



JUN 08 2016

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

May 17, 2016

Mr. Scott Glenn
Interim Director, Office of Environmental Quality Control
Department of Health, State of Hawaii
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Re: Wai'anae High School
Athletic Field-Remove/Replace Bleachers
Tax Map Key: 8-5-002: 018 por.
Wai'anae - Kai, District of Wai'anae, O'ahu, Hawaii
DOE Job No. Q85001-15

RECEIVED
16 MAY 25 10:54
OFC. OF ENVIRONMENTAL
QUALITY CONTROL

Dear Mr. Glenn:

The State of Hawaii, Department of Education, has reviewed the Draft Environmental Assessment for the subject project and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish this determination in the next Environmental Notice.

One printed copy of the Draft Environmental Assessment and a CD with the document in PDF format are enclosed. The Environmental Notice publication form will be e-mailed to OEQC.

Should you have any questions or concerns, please contact Robert Purdie, Project Coordinator of the Facilities Development Branch at 586-0448 or via e-mail at robert_purdie@notes.k12.hi.us.

Sincerely,

Duane Y. Kashiwai
Public Works Administrator
Facilities Development Branch

DYK:dw
Enclosures

c: Facilities Development Branch

**AGENCY
PUBLICATION FORM**

JUN 08 2016

Project Name:	Wai'anae High School Athletic Field Remove/Replace Bleachers
Project Short Name:	WHS Bleacher Project
HRS §343-5 Trigger(s):	§343-5(a)(1) Propose the use of state or county lands or state or county funds
Island(s):	O'ahu
Judicial District(s):	Wai'anae
TMK(s):	8-5-002: 018 por.
Permit(s)/Approval(s):	Special Management Area, Variance from Pollution Control (Noise), Building, Grading, Grubbing, and Stockpiling
Proposing/Determining Agency:	Department of Education State of Hawai'i
Contact Name, Email, Telephone, Address	Robert Purdie Facilities Development Branch PO Box 2360 Honolulu, Hawai'i 96804 T: 586-0448 E: Robert_Purdie/FacilDev/HIDOE@note.k12.hi.us
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Gerald Park Urban Planner
Contact Name, Email, Telephone, Address	Gerald Park 95-595 Kanamee Street, #324 Mililani, HI 96789 T: 625-9626 E: gpark@gpup.biz

RECEIVED
16 MAY 25 10:54
OFC. OF ENVIRONMENTAL QUALITY CONTROL

Status (select one)

DEA-AFNSI

Submittal Requirements

Submit 1) the proposing 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.

FEA-FONSI

Submit 1) the proposing 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 FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.

FEA-EISPN

Submit 1) the proposing 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 FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.

Act 172-12 EISPN ("Direct to EIS")

Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.

DEIS

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.

FEIS

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.

FEIS Acceptance Determination

The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the

FEIS; no comment period ensues upon publication in the Notice.

FEIS Statutory
Acceptance

Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.

____ Supplemental EIS
Determination

The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.

____ Withdrawal

Identify the specific document(s) to withdraw and explain in the project summary section.

____ Other

Contact the OEQC if your action is not one of the above items.

Project Summary

The Department of Education proposes improvements at Waianae High School Athletic Field. The action will remove existing wood and steel bleachers on the Visitor's side of the field and replace them with new aluminum bleachers featuring 15-tier seating, space for 17 wheelchairs, ADA accessibility, and seating for up to 2,065 spectators.

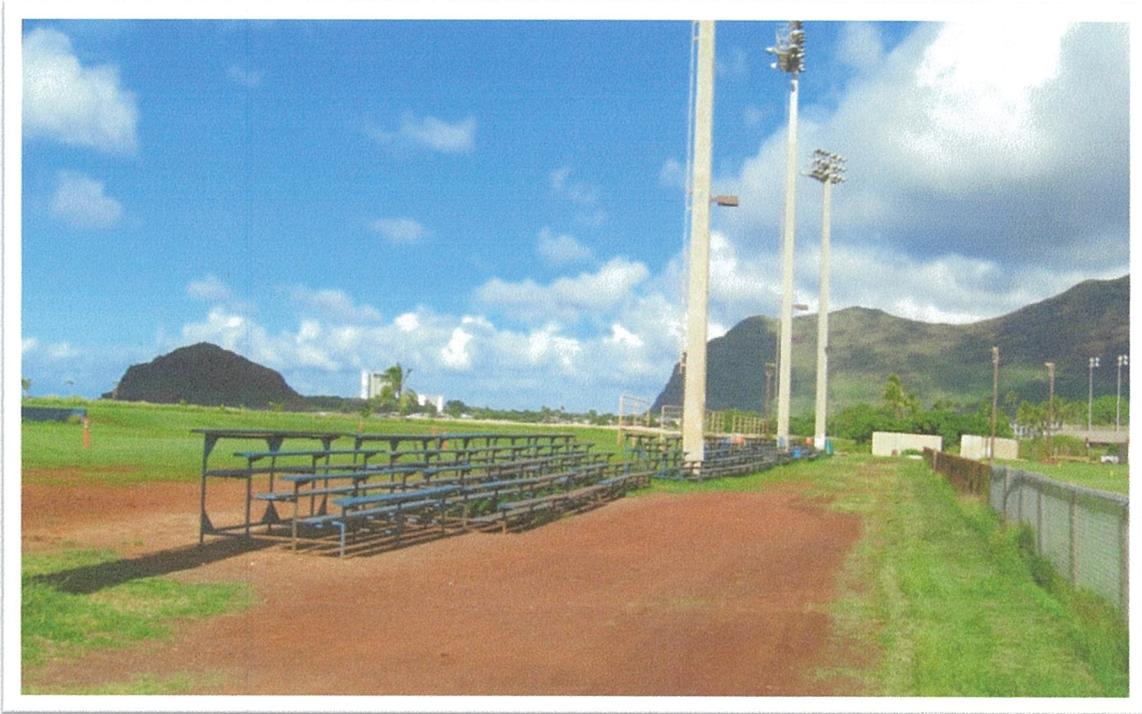
The project also proposes constructing a new accessible walkway from the Makaha end of the field (in the vicinity of a concession stand) to the Visitor's bleachers and to a performance stage behind the Visitor's bleachers and replacing two concrete athletic field light poles with two new steel poles of the same nominal height in back of the new bleachers.

The cost of the project is estimated at \$1.66 million. Construction will commence after all approvals are received and should take 12 months to complete.

DRAFT ENVIRONMENTAL ASSESSMENT

**WAI'ANAE HIGH SCHOOL ATHLETIC FIELD
REMOVE/REPLACE BLEACHERS**

Wai'anae-Kai, District of Wai'anae, O'ahu, Hawai'i



Prepared for:

Department of Education
State of Hawai'i
Facilities Development Branch
PO Box 2360
Honolulu, HI 96804

May 2016

DRAFT ENVIRONMENTAL ASSESSMENT

**WAIANAЕ HIGH SCHOOL ATHLETIC FIELD
REMOVE/REPLACE BLEACHERS**

Wai'anae Kai, District of Wai'anae, O'ahu, Hawai'i

Prepared in Partial Fulfillment of the Requirements of Chapter 343, Hawai'i Revised Statutes

Prepared For:

Department of Education
State of Hawai'i
Facilities Development Branch
PO Box 2360
Honolulu, HI 96804

Prepared By:

Gerald Park Urban Planner
95-595 Kaname'e Street, #324
Mililani, Hawai'i 96789

And

WTN Architecture, Inc.
650 Iwilei Road, Suite 260
Honolulu, Hawai'i 96817

May 2016

PROJECT PROFILE

Project: Waia'anae High School
Athletic Field Remove/Replace Bleachers
DOE Job No. Q85001-15

Street Address: Wai'anae High School
85-251 Farrington Highway
Wai'anae, O'ahu, Hawai'i

Proposing/Determining Agency: Department of Education
Facilities Development Branch
State of Hawai'i
P.O. Box 2360
Honolulu, Hawai'i 96804

Tax Map Key: 8-5-002: 018 por.
Land Area: 23.8 acres
Land Owner: State of Hawai'i

State Land Use Designation: Urban
General Plan: Rural
Sustainable Communities Plan: Wai'anae
SCP Land Use Map: Rural Residential
Zoning: P-2 General Preservation
Special Management Area: Inside Special Management Area

Existing Use: Wai'anae High School Athletic Field

Need for Environmental Assessment: Chapter 343, Hawai'i Revised Statutes
§343-5(a)(1) Propose the use of state or
county lands or state or county funds

Anticipated Determination: Finding of No Significant Impact

Project Contact: Robert W. Purdie, Jr.
Department of Education
State of Hawai'i
Facilities Development Branch
PO Box 2360
Honolulu, Hawai'i 96804

Phone: 586-0448

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SECTION 1 DESCRIPTION OF THE PROPOSED ACTION

The Department of Education, State of Hawai'i, proposes to upgrade spectator facilities on the athletic field at Wai'anae High School, located at Wai'anae-Kai, District of Wai'anae, O'ahu, Hawai'i. Wai'anae High School ("School") is bounded by Farrington Highway on the north, undeveloped land previously called Wai'anae Regional Park on the east, the Pacific Ocean on the south, and the Makaha Surfside a low-rise multi-unit housing development on the west.

The School comprises two separate lots. One lot bearing tax map key 8-5-002: 018 with an area of 23.8 acres is owned by the State of Hawai'i. The second lot is owned by the City and County of Honolulu and bears tax map key 8-5-015: 001 with a land area of 14.06 acres.

Located on the *makai* or oceanside section of the campus, the athletic field is situated on parcel 018 owned by the State of Hawai'i. A Vicinity Map and Tax Map are shown as Figures 1 and 2.

A. Purpose of the Proposed Action

The purpose of the action is to improve spectator seating by replacing old, portable wooden bleachers with new aluminum bleachers. The existing five-tier visitor's bleachers on the *makai* side of the athletic field provide insufficient seating capacity for well-attended football games. The existing bleachers, built in the 1960's, were last repaired from hurricane damage in 1983. They are in poor condition due to weathering and the salt-air environment. Further, the 5-tier bleachers are non-elevated and located directly in back of the football team benches and existing light poles that block spectator views of the field.

B. Technical Characteristics

The project proposes:

- a) Removing and replacing 22 existing metal framed wooden bleachers, each with 45 person capacity, on the visitor's side of the field;
- b) Replacing two concrete athletic field light poles with two new steel poles in back of the new bleachers so as to not block view; and
- c) Constructing a new accessible walkway from the Makaha end of the field (in the vicinity of a concession stand) to the visitor's bleachers and to a performance stage behind the visitor's bleachers.

The existing wooden bleachers will be removed and a continuous concrete pad approximately 280'L X 31'W will be constructed on the same location as the existing bleachers. The pad will accommodate new aluminum bleachers and 11'-0" and 5'-0" wide on-grade ADA walkways. The walkways extend the length of the bleachers providing at-grade walking and standing room in front of the bleachers and existing track and at the back of the bleachers. A Site Plan is shown as Sheet A-101 and Elevated Bleacher Plan as Sheet C-201.

The new bleachers consist of five (5) aluminum sections typically 36'-8"L x 30'-0"W and two (2) 16'0" long end sections. The new bleachers stretch almost the entire length of the football field between the 10 yard lines (c. 240 feet). Each section provides 15 elevated tiers that in total can seat about 2,065 spectators with space for 17 wheelchairs. Seating areas are elevated above grade such that the lowest tier is 3'0" above grade and the highest 13'-5". A Partial Elevation Plan is shown as Sheet A-201.

Stairs and accessible ramps will be provided at both ends. In section view (Sheet A-203) a 5'-4" wide elevated walking space fronts the lowest seating tier. Cross aisles/steps (5'-4" wide) to seating areas also are provided between bleacher sections.

Bleacher parts and materials (frames, planks, seat and foot boards, railings, and ADA ramps, etc.) will be fabricated stateside, transported to the field, and assembled on-site. Anchor bolts will secure the bleachers to the concrete pad.

Two (of four) existing 87-foot high field light poles and light fixtures will be removed and replaced by two new light poles approximating the height (nominal height of 90-feet) and function of the existing poles (See Sheets A-201 and Sheet E-7). The existing two poles are positioned on the 30-yard lines and will be relocated 45± feet directly behind the bleachers in line with the 30-yard lines. The relocated poles will provide unobstructed viewing of the field from the bleachers. New LED light fixtures will be mounted on the new poles. Minor trenching will be required to underground electrical conduits and connection to the existing electrical system.

Minor grubbing and grading will be required to construct the proposed ADA compliant walkways. The area to be graded for the bleacher pad and walkway is estimated at 0.5 acres (21,600 square feet). Earthwork quantities are estimated at 200 cubic yards of excavation and 25 cubic yards of embankment (Hida Okamoto, 2016). An Erosion Control, Demolition, and Grading and Drainage Plan is shown as Sheet C-102.

Improvements to the athletic field and track oval are not proposed.

Two underground irrigation water lines passing under the bleachers to the grass lawn and performance state will be rerouted around the new bleacher foundation and reconnected to their former service (See Sheet C-103).

C. Economic Characteristics

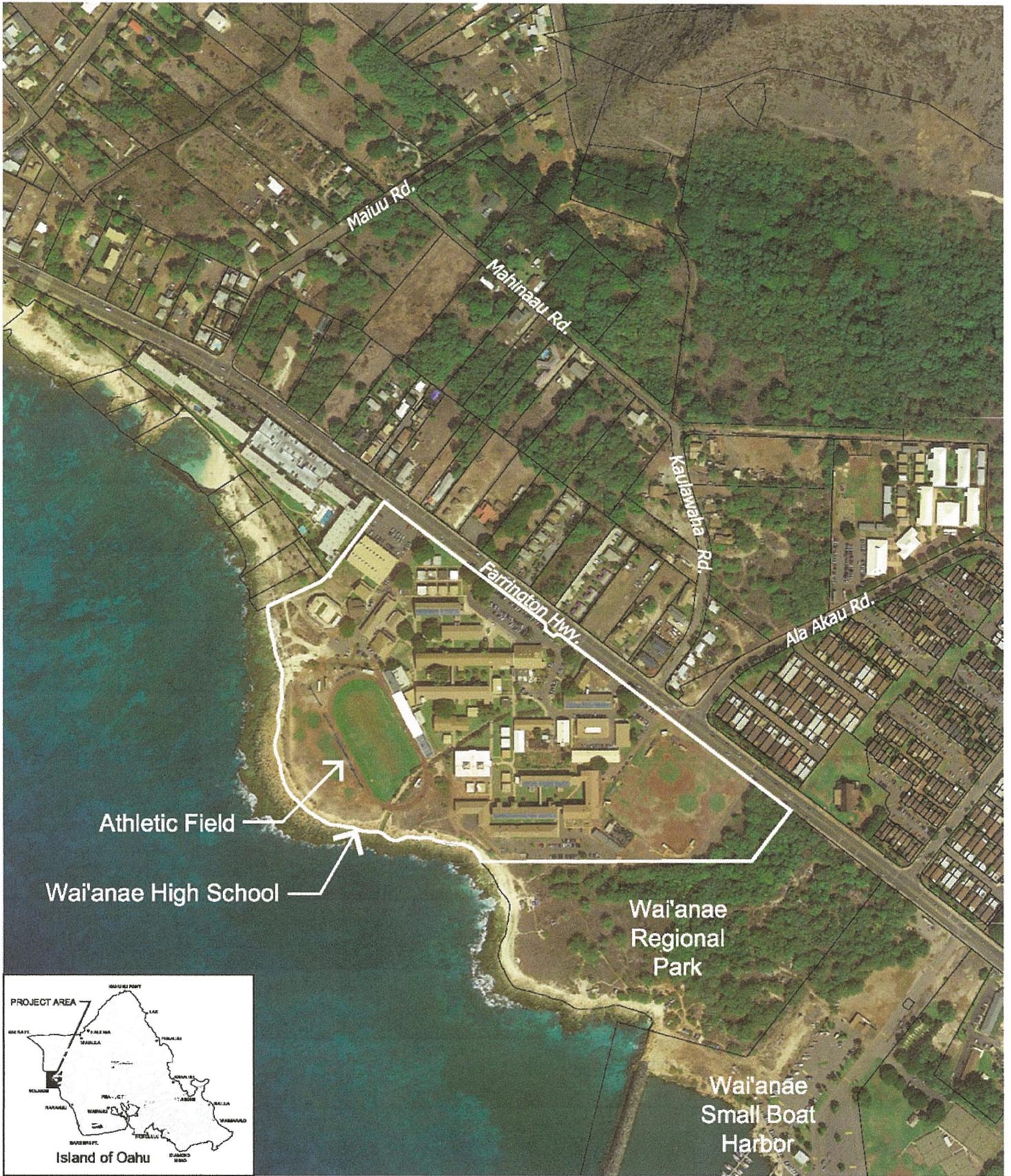
The cost of the project is estimated at \$1,660,000.00 and will be funded by the State of Hawai'i. The improvements will be constructed in one phase projected at twelve (12) months to complete. Work will commence after all permits and approvals have been received.

D. Social Characteristics

The proposed action will not permanently displace any school activity conducted on the athletic field. For the short-term the contractor, School administrators, P.E. instructors, and coaches will coordinate construction and field use for school activities and sport team use.

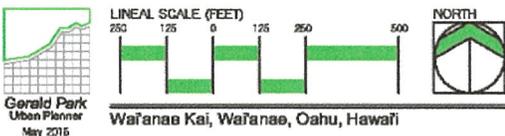
Figure 1

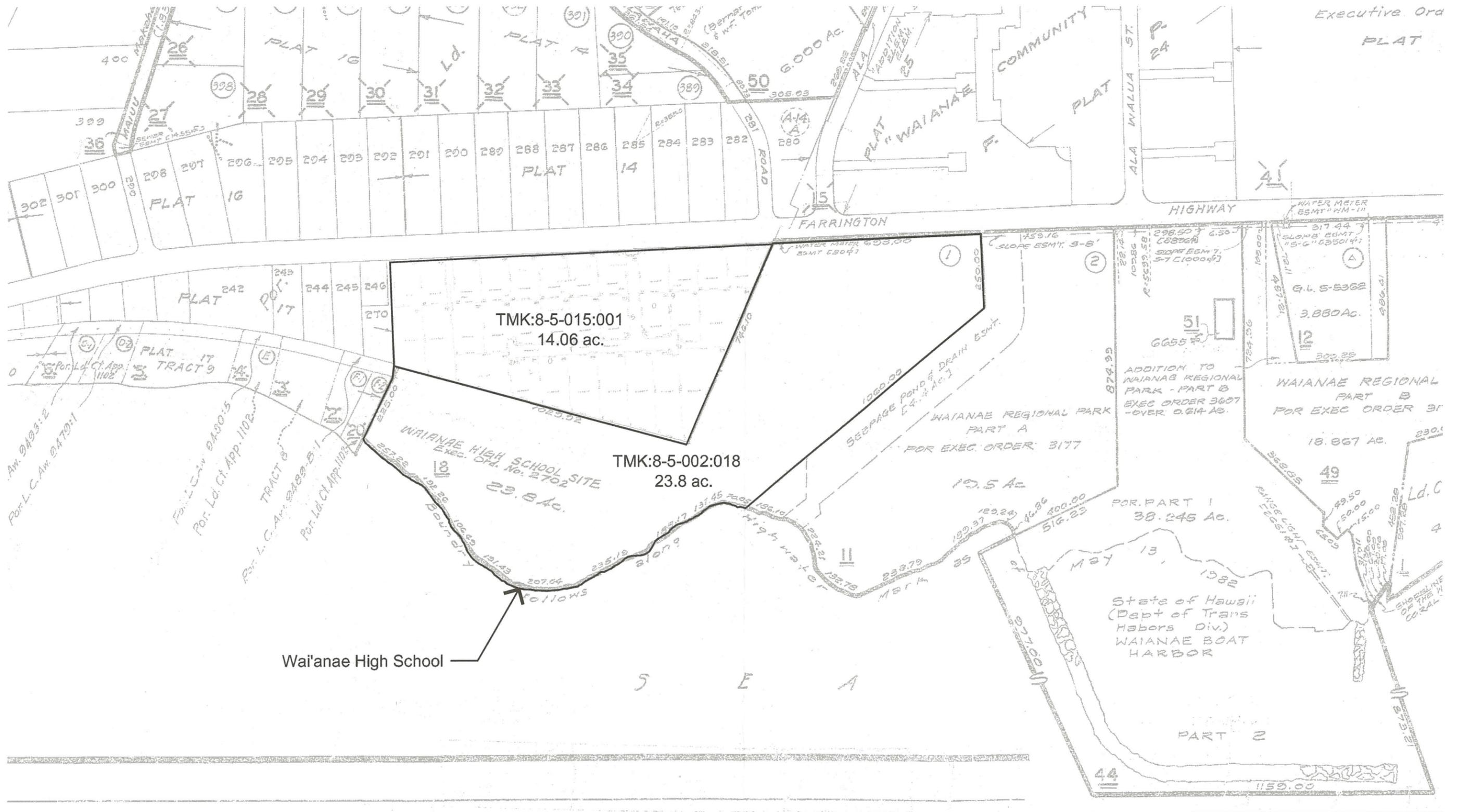
Vicinity Map



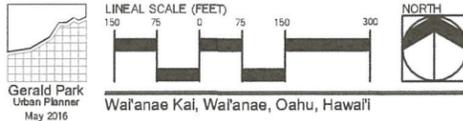
Source: USGS, Wai'anae Quadrangle

Figure 1
Vicinity Map
Wai'anae High School Athletic
Field Remove/Replace Bleachers





Source: USGS, Wai'anae Quadrangle

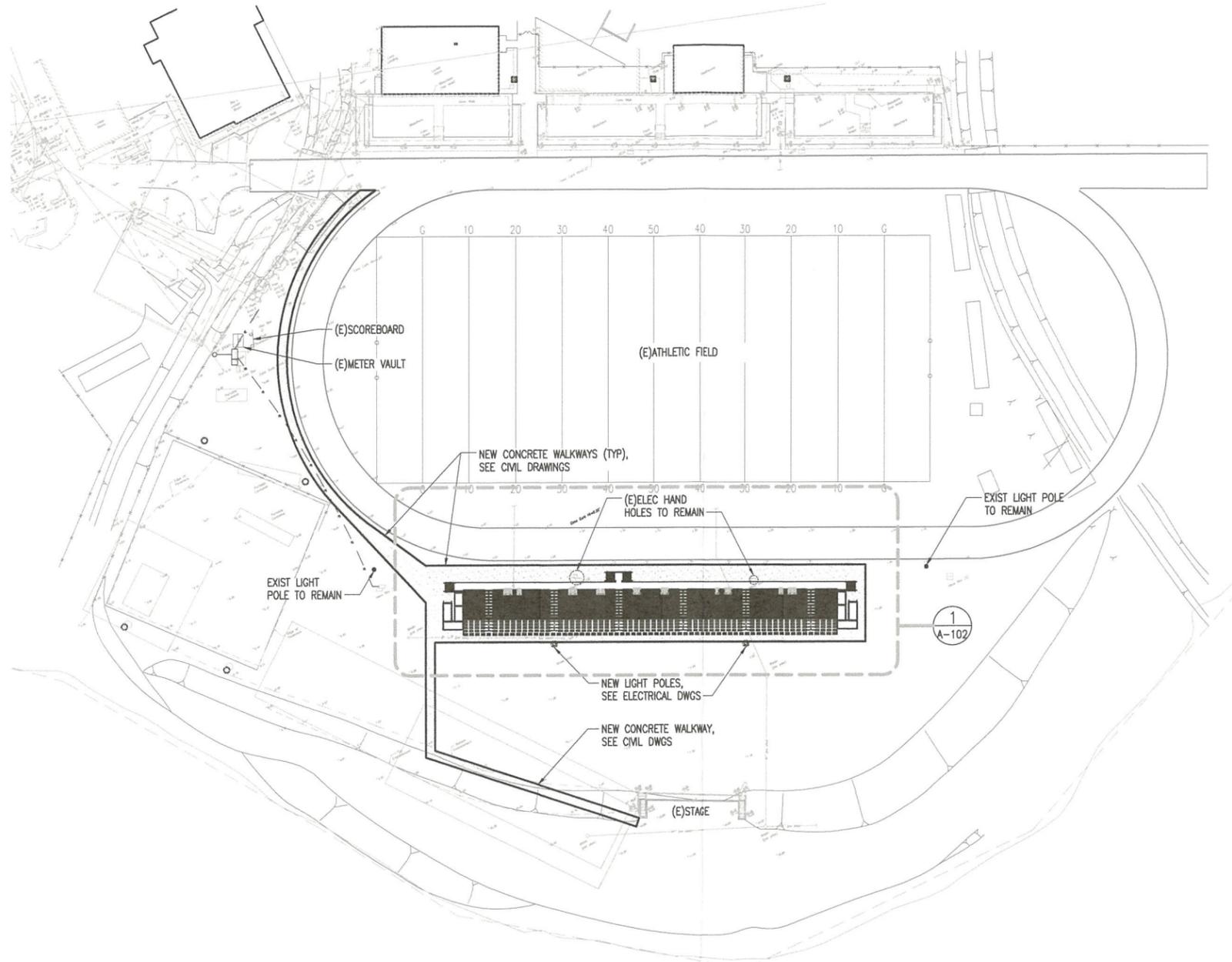


Gerald Park
 Urban Planner
 May 2016
 Wai'anae Kai, Wai'anae, Oahu, Hawaii

Figure 2
 Tax Map
 Wai'anae High School Athletic
 Field Remove/Replace Bleachers

Department of Education, State of Hawaii

p:\w-15-203-01 - waianae hs bleachers\Cadd\WHS Bleachers - New site plan.dwg, 5/9/2016 3:19:16 PM



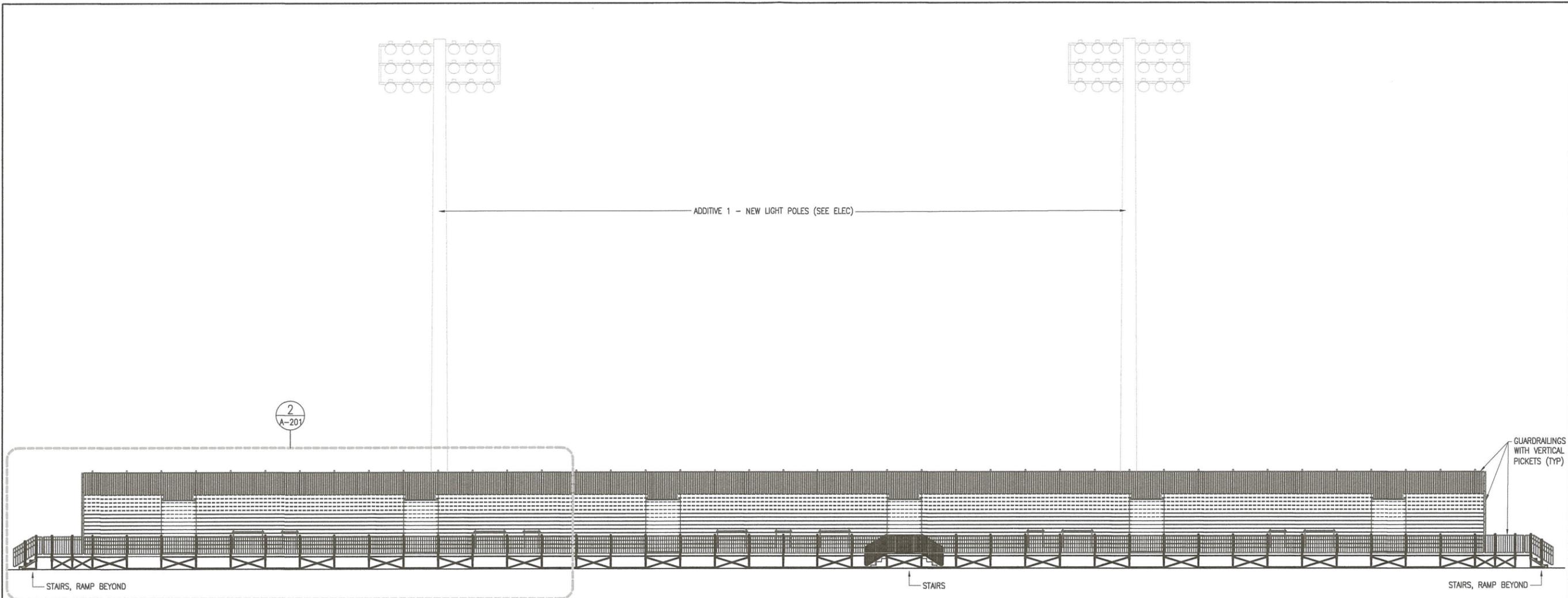
1
A-101 NEW ARCHITECTURAL SITE PLAN

SCALE: 1"=40'

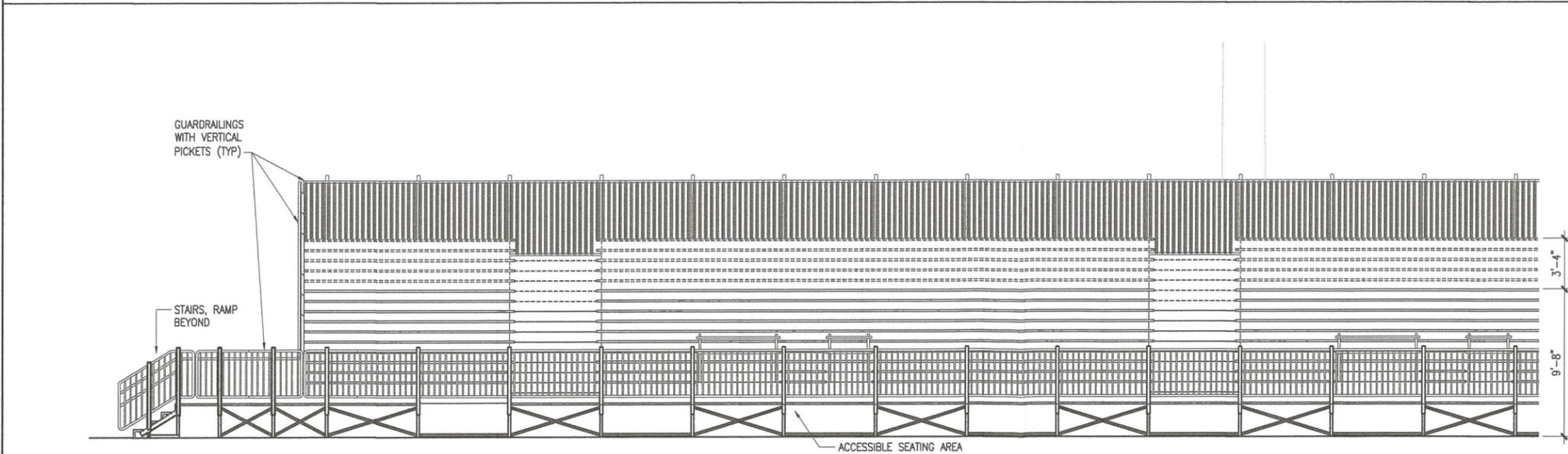


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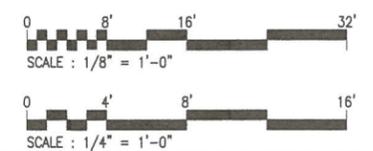
		DEPARTMENT OF EDUCATION STATE OF HAWAII		
		WAIANAE HIGH SCHOOL ATHLETIC FIELD - REMOVE/REPLACE BLEACHERS		
WAIANAE	OAHU	HAWAII	NEW ARCHITECTURAL SITE PLAN	
WTN ARCHITECTURE, INC		JOB NO. Q85001-15	DRAWING NO. A-101	
DESIGNED BY: CM	CHECKED BY: WN	DATE MAY 2016	SHEET 9 OF 33 SHEETS	
DRAWN BY: CM	APPROVED BY: WN	SCALE: AS NOTED	FILE _____ DRAWER _____ FOLDER _____	



