMO-05	P-11	Office	12"x12" flr tile, red brown mottled
6	6	KHS DEMO-06	P-11	Office	12"x12" flr tile, red brown mottled
7	7	KHS DEMO-07	P-9	Storage	floor ceramic tile, grout, mortar
8	8	KHS DEMO-08	P-9	Storage	floor ceramic tile, grout, mortar
9	9	KHS DEMO-09	P-9	Storage	floor ceramic tile, grout, mortar
10	10	KHS DEMO-10	P-9	Storage	wall ceramic tile, grout, mortar
11	11	KHS DEMO-11	P-9	Storage	wall ceramic tile, grout, mortar
12	12	KHS DEMO-12	P-9	Storage	wall ceramic tile, grout, mortar
13	13	KHS DEMO-13	P-11	Classroom	green chalkboard coating, particle board
14	14	KHS DEMO-14	P-11	Classroom	green chalkboard coating, particle board
15	15	KHS DEMO-15	P-11	Classroom	green chalkboard coating, particle board
16	16	KHS DEMO-16	—	Exterior	anti-slip deck coating
17	17	KHS DEMO-17	—	Exterior	anti-slip deck coating
18	18	KHS DEMO-18	—	Exterior	anti-slip deck coating
19	19	KHS DEMO-19	—	Exterior	roof core/ built up rolled asphalt
20	20	KHS DEMO-20	—	Exterior	roof core/ built up rolled asphalt
21	21	KHS DEMO-21	—	Exterior	roof core/ built up rolled asphalt
22	22	KHS REL-22	—	Exterior	anti-slip deck coating
23	23	KHS REL-23	—	Exterior	anti-slip deck coating
24	24	KHS REL-24	—	Exterior	anti-slip deck coating
25	2627	" DEMO 789	P-9	STORAGE	ADDITIONAL LAYERS

Special Instructions: Final report shall include results of all batches and be sent electronically in .pdf format and excel to mayumi@hiesinc.com

Sample Collector (print) Ed Yoshinaga Sampled: 12/23/13
Relinquished by: Ed Yoshinaga Date/Time 12/24/13 1200 Received by: [illegible] Date/Time: 12/27/13 9:25
Relinquished by: [illegible] Date/Time 12/27/13 10:20 Received by: [illegible] Date/Time: 12/27/13 1020
Relinquished by: Date/Time Received by: Date/Time:

Printed on: 12/24/2013

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LEAD (Pb) IN PAINT CHIP SAMPLES

EMC SOP METHOD #L01/1 EPA SW-846 METHOD 7420

EMC LAB #:	L51094	**DATE RECEIVED:**	12/27/13
CLIENT:	Hawaii International Environmental Services, Inc.	**REPORT DATE:**	01/03/14
		DATE OF ANALYSIS:	01/02/14
CLIENT ADDRESS:	70 Kihapai St. Kailua, HI 96734	**P.O. NO.:**	
PROJECT NAME:	Hara Kauai DOE Portables	**PROJECT NO.:**	13025

EMC # L51094-	SAMPLE DATE /13	CLIENT SAMPLE #	DESCRIPTION	REPORTING LIMIT (%Pb by weight)	%Pb BY WEIGHT
1	12/23	KHS DEMO-L01	P-11 / Classroom / Door Frame, Brown/White, Wood	0.010	BRL
2	12/23	KHS DEMO-L02	P-11 / Classroom / Interior Wall, Cream/Cream, Wood	0.010	0.039
3	12/23	KHS DEMO-L03	Exterior / Wall, Cream/Cream, Wood	0.010	0.320
4	12/23	KHS DEMO-L04	Exterior / Window Sill, Brown/Lt. Brown, Wood	0.010	0.055
5	12/23	KHS DEMO-L05	Exterior / Handrail, Brown/Gray Green , Wood	0.010	BRL
6	12/23	KHS DEMO-L06	Exterior / Jalousie Panels, Tan/Lt Tan, Wood	0.010	0.057
7	12/23	KHS DEMO-L07	Exterior / Stair Riser, Med Brown, Wood	0.010	BRL
8	12/23	KHS DEMO-L08	Exterior / Soffit, Cream/Gray Green, Wood	0.010	0.342
9	12/23	KHS REL-L09	P-5 / Exterior / Wall, Cream, Wood	0.010	BRL

^ = Dilution Factor Changed * = Excessive Substrate May Bias Sample Results **BRL** = Below Reportable Limits # = Very Small Amount Of Sample Submitted, May Affect Result

This report applies to the standards or procedures identified and to the samples tested only. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. Unless otherwise noted, all quality control analyses for the samples noted above were within acceptable limits.

Where it is noted that a sample with excessive substrate was submitted for laboratory analysis, such analysis may be biased. The lead content of such sample may, in actuality, be greater than reported. EMC makes no warranty, express or implied, as to the accuracy of the analysis of samples noted to have been submitted with excessive substrate. Resampling is recommended in such situations to verify original laboratory results.

These reports are for the exclusive use of the addressed client and are rendered upon the condition that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. Samples not destroyed in testing are retained a maximum of sixty (60) days.

ANALYST: Jason Thompson

QA COORDINATOR: Kurt Kettler

Rev. 11/30/08

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LEAD (Pb) IN PAINT CHIP SAMPLES

EMC SOP METHOD #L01/1 EPA SW-846 METHOD 7420

EMC LAB #:	L51094	**DATE RECEIVED:**	12/27/13
CLIENT:	Hawaii International Environmental Services, Inc.	**REPORT DATE:**	01/03/14
		DATE OF ANALYSIS:	01/02/14
CLIENT ADDRESS:	70 Kihapai St. Kailua, HI 96734	**P.O. NO.:**	
PROJECT NAME:	Hara Kauai DOE Portables	**PROJECT NO.:**	13025

EMC # L51094-	SAMPLE DATE /13	CLIENT SAMPLE #	DESCRIPTION	REPORTING LIMIT (%Pb by weight)	%Pb BY WEIGHT
10	12/23	KHS REL-L10	P-5 / Exterior / Handrail, Brown/Tan, Metal	0.010	BRL
11	12/23	KHS REL-L11	P-5 / Exterior / Support Flashing, Brown/Tan, Metal	0.010	BRL
12	12/23	KHS REL-L12	P-20 / Exterior / Wall, Cream, Wood	0.010	BRL
13	12/23	KHS REL-L13	P-20 / Exterior / Handrail, Brown, Wood	0.010	BRL
14	12/23	KHS REL-L14	P-20 / Exterior / Wall, Cream, Wood	0.010	BRL
15	12/23	KHS REL-L15	P-21 / Exterior / Door, Brown, Wood	0.022	BRL
16	12/23	KHS REL-L16	P-21 / Exterior / Wall, Cream, Wood	0.010	BRL
17	12/23	KHS REL-L17	P-22 / Exterior / Handrail, Brown, Wood	0.010	BRL
18	12/23	KHS REL-L18	P-23 / Exterior / Wall, Cream, Wood	0.010	BRL

^ = Dilution Factor Changed * = Excessive Substrate May Bias Sample Results **BRL** = Below Reportable Limits # = Very Small Amount Of Sample Submitted, May Affect Result

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ANALYST: Jason Thompson

QA COORDINATOR: Kurt Kettler

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LEAD (Pb) IN PAINT CHIP SAMPLES

EMC SOP METHOD #L01/1 EPA SW-846 METHOD 7420

EMC LAB #:	L51094	**DATE RECEIVED:**	12/27/13
CLIENT:	Hawaii International Environmental Services, Inc.	**REPORT DATE:**	01/03/14
		DATE OF ANALYSIS:	01/02/14
CLIENT ADDRESS:	70 Kihapai St. Kailua, HI 96734	**P.O. NO.:**	
PROJECT NAME:	Hara Kauai DOE Portables	**PROJECT NO.:**	13025

EMC # L51094-	SAMPLE DATE /13	CLIENT SAMPLE #	DESCRIPTION	REPORTING LIMIT (%Pb by weight)	%Pb BY WEIGHT
19	12/23	KHS REL-L19	P-23 / Exterior / Lattice, Brown, Wood	0.010	BRL
20	12/23	KHS REL-L20	P-24 / Exterior / Wall, Cream, Wood	0.010	BRL
21	12/23	KHS REL-L21	P-21 / Exterior / Ant-Slip Coating, Brown, Wood	0.010	BRL

^ = Dilution Factor Changed * = Excessive Substrate May Bias Sample Results **BRL** = Below Reportable Limits # = Very Small Amount Of Sample Submitted, May Affect Result

This report applies to the standards or procedures identified and to the samples tested only. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. Unless otherwise noted, all quality control analyses for the samples noted above were within acceptable limits.

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ANALYST: Jason Thompson

QA COORDINATOR: Kurt Kettler

Rev. 11/30/08

25/094

LAB#:
TAT: 3-5day
Rec'd:
EMC USE ON
12/27/13

CHAIN OF CUSTODY
EMC Laboratories
9830 S. 51ST St., Ste B-109
Phoenix, AZ 85044
(800) 362-3373 Fax (480) 893-1726

Company Name:	Hawaii International Environmental Services, Inc.	
Bill to:	70 Kihapai St.	
	Kailua, HI 96734	
Contact:	Mayumi Randall	
Phone/Fax:	808-263-4787	808-263-0860
Email:	mayumi@hiesinc.com	

Complete Items 1-4:

1 TURNAROUND TIME: [4 hr. rush] [8 hr. rush] [1 day] [2 days] **[3 days]** **[5 days]** [6-10 days]
2 TYPE OF ANALYSIS: [Bulk PLM] [Air PCM] **[Lead]** [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]
3 DISPOSAL INSTRUCTIONS: **[Dispose of Samples]** [Return Samples to me at my expense]

4 **HIES Project Name: Hara Kauai DOE Portables**

P.O. Number: **HIES Project Number: 13025**

	EMC Sample ID	Sample No.	Unit #	Room function	Description of Material, layer/layer,substrate
1		KHS DEMO-L01	P-11	Classroom	door frame, brown/white, wood
2		KHS DEMO-L02	P-11	Classroom	interior wall, cream/cream, wood
3		KHS DEMO-L03	—	Exterior	wall, cream/cream, wood
4		KHS DEMO-L04	—	Exterior	window sill, brown/lt. brown, wood
5		KHS DEMO-L05	—	Exterior	handrail, brown/gray green, wood
6		KHS DEMO-L06	—	Exterior	jalousie panels, tan/lt tan, wood
7		KHS DEMO-L07	—	Exterior	stair riser, med brown, wood
8		KHS DEMO-L08	—	Exterior	soffit, crean/gray green, wood
9		KHS REL-L09	P-5	Exterior	wall, cream, wood
10		KHS REL-L10	P-5	Exterior	handrail, brown/tan, metal
11		KHS REL-L11	P-5	Exterior	support flashing, brown/tan, metal
12		KHS REL-L12	P-20	Exterior	wall, cream, wood
13		KHS REL-L13	P-20	Exterior	handrail, brown, wood
14		KHS REL-L14	P-20	Exterior	wall, cream, wood
15		KHS REL-L15	P-21	Exterior	door, brown, wood
16		KHS REL-L16	P-21	Exterior	wall, cream, wood
17		KHS REL-L17	P-22	Exterior	handrail, brown, wood
18		KHS REL-L18	P-23	Exterior	wall, cream, wood
19		KHS REL-L19	P-23	Exterior	lattice, brown, wood
20		KHS REL-L20	P-24	Exterior	wall, cream, wood
21		KHS REL-L21	P-21	Exterior	ant-slip coating, brown, wood
22					
23					
24					
25					

Special Instructions: Final report shall include results of all batches and be sent electronically in .pdf format and excel to mayumi@hiesinc.com

Sample Collector (print) Ed Yoshinaga 1200 Sampled: 12/23/13
Relinquished by: Ed Yoshinaga Date/Time 12/24/13 1015 Received by: Date/Time: 12/27/13 930
Relinquished by: Date/Time 12/27/13 Received by: Date/Time: 12/27/13 11:15
Relinquished by: Date/Time Received by: Date/Time:

Printed on: 12/24/2013

APPENDIX C:

Traffic Assessment Report

Traffic Assessment Report

Kauai High School Gymnasium

Prepared for:
John Hara Associates, Inc.

Prepared by:
Wilson Okamoto Corporation

June 2018

TRAFFIC ASSESSMENT REPORT

FOR THE

KAUAI HIGH SCHOOL GYMNASIUM

Prepared for:

John Hara Associates, Inc.
1018 Kemole Lane
Honolulu, HI 96826

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #8406-04

June 2018

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the proposed gymnasium at Kauai High School in Nawiliwili on the island of Kauai. The project entails the demolition of the existing gymnasium and the construction of a new facility on the existing Kauai High School campus.

