DAVID Y. IGE
GOVERNOR

FILE COPY
MAY 23 2020

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

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

OFFICE OF FACILITIES AND OPERATIONS

May 5, 2020

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

FROM: Tracy Okumura
Executive Assistant

SUBJECT: **Draft Environmental Assessment for**
Maui High School, STEM Building and Autism Center
DOE Job No. Q55208-19
TMK: (2) 3-8-007:098
Kahului, Maui County, Hawaii

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

The proposed action will provide a permanent structure for accommodating the Maui High School STEM program and an Autism Center for Maui District special needs school children.

One CD with the Draft Environmental Assessment in PDF format is attached and one printed copy will be deposited at the Hawaii Documents Center. The Environmental Notice publication form will be emailed to the Office of Environmental Quality Control.

If there are any questions, please contact Janna Mihara, Project Coordinator of the Facilities Development Branch, Project Management Section, at 784-5120.

TO:jm
Enclosures

c: Office of Facilities and Operations
Facilities Development Branch

20-263

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Thursday, May 7, 2020 8:53:50 AM

Action Name

Maui HIgh School STEM Building / Autism Center

Type of Document/Determination

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

HRS §343-5(a) Trigger(s)

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

Judicial district

Wailuku, Maui

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

3-8-007: 098

Action type

Agency

Other required permits and approvals

Disability and Communication Access Board (Facility Access Review), Variance from Pollution Controls (Noise Permit), Historic Site Review (Chapter 6E), Temporary Water Permit (To Be Determined), Building Permit, Grading and Grubbing Permit, Certificate of Occupancy, Fire Protection (Fire Sprinkler Plans).

Proposing/determining agency

Department of Education, State of Hawaii

Agency contact name

Janna Mihara

Agency contact email (for info about the action)

janna.mihara@k12.hi.us

Email address or URL for receiving comments

janna.mihara@k12.hi.us

Agency contact phone

(808) 784-5120

Agency address

Hawaii Department of Education, FDB, OFO
3633 Waialae Avenue
Honolulu, Hawaii 96816
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Gerald Park Urban Planner

Consultant contact name

Gerald Park

Consultant contact email

gpark@gpup.biz

Consultant contact phone

(808) 625-9626

Consultant address

95-595 Kanamee Street #324
Mililani, HI 96789
United States
Map It

Action summary

The proposed action will provide a permanent structure for accommodating the Maui High School STEM program and an Autism Center for Maui District school children. The uses will occupy separate spaces in the structure.

Maui High School does not have sufficient classroom space and does not have a flexible STEM/Science Lab for multi-purpose collaborative learning, research, design, and experiments for STEM students. A dedicated space for the STEM program will foster and promote the Department of Education goal to expose and develop student interest and grow STEM programs in all public schools.

The Autism Center will accommodate special needs children who are not able to be mainstreamed into the general student population. Currently there is no permanent Maui facility specifically designed to accommodate the special needs children.

Reasons supporting determination

Refer to Section 7, Determination of Significance in Draft EA.

Attached documents (signed agency letter & EA/EIS)

- WAILUKU-61-LRFI-Maui-HS_Draft_to-client.pdf
- Maui-High-School-STEM-Bldg.pdf
- MauiHighAFONSI0001.pdf

Authorized individual

Gerald Park

Authorization

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

DRAFT ENVIRONMENTAL ASSESSMENT

MAUI HIGH SCHOOL
STEM BUILDING and AUTISM CENTER

Wailuku Ahupua'a, District of Wailuku, Maui, Hawai'i

"A Path Through the Trees" *Sculpture by Satoru Abe*

Prepared for

Department of Education, State of Hawai'i
Office of Facilities and Operations
Facilities Development Branch-Project Management Section
3633 Waialae Avenue
Honolulu, Hawai'i 96816

Malaki 2020

DRAFT ENVIRONMENTAL ASSESSMENT

MAUI HIGH SCHOOL STEM BUILDING and AUTISM CENTER

Wailuku Ahupua'a, District of Wailuku, Maui, Hawai'i

Prepared in Partial Fulfillment of the Requirements of Chapter 343, Hawai'i Revised Statutes and Title 11-200.1, Hawai'i Administrative Rules, Department of Health, State of Hawai'i

Prepared for

Department of Education, State of Hawai'i
Office of Facilities and Operations
Facilities Development Branch-Project Management Section
3633 Waialae Avenue
Honolulu, Hawai'i 96816

Prepared by

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

and

Design Partners Inc.
1580 Makaloa Street, Suite 1100
Honolulu, Hawai'i 96814

Malaki 2020

PROJECT PROFILE

Project:	Maui High School STEM Building and Autism Center DOE Job No. Q55208-19
Street Address:	660 South Lono Avenue Kahului, Maui, Hawai'I 96732
Proposing/Determining Agency:	Department of Education Facilities Development Branch State of Hawai'i 3633 Waialae Avenue Honolulu, Hawai'i 96816
Tax Map Key:	[2] 3-8-007: 098
Land Area:	73.538 acres
Disturbed Area:	*Classroom Building: 48,000 square feet (est.)* *Parking Area: 33,000 square feet (est.)*
Land Owner:	State of Hawai'i
State Land Use Designation:	Urban
Maui Island Plan:	Urban
Community Plan:	Public/Quasi-Public
Community Zoning:	R-2 Residential
Special Management Area	Outside Special Management Area
Existing Use:	Public high school
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:	Janna Mihara, Project Coordinator Project Management Section, Room B202 Hawai'i Department of Education, FDB, OFO 3633 Waialae Avenue Honolulu, Hawai'i 96816 Phone: (808) 784-5120 E: janna.mihara@k12.hi.us

TABLE OF CONTENTS

	PROJECT PROFILE	i
SECTION 1	DESCRIPTION OF THE PROPOSED ACTION	1
	A. Purpose of the Proposed Action	**1**
	B. Technical Characteristics	**1**
	1. Demolition and Grading	1
	2. STEM/Autism Center	1
	3. Circulation and Parking	2
	4. Infrastructure	2
	5. Landscaping	3
	C. Economic Characteristics	**3**
	D. Social Characteristics	4
SECTION 2	DESCRIPTION OF THE AFFECTED ENVIRONMENT	16
	A. Existing Conditions	16
	B. Environmental Characteristics	**17**
	1. Climate	17
	2. Topography	17
	3. Soils	17
	4. Flood Hazard and Drainage	18
	5. Water Resources	18
	a. Surface Water	18
	b. Groundwater	18
	6. Biological Resources	20
	7. Historical Resources	20
	C. Land Use Controls	20
	D. Public Facilities	22
SECTION 3	SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MEASURES TO MITIGATE ADVERSE EFFECTS	24
	A. Assessment Process	**24**
	B. Short-term Impacts	**24**
	1. Site Work	24
	2. Air Quality	25
	3. Noise	25
	4. Erosion	26
	5. Soil Hazard	26
	6. Flora	26
	7. Historical Features	26
	8. Traffic	26
	C. Long-term Impacts	28

TABLE OF CONTENTS

SECTION 4	**ALTERNATIVES TO THE PROPOSED ACTION**	**30**
	A. **No Action/Delay the Action**	**30**
SECTION 5	**AGENCIES AND ORGANIZATIONS TO BE CONSULTED**	**31**
SECTION 6	**PERMITS AND APPROVALS**	**32**
SECTION 7	**DETERMINATION OF SIGNIFICANCE**	**33**
REFERENCES		**35**
EXHIBIT A	Zoning and Flood Confirmation Form	
EXHIBT B	Draft Archaeological Literature Review and Field Inspection Report for the Maui High School STEM & Autism Center Project, Wailuku Ahupua'a, Wailuku District, Maui Island. TMK: [2] 3-8-007: 098.	