1 BLEACHER ELEVATION - FRONT
A-201 SCALE: 1/8"=1'-0"



2 PARTIAL ENLARGED ELEVATION
A-201 SCALE: 1/4"=1'-0"

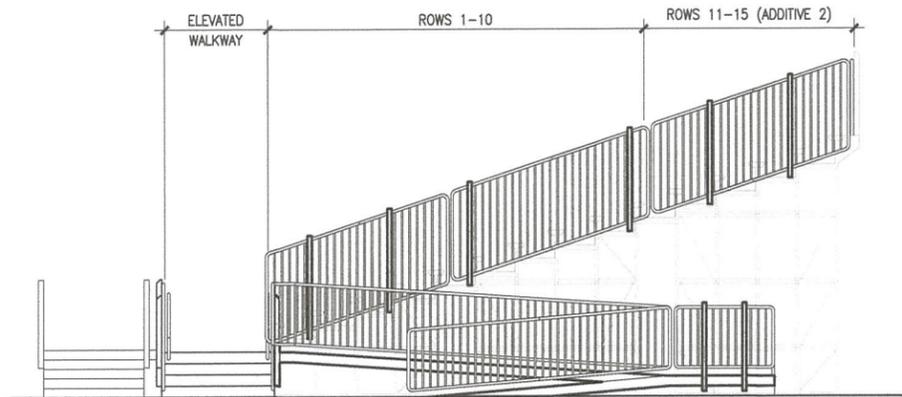


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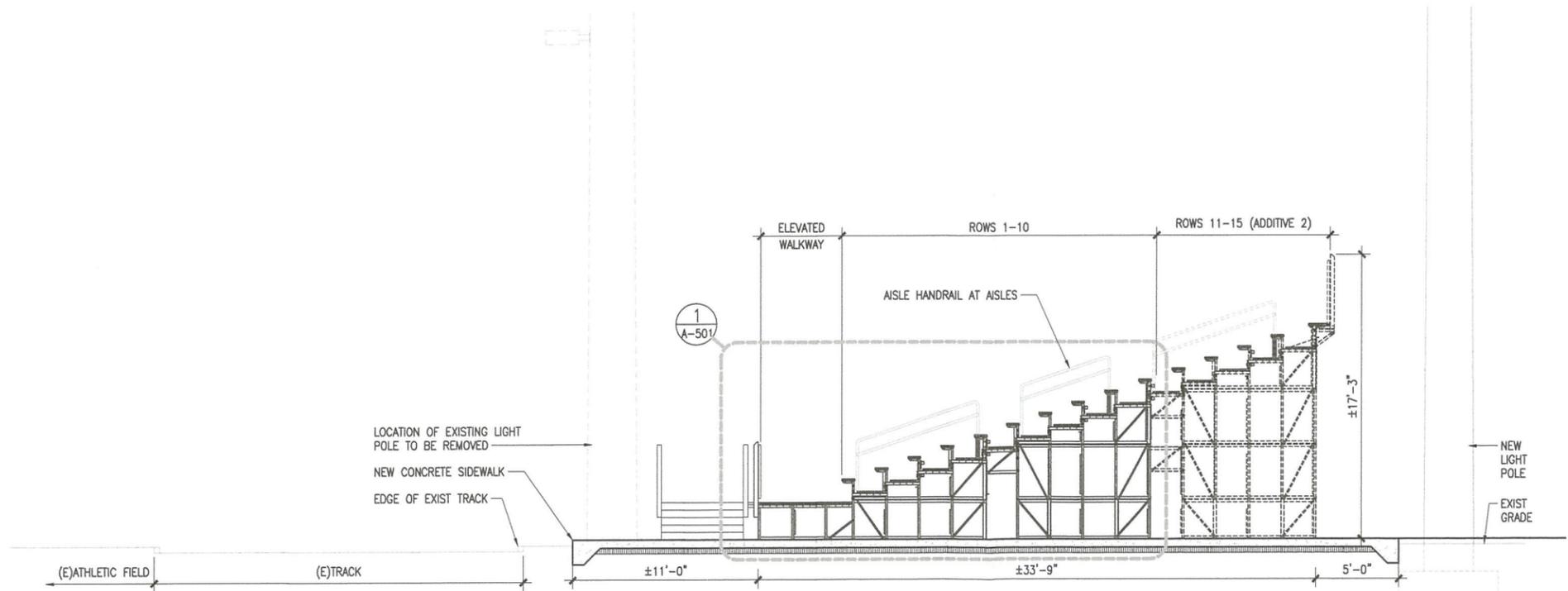
	DEPARTMENT OF EDUCATION STATE OF HAWAII		
	WAIANAHE HIGH SCHOOL ATHLETIC FIELD - REMOVE/REPLACE BLEACHERS		
	WAIANAHE	OAHU	HAWAII
BLEACHER ELEVATIONS			
DESIGNED BY: CM DRAWN BY: CM	CHECKED BY: WN APPROVED BY: WN	JOB NO.: Q85001-15 DATE: MAY 2016	DRAWING NO.: A-201 SHEET: 15 OF 33 SHEETS
WTN ARCHITECTURE, INC SCALE: AS NOTED		FILE: _____ DRAWN: _____ FOLDER: _____	This work was prepared by me or under my supervision and construction of this project will be under my observation.

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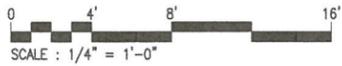
FINAL



1 BLEACHER ELEVATION - SIDE
A-203 SCALE: 1/4"=1'-0"



2 BLEACHER SECTION
A-203 SCALE: 1/4"=1'-0"



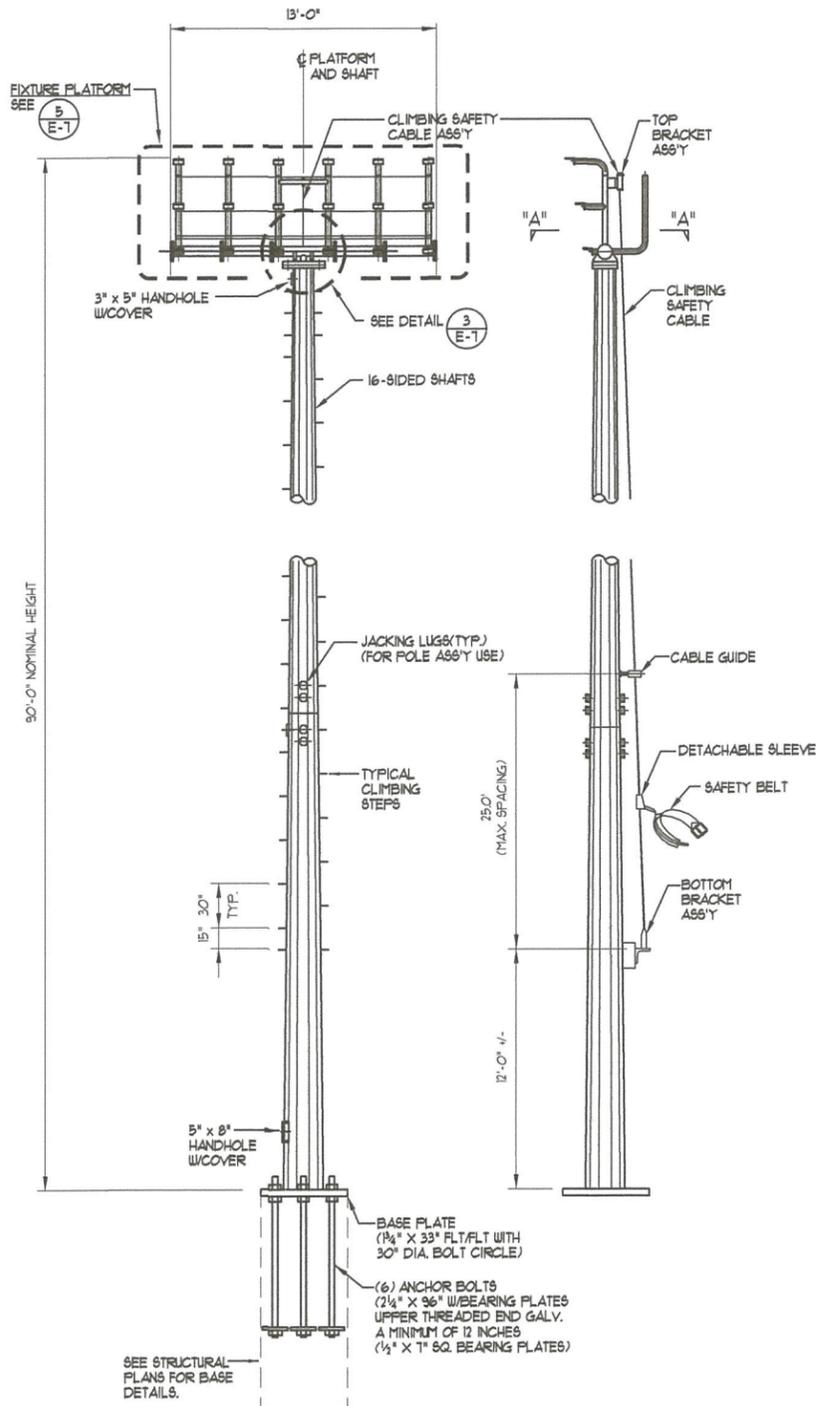
REVISION NO.	DATE	DESCRIPTION	SHT OF	DATE
DEPARTMENT OF EDUCATION STATE OF HAWAII WAIANAE HIGH SCHOOL ATHLETIC FIELD - REMOVE/REPLACE BLEACHERS WAIANAE OAHU HAWAII				
BLEACHER ELEVATION & SECTION				
WTN ARCHITECTURE, INC DESIGNED BY: CM DRAWN BY: CM		CHECKED BY: WN APPROVED BY: WN		JOB NO. Q85001-15 DATE MAY 2015
WTN ARCHITECTURE, INC FILE _____ DRAWER _____ FOLDER _____		DRAWING NO. A-203 SHEET 17 OF 33 SHEETS		

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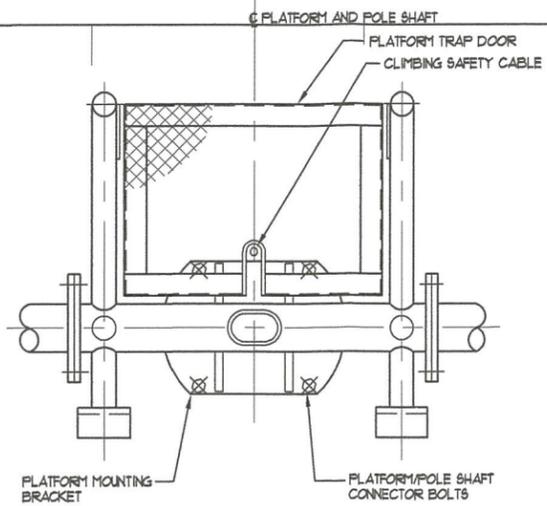
FINAL

NOTES:

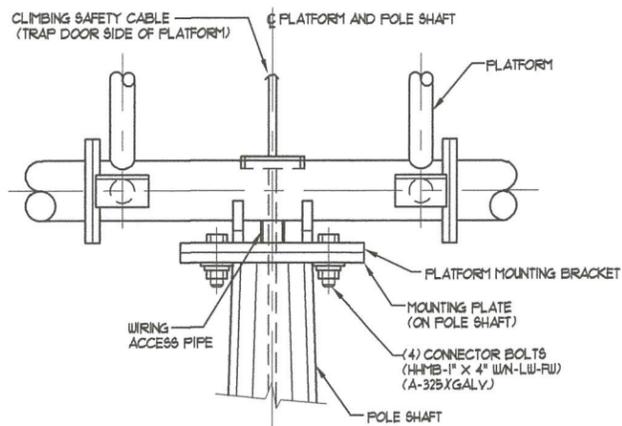
1. POLE SHAFT SHALL MEET - ASTM A-512 (65 KSI. MIN. YIELD)
2. BASE PLATE SHALL MEET - ASTM A-512 (50 KSI. MIN. YIELD)
3. ANCHOR BOLTS SHALL MEET - FB54 (60 KSI. MIN. YIELD)
4. PLATFORM PIPE SHALL MEET - ASTM A-53, Gd B
5. PLATFORM STRUCTURAL SHAPES AND PLATES SHALL MEET - ASTM A-36
6. STRUCTURES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.



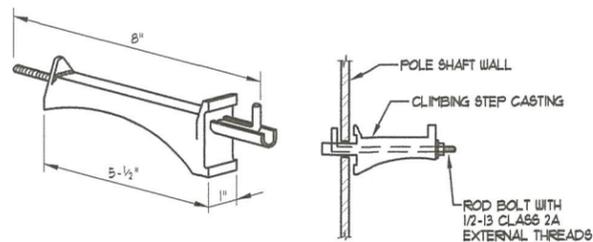
1 FLOODLIGHT POLE ELEVATION
E-7 NOT TO SCALE



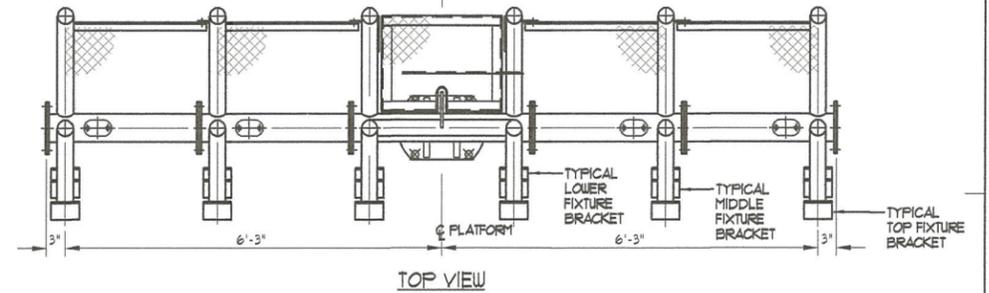
2 SECTION "A" - "A"
E-7 NOT TO SCALE



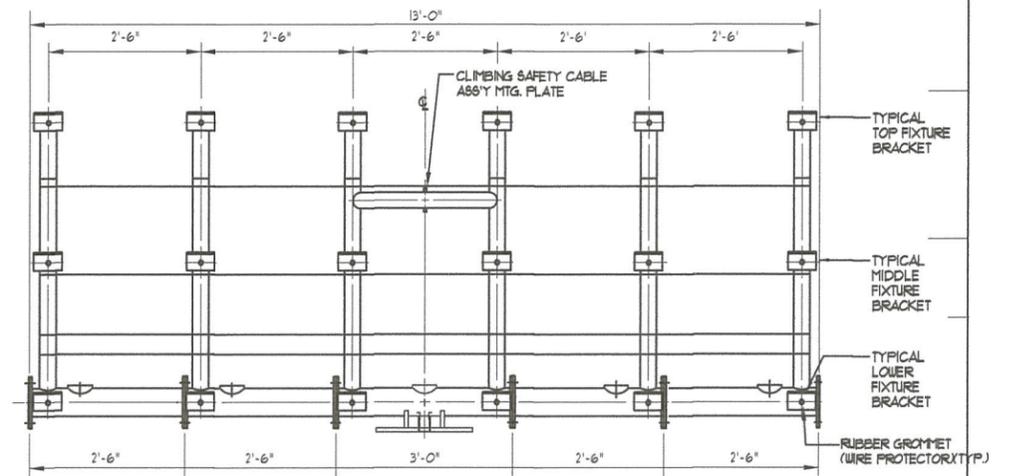
3 PLATFORM/POLE SHAFT CONNECTION
E-7 NOT TO SCALE



4 CLIMBING STEP AND MOUNTING DETAIL
E-7 NOT TO SCALE



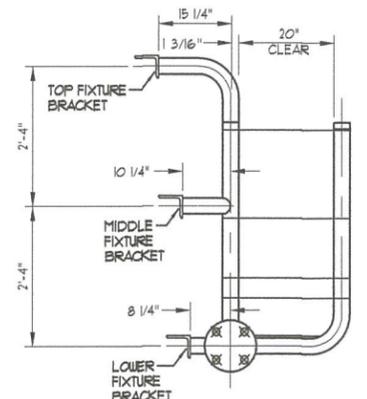
TOP VIEW



FRONT VIEW

NOTES:

1. MATERIAL, WORKMANSHIP AND WELDING SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE 'AMERICAN WELDING SOCIETY SPECIFICATION AWS D11', LATEST EDITION.
2. ALL WELDS TO BE VISUALLY INSPECTED AND SHALL BE FREE FROM CRACKS, EXCESSIVE UNDERCUT AND POROSITY.
3. ALL WELDING DEFECTS SHALL BE REPAIRED BY REMOVING THE DEFECTIVE MATERIAL AND REPLACING IT WITH SOUND WELD MATERIAL.
4. ENTIRE ASSEMBLY TO BE COATED BRONZE TO MATCH THE SHAFT FINISH OF WEATHERING STEEL.
5. PIPE SHALL MEET - ASTM A-53, Gd B
6. STRUCTURAL SHAPES SHALL MEET - ASTM A-36
7. PLATE SHALL MEET - ASTM A-36



SIDE VIEW

5 DETAIL - FIXTURE PLATFORM
E-7 NOT TO SCALE

REVISION NO.	DATE	DESCRIPTION	SHEET NO.	DATE

EXPIRES 4/30/18
This work was prepared by me or under my supervision and construction of this project will be under my observation.

DEPARTMENT OF EDUCATION
STATE OF HAWAII

WAIANA'E HIGH SCHOOL
ATHLETIC FIELD REMOVE/REPLACE BLEACHERS

WAIANA'E OAHU HAWAII

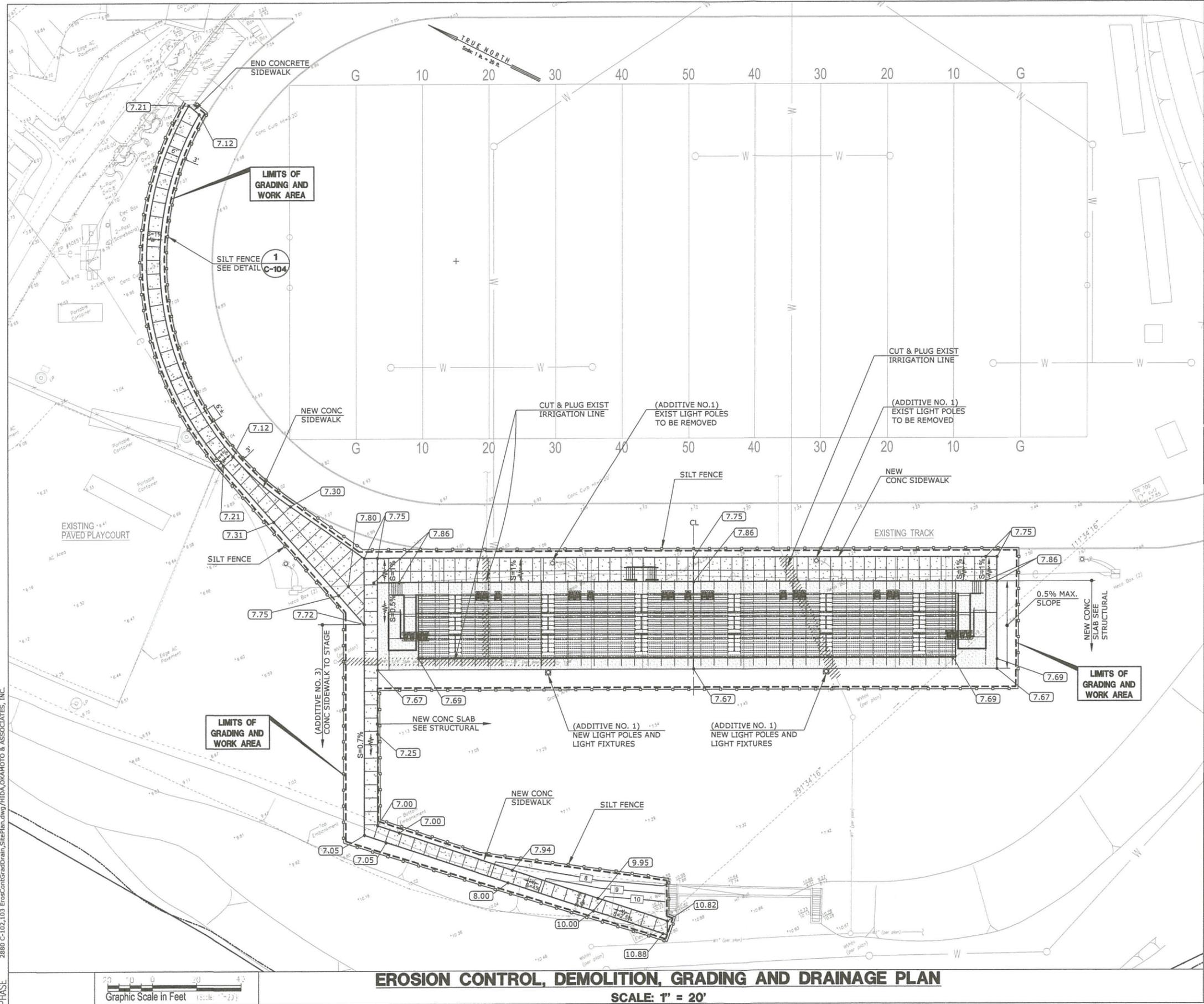
FLOODLIGHT POLE DETAILS

H & O - III, INC.

DESIGNED BY: BI CHECKED BY: SM JOB NO.: Q85001-15 DRAWING NO.: E-7

DRAWN BY: AC APPROVED BY: BI DATE: APRIL 2016 SHEET: 1 OF 1

SCALE: AS NOTED FILE: DWG: FOLDER: 559.023



EXISTING	DESCRIPTION	NEW
---	CONTOURS	---(40)---
---(38.27)---	SPOT GRADE	---(40.50)---
---	SILT FENCE	---o---o---
---	LIMITS OF GRADING	---o---o---
---	LIMITS OF DISTURBED AREA	---o---o---
---	PROPERTY LINE	---
---	DRAINAGE FLOW	--->---
---	WATERLINE	---
---	SEWER LINE	---
---	DRAIN LINE	---

- EROSION CONTROL/BEST MANAGEMENT PRACTICE NOTES**
1. EROSION CONTROL MEASURES SHALL BE INSTALLED BEFORE GRADING WORK COMMENCES AND MAINTAINED UNTIL COMPLETION OF GRADING WORK.
 2. CONSTRUCTION ACCESS PAD SHALL BE INSTALLED AT ENTRANCE TO THE CONSTRUCTION SITE TO PROTECT ROADS FROM MUD, DIRT AND ROCKS.
 3. THE SILT FENCE SHALL BE INSTALLED BEFORE ANY GRADING OPERATIONS AND SHALL BE MAINTAINED UNTIL COMPLETION OF CONSTRUCTION ACTIVITIES.
 4. CONTRACTOR SHALL DESIGNATE AN INDIVIDUAL TO BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL AND SHALL MAINTAIN A LOG OF INSPECTION AND REPAIR.
 5. CONTRACTOR TO PERIODICALLY INSPECT CONSTRUCTION ACCESS PAD AND SILT FENCE;
 - a. DRY PERIODS - WEEKLY BASIS.
 - b. RAINFALL OF 0.5 INCH OR GREATER - WITHIN 24 HOURS.
 - c. PROLONGED RAINFALL - DAILY.
 6. THE FINAL LIFT OF EACH DAYS WORK SHALL BE COMPACTED TO PREVENT EROSION OF FILL MATERIALS.
 7. THE CONTRACTOR SHALL DISPOSE OF VEGETATION AND EQUIPMENT AND HYDRAULIC OF FILL MATERIALS.
 8. NO OIL FUEL SHALL BE STORED ON SITE.
 9. ALL EQUIPMENT SHALL BE SERVICED IN A CONFINED AREA AND ALL FLUIDS SHALL DRAIN INTO PANS FOR HANDLING.
 10. ALL EXPOSED AREAS TO BE GRASSED OR PAVED UPON COMPLETION OF GRADING WORK.

- DUST CONTROL**
1. THE CONTRACTOR SHALL CONTROL DUST AT ALL TIMES. WATER USED FOR DUST CONTROL SHALL NOT BE ALLOWED TO FLOW OFFSITE.
 2. PROVIDE ADDITIONAL PROTECTION AS REQUIRED FOR CLASSROOM LOUVERS FROM DUST.

EARTH WORK QUANTITIES (ESTIMATED FOR PERMIT PURPOSES ONLY)	
AREA TO BE GRADED	0.50 AC
EXCAVATION	200 CY
EMBANKMENT	25 CY

		DEPARTMENT OF EDUCATION STATE OF HAWAII WAIANAE HIGH SCHOOL ATHLETIC FIELD REMOVE/REPLACE BLEACHERS	
WAIANAE OAHU HAWAII		EROSION CONTROL, DEMOLITION, GRADING AND DRAINAGE PLAN	
DESIGNED BY: ATO DRAWN BY: QJP	CHECKED BY: HKH APPROVED BY: HKH	JOB NO.: Q85001-15 DATE: MARCH 2016	DRAWING NO.: C-102 SHEET: 4 OF 33
SCALE: AS NOTED		FILE: DRAWER: FOLDER:	

EROSION CONTROL, DEMOLITION, GRADING AND DRAINAGE PLAN
 SCALE: 1" = 20'



PHASE 2880 C-102.103 ErosionControlPlan.dwg / HIDA, OKAMOTO & ASSOCIATES, INC.

SECTION 2 DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Existing Conditions

Wai'anae High School, home of the Seariders, is located on the western edge of Wai'anae Town on the Island of O'ahu, Hawai'i. Wai'anae Town is located between the Leeward Oahu communities of Makaha on the west and Mā'ili on the east.

The School opened in 1957 at its present location with sparse but essential facilities for a new school. At that time the physical plant comprised 6 permanent classroom buildings, a serving kitchen, administration building, separate PE locker rooms for boys and girls, 3 portable classroom buildings, and an athletic/track field. Today, the campus features 24 permanent buildings, 24 portables, athletic facilities, and support facilities.

The School is part of the Nānākuli-Wai'anae Complex Area consisting of elementary, middle, and high schools on the Leeward Coast. The Wai'anae Complex comprises Leihoku Elementary, Mā'ili Elementary, Makaha Elementary, Wai'anae Elementary, Wai'anae Intermediate, and Wai'anae High Schools. Elementary schools "feed" students to the intermediate school which in turn "feed" students into high school.

In school year 2013-2014 Wai'anae High School enrolled 1,795 students taught by 118 full time teachers. Administrative and clerical staff, cafeteria positions, maintenance, security, teacher's aides, counselors, and specialty positions add to the overall full and part-time staffing.

The Seariders compete athletically in the Western Division of the O'ahu Interscholastic Association. Varsity football and soccer (men's and women's) home games are played at night (typically 5 games per season/team/sport). The football season runs from August to November and soccer from December to February. Junior Varsity football home games are played during the afternoon. The field and track are used for track and field competitions.

The athletic field and track was built in 1957 (Department of Education). Early on spectators sat on wooden bleachers on the Home and Visitors sides. Permanent seating was constructed on the Home side in 1970 with sections replaced between 2004 and 2011.

An existing typical bleacher section is shown as Photograph 1. The five-tier, 15-foot long section consists of wood planks (for seating and walking) bolted to metal frames. The bleachers are portable and rearranged as needed. When configured for football the bleachers can seat up to 990 spectators.



Photograph 1. Typical Bleacher Section.



Spectators enter the field from the Home side. The Visitors side is gained by walking around the end zone and concession stand on the Makaha (or east) end of the field. In the absence of a paved walkway, people walk on a section of the track (Photograph 2) and in front of the bleachers (Cover Photograph). In addition there is no walkway to a performance stage and grass lawn *makai* of the bleachers.

Photograph 2. Concession Stand with Section of Track Used as Walkway.

The grass lawn and open space is used for the School's commencement exercise. Graduating students assemble on the stage and family and friends sit on the lawn. Additional seating is provided by turning the bleachers to face the stage. People also sit on the Home side of the field during the graduation ceremony.

B. Climate

The climate of Wai'anae can be characterized as hot and dry. Annual rainfall averages less than 25 inches along the coastline to 80-100 inches at the higher elevations of the Wai'anae Mountains. Daily temperatures range between 72 and 80 degrees Fahrenheit and can reach the low to mid-90s during the summer. Prevailing winds blow from a northeast direction at an average 10-13 mph.

C. Topography

The bleacher area is relatively flat having been graded to site the existing bleachers, track oval, and the existing field. Ground elevation in the bleacher area slopes from 7'-6" on the east to 7'-0" on the west. The small change in elevation is equivalent to a 0% slope.

D. Soils

Soil Conservation Soil Maps (1972) identify two soil types at the School: Coral Outcrop (Soil Legend: CR) and Mokuleia Silty Clay (Soil Legend: Mtb). Coral Outcrop, which consists of coral or cemented calcareous sand, underlies about 90% of the School including the athletic field. This soil consists of coral or cemented, calcareous sand. The coral outcrop formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of uplands. This soil is found at elevations ranging from sea level to approximately 100 feet above sea level.

Borings and test pits for a geotechnical study encountered fill material consisting of brown clayey silt extending to depths ranging from 0.5 to 1 foot below ground surface. Underlying the fill was dense to medium hard coral (Hirata & Associates, 2015).

E. Water Resources

1. Surface Water

There are no freshwater streams, rivers, ponds, or wetlands on-campus. The Pacific Ocean borders the field on the south.