B. Scope of Study

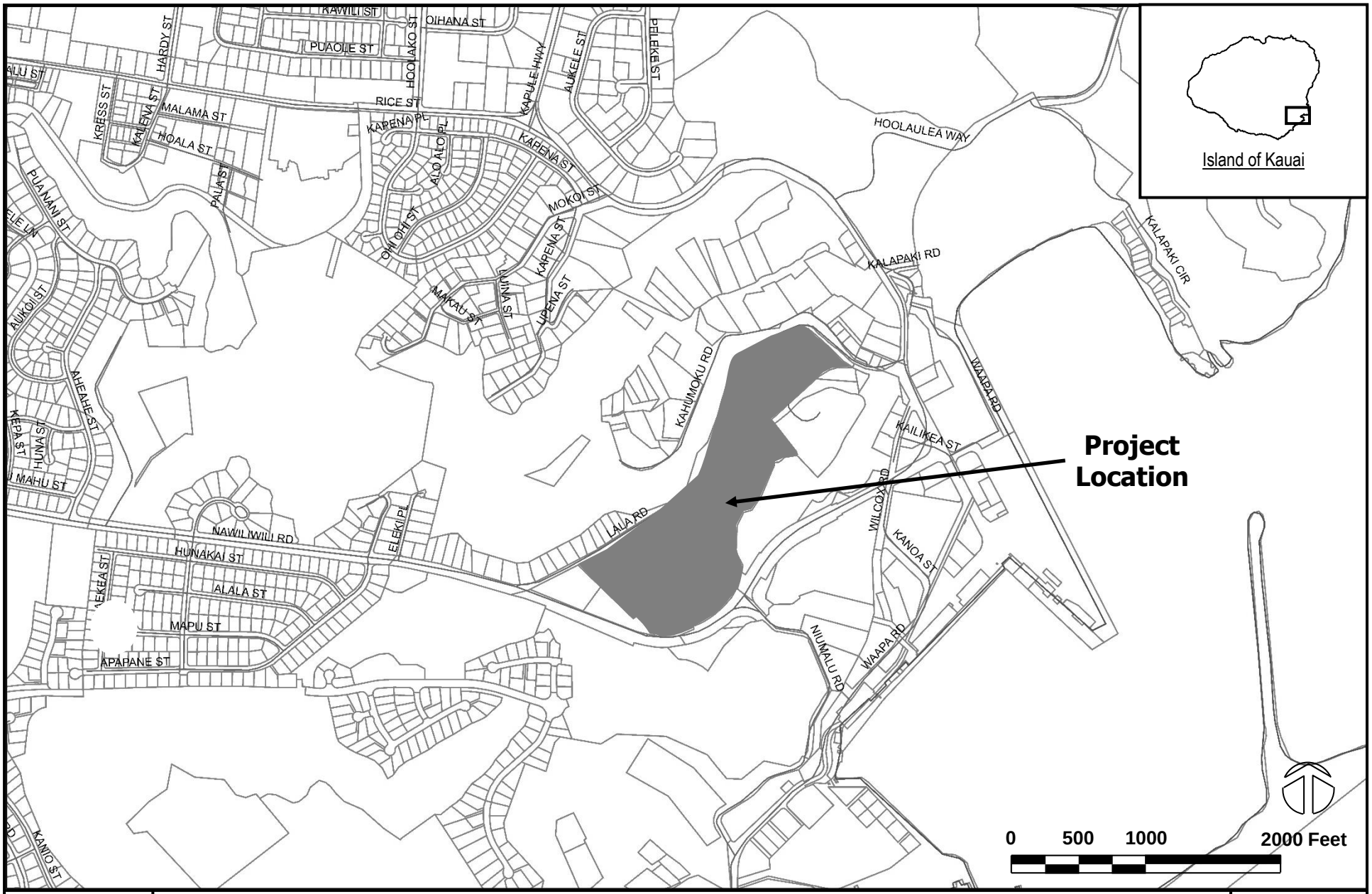
This report presents the findings and conclusions of the traffic study, the scope of which includes:

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

II. PROJECT DESCRIPTION

A. Location

The existing campus for Kauai High School is located adjacent to Lala Road on the island of Kauai. It is bounded by Lala Road to the north, Nawiliwili to the west and south, and resort and commercial uses to the east (see Figure 1). The project site is further identified as Tax Map Key (TMKs): (4) 3-3-003:007 and 015, and 3-2-005:010 and 011. Primary access to the project site will continue to be provided via existing driveways off Lala Road.



KAUAI HIGH SCHOOL GYMNASIUM

LOCATION AND VICINITY MAP

FIGURE 1

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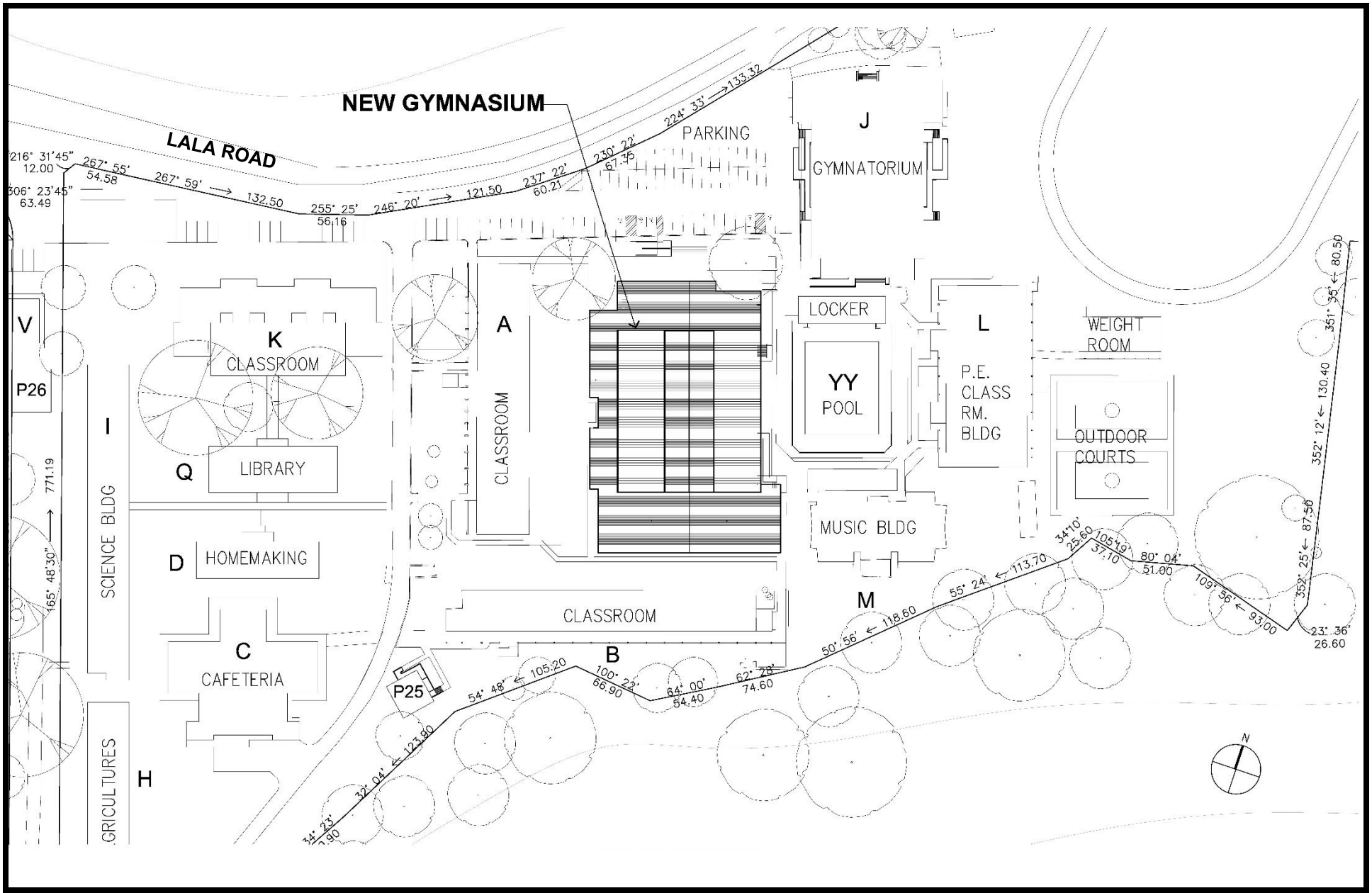
B. Project Characteristics

The proposed project entails the construction of a new multi-function gymnasium that serves as a space for indoor sports as well as an auditorium. The school's existing gymnasium was originally constructed in 1939 and seats only 70% or approximately 700 – 800 of the school's current student enrollment of approximately 1,128 students. Due to its small size and limited seating capacity, the existing gymnasium is unable to comfortably seat all students during school assemblies and constrains the school's ability to host typical high school athletic activities. As such, a new gymnasium with a seating capacity of up to 1,500 persons is being proposed to accommodate the school's current enrollment, as well as to incorporate a wrestling room, locker facilities, equipment storage, and other supporting spaces. The proposed new gymnasium is planned to be located south of the existing gymnasium. Once construction of the new gymnasium is complete, the existing gymnasium is expected to be demolished. The proposed project is anticipated to be completed by the Year 2021.

Primary access to Kauai High School is provided via two one-way driveways off Lala Road on the west end of the existing school campus. These driveways provide access to a student drop-off/pick-up area, as well as access to an internal service roadway. East of these driveways are a series of connections to at-grade parking areas adjacent to Lala Road that are primarily designated for faculty and staff. According to the school's traffic management plan, these areas are managed during the beginning and end of the school day to facilitate the use of the aisles as a bus loading/unloading zone and secondary student drop-off/pick-up area. With the proposed new Kauai High School gymnasium, access to the school is expected to continue being provided via the existing driveways off Lala Road. See Figure 2 for the proposed project site plan.



KAUAI HIGH SCHOOL GYMNASIUM

PROPOSED PROJECT SITE PLAN

FIGURE 2

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III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

In the vicinity of the project site, Nawiliwili Road is a predominantly two-lane, two-way roadway generally oriented in the north-south direction between Kaumualii Highway and Lala Road but transitions to an east-west roadway at Niumalu Road until it reaches its terminus on Waapa Road. Northwest of the project site, Nawiliwili Road intersects Lala Road. At this unsignalized T-intersection, the southbound approach of Nawiliwili Road is comprised of a shared left-turn and through lane, while the northbound approach includes one through lane. It should be noted that there is a sign along the northbound approach prohibiting right-turn movements from this approach. The east leg of the intersection is comprised of Lala Road, a predominantly two-lane, two-way roadway that begins as an east-west roadway at Nawiliwili Road but transitions to a north-south roadway at Kahumoku Road until its terminus on Rice Street. The Lala Road approach of the intersection includes a stop-controlled right-turn lane. It should be noted that there is a sign along this approach prohibiting left-turn movements at the intersection with Nawiliwili Road.

Southeast of the intersection with Lala Road, Nawiliwili Road intersects Wilcox Road. At this unsignalized T-intersection, the eastbound approach of Nawiliwili Road is comprised of one through lane and an exclusive right-turn lane, while the westbound approach has an exclusive left-turn lane and a through lane. Wilcox Road is a predominantly two-lane, two-way roadway generally oriented in the north-south direction and is comprised of two segments. The southern segment of Wilcox Road extends between Kanoa Road and Nawiliwili Road while the northern segment extends between the intersection of Nawiliwili Road and Waapa Road and the driveway that serves the adjacent Banyan Harbor Resort. At the intersection with Nawiliwili Road, the northbound approach of Wilcox Road has a stop-controlled left-turn lane and a stop-controlled right-turn lane.

East of the intersection with Wilcox Road, Nawiliwili Road intersects Waapa Road and Wilcox Road. At this unsignalized intersection, the eastbound approach of Nawiliwili Road is comprised of an exclusive left-turn lane and a shared through and

right-turn lane. Waapa Road is a predominantly two-lane, two-way roadway that begins south of Nawiliwili Road as a north-south roadway, transitions to an east-west roadway at the intersection with Nawiliwili Road, then returns to a north-south roadway at Lala Road where it transitions as Rice Street. The westbound approach of Waapa Road includes an exclusive left-turn lane and a shared through and right-turn lane. The northbound approach of Waapa Road includes one stop-controlled lane that serves all traffic movements. The southbound approach of Wilcox Road includes one stop-controlled lane that serves all traffic movements.

Northeast of the intersection with Nawiliwili Road and Wilcox Road, Waapa Road intersects Lala Road and Rice Street. At this unsignalized intersection, Waapa transitions as a north-south roadway. The northbound approach of Waapa Road is comprised of an exclusive left-turn lane and a shared through and right-turn lane. Rice Street is a predominantly four lane, two-way roadway generally oriented in the north-south direction. The southbound approach of Rice Street includes an exclusive left-turn lane and a shared through and right-turn lane. The eastbound approach of the intersection is comprised of Lala Road which includes a stop-controlled shared left-turn and through lane and a stop-controlled right-turn lane. The east leg of the intersection is comprised of a one-way (southbound) driveway that serves the adjacent Anchor Cove Shopping Center.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted in April 2018 and consisted of manual turning movement count surveys during the morning peak hours between 6:00 AM and 9:00 AM, and the afternoon school peak hours between 1:00 PM and 4:00 PM. It should be noted that a typical school day at Kauai High School begins at 7:40 AM every day and ends at 2:00 PM on Mondays, 2:45 PM on Tuesdays and Thursdays, and 1:30 PM on Wednesdays and Fridays. These counts were taken at the following intersections:

- Nawiliwili Road and Lala Road
- Nawiliwili Road and Wilcox Road
- Nawiliwili Road, Waapa Road, and Wilcox Road
- Waapa Road, Rice Street, and Lala Road

Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2010, and the "Synchro" software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

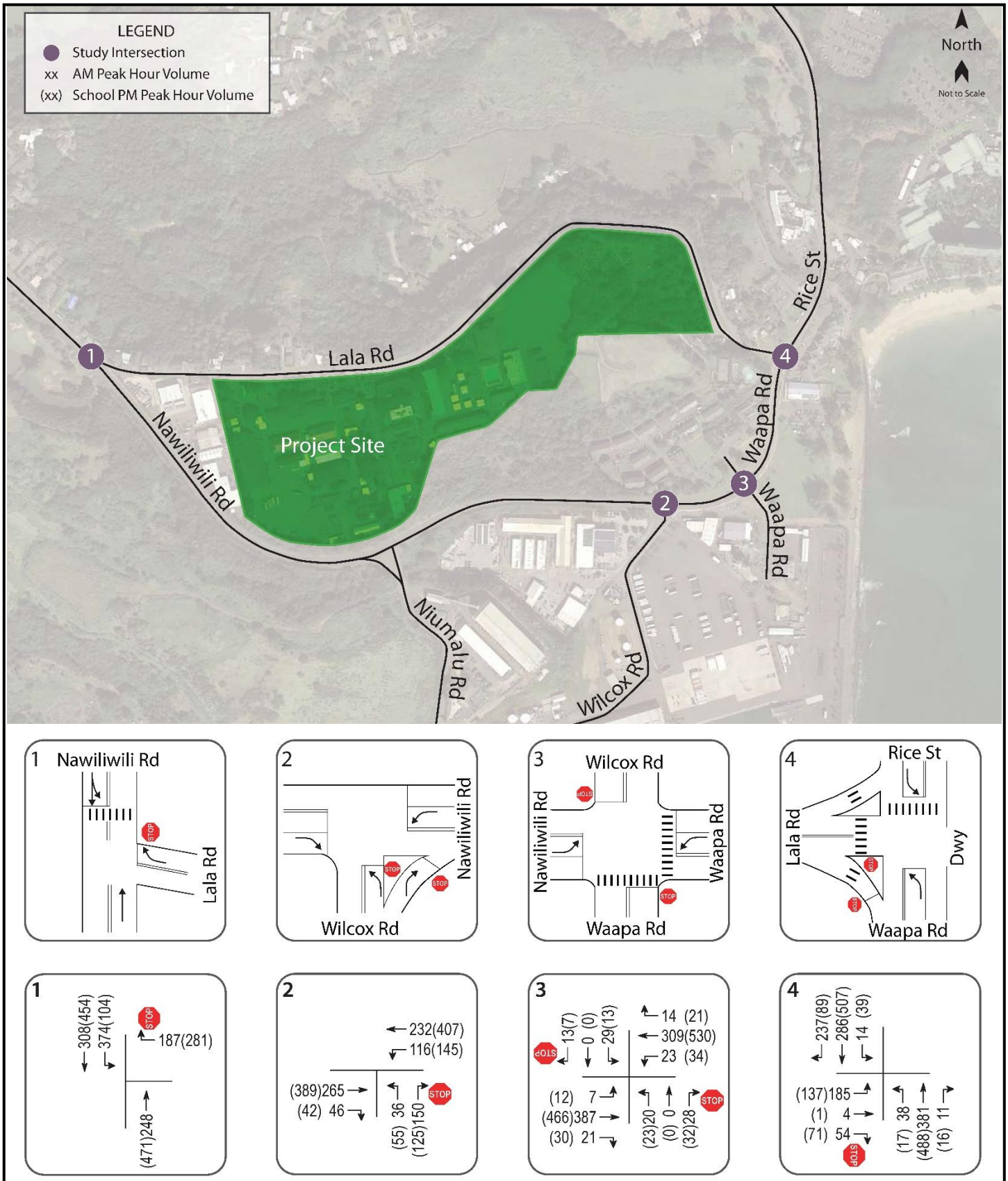
LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