FIGURES

Figure	Title	Page
1	Vicinity Map	5
2	Tax Map	6
Sheet	Site Plan	7
Sheet A-1.01	Ground Floor Plan	8
Sheet A-2.01	Exterior Elevations	9
Sheet A-3.01	Cross Section3.01	10
Sheet C402	Grading Plan	11
Sheet C302	Parking Lot Grading Plan	12
Sheet 403	Utility Plan	13
Sheet L-1.01	Landscape Plan	14
Sheet L-2	Landscape Plan South Parking Lot	15
3	Flood Insurance Rate Map	18
4	Zoning	23
Sheet C201	Erosion and Sediment Control Plan	27

TABLES

Table	Title	Page
1	Aquifer Classification System	19

PHOTOGRAPHS

Photograph	Title	Page
***	"A Path Through the Trees"	Cover
1	West View of Building Site from Driveway. Building A in Background.	16

SECTION 1
DESCRIPTION OF THE PROPOSED ACTION

The Department of Education, State of Hawai'i, proposes to construct a STEM Building and Autism Center on the campus of Maui High School located in the town of Kahului, District of Kahului, Maui, Hawai'i. Maui High School ("Maui High" or "School") is located in a residential area and bounded on three sides by residential subdivision streets---Lono Avenue on the east, W. Papa Avenue on the south, and Molokai Hema Street on the west. A section of Laau Street, dwellings, and Kahului Elementary School border the School on the north.

The square-shaped parcel bears Tax Map Key: [2] 3-8-00&: 098. The 73.538 parcel is 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 proposed action will provide a permanent structure for accommodating the Maui High School STEM program and an Autism Center for Maui District school children.

Maui High School does not have sufficient classroom space and does not have a flexible STEM/Science Lab for multi-purpose collaborative learning, research, design, and experiments for STEM students. The School accommodates its STEM program in spaces designed for other uses. A dedicated space for the STEM program will foster and promote the Department of Education goal to expose and develop student interest and grow STEM programs in all public schools.

The Autism Center will accommodate special needs children who are not able to be mainstreamed into the general student population. Currently there is no permanent Maui facility specifically designed to accommodate the special needs of these students. The Center will provide a needed service for Maui families. Maui High School was selected because it is one of the largest campuses on the island and its central location makes it a convenient site for the facility.

B. Technical Characteristics

1. Demolition and Grading

The STEM / Autism Center will be constructed on an existing grass lawn at the front of the School. The building site is bounded by portable classrooms and grass lawn on the north, the Administration Building (Building M) on the south, a paved driveway and student drop off area on the east, and Classroom Building A on the west.

The Project Limit is estimated at 1.97 acres---1.2 acres for the new building and 0.77 acres for a new parking area. The estimate includes areas for miscellaneous improvements and a buffer area around both construction areas.

There are no on-site structures to be demolished. Both sites will be grubbed, graded, and existing utility lines cut, plugged, and/or abandoned in place. Three existing shower trees

will be relocated. Grading quantities are estimated at 2,128 CY of excavation and 1,460 CY of structural fill.

2. STEM / Autism Center Building

The STEM / Autism Center will be constructed as a rectangular shaped, one-story structure. Both uses will share the structure with hallways providing separation. STEM will be located on the south side and the Autism Center on the north side of the structure. Each will have separate entries. The building footprint is approximately 14,100 square feet including program and non-program spaces (restrooms, circulation areas).

The structure will be erected on a poured in place concrete foundation and exterior walls, CMU interior walls, and topped by a standing seam metal roofing system over steel roof framing with metal decking. The roof is a combination of pitched and low sloping surfaces. The height of the structure will not exceed 30'-0" feet measured from grade to top of roof at the STEM Laboratory and 14'-0" at the Autism Center. In Plan View the structure is perpendicular to the western side of Building A and parallel with the existing driveway.

Program spaces for the STEM include a flexible STEM/Science Lab, 3 math classrooms, and a Faculty Center. A Maker Space has been designated in front of the Science Lab for future construction.

Space in the 3,300 square foot Autism Center is programmed for 2 classroom one of which can be divided with an operable partition, office, and Faculty Training Center. One of the spaces will have a kitchen to be used as a training tool.

The building will be air conditioned and equipped with a fire sprinkler system.

A fenced in area on the north is proposed for outdoor learning and play.

Anticipated staffing for the Center includes two teachers and four assistants. Service providers are DOE staff and the Center would be open to all Maui students in grades K to 12. Enrollment is projected at two to twelve students per school year.

3. Circulation and Parking

Major changes to vehicle circulation along the driveway are not proposed. Additional parking, however, is required and proposed at three locations. Proposed changes and parking additions include:

- Constructing a 3-Stall Drop Off area for the Autism Center directly in front of the Center
- Providing 3 additional parking stalls at the existing parking area to the south of the Administration Building.
- Constructing a new parking area with 36 stalls. The new parking area will be located adjoining the existing parking area and driveway. The area to be disturbed is approximately 33,000 square feet.
- Widening the turning radius into an existing parking area adjoining the Administration Building.

The new parking area will not encroach into the "*Carolina*" earth sculpture.

4. Infrastructure

Existing potable water and wastewater lines at the building site will be cut and removed. New water (6") and wastewater (6") mains will be installed and connect to the existing system, respectively. Fire flow will be provided through new 6" and 8" lines connected to the existing fire flow system.

Drain inlets and drywells will receive and contain roof and site runoff. Drain inlets will be installed on the west side of the building and drain to a series of drywells (5 total) placed on the south and east side of the building. The system is connected by 12" drain lines.

5. Landscaping

The "public" side of the building facing Lono Avenue will be landscaped with Native trees, shrubs, and grass. Existing and relocated shower trees, Native white hibiscus, milo, and Loulu palm are the primary vertical elements in the landscape. Areas adjacent to the building will be planted with Native shrubs and open areas grassed.

An underground irrigation system will be installed

A 20' wide space (20' wide) separates the new building from Building A. A new walkway will be constructed in the space and open areas grassed.

The new parking area will be landscaped with white tecoma trees, lo'ulu palm, and grass.

6. Sustainability

The project will not be seeking formal LEED or HI-CHPS certification. The structure, however, incorporates sustainable design features for creating and enhancing a comfortable, productive, healthy, and a quality learning environment.

Features to promote energy conservation and minimize consumption include energy efficient lighting (LED lights) and controls (dimming switches and occupancy sensors), daylight harvesting (use natural lighting and reduce artificial lighting), full cut off luminaries to minimize light trespass, energy monitoring by load type, high efficiency HVAC system, and installing photovoltaic system for renewable energy.

The building will be built "electrical ready" for PV panel installation at a later time.

Flow reducers on plumbing fixtures, low gallon flush toilets, and smart irrigation controllers will aid in water conservation for interior and exterior areas.

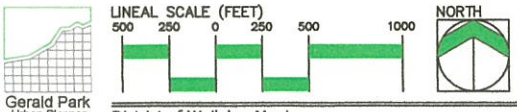
C. Economic Characteristics

The cost of the project is estimated at $13.0 million and will be funded by the State of Hawai'i. The improvements will be constructed concurrently in one phase commencing on or about July 2021 with completion on or about January 2023. Work will commence after all permits and approvals have been received.