2. Groundwater

According to groundwater maps prepared by Mink and Lau (1990), the School overlies the Wai'anae aquifer of the Wai'anae aquifer sector (See Table 1). The Wai'anae aquifer is characterized by an unconfined sedimentary aquifer above a confined dike aquifer. The sedimentary aquifer is comprised of moderately brackish water, is currently being used (but not for drinking water), and is highly vulnerable to contamination. The dike-confined aquifer also is not used for drinking water, is low in salinity, and has a low vulnerability to contamination.

Table 1. Aquifer Classification System

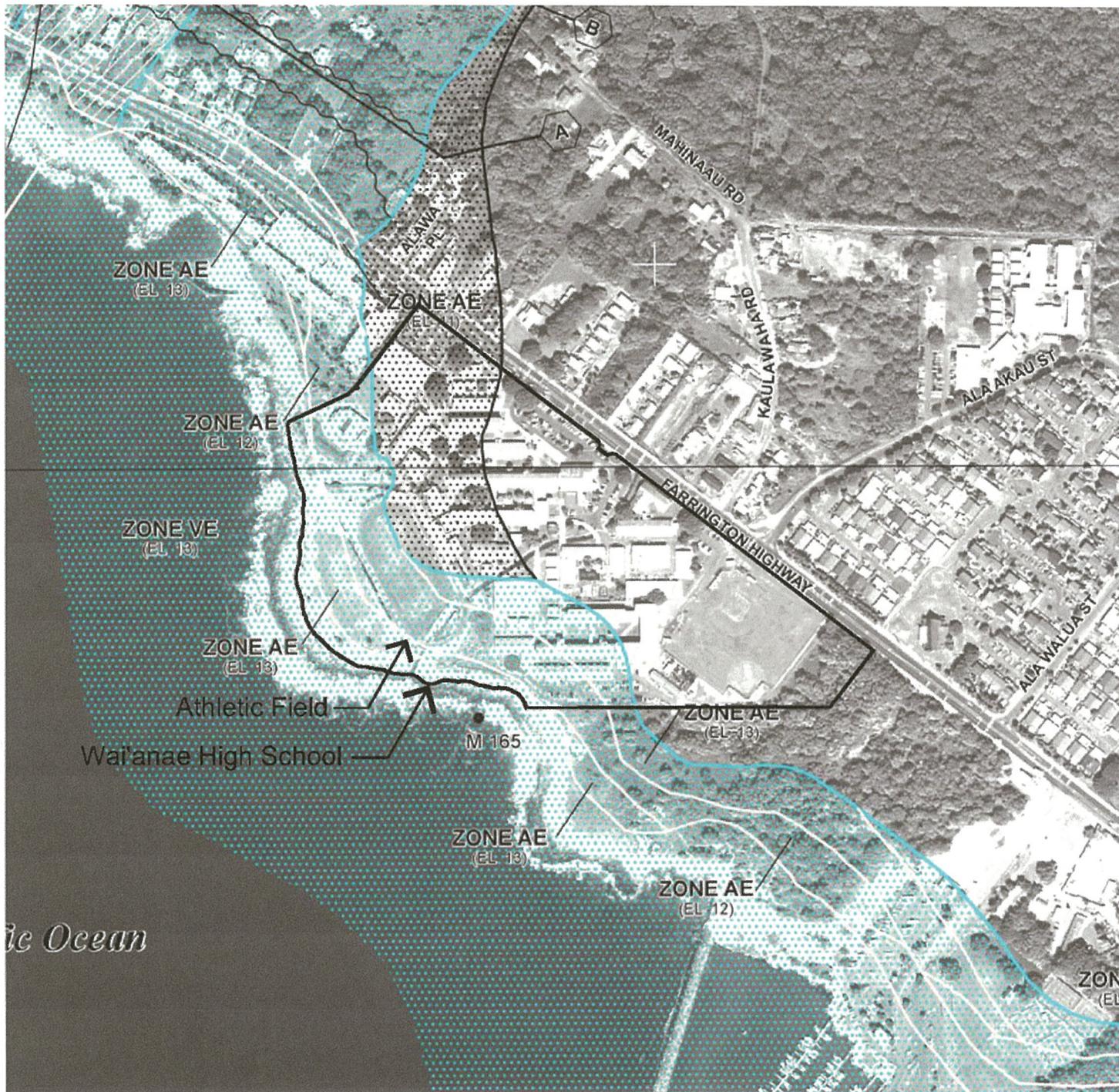
Aquifer Code	30303116	30303122
Island Code	3 - Oahu	3 - Oahu
Aquifer Sector	03 - Waianae	03 - Waianae
Aquifer system	03 - Waianae	03 - Waianae
Aquifer Type, hydrogeology	1 - Basal	1 - Basal
Aquifer Condition	1 - Unconfined	2 - Confined
Aquifer Type, geology	6 - Sedimentary	2 - Dike
Status Code	13311	23223
Developmental Stage	1 - Currently Used	2 - Potential Use
Utility	3 - Neither	3 - Neither
Salinity (in mg/L Cl ⁻)	3 - Moderate (1,000-5,000)	2 - Low (250-1,000)
Uniqueness	1 - Irreplaceable	2 - Replaceable
Vulnerability to Contamination	1 - High	3 - Low

Source: Mink and Lau, 1990.

F. Flood Hazard and Drainage

Approximately 60% of the School lies in flood zones identified on the Flood Insurance Rate Map for the area (See Figure 3). The shoreline and areas between 400 to 500 feet inland of the ocean are designated 'Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood'. The 1% annual chance flood is the 100-year flood.

Two flood zones within the Special Flood Hazard Area are identified: Zone VE which is a "coastal flood zone with velocity hazard (wave action) Base Flood Elevations determined". The base flood elevation is 13 feet above mean sea level (amsl). Zone VE applies to the rocky shoreline to the south of the athletic field.

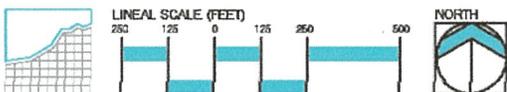


Legend

-  Special Flood Hazard Zone Subject to Inundation by the 1% Annual Chance Flood
- Zone AE** Base Flood Elevation Determined.
- Zone VE** Coastal Flood Zone with Velocity Hazard (Wave Action); Base Flood Elevations Determined.
-  Floodway Areas In Zone AE
- The floodway is the channel of a stream plus adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood height.

-  Other Flood Areas
- Zone X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
-  Other Areas
- Zone X** Areas determined to be outside the 0.2% annual Chance Floodplain.
- Zone D** Areas in which flood hazards are undetermined, but possible.

Source: Federal Emergency Management Agency
 Flood Insurance Rate Map
 Map Number 15003C0183H
 Date: Nov. 5, 2014.



Gerald Park
 Urban Planner
 May 2016

Wai'anae Kai, Wai'anae, Oahu, Hawaii

Figure 3
FIRM Map
Wai'anae High School Athletic
Field Remove/Replace Bleachers

Department of Education, State of Hawaii

The western end of the campus above the Floodway Area in Zone AE is designated 'Other Flood Area – Zone X' which is "areas of 0.2% annual chance flood [Note: the 500-year flood]; areas of 1% annual chance flood with depths of less than 1 foot or with drainage areas less than 1 square mile...". This flood designation extends north across Farrington Highway and a flood elevation of 11 feet amsl is shown.

The athletic field is designated Zone AE with base flood elevations varying between 12 to 13 feet amsl.

Public Safety maps prepared for the Island of O'ahu (Department of Planning and Permitting, 2011) place the School "inside" a tsunami evacuation zone.

The campus appears to be well drained. Drainage swales and drain inlets are found throughout the grounds but this writer does not know for certain where runoff is discharged. A drainage culvert extends from Farrington Highway through the campus and outlets into the Pacific Ocean on the eastern side of the football field. The inlet and outlet ends were not investigated. The culvert occurs as an open, shallow, trapezoid-shaped vessel excavated through underlying coral traversing the east side of the campus. At its outlet (beyond the eastern end of the athletic field), the channel is tidal influenced and the bottom is covered with sand.

G. Biological Resources

Birds and wildlife were not observed during this author's field inspection.

The U.S. Fish and Wildlife Service (iPaC mapping tool) identifies seven avian species that frequent the area of the school and its environs. The endemic 'apapane (*Himatione sanguinea sanguinea*) was identified although it is uncommon to Oahu and establishes its habitat in wet forests above the 4,000 foot elevation. Bar-tailed Godwit, Bristle-thighed Curlew, Christmas Shearwater, Laysan Albatross, Tahiti Petrel, and Tristram's Storm Petrel are common migratory birds that winter, breed, or migrate through the area.

H. Historical Resources

Cultural Surveys Hawaii (2015) conducted a Literature Review / Field Investigation for the project. Their findings are excerpted below:

"The proposed project includes the replacement of the current portable metal bleachers with a similar type of bleachers that will be secured on a poured-in-place concrete foundation. Possible ground disturbance is considered to be minimal and consists primarily of grading and shallow excavation for the installation of the concrete foundation.

The project area is located within the WHS athletic field. The project area encompasses 0.2 hectares (0.49 acres) of an area north and west of the existing football field and track. Temporary bleachers, stadium lighting, and a concrete block stage are the only structures located within the project area. A concession stand is located just north of the western extent of the project area, but will not be affected.

No potential historic properties were identified during the LRFI. The project area is located atop an emerged coral karstic outcrop that has been filled with approximately 70 cm of fill consisting of crushed coral and terrigenous fill.

Due to the findings of the pedestrian inspection and background research, no surface historic properties will be potentially affected by the proposed project. Coral karstic outcrops are known to contain pre- and post-Contact archaeological deposits and human burials; however, based on the minimal ground disturbance proposed and the general thickness of the fill deposits overlying the coral outcrop, it is unlikely the coral outcrop, and any archaeological deposits therein, will be encountered or affected.”

I. Land Use and Controls

State and County land use controls are cited below:

State Land Use Designation: Urban
General Plan Development Pattern: Rural
Sustainable Communities Plan (SCP): Wa‘ianae
SCP Land Use Map: Rural Residential
Zoning: P-2 General Preservation

Public uses and structures are permitted in the P-2 General Preservation zoning district (Land Use Ordinance, Table 21-3). Public uses and structures “means uses conducted by or structures owned or managed by the federal government, the State of Hawaii or the city to fulfill a governmental function, activity or service for public benefit and in accordance with public policy” (Land Use Ordinance, Definitions, 1968). A public school is cited as a typical example of public uses and structures.

Parcel 018 is located inside the County delineated Special Management Area (“SMA”). All of Wai‘anae High School is inside the SMA which begins at the shoreline and extends inland to the centerline of Farrington Highway. The proposed project is subject to permitting pursuant to Chapter 25, Special Management Area, Revised Ordinances of Honolulu.

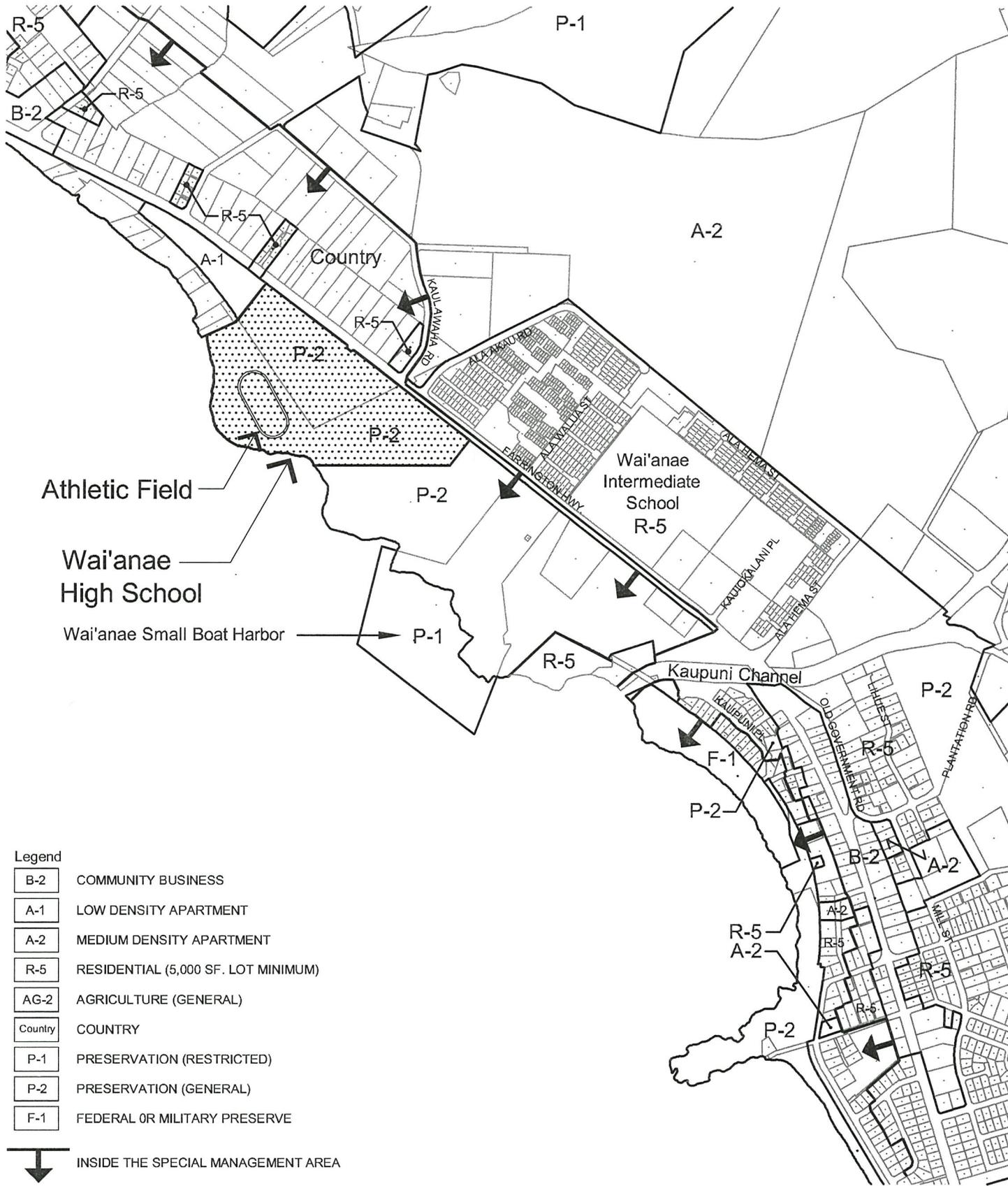
Zoning districts and the Special Management Area are shown as Figure 4.

Parcel 018 is a shoreline lot. The athletic field and proposed improvements are beyond the 40-foot shoreline setback and not subject to Chapter 23, Shoreline Setbacks, Revised Ordinances of Honolulu.

J. Public Facilities

Farrington Highway, a two-lane, two-way, all-weather surfaced **roadway** bounds the School on the northeast. The State-owned highway is fully improved with curbs, gutters, sidewalks, and landscaping planting strips on both sides of the travel lanes. The speed limit is 25 mph fronting the School. Stacking lanes on Farrington Highway facilitate left turn movements into the campus at three of five intersections. Crosswalks are clearly striped and lane markings alert motorists of pedestrian crossings.

Potable **water** is supplied by the Board of Water Supply, City and County of Honolulu. A 24-inch water main runs under the *makai* side of Farrington Highway and an 8-inch main under



- Legend**
- B-2 COMMUNITY BUSINESS
 - A-1 LOW DENSITY APARTMENT
 - A-2 MEDIUM DENSITY APARTMENT
 - R-5 RESIDENTIAL (5,000 SF. LOT MINIMUM)
 - AG-2 AGRICULTURE (GENERAL)
 - Country COUNTRY
 - P-1 PRESERVATION (RESTRICTED)
 - P-2 PRESERVATION (GENERAL)
 - F-1 FEDERAL OR MILITARY PRESERVE

INSIDE THE SPECIAL MANAGEMENT AREA

Source: City & County of Honolulu, Department of Planning & Permitting
 Zoning Map 20, Ord. 86-121, Oct. 22, 1986
 Special Management Area, City & County of Honolulu Online GIS Database



Gerald Park
 Urban Planner
 May 2016
 Wai'anae-Kai, District of Wai'anae, O'ahu

Figure 4
 Zoning & Special Management Area Map
 Wai'anae High School Athletic
 Field Remove/Replace Bleachers

the *mauka* side. Water is taken from the 8-inch and supplied to the School through a 6" lateral. An on-site water system distributes domestic water throughout the School. Fire flow is delivered by two 8-inch fire lines also from the 8-inch main.

Wastewater is discharged into a 42-inch main in Farrington Highway and conveyed to the Waianae Wastewater Treatment Plant for treatment and disposal.

Protective services originate from Wai'anae Town located to the east. The Honolulu Police Department will be opening a new Wai'anae Police Substation later this year (2016). Located at the intersection of Farrington Highway at Wai'anae Valley Road the Substation is about 0.8 miles away. The Waianae Fire Station (Engine 26 and Ladder 26) is located on Farrington Highway next to Waianae District Park. In terms of highway distance, the School is approximately 0.4 miles west of the fire station.

Wai'anae District Park, one of eight City beach **parks** in the Wai'anae District, is located about 0.25 miles to the east of the School. The Park consists of two separate but adjoining lots. Facilities on the park lot nearest the School include a parking area, comfort station / pavilion, lighted tennis courts, and grassed play fields. The comfort station is currently closed pending renovation.

Wai'anae Small Boat Harbor is located next to the District Park on the west. The boat harbor is owned by the State of Hawai'i and under jurisdiction of the Department of Land and Natural Resources, Division of Boating and Ocean Recreation.

Approximately 19.5 acres between the Wai'anae Small Boat Harbor Access Road and the School is (or was) designated Wai'anae Regional Park by the City and County of Honolulu. The land was transferred to the City and County of Honolulu for park purposes as part of Governor's Executive Order 3177. The park was never built. In 2008, the land was withdrawn from Governor's Executive Order 3177 and reset aside to the Department of Land and Natural Resources, Division of Aquatic Resources for conservation and management purposes.

The site remains undeveloped. A local newspaper reported that the site is occupied by a population of 260 homeless single adults and families with children (Honolulu Star Advertiser, December 28, 2015). Several of the homeless have been living on the property for 10+ years.

K. Views

The Coastal View Study (Chu and Jones, 1987) surveyed coastal views and landforms for the island of O'ahu. The Study inventoried coastal areas by viewshed and rated them from Type 1 to Type 6 (Type 1 offering significant coastal views and Type 6 as coastal views linked to large development proposals such as West Beach, Ewa Marina, and Kuilima).

Wai'anae High School is within Section B, Pōka'i Bay of the Wai'anae Viewshed. The Wai'anae Viewshed is classified a Type 3 Viewshed. Type 3 refers specifically to the Wai'anae and Nānākuli Viewsheds where coastal views and the design of the coastal Highway frontage including buildings and landscaping are the key components to visual resource management of the area.

The Study does not identify coastal views, significant stationary views, or important open space / landscape associated with the School. The linear frontage of the School along Farrington Highway obstructs views of the ocean from the Highway. Significant stationary views are identified at Pōkaʻī Bay Beach Park and near Mauna Lahilahi (Note: The Study identifies the latter view as “a [A] makai view from Farrington Highway is fronting Mauna Lahilahi Beach Park’.]

The Study points out the descending mountainous ridges *mauka* of Farrington Highway are vivid landmarks and the primary visual attributes of the viewshed. Pu’u Kamaile’unu and Pu’u Pāhe’ehe’e *mauka* of the School, Mauna Lahilahi on the coast to the west, and Pu’u Mā’ili’ili to the south are identified as important coastal land forms within the Pokai Bay Viewshed.

The Wai’anae Sustainable Communities Plan (2012) also talks about the importance of views and coastal lands that comprise the fabric of the Leeward Coast communities. Eighteen (18) miles of beach land make up the nearly 20 mile long Leeward coastline and the remaining two miles are rocky ledges and residential coastal development. The Plan also postulates that “[T]he coastal lands are important cultural, scenic, and open space resources that must be preserved and protected for the benefit of present and future generations”.

SECTION 3

SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MEASURES TO MITIGATE ADVERSE EFFECTS

A. Assessment Process

The scope of the project was discussed with the Project Manager for the Department of Education and the consulting architect. State and County agencies were contacted for information relative to their jurisdiction, expertise, and areas of concern. Time was spent in the field noting site conditions and conditions in the vicinity of the athletic field. From the discussions and field investigations, existing conditions and features that could be affected by or affect the project were identified. These influencing conditions are:

- The athletic field was constructed in 1957;
- There are no archaeological features on or near the field and visitor's bleachers;
- There are no rare, threatened, or endangered flora and fauna on the athletic field;
- There are no surface water bodies on the athletic field;
- The athletic field is inside a Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood (Zone AE with base flood elevation of 12 – 13 feet amsl);
- The athletic field is located outside the 40-foot shoreline setback;
- Existing public infrastructure and utilities are adequate;
- A 12-month construction schedule is projected; and
- Construction will not displace use of the field for P.E. classes and school functions.

B. Short-term Impacts

1. Air Quality

Construction will temporarily affect air quality and the acoustical environment. Demolition, grubbing, grading, stockpiling, backfilling and other soil (or earth) moving activities will raise fugitive dust that can settle in adjoining areas. Windy conditions coupled with exposed soil can create severe dust problems. The general contractor will employ dust control measures to prevent the work site and construction equipment and activities from becoming significant dust generators. Control measures shall comply with Chapter 60.1, Air Pollution Control, Title 11, Department of Health, State of Hawaii (and revisions thereto). The site work contractor may implement alternative methods adaptable to the scope of the improvements and features of the site.

Most construction equipment and vehicles are diesel powered and emit exhaust emissions typically high in nitrogen dioxide and low in carbon monoxide. The Federal and State nitrogen dioxide standard ---100mg/m³ per annum---which is an annual standard, is not likely to be exceeded during construction. Carbon dioxide emissions should be less than that generated by automobile traffic on adjoining streets. Aldehyde odors from diesel equipment may be detected but should be dispersed by the prevailing winds.

2. Noise

Construction noise, like fugitive dust, cannot be avoided. Exposure to noise will vary by construction phase, the duration of each phase, and the type of equipment used during the different phases. Maximum sound levels in the range of 82-96 db(A) measured at 50 feet from the source will be generated by heavy machinery during site work. The existing wood bleachers will be salvaged by the school. After site work and demolition are completed, reductions in sound levels, frequency, and duration can be expected as the foundation is formed, concrete footings and matting poured, and pre-fabricated bleacher sections and light poles/fixtures assembled and bolted in place.

Community Noise Control regulations establish maximum permissible sound levels for construction activities occurring within "acoustical" zoning districts. Based on the preservation zoning for the site, the site is considered to be located in the Class A zoning district for noise control purposes. The maximum permissible daytime sound level in the district attributable to stationary noise sources and equipment related to construction activities is 55 dBA during daytime (7:00 AM to 10:00 PM) and 45 dBA during nighttime (10:00 PM to 7:00 AM) (Chapter 46, Community Noise Control, 1996). As disclosed above, construction noise occasionally will exceed the 55 dBA threshold.

In general, construction activities cannot exceed the permissible noise levels for more than ten percent of the time within any twenty-minute period except by permit or variance. Any noise source that emits noise levels in excess of the maximum permissible sound levels cannot be operated without first obtaining a noise permit from the State Department of Health. Although the permit does not attenuate noise per se it regulates the hours during which excessive noise is allowed.

The general contractor will obtain and comply with conditions attached to the permit. Work will be scheduled between the hours of 7:00 AM to 3:30 PM Mondays through Fridays. The contractor will also ensure that construction equipment with motors is equipped with mufflers in proper operating condition.

Noise will be audible over the entire construction period. However, noise should not interfere with classroom instruction given the location of the project area, the modest scale of construction, and the distance from the nearest classroom buildings. All construction activities will comply with Chapter 46 Community Noise Control, Title 11, Administrative Rules, Department of Health, State of Hawai'i.

3. Erosion

Site work will create opportunities for erosion (fugitive dust and suspended sediment in runoff). Grubbing, grading, and stockpiling of excavated and imported material will be performed in accordance with the erosion control ordinance of the City and County of Honolulu and grading plans approved by the Department of Planning and Permitting, City and County of Honolulu.

Best Management Practices (BMPS) for erosion and drainage control during construction will be incorporated into a detailed BMP plan. Silt curtains will be erected around work sites and gravel blankets placed at vehicle access points. Additional BMPS will be considered based on site conditions.

The 15,000 square feet construction area is less than one (1) acre thus a NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activity will not be required from the State Department of Health

4. Flora

A site inspection did not reveal the presence of rare, threatened, or endangered flora or candidates for that status. Recorded vegetation is primarily grass and weedy specimens common to the Island of O'ahu and the State of Hawai'i.

5. Archaeological Features

Based on the findings of the Literature Review/Field Inspection report, there are no surface archaeological features present in the project area. In the absence of such features, environmental impacts are not anticipated.

In the event that subsurface features are unearthed, work in the immediate area will cease and the proper authorities (both historical and police) notified of the finds. Treatment and disposition of the finds will adhere to established protocols of the State Historic Preservation Division and/or the Honolulu Police Department.

6. Traffic

Construction vehicles hauling workers and material will contribute to traffic on Farrington Highway. Deliveries will be scheduled to minimize impacts to local and on-campus traffic circulation. Materials will be off-loaded at or near the visitor's side and/or stored in a construction baseyard to be located behind the scoreboard and concession stand.

C. Long-term Impacts

The proposed action will replace existing, aged wooden bleachers, serve the same seating function, provide accessible seating areas, and promote public safety. New walkways will provide ADA access from the concession stand to the bleachers and to the performance stage. The 15-tier (or row) bleachers will increase seating capacity and, with the relocated light poles, improve viewing of activities taking place on the field.

The project includes lighting improvements to promote pedestrian circulation and safety to and from the bleachers, along the bleacher walkway, and within the bleacher tiers. While the lights will benefit spectators and players as well, nocturnal seabirds especially fledglings can be disoriented by exterior lights. When disoriented the birds are known to experience fallout due to exhaustion or flying into man-made objects. If not killed outright, the dazed or injured birds are easy targets for feral mammals. This situation was common on the island of Kaua'i where field lights at school stadiums disoriented Newell's Shearwater fledglings during their migratory season (September to November) to the sea. The Shearwater is a listed endangered species protected by the Endangered Species Act and the Migratory Bird Treaty Act.

Limited night use of the field for athletic and school functions during the school year is expected to continue and moving two light poles (and fixtures) further away from the playing field will not significantly change existing lighting conditions. The light poles will be of the same nominal height and serve the same function as the existing poles. School

administrators and custodial staff have not seen or reported bird fallout at the athletic field during and after night football games for the past twenty years. Unknown migratory seabirds may overfly the athletic field on occasion. As night use of the field continues into the future under almost the same lighting conditions as currently existing, these conditions and the historical record suggest that fallout is not likely to happen. It does not mean fallout will not happen. To minimize glare pole mounted light standards will be shielded as much as possible and illumination directed downward to the athletic field. Lighting will not be directed into the sky.

The overall length of the concrete pad (280 feet) exceeds the approximate 120-foot length of the existing bleachers between the 30 yard lines. The modest expansion is proposed to an area already modified by previous site work (for construction of the field) and spectator seating and should not result in adverse environmental impacts.

The project does not propose the construction or expansion of any structure that would affect land use. Schools and its associated facilities are a permitted use in the General Preservation zoning and bleacher replacement does not call into question the zoning for area.

The proposed action will not negatively affect shoreline ecology or the use of the shoreline as prescribed in the Wai'anae Sustainable Communities Plan (Section 3, Coastal Plans). The project will not adversely affect views of the shoreline from Farrington Highway as views to the ocean across the School are already obstructed by permanent buildings, associated structures and facilities, trees and landscaping, and parking areas. As an in-kind replacement for existing bleachers and two light poles, the new bleachers and light poles will not adversely affect views of the shoreline and infringe on open space, respectively. The light poles will be the same height as the existing poles and serve the same function albeit at a new location. The new bleachers likewise serve the same function as the existing and will be located on about the same "footprint". The 15-tier bleachers will allow views of the ocean between the seating tiers as does the existing 5-tier bleachers. In the long-term, the project will maintain but improve the status quo for the betterment of the School and the general public.

The existing 1500W metal halide lights have an energy draw of about 1600W each. The total energy consumption is approximately 57,600 watts for the 36 lights on the poles (18 lights per pole). The new LED lights will consume 960 watts each. With 36 new lights, the total consumption is estimated at 34,560 watts. Energy consumption will be reduced by 23,040 watts.

SECTION 4 ALTERNATIVES TO THE PROPOSED ACTION

A. No Action / Delay the Action

A No Action / Delay the Action alternative will maintain the status quo of the physical environment and preclude the occurrence of all impacts, short and long term, beneficial and adverse disclosed in this Assessment. A No Action alternative will not achieve the stated objectives of the project. Delaying the Action only suspends the project until such time that it can be constructed.

SECTION 5 AGENCIES AND ORGANIZATIONS TO BE CONSULTED IN THE ENVIRONMENTAL ASSESSMENT PROCESS

Federal Government

U.S. Department of the Interior
Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office

State of Hawaii

Department of Land and Natural Resources
Historic Preservation Division
Department of Health
Environmental Planning Office

City and County of Honolulu

Department of Planning and Permitting

Other

Hawaiian Electric Company
Wai'anae Coast Neighborhood Board No. 24
The Honorable Maile Shimabukuro, 21st Senatorial District
The Honorable Jo Jordan, 44th Representative District
The Honorable Kymberly Marcos Pine, Honolulu City Council
Wai'anae Public Library (Placement)

SECTION 6 PERMITS AND APPROVALS

Permits and approvals required for the project and approving authorities are listed below. Additional permits and approvals may be required pending final construction plans.

State of Hawai'i

Department of Health

Variance from Pollution Control (Noise Permit)

City and County of Honolulu

Honolulu City Council

Special Management Area Permit

Department of Planning and Permitting

Grubbing, Grading, and Stockpiling Permit

Building Permit for Building, Electrical, Plumbing, Sidewalk/Driveway and Demolition Work

SECTION 7 DETERMINATION OF SIGNIFICANCE

Chapter 200 (Environmental Impact Statement Rules) of Title 11, Administrative Rules of the State Department of Health, establishes criteria for determining whether an action may have significant effects on the environment (§11-200-12). The relationship of the proposed project to these criteria is discussed below.

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

The project does not involve a commitment to loss or destruction of any natural or cultural resources. The Literature Review/Field Investigation indicated the absence of archaeological/historical features associated with the athletic field and bleacher area.

It is a standard construction practice that all who perform site work are informed of proper protocol if burials or historical features are unearthed. If burials or features are unearthed, work in the immediate area will cease and historic authorities notified for disposition of the finds per State law.

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

The project will be constructed on the same site and serve the same purpose as the existing bleachers. Improved, paved ADA access to the visitor's area, ADA access at the bleachers, and wheel chair seating will benefit all attending athletic and academic events conducted at the field.