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

2. Existing Peak Hour Traffic

a. General

Figure 3 show the existing lane use and peak hour traffic volumes. The AM peak hours of traffic generally occurs between 7:00 AM and 8:00 AM while the PM school peak hour of traffic generally occurs between 2:00 PM and 3:00 PM. The analysis is based on these



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KAUAI HIGH SCHOOL GYMNASIUM

EXISTING LANE CONFIGURATIONS AND
EXISTING AM AND PM PEAK HOUR OF TRAFFIC

FIGURE
3

school peak hour time periods to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

b. Nawiliwili Road and Lala Road

At the intersection with Lala Road, Nawiliwili Road carries 248 vehicles northbound and 682 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is greater with 471 vehicles traveling northbound and 558 vehicles traveling southbound. The Lala Road approach of the intersection carries 187 vehicles westbound during the AM peak period and 281 vehicles during the PM peak period. The westbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues occasionally formed on the Lala Road approach with the most significant queuing occurring during the PM peak period. Average queue lengths of 2-3 vehicles were observed with a maximum queue length of 7 vehicles. Field observation indicate that queueing along Lala Road seem to be comprised of vehicles accessing the nearby high school as queuing was primarily observed prior to the start and end of the school day.

A crosswalk is provided across Nawiliwili Road on the north side of the intersection; however, there were no pedestrians observed crossing at this location during the AM peak period, while 3 pedestrians were observed crossing Nawiliwili Road during the PM peak period.

c. Nawiliwili Road and Wilcox Road

At the intersection with Wilcox Road, Nawiliwili Road carries 311 vehicles eastbound and 348 vehicles westbound during the AM peak period. During the PM peak period, the traffic volumes are greater with 431 vehicles traveling eastbound and 552 vehicles traveling westbound. The Wilcox Road approach of the intersection carries 186 vehicles during the AM peak period and 180 vehicles

during the PM peak period. The northbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues occasionally formed on the Wilcox Road approach of the intersection with the most significant queueing occurring during the AM peak period. Average queue lengths of 1-2 vehicles were observed with a maximum queue length of 3 vehicles.

Although there are no crosswalks provided across this intersection, 4 pedestrians and 2 pedestrians were observed crossing Wilcox Road and Nawiliwili Road, respectively, during the AM peak period.

d. Nawiliwili Road, Waapa Road, and Wilcox Road

At the intersection with Waapa Road, Nawiliwili Road carries 415 vehicles eastbound and 346 vehicles westbound during the AM peak period. During the PM peak period, the traffic volumes are greater with 508 vehicles traveling eastbound and 585 vehicles traveling westbound. The Waapa Road approach of the intersection carries 48 vehicles northbound and 42 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is lower with 55 vehicles traveling northbound and 20 vehicles traveling southbound. The northbound and southbound approaches operate at LOS "C" during the AM and PM peak periods.

Crosswalks are provided across Nawiliwili Road on the east of the intersection and across Waapa Road on the south side of the intersection. During the AM peak period, 10 pedestrians were observed crossing Waapa Road, while 12 pedestrians were observed crossing Nawiliwili Road. During the PM peak period, 8 pedestrians were observed crossing Waapa Road, while 10 pedestrians were observed crossing Nawiliwili Road.

e. Waapa Road, Rice Street, and Lala Road

The Waapa Road approach of the intersection carries 430 vehicles northbound during the AM peak period and 521 vehicles during the PM peak period, while the Rice Street approach of the intersection carries 537 vehicles southbound during the AM peak period and 635 vehicles during the PM peak period. Both approaches operate at LOS "A" during both peak periods. The Lala Road approach of the intersection carries 243 vehicles and 209 vehicles eastbound during the AM and PM peak periods, respectively. This approach operates at LOS "A" during both peak periods. Traffic queues occasionally formed on the Lala Road approach of the intersection with the most significant queueing occurring during the PM peak period. Average queue lengths of 2-3 vehicles were observed with a maximum queue length of 5 vehicles.

Crosswalks are provided across Rice Street on the north side of the intersection and across Lala Road on the west side of the intersection. During the AM peak period, 19 pedestrians were observed crossing Rice Street, while20 pedestrians were observed crossing Lala Road. During the PM peak period, 11 pedestrians were observed crossing Rice Street, while 24 pedestrians were observed crossing Lala Road.

III. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

The proposed new Kauai High School gymnasium is not expected to generate additional traffic in the vicinity of the existing school. With the proposed project, school enrollment is expected to remain similar to existing conditions as the new Kauai High School gymnasium is intended to address the existing gymnasium's capacity constraints and provide adequate accommodations for the school's current enrollment. As such, site-generated traffic related to Kauai High School was assumed to remain similar to existing conditions.

B. Through Traffic Forecasting Methodology

The travel forecast is based upon historical traffic count data obtained from the State Department of Transportation, Highways Division at survey stations in the vicinity of the project site. The historical data indicates relatively stable/declining traffic volumes along Nawiliwili. As such, an annual traffic growth rate of approximately 0.5% was conservatively assumed along Nawiliwili Road in the project vicinity. Using 2018 as the Base Year, a growth rate factor of 1.02 was applied to the existing through traffic demands along Nawiliwili Road to achieve the projected Year 2021 traffic demands.

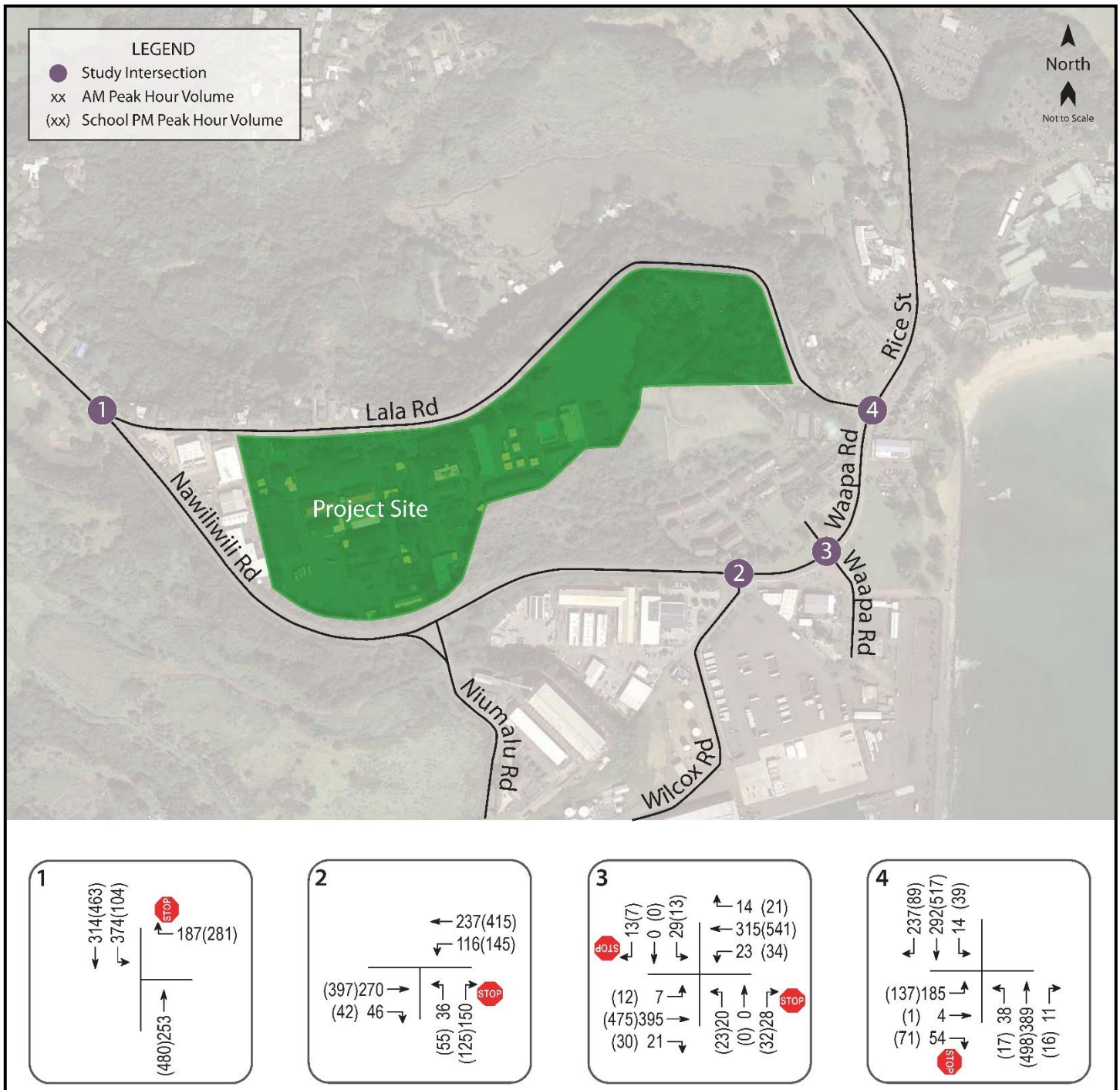
C. Year 2021 Total Traffic Volumes

The Year 2021 AM and PM peak hour traffic conditions with the proposed new Kauai High School gymnasium is shown in Figure 4 and summarized in Table 1. The existing levels of service are included for comparison purposes. LOS calculations are included in Appendix D.

Table 1: Existing and Projected Year 2021 (With Project) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Exist	Year 2021 w/ Proj	Exist	Year 2021 w/ Proj
Nawiliwili Rd/ Lala Rd	Westbound	B	B	C	C
	Southbound (LT*)	A	A	A	A
Nawiliwili Rd/ Wilcox Rd	Westbound (LT*)	A	A	A	A
	Northbound	B	B	C	C
Nawiliwili Rd/ Waapa Rd/ Wilcox Rd	Eastbound (LT*)	A	A	A	A
	Westbound (LT*)	A	A	A	A
	Northbound	C	C	C	C
	Southbound	C	C	C	C
Waapa Rd/ Rice St/ Lala Rd/	Eastbound	A	A	A	A
	Northbound (LT*)	A	A	A	A
	Southbound (LT*)	A	A	A	A

*LT = Left-Turn



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KAUAI HIGH SCHOOL GYMNASIUM

YEAR 2019 AM AND PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 3

Under Year 2021 with project conditions, traffic operations in the vicinity of the proposed Kauai High School gymnasium are generally expected to remain similar to existing conditions. Along Nawiliwili Road, traffic operations at the intersection with Lala Road are expected to continue operating at LOS "B" or better and LOS "C" or better during the AM and PM peak periods, respectively, while traffic operations at the intersection with Wilcox Road are expected to continue operating at LOS "B" or better and LOS "C" or better during the AM and PM peak periods, respectively. The remaining study intersections are also expected to continue operating at levels of service similar to existing conditions.

IV. RECOMMENDATIONS

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

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways.

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

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

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

5. Prepare a Transportation Management Plan to identify strategies to minimize the impact of school-related activities on the surrounding roadways. This plan should address daily school traffic including issues related to drop-off/pick-ups along the adjacent public roadways as well as special events planned for the future gymnasium.

V. CONCLUSION

The proposed project entails the construction of new gymnasium at the existing Kauai High School campus. With the implementation of the proposed project, traffic operations in the vicinity of Kauai High School are expected to remain similar to existing conditions as the proposed gymnasium is intended to address the inadequacies of the school's current gymnasium and provide enough seating accommodations for the school's existing student enrollment. Although traffic operations are expected to remain similar to existing conditions

with the proposed new Kauai High School gymnasium, the preparation or an update of the Transportation Management Plan is recommended to identify strategies to minimize the impact of school-related activities on the surrounding roadways including student drop-off/pick-ups, as well as planned special events conducted after regular school hours. As such, with the implementation of the aforementioned recommendations, the new Kauai High School gymnasium is not expected to have a significant impact on traffic operations in the project vicinity.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

National Data & Surveying Services Intersection Turning Movement Count

Location: Nawiliwili Rd & Lala Rd
City: Lihue
Control: 1-Way Stop(WB)

Project ID: 18-02037-001
Date: 4/3/2018

Total

NS/EW Streets:	Nawiliwili Rd				Nawiliwili Rd				Lala Rd				Lala Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	15	0	0	4	35	0	0	0	0	0	0	0	0	3	0	57
6:15 AM	0	33	0	0	8	50	0	0	0	0	0	0	0	0	7	0	98
6:30 AM	0	42	0	0	20	61	0	0	0	0	0	0	0	0	9	0	132
6:45 AM	0	31	0	0	44	62	0	0	0	0	0	0	0	0	17	0	154
7:00 AM	0	44	0	0	88	58	0	0	0	0	0	0	0	0	33	0	223
7:15 AM	0	54	0	0	174	92	0	0	0	0	0	0	0	0	57	0	377
7:30 AM	0	77	0	0	99	91	0	0	0	0	0	0	0	0	82	0	349
7:45 AM	0	73	0	0	13	67	0	0	0	0	0	0	0	0	15	0	168
8:00 AM	0	64	0	0	9	71	0	0	0	0	0	0	0	0	7	0	151
8:15 AM	0	75	0	0	6	76	0	0	0	0	0	0	0	0	4	0	161
8:30 AM	0	67	0	0	6	60	0	0	0	0	0	0	0	0	3	0	136
8:45 AM	0	102	1	0	7	77	0	0	0	0	0	0	0	0	8	0	195
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	677	1	0	478	800	0	0	0	0	0	0	0	0	245	0	2201
APPROACH %'s :	0.00%	99.85%	0.15%	0.00%	37.40%	62.60%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	248	0	0	374	308	0	0	0	0	0	0	0	0	187	0	1117
PEAK HR FACTOR :	0.000	0.805	0.000	0.000	0.537	0.837	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.570	0.000	0.741
	0.805				0.641								0.570				