D. Social Characteristics

The Autism Center will be staffed by DOE professionals. At this time, the projected enrollment is 8 students. Currently the DOE services students with severe autistic needs in spaces not specifically designed for them and sometimes in off campus leased facilities. The Autism Center at Maui High School will provide a permanent structure for special needs children at a central and convenient location for Maui families.

Source: Aerial-Goggle Earth Website

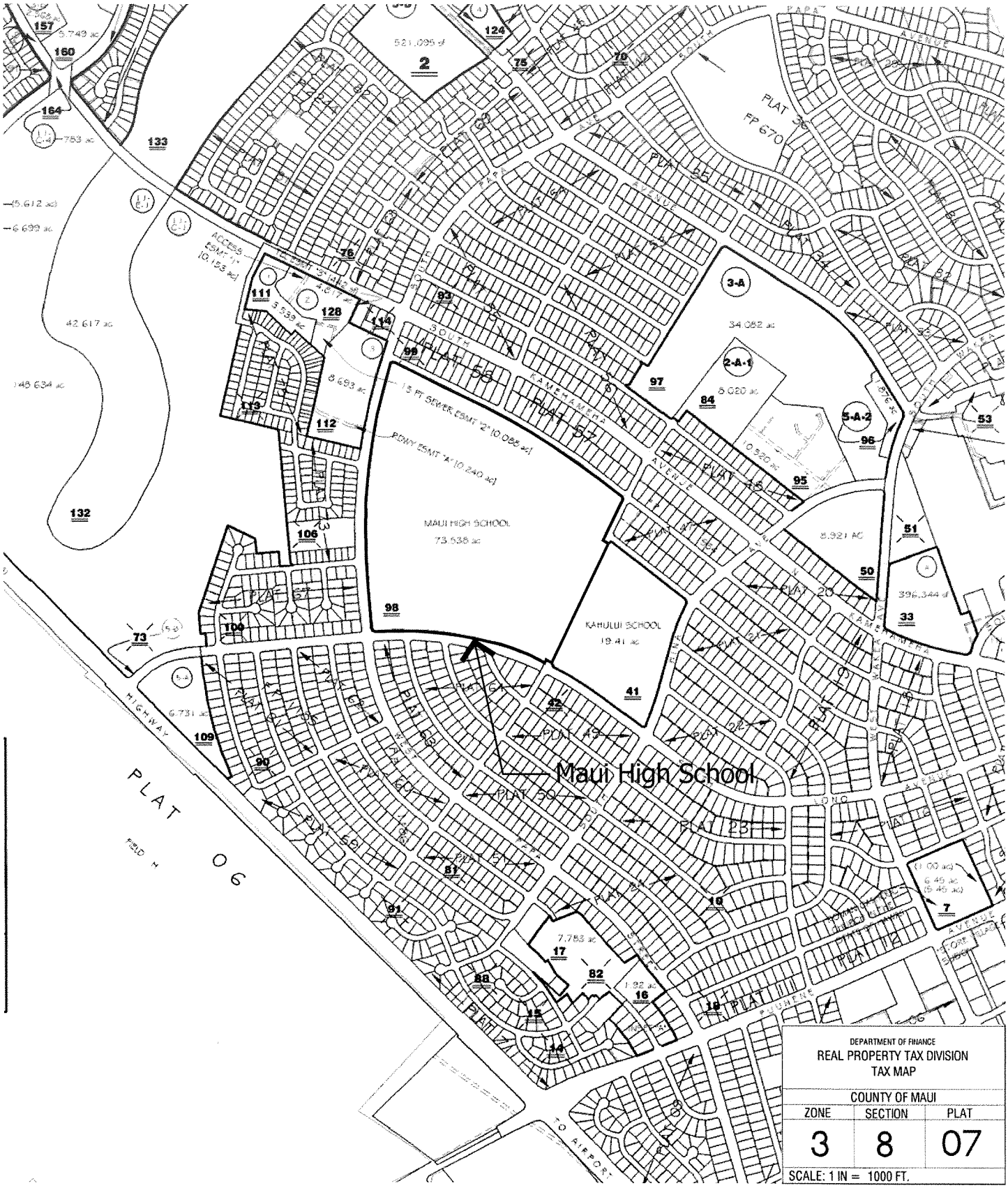


Gerald Park
Urban Planner
December 2019

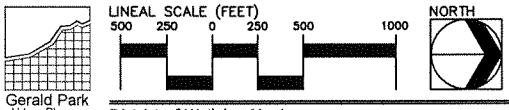
District of Wailuku, Maui

Figure 1
Vicinity Map
Maui High School
STEM Building / Autistic Center

Department of Education, State of Hawai'i



Source: Maui Property Tax Website



Gerald Park
Urban Planner
December 2019

District of Wailuku, Maui

Figure 2
Tax Map
Maui High School
STEM Building / Autistic Center

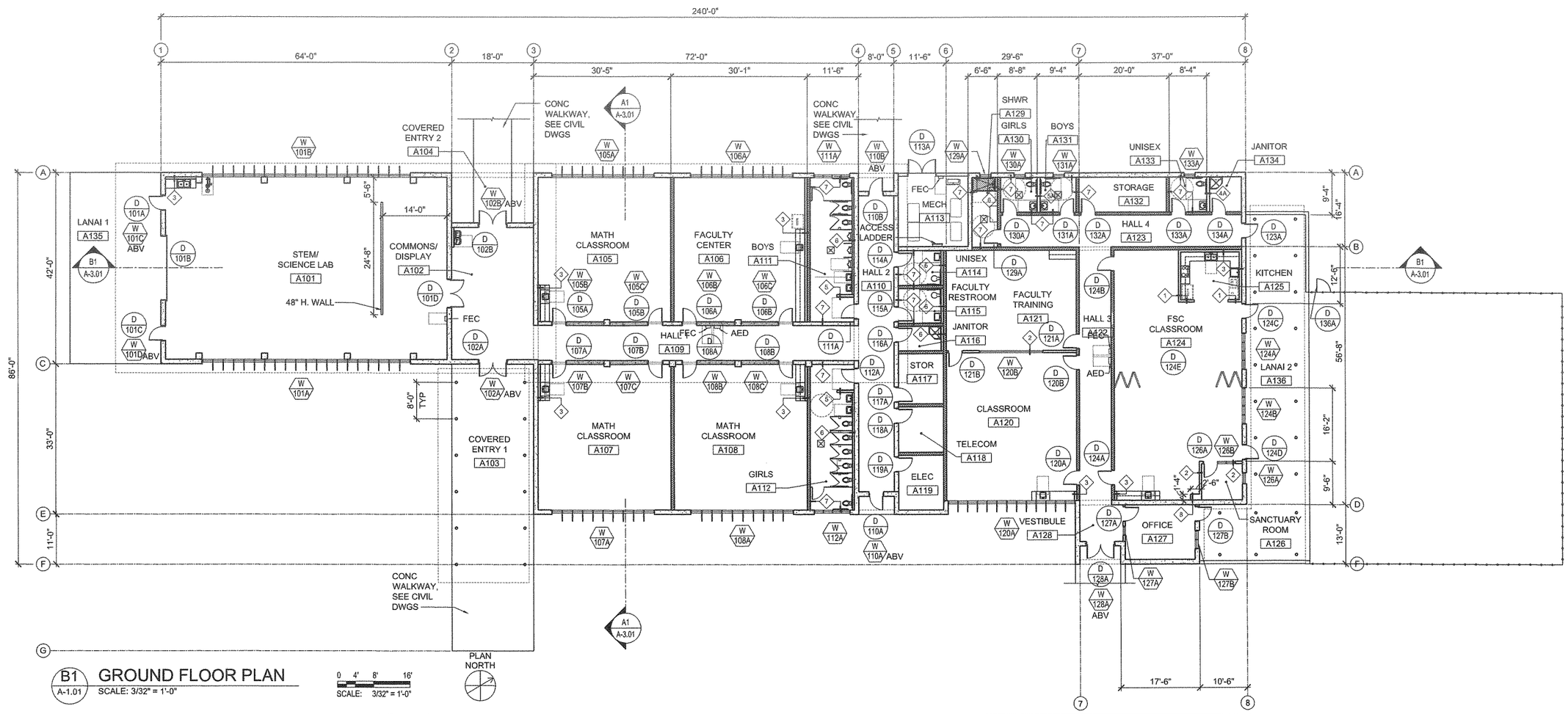
Department of Education, State of Hawai'i