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

The project does not conflict with long-term environmental policies, goals, and guidelines of the State of Hawaii.

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

The project will not substantially affect the economic welfare, social welfare, and cultural practices of the community and State.

Cultural practices associated with the site have not been identified.

5) Substantially affects public health;

Public health should not be adversely affected by the proposed project.

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

The project will not initiate population changes or effects on public facilities.

7) Involves a substantial degradation of environmental quality;

The project will not substantially degrade environmental quality.

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

The project is not the precursor for a larger action at the athletic field and its environs.

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

Rare, threatened or endangered flora or fauna were not observed on the premises. 'Apapane, an endemic bird which may frequent the area of the School is not listed as rare, threatened, or endangered.

10) Detrimentially affects air or water quality or ambient noise levels;

Air and water quality and ambient noise levels will not be affected. Noise associated with athletic events and school activities currently held on the field will continue into the long-term.

11) Affects an environmentally sensitive area such as a flood plain, tsunami zone, erosion prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

The bleachers will be erected on a concrete matting (or pad). Its aluminum-framed construction material and posting on the pad will allow runoff to flow thru the seating area without impeding drainage.

Runoff will increase due to the impervious bleacher pad and new sidewalks. Drainage will be contained on-site and dispersed to the open grass area behind the bleachers preventing adverse effects on adjoining property and the ocean. Storm water mitigation measures could include construction of drywells to contain the increase in storm water runoff.

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

Coastal views, significant stationary views, or important open space / landscape associated with the School are not identified in county or state plans or studies.

Public views of the ocean from Farrington Highway are already blocked by a myriad of school buildings, parking areas, and trees.

13) Requires substantial energy consumption.

The new LED lights will reduce energy consumption from the current estimated 57,600 watts to an estimated 34,560 watts, a difference of 23,040 watts. Energy consumption will be reduced in the long-term.

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APPENDIX A

Archaeological Literature Review and Field Inspection Report
for the Waianae High School Bleachers Replacement Project
Wai'anae Ahupua'a, Wai'anae District, O'ahu
TMK: [1] 8-5-002: 018

Final
Archaeological Literature Review and Field Inspection
Report for the Wai‘anae High School
Athletic Field Bleachers Replacement Project
Wai‘anae Ahupua‘a, Wai‘anae District, O‘ahu
TMK: [1] 8-5-002:018

Prepared for
Gerald Park Urban Planners

Prepared by
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Management Summary

Reference	Archaeological Literature Review and Field Inspection Report for the Wai'anae High School Athletic Field Bleachers Replacement Project Wai'anae Ahupua'a, Wai'anae District, O'ahu Island, TMK: [1] 8-5-002:018 (Belluomini and Hammatt 2016)
Date	March 2016
Project Number(s)	Cultural Surveys Hawai'i, Inc. (CSH) Job Code: WAIANAE 12
Investigation Permit Number	The fieldwork for this study was completed under CSH's annual archaeological fieldwork permit number 15-03, issued by the Hawai'i State Historic Preservation Division (SHPD) per Hawai'i Administrative Rules (HAR) §13-282.
Agencies	SHPD
Land Jurisdiction	State of Hawai'i
Project Proponent	Gerald Park Urban Planner
Project Location	The project area is located southwest of Farrington Highway within the Wai'anae High School campus and includes a portion of the athletic field. The project area is depicted on a portion of the 1998 Waianae U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The proposed project includes the replacement of the current portable metal bleachers with a similar type of bleachers that will be secured on a poured-in-place concrete foundation. The project may also require the relocation of two light poles in order to provide unobstructed views of the playing field. The two light poles will be relocated within the project area and will require borehole excavations for their installation. Possible ground disturbance associated with the installation of the concrete foundations and walkways is considered to be minimal.
Project Acreage	The project area includes approximately 0.2 hectares (0.49 acres)
Area of Potential Effect (APE)ⁱ	The APE is considered to be the entire 0.2-hectare (0.49-acre) project area
Document Purpose	This investigation was designed—through detailed historical, cultural, and archaeological background research and a field inspection of the project area—to determine the likelihood that historic properties may be affected by the project and, based on findings, consider cultural resource management recommendations. This document is intended to facilitate the project's planning and support the project's historic preservation and environmental review compliance. This investigation does not fulfill the requirements of an archaeological inventory survey investigation, per HAR §13-276. Consequently, this report cannot be used to make formal recommendations for SHPD review and acceptance.

Fieldwork Effort	Fieldwork was accomplished on 11 December 2015 by Scott Belluomini, B.A., and Trevor Yucha, B.S., under the general supervision of principal investigator, Hallett H. Hammatt, Ph.D. This work required approximately 1 person-day to complete.
Results Summary	No potential historic properties were identified during the literature review and field inspection (LRFI). The project area is located atop an emerged coral karstic outcrop that has been covered with approximately 70 cm of fill consisting of crushed coral and a terrigenous fill.
Recommendations	No further archaeological historic preservation work is recommended for the proposed project. However, if significant finds are encountered, including human burials, all work in the immediate vicinity will cease and the SHPD will be promptly notified.

ⁱ "Project Area" is defined (HAR §13-284-2) as "the area the proposed project may potentially affect, either directly or indirectly. It includes not only the area where the proposed project will take place, but also the proposed project's area of potential effect." "Effects include, but are not limited to, partial or total destruction or alteration of the historic property, detrimental alteration of the properties' surrounding environment, detrimental visual, spatial, noise or atmospheric impingement, increasing access with the chances of resulting damage, and neglect resulting in deterioration" (HAR §13-284-7[b]). Based on these definitions of "project area" and "effects" there is potential for project effects to historic properties to extend outside the footprint of project construction. Accordingly a definition and justification of the "project area" and "area of potential effect" employed in the AIS study is required.

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Section 1 Introduction

1.1 Project Background

At the request of Gerald Park Urban Planner, Cultural Surveys Hawai'i, Inc. (CSH) has prepared this literature review and field inspection report (LRFI) for the Wai'anae High School (WHS) Athletic Field Replacement project, Wai'anae Ahupua'a, Wai'anae District, O'ahu, TMK: [1] 8-5-002:018. The project area is located southwest of Farrington Highway within the WHS campus and includes a portion of the athletic field. The 0.2-hectare (0.49-acre) project area is depicted on a portion of the 1998 Waianae U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), a tax map plat (Figure 2), and a 2013 aerial photograph (Figure 3).

The proposed project includes the replacement of the current portable metal bleachers with a similar type of bleachers that will be secured on a poured-in-place concrete foundation (Figure 4). The project may also require the relocation of two light poles in order to provide unobstructed views of the playing field. The two light poles will be relocated within the project area and will require borehole excavations for their installation. Possible ground disturbance associated with the installation of the concrete foundations and walkways is considered to be minimal.

This investigation was designed—through detailed historical, cultural, and archaeological background research and a field inspection of the project area—to determine the likelihood that historic properties may be affected by the project and, based on findings, consider cultural resource management recommendations. This document is intended to facilitate the project's planning and support the project's historic preservation and environmental review compliance. This investigation does not fulfill the requirements of an archaeological inventory survey investigation, per Hawai'i Administrative Rules (HAR) §13-276. Consequently, this report cannot be used to make formal recommendations for Hawai'i State Historic Preservation Division (SHPD) review and acceptance.

1.2 Environmental Setting

1.2.1 Natural Environment

The project area is located within the traditional Hawaiian land division (*ahupua'a*) of Wai'anae (Wai'anae Kai) in the district (*moku*) of Wai'anae on the leeward coast of O'ahu. The project area lies in central coastal Wai'anae Town on the karstic flats of an emerged limestone reef (Stearns 1940:36). The emerged reef formation is relatively flat with frequent sinkholes, depressions and cobble concentrations. The project area is between 40 and 160 m inland of the coast and the project area is relatively flat and approximately 1 m above mean sea level.

Rainfall in the project area ranges between 550 and 560 millimeters (21.7-22 inches) annually (Giambelluca et al. 2013). No streams are located in the project area, however, a man-made drainage canal extends through the WHS campus southeast of the project area. 'Eku Stream is located approximately 500 m to the northwest of the project area and Kawiwi Stream is located 1,000 m to the southeast.

According to the U.S. Department of Agriculture (USDA) soil survey for O'ahu, the project area is located within the coral outcrop (CR) soil type (Foote et al. 1972) (Figure 5).

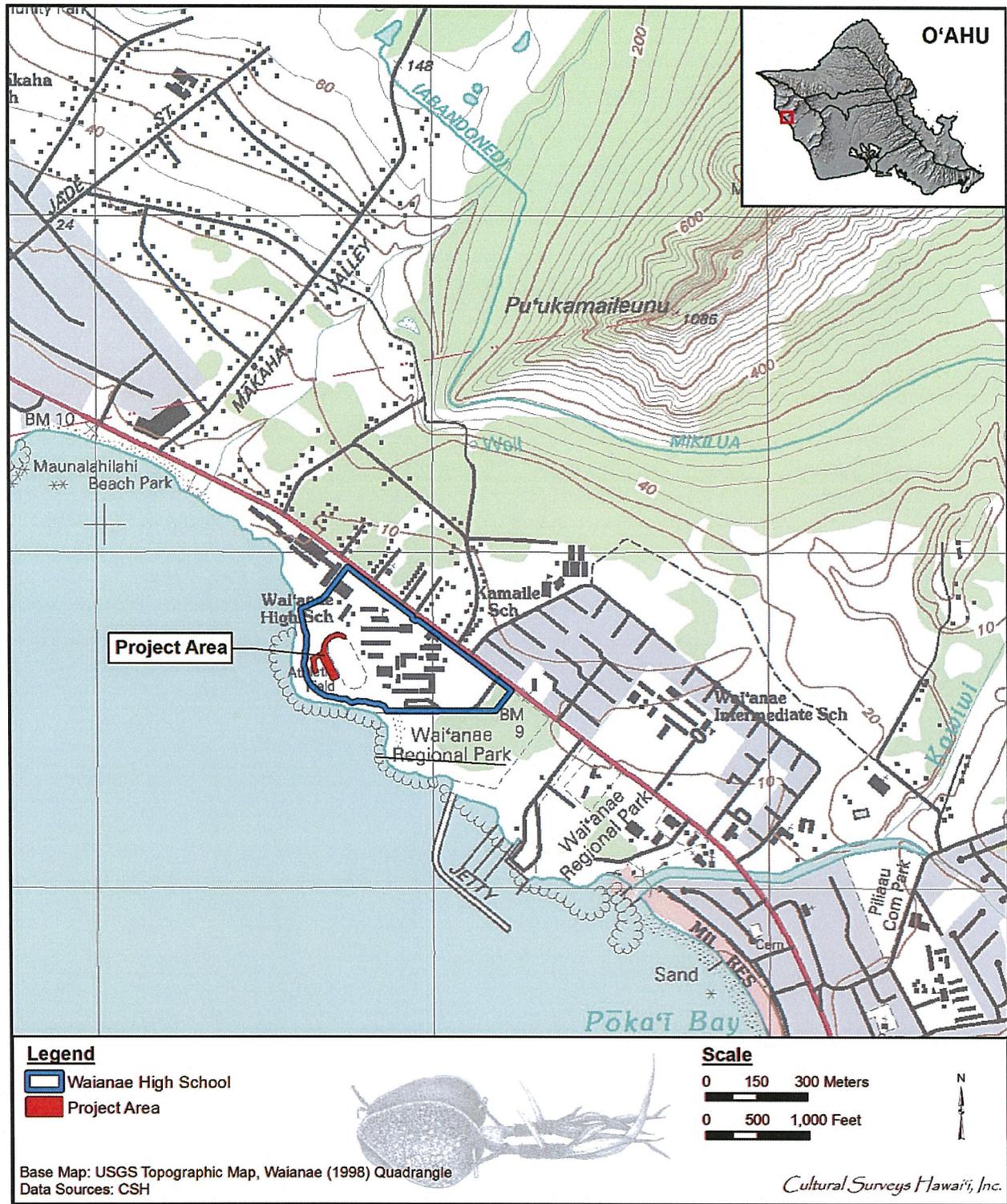


Figure 1. Portion of the 1998 Waianae USGS 7.5-minute topographic quadrangle showing the location of the project area within the WHS campus

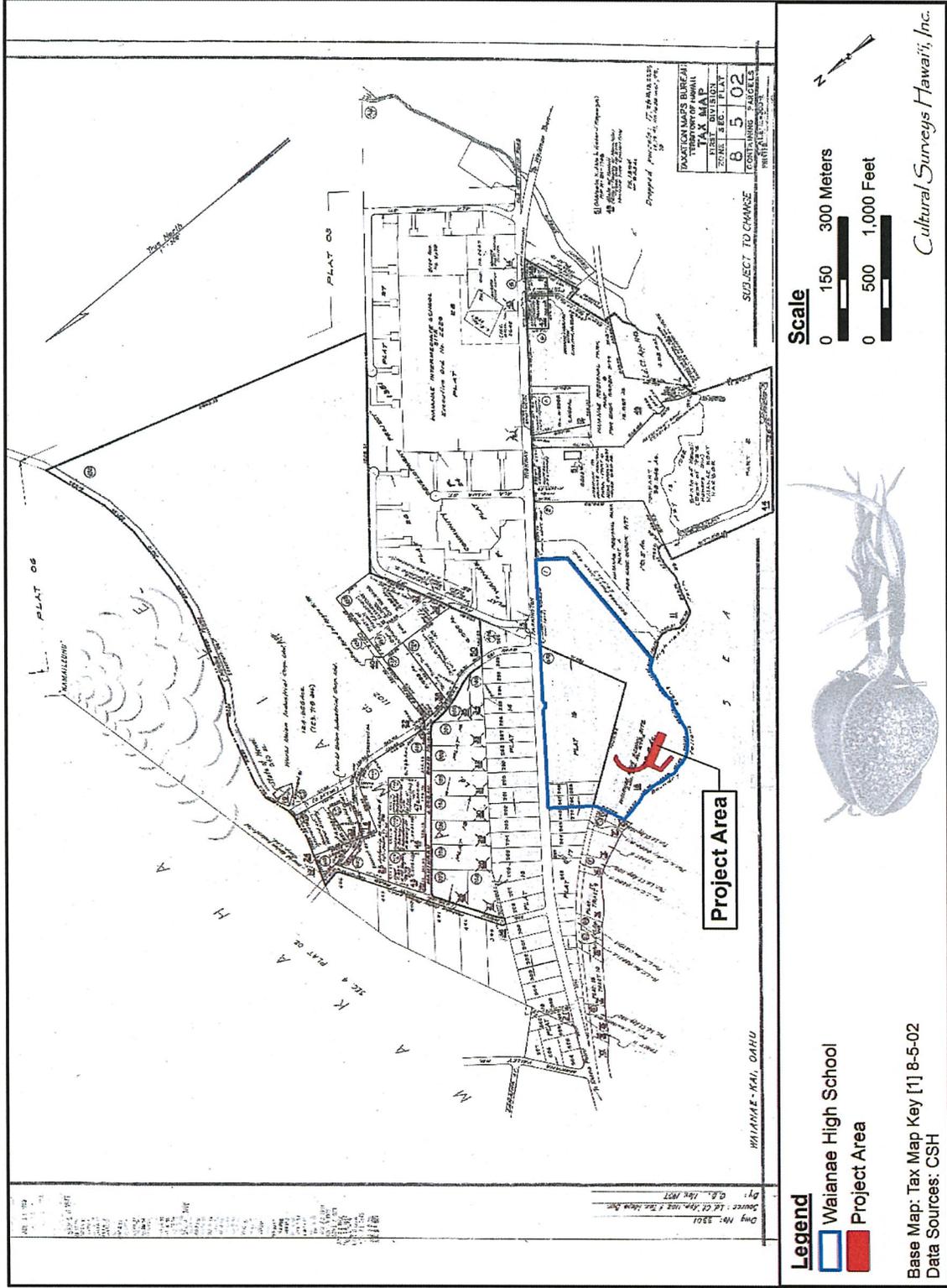


Figure 2. Tax Map Key (TMK) [1] 8-5-002 showing the project area (Hawai'i TMK Service 2014)

LRFI for the WHS Athletic Field Bleachers Replacement Project, Wai'anae, O'ahu

TMK: [1] 8-5-002:018

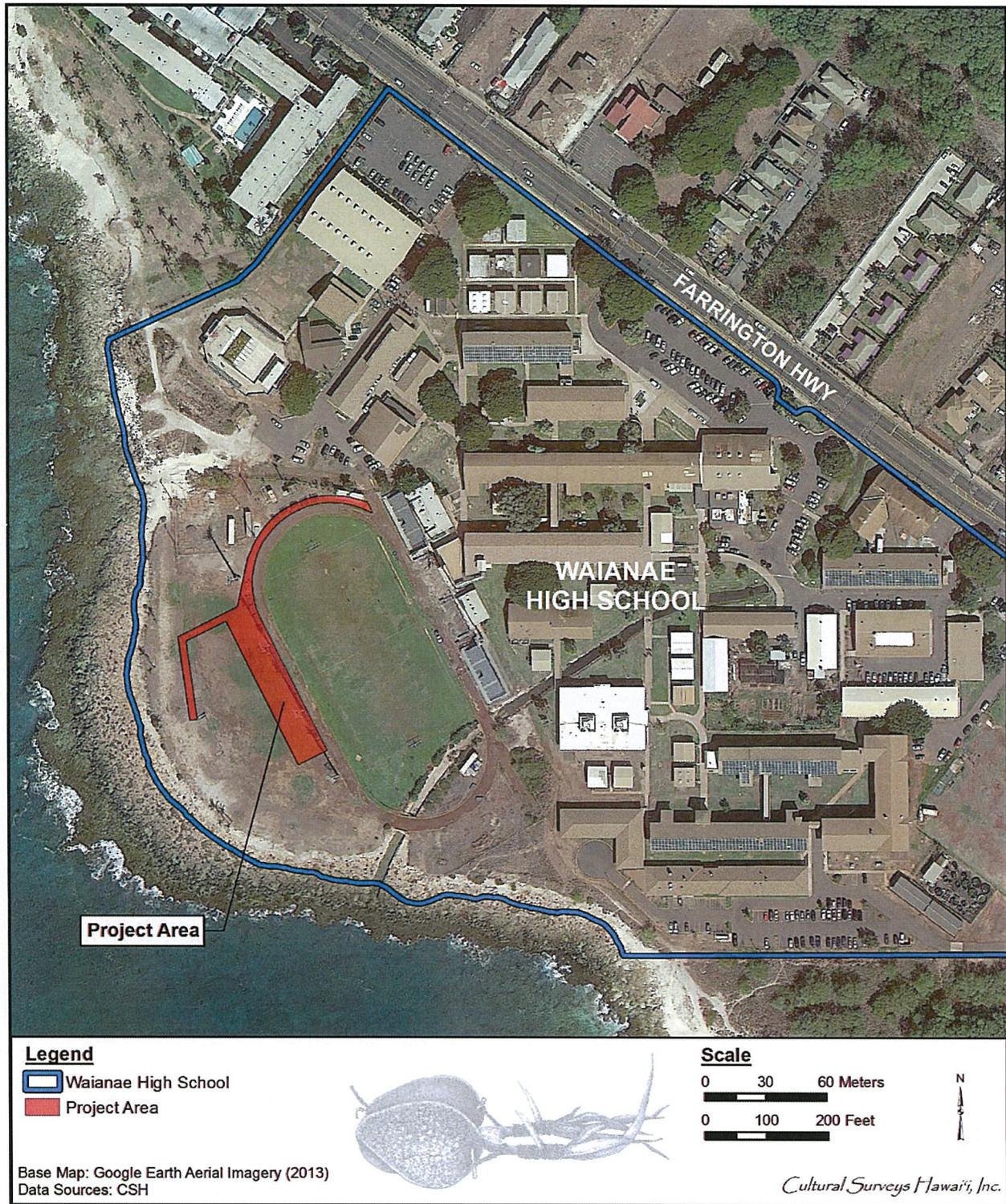


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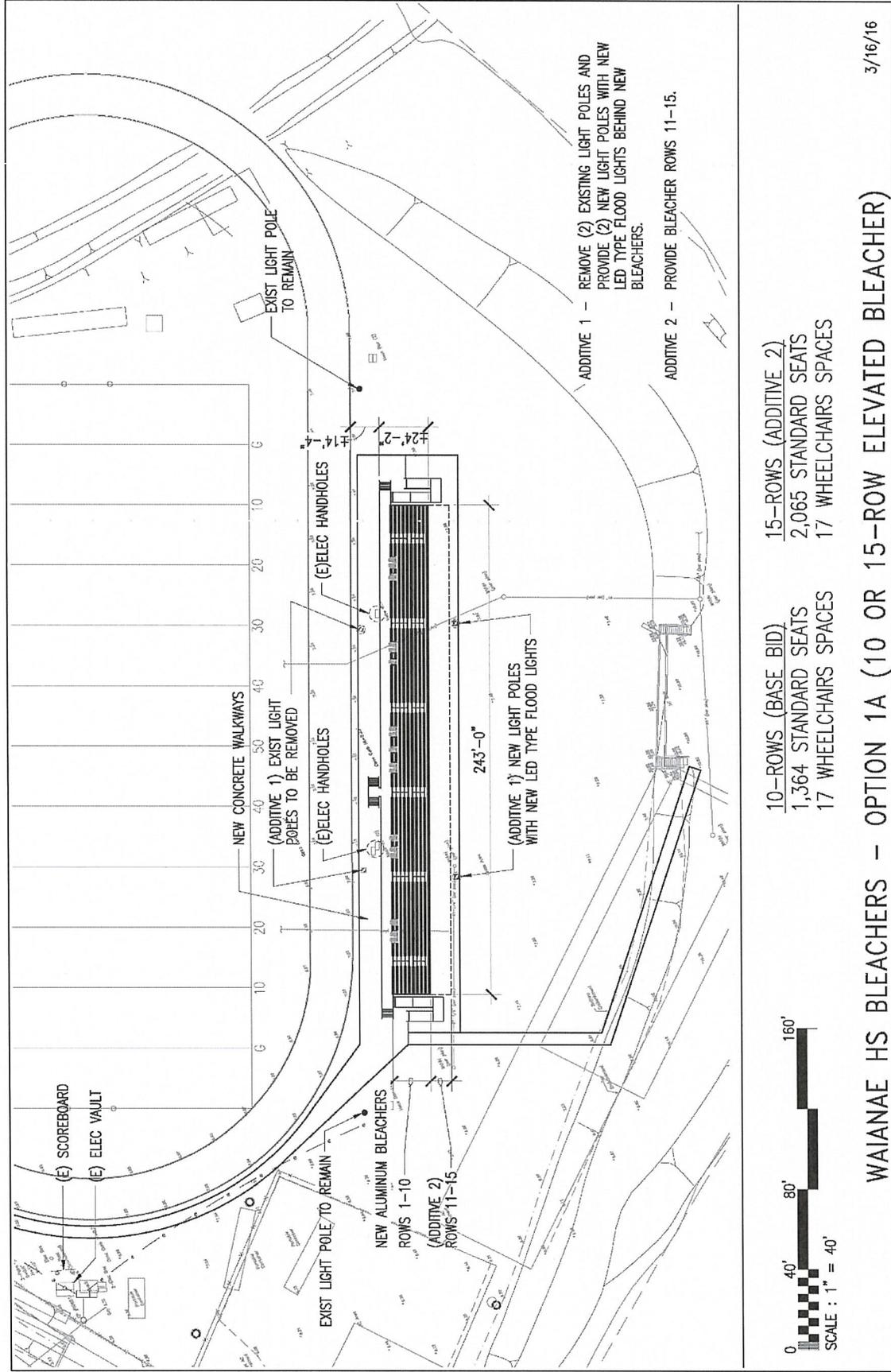


Figure 4. Site plans of proposed bleacher replacement project (courtesy of client)

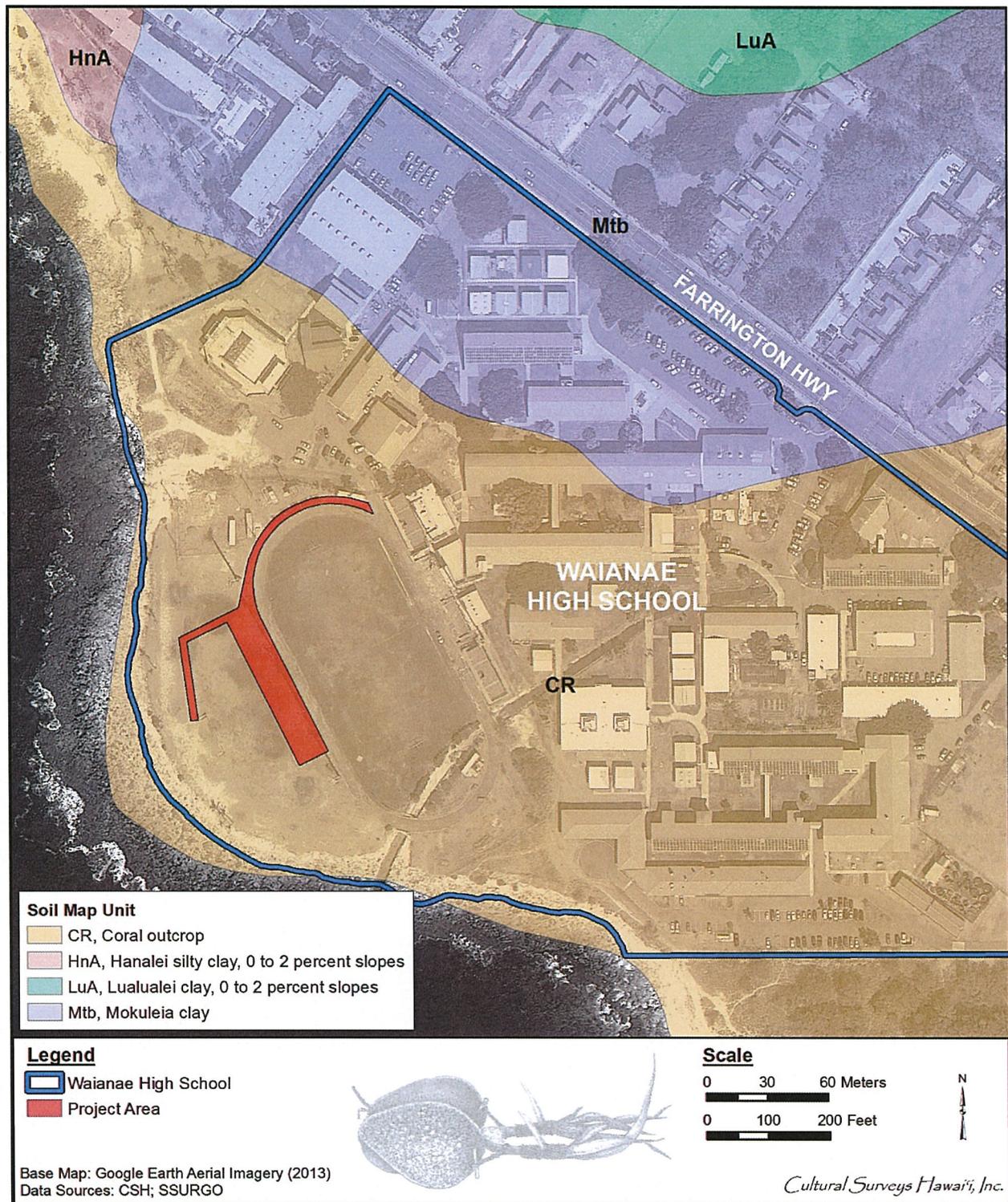


Figure 5. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972) on a 2013 Google Earth aerial photograph, indicating soil types within and surrounding the project area (U.S. Department of Agriculture Soils Survey Geographic Database [SSURGO] 2001)

Coral Outcrop (CR) is described as:

...coral or cemented calcareous sand on the island of Oahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands. Elevations range from sea level to approximately 100 feet. The annual rainfall amounts to 18 to 40 inches. Coral outcrop is geographically associated with Jaucas, Keaau, and Mokuleia soils.

Coral outcrop makes up about 80 to 90 percent of the acreage. The remaining 10 to 20 percent consists of a thin layer of friable, red soil material in cracks, crevices, and depressions within the coral outcrop. This soil material is similar to that of the Mamala series. This land type is used for military installations quarries, and urban development. Vegetation is sparse. It consists. of kiawe, koa haole, and fingergrass. [Foote et al. 1972:29]

1.2.2 Built Environment

The project area is located within the WHS athletic field. Temporary bleachers and stadium lighting are currently located in the project area on the southwest side of the athletic field. One structure, a concession stand, is located just outside the project area.

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of this study under archaeological fieldwork permit number 15-03, issued by the SHPD pursuant to HAR §13-282. Fieldwork was conducted on 11 December 2015 by CSH archaeologists Scott Belluomini, B.A., and Trevor Yucha, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. This work required approximately 1 person-day to complete.

In general, fieldwork included 100% pedestrian inspection of the project area and GPS data collection. A 100%-coverage pedestrian inspection of the project area was undertaken for the purpose of historic property identification and documentation. The pedestrian survey was accomplished through systematic sweeps of the project area.

2.2 Research Methods

Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Mission Houses Museum Library, the Hawai'i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai'i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona 'Aina database (Waihona 'Aina 2000).

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

Section 3 Background Research

3.1 Traditional and Historical Background

Wai'anae Kai Ahupua'a occupies the central portion of Wai'anae District on the leeward coast of O'ahu. The district originally owed its fame to its multitude of fish, especially the opportunities for deep sea fishing from the calm lee side of Ka'ena Point, where the ocean currents meet. The term Wai'anae refers to "mullet water" and the meaning implies an abundance of fish with the word "'anae" referring to full-grown mullet (Pukui et al. 1974:220). Handy and Handy (1972:468) attribute the naming of Wai'anae to a large freshwater pond for mullet called Pueha [*sic*] (Puehu) located just inland of Pōka'i Bay. Today, Wai'anae maintains its reputation as one of the best fishing locales on O'ahu.

Another age-old characteristic of the Wai'anae District has been the independent lifestyle and attitudes of many of the residents. There were many political struggles in the pre-Contact and early historic period, with the district varying from battlefield to refuge for dissident and/or contentious factions. This independent spirit owes its origins to generations of inhabitants conditioned to cope with a marginal physical environment. Human survival depended on consistent availability of water for cultivation and consumption along with offshore marine resources.