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
1:00 PM	0	108	0	0	9	114	0	0	0	0	0	0	0	0	6	0	237
1:15 PM	0	109	0	0	10	113	0	0	0	0	0	0	0	0	10	0	242
1:30 PM	0	110	0	0	14	99	0	0	0	0	0	0	0	0	4	0	227
1:45 PM	0	87	0	0	25	112	0	0	0	0	0	0	0	0	11	0	235
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	414	0	0	58	438	0	0	0	0	0	0	0	0	31	0	941
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	11.69%	88.31%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	0	414	0	0	58	438	0	0	0	0	0	0	0	0	31	0	941
PEAK HR FACTOR :	0.000	0.941	0.000	0.000	0.580	0.961	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.705	0.000	0.972
	0.941				0.905								0.705				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
2:00 PM	0	123	0	0	39	96	0	0	0	0	0	0	0	0	133	0	391
2:15 PM	0	148	0	0	26	116	0	0	0	0	0	0	0	0	89	0	379
2:30 PM	0	110	0	0	23	120	0	0	0	0	0	0	0	0	30	0	283
2:45 PM	0	90	0	0	16	122	0	0	0	0	0	0	1	0	29	0	258
3:00 PM	0	136	0	0	19	98	0	0	0	0	0	0	0	0	25	0	278
3:15 PM	0	101	0	0	23	146	0	0	0	0	0	0	0	0	20	0	290
3:30 PM	0	110	0	0	16	139	0	0	0	0	0	0	0	0	26	0	291
3:45 PM	0	101	0	0	19	120	0	0	0	0	0	0	0	0	15	0	255
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	919	0	0	181	957	0	0	0	0	0	0	1	0	367	0	2425
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	15.91%	84.09%	0.00%	0.00%					0.27%	0.00%	99.73%	0.00%	
PEAK HR :	02:00 PM - 03:00 PM																TOTAL
PEAK HR VOL :	0	471	0	0	104	454	0	0	0	0	0	0	1	0	281	0	1311
PEAK HR FACTOR :	0.000	0.796	0.000	0.000	0.667	0.930	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.528	0.000	0.838
	0.796				0.976								0.530				

National Data & Surveying Services Intersection Turning Movement Count

Location: Rice St & Lala Rd
City: Lihue
Control: 1-Way Stop(EB)

Project ID: 18-02037-002
Date: 4/3/2018

Total

NS/EW Streets:	Waapa Road				Rice St				Lala Rd				Driveway				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	0	0	0.5	0	0.5	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	44	0	0	0	17	4	0	1	0	2	0	0	0	0	0	68
6:15 AM	1	42	1	0	1	51	4	0	2	0	1	0	0	0	0	0	103
6:30 AM	0	69	1	0	3	54	14	0	4	1	2	0	0	0	0	0	148
6:45 AM	1	55	4	0	1	72	25	0	16	2	4	0	0	0	0	0	180
7:00 AM	2	72	5	0	7	60	57	0	32	1	14	0	0	0	0	0	250
7:15 AM	18	120	1	0	0	61	97	0	57	0	12	0	0	0	0	0	366
7:30 AM	17	98	3	0	1	75	72	0	82	3	25	0	0	0	0	0	376
7:45 AM	1	91	2	0	6	90	11	0	14	0	3	0	0	0	0	0	218
8:00 AM	2	86	4	0	6	89	8	0	10	0	0	0	0	0	0	0	205
8:15 AM	2	91	2	0	3	94	4	0	5	0	0	0	0	0	0	0	201
8:30 AM	2	92	5	0	7	87	10	0	6	0	1	0	0	0	0	0	210
8:45 AM	4	85	7	0	7	107	9	0	10	0	2	0	0	0	0	0	231
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	50	945	35	0	42	857	315	0	239	7	66	0	0	0	0	0	2556
APPROACH %'s :	4.85%	91.75%	3.40%	0.00%	3.46%	70.59%	25.95%	0.00%	76.60%	2.24%	21.15%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	38	381	11	0	14	286	237	0	185	4	54	0	0	0	0	0	1210
PEAK HR FACTOR :	0.528	0.794	0.550	0.000	0.500	0.794	0.611	0.000	0.564	0.333	0.540	0.000	0.000	0.000	0.000	0.000	0.805
	0.773				0.850				0.552								

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	0	0	0.5	0	0.5	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
1:00 PM	6	124	5	0	7	129	12	0	2	0	2	0	0	0	0	0	287
1:15 PM	2	118	1	0	7	122	10	0	5	1	2	0	0	0	0	0	268
1:30 PM	1	134	2	0	3	115	18	0	8	0	3	0	0	0	0	0	284
1:45 PM	10	114	4	1	8	109	25	0	6	0	3	0	0	0	0	0	280
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	19	490	12	1	25	475	65	0	21	1	10	0	0	0	0	0	1119
APPROACH %'s :	3.64%	93.87%	2.30%	0.19%	4.42%	84.07%	11.50%	0.00%	65.63%	3.13%	31.25%	0.00%					
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	19	490	12	1	25	475	65	0	21	1	10	0	0	0	0	0	1119
PEAK HR FACTOR :	0.475	0.914	0.600	0.250	0.781	0.921	0.650	0.000	0.656	0.250	0.833	0.000	0.000	0.000	0.000	0.000	0.975
	0.953				0.954				0.727								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	0	0	0.5	0	0.5	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
2:00 PM	8	104	2	0	12	125	38	0	63	0	45	0	0	0	0	0	397
2:15 PM	4	122	5	0	11	121	14	0	41	0	18	0	0	0	0	0	336
2:30 PM	3	140	5	0	10	126	19	0	13	1	5	1	0	0	0	0	323
2:45 PM	2	122	4	0	6	135	18	0	20	0	3	0	0	0	0	0	310
3:00 PM	1	123	7	0	15	129	14	0	16	0	1	0	0	0	0	0	306
3:15 PM	1	144	10	0	9	133	19	0	15	0	1	0	0	0	0	0	332
3:30 PM	4	154	4	0	11	122	13	0	16	0	1	0	0	0	0	0	325
3:45 PM	5	136	6	0	8	130	10	0	8	1	0	0	0	0	0	0	304
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	28	1045	43	0	82	1021	145	0	192	2	74	1	0	0	0	0	2633
APPROACH %'s :	2.51%	93.64%	3.85%	0.00%	6.57%	81.81%	11.62%	0.00%	71.38%	0.74%	27.51%	0.37%					
PEAK HR :	02:00 PM - 03:00 PM																TOTAL
PEAK HR VOL :	17	488	16	0	39	507	89	0	137	1	71	1	0	0	0	0	1366
PEAK HR FACTOR :	0.531	0.871	0.800	0.000	0.813	0.939	0.586	0.000	0.544	0.250	0.394	0.250	0.000	0.000	0.000	0.000	0.860
	0.880				0.907				0.486								

National Data & Surveying Services Intersection Turning Movement Count

Location: Wilcox Rd & Nawiliwili Rd
City: Lihue
Control: 1-Way Stop(NB)

Project ID: 18-02037-003
Date: 4/3/2018

Total

NS/EW Streets:	Wilcox Rd				Wilcox Rd				Nawiliwili Rd				Nawiliwili Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	2	0	15	0	0	0	0	0	0	25	8	0	8	11	0	0	69
6:15 AM	3	0	9	0	0	0	0	0	0	37	5	0	21	33	0	0	108
6:30 AM	8	0	13	0	0	0	0	0	0	54	9	0	14	31	0	0	129
6:45 AM	4	0	17	0	0	0	0	0	0	39	14	0	32	29	0	0	135
7:00 AM	8	0	22	0	0	0	0	0	0	48	5	0	22	38	0	0	143
7:15 AM	5	0	45	0	0	0	0	0	0	82	11	0	24	50	0	0	217
7:30 AM	7	0	34	0	0	0	0	0	0	75	12	0	28	72	0	0	228
7:45 AM	9	0	39	0	0	0	0	0	0	52	9	0	31	61	0	0	201
8:00 AM	15	0	32	0	0	0	0	0	0	56	14	0	33	49	0	0	199
8:15 AM	5	0	36	0	0	0	0	0	0	56	16	0	27	63	0	0	203
8:30 AM	12	0	44	0	0	0	0	0	0	47	13	0	30	58	0	0	204
8:45 AM	15	0	26	0	0	0	0	0	0	60	17	0	32	79	0	0	229
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	93	0	332	0	0	0	0	0	0	631	133	0	302	574	0	0	2065
APPROACH %'s :	21.88%	0.00%	78.12%	0.00%					0.00%	82.59%	17.41%	0.00%	34.47%	65.53%	0.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	36	0	150	0	0	0	0	0	0	265	46	0	116	232	0	0	845
PEAK HR FACTOR :	0.600	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.000	0.808	0.821	0.000	0.879	0.806	0.000	0.000	0.927
	0.930								0.836				0.870				

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
1:00 PM	11	0	30	0	0	0	0	0	0	98	17	0	39	87	0	0	282
1:15 PM	18	0	37	0	0	0	0	0	0	88	14	0	39	89	0	0	285
1:30 PM	13	0	44	0	0	0	0	0	0	89	11	0	41	85	0	0	283
1:45 PM	12	0	41	0	0	0	0	0	0	89	13	0	36	71	0	0	262
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	54	0	152	0	0	0	0	0	0	364	55	0	155	332	0	0	1112
APPROACH %'s :	26.21%	0.00%	73.79%	0.00%					0.00%	86.87%	13.13%	0.00%	31.83%	68.17%	0.00%	0.00%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	54	0	152	0	0	0	0	0	0	364	55	0	155	332	0	0	1112
PEAK HR FACTOR :	0.750	0.000	0.864	0.000	0.000	0.000	0.000	0.000	0.000	0.929	0.809	0.000	0.945	0.933	0.000	0.000	0.975
	0.904								0.911				0.951				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	1	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
2:00 PM	17	0	30	0	0	0	0	0	0	73	10	0	42	113	0	0	285
2:15 PM	17	0	30	0	0	0	0	0	0	101	15	0	30	113	0	0	306
2:30 PM	10	0	37	0	0	0	0	0	0	109	7	0	31	95	0	0	289
2:45 PM	11	0	28	0	0	0	0	0	0	106	10	0	42	86	0	0	283
3:00 PM	20	0	28	0	0	0	0	0	0	95	3	0	25	109	0	0	280
3:15 PM	11	0	38	0	0	0	0	0	0	125	9	0	38	95	0	0	316
3:30 PM	11	0	25	0	0	0	0	0	0	129	6	0	31	88	0	1	291
3:45 PM	9	0	35	0	0	0	0	0	0	113	7	0	35	95	0	0	294
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	106	0	251	0	0	0	0	0	0	851	67	0	274	794	0	1	2344
APPROACH %'s :	29.69%	0.00%	70.31%	0.00%					0.00%	92.70%	7.30%	0.00%	25.63%	74.28%	0.00%	0.09%	
PEAK HR :	03:00 PM - 04:00 PM																TOTAL
PEAK HR VOL :	51	0	126	0	0	0	0	0	0	462	25	0	129	387	0	1	1181
PEAK HR FACTOR :	0.638	0.000	0.829	0.000	0.000	0.000	0.000	0.000	0.000	0.895	0.694	0.000	0.849	0.888	0.000	0.250	0.934
	0.903								0.902				0.965				

National Data & Surveying Services Intersection Turning Movement Count

Location: Waapa Rd & Nawiliwili Rd
City: Lihue
Control: 2-Way Stop(NB/SB)

Project ID: 18-02037-004
Date: 4/3/2018

Total

NS/EW Streets:	Waapa Rd				Wilcox Rd				Nawiliwili Rd				Waapa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	5	0	2	0	2	0	0	37	2	0	3	17	0	0	68
6:15 AM	4	0	0	0	2	0	4	0	0	41	5	0	4	46	2	0	108
6:30 AM	2	0	4	0	6	0	1	0	1	64	3	0	1	44	6	0	132
6:45 AM	1	0	5	0	6	0	1	0	2	50	6	0	7	62	6	0	146
7:00 AM	1	0	7	0	4	0	1	0	0	71	5	0	7	59	6	0	161
7:15 AM	3	0	16	0	6	0	4	0	1	117	5	0	7	61	2	0	222
7:30 AM	4	0	6	0	7	0	6	0	2	106	7	0	5	90	2	0	235
7:45 AM	6	0	3	0	10	0	0	0	0	81	5	0	3	86	5	0	199
8:00 AM	7	0	3	0	6	0	3	0	4	83	4	0	8	72	5	0	195
8:15 AM	4	1	5	0	4	0	2	0	1	81	4	0	4	83	4	0	193
8:30 AM	6	0	5	0	6	1	2	0	1	87	6	0	2	85	2	0	203
8:45 AM	9	0	6	0	8	0	6	0	2	82	3	0	6	92	5	0	219
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	47	1	65	0	67	1	32	0	14	900	55	0	57	797	45	0	2081
APPROACH %'s :	41.59%	0.88%	57.52%	0.00%	67.00%	1.00%	32.00%	0.00%	1.44%	92.88%	5.68%	0.00%	6.34%	88.65%	5.01%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	20	0	28	0	29	0	13	0	7	387	21	0	23	309	14	0	851
PEAK HR FACTOR :	0.714	0.000	0.438	0.000	0.725	0.000	0.542	0.000	0.438	0.827	0.750	0.000	0.719	0.858	0.700	0.000	0.905
	0.632				0.808				0.843				0.892				

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
1:00 PM	5	0	10	0	5	0	3	0	2	120	5	0	9	121	3	1	284
1:15 PM	10	1	7	0	1	0	4	0	5	118	7	0	5	112	2	0	272
1:30 PM	6	0	5	0	0	1	4	0	0	122	7	0	3	116	2	0	266
1:45 PM	2	0	11	0	3	0	5	0	1	127	6	0	8	100	2	0	265
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	23	1	33	0	9	1	16	0	8	487	25	0	25	449	9	1	1087
APPROACH %'s :	40.35%	1.75%	57.89%	0.00%	34.62%	3.85%	61.54%	0.00%	1.54%	93.65%	4.81%	0.00%	5.17%	92.77%	1.86%	0.21%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	23	1	33	0	9	1	16	0	8	487	25	0	25	449	9	1	1087
PEAK HR FACTOR :	0.575	0.250	0.750	0.000	0.450	0.250	0.800	0.000	0.400	0.959	0.893	0.000	0.694	0.928	0.750	0.250	0.957
	0.792				0.813				0.970				0.903				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
2:00 PM	1	0	7	0	5	0	3	0	2	98	3	0	10	164	5	0	298
2:15 PM	10	0	12	0	2	0	3	0	4	118	6	0	9	126	7	0	297
2:30 PM	4	0	6	0	3	0	1	0	6	134	9	0	10	116	3	0	292
2:45 PM	8	0	7	0	3	0	0	0	0	116	12	0	5	124	6	0	281
3:00 PM	6	1	7	0	2	0	7	0	3	121	7	0	5	120	2	0	281
3:15 PM	10	0	9	0	1	0	3	0	4	156	8	0	12	120	2	0	325
3:30 PM	9	0	7	0	5	0	1	0	5	143	5	0	9	111	5	0	300
3:45 PM	8	0	8	0	3	0	1	0	3	137	11	0	12	115	5	0	303
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	56	1	63	0	24	0	19	0	27	1023	61	0	72	996	35	0	2377
APPROACH %'s :	46.67%	0.83%	52.50%	0.00%	55.81%	0.00%	44.19%	0.00%	2.43%	92.08%	5.49%	0.00%	6.53%	90.30%	3.17%	0.00%	
PEAK HR :	03:00 PM - 04:00 PM																TOTAL
PEAK HR VOL :	33	1	31	0	11	0	12	0	15	557	31	0	38	466	14	0	1209
PEAK HR FACTOR :	0.825	0.250	0.861	0.000	0.550	0.000	0.429	0.000	0.750	0.893	0.705	0.000	0.792	0.971	0.700	0.000	0.930
	0.855				0.639				0.897				0.966				

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR URBAN STREET FACILITIES

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.