SCALE 1:60 0 10' 30' 60' 150'

Overall Site Plan

MAUI HIGH SCHOOL STEM BUILDING & AUTISM CENTER | Job No. Q55208-18 | 22-Oct 2019

DESIGN PARTNERS INCORPORATED



B1 A-1.01 GROUND FLOOR PLAN

SCALE: 3/32" = 1'-0"

PROGRAM AREA TABULATION

(500 STUDENT DESIGN ENROLLMENT)

I. PROGRAM AREAS

RM NO. (Only for Contruct.)	RM NO. (Actual Signage)	ROOM NAME	FADS (Net sf)	Revised FADS (Net sf)	ACTUAL (Net sf)	REMARKS
A101		STEM/SCIENCE LAB	2500	2500	2480	
A105		MATH CLASSROOM	940	940	936	
A106		FACULTY CENTER	940	940	936	
A107		MATH CLASSROOM	940	940	941	
A108		MATH CLASSROOM	940	940	941	
A121		FACULTY TRAINING	600	600	634	
A120		CLASSROOM	940	940	937	
A124		FSC CLASSROOM	1560	1560	1343	
A125		FSC KITCHEN	-	-	143	
A126		SANCTUARY ROOM	-	-	72	
A127		OFFICE	200	200	186	
SUBTOTAL PROGRAMMED AREAS					9,549	

II. NON-PROGRAM AREAS

A102		COMMONS/DISPLAY	--	--	522
A103		COVERED ENTRY 1	--	--	864
A104		COVERED ENTRY 2	--	--	192
A109		HALL 1	--	--	552
A110		HALL 2	--	--	520
A111		BOY'S TOILET	--	--	300
A112		GIRL'S TOILET	--	--	300
A113		MECHANICAL	--	--	245
A114		UNISEX	--	--	72
A115		FACULTY RESTROOM	--	--	72
A116		JANITOR / CUSTODIAL ROOM			50
A117		STORAGE	--	--	118
A118		TELECOM	--	--	98
A119		ELECTRICAL	--	--	118
A122		HALL 3	--	--	397
A123		HALL 4	--	--	373
A128		VESTIBULE	--	--	76
A129		SHOWER	--	--	92
A130		GIRLS	--	--	61
A131		BOYS	--	--	61
A132		STORAGE	--	--	153
A134		JANITOR / CUSTODIAL ROOM			54
A135		LANAI 1	--	--	124
A136		LANAI 2	--	--	1,182

II. NON-PROGRAM AREAS

SUBTOTAL NON-PROGRAMMED AREAS	--	--	6,596
TOTAL NET FLOOR AREA			16,145
TOTAL GROSS FLOOR AREA			18,442

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

DEPARTMENT OF EDUCATION
STATE OF HAWAII

MAUI HIGH SCHOOL
STEM BUILDING & AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

GROUND FLOOR PLAN

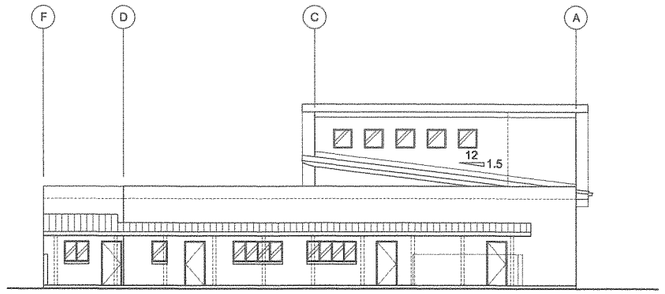
DESIGN PARTNERS, INC.

DIGS JOB NO. Q55208-19

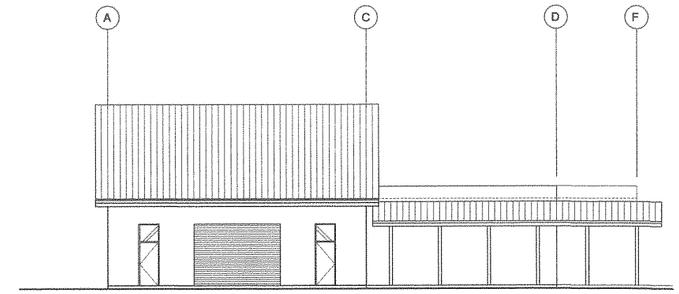
DRAWING NO. A-1.01

DESIGNED BY: KE, NN
CHECKED BY: NN, CN
DRAWN BY: KY, CN
APPROVED BY: KE, NN
SCALE: AS SHOWN
DATE MARCH 2020
SHEET OF SHTS.

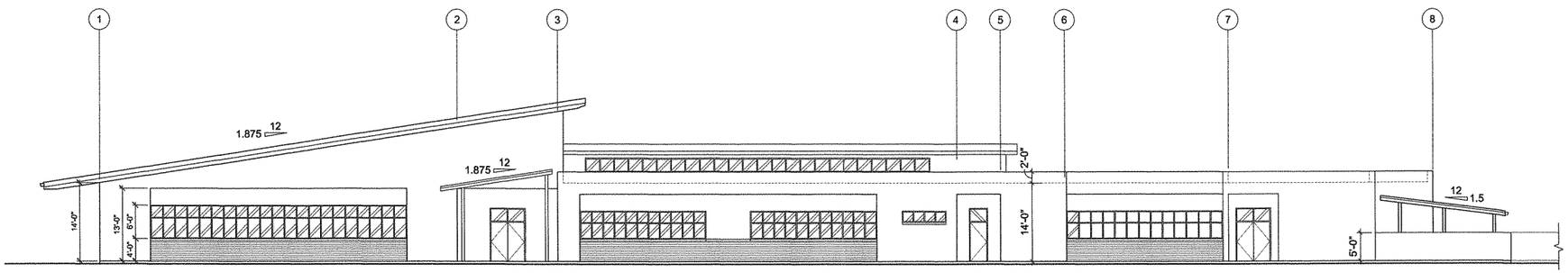
FILE DRAWER FOLDER



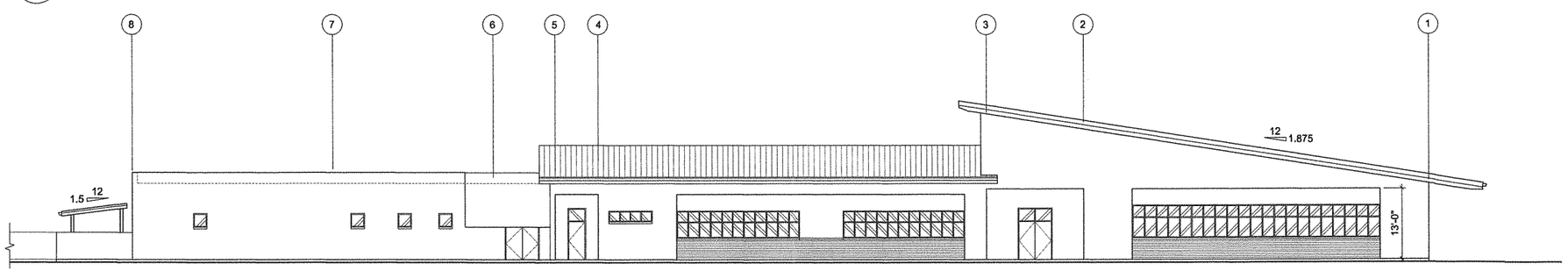
D1 A-2.01 EAST ELEVATION
SCALE: 3/32" = 1'-0"