In January 1778, Captain James Cook sighted Wai'anae from a distance but chose to continue his journey, landing instead first near Waimea on Kaua'i. Fifteen years later, Captain George Vancouver approached the coast of Wai'anae from Pu'uloa and wrote in his log:

The few inhabitants who visited us [in canoes] from the village earnestly entreated our anchoring . . . And [they] told us that, if we would stay until morning, their chief would be on board with a number of hogs and a great quantity of vegetables; but that he would not visit us then because the day was taboo poory [a *kapu* day]. The face of the country did not however, promise an abundant supply [of water]; the situation was exposed. [Vancouver 1798:218]

Unimpressed with his limited view of the Wai'anae coastline, Vancouver described it as "one barren, rocky, waste nearly destitute of verdure, cultivation or inhabitants" (Vancouver 1798:217). Despite the dismal forecast presented by the arid coast, the ocean hosted an abundant supply of fish, the lowlands produced 'uala (sweet potato; *Ipomoea batatas*) and niu (coconut; *Cocos nucifera*), and the inland valley boasted kalo (taro; *Colocasia esculenta*) and wauke (paper mulberry; *Broussonetia papyrifera*). The upland forest regions sustained various trees whose wood could be worked into weapons and canoes.

3.1.1 Mythological and Traditional Accounts

The district is a focus in the mythological cycles of the demigod Māui, the pig demigod Kamapua'a, and the shark god and older brother of Pele, Kamohoali'i.

The demigod Māui and his brothers were said to have been born in Wai'anae, and it was here that Māui learned the secret of making fire for mankind. Samuel Kamakau (in Sterling and Summers 1978:65–66) enumerates, among the famous locales in Wai'anae, the cave in which Hina, the moon goddess and mother of Māui, made her *tapa*, the fishhook Manaia Kalani (with

which Māui attempted to unite the Hawaiian Islands), the snare for catching the sun (which Māui used to his advantage on Haleakalā), and the place where Māui's adze was made.

The pig demigod, Kamapua'a, battled with the giant man-dog Kū-ʻīlio-loa (after whom the *heiau* in Waiʻanae is named) and razed the taro patches of Waiʻanae Valley. The people caught him, tied him up, and were preparing to sacrifice him when his many supernatural bodies swept over the plains, devouring the men of Waiʻanae and sending them fleeing in terror (Pooloa 1930:4, translated in Sterling and Summers 1978:72).

The older and favorite brother of Pele, Kamohoali'i the shark god, became enamored with a maiden of the Waiʻanae coast and begot a half-man/half-shark child who devoured many people before being captured and killed (Stearns 1939 in Sterling and Summers 1978:83).

3.1.2 Place Names

Waiʻanae extends from the seashore on the *makai* (seaward) side to the top of the Koʻolau mountain range on the *mauka* (inland) side. The mountain range separates Waiʻanae on the leeward side of Oʻahu from the Waialua District on the north shore of Oʻahu and Waiʻanae Uka District in central Oʻahu. The center of the coastal promontory called Mauna Lahilahi ("thin mountain") is the coastal boundary point dividing Waiʻanae and Makaha Ahupua'a. This boundary continues upward along Kamaile'unu ("the striped *maile* vine") Ridge to central Oʻahu. At the *makai* base of this ridge was a spring called Keke'o (Chamberlain 1826 in McAllister 1933:114), or Ka'aipueo, and a coconut grove; in historic times this was called the village of Kamaile ("the *maile* vine").

Along the ridge separating Waiʻanae and Makaha are several named *pu'u*, or peaks: Pu'u Kepualaa; a peak at 3,220 feet (ft), which may be a boundary point called Pu'u Kūmaipō ("Kū from the night") mentioned in Boundary Commission Testimony (see Soehren 2009); and Pu'u Kawiwi. The northern point of Waiʻanae is at Ka'ala (possibly "laughter" or "the path") at 4,020 ft amsl, the highest mountain on Oʻahu. The northeastern boundary of Waiʻanae is separated from the Waiʻanae Uka District by the Waiʻanae mountain range, with the peaks Pu'u Kalena ("the lazy one") and Pu'u Kūmakali'i. For the division between Waiʻanae and Lualualei Ahupua'a to the south, the boundary line follows a ridge called Pāhe'ehe'e ("slippery"). On this ridge are the peaks Kaua'ōpu'u (possibly "swelling battle," Thrum 1922:646), Mauna Kūwale ("mountain standing alone") and Pu'u Pāhe'ehe'e ("slippery hill") at the *makai* end of the ridge of the same name. The ridge may have been named this for an ancient *hōlua* slide that once extended from the *makai* end of the ridge toward the shore. The eastern edge of the coastal promontory called Kāne'īlio (dog Kāne) is the coastal point on the boundary of Waiʻanae / Lualualei.

In the *mauka* interior Waiʻanae section, there is a peak called Pu'u Kōleali'ili'i, which means "small plover." The Pacific golden plover (*Pluvialis dominica*) is a migratory bird that nests in inland areas of the island; the Hawaiians were fond of the meat of this bird and travelled into the uplands to catch the nesting birds. The name of this hill may indicate this is an area where plovers were trapped. Below this hill was a *pali* (cliff, called Ka'oniapuhi ["the writhing eel"]), with wavy scars that reminded the Hawaiians of the movement of a *puhi*, or eel. Near the coast was a hill on the plain called Pu'u Kāhea ("calling hill"); three *heiau* (pre-Christian place of worship) were built on top or at the base of this hill.

The boundary line between Wai‘anae and Makaha runs along a center line that splits Mauna Lahilahi promontory from a coastal point called Keawaiki (“the small bay”). On the south side of the promontory was a shoreline area called Laulauwa‘a (“the canoe paddle blade,” Clark 1977:89). At the eastern end of the *ahupua‘a* is a bay, traditionally called Mā‘alaea. Stretching along the shoreline of the bay was a large coconut (*niu*) grove called Ka Ulu Niu of Pōka‘ī. In historic times, the name Pōka‘ī (“night [of] the supreme one”) began to be used for the bay itself, and the original name, Mā‘alaea, was abandoned. The bay ends at Kāne‘īlio Point; at the *mauka* end of the point was an ancient fishing village called Nene‘u, a shortened version of the word, *nenelu*, meaning “marshy, swampy” (Pukui and Elbert 1986:265). In historic times, this expanded and grew into the modern town of Wai‘anae.

The *ahupua‘a* is watered by one large drainage system, now called the Wai‘anae River. In ancient times, each section and tributary was given its own name, only a few of which can be found on historic and modern maps. Two tributary streams in the northeastern sections are called Kānewai (“water of Kāne) and Kūkahi (“standing along” possibly, Thrum 1922:653); these merge to form the Honua Stream. In the northeastern uplands, the streams called Pūnana‘ula, Kūmuipō (“Kū from the night”), Hiu (“throw violently”), Honua (“land”), and Kaua‘ōpu‘u (possibly “swelling battle,” Thrum 1922:646), all flow and join to form the Kaupuni Stream (“place around”) at a point west of the peak Kaua‘ōpu‘u. Kawiwi Stream drains the western section of the *ahupua‘a* and joins with Kaupuni Stream near the coast. Traditionally the stream section near the coast was called Puehu (“scattered”), which emptied into the sea at an inlet also called Puehu. Other names for this stream were Keaupuni (“the government or nation”; Pukui and Elbert 1986) and Kānepūniu (Clark 1977:87). There was once one small watercourse, usually dry, at the eastern end of Laulauwa‘a, now called Mauna Lahilahi Beach Park, called ‘Eku, which means “to root, as does a pig” (Clark 1977:90).

3.1.3 Pre-Contact Period

The earliest permanent habitation of the district most likely was in Wai‘anae Kai Ahupua‘a along Kaupuni Stream. In an archaeological study of Mākaha, the *ahupua‘a* immediately north of Wai‘anae, Green (1980) proposed the following scenario:

The first settlement of the district was probably, as tradition tends to suggest, on the coast around the stream at the mouth of the Wai‘anae-kai Valley where the foreign chief from Kahiki planted the first coconut of the famous grove. That area, with its well-watered valley behind, would have been the most favored locality in the district . . . [Green 1980:72]

Archaeological investigations at Pōka‘ī Bay have processed dates for occupation of the area well within the prehistoric period. During monitoring of 943 m of sewer and water line trenching at the Wai‘anae Army Recreation Center (WARC), five articulated human burials were recovered and a charcoal sample from the prehistoric cultural layer (Layer V) yielded a radiocarbon age of AD 1376 +/-50 (C13 adjusted) (Riford 1984). Further study at the Wai‘anae Army Recreation Center (Hammatt et al. 1985) encountered additional burials. Testing of a sample from a pit feature yielded a radiocarbon date of AD 1340 +/- 70. Hammatt et al. (1985) noted the following:

The archaeological assemblage points to the heavy use of the site as a communal area for fishing preparation, canoe landing and return. The site was the focus of

beach access for the inhabitants of Wai'anae-Kai as well as occasional informal sand burial from at least 1300 A.D. onwards. [Hammatt et al. 1985:i]

Inland of Pōka'i Bay, three trenches were excavated in a complex of possible taro *lo'i* (agricultural field pond) that dated to AD 1170-1430, 1270-1480, and 1299-1510 (Shapiro and Rosendahl 1988:32). This suggests permanent habitation of Wai'anae Ahupua'a by the late 1100s.

Evidence of elaborate and expanded settlement throughout the *ahupua'a* during the pre-Contact period has also presented itself in the number and variety of sites recorded during the first investigation of Wai'anae during the 1930s. McAllister (1933:112–114) noted 16 sites within the *ahupua'a*, including ten *heiau* (sacred temples) (seven of which had been destroyed), the Puehu fishpond, the Kawiwi place of refuge, and several house sites. The sites extend well inland adjacent to streams at the head of Wai'anae Valley. Of those, Sites 160 and 161 are in the vicinity of the current project area (Figure 6).

McAllister Site 160 is identified as Kane Heiau in Kamaile and based on a site map by McAllister (1933), the site was located east of the project area (see Figure 6). The exact location of the structure is unknown since it had been destroyed by the time of McAllister's survey of the island. McAllister (1933) describes the site:

The approximate location in the cane field was pointed out, but all the stones have been moved. The full name is said to be Kane-i-ka-pua-lena. This is the heiau at which Kawelo is said to have stopped and offered sacrifices when on his way to Kauai to wage war on Aikanaka [Westervelt 1915:183]. Some legends say that Kawelo stopped at the Makaha heiau known as Kaneaki (Site 170). [McAllister 1933:114]

The project area is approximately 300 m southeast of Site 161, Kamaile Heiau, located at about 400 ft elevation on Kamaile ridge, between Wai'anae and Mākaha Valleys (Figure 7). McAllister (1933:114–115) describes the Kamaile Heiau as follows:

The heiau is a single terrace, built of large, sharp lava rocks. The facings of the terrace are surprisingly even and were carefully fitted [Figure 8]. The heiau was formerly paved with small bits of coral, giving it the appearance of fine, white gravel. The amount of such coral is surprising. Small inclosures and terraces are shown in [Figure 7]. Thrum [1911] offers the following information: 'A medium sized heiau of platform character and pookanaka class, still in fair condition, to be seen from the road on the bluff above the pipe line of the electric pumping station.' Beneath the heiau, but still above the pump, is a shallow cave shelter known as Kukaaauau [see Figure 6]. The entrance, which faces due south, is concealed by a large *kiawe* (algaroba), some *Cactus*, and *haole* koa. The cave is approximately 40 feet deep and 25 feet wide and 10 feet high at the entrance. It might prove interesting if excavated because it is on the ridge back of what was once a large Hawaiian settlement. The famous Kaimaile spring, known as Kekoo, which watered many acres of taro land (73 just before it was taken over by the plantation) between the ridge and Mauna Lahilahi, was near the base of the shelter. The cave has the appearance of being artificially filled in, for the dust of the floor does not appear to have dropped from the roof. On the floor are many bits of matting, broken gourds, straw, and a few pages from a book printed in Hawaiian which appears to

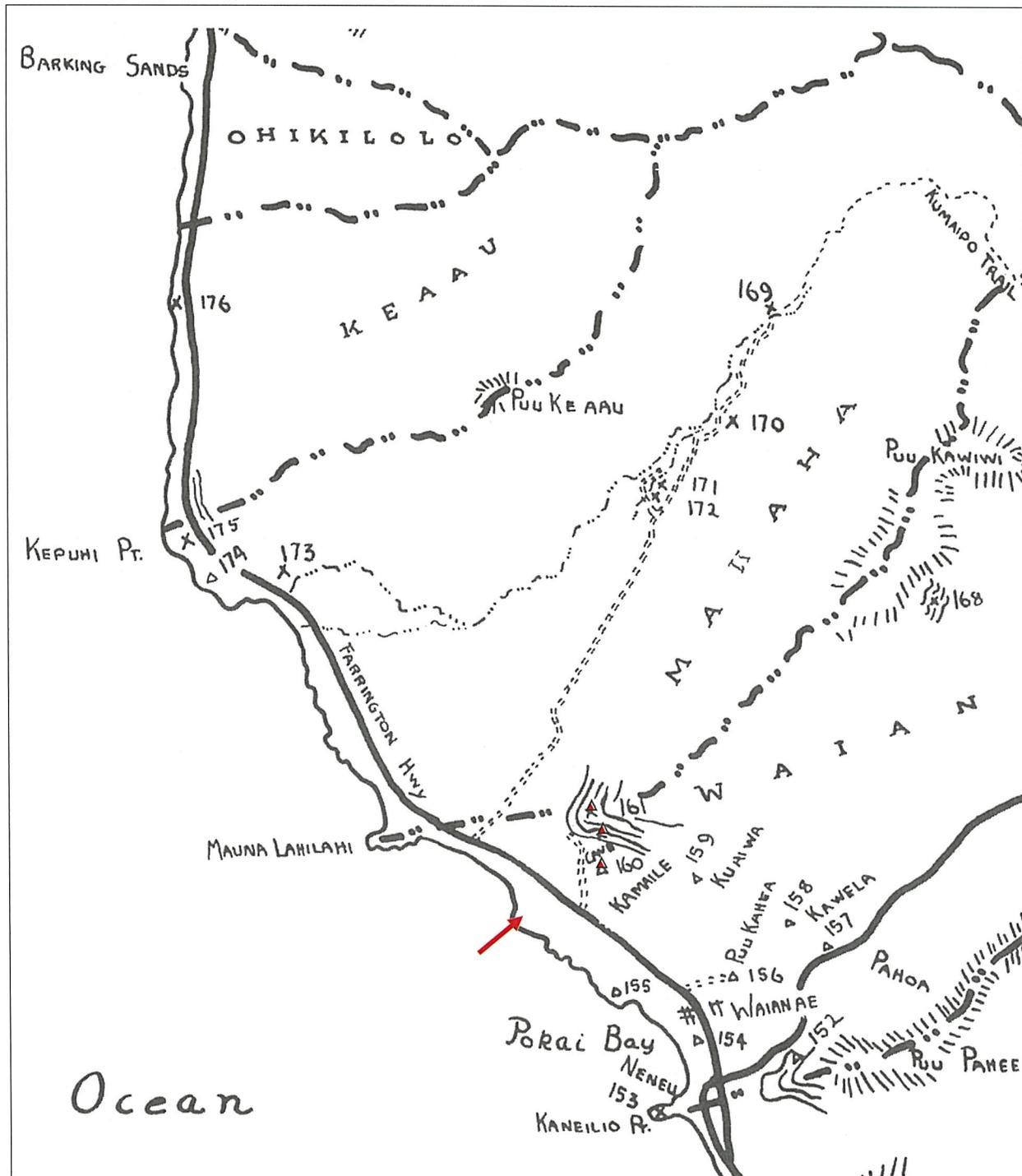


Figure 6. McAllister (1933) Archaeological Sites 160 and 161 and Kuka'au'au Cave (red triangles) in the northeast of the present project area (red arrow indicates approximate location) (adapted from Sterling and Summers 1978:80)

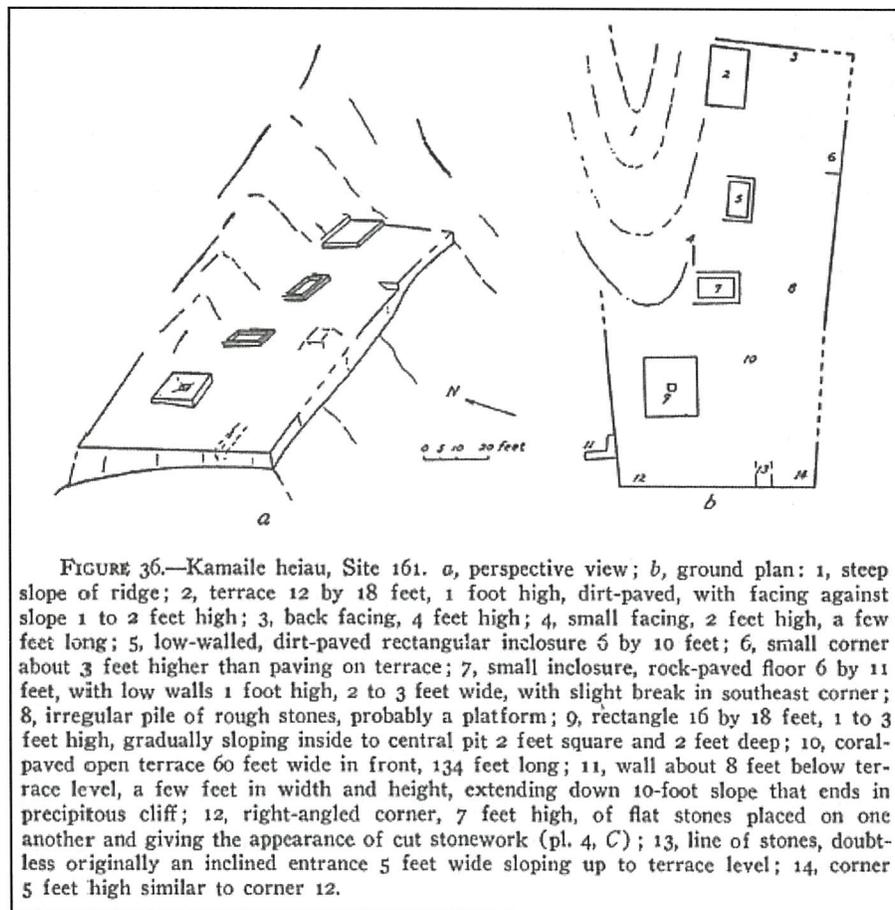


Figure 7. Illustration of Kamaile Heiau, Site 161, by McAllister (1933:115)

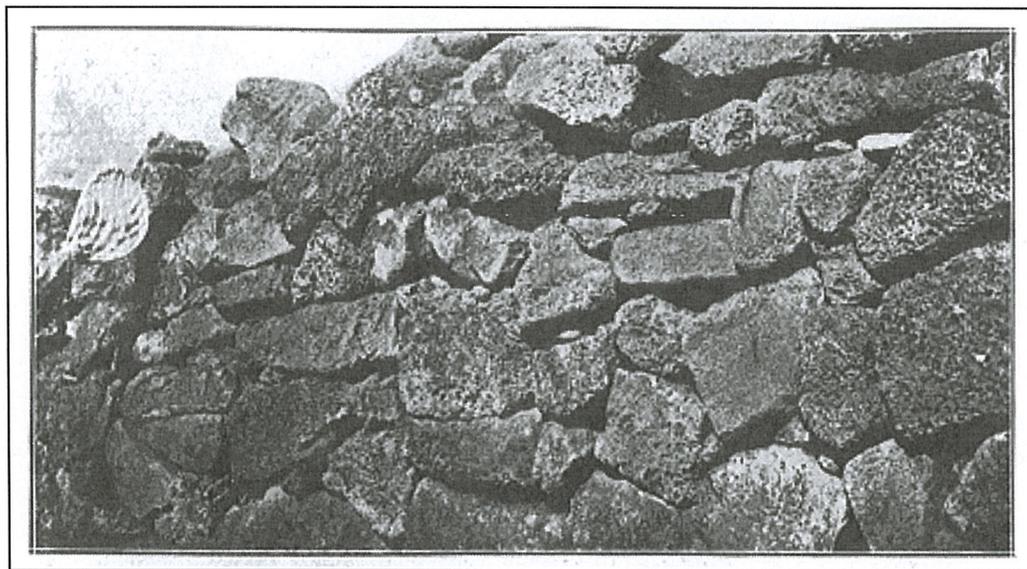


Figure 8. Terrace facing with fitted, flat angular stones at Kamaile Heiau, Site 161 (McAllister 1933:Plate 3A)

be a portion of a catechism. About one-third of the way in, on the right-hand side facing into the cave, a small hole 6 inches deep was made with a stick and a torn part of 'Ka Hae Hawaii,' dated Mei 14, 1856, was found. These cut pieces are in surprisingly excellent condition; the paper is not even yellow or fragile. The paper has been cut with a scissors or knife. A number of tapa (kapa) fragments were found; one a brick-red color. The floor is covered with grasses, ti leaves, banana stalks, coral, sea shells, a bunch of awa strainers, kukui nuts, coconut shells, charcoal, and a few broken bottles. Near the back of the cave was a hole 2 feet in diameter and about 1 foot deep. Though there is a small plantation camp at the base, the shelter is probably not often frequented now. [McAllister 1933:114-115]

The number of *heiau* recorded within Wai'anae (Kai) Ahupua'a alludes to its political centrality within the district and its association with the *ali'i* (royalty) during the pre-Contact period. Samuel Kamakau, the pioneering nineteenth century Hawaiian historian, recorded oral traditions that associated some of the Wai'anae *heiau* with prominent *ali'i* as in the following two accounts:

At Wai'anae [Kahahana, late eighteenth-century O'ahu ruling chief] restored the *heiau* of Ka-moho-ali'i . . . [Kamakau 1992:134]

Take the story of Ka-welo when he sailed for Kaua'i to make war. He set a tabu over the *heiau* at Puehu at Wai'anae, and at the end of the sacrifice ordered that the wood of the paehumu, both the fence and the images themselves, be used for firewood for the expedition to Kaua'i. [Kamakau 1992:203]

Figure 10 shows place names and *heiau* of Wai'anae.

There was a coastal pre-Contact/early historic trail that connected the leeward coast with Waialua and Honolulu (Figure 9). 'I'i (1959:97)

. . . There were three trails to Waianae, one by way of Puu O Kapolei, another by way of Pohakea, and the third by way of Kolekole.

From Kunia the trail went to the plain of Keahumoa, on to Maunauna, and along Paupauwela, which met with the trails from Wahiawa and Waialua. The trail continued to the west of Mahu, to Malamanui, and up to Kolekole, from where one can look down to Pokai and Waianaeuka. There was a long cliff trail called Elou from Kalena and Haleauau on the east side of Kaala coming down to Waianae. There was also a trail called Kumaipo which went up and then down Makahauka.

Below Kumaipo trail in the olden days was a stronghold named Kawiwi. At the time of a battle, a boy was posted there as a guard every night. He was often hungry, for the lord of the stronghold did not supply him with food. This caused him to change his allegiance and give the place over to the rebels. This he did by calling out 'Hake. Come up the ladder. Let two come, let the second stay back, let one come along. Hake, hake. Come up the ladder. Let three come up, leave the third, and let two continue up.' The boy kept up the cry until the stronghold was filled with men, and its lords were taken captive by the rebels. O friends, if it is true that the boy did this, it proves what the Holy Scriptures have pointed out (Luke 10:7) that 'the laborer is worthy of his hire (E pono ke uku 'ia mai ka pa'ahana).'

The stronghold of Kawiwi was part of a mountain ridge lying between Waianae and Makaha and overlooking Kamaile. The trail, Kumaipo, went down to the farms of Makaha and the homes of that land. A branch trail which led up Mount Kaala and looked down on Waialua and Mokuleia could be used to go down to those level lands. It was customary to have dwelling places along the mountain trails that led downward from here into Kamaile, as well as along the beach trail of Makaha. There were many houses at Makaha, where a fine circle of sand provided a landingplace for fleets of fishing canoes. The trail which passed by this sandy bar was the one from Puu O Kapolei, which had joined the beach trail from Puuloa and from Waimanalo. It then went along the shore all around this island. [‘I‘i 1959:97]

3.1.4 Early Post-Contact Period

The latter eighteenth century also saw the involvement of Wai‘anae Ahupua‘a and its population in the political changes impelled by the struggle of *ali‘i* from other islands for political control and conquest of O‘ahu. The Maui Island king Kahekili invaded O‘ahu ca. 1783, vanquishing the O‘ahu chiefs in a series of battles that culminated in Wai‘anae:

Pupuka [an O‘ahu chief] rallied the retainers of the chiefs of Kona, ‘Ewa, Wai‘anae, Waialua, and Ko‘olau at Kawiwi, a stronghold between Wai‘anae and Mākaha, where many died of starvation or were flung over the precipice because of famine, and many perished. [Kamakau 1992:139–140]

In 1794, Ka‘eokūlani recruited the “warriors of Waialua and Wai‘anae” to make war on his nephew Kalanikūpule, then ruler of O‘ahu (Kamakau 1992:168). By December 1794, Ka‘eo had been killed and his forces were defeated. Kalanikūpule was himself deposed the following year when the invading Hawai‘i Island forces of Kamehameha prevailed at the Battle of Nu‘uanu in April 1795. Wai‘anae itself did not host any major conflicts associated with the conquest of O‘ahu by Kamehameha, but traditional records designated it as a refuge for large numbers of O‘ahu residents who resettled after fleeing from the Hawai‘i Island invaders.

In 1796, Kamehameha went to Wai‘anae where his fleet of 80 double canoes stopped on their way to invade Kaua‘i. “The fleet went on to Wai‘anae and the war god [Kū-kaili-moku] was carried ashore that evening” (Kamakau 1992:173). Kamakau records that the fleet departed Wai‘anae before midnight but Wai‘anae tradition maintains that Kamehameha remained on the coast long enough to rededicate two *heiau* to his war god and that his presumption so angered the Wai‘anae gods that they sent the storm which caused the disastrous end of his Kaua‘i expedition.

3.1.5 Early 1800s

The Hawaiian Islands began exporting sandalwood to Asia shortly after 1800 and the commerce flourished until the supply dwindled in the mid-1830s. Trade in sandalwood was the strict monopoly of the *ali‘i*, beginning with the first Hawaiian monarch, Kamehameha I. At the height of the sandalwood boom, Kamehameha was buying foreign ships, including six vessels between 1816 and 1818, to transport his own wood to Asia (Kuykendall 1965:87).

After Kamehameha’s death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the sandalwood trade, which resulted in an unrestrained demand on the stocks of the wood and upon the commoners who did the harvesting. By the middle of 1828, the stands of sandalwood above the Wai‘anae coast may already have been depleted. This happened significantly, perhaps,

when Boki Kamauleule, the chief of Wai‘anae appointed by Kamehameha to also serve as governor of O‘ahu, supervised “collecting Sandalwood to pay [his] debts” (Kuykendall 1965:234).

During the same decades that commercial ventures were forcing changes upon the Hawaiian landscape, western missionary interests were establishing their foothold in the Islands. The first company of Christian missionaries came to the Hawaiian Islands in 1820 and within a single year had established close ties with the *ali‘i* (McGrath et al. 1973:20).

Beginning in 1831, Protestant missionaries throughout the Hawaiian Islands took a census of the native population, thus providing the first documentation of its size after the first decades of Western Contact. In 1831–1832, the first census of *ahupua‘a* within the Wai‘anae District totaled 1,868 people comprised of 757 adult males, 695 adult females, and 416 children (Schmitt 1973:19). Four years later, in the 1835–1836 census, the total district population had dropped to 1,654 (Schmitt 1973:9).

3.1.6 Māhele and LCA Documentaries

The Organic Acts of 1845 and 1846 initiated the process of the Māhele, the division of Hawaiian lands, which introduced the concept of private property to Hawaiian society. In 1848, the crown and the *ali‘i* (royalty) received their land titles. *Kuleana* Land Commission Awards (LCAs) for individual parcels within *ahupua‘a* subsequently were granted beginning in 1850. These awards were presented to tenants, i.e., Native Hawaiians, naturalized foreigners, non-Hawaiians born in the Islands, or long-term resident foreigners who could prove occupancy on the parcels prior to 1845 (Chinen 1958:8).

The *ali‘i* Mataio Kekūānao‘a was awarded the *ahupua‘a* of Wai‘anae in the Māhele, but he returned it to pay the commutation fee for the lands he retained. Wai‘anae then became one of the Crown Lands, lands set aside for the use of the Hawaiian monarchy (Chinen 1958:26). As such, the land was under the control of the king, and much of it was leased to high chiefs and foreigners for use in ranching (McGrath et al. 1973:32). Traditional life was greatly altered as there were many instances where commoners were denied access to the land and upland agriculture ended.

Wai‘anae Kai was divided into three areas, Kamaile on the northwest, Pōka‘i in the central section, and Pāhoa on the southeast. The distribution of LCA *‘āpana* (lots) in Wai‘anae Kai Ahupua‘a indicate two major foci of residence, one at Kamaile, and the other on the opposite side of Kaupuni Stream in Pāhoa (Green 1980:10–11). Numerous LCAs are located north (*mauka*) of the project area, known as Kamaile. LCA parcels near the coastline or within the immediate vicinity of the project area are shown in Figure 11 and Figure 12 and are listed in Table 1. No LCAs are located within the WHS campus or the current project area.

3.1.7 Mid- to Late 1800s

In October 1819, two whale ships anchored in the Hawaiian Islands. In the following decades, the number of whale ships increased greatly and the Islands became a victualing center and layover base in the mid-Pacific. Supplies of both fresh and salted beef were in high demand and a trade in hide and tallow developed. Following the collapse of the sandalwood trade, the Hawaiian economy depended primarily on supplying whale ships during their long layovers in the Islands. The trade sustained the Islands until the collapse of the whaling industry in the mid-1860s.