LOS B describes reasonably impeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.

LOS C describes stable operation. The ability to maneuver and change lanes at midsegment locations may be more restricted than LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.

LOS E is characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is 30% and 40% of the base free-flow speed.

LOS F is characterized by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed. Also, LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.

"Highway Capacity Manual," Transportation Research Board, 2010.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK PERIOD TRAFFIC ANALYSIS

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	187	248	0	374	308
Future Vol, veh/h	0	187	248	0	374	308
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	249	331	0	499	411

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	331	0	-	331	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	0	711	-	0	1228	-
Stage 1	0	-	-	0	-	-
Stage 2	0	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	711	-	-	1228	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	5.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	711	1228	-
HCM Lane V/C Ratio	-	0.351	0.406	-
HCM Control Delay (s)	-	12.8	9.9	0
HCM Lane LOS	-	B	A	A
HCM 95th %tile Q(veh)	-	1.6	2	-

Intersection	
Int Delay, s/veh	5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	281	471	0	104	454
Future Vol, veh/h	0	281	471	0	104	454
Conflicting Peds, #/hr	1	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	335	561	0	124	540

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	562	0	-	561	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	0	526	-	0	1010	-
Stage 1	0	-	-	0	-	-
Stage 2	0	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	525	-	-	1009	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.1	0	1.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	525	1009	-
HCM Lane V/C Ratio	-	0.637	0.123	-
HCM Control Delay (s)	-	23.1	9.1	0
HCM Lane LOS	-	C	A	A
HCM 95th %tile Q(veh)	-	4.4	0.4	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	265	46	116	232	36	150
Future Vol, veh/h	265	46	116	232	36	150
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	160	100	-	50	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	285	49	125	249	39	161

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	286	0	785	286
Stage 1	-	-	-	-	286	-
Stage 2	-	-	-	-	499	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1276	-	361	753
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	610	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1276	-	325	752
Mov Cap-2 Maneuver	-	-	-	-	325	-
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	550	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	325	752	-	-	1276	-
HCM Lane V/C Ratio	0.119	0.214	-	-	0.098	-
HCM Control Delay (s)	17.6	11.1	-	-	8.1	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.8	-	-	0.3	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	389	42	145	407	55	125
Future Vol, veh/h	389	42	145	407	55	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	160	100	-	50	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	409	44	153	428	58	132

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	409	0	1143	409
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	734	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1150	-	221	642
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	475	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1150	-	192	642
Mov Cap-2 Maneuver	-	-	-	-	192	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	192	642	-	-	1150	-
HCM Lane V/C Ratio	0.302	0.205	-	-	0.133	-
HCM Control Delay (s)	31.6	12	-	-	8.6	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.2	0.8	-	-	0.5	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	387	21	23	309	14	20	0	28	29	0	13
Future Vol, veh/h	7	387	21	23	309	14	20	0	28	29	0	13
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	60	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	425	23	25	340	15	22	0	31	32	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	355	0	0	450	0	0	859	859	443	870	864	347
Stage 1	-	-	-	-	-	-	454	454	-	398	398	-
Stage 2	-	-	-	-	-	-	405	405	-	472	466	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1204	-	-	1110	-	-	277	294	615	272	292	696
Stage 1	-	-	-	-	-	-	586	569	-	628	603	-
Stage 2	-	-	-	-	-	-	622	598	-	573	562	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1204	-	-	1106	-	-	265	285	611	252	283	696
Mov Cap-2 Maneuver	-	-	-	-	-	-	265	285	-	252	283	-
Stage 1	-	-	-	-	-	-	581	564	-	624	589	-
Stage 2	-	-	-	-	-	-	595	584	-	538	557	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.6	15.5	18.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	396	1204	-	-	1106	-	-	314
HCM Lane V/C Ratio	0.133	0.006	-	-	0.023	-	-	0.147
HCM Control Delay (s)	15.5	8	-	-	8.3	-	-	18.4
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	466	30	34	530	21	23	0	32	13	0	7
Future Vol, veh/h	12	466	30	34	530	21	23	0	32	13	0	7
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	60	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	476	31	35	541	21	23	0	33	13	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	565	0	0	507	0	0	1140	1151	494	1158	1156	555
Stage 1	-	-	-	-	-	-	516	516	-	624	624	-
Stage 2	-	-	-	-	-	-	624	635	-	534	532	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1007	-	-	1058	-	-	178	198	575	173	197	531
Stage 1	-	-	-	-	-	-	542	534	-	473	478	-
Stage 2	-	-	-	-	-	-	473	472	-	530	526	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1007	-	-	1056	-	-	169	188	573	157	187	529
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	188	-	157	187	-
Stage 1	-	-	-	-	-	-	535	527	-	466	461	-
Stage 2	-	-	-	-	-	-	451	455	-	493	519	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.5	20.6	24.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	287	1007	-	-	1056	-	-	208
HCM Lane V/C Ratio	0.196	0.012	-	-	0.033	-	-	0.098
HCM Control Delay (s)	20.6	8.6	-	-	8.5	-	-	24.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.3

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	185	4	54	0	0	0	38	381	11	14	286	237
Future Vol, veh/h	185	4	54	0	0	0	38	381	11	14	286	237
Conflicting Peds, #/hr	9	0	0	0	0	0	8	0	12	12	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	231	5	68	0	0	0	48	476	14	18	358	296

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	988	998	366	366	0	0	502	0	0
Stage 1	401	401	-	-	-	-	-	-	-
Stage 2	587	597	-	-	-	-	-	-	-
Critical Hdwy	5.5	5.5	5.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	353	323	753	1193	-	-	1062	-	-
Stage 1	676	601	-	-	-	-	-	-	-
Stage 2	556	491	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	328	0	747	1193	-	-	1053	-	-
Mov Cap-2 Maneuver	328	0	-	-	-	-	-	-	-
Stage 1	659	0	-	-	-	-	-	-	-
Stage 2	530	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	6.2	0.7	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1193	-	-	3362	1053	-	-
HCM Lane V/C Ratio	0.04	-	-	0.09	0.017	-	-
HCM Control Delay (s)	8.1	-	-	6.2	8.5	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	1	71	0	0	0	17	488	16	39	507	89
Future Vol, veh/h	137	1	71	0	0	0	17	488	16	39	507	89
Conflicting Peds, #/hr	3	0	0	0	0	0	8	0	4	4	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	1	83	0	0	0	20	567	19	45	590	103

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1307	1318	598	598	0	0	590	0	0
Stage 1	688	688	-	-	-	-	-	-	-
Stage 2	619	630	-	-	-	-	-	-	-
Critical Hdwy	5.5	5.5	5.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	246	228	595	979	-	-	985	-	-
Stage 1	499	447	-	-	-	-	-	-	-
Stage 2	537	475	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	226	0	590	979	-	-	982	-	-
Mov Cap-2 Maneuver	226	0	-	-	-	-	-	-	-
Stage 1	473	0	-	-	-	-	-	-	-
Stage 2	522	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	7.4	0.3	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	979	-	-	1737	982	-	-
HCM Lane V/C Ratio	0.02	-	-	0.14	0.046	-	-
HCM Control Delay (s)	8.8	-	-	7.4	8.8	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.1	-	-

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2021 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	187	248	0	374	308
Future Vol, veh/h	0	187	248	0	374	308
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	249	337	0	499	419

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	337	0	-	337	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	0	705	-	0	1222	-
Stage 1	0	-	-	0	-	-
Stage 2	0	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	705	-	-	1222	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	5.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	705	1222	-
HCM Lane V/C Ratio	-	0.354	0.408	-
HCM Control Delay (s)	-	12.9	10	0
HCM Lane LOS	-	B	A	A
HCM 95th %tile Q(veh)	-	1.6	2	-

Intersection	
Int Delay, s/veh	5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	281	471	0	104	454
Future Vol, veh/h	0	281	471	0	104	454
Conflicting Peds, #/hr	1	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	335	572	0	124	551

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	573	0	-	572	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	0	519	-	0	1001	-
Stage 1	0	-	-	0	-	-
Stage 2	0	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	-	519	-	-	1000	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.7	0	1.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	519	1000	-
HCM Lane V/C Ratio	-	0.645	0.124	-
HCM Control Delay (s)	-	23.7	9.1	0
HCM Lane LOS	-	C	A	A
HCM 95th %tile Q(veh)	-	4.5	0.4	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	265	46	116	232	36	150
Future Vol, veh/h	265	46	116	232	36	150
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	160	100	-	50	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	291	49	125	254	39	161

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	292	0	796	292
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	504	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1270	-	356	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	607	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1270	-	321	746
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	547	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	321	746	-	-	1270	-
HCM Lane V/C Ratio	0.121	0.216	-	-	0.098	-
HCM Control Delay (s)	17.7	11.2	-	-	8.1	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.8	-	-	0.3	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	389	42	145	407	55	125
Future Vol, veh/h	389	42	145	407	55	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	160	100	-	50	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	418	44	153	437	58	132

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	418	0	1160	418
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	742	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1141	-	216	635
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	471	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1141	-	187	635
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	408	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	187	635	-	-	1141	-
HCM Lane V/C Ratio	0.31	0.207	-	-	0.134	-
HCM Control Delay (s)	32.7	12.1	-	-	8.6	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.2	0.8	-	-	0.5	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	387	21	23	309	14	20	0	28	29	0	13
Future Vol, veh/h	7	387	21	23	309	14	20	0	28	29	0	13
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	60	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	434	23	25	346	15	22	0	31	32	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	362	0	0	459	0	0	875	875	451	885	879	354
Stage 1	-	-	-	-	-	-	463	463	-	405	405	-
Stage 2	-	-	-	-	-	-	412	412	-	480	474	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1197	-	-	1102	-	-	270	288	608	266	286	690
Stage 1	-	-	-	-	-	-	579	564	-	622	598	-
Stage 2	-	-	-	-	-	-	617	594	-	567	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1197	-	-	1098	-	-	258	279	605	246	277	690
Mov Cap-2 Maneuver	-	-	-	-	-	-	258	279	-	246	277	-
Stage 1	-	-	-	-	-	-	574	559	-	618	584	-
Stage 2	-	-	-	-	-	-	590	580	-	533	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	15.7	18.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	388	1197	-	-	1098	-	-	307
HCM Lane V/C Ratio	0.136	0.006	-	-	0.023	-	-	0.15
HCM Control Delay (s)	15.7	8	-	-	8.4	-	-	18.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	466	30	34	530	21	23	0	32	13	0	7
Future Vol, veh/h	12	466	30	34	530	21	23	0	32	13	0	7
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	60	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	485	31	35	552	21	23	0	33	13	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	576	0	0	517	0	0	1161	1171	503	1178	1176	565
Stage 1	-	-	-	-	-	-	526	526	-	635	635	-
Stage 2	-	-	-	-	-	-	635	645	-	543	541	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	997	-	-	1049	-	-	172	193	569	168	191	524
Stage 1	-	-	-	-	-	-	535	529	-	467	472	-
Stage 2	-	-	-	-	-	-	467	467	-	524	521	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	997	-	-	1047	-	-	164	184	567	152	182	523
Mov Cap-2 Maneuver	-	-	-	-	-	-	164	184	-	152	182	-
Stage 1	-	-	-	-	-	-	528	522	-	460	455	-
Stage 2	-	-	-	-	-	-	445	450	-	487	514	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.5	21.1	24.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	280	997	-	-	1047	-	-	202
HCM Lane V/C Ratio	0.2	0.012	-	-	0.033	-	-	0.101
HCM Control Delay (s)	21.1	8.7	-	-	8.6	-	-	24.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.3

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	185	4	54	0	0	0	38	381	11	14	286	237
Future Vol, veh/h	185	4	54	0	0	0	38	381	11	14	286	237
Conflicting Peds, #/hr	9	0	0	0	0	0	8	0	12	12	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	231	5	68	0	0	0	48	486	14	18	365	296

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1005	1015	373	373	0	0	512	0	0
Stage 1	408	408	-	-	-	-	-	-	-
Stage 2	597	607	-	-	-	-	-	-	-
Critical Hdwy	5.5	5.5	5.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	346	318	748	1185	-	-	1053	-	-
Stage 1	671	597	-	-	-	-	-	-	-
Stage 2	550	486	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	321	0	742	1185	-	-	1044	-	-
Mov Cap-2 Maneuver	321	0	-	-	-	-	-	-	-
Stage 1	654	0	-	-	-	-	-	-	-
Stage 2	524	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	6.2	0.7	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	1185	-	-	3339	1044	-	-
HCM Lane V/C Ratio	0.04	-	-	0.091	0.017	-	-
HCM Control Delay (s)	8.2	-	-	6.2	8.5	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	1	71	0	0	0	17	488	16	39	507	89
Future Vol, veh/h	137	1	71	0	0	0	17	488	16	39	507	89
Conflicting Peds, #/hr	3	0	0	0	0	0	8	0	4	4	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	1	83	0	0	0	20	579	19	45	601	103