D4 A-2.01 WEST ELEVATION
SCALE: 3/32" = 1'-0"



C1 A-2.01 SOUTH ELEVATION
SCALE: 3/32" = 1'-0"



B1 A-2.01 NORTH ELEVATION
SCALE: 3/32" = 1'-0"

0 4' 8' 16'
SCALE: 3/32" = 1'-0"

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

DEPARTMENT OF EDUCATION
STATE OF HAWAII

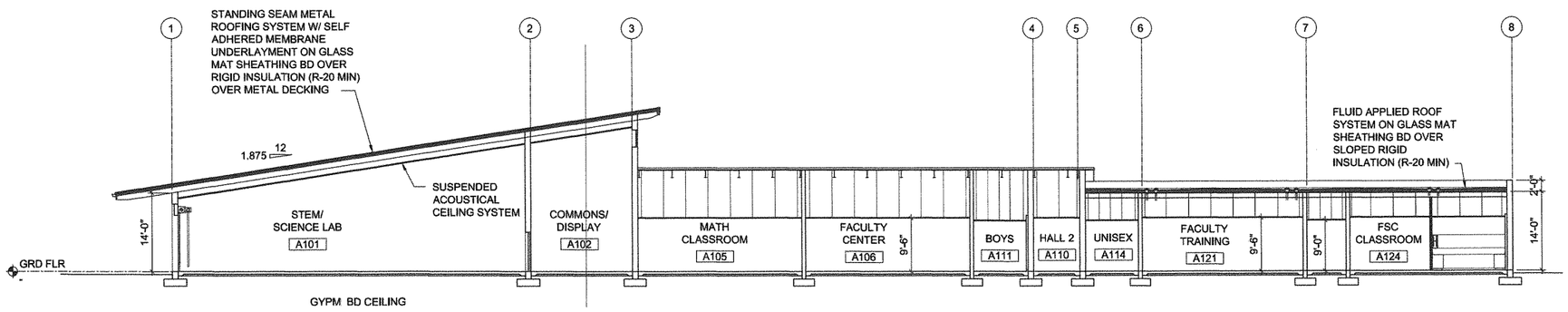
MAUI HIGH SCHOOL
STEM BUILDING & AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

EXTERIOR ELEVATIONS

DESIGN PARTNERS, INC.

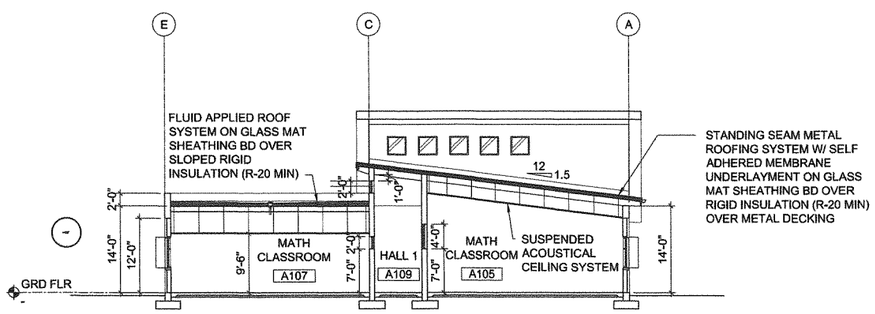
DESIGNED BY: KE, NN	CHECKED BY: NN, CN	DAGS JOB NO. Q55208-19	DRAWING NO. A-2.01
DRAWN BY: KY, CN	APPROVED BY: KE, NN	DATE MARCH 2020	SHEET OF - SHTS.
SCALE: AS SHOWN			

FILE_____ DRAWER_____ FOLDER_____



B1 / A-3.01 LONGITUDINAL SECTION

SCALE: 3/32" = 1'-0"



A1 / A-3.01 CROSS SECTION

SCALE: 3/32" = 1'-0"

0 4' 8' 16'
SCALE: 3/32" = 1'-0"

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

DEPARTMENT OF EDUCATION
STATE OF HAWAII

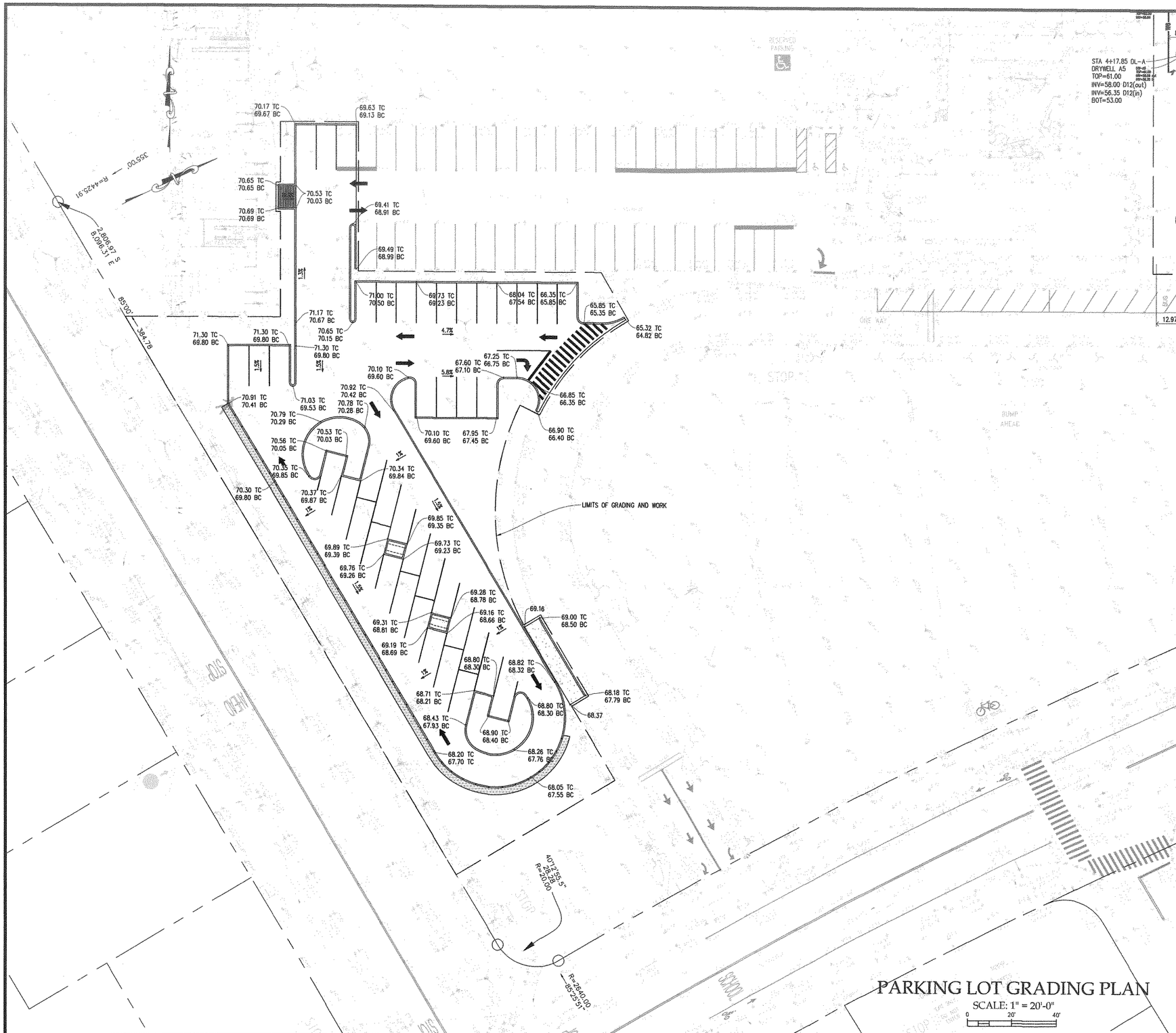
MAUI HIGH SCHOOL
STEM BUILDING & AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