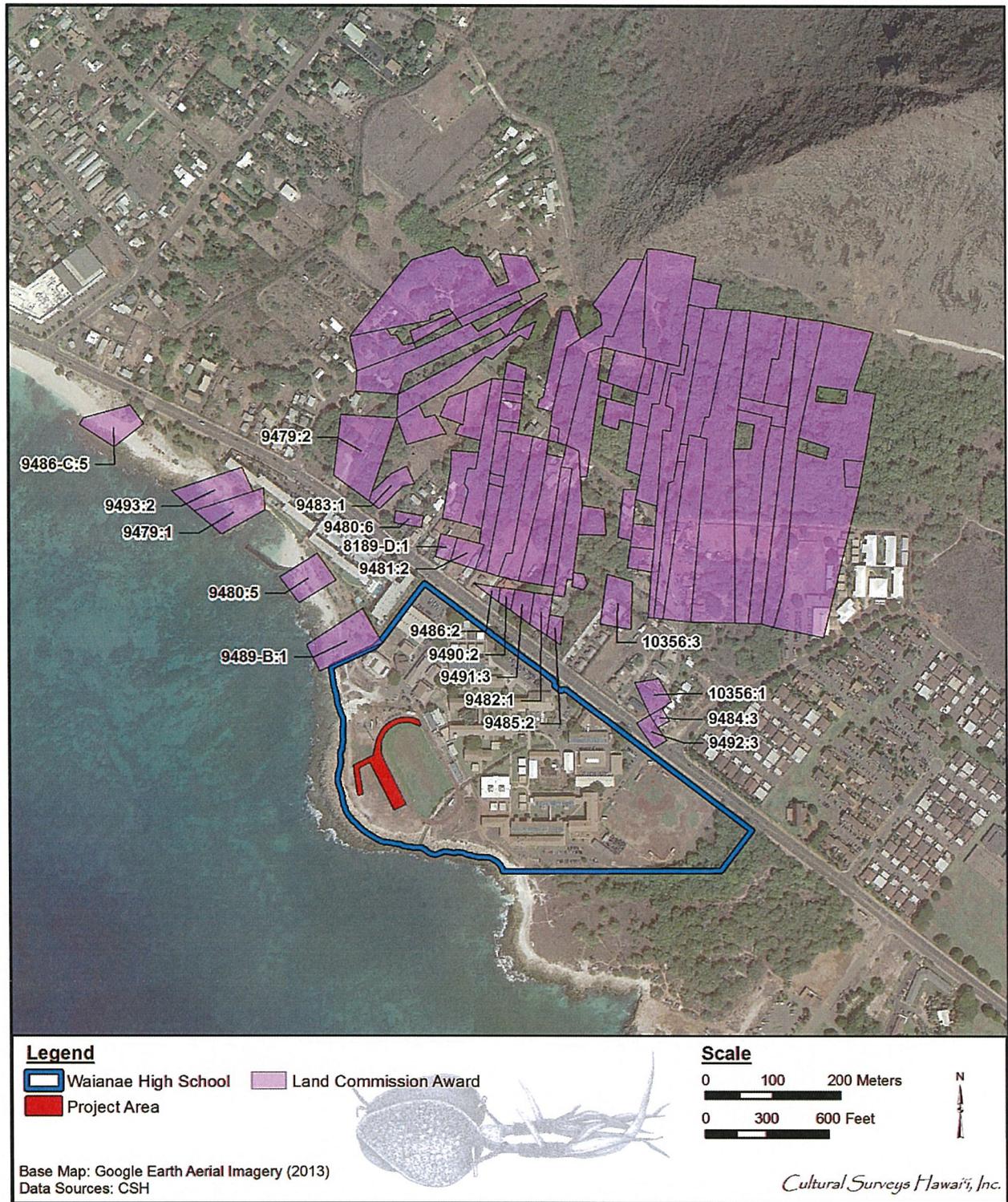


Figure 12. 2013 aerial photograph showing the locations of LCAs near the coastline and near the project area (Google Earth)

Table 1. LCAs Located near the Coast or in the Immediate Vicinity of the Project Area

Land Claim #	Claimant	<i>Ahupua'a</i>	<i>'Ili</i>
8189-D	Nakoalele	Kamaile	Kamaile 1
9479	Kahinu	Wai'anae	Kamaile
9480	Ohule	Kamaile	Kuaimoa
9481	Kaluoku	Wai'anae	Kamaile
9482	Kawaamole	Wai'anae	Kamaile
9483	Kahue	Wai'anae	Kamaile
9484	Hema	Wai'anae	Kamaile, Kaulupuuawa
9485	Lae	Wai'anae	Kamaile
9486	Kaipu	Wai'anae	Kamaile
9486-C	Kuheleloa 2	Wai'anae	Kamaile
9489-B	Holi	Wai'anae	Kamaile 1
9490	Kamuno	Wai'anae	Kamaile 1
9491	Kaneele	Wai'anae	Kamaile
9492	Paaluhi	Wai'anae	Kamaile
9493	Kuheleloa	Wai'anae	Kamaile 2
10356	Nuhi, wahine	Kamaile 2	Kaulupunawai

In 1851, Paul F. Manini, son of Don Francisco de Paula Marin, leased 17,000 acres in Lualualei Valley for grazing livestock. By 1863, a missionary reported that “most of the land in the Wai'anae District was devoted to grazing and had already been divided ‘into six or seven divisions; and secured to as many parties or individuals on long lease or fee simple titles’” (McGrath et al. 1973:31). The experience of the *maka'āinana* (commoners) in Wai'anae likely mirrored that of the remaining Hawaiians in Waialua:

... the depredations of the foreigners' cattle had virtually reduced agriculture to the cultivation of wetland taro. For destruction of sweet potato fields and gardens of melons, bananas, maize, and other crops was causing the people to take these out of cultivation, and in some cases to take themselves out of Waialua. [Kirch and Sahlins 1992:149]

A missionary account in 1863 reported only 100 acres were in taro in Wai'anae Valley and that the only items for sale were fish and fungus. Censuses taken during the second half of the nineteenth century recorded a diminishing population for the Wai'anae District. In 1853 a combined total of 2,451 persons were recorded in the 'Ewa and Wai'anae districts; 19 years later, in 1872, the population total had dropped to 1,671. By 1890, when the districts were recorded separately, the population of Wai'anae was recorded at 903 individuals (Schmitt 1977:12–13). A large part of the population in 1890 would have been workers at the Waianae Sugar Company Plantation.

The first large-scale industry for Wai'anae was ranching. James Isaac Dowsett began a ranch in Waianae Uka around 1870 and by the 1880s a relative leased 17,200 acres of Crown Lands in the Wai'anae Valley for a cattle ranch (McGrath et al. 1973:32). When the Oahu Land and Railway Company (OR&L) railroad was extended to Wai'anae in 1895, the district became much more accessible. Sometime before 1895 Dowsett built a small hotel on Keaupuni Point in an area later sold as Land Grant 4200, located at present-day Wai'anae District Park.

It may have been at this time that Keaupuni Heiau, in the same location, was destroyed. In a photograph of the wooden hotel, large scattered rocks and cut stones are shown on a seawall surrounding the house (Figure 13). It is possible some of the stones of the *heiau* were used to construct the seawall or the house foundation, although no historic documents could be found to confirm this suggestion. In 1898, Dowsett sold this parcel of land, Land Grant No. 4200, to the Waianae Sugar Company, and in 1907 he sold the remaining 1,231 acres of land in Wai'anae Kai to the Waianae Sugar Company (Hawaii Office of the Commissioner of Public Lands 1916, Hawaii Office of the Government Survey 1907).

The livestock industry in the Islands reached its peak in the 1870s. At Wai'anae, a new venture arose to supplant ranching. In 1878, Hermann A. Widemann, a retired Hawaii Supreme Court justice, started the Waianae Sugar Company on land formerly owned by James Dowsett in the *ahupua'a* of Mākaha, Wai'anae, and Lualualei (Dorrance and Morgan 2000:43). Widemann leased most of Wai'anae Kai for 25 years, beginning in 1879:

Between 1878 and 1884 the economy and community of Wai'anae underwent a major change, in which the former Hawaiian landscape virtually disappeared. The reason was the production of sugar. The results were the conversion beginning in 1878 of coastal and central valley garden plots and irrigation systems to large fields of sugarcane, the construction in 1880 of a plantation railway to haul the cane to the mill, and the building, in the former Hawaiian village, not only of the mill itself, but the creation of a whole town to support the processing of cane. [Green 1980:12]

Widemann hired 20 local Hawaiians, and brought in 15 technicians and almost 60 Chinese laborers. He built 24 new houses in Wai'anae Valley and a plantation manager's mansion on the site of Haua Heiau. He built a water reservoir and installed a flume system to bring water from the reservoir to the mill. A tramway was built from the mill site to the coast where a jetty was constructed. Seven miles of track were laid to haul harvested cane to the mill. In 1880, a Chinese firm planted 122 acres of cane in Wai'anae and employed about 30 men.

By 1884 Waianae Sugar Company had 475 acres under cultivation, 9 miles of railroad, and 175 men employed. Although no sugarcane was planted directly on the coast, the Waianae Sugar Company did acquire several coastal lots, probably for offices or warehouses. In 1890, Waianae Sugar Company had 600 acres in cultivation. On 4 July 1895, a rail line of the OR&L extended from Ewa Mill and reached the Waianae Sugar Company track (McGrath et al. 1973:62, 72). The 1884 Jackson map shows the OR&L track traversing near the northwest portion of the project area. (Figure 14). In 1898, the OR&L railway was extended around Ka'ena Point, linking Wai'anae with Waialua on O'ahu's north shore. The plantation was purchased by Amfac, Inc. in 1947, and then closed down (Dorrance and Morgan 2000:44).

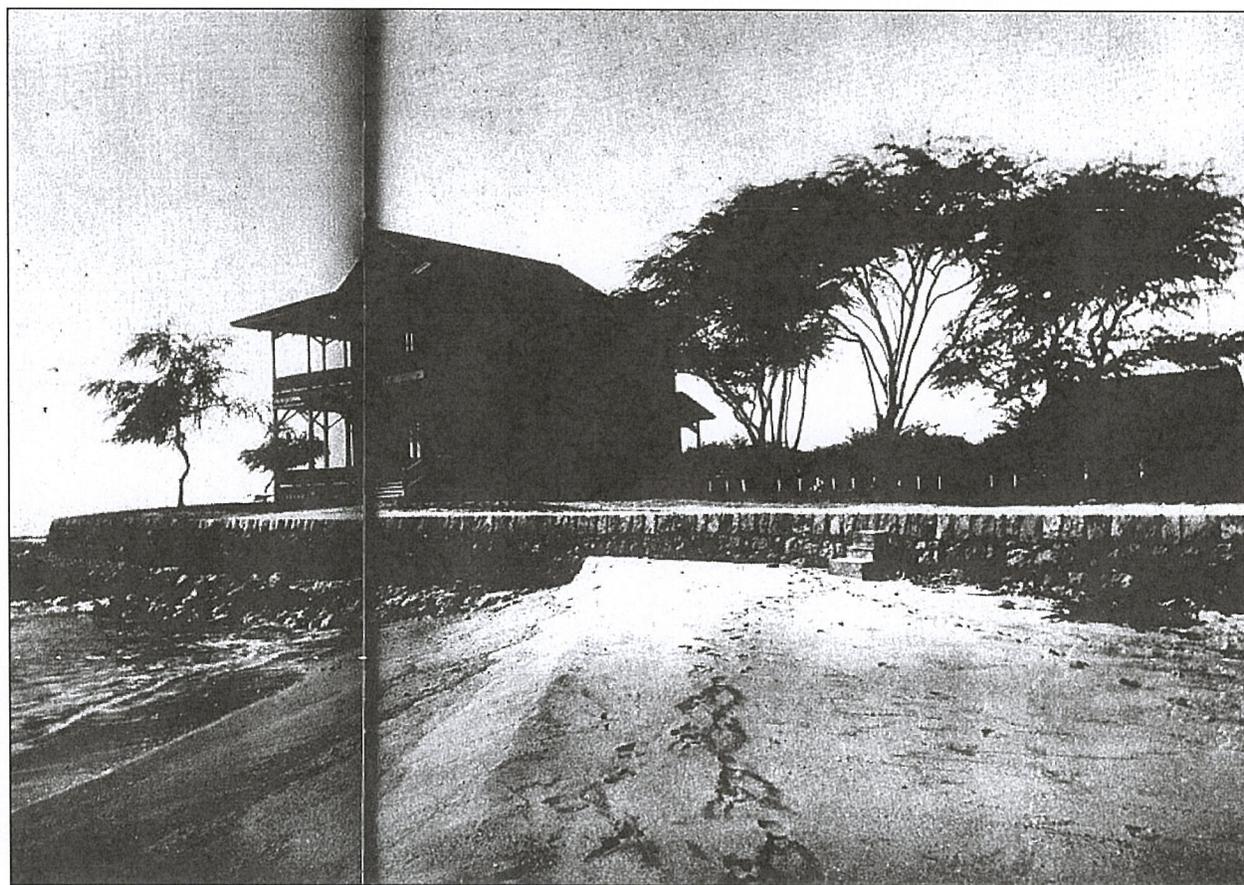


Figure 13. Photograph (ca. 1890s) of the Dowsett Hotel at Keaupuni Point; note large rocks within and outside the seawall; some of these rocks may be the remains of Keaupuni Heiau (McGrath et al. 1973)

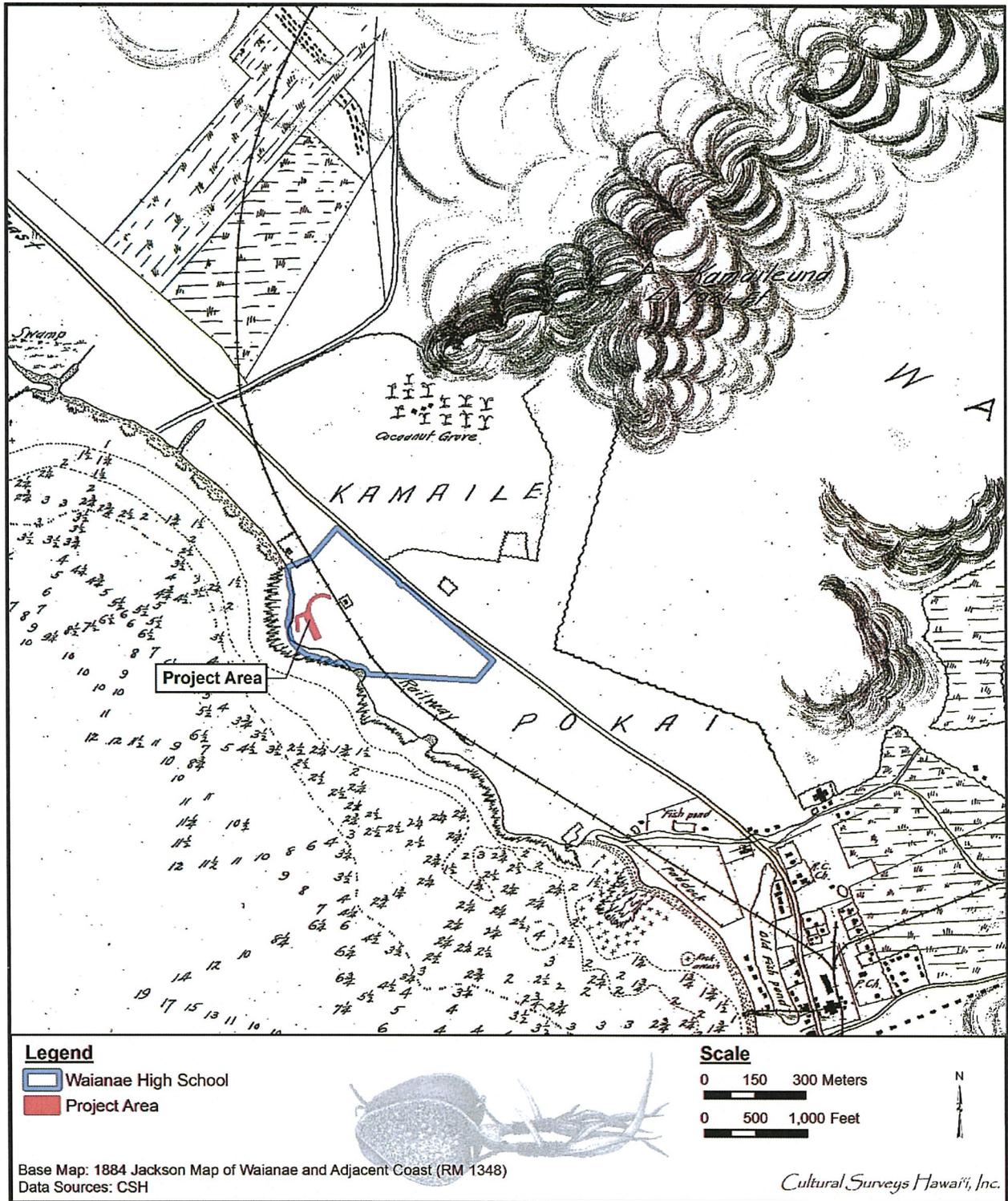


Figure 14. Portion of 1884 Jackson map of Waianae and adjacent coast, showing the OR&L Railway extending through the WHS Campus

3.1.8 1900s to Present

Several maps, and aerial photographs show the land use and general development in the vicinity of the project area (Figure 15 through Figure 24). According to Schilz (1994:23), a business directory of 1900 identified 23 taro planters in the Wai'anae District but by the 1924 edition, only one taro planter was listed. Other Hawaiian traditions remained in practice in Wai'anae into the first decades of the twentieth century; a *kama'āina* (local inhabitant) reported: ". . . between 1910 and 1912 there lived in the Wai'anae area about 25 *kahunas* known [only] to the Hawaiians" (McGrath et al. 1973:84). However, the sugar plantation continued to dominate the landscape. A 1906 Donn map shows the area northwest of the project area planted in sugar and the railway still extant through the high school campus (see Figure 15).

U.S. Army War Department Fire Control maps from 1919 and 1936 show a line of the OR&L railway extending through the high school campus area near the current project area. (see Figure 16 and Figure 18). A 1928 aerial photograph shows the project area in an undeveloped and relatively undisturbed area (see Figure 17).

On 2 July 1918, the U.S. Army established the Waianae Kai Military Reservation by presidential executive order 2900 (Flood et al. 1994:42). During World War II, Wai'anae became the site of massive amphibious training operations with more than 200,000 men training at the Waianae Kai Reservation and surrounding lands. A 1943 U.S. Army War Department map shows the structures and roadways near the project area, which is north of the Military Reservation (see Figure 19).

The sugar plantation never recovered after the war. American Factors Ltd. had bought the plantation in 1931. On 17 October 1946, the stockholders voted to liquidate the plantation, eliminating the economic mainstay of the Wai'anae Coast. Chinn Ho, head of Capital Investment Company, bought the nearly 10,000-acre plantation parcel for \$1.25 million in 1947. During the late 1940s, Chinn Ho promoted the establishment of new ventures in Wai'anae:

By 1949, [Chinn Ho] was trying to interest dairy operators in farm lots. The manager of a large dairy company in San Francisco turned down an offer of about 450,000 acres of prime sugar land in Wai'anae Valley because 'land in Hawaii is going to be much cheaper in the future.' The wife of a local dairy operator was concerned about the schools in Wai'anae, but her husband bought the farm anyway. [McGrath et al. 1973:151]

A 1954 U.S. Army Map Service topographic map depicts the project area near military reservations and the railway appears to have been converted to a roadway (see Figure 20). USGS aerial orthophotos from 1960, 1971 and 1977 and a 1963 USGS map show increased development of Wai'anae, including the creation of WHS (see Figure 21 through Figure 24). The athletic field was constructed around the same time as the rest of the campus and remains relatively unchanged throughout this period.

3.1.9 Contemporary Land Use

Today, Wai'anae Kai Ahupua'a is covered by homes, farms, and gardens. Wai'anae Valley and its people are engaged in many new projects that perpetuate Hawaiian traditions and culture. These projects range from archaeological field trips to restoring ancient *lo'i* terraces near Mount Ka'ala. Ka'ala Farm was developed in 1996 as a learning center for children and the community with *hale*

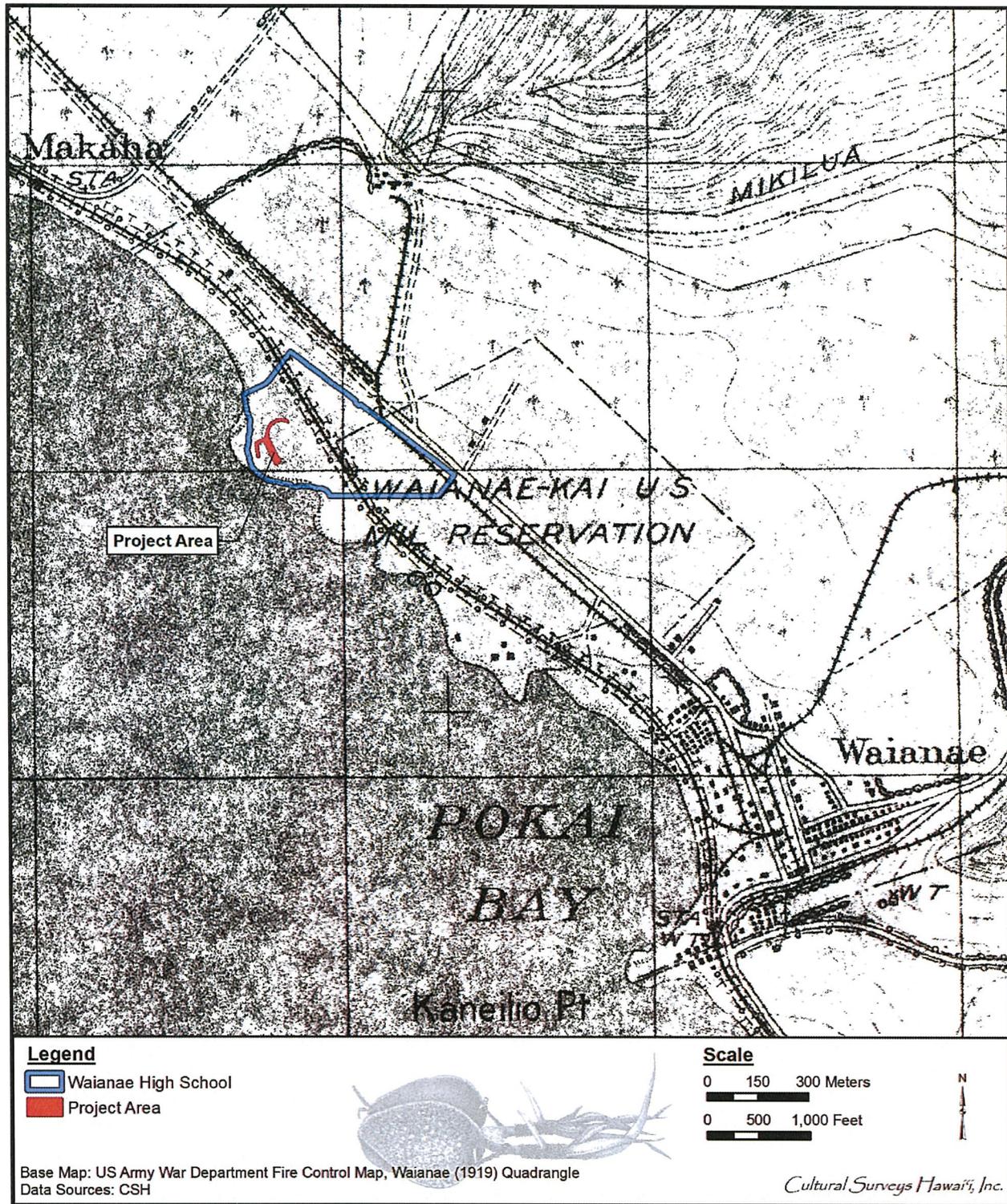


Figure 16. Portion of 1919 U.S. Army War Department Fire Control map, Waianae Quadrangle showing the location of the project area

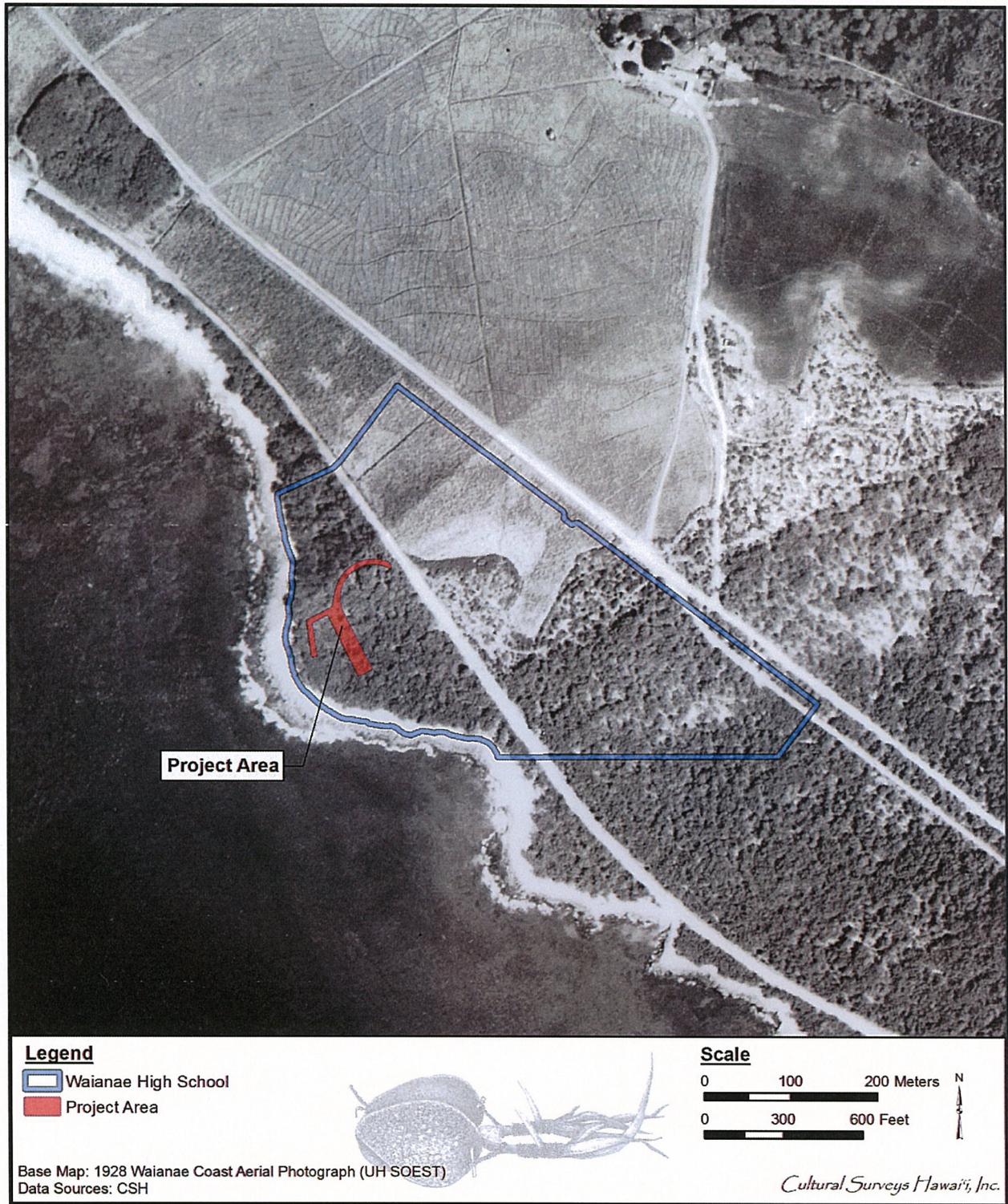


Figure 17. 1928 UH SOEST Waianae Coast aerial photograph showing the lack of development within the project area

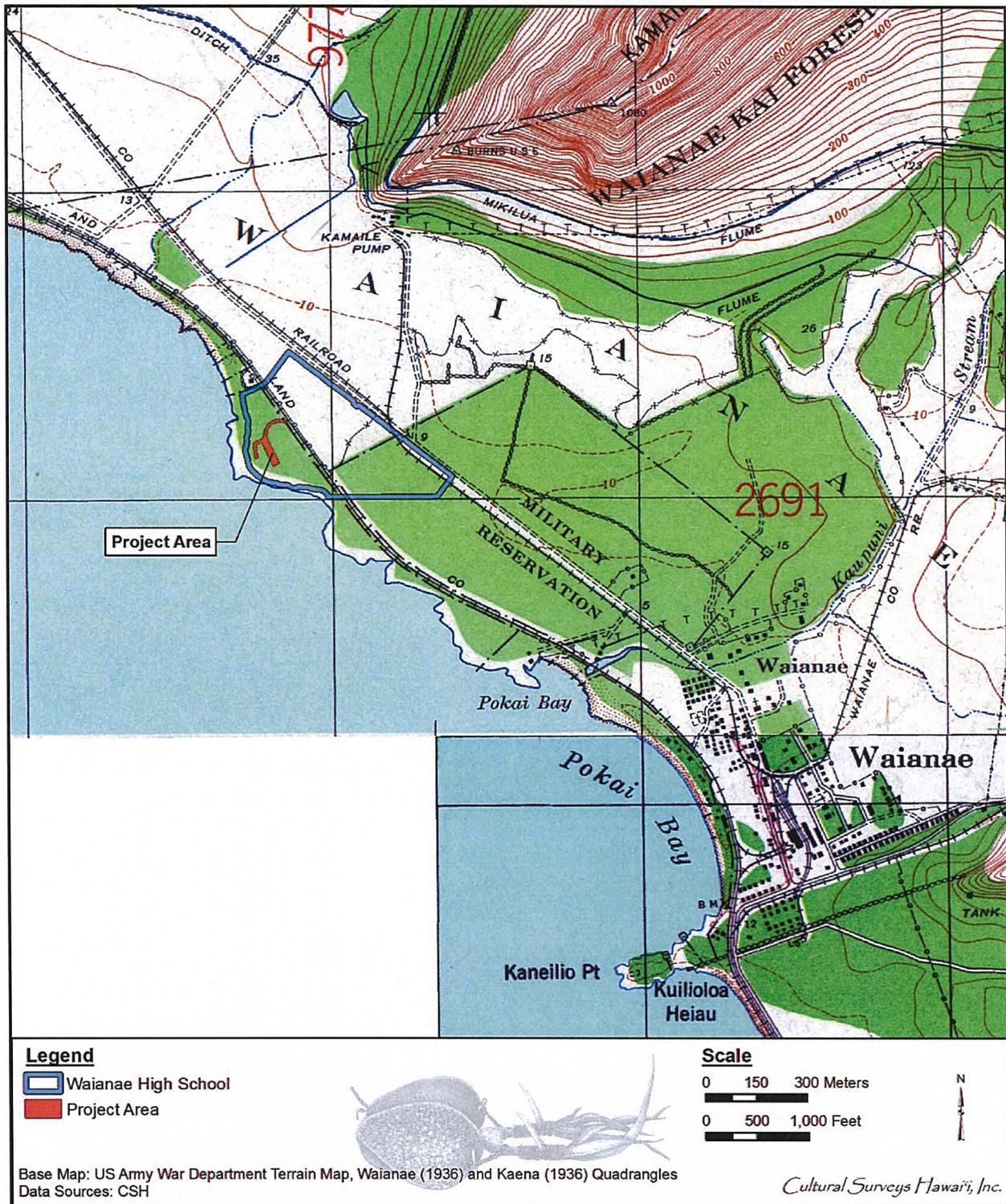


Figure 18. Portion of the 1936 U.S. Army War Department Terrain map, Waianae and Kaena Quadrangles, showing the location of the project area