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1331	1341	609	609	0	0	601	0	0
Stage 1	700	700	-	-	-	-	-	-	-
Stage 2	631	641	-	-	-	-	-	-	-
Critical Hdwy	5.5	5.5	5.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	239	223	588	970	-	-	976	-	-
Stage 1	493	441	-	-	-	-	-	-	-
Stage 2	530	469	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	220	0	584	970	-	-	973	-	-
Mov Cap-2 Maneuver	220	0	-	-	-	-	-	-	-
Stage 1	467	0	-	-	-	-	-	-	-
Stage 2	515	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	7.4	0.3	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	970	-	-	1719	973	-	-
HCM Lane V/C Ratio	0.02	-	-	0.141	0.047	-	-
HCM Control Delay (s)	8.8	-	-	7.4	8.9	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.1	-	-

APPENDIX D:

Pre-Assessment Consultation Comment Letters & List of Consulted Cultural Descendants and Responses

Keola Cheng

From: Jeremy Lee <jlee@kauai.gov>
Sent: Monday, April 2, 2018 4:18 PM
To: Public Comment
Cc: Celia Mahikoa; Lee Steinmetz
Subject: Environmental Assessment (EA) Pre-Assessment Consultation, Kauai High School Gymnasium, TMK:3-3-003:007, 015 and 3-2-005:010, 011, Nawiliwili, Kauai, Hawaii

Keola,
Mahalo for giving us the opportunity to provide feedback and comment on the subject EA pre-assessment consultation.
The CTA does not have any comments at this time.
Mahalo,

Jeremy Kalawaia Lee
The Kauai Bus
Program Specialist III
3220 Hoolako Street
Lihue, HI 96766
(808)246-8112
jlee@kauai.gov

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8406-01
April XX, 2018

Mr. Jeremy Kalawaia Lee
Program Specialist III, The Kaua'i Bus
County of Kaua'i
County Transportation Agency
3220 Hoolako Street
Lihue, HI 96766

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua'i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua'i, Hawai'i

Dear Mr. Lee:

Thank you for your letter dated April 2, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We acknowledge that the County of Kaua'i CTA does not have any comments at this time.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

April 10, 2018

In reply, please refer to:
File: HEER Office
2018-108GG

KC

Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawai`i 96826
Attention: Mr. Keola Cheng, Project Manager

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua`i High School New Gymnasium
Tax Map Keys (TMK) 3-3-003:007, 015, and 3-2-005:010, 011
Nawiliwili, Kaua`i, Hawai`i

Dear Mr. Cheng:

The State of Hawaii, Department of Health, Hazard Evaluation and Emergency Response (HDOH-HEER Office) Office is working with Bureau Veritas in addressing potential environmental concerns at the property. Based on the environmental data from other properties in the general vicinity, the HDOH-HEER Office suspects that soil beneath the gymnasium may be impacted by contaminants associated with pesticides or other related hazardous material.

The Kaua`i High School, Building T site was subject to a previous Environmental Hazard Evaluation (EHE). During the excavation activities, an odor was emanating from the soil in the trenches. Multi-Increment (MI)-sampling of the soil confirmed the presence of the organochlorine pesticides (aldrin and dieldrin) at concentrations above the Tier 1 Environmental Action Levels (EALs).

The perimeter of the site has not been assessed and therefore pesticide concentrations around the building's perimeter are unknown. Therefore, we recommend following best practices to help avoid and reduce the potential for exposure if termiticides are assumed to be present underneath or around the foundation's perimeter. [See attached]

Similar contamination may possibly exist in other areas on the property, which could delay future construction and renovation activities at the school. Should you have any question concerning the above please feel free to contact me at 586-0956 or gwen.geronimo@doh.hawaii.gov.

Sincerely,

Gwen Geronimo

Gwen Geronimo, Environmental Health Specialist
Site Discovery, Assessment and Remediation Section
Hazard Evaluation and Emergency Response Office

Attached: Fact Sheet "*Past Use of Chlordane, Dieldrin, and other Organochlorine Pesticides for Termite Control in Hawaii: Safe Management Practices around treated Foundations or during Building Demolition*"; HDOH, September 2011

cc: Arnold Fukunaga, Department of Education, Facilities Development Branch

HAWAII STATE
DEPARTMENT
OF HEALTH

The **Hazard Evaluation and Emergency Response Office (HEER Office)** is part of the Hawai'i Department of Health (HDOH) Environmental Health Administration, whose mission is to protect human health and the environment. The HEER Office provides leadership, support, and partnership in preventing, planning for, responding to, and enforcing environmental laws relating to releases or threats of releases of hazardous substances.

Past Use of Chlordane, Dieldrin, and other Organochlorine Pesticides for Termite Control in Hawai'i: Safe Management Practices around Treated Foundations or during Building Demolition

This fact sheet provides building owners, demolition and construction contractors, developers, realtors, and others with an overview of the potential environmental concerns associated with the past use of organochlorine termiticides (pesticides used to control termites) in Hawai'i. In addition, this fact sheet discusses methods for reducing exposure to organochlorine termiticides during building demolition or around the foundations of treated buildings and identifies resources for further information.

What are organochlorine termiticides?

Organochlorine termiticides are a group of pesticides that were used for termite control in and around wooden buildings and homes from the mid-1940s to the late 1980s. These organochlorine pesticides included chlordane, aldrin, dieldrin, heptachlor, and dichlorodiphenyltrichloroethane (DDT). They were used primarily by pest control operators in Hawaii's urban areas, but also by homeowners, the military, the state, and counties to protect buildings against termite damage. In the 1970s and 1980s, the U.S. Environmental Protection Agency (EPA) banned all uses of these organochlorine pesticides except for heptachlor, which can be used today only for control of fire ants in underground power transformers. Chlordane was the most widely used organochlorine pesticide against termites in Hawai'i. Termiticides were commonly applied directly to soil beneath buildings or beneath slab foundations and around the foundation perimeter for new construction. They may also have been periodically applied underneath the building (if accessible) at occupied structures, around the perimeter of the foundation, or in trenches excavated around the foundation, or by injection through holes drilled next to the foundation or in the flooring at the periphery of walls. These pesticides break down slowly in the environment, application rates were relatively high, and applications may have been repeated over time. As a result, these organochlorine termiticides may sometimes still be found in treated soils at concentrations detrimental to human health.

At least seven species of termites are found in Hawai'i. The most destructive are the Formosan subterranean termite (shown here) and the West Indian drywood termite, both of which arrived during the past 100 years and are now common throughout the state.

How do I identify if organochlorine termiticides are present at levels that may be a concern?

Some organochlorine termiticide contamination may be found below wooden structures, building slabs, or adjacent to foundations built in Hawai'i before 1989. The highest concentration of termiticides in soil is typically found beneath the house or around the perimeter of the building foundation (extending away from the building a distance of up to 1 to 3 feet). Highest concentrations are believed to be contained in the top 1 to 2 feet of soil because termiticides are persistent chemicals that stick to soil particles. Most, however, are likely within the top 6 inches or top 12 inches of treated soil depending on soil type and if the termiticides had been applied on the surface, in shallow trenches, or injected a little deeper underground during application. If soils in the areas treated were subsequently covered or scraped off, that could also affect the depth where any residues may be found. Termiticides applied more than two decades ago are not detectable by smell or sight, so generally they are assumed to be present at levels that may be a concern, or soil testing is recommended to confirm the presence and level of these toxic substances. The Department of Health (HDOH) HEER Office has established specific soil action levels for each of the organochlorine termiticides that, if exceeded, represents a potential hazard that would warrant further evaluation or cleanup.

When organochlorine termiticides are assumed to be present underneath or around the foundation perimeter (or both) of wooden structures built before 1989, the HEER Office recommends following practices that will help avoid or greatly reduce the potential for exposure in the (presumed) treated areas. See the section below on *What can I do to limit or avoid exposure to soil or foods contaminated with organochlorine termiticides?*

The HEER Office recommends testing soils (at wooden structures built before 1989) when: (1) the homeowner plans to grow produce within 5 feet of the building foundation, (2) the soils adjacent to the foundation cannot be covered or landscaped with non-edible plants and children or others playing or working in this area may periodically come in contact with bare soil, (3) the home or other structures are going to be demolished and the soil underneath the structure and from around the foundation will be reused either on or off site, and (4) there is reason to believe soil in areas of the yard away from the foundation were treated with organochlorine termiticides in the past, or that treated soil from underneath the structure or from the foundation perimeter may have been spread out in the yard.

In the case where structures will be demolished, the demolition and redevelopment process could spread termiticide-contaminated soil about the property in the process of grading or site preparation. Spreading the soil could put the demolition and construction contractors at risk of exposure as well as future site inhabitants. Consequently, testing before grading is conducted is important to evaluate the potential for soil contamination. Alternatively, the soil from under the structure and around the foundation perimeter (to a depth of at least 1 foot) can be assumed to be contaminated, excavated, and disposed of in an approved landfill. If soil is disposed of at a landfill, any specific landfill testing or disposal requirements would apply.

A knowledgeable contractor can collect soil samples, arrange for laboratory testing, and help interpret testing data. A guide to assist contractors in soil testing for organochlorine termiticides is available on the HEER Office website (see Further Information below). Once the soil has been tested, the HEER Office also offers guidance to assess the termiticide levels (if present) and help decide what actions may be appropriate to reduce or eliminate exposures.

What can I do to limit or avoid exposure to soil or foods contaminated with organochlorine termiticides?

Residents or owners of homes or buildings treated with organochlorine termiticides have a higher potential risk of exposure, primarily through direct contact with contaminated soil or eating foods grown in contaminated soil. If you have or suspect organochlorine termiticide-contaminated soil on your property, the Department of Health HEER Office recommends these actions to limit or avoid exposure:

Limiting Exposures

- Plant grass or other non-edible vegetation, or cover contaminated soil with some kind of surface material such as gravel (within several feet of the foundation) to act as a barrier to prevent soil exposure.
- Keep children from playing in dirt near the foundation and keep toys, pacifiers, and other items that go into children's mouths clean.
- Locate pet enclosures away from the perimeter of the building foundation.
- Do not grow edible produce such as fruits and vegetables in potentially contaminated soils next to the building foundation. Cover the soil next to the foundation, or add clean soil and landscape with non-edible plants.
- Do not relocate soils from underneath the building or from the foundation perimeter to other areas of the property.
- To reduce exposure to soil, cover bare soil underneath the house with a barrier material such as gravel or plastic before you work or store materials underneath the house.

Practices for Exposure Prevention

- Wash hands and face thoroughly after you work or play in soil near the building foundation, especially before meals and snacks.
- Avoid tracking soil from near the foundation perimeter into the home and clean it up right away if soil is tracked in. Remove work and play shoes before you enter the house. Keep pets from tracking contaminated soil into your home.
- If you work with contaminated soil or soil that may be contaminated, you should wear gloves and protective clothing (long-sleeve shirt and pants) to reduce exposure. A protective paper mask (N-95 type with two elastic straps) should be worn if airborne dust is present (such as when you are operating a weed-eater in contaminated or potentially contaminated areas). Working with contaminated soil may leave residues on your clothing, so change clothes and shower after you work with the soil and avoid spreading dirt from clothes or shoes into your vehicle or house.

What are the hazards of organochlorine termiticides?

The organochlorine termiticides used in Hawai'i before 1989 are persistent synthetic chemicals that stick to soil particles, do not dissolve easily in water, remain in the environment for many years, and may bioaccumulate up food chains. Exposure to the organochlorine termiticides can occur through ingestion, absorption through the skin, or inhalation; however, the primary exposure to these chemicals long after application is from unintentional ingestion of contaminated soil or through contaminated foods (plants can take up residues from the soil). The greatest exposure to these chemicals is expected in areas where they were applied at homes or building sites for termite control, but the potential for exposure would depend on how and where they were applied in the past, the frequency residents may come into contact with contaminated soil or foods grown in contaminated soil, and any actions after applications that may have disturbed or spread contaminated soil. Following is general information for each of these pesticides, as published by the U.S. Department of Health and Human Services and EPA.

CHLORDANE (Technical Chlordane)

Chlordane was the most common organochlorine termiticide used in Hawai'i. The amount of chlordane used was more than twice that of the termiticides aldrin, dieldrin, or heptachlor. Exposure to high levels of chlordane can harm the human endocrine system, nervous system, digestive system, and liver. EPA has also concluded that chlordane is a probable human carcinogen and may cause liver cancer. Chlordane can persist in the soil for more than 20 years. Technical chlordane does not occur naturally in the environment. It is not a single chemical, but a mixture of pure chlordane (50 to 75 percent) and more than 100 related compounds, including heptachlor and heptachlor epoxide. Chlordane was used widely throughout the U.S. from 1948 to 1983 for control of termites as well as pests in some agricultural crops and in lawns. EPA banned all uses of chlordane in 1983 except to control termites, and banned all uses in 1988, because of concern about damage to the environment and harm to human health.

ALDRIN and DIELDRIN

Aldrin and dieldrin are often considered together because they are chemically similar compounds. These chemicals were used as insecticides in agriculture and as termiticides to protect buildings after they were commercially available in the early 1950s. EPA banned all uses of aldrin and dieldrin in 1987. Exposures of animals to high levels of aldrin or dieldrin have caused nervous system effects. Based on animal studies, EPA has also concluded that aldrin and dieldrin are probable human carcinogens. Aldrin breaks down to dieldrin in the body and in the environment. Dieldrin breaks down very slowly in soil.

DDT, DDD, and DDE

Since the mid-1940s, dichlorodiphenyltrichloroethane (DDT) had been used widely as an insecticide in agriculture, for control of mosquitoes that may carry disease, and as a termiticide. EPA banned DDT in 1972. Dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethylene (DDE) are chemicals similar to DDT that occur as manufacturing byproducts and breakdown products or metabolites of commercial DDT. DDD also had been produced and sold as an insecticide, but its use was banned along with DDT. Exposure to high levels of DDT affects the nervous system. EPA has concluded that DDT, DDD, and DDE are probable human carcinogens. DDT, DDD, and DDE are long-lived in the environment, though current levels found in soils of agricultural fields are typically quite low. However, higher DDT levels may occur around or beneath wooden building foundations where it was used as a termiticide because the application rates for termite control were higher than the application rates for agricultural insect control.

HEPTACHLOR and HEPTACHLOR EPOXIDE

Heptachlor is a manufactured chemical that was commercially available from 1953 through 1987, when EPA banned virtually all uses. Little is known about the health effects of heptachlor in humans, but high levels may damage the liver and nervous system. EPA considers heptachlor epoxide a possible human carcinogen. Heptachlor was used as an insecticide in agriculture, as well as a termiticide for homes. Currently, it can be used only for fire ant control in underground power transformers. Bacteria and animals break down heptachlor to form heptachlor epoxide; therefore, heptachlor epoxide is more likely to be found in the environment over time than is heptachlor.