BUILDING SECTIONS

DESIGN PARTNERS, INC.

DESIGNED BY: KE, NN	CHECKED BY: NN, CN	DASS JOB NO. Q55208-19	DRAWING NO. A-3.01
DRAWN BY: KY, CN	APPROVED BY: KE, NN	DATE MARCH 2020	SHEET OF SHTS.
SCALE: AS SHOWN			

FILE_____ DRAWER_____ FOLDER_____



PARKING LOT GRADING PLAN

SCALE: 1" = 20'-0"

0 20' 40'

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

ALAN T. OKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 5483-C
HAWAII, U.S.A.

DEPARTMENT OF EDUCATION
STATE OF HAWAII

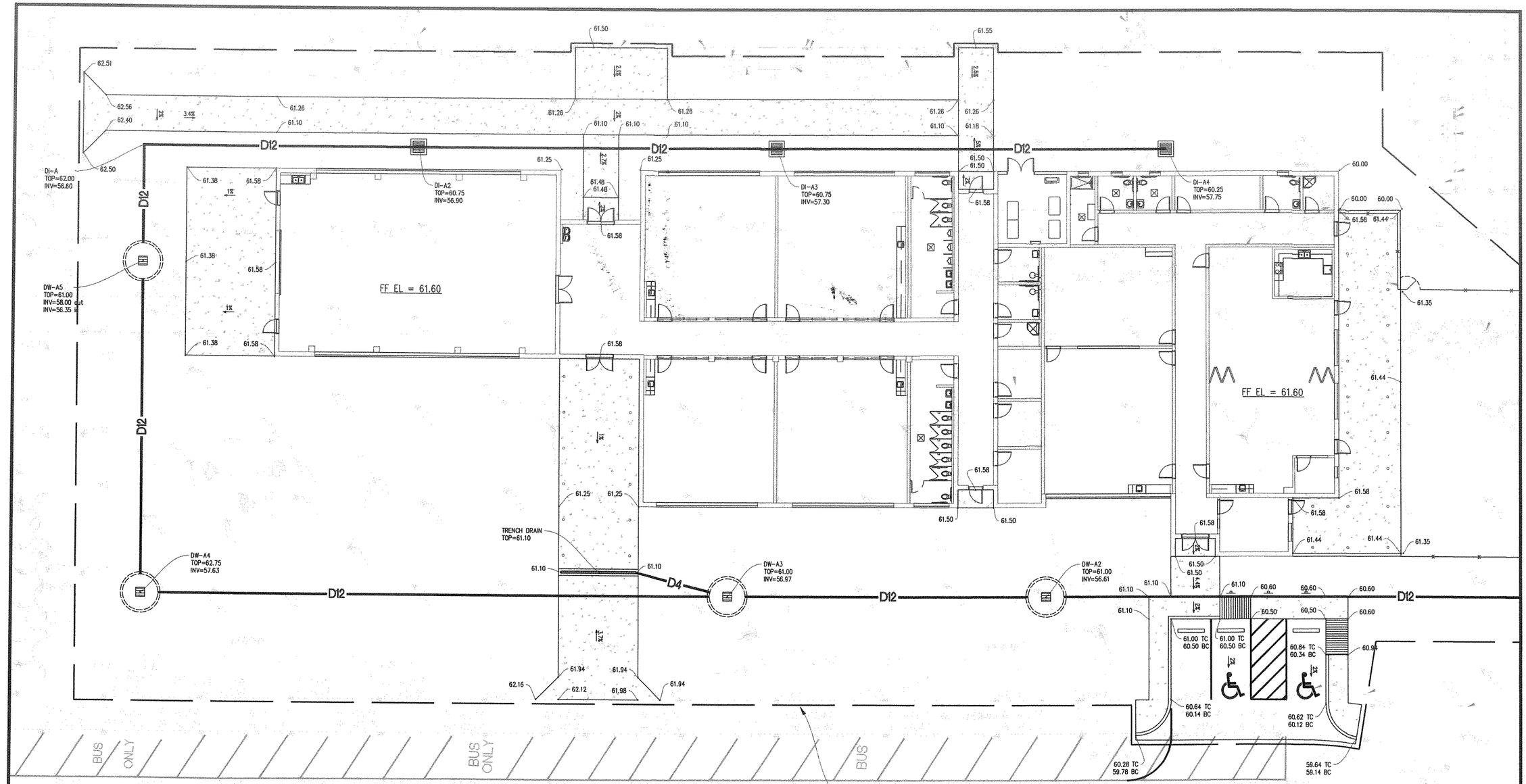
MAUI HIGH SCHOOL
NEW STEM BUILDING AND AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

PARKING LOT GRADING PLAN

DESIGN PARTNERS, INC.

DESIGNED BY: CYO	CHECKED BY: CYO	DAGS JOB NO. Q55200-19	DRAWING NO. C302
DRAWN BY: CYO	APPROVED BY: ATO	DATE MARCH 2020	SHEET OF SHTS.
SCALE:			

FILE_____ DRAWER_____ FOLDER_____



GRADING PLAN

SCALE: 1" = 10'-0"

0 10' 20'

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

ALAN T. OKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 5465-C
HAWAII, U.S.A.