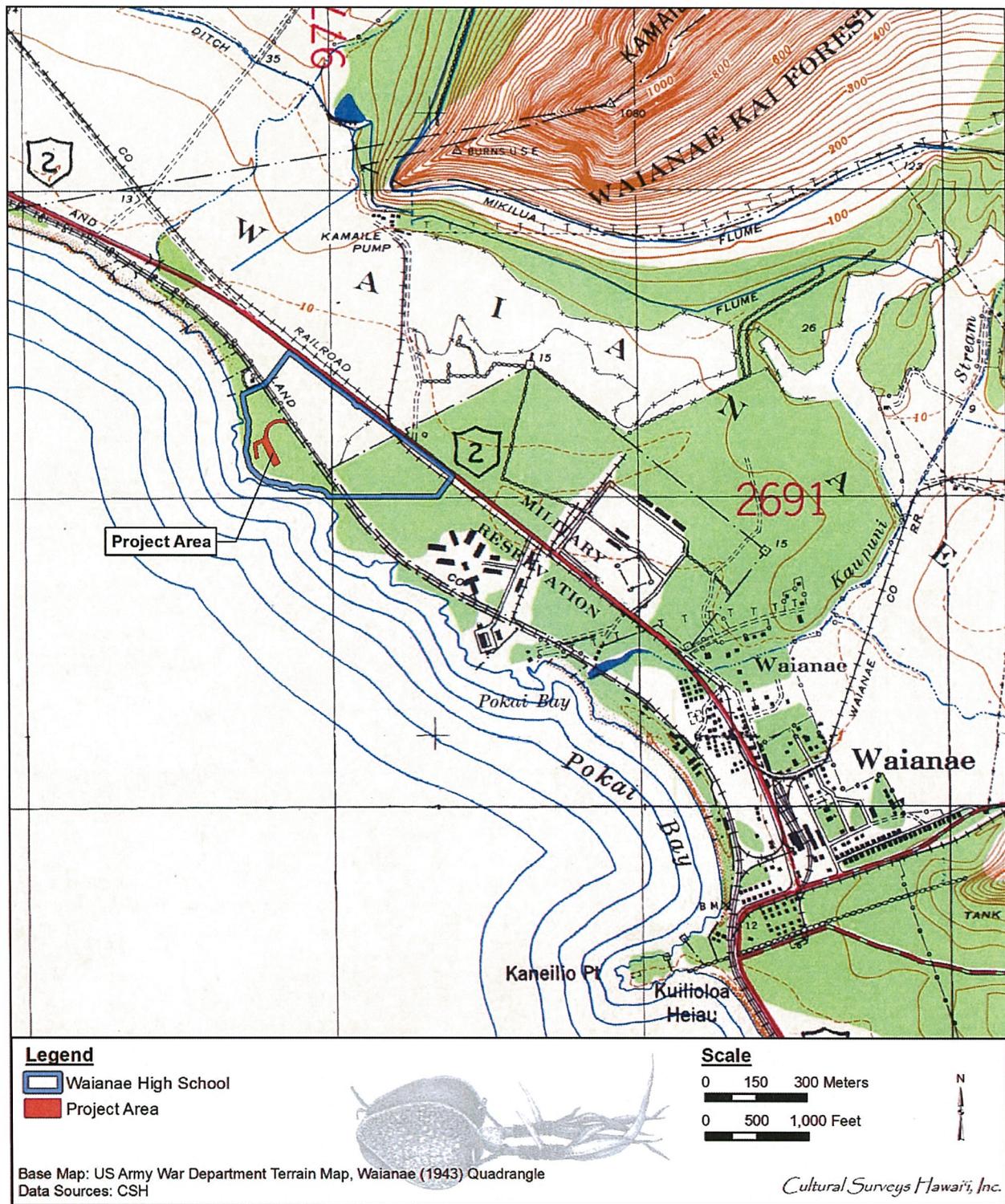


Figure 19. Portion of 1943 U.S. Army War Department Terrain map, Waianae Quadrangle, showing the location of the project area

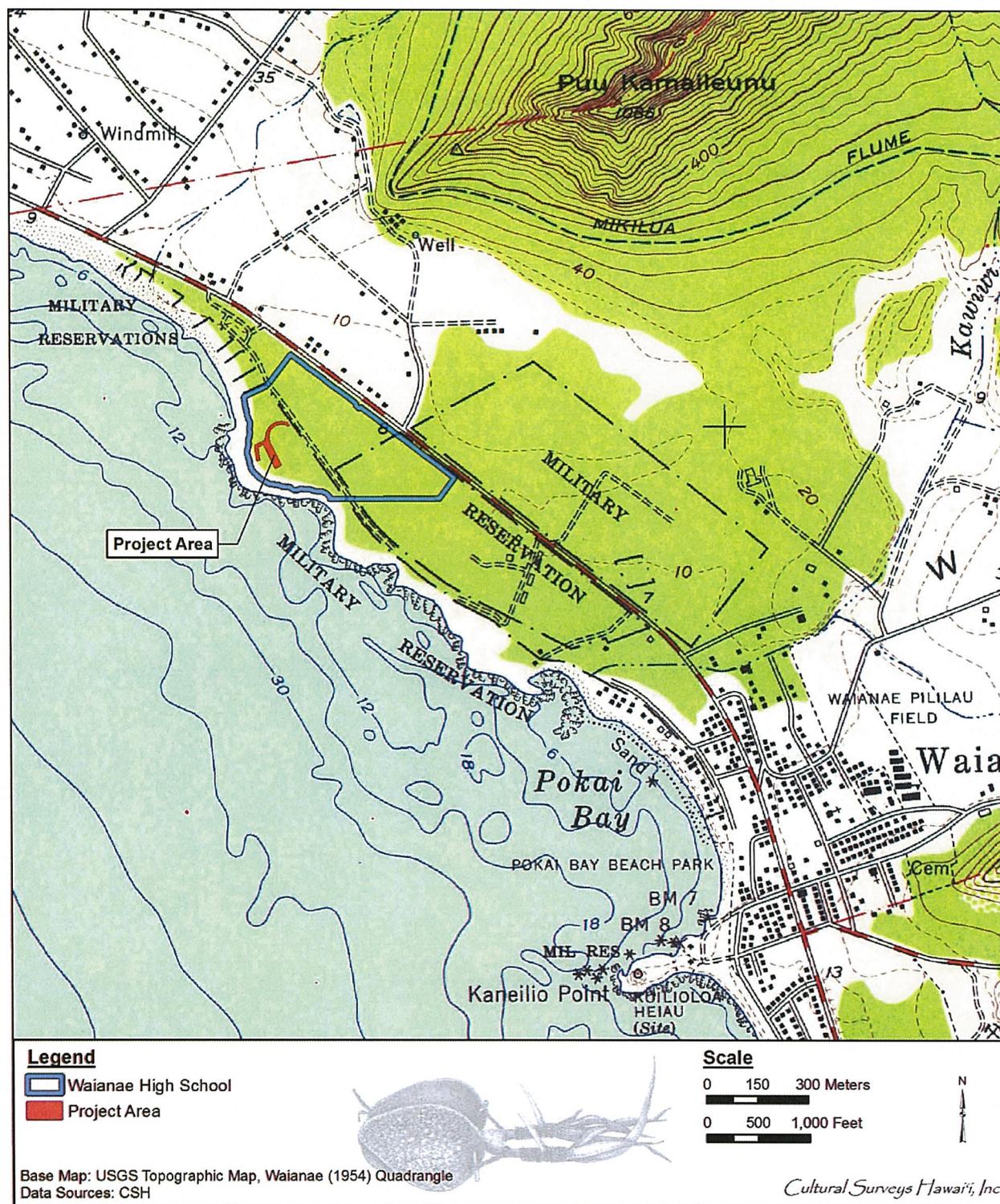


Figure 20. Portion of the 1954 Waianae USGS topographic quadrangle showing the location of the project area

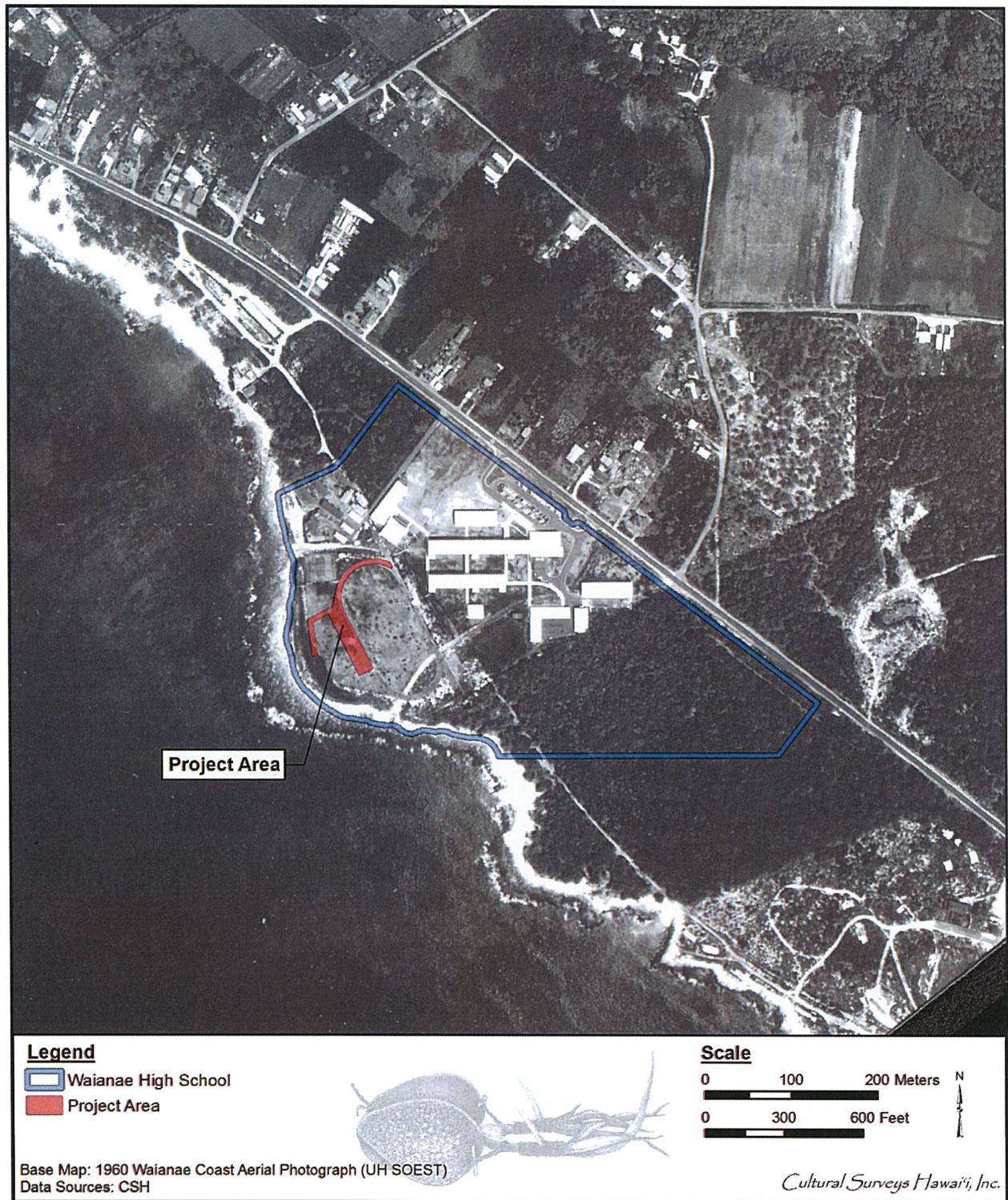


Figure 21. 1960 UH SOEST Waianae Coast aerial photograph showing the development of Waianae High School within the project area



Figure 23. 1971 UH SOEST Waianae Coast aerial photograph showing the project area within the WHS athletic field



Figure 24. 1977 UH SOEST Waianae Coast aerial photograph showing the project area within the WHS athletic field

(a house), working *lo'i*, and access to numerous archaeological sites including *heiau*, terrace systems, and house sites (Cordy 2013).

3.2 Previous Archaeological Research

No previous archaeological studies have been conducted within the WHS campus. Numerous studies were conducted within the vicinity of the project area. These studies and their results are summarized in Table 2 and discussed chronologically in the following paragraphs. The locations of previously conducted archaeological studies and previously documented historic properties within the vicinity of the project area are depicted on Figure 25 and Figure 26.

In 1930, McAllister (1933) conducted an island-wide survey of sites on O'ahu. These sites were designated with site numbers and described. Six sites were documented in the vicinity of the project area (see Figure 26):

Site 154. Puehu Fishpond, Waianae.

Located on the west side of the foot of the Waianae stream, Puehu pond is said to have once been of great importance. Due to neglect it is greatly overgrown and its extent not clearly defined. Its original area was probably 300 by 75 feet, and it seems to have been dug out of the earth 25 feet from the stream. . This pond is about 500 feet from the beach and is not affected by the tides, though the end toward the sea may at one time have been connected with the stream. The water now standing in the pond is from 1 to 2 feet deep. [McAllister 1933:113]

Site 155. Keaupuni, said to be the name of a *heiau* which was once located on the small point on the Makaha side of Pokai Bay where the J.M. Dowsett home is now located. Nothing remains of the old temple. [McAllister 1933:114]

Site 156. Kahoalii *heiau*, on Puu Kahea. The present site of Mr. Brecht's barn was pointed out by Harry Poe and William Smithers as the old *heiau* site. Nothing now remains except an elevation of land and the knowledge among the natives. Thrum [1907] has the following information:

Size 120 by 80 feet; entirely destroyed even to its foundations. Stones taken in 1870 for fence building. This is said to have been the place of Kahahana's residence, and the scene of some of Kamapuaa's escapades. . . . This *heiau* destroyed by J.L. Richardson, and its stones used to enclose the manager's premises. [McAllister 1933:114]

Site 159. Kalamaluna *heiau* at Kuaiwa, the approximate site of which was pointed out in the cane field, but of which nothing else is known or remembered. [McAllister 1933:114]

Site 160. Kane *heiau*, Kamaile.

The approximate location in the cane field was pointed out, but all the stones have been moved. The full name is said to be Kane-i-ka-pua-Iena. This is the *heiau* at which Kawelo is said to have stopped and offered sacrifices when on his way to Kauai to wage war on Aikanaka (85, p. 183). Some legends say that Kawelo stopped at the Makaha *heiau* known as Kaneaki (Site 170). [McAllister 1933:114]

Table 2. Previous Archaeological Studies in the Vicinity of the Project Area

Reference	Type of Study	Location	Results (SIHP # 50-80-07-****)
McAllister 1933	Reconnaissance survey	Island-wide	Describes Site 154 (Puehu Fishpond), Site 155 (Keaupuni Heiau), Site 156 (Kahoalii Heiau), Site 159 (Kalamaluna Heiau), Site 160 (Kane Heiau) and Site 161 (Kamaile Heiau) within the vicinity of the project area
Sinoto 1975	Reconnaissance survey	Wai'anae Light-Draft Harbor, Wai'anae Regional Park	Documented five historic properties: SIHP #s -4822 (enclosure), -4823 (enclosure/L-shaped wall), -4824 (wall), -4825 (enclosure), and -4826 (L-shaped wall)
Douglas 1991a	Burial report	Makaha Surfside Apartments, Wai'anae	Recovered and documented sub-adult burial eroding out of Mauna Lahilahi Beach Park (SIHP # -4064)
Douglas 1991b	Burial report	Makaha Surfside Apartments, Wai'anae	Artifact memorandum and skeletal analysis from two individuals recovered by SHPD in 1979 (SIHP # -4064)
Kawachi 1991a	Burial report	Makaha Surfside Apartments, Wai'anae	Recovered and documented sub-adult burial eroding out of Mauna Lahilahi Beach Park (SIHP # -4064)
Kawachi 1991b	Burial report	Makaha Surfside Apartments, Wai'anae	Artifact memorandum and skeletal analysis from two individuals recovered by SHPD in 1979 (SIHP # -4064)
Denham et al. 1992	Archaeological inventory survey	Wai'anae Regional Park	No historic properties identified
Kawachi 1992	Burial study	Wai'anae Regional Park	Human remains of one individual identified and designated as part of SIHP # -3967 (Wai'anae Regional Park)
Flood et al. 1994	Archaeological inventory survey	Wai'anae Intermediate School	SIHP # -2474 (pre- and post-Contact complex) identified; 24 features, including 18 sinkholes documented along with lure point artifact made of human long bone
Jourdane 1995	Burial report	Mauna Lahilahi Beach Park	Reported discovery of two burials eroding out of Mauna Lahilahi Beach Park (SIHP # -4064)

Reference	Type of Study	Location	Results (SIHP # 50-80-07-****)
Borthwick and Hammatt 1997	Inadvertent discovery of human skeletal remains report	Church of Jesus Christ of Latter Day Saints, Wai'anae	Documented six burials exposed after area graded ; located in a cluster at southwestern edge of property (no SIHP # assigned)
Magnuson 2000	Archaeological reconnaissance survey	Southern base of Pu'u Kamaile'unu in Wai'anae	No historic properties identified.
Elmore and Kennedy 2001	Archaeological inventory survey	Wai'anae coast emergency access road	Documented SIHP # -5949 (traditional Hawaiian habitation site and burial) and SIHP # -5950 (sugar plantation camp and pumping station remnants)
Cordy 2002	Archaeological investigation	Makaha Surfside Apartments, Mauna Lahilahi Beach Park	Documented 15 features: two burial pits, four fire pits, five indeterminate pits, two paving stone foundations, and two twentieth century trash pits along coastal habitation site (SIHP # -4064)
Jones and Hammatt 2003	Archaeological monitoring	Mauna Lahilahi Beach Park	No historic properties identified
Kailihiwa and Cleghorn 2003	Archaeological monitoring	Board of Water Supply water improvement project; on ten streets including Valley and Ma'i'u'u roads, and Lahaina, Hanalei, Jade, Orange, Fricke, Moua, Lahilahi, Widemann, and Upena streets	Documented three historic properties: SIHP #s -3325 (portion of a concrete flume), -6521 (pit feature), and -6522 (two fire pits); a possible trench and charcoal deposit also identified but no SIHP # assigned; SIHP #s -6521 and -6522 not located in the vicinity of the project area

Reference	Type of Study	Location	Results (SIHP # 50-80-07-****)
Clark et al. 2004	Archaeological inventory survey	Wai'anae Regional Park	Located sites documented by Sinoto (1975) and redesignated the three extant historic properties (SIHP #s -4822, -4825, and 4826) as Features 2 through 4 of SIHP # -3967, respectively; also redesignated the burial identified by Kawachi (1992) as Feature 1 of SIHP # -3967 and documented four newly identified features (Features 5 through 8) consisting of four sinkholes
Perzinski and Hammatt 2004	Archaeological inventory survey	Mauna Lahilahi Beach Park	Documented two new historic properties: SIHP #s -6634 (intact cultural layer) and -6635 (historic basalt alignment); also documented components of previously documented historic properties: SIHP # -4064, human burials, and SIHP # 50-80-12-9714 (OR&L Railroad Right of Way)
Tulchin and Hammatt 2004	Archaeological monitoring	Farrington Hwy from Jade St to Kaulawaha Rd	No historic properties identified
Hammatt and Shideler 2006	Archaeological inventory survey	Wai'anae Civic Center	Identified a single human burial (SIHP # -6860)
Shefcheck and Spear 2007	Archaeological assessment	2.5-acre property north of Wai'anae Intermediate School	No historic properties identified
Tulchin and Hammatt 2007	Archaeological inventory survey	Spotkaeff House project, east of Mai'u'u Rd and Mahina'au Rd	Documented SIHP # -6858 (remnant historic L-shaped basalt and mortar foundation); related to former sugar cane plantation in area
Desilets 2008	Archaeological assessment	Hawai'i Department of Transportation Wai'anae baseyard	No historic properties identified
Hazlett et al. 2008	Archaeological monitoring	Wai'anae Civic Center	No historic properties identified
McElroy 2008	Archaeological monitoring	Farrington Hwy, in Lualualei, Mākaha, and Wai'anae Ahupua'a	No historic properties identified

Reference	Type of Study	Location	Results (SIHP # 50-80-07-****)
Shefcheck and Spear 2008	Archaeological assessment	Wai'anae Regional Park	No historic properties identified
Hammatt 2009	Memorandum	Seawind Apartment project	Located and conducted GPS data collection for a portion of the site complex SIHP # -2474, previously documented by Flood et al. (1994)
Jones and Hammatt 2009	Archaeological monitoring	Mauna Lahilahi Beach Park	Identified two human burials, SIHP #s -6704 (intact historic coffin burial) and -6705 (previously disturbed human remains)
Shefcheck and Spear 2009	Archaeological monitoring	2.5-acre property north of Wai'anae Intermediate School	No historic properties identified
Liebhardt and Kennedy 2010	Archaeological inventory survey	Mākaha Valley Road and Farrington Hwy	No historic properties identified
Mooney et al. 2013	Archaeological assessment	Proposed Wai'anae Solar Power Farm	Identified 16 potential historic properties designated T-001 through T-016; no SIHP #s assigned
Yucha et al. 2014	Archaeological inventory survey	Kamaile Plantation Wells and Production Wells site	Documented five historic properties: SIHP #s -1185 (Kuka'au'au Complex), -1190 (C-shaped enclosure), -1191 (Wai'anae "Kamaile" Complex), -5949 (traditional Hawaiian habitation site and burial) and -5950 (sugar plantation camp and pumping station remnants)
Yucha et al. 2015	Archaeological monitoring	Wai'anae Regional Park	No historic properties identified
Hawai'i Register	N/A	Former Waianae Plantation	Waianae Plantation, designated SIHP # -9993, listed on the Hawai'i Register of Historic Places

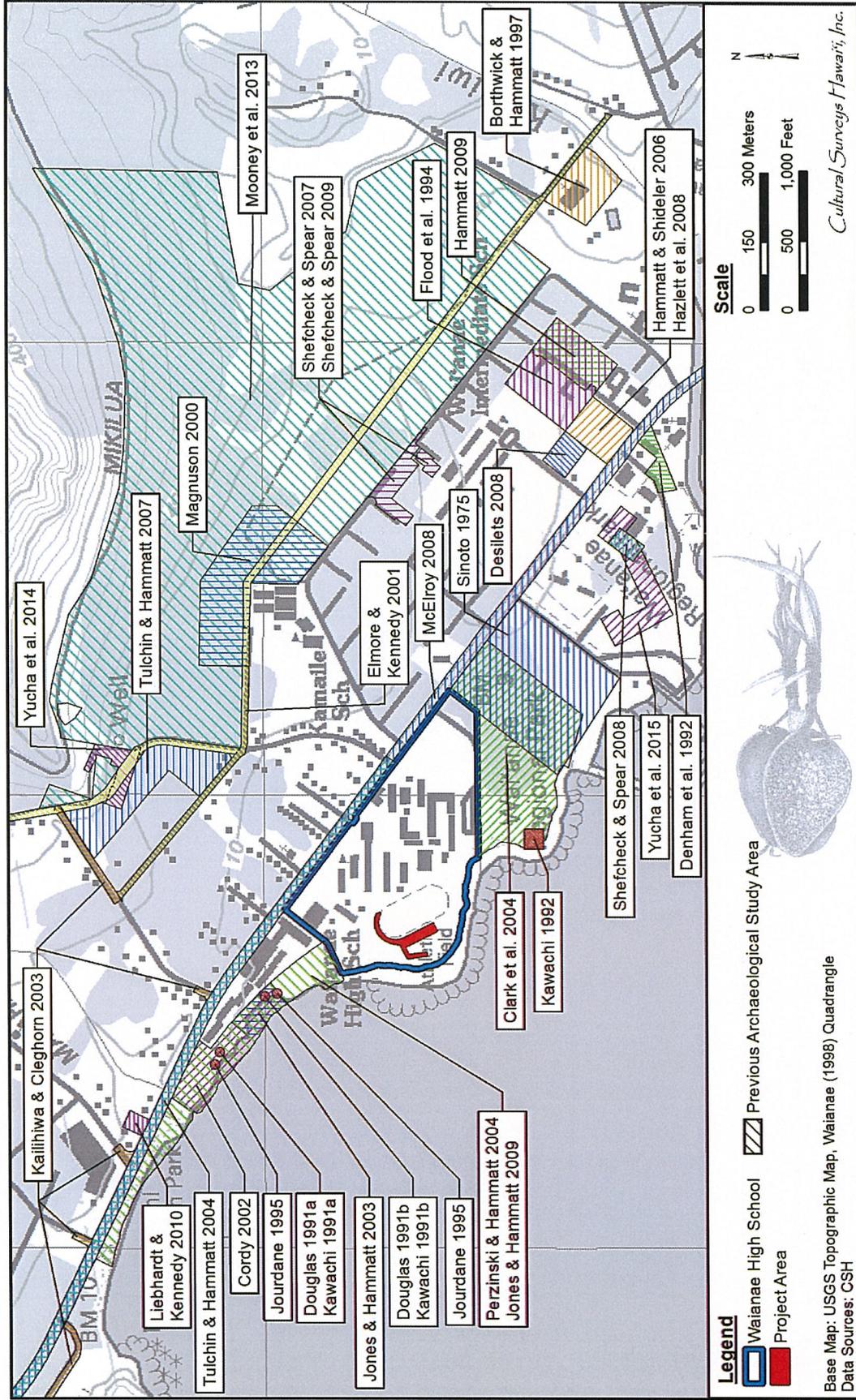


Figure 25. Portion of 1998 Waianae USGS 7.5-minute topographic quadrangle showing the locations of previously conducted archaeological studies within the vicinity of the project area

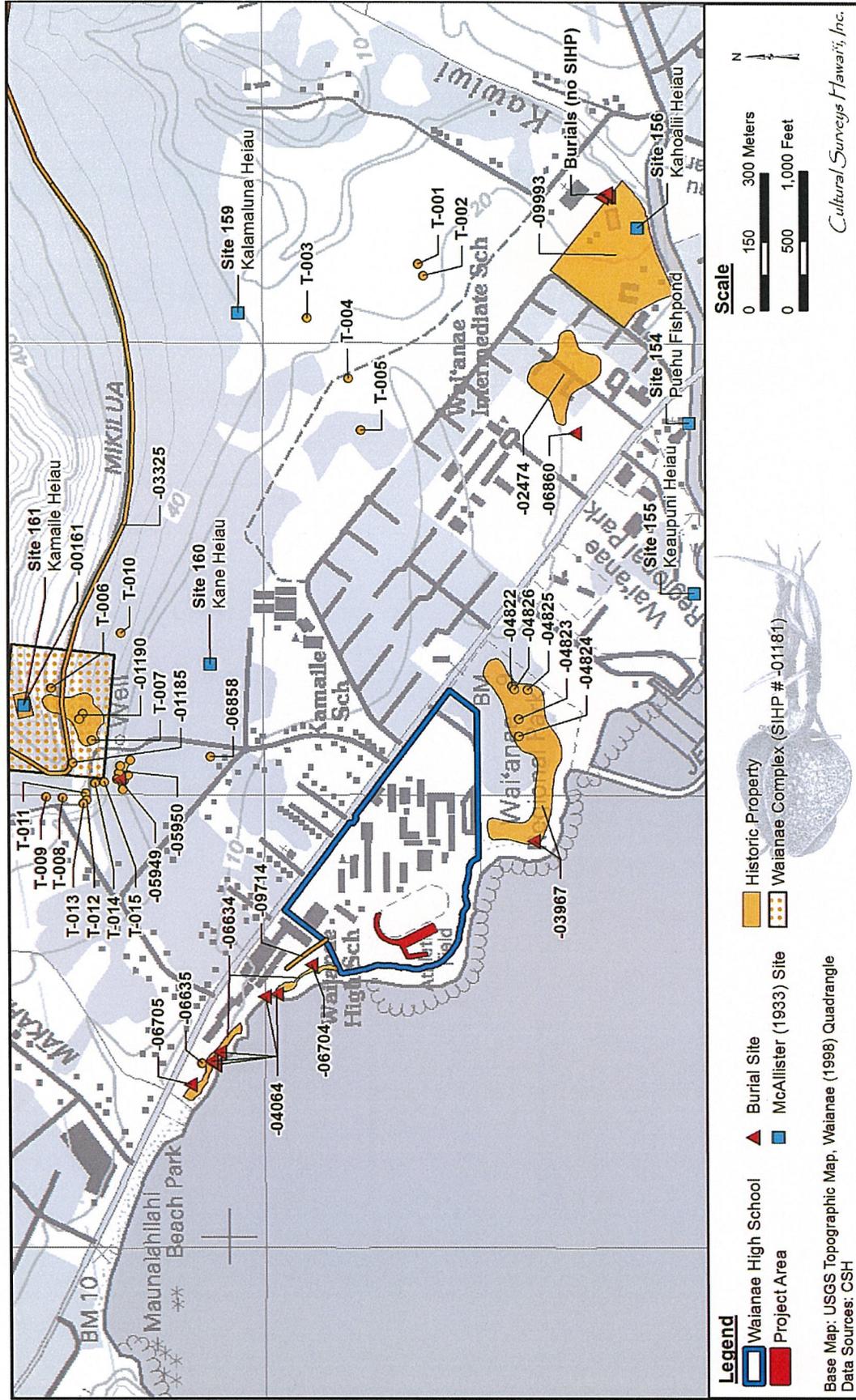


Figure 26. Portion of 1998 Waianae USGS 7.5-minute topographic quadrangle showing the locations of previously documented historic properties within the vicinity of the project area

Site 161. Kamaile heiau, on Kamaile ridge between Waianae and Makaha valleys, an elevation about 400 feet, just above pumping station...

The heiau is a single terrace, built of large, sharp lava rocks. The facings of the terrace are surprisingly even and were carefully fitted. The heiau was formerly paved with small bits of coral, giving it the appearance of fine, white gravel. The amount of such coral is surprising . . . Thrum [1907] offers the following information: 'A medium sized heiau of platform character and pookanaka class, still in fair condition, to be seen from the road on the bluff above the pipe line of the electric pumping station.'