For questions about this fact sheet of further information, contact:

- *Hawai'i Department of Health, Hazard Evaluation and Emergency Response Office, Telephone: (808) 586 – 4249, Website: http://hawaii.gov/health/environmental/hazard/index.html*

Additional references located on the HEER Office website:

- HDOH, 2011. *A Guide to Soil Testing for Organochlorine Termiticides at Residential Sites in Hawai'i*

Access information from the federal government on termiticides:

- (U.S.) Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine ToxFAQs Website: http://www.atsdr.cdc.gov/toxfaq.html.
- U. S. Environmental Protection Agency Website: http://www.epa.gov/pbt/pubs/cheminfo.htm

This fact sheet was created with assistance and funding from USEPA's Region 9 Superfund Division

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
May XX, 2018

Ms. Gwen Geronimo
Environmental Health Specialist
Hazard Evaluation and Emergency Response Office
State of Hawai'i
Department of Health
PO Box 3378
Honolulu, HI 96801-3378

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua'i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua'i, Hawai'i

Dear Ms. Geronimo:

Thank you for your letter dated April 10, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We acknowledge that in a previous Environmental Hazard Evaluation (EHE), the presence of organochlorine pesticides (aldrin and dieldrin) was confirmed for the subject parcel and may be in soil beneath the gymnasium and surrounding perimeter. In order to avoid and reduce the potential exposure and impacts of termiticides, recommended best management practices will be discussed in the Draft EA.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

KC

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

EPO 18-114

April 17, 2018

RECEIVED
APR 23 2018
WILSON OKAMOTO CORPORATION

Mr. Keola Cheng, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
Email: kauaihighschoolgym@wilsonokamoto.com

Dear Mr. Cheng:

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment (PAC DEA) for Kauai High School New Gymnasium, Nawiliwili, Kauai
TMK: 3-3-003:007, 015, and 3-2-005:010, 011

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your PAC DEA to our office on April 6, 2018.

We understand from the PAC DEA that *"A new gymnasium is proposed to be constructed at a location to the southwest of the existing gymnasium adjacent to Classroom Building A and Classroom Building B. The proposed structure is envisioned as a metal frame building with standing seam metal roofing. The new structure will also serve as an Enhanced Hurricane Protection Area for the community."*

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

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

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

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not

limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.hawaii.gov or call (808) 586-4200.

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

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

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

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

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

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

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office

LM:nn

c: DOH: DHO Kauai, CAB, HEER, DCAB {via email only}

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

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

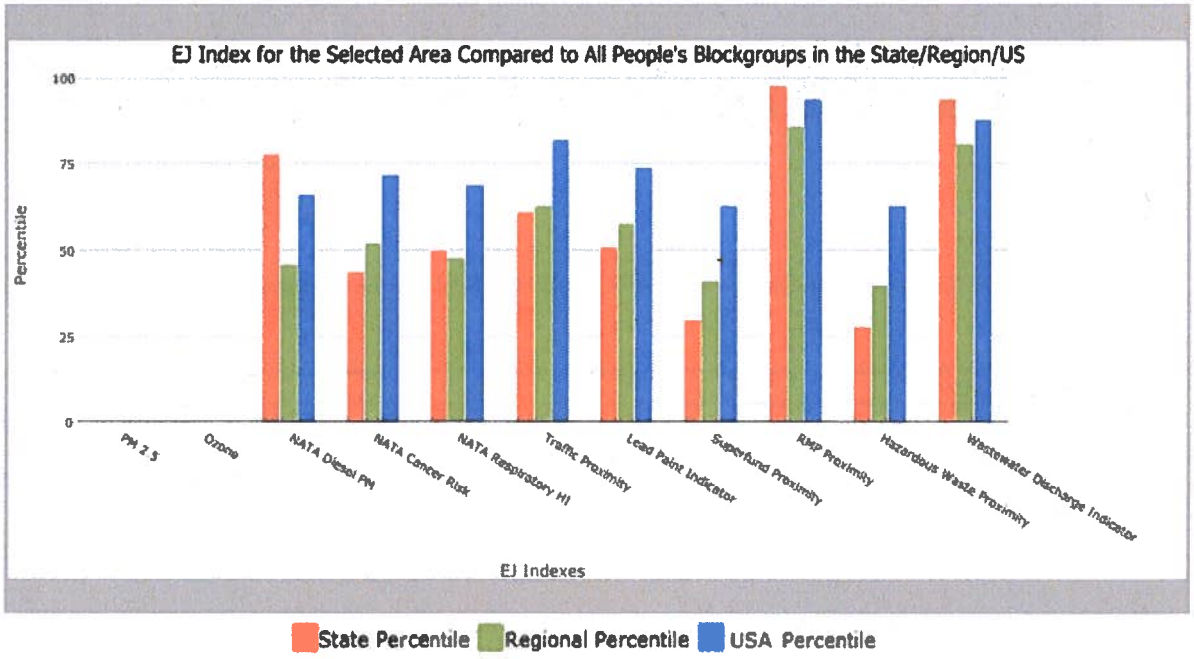
EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.959265,-159.358083, HAWAII, EPA Region 9

Approximate Population: 3,795

Input Area (sq. miles): 3.14

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	78	46	66
EJ Index for NATA* Air Toxics Cancer Risk	44	52	72
EJ Index for NATA* Respiratory Hazard Index	50	48	69
EJ Index for Traffic Proximity and Volume	61	63	82
EJ Index for Lead Paint Indicator	51	58	74
EJ Index for Superfund Proximity	30	41	63
EJ Index for RMP Proximity	98	86	94
EJ Index for Hazardous Waste Proximity	28	40	63
EJ Index for Wastewater Discharge Indicator	94	81	88



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

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.959265,-159.358083, HAWAII, EPA Region 9

Approximate Population: 3,795

Input Area (sq. miles): 3.14

April 16, 2018

Digitized Point

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

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.959265,-159.358083, HAWAII, EPA Region 9

Approximate Population: 3,795

Input Area (sq. miles): 3.14

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	N/A	N/A	N/A	9.9	N/A	9.14	N/A
Ozone (ppb)	N/A	N/A	N/A	41.8	N/A	38.4	N/A
NATA* Diesel PM (µg/m³)	0.208	0.149	79	0.978	<50th	0.938	<50th
NATA* Cancer Risk (lifetime risk per million)	28	34	28	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.84	1	45	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	270	1000	56	1100	49	590	67
Lead Paint Indicator (% Pre-1960 Housing)	0.091	0.16	45	0.24	44	0.29	35
Superfund Proximity (site count/km distance)	0.0069	0.1	28	0.15	5	0.13	1
RMP Proximity (facility count/km distance)	3.2	0.39	99	0.98	93	0.73	96
Hazardous Waste Proximity (facility count/km distance)	0.0062	0.1	24	0.12	2	0.093	2
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.0027	0.04	92	13	73	30	73
Demographic Indicators							
Demographic Index	54%	51%	58	47%	61	36%	76
Minority Population	67%	77%	25	59%	56	38%	77
Low Income Population	41%	26%	83	36%	60	34%	64
Linguistically Isolated Population	8%	6%	74	9%	58	5%	79
Population With Less Than High School Education	7%	9%	48	17%	30	13%	35
Population Under 5 years of age	13%	6%	93	7%	94	6%	94
Population over 64 years of age	14%	16%	45	13%	66	14%	57

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

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

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
April XX, 2018

Ms. Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office
State of Hawai‘i
Department of Health
P.O. Box 3378
Honolulu, Hawai‘i 96801-3378

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua‘i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua‘i, Hawai‘i

Dear Ms. Phillips McIntyre:

Thank you for your letter dated April 17, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation. We offer the following in response to your comments:

The proposed project will adhere to all applicable standard comments outlined in the URL links provided in your letter. Furthermore, the Department of Health’s Hawai‘i Environmental Health Portal and the updated Water Quality Standards Maps will be utilized as a reference resource throughout the design process for the subject project.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

KC

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
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
Web: http://planning.hawaii.gov/

DTS 201804181320BE

April 18, 2018

RECEIVED
APR 23 2018
WILSON OKAMOTO CORPORATION

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

Dear Mr. Cheng:

Subject: Environmental Assessment Pre-Assessment Consultation; Kauai High School New Gymnasium;
TMK: (3) 3-3-003: 007, 015 and 3-2-005: 010-011

Thank you for the opportunity to provide comments on the pre-consultation request for the preparation of a Draft Environmental Assessment (Draft EA) for the Kauai High School gymnasium project. The pre-consultation review material was transmitted to our office via letter dated March 29, 2018.

It is our understanding that the existing Kauai High School gymnasium building was constructed in 1939. The State Department of Education proposes the construction of a replacement gym to be located adjacent to Classroom Buildings A and B, and the school pool complex. The building structure will have metal framing with standing seam metal roofing.

The proposed project also includes the construction of a wrestling room, locker rooms, restrooms, a ticket office, a training room, meeting rooms, laundry facilities, support offices, concessions, and electric, mechanical, and hardware storage areas housed within the new gym complex.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. The Hawaii State Planning Act.
   Pursuant to Hawaii Administrative Rules (HAR) § 11-200-10(4) – general description of the action's technical, economic, social, and environmental characteristics; this project must demonstrate that it is consistent with State environmental, social, economic goals, and policies. Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Planning Act, provides goals, objectives, policies, planning coordination and implementation, and priority guidelines for growth, development, and the allocation of resources throughout the State.

The Draft EA should include a discussion on the project's ability to meet all parts of HRS Chapter 226. The analysis should examine consistency with these statutes, clarify where it is in conflict with them, and what steps will be taken for it be in compliance with HRS Chapter 226. If any of these statutes are not applicable to the project, the analysis should affirmatively state such determination, followed by discussion paragraphs.

2. Objectives and Policies of the Hawaii Coastal Zone Management Program.
The Coastal Zone Management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (HRS § 205A-1).

   The Draft EA should include an assessment as to how the proposed action conforms to each of the goals and objectives as listed in HRS § 205A-2. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. Stormwater Runoff, Erosion Controls, and Protection of Water Resources.
Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; to ensure that the surface water and nearshore marine resources near the coastal area of Kauai remain protected, the negative effects of stormwater inundation resulting from this project should be evaluated in the Draft EA.

   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 surface water resources, soil absorption characteristics of the project area, and examining the amount of permeable versus impervious surfaces. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200-10(7).

   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 that should be used during the design process include:

   - Hawaii Watershed Guidance provides direction on mitigation strategies for urban development activities that will safeguard watersheds and implement watershed plans. http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf

- 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
- 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.

Sincerely,

Leo R. Asuncion
Director

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
April XX, 2018

Mr. Leo Asuncion
Director
State of Hawai‘i Office of Planning
PO Box 2359
Honolulu, HI 96804

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua‘i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua‘i, Hawai‘i

Dear Mr. Asuncion:

Thank you for your letter dated April 18, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation. We offer the following responses in order of your comments:

1. The Draft EA will include a discussion relating to the Hawai‘i State Planning Act pursuant to Hawai‘i Administrative Rules (HAR) 11-200-10(4).

2. The Draft EA will include a discussion relating to the Objectives and Policies of the Hawai‘i Coastal Zone Management Program

3. The Draft EA will include a discussion relating to Stormwater Runoff, Erosion, Controls, and Protection of Water Resources pursuant to HAR 11-200-10(6)

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

DAVID Y. IGE
GOVERNOR

RODERICK K. BECKER
Comptroller

AUDREY HIDANO
Deputy Comptroller

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

(P1111.8

KC

APR 25 2018

RECEIVED
APR 26 2018
WILSON OKAMOTO CORPORATION

Mr. Keola Cheng, Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Cheng:

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kauai High School New Gymnasium
Federal Aid Project No. BR-083-1(57)
Nawiliwili, Kauai, Hawaii
TMK: (4) 3-3-003: 007, 015 and 3-2-004: 005: 010, 011

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

If you have any questions, your staff may call Ms. Gayle Takasaki of the Public Works Division at 586-0584.

Sincerely,

RODERICK K. BECKER
Comptroller

c: Mr. Eric Agena, DAGS Kauai District Office

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
April XX, 2018

Mr. Roderick K. Becker
Comptroller
State of Hawai‘i
Department of Accounting and General Services
PO Box 119
Honolulu, HI 96810

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua‘i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua‘i, Hawai‘i

Dear Mr. Becker:

Thank you for your letter dated April 25, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We acknowledge that the State Department of Accounting and General Services do not have any comments at this time.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
DIR 0364
STP 8.2387

April 18, 2018

KC

Mr. Keola Cheng
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
APR 26 2018
WILSON OKAMOTO CORPORATION

Dear Mr. Cheng:

Subject: Kauai High School New Gymnasium
Environmental Assessment Early Consultation
Nawiliwili, Kauai, Hawaii
TMK: (4) 3-3-003:007, 015 and 3-2-005:010, 011

The Department of Transportation (DOT) understands the Department of Education is proposing to replace an existing gymnasium with a new one at Kauai High School. The project site is within five miles of the Lihue Airport (LIH), and would be accessed via Lala Road from Nawiliwili Road. The proposed 13,750 square feet gymnasium with a seating capacity for 1,500 people will be approximately 45 feet tall.

Our DOT comments on the subject project are as follows:

Airports Division (DOT-AIR)

1. The proposed site is located approximately 1 mile from the end of Runway 21 and 1.5 miles from the end of Runway 35 of LIH. Any proposed development within five miles of an airport is subject to the State of Hawaii, Office of Planning, Technical Assistance Memorandum. You can find out more details through this link: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf.

2. If the proposed development includes photovoltaic (PV) panels, a glint and glare analysis must be submitted for FAA review. This analysis must be submitted with any Form 7460-1 Notice including PV panels. The following website may assist you with preparation of a glint and glare analysis: www.sandia.gov/glare. FAA Form 7460-1 and criteria for its submittal can be found at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

PV systems located in or near the approach path of the aircraft into LIH can create a hazardous condition for a pilot due to possible glint and glare reflected from the PV array. If glint or glare from the PV array creates a hazardous condition for pilots, the owner of the photovoltaic system must be prepared to immediately mitigate the hazard, upon notification by the DOT-AIR or FAA. The FAA has advised us that there can be no glint or glare from the PV array into the Air Traffic Control Tower cab at the Airport.

PV systems have also been known to emit radio frequency interference (RFI) to aviation-dedicated radio signals, disrupting the reliability of air-to-ground communications. The responsible PV system owner shall mitigate any RFI that affects aviation operations.

Highways Division

The traffic assessment should evaluate the intersections at Lala Road and Rice Street and at Lala Road and Nawiliwili Road, though that would be for the operation of the High School. It should also evaluate the manner in which the proposed gymnasium might be utilized and the likely result is that certain kinds of activities may require some kind of traffic control plan. In general, the gym should operate within school hours and probably accommodate existing extra-curricular activities, but it has the potential to accommodate larger functions that the new gym will offer.