DEPARTMENT OF EDUCATION
STATE OF HAWAII

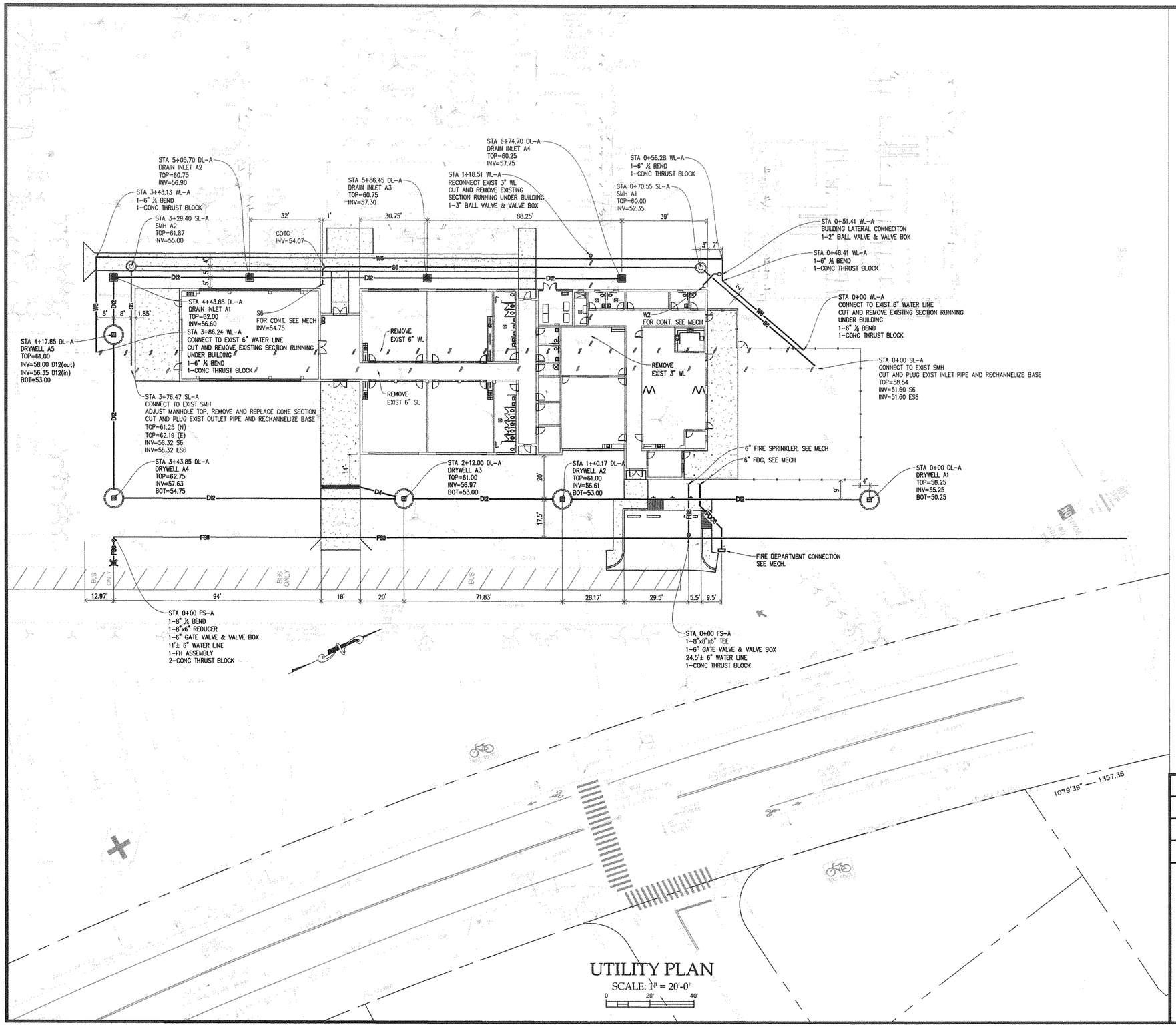
MAUI HIGH SCHOOL
NEW STEM BUILDING AND AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

GRADING PLAN

DESIGN PARTNERS, INC.

DESIGNED BY	CHECKED BY	DAGS JOB NO.	DRAWING NO.
CYO	CYO	Q55200-19	C402
DRAWN BY CYO	APPROVED BY ATO	DATE MARCH 2020	SHEET OF SHTS.
SCALE:			

FILE_____ DRAWER_____ FOLDER_____



UTILITY PLAN
SCALE: 1" = 20'-0"

NOTES:

1. REMOVE ALL EXISTING WATER LINES WITHIN LIMITS OF WORK. ALL EXISTING LATERALS KNOWN ARE SHOWN ON THE PLANS. CONTRACTOR TO EXPOSE AND REMOVE EXISTING 6" WATER MAIN AND TRACE EXISTING LATERAL CONNECTIONS FOR ANY LATERALS NOT SHOWN ON THE PLANS.. EXISTING LATERALS SHALL BE RECONNECTED TO THE NEW 6" WATER MAIN SIZE LINE TO MATCH EXISTING WITH NEW BALL VALVE AND VALVE BOX.
2. SEE LANDSCAPE PLANS FOR IRRIGATION REMOVAL AND RELOCATION WORK.
3. UTILITIES WITHIN THE LIMITS OF THE BUILDING WORK ARE TO BE REMOVED AND NOT ABANDONED IN PLACE.
4. REMOVE ALL EXISTING SEWER LINES WITHIN LIMITS OF WORK. ALL EXISTING LATERALS KNOWN ARE SHOWN ON THE PLANS. CONTRACTOR TO EXPOSE AND REMOVE EXISTING 6" SEWER LINE AND TRACE EXISTING LATERAL CONNECTIONS FOR ANY LATERALS NOT SHOWN ON THE PLANS.. EXISTING LATERALS SHALL BE RECONNECTED TO THE NEW 6" SEWER LINE, SIZE LINE TO MATCH EXISTING.
5. ALL SEWER LATERALS SHALL BE A MINIMUM SLOPE OF 2%.

REV. NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

ALAN T. OKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 5485-C
HAWAII, U.S.A.

DEPARTMENT OF EDUCATION
STATE OF HAWAII

MAUI HIGH SCHOOL
NEW STEM BUILDING AND AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 096

UTILITY PLAN

DESIGN PARTNERS, INC.		DAGS JOB NO.	DRAWING NO.
DESIGNED BY CYO	CHECKED BY CYO	Q55200-19	C403
DRAWN BY CYO	APPROVED BY ATO	DATE MARCH 2020	SHEET OF SHTS.
SCALE			

FILE_____ DRAWER_____ FOLDER_____

BUILDING O
BUILDING N
BUILDING A
BUILDING A
P-12
P-19
P-13
P-14
P-18
LAWN
LAWN
GRAVEL
CROTON
CROTON
EXISTING SHOWER TREE TO RELOCATE (TYP.)
EXISTING SHOWER TREE TO RELOCATE (TYP.)
GATE -SEE ARCH
WATER TABLE WITH SPLASH BLOCKS
GOLDEN ELDORADO (TYP.)
FENCE -SEE ARCH
MILO
METAL HEADER
LANAI
METAL HEADER
EXISTING SHOWER TREES TO RELOCATE (TYP.) (3)
TIARE
NATIVE WHITE HIBISCUS (TYP.)
NAU
LAWN
POHINAHINA
GRAVEL (TYP.)
TIARE
GREEN TI (TYP.)
TIARE
LAWN
PLAY STRUCTURE ON SYNTHETIC TURF
FALL ZONE
EXISTING SCULPTURE
MAIN OFFICE
LAWN
LOULU (3)
LAWN
NATIVE WHITE HIBISCUS (TYP.)
RELOCATED SHOWER TREES (3)
EXISTING SHOWER TREES TO PROTECT AND REMAIN (2)
LAWN
EXISTING LAWN

1 LANDSCAPE PLAN

SCALE: 1"=20'-0" L-1.01

GRAPHIC SCALE

SCALE: 1"= 20'-0" 0 10' 20' 40'

N

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED STATE PUBLIC WORKS ENGINEER

RICHARD L. QUINN
LICENSED PROFESSIONAL LANDSCAPE ARCHITECT
No. 6028
HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