Beneath the heiau, but still above the pump, is a shallow cave shelter known as Kukaauau. The entrance, which faces due south, is concealed by a large kiawe (algaroba), some Cactus, and haole koa. The cave is approximately 40 feet deep and 25 feet wide and 10 feet high at the entrance. It might prove interesting if excavated because it is on the ridge back of what was once a large Hawaiian settlement. The famous Kaimaile spring, known as Kekoo, which watered many acres of taro land (73 just before it was taken over by the plantation) between the ridge and Mauna Lahilahi, was near the base of the shelter. The cave has the appearance of being artificially filled in, for the dust of the floor does not appear to have dropped from the roof. On the floor are many bits of matting, broken gourds, straw, and a few pages from a book printed in Hawaiian which appears to be a portion of a catechism. About one-third of the way in, on the right-hand side facing into the cave, a small hole 6 inches deep was made with a stick and a torn part of 'Ka Hae Hawaii,' dated Mei 14, 1856, was found. These cut pieces are in surprisingly excellent condition; the paper is not even yellow or fragile. The paper has been cut with a scissors or knife. A number of tapa (kapa) fragments were found; one a brick-red color. The floor is covered with grasses, ti leaves, banana stalks, coral, sea shells, a bunch of awa strainers, kukui nuts, coconut shells, charcoal, and a few broken bottles. Near the back of the cave was a hole 2 feet in diameter and about 1 foot deep. Though there is a small plantation camp at the base, the shelter is probably not often frequented now. [McAllister 1993:114-115]

In 1975, the Department of Anthropology at the Bernice Pauahi Bishop Museum conducted a reconnaissance survey for the Wai'anae Light-Draft Harbor project near the western boundary of the Wai'anae Regional Park (Sinoto 1975). The project area is located adjacent to the boundary of the Wai'anae Regional Park and was previously disturbed, most likely due to military activities and more modern bulldozing. During the survey, five archaeological sites were identified, although all had been destroyed beyond the point required for any research of interpretative potential. The sites include two enclosures (SIHP #s -4822 and -4825), an enclosure with adjoining L-shaped wall (SIHP # -4823), and two walls, one L-shaped (SIHP # -4826) and one linear (SIHP # -4824). Due to the stark contrast in the environment between this area and the inland areas of nearby Wai'anae and Mākaha valleys, these sites were thought to be part of fringe settlement, where activities were limited to those related to the sea. Dr. Sinoto concludes that due to the crude construction of these structures, the sites were most likely temporary in nature (Sinoto 1975).

A memorandum by Kawachi (1991a) from SHPD documents the discovery and disinterment of human skeletal remains from 27 February 1991. The burial was reported as eroding out of the beach at the Ka'ena corner of the Makaha Surfside Apartments, on City land over 24 m southwest from the property line. A 30-cm-thick cultural layer exhibited dark staining, charcoal, and midden at 54 cm below surface (cmbs) and was designated SIHP # -4064. A shell fishhook preform also was found in this cultural layer. The burial pit was completely within the cultural layer and the burial was determined to be in a supine flexed position with the head facing toward the ocean and some displacement of elements likely due to wave action (and police investigations during the previous day). Douglas (1991a) conducted an osteological analysis and concluded the partial remains of two individuals were present. One individual was a 7 to 9-year-old child. The second individual was represented by several cranial bones and determined to possibly be a middle-aged male individual. These remains were reinterred with other finds at the designated Lucio Badayos family reinterment site within Mauna Lahilahi Beach Park.

A memorandum by Kawachi (1991b) and Douglas (1991b) from SHPD includes an artifact and skeletal analysis summary to supplement the disinterment of human skeletal remains from October 1979, designated SIHP # -4064. A burial containing two individuals was found in front of the Makaha Surfside Apartments which border the Mauna Lahilahi Beach Park in Wai'anae. The artifacts were found during the skeletal analysis and included a rusted nail, wood fragments, a non-human bone fragment, a *kukui* nut shell, and five buttons. The skeletal remains indicated a middle-aged male around 5ft 10 inches tall, and a probable female adult. The ancestry of the individuals was indeterminate due to the incompleteness of the remains, and the time period (pre-Contact versus post-Contact) also was indeterminate. The artifacts were historic but the exact association of the artifacts to the remains is unknown as they may have originated from the surrounding fill material. As part of the skeletal analysis, it was stated that the "place of burial infers that these two were not people of rank" (Kawachi 1991b:6).

In May 1992, Archaeological Consultants of Hawaii, Inc. conducted an archaeological inventory survey (AIS) on a 2-acre parcel for the proposed extension of Wai'anae Regional [District] Park (Denham et al. 1992), located directly east of the current project area. The study included ten test excavations in the parcel and six auger holes drilled specifically along the southern boundary to test for the presence of sediment from the former Puehu Fishpond. The lack of carbon in the samples indicated a highly unlikely presence of fishpond sediment in the area (Denham et al. 1992). Artifacts included mostly modern and historic items, as well as a pre-Contact volcanic glass flake and a possible basalt abrader. No significant cultural deposits were observed. The stratigraphy in the area was representative of a marine transgression and emergent reef environment from the lowering of the sea level (Denham et al. 1992:54).

In September 1992, Carol Kawachi from SHPD responded to a find of skeletal remains likely exposed by Hurricane 'Iniki on the beach fronting Wai'anae Regional Park, approximately 25 m from the water. Kawachi (1992) identified the remains as a flexed burial likely of an adult female. The burial was left in situ and unmarked. Kawachi (1992) notes that in 1988, Wai'anae Regional Park was designated SIHP # -3967 because of sites observed by the SHPD. Informants indicated the area was part of a known burial ground of the Kamaile complex and families would bury members in the sinkholes (Kawachi 1992).

In 1993, Bishop Museum conducted an AIS of a 7-acre parcel near the Wai'anae Intermediate School approximately 250 m northeast of the current project area. A total of 24 archaeological features were identified and designated as components of SIHP # -2474 (Flood et al. 1994). These features included a core-filled wall, a scatter of historic artifacts, a rubbish mound, an L-shaped boulder slab alignment, a low platform, a small terrace, four modified sinkholes yielding pre-Contact cultural material, and 14 unmodified sinkholes. Excavations conducted on ten of the features yielded pre-Contact cultural material such as lithics, a bone fishhook fragment, midden, an assemblage of extinct avifauna remains and other faunal material, and an assortment of historic artifacts. A probable "human long bone fragment which was apparently part of a finished lure point" (Flood et al. 1994:151) was the only human bone recovered. The extinct avifauna included a true goose (*Branta* sp.), a goose-like *moa-nalo* of the family Anatidae (*Thambetochen xanion*), a small flightless rail (*Porzana zieglerei*), a large crow (*Corvus* sp.), and a Hawaiian petrel (*Pterodroma phaeopygia*) that was extinct on O'ahu prior to Contact (Flood et al. 1994:147). The study concluded the site (SIHP # -2474) "appears to have been somewhat peripheral to the impact of many of the broader historical events . . . probably due to the relatively impermeable limestone reef deposits which precluded any profitable use of the area except for the hardest attempts at dry land agriculture . . ." (Flood et al. 1994:150). They interpreted five basic land use patterns, refuse disposal, agriculture, ranching, habitation, and military. They suggest the site area may also have been utilized as a sugar or railroad camp (Flood et al. 1994:x). The soils in the project area were noted as relatively thin and unlikely to contain burials (Flood et al. 1994:162).

A memorandum by Jourdane (1995) from SHPD describes the discovery of two burials (designated SIHP # -4064) found eroding out of the shoreline fronting the Makaha Surfside Apartments on 21 June 1995. The find was reported by Mr. Alike Silva after walking the beach checking for exposed burials following a period of large surf. Burial 1 was found approximately 40 m west of the apartment complex on the western edge of a small cove. A burial pit was evident on the surface and the face of the encompassing dark sandy layer was about 50 cm thick. Burial 2 was found at the edge of the lawn fronting the second building from the Nānākuli end of the complex. A faint burial pit was visible in the profile and the remains appeared to be those of a juvenile. At the time, both burials were covered with limestone rocks by Mr. Silva in order to protect them from further erosion. SHPD later recommended relocation, and the remains were disinterred in October 1995 in consultation with the Lucio Badayos family. The remains were reinterred in the Badayos reinterment site within the park on 2 January 1996.

In 1997, CSH responded to an inadvertently discovered burial found during grading activities in a parking lot at the Church of Jesus Christ of Latter Day Saints, east of Wai'anae Intermediate School near Plantation Road and Kaupuni Channel (Borthwick and Hammatt 1997), over 700 m east of the project area. After monitoring further construction activity, five additional human burials were reported. All of the burials were relatively close to the ground surface, which used to be much higher according to historic data, and none of the burials were completely intact. No SIHP # was assigned to the burials.

In May 2000, International Archaeological Research Institute, Inc. (IARII) conducted a reconnaissance survey for the Kamaile Elementary School Expansion project (Magnuson 2000). The survey included a pedestrian field inspection over the parcel. No traditional Hawaiian or historic properties were identified. The ground was composed of remnants from an exposed raised

limestone reef. It was noted that the area had been previously bulldozed which may be partly responsible for the lack of archaeological surface sites.

From June to July 2001, Archaeological Consultants of the Pacific, Inc. (ACP) conducted an AIS for the Wai'anae Coast Emergency Access Road (Elmore and Kennedy 2001). The project area consisted of five corridors within the *ahupua'a* of Mākaha, Wai'anae Kai, Lualualei, and Nānākuli: 1) Kaulawaha Road Corridor, 2) Maiu'u/Mahina'au Road Alternate Corridor, 3) Pakeke Street/Hakimo Road Connector Corridor, 4) Pa'akea Road Corridor, and 5) Nānākuli Improvements Corridor. Two sites were identified within the Kaulawaha Road Corridor, SIHP # -5949, a traditional Hawaiian subsurface deposit identified within a backhoe trench (Trench 35); and SIHP # -5950, four historic mortar and basalt foundations and a well, identified during the surface survey.

From 1999 to 2001, Dr. Ross Cordy of the SHPD investigated the shoreline exposures of a coastal habitation site (SIHP # -4064) fronting the Makaha Surfside Apartments within Mauna Lahilahi Beach Park in Wai'anae during yearly visits with advanced archaeology students (Cordy 2002). The site was determined to extend over 425 m along the shore and about 60 to 70 m inland, based on past burial finds and the exposed deposits. Several representative profiles were documented each year. Overall, the stratigraphy consisted of two layers of modern fill above clear plastic, overlying a cultural layer that was mixed in some areas, then up to three additional layers of non-cultural sand over a brownish basal soil layer (Cordy 2002:3). A total of 15 features were documented over the three years.

Several features associated with SIHP # -4064 were recorded by Cordy (2002) in the central north cove area in 1999. Two burial pits (Feature 1 and Feature 3) with partial human remains were exposed in Layer III. Feature 1 had eroded by 2000 and Feature 3 was still exposed in 2001. Feature 4 was identified as a twentieth century trash pit originating from the same layer and containing metal and bottles. Feature 2 and Feature 7 were fire pits found in Layer V. Paving stones (Feature 5 and Feature 6) from a possible house foundation were found in Layer III north of the northern cove, and in the center of the south part of the park. In the south end of the north cove, there were three pit features encountered in Layer III, two were of indeterminate function (Feature 11 and Feature 15) and one was a twentieth century trash pit (Feature 12). In Layer V in this area, there were three additional pit features containing charcoal (Features 8 through 10) and two fire pits (Features 13 and 14).

In 2003, CSH conducted archaeological monitoring for the Mauna Lahilahi Beach Park Shoreline Protection project. Areas believed to be possibly culturally sensitive were protected with fencing during construction. No historic properties were identified.

Between September 2001 and October 2002, Pacific Legacy, Inc. conducted archaeological monitoring for a water systems improvements project in Mākaha and Wai'anae (Kailihiwa and Cleghorn 2003). Monitoring locations for the project involved areas on Lahaina Street, Hanalei Street, Jade Street, Orange Street, Fricke Street, Moua Street, Lahilahi Street, Widemann Street, Upena Street, Mai'u'u Road, and Mākaha Valley Road. Three historic properties comprised of five features were identified during the project: SIHP #s -6521, a pit feature not located in the vicinity of the current project area; -3325, a portion of a concrete flume; and -6522, two fire features not located in the vicinity of the current project area, and a charcoal deposit.

No significant finds were encountered at the monitoring location at Mākaha Valley Road. Results of monitoring indicated a fill of rubble used to grade the *makai* section of the road like that of Farrington Highway. A very dark gray likely relating to the previous land use of *lo 'i kalo* (taro paddies) was identified near the intersection of Mai'u'u Road and Mahina'au Street. A concrete flume (SIHP # -3325) was identified along the northwest side of Mai'u'u Road and is believed to be associated with the Mikilua Flume, under the same site designation. Kalihiwa and Cleghorn (2003) determined SIHP # -3325 is no longer assessed as being significant.

Between 2002 and 2003, Pacific Consulting Services, Inc. conducted an AIS at Wai'anāe Regional Park, SIHP # -3967 (Clark et al. 2004). Three of the five sites previously identified by Sinoto (1975) were reevaluated and subsumed under SIHP # -3967 while the other two previously identified sites had been destroyed, and four undocumented sites were recorded. These sites were designated as Features 1 through 8 by Clark et al. (2004:19) and included the burial documented by Kawachi (1992), three sinkholes, one modified sinkhole, two enclosures, and an L-shaped structure.

In August 2003, CSH conducted an AIS consisting of a surface survey, 32 test excavations, four wave-cut bank profiles, and six backhoe trenches for proposed improvements at the Mauna Lahilahi Beach Park (Perzinski and Hammatt 2004). The stratigraphy in the southern half of the project area generally consisted of one to four layers of imported fill or mixed/disturbed sediment (Stratum I), overlying one to three cultural layers (Stratum II), and a culturally sterile layer (Stratum III).

A total of two new sites and two previously documented sites were documented by Perzinski and Hammatt (2004). The new sites consist of SIHP # -6634, an intact cultural layer and SIHP # -6635, an historic basalt alignment. SIHP # -6634, the intact cultural layer, was radiocarbon dated to AD 1430. This date, along with the stratigraphy and artifactual information, indicated continued use and settlement of the shoreline, including a pre-Contact component and an early post-Contact cultural deposit. SIHP # -6635 is a rectangular basalt alignment without a cultural layer and of indeterminate function. The two previously identified sites within the study area are SIHP # -4064, which designates a concentration of human burials, and SIHP # -9714, a portion of the former OR&L railroad berm formerly used to transport sugarcane from Waiānae Sugar Company land to the Ewa mill and was still visible within the southeastern area. Findings related to SIHP # -4064 included a human burial eroding out of a wave-cut bank. It was determined this burial was likely the same as the designated SIHP # -6592:2 burial reported by Cordy (1997). It was left in place pending a decision for final disposition. In addition, a probable burial crypt in Test Unit 27 was identified by basalt capstones and a basalt-lined pit. No human remains were encountered within the feature; however, it was identified based on the proximity to the newly identified human burial and a previously identified human burial believed to have eroded out before September 2001 (Perzinski and Hammatt 2004:132).

From April through November 2002, CSH conducted archaeological monitoring of a Board of Water Supply water main project along Farrington Highway from Jade Street to Kaulawaha Road in Wai'anāe (Tulchin and Hammatt 2004). Representative profiles indicated sand deposits only in the western end of the study area, between Jade Street and Lahilahi Street. Charcoal flecking from a sand deposit near Orange Street provided a 2-sigma calibrated date range of AD 1719–1820 (late prehistoric to early historic era). No historic properties were identified.

In August 2006, CSH conducted an AIS on 2.817 acres for a Leeward Coast Emergency Homeless Shelter project at the “Wai‘anae Civic Center Location” (Hammatt and Shideler 2006), which has become the current site of the Pai‘olu Kaiaulu Shelter. The parcel is located on the northern corner of Farrington Highway and Kau‘iokalani Place. Testing included the subsurface excavation of 22 trenches, each approximately 8-10 m long. One test excavation in the northern corner of the parcel exposed a small portion of a human burial designated as SIHP # -6860. The burial was estimated to be in a flexed position due to the small size of the depression in the surrounding limestone bedrock. No additional finds were encountered. CSH conducted archaeological monitoring of construction activities from October through November 2006 and no other sites or significant cultural materials were identified, and no historic properties were affected (Hazlett et al. 2008).

In 2007, Scientific Consultant Services, Inc. conducted an archaeological assessment of approximately 2.5 acres for the development of a housing facility *mauka* (north) of Wai‘anae Intermediate School with no significant findings (Shefcheck and Spear 2007). Archaeological monitoring for the development was conducted from June 2007 to January 2008. The only find consisted of a large grinding stone mortar artifact; no cultural deposits were encountered (Shefcheck and Spear 2009).

In July 2006, CSH conducted an AIS on an approximately 6.7-acre parcel for the proposed development of a single-story home by the Spotkaeff family. The project area was located directly south of the current project area and east of the intersection of Maiu‘u and Mahinaau roads. Fieldwork consisted of surface inspections and six backhoe test trenches (Tulchin and Hammatt 2007). In general, the stratigraphy observed within the backhoe test trenches consisted of alluvial clay layers, which was expected based on the presence of Keko‘o Spring within the vicinity. The survey identified SIHP # -6858, a remnant historic L-shaped basalt and mortar foundation related to the sugarcane plantation in the area. Due to the deteriorated condition of the feature, it did not fulfill any of the criteria for recommended eligibility for the Hawai‘i Register of Historic Places.

In 2007, Garcia and Associates conducted a subsurface archaeological investigation of a 60 m by 60 m area at the Hawai‘i Department of Transportation Wai‘anae Baseyard, located *mauka* of the current project area on the opposing side of Farrington Highway. The stratigraphy was variable over the area and often consisted of modern fill over limestone substrate with a paleosol in the majority of the excavations (Desilets 2008). No significant cultural material was encountered.

In 2007, Garcia and Associates conducted archaeological monitoring for the installation of a fiber optic cable along Farrington Highway (McElroy 2008). Trenching boring pits connected via horizontal drilling was conducted. Stratigraphy included the current road surface and associated base course, and various layers of fill overlying either natural sand or the coral shelf. No historic properties were identified.

Shefcheck and Spear (2008) report that Scientific Consultant Services, Inc. conducted an AIS consisting of six test excavations for planned parking lot improvements in the Wai‘anae Regional [District] Park between the Public Library and basketball court, near the recreational complex (no project dates are provided by the authors). The testing revealed shallow soil deposits, primarily of

dark reddish brown clay or silty clay, over limestone bedrock. No significant cultural deposits were encountered.

In July 2009, CSH submitted a memorandum concerning archaeological services for the Proposed Seawind Apartment project. The memorandum addressed the documentation of 12 features associated with SIHP # -2474 previously documented by Flood et al. (1994). Nine of the 12 features were reevaluated and located. No new historic properties were identified.

From November 2003 to June 2004, CSH conducted archaeological monitoring for proposed improvements to beautify Mauna Lahilahi Beach Park (Jones and Hammatt 2009). Project-related ground disturbance included planting 100 coconut trees, installing water lines and fence posts, and grading. Two human burial sites were identified during monitoring. SIHP # -6704 designates an intact historic coffin burial encountered in the southeast portion of the project area within a layer of clay sediment, with no cultural sand layer present. SIHP # -6705 designates human remains that appeared to have been previously disturbed. This burial was located in a layer of sandy clay sediment in the northwestern portion of the project area. The remains were determined to be pre-Contact due to the lack of historic artifacts and proximity to a cultural layer. Both burials were preserved in situ with small boulders/cobbles placed over and around the burials, and a waterworn rock placed on the top for cultural identification prior to backfilling.

On 6 April 2010, ACP conducted an AIS of a parcel located on the *mauka* side of Farrington Highway near the Makaha Valley Road intersection. Testing included a pedestrian survey and five backhoe test excavations (2 by 1 m and up to 105 cmbs). Overall, it was found the project area had been greatly impacted by modern activities, and there were no significant archaeological finds (Liebhardt and Kennedy 2010).

In 2013, Pacific Legacy conducted an assessment for the proposed Wai'anae Solar Power Farm (Mooney et al. 2013). Several potential sites were observed (T-001 through T-015). These potential sites were not designated historic properties and primarily consisted of plantation era infrastructure.

In November 2013, CSH conducted an AIS for the Kamaile Plantation Wells Sites in Wai'anae Ahupua'a (Yucha et al. 2014). Three historic properties were identified. SIHP # -1181, the Wai'anae (Kamaile) Complex, which includes McAllister Site 161, Kamaile Heiau; SIHP # -1185, the Kuka'au'au Cave Shelter; SIHP # -190, a C-shaped enclosure and numerous platforms; and SIHP # -5949, a subsurface platform and previously disturbed burial, were identified as well as SIHP # -5949, a pre-Contact to early post-Contact habitation site, and SIHP # -5950, a plantation-era site complex.

In 2014, CSH conducted archaeological monitoring for the Wai'anae District Park Reconstruction of Wastewater System project (Yucha et al. 2015). The documented stratigraphy consists of various fill layers overlying the coral shelf. No historic properties were identified.

Section 4 Results of Fieldwork

CSH completed the fieldwork component of this study under archaeological fieldwork permit number 15-03, issued by the SHPD pursuant to HAR §13-282. Fieldwork was conducted on 11 December 2015 by CSH archaeologists Scott Belluomini, B.A., and Trevor Yucha, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. This work required approximately 1 person-day to complete.

The entire project area was inspected and surveyed. The project area consists of the temporary bleachers on the southwest (seaward) side of the WHS athletic field, and associated grass pathway located north and west of the athletic field along the outer edge of the track (Figure 27 and Figure 28). A cinder block and wooden structure was observed just north of the western end of the project area (Figure 29 and Figure 30). This structure is the concession stand used primarily during sporting events. While the structure will not be affected by the project, the concrete pathway at the front of the building will be rehabilitated. Four concrete posts that hold stadium lighting are located within or just outside the project area, but will not be affected by the proposed project. The project area also extends to the west and south through a manicured lawn and terminates at a stage, comprised of a cinder block retaining wall and concrete stairway (Figure 31 and Figure 32).

The project area is located on an emerged coral karstic outcrop, still visible along the coastline west and south of the project area (Figure 33). The project area is located in an area previously filled with crushed coral and covered with terrigenous fill (Figure 34). This fill was documented at the outer flanks of the WHS property as being approximately 70 cm deep.



Figure 27. General view of the project area, view to north



Figure 28. General view of temporary bleachers, view to south



Figure 29. Concession stand and walkway within the project area, view to east



Figure 30. General view of north portion of the project area, view to southwest

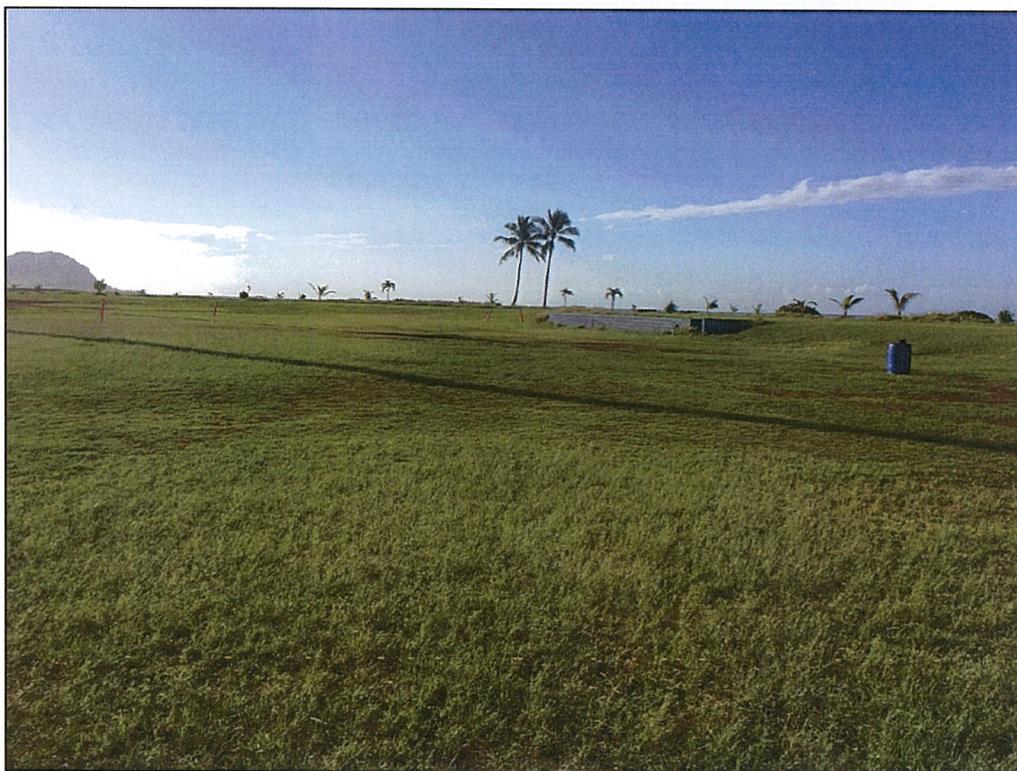


Figure 31. General view of lawn area behind the temporary bleachers, view to south



Figure 32. View of the existing stage and termination of proposed pathway, view to southwest

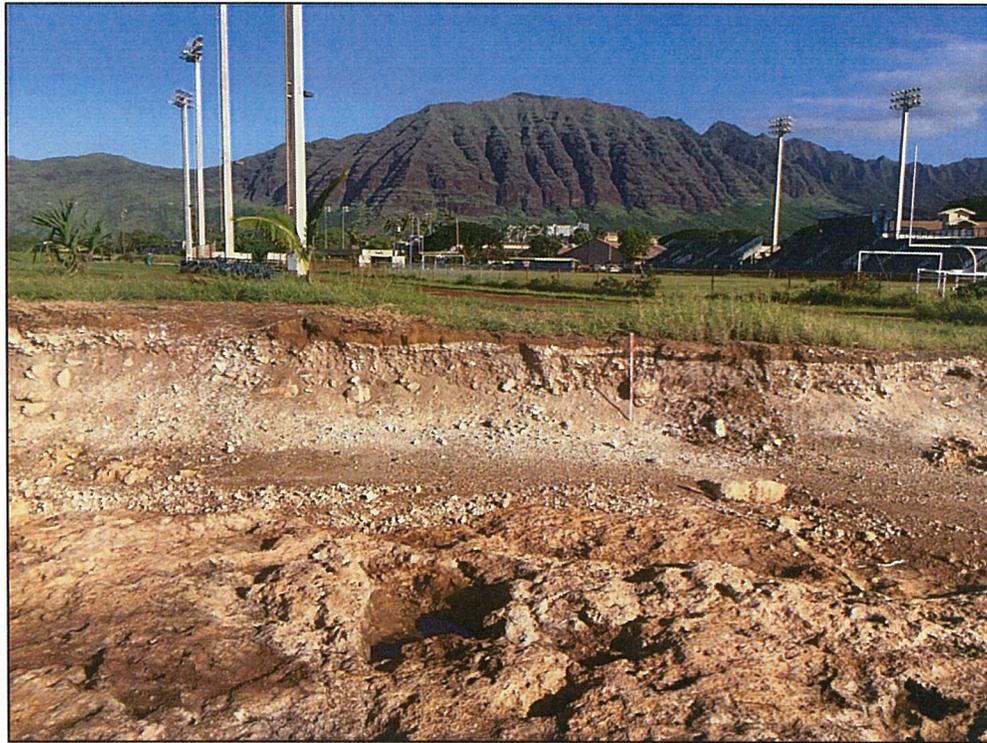


Figure 33. View of athletic field from emerged coral shelf on the coastline, view to north



Figure 34. Profile view of fill deposits used to raise the land surface for the construction of the athletic field, view to north

Section 5 Summary and Recommendations

At the request of Gerald Park Urban Planner, CSH has prepared this LRFI for the WHS Athletic Field Replacement project, Wai'anae Ahupua'a, Wai'anae District, O'ahu, TMK: [1] 8-5-002:018. The project area is located southwest of Farrington Highway within the WHS campus and includes a portion of the athletic field. The proposed project includes the replacement of the current portable metal bleachers with a similar type of bleachers that will be secured on a poured-in-place concrete foundation. Possible ground disturbance is considered to be minimal and consists primarily of grading and shallow excavation for the installation of the concrete foundation.

This LRFI study was completed for use as a planning document. The proposed project is subject to Hawai'i State environmental and historic preservation review legislation (HRS §343 and HRS §6E-8/HAR §13-275, respectively). While this investigation does not fulfill the requirements of an archaeological inventory survey investigation (per HAR §13-276), it serves as a document to facilitate the proposed project's planning and supports historic preservation review compliance by assessing if there are major archaeological concerns within the project area and developing data on the general nature, density, and distribution of archaeological resources.

The seaward portion of Wai'anae Kai Ahupua'a is one of the most densely populated areas of O'ahu between Pearl Harbor and Waialua. This population (as reflected by mid-1800s *kuleana* data) was largely at two major foci of residence, one at Kamaile northeast of the project area, and the other on the opposite side of Kaupuni Channel in Pāhoa to the southeast. The project area itself is in a seemingly unpopulated area near Kamaile. The project area sits on an emerged karstic coral outcrop which in the pre-Contact period probably had only temporary habitation or activity areas. No LCA parcels appear to have been claimed in the project area or within the WHS campus.

A Jackson 1884 map shows the OR&L Railroad traversing the WHS campus northeast of the project area, and no other development or agricultural land at the location. The 1919 and 1933 U.S. Army War Department Fire Control maps show the OR&L railway crossing the project area and the land to the south as being part of the Waianae-Kai U.S. Military Reservation. A 1943 U.S. Army War Department map and 1954 USGS topographic map depict minimal development within the military reservation. However, training exercises of the 200,000 army-troops operating at the Wai'anae Kai Military Reservation would have likely impacted the region and left an impression on the land. Aerial photographs show the project area as being undeveloped until the creation of the WHS athletic field in the mid-1900s.

Numerous archaeological studies have been conducted in the vicinity of the project area. To the northwest, several burials and pre-Contact sites have been identified, primarily in the Jaucas beach sands of Mauna Lahilahi Beach. Surface sites and one burial have been documented within the Waianae Regional Park, southeast of the project area. The surface sites consisted of walls and enclosures comprised of stacked basalt; it is unknown, however, if these sites are modern creations. Based on archaeological findings, the coastline contained mostly temporary habitation and activity areas, while the denser and more permanent areas are located in the more inland portions of Kamaile and Pokai near freshwater springs and rivers.

Fieldwork associated with the study consisted of a 100% pedestrian inspection of the project area. Fieldwork was conducted on 11 December 2015 by CSH archaeologists Scott Belluomini, B.A., and Trevor Yucha, B.S., under the general supervision of Hallett H. Hammatt, Ph.D.

The project area is located within the WHS athletic field. The project area encompasses 0.2 hectares (0.49 acres) of an area north and west of the existing football field and track. Temporary bleachers, stadium lighting, and a concrete block stage are the only structures located within the project area. A concession stand is located just north of the western extent of the project area, but will not be affected. No potential historic properties were identified during the LRFI. The project area is located atop an emerged coral karstic outcrop that has been filled with approximately 70 cm of fill consisting of crushed coral and terrigenous fill.

Due to the findings of the pedestrian inspection and background research, no surface historic properties will be potentially affected by the proposed project. Coral karstic outcrops are known to contain pre- and post-Contact archaeological deposits and human burials; however, based on the minimal ground disturbance proposed and the general thickness of the fill deposits overlying the coral outcrop, it is unlikely the coral outcrop, and any archaeological deposits therein, will be encountered or affected.

Therefore, no further archaeological historic preservation work is recommended for the proposed project. However, if significant finds are encountered, including human burials, all work in the immediate vicinity will cease and the SHPD will be promptly notified.

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