If there are any questions, please contact Mr. Blayne Nikaido of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7979.

Sincerely,

JADE T. BUTAY
Director of Transportation

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
April XX, 2018

Ms. Jade T. Butay
Director of Transportation
State of Hawai‘i
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua‘i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua‘i, Hawai‘i

Dear Ms. Butay:

Thank you for your letter dated April 18, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation. We offer the following responses in order of your comments:

1. We acknowledge that the subject project is in proximity to the Līhu‘e Airport and the forthcoming Draft EA will include a discussion relating to the provided Technical Assistance Memorandum and FAA Order 5190.6 B.

2. The design of the proposed gymnasium will not feature the installation of photovoltaic (PV) panels.

3. A Traffic Impact Analysis Report (TIAR) and Transportation Management Plan will be prepared for the proposed action and will be summarized and appended to the forthcoming Draft EA.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

HOUSE OF REPRESENTATIVES

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

Wilson Okamoto Corporation
1907 South Beretania Street
Honolulu, HI 96826
Attention: Mr. Keola Cheng, Project Manager

RE: SUPPORT OF KAUA'I HIGH SCHOOL NEW GYMNASIUM PROJECT

I am writing to express my strong support of the Kaua'i High School New Gymnasium Project, as proposed by the Wilson Okamoto Corporation.

Founded in 1913, Kauai High School is one of the oldest schools in the state. The gymnasium is nearly as old; the current facility was constructed in 1939 and has served as a multi-purpose activity center ever since. As the school has grown and expanded, the needs of the student body have outgrown the modest gym space. Various extracurricular clubs and programs compete for use of the gym, often resulting in situations such as the wrestling program conducting practices in the cafeteria.

I believe that the students and faculty of Kaua'i High School need and deserve a more modern gymnasium that will be better-suited to its various academic and extracurricular uses, from basketball games to community meetings to theater and orchestra performances. The additions of a dedicated wrestling room, locker rooms, storage areas, and other electrical and mechanical utility areas will serve the school well.

Of all the improvements this project would provide, one of the most crucial is its ability to serve as an Enhanced Hurricane Protection Area in the event of a natural disaster. As we have seen in recent months, we have a long way to go in our preparation for emergency situations. A modern facility in a central location, with the ability to provide shelter to the community in times of crisis, will be an invaluable addition to Kaua'i.

Sincerely,

Representative James Kunane Tokioka
Hawai'i State House of Representatives – District 15

Representative James Kunane Tokioka
State Capitol, Room 322 • Honolulu, HI 96813
Phone: (808) 586-6270 • Fax: (808) 586-6271
Email: reptokioka@capitol.hawaii.gov

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
April XX, 2018

Representative James Kunane Tokioka
Hawai‘i State House of Representatives
District 15
Hawai‘i State Capital
415 South Beretania Street
Room 322
Honolulu, HI 96813

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua‘i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua‘i, Hawai‘i

Dear Representative Tokioka:

Thank you for your letter regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We acknowledge that you are in strong support of the proposed project and the features that the new gymnasium can provide for the community.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 27, 2018

Wilson Okamoto Corporation
Attention: Mr. Keola Cheng via email: kauaihighschoolgym@wilsonokamoto.com
1907 South Betretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Cheng:

SUBJECT: Environmental Assessment (EA) Pre-Consultation for **Kauai High School New Gymnasium**

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

At this time, enclosed are comments from the Engineering Division on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

'18 APR 09 AM 10:43 ENGINEERING

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 6, 2018

MEMORANDUM

RECEIVED
LAND DIVISION
2018 APR 19 AM 10:51
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

~~TO:~~ FROM

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

~~FROM:~~ TO: Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Assessment (EA) Pre-Consultation for **Kauai High School New Gymnasium**
LOCATION: Nawiliwili, Island of Kauai; TMKs: (4) 3-3-003:007, 015, and 3-2-005:010, 011
APPLICANT: State Department of Education

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **April 27, 2018**.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

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

Signed: _____

Print Name: Carty S. Chang, Chief Engineer
Date: 4/18/18

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Environmental Assessment (EA) Pre-Consultation for Kauai High School New Gymnasium, Nawiliwili, Island of Kauai;
TMKs: (4) 3-3-003:007, 015, and 3-2-005:010, 011

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 4/12/10

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
May XX, 2018

Mr. Russell Y. Tsuji
Land Administrator
Land Division
State of Hawai‘i
Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua‘i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua‘i, Hawai‘i

Dear Mr. Tsuji:

Thank you for your letter dated April 27, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

The subject project falls within Flood Zone X as designated on FEMA's Flood Insurance Rate Maps and will comply with 44CFR regulations as stipulated in Section 60.12 of the National Flood Insurance Program. The Draft EA will also include a discussion about the water demands and infrastructure to meet the project needs.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

Department of Water County of Kaua'i

Water has no substitute.....Conserve it

May 21, 2018

KC

Mr. Keola Cheng
Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

RECEIVED
MAY 22 2018
WILSON OKAMOTO CORPORATION

Dear Mr. Cheng:

Subject: Pre-Assessment Consultation for Environmental Assessment: Kaua'i High School New Gymnasium, TMK: 3-3-003:007, 015 and 3-2-005:010, 011 Nāwiliwili, Kaua'i

This is in regard to your request dated March 29, 2018. The Department of Water (DOW) has no objections to the draft environmental assessment. The following are our comments to the draft environmental assessment for the proposed Kaua'i High School New Gymnasium Project.

Water service will be limited to the existing water meters serving this parcel. Any actual subdivision or development of this area will be dependent on the adequacy of the source, storage and transmission facilities existing at that time. At the present time, the existing source, storage and transmission facilities are adequate.

Prior to the DOW recommending water meter service or building permit approval, the applicant must:

1. Submit detailed water demand calculations (both domestic and irrigation) along with the proposed water meter size. Water demand calculation submitted by your engineer or architect should also include fixture count and water meter sizing worksheets. The DOW's comments may change depending on the approved water demand calculations.

2. Submit a formal request for water service, if applicable.

3. Prepare and receive DOW's approval of construction drawings for the necessary water system facilities and construct said facilities. These facilities shall include, but not be limited to:

   a) The domestic connection, if applicable.
   b) The fire service connection, if applicable.
   c) The interior plumbing plans with the appropriate backflow prevention device, if applicable.

4. Pay the applicable charges in effect at the time of payment to the DOW. At the present time, these charges shall include the Facilities Reserve Charge (FRC), if applicable.

5. Receive a "Certification of Completion" (COC) notice for the construction of necessary water system facilities from the DOW, if applicable.

If you have further questions, please contact Ms. Regina Flores at (808) 245-5418 or rflores@kauaiwater.org

Sincerely,

for Edward Doi, P.E.
Chief of Water Resources and Planning

EA 3-3-003:007. 015; 3-2-005:010, 011, T-19442, KHS Gymnasium/RF:mja

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
May XX, 2018

Mr. Edward Doi
Chief of Water Resources and Planning
Department of Water
County of Kaua'i
PO Box 1706
Līhu'e, HI 96766

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua'i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua'i, Hawai'i

Dear Mr. Doi:

Thank you for your letter dated May 21, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We understand that the Department of Water (DOW) has no objections to the Draft Environmental Assessment (DEA). We also acknowledge that water service is limited to the existing water meters serving the subject parcel and that at the present time the existing water source, storage, and transmission facilities are adequate. Prior to consulting with DOW for water meter service or a building permit approval, the applicant will follow the listed requirements provided in the comment letter.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

KC

RECEIVED
MAY 07 2018
WILSON OKAMOTO CORPORATION

HRD18-8508

April 30, 2018

Keola Chang
Project Manager
Wilson Okamoto Corporation
1907 South Beretainia Street, Suite 400
Honolulu, HI 96826

Re: Request for Comments on a Pre-Consultation for Draft Environmental Assessment
Kaua'i High School New Gymnasium
Nāwiliwili Ahupua'a, Puna District, Kaua'i Island
Tax Map Key: (4) 3-3-003:007, 029, and 3-2-005:010, 011

Aloha e Keola Chang:

The Office of Hawaiian Affairs (OHA) is in receipt of your March 29, 2018 letter requesting comments in preparation of a draft environmental assessment (DEA) for the new Kaua'i High School gymnasium (gym). The State of Hawai'i Department of Education is proposing this new construction using State land and funds.

The proposed project includes construction of a new metal frame gym, which will also serve as an enhanced hurricane protection area for the community. The new gym will consist of regulation interior court for basketball and volleyball, retractable bleachers and seating for 1,500, wrestling and training rooms, locker and laundry rooms, meeting rooms, support offices, concession space, and equipment and storage areas.

If you have not already done so, OHA recommends consulting with Native Hawaiian Organizations (NHOs), listed in the U.S. Department of the Interior's (DOI) Native Hawaiian Organization List that have expressed interest in the project area. The digital copy of the list is located on the DOI's Office of Native Hawaiian Relations website at www.doi.gov/hawaiian/NHOL. Please note that this list is not comprehensive as additional NHOs may be identified as you move forward with your consultation process.

Mahalo for the opportunity to comment. We look forward to reviewing the DEA. Should you have any questions, please contact Kathryn Keala at (808) 594-0272 or kathyk@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Kamanaopono Crabbe

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:kk

C: Kaliko Santos - Kaua'i Community Outreach Coordinator (via email)

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
May XX, 2018

Mr. Kamanaʻopono M. Crabbe
Ka Pouhana, Chief Executive Officer
State of Hawaiʻi
Office of Hawaiian Affairs
560 N. Nimitz Hwy
Suite 200
Honolulu, HI 96817

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kauaʻi High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kauaʻi, Hawaiʻi

Dear Mr. Crabbe:

Thank you for your letter dated April 30, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We acknowledge that Native Hawaiian Organizations (NHOs) have expressed interest in the project area listed in the U.S. Department of the Interior's Native Hawaiian Organization List. This will be taken into consideration as we move forward in the EA process.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

In Reply Refer To:
01EPIF00-2018-TA-0283

April 30, 2018

Mr. Keola Cheng
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawai‘i 96826

Subject: Kaua'i High School Gymnasium Environmental Assessment

Dear Mr. Cheng

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq*.), as amended and Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712).

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the ‘**Occurs In or Near Project Area’** column. Please note, this list is not comprehensive and should only be used for general guidance.

If you are representing a federal action agency, please use the official species list on our web-site for your section 7 consultation. You can find out if your project occurs in or near designated critical habitat here: https://ecos.fws.gov/ipac/.

Under section 7 of the ESA, it is the Federal agency’s (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project “may affect” federally listed species or designated critical habitat. A “may affect, not likely to adversely affect” determination is appropriate when effects to federally listed species are expected to be discountable (*i.e*., unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a “may affect, likely to adversely affect” determination is made, then the Federal agency must initiate formal

consultation with the Service. Projects that are determined to have “no effect” on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a “may affect, not likely to adversely affect” determination for your project. If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

Island Team Manager
Pacific islands Fish and Wildlife Office

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance, we‘ve marked species that may occur in the vicinity of your project

Scientific Name	**Common Name / Hawaiian Name**	**Federal Status**	**Occurs In or Near Project Area**
Mammals			
Lasiurus cinereus semotus	Hawaiian hoary bat/ `ōpe`ape`a	E	☒
Reptiles			
Chelonia mydas	Green sea turtle/honu - Central North Pacific DPS	T	☐
Erectmochelys imbricate	Hawksbill sea turtle/ honu`ea	E	☐
Birds			
Anas wyvilliana	Hawaiian duck/ koloa	E	☐
Branta sandvicensis	Hawaiian goose/ nēnē	E	☐
Fulica alai	Hawaiian coot/ `alae kea	E	☐
Gallinula galeata sandvicensis	Hawaiian gallinule/ `alae `ula	E	☐
Himantopus mexicanus knudseni	Hawaiian stilt/ ae`o	E	☐
Oceanodroma castro	Band-rumped storm-petrel/ `akē`akē	E	☒
Pterodroma sandwichensis	Hawaiian petrel/ `ua`u	E	☒
Puffinus auricularis newelli	Newell’s shearwater/ `a`o	T	☒
Ardenna pacificus	Wedge-tailed Shearwater/ `ua`u kani	MBTA	☐
Gygis alba	White Tern/ manu-o-kū	MBTA	☐
Buteo solitarius	Hawaiian hawk/ ‘io	E	☐
Insects			
Manduca blackburni	Blackburn’s sphinx moth	E	☐
Megalagrion pacificum	Damselfly, Pacific Hawaiian	E	☐
M. xanthomelas	Damselfly, Orangeblack	E	☐

Below are our general conservation measures to avoid and minimize potential impacts to federally listed species that may occur in your project area:

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.

Endangered Hawaiian petrel (*Pterodroma sandwichensis*), Threatened Newell's shearwater (*Puffinus auricularis newelli*), and Endangered Band-rumped storm-petrel (*Oceanodroma castro*): Newell's shearwaters are found in the highest densities on Kauai with lower densities on all of the other islands, except Lanai. Hawaiian Petrel populations are greatest on Maui, Lanai, and Kauai with lower densities on Hawaii and Molokai. Band-rumped storm-petrels are found in low densities throughout the islands. All islands may experience overflight at night.

For all projects, 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.

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8406-01
May XX, 2018

Mr. Aaron Nadig
Island Team Manager
Pacific Islands Fish and Wildlife Office
United States Department of Interior
Fish and Wildlife Service
300 Ala Moana Boulevard
Room 3-122
Honolulu, HI 96850

Subject: Environmental Assessment (EA) Pre-Assessment Consultation
Kaua'i High School Gymnasium
Tax Map Keys (TMK): 3-3-003:007 and 3-2-005:010, 011
Nāwiliwili, Kaua'i, Hawai'i

Dear Mr. Nadig:

Thank you for your letter dated April 30, 2018 regarding the subject Environmental Assessment (EA) Pre-Assessment Consultation.

We acknowledge that protected species provided, although not comprehensive, may be encountered at the project site. Avoidance, minimization, and conservation measures will be implemented if a protected species is encountered in the project area to minimize and mitigate adverse effects.

Your letter, along with this response, will be reproduced and included in the forthcoming Draft EA.

We appreciate your participation in the EA Pre-Assessment Consultation review process.

Sincerely,

Earl Matsukawa, AICP
Project Manager

Enclosures

cc:

Kaua'i High School New Gymnasium

Draft Environmental Assessment

WILSON OKAMOTO
CORPORATION
INNOVATORS • PLANNERS • ENGINEERS