APRIL 30, 2022

EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF EDUCATION

STATE OF HAWAII

MAUI HIGH SCHOOL
STEM BUILDING & AUTISM CENTER

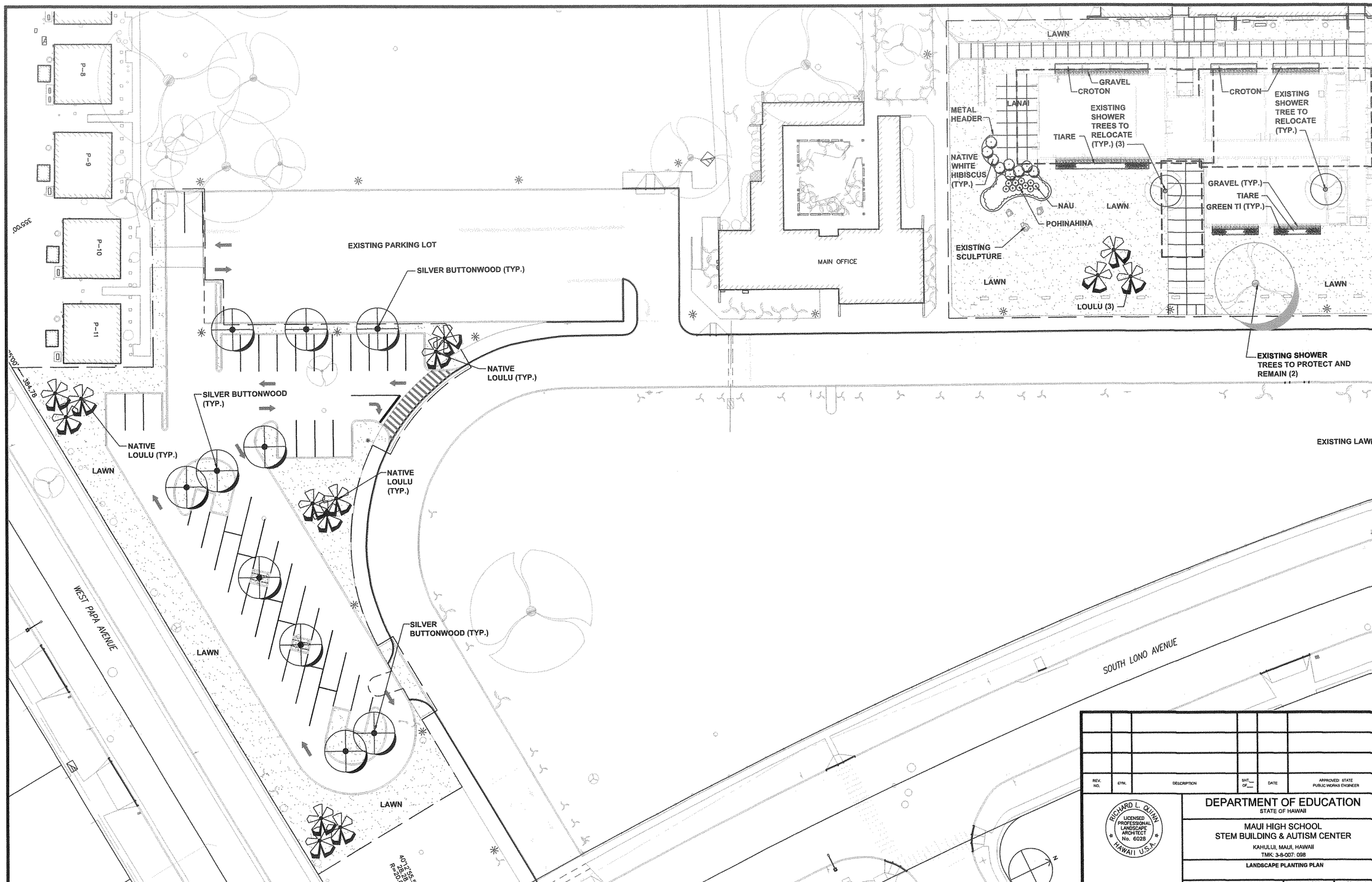
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

LANDSCAPE PLANTING PLAN

DESIGN PARTNERS, INC.

DESIGNED BY: AR, RQ	CHECKED BY: RQ	DAGS JOB NO. Q55208-19	DRAWING NO. L-1.01
DRAWN BY: AR	APPROVED BY: RQ	DATE MARCH 2020	SHEET OF * SHTS.
SCALE: AS SHOWN			

FILE_____ DRAWER_____ FOLDER_____



1 **LANDSCAPE PLAN - SOUTH PARKING LOT**
SCALE: 1"=20'-0" L-1.02

GRAPHIC SCALE
SCALE: 1"= 20'-0" 0 10' 20' 40'

REV. NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED STATE PUBLIC WORKS ENGINEER

RICHARD L. QUINN LICENSED PROFESSIONAL LANDSCAPE ARCHITECT No. 6028 HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

APRIL 30, 2022

EXPIRATION DATE OF THE LICENSE.

DEPARTMENT OF EDUCATION
STATE OF HAWAII

MAUI HIGH SCHOOL
STEM BUILDING & AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

LANDSCAPE PLANTING PLAN

DESIGN PARTNERS, INC.

DESIGNED BY	CHECKED BY	DAGS JOB NO.	DRAWING NO.
AR, RQ	RQ	Q55208-19	L-1.02
DRAWN BY: AR	APPROVED BY: RQ	DATE	SHEET
SCALE: AS SHOWN		MARCH 2020	OF__-__SHTS.

FILE_____ DRAWER_____ FOLDER_____

SECTION 2
DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Existing Conditions

The building site is an open lawn devoid of structures. Several trees and benches for sitting are spaced along a walkway fronting the driveway (See Photograph 1). It is presumed that the lawn was created with construction of the School.

Two prominent art works are located near the building site. An earthwork named *"Carolina"* featuring three rising grass mounds and depressions is located at the front of the school between the driveway and South Lono Avenue. The earthwork sculpture is about 280 feet long and 140 feet wide (Carolina Plaque).

A stone and copper sculpture is positioned on the lawn area north of the Administration Building. The sculpture represents a grove of trees and is named "*A Path Through the Trees*". The piece was cast by Satoru Abe a prominent local artist.

Photograph 1. West View of Building Site from Driveway. Building A in Background.

Maui High School, home of the Sabers, originally opened in 1913 in Hāmākua Poko, a plantation village in northeastern region of Maui It was the first public school on Maui and had an initial enrollment of 16 students. The school consisted of a two-story, seven room, wooden building that served both high school and grammar school students (Cultural Surveys Hawa'ii, 2020).

The School moved to its current location in 1972. Since its opening, the school campus has expanded to include 12 permanent buildings (a 13th is under construction), portable

classrooms, athletic fields for baseball, football, and track, tennis courts, parking lots, and grass lawns.

Maui High is part of the Baldwin-Kekaulike-Maui Complex Area consisting of elementary, middle, and high schools in Central Maui. The Maui Complex comprises Kahului, Kamaili, Kihei, Lihikai, and Pomaikai Elementary Schools, Lokelani and Maui Waena Intermediate Schools, and Maui High School. The five Elementary schools "feed" students into the two intermediate schools which in turn "feed" students into Maui High School.

In school year 2018 – 2019 Maui High enrolled 2,082 students (DOE, 2020). The design capacity of the school is 2,200 students (Ibid, 2006).

B. Environmental Characteristics

1. Climate

Maui's climate, like most of the State of Hawai'i, can be characterized as sunny, mildly temperate, moderately humid, and cooled by the northeast trade winds. Average temperatures in Kahului range from lows in the mid 60's to highs in the mid 80's. September is historically the warmest month and January and February the coolest. Average annual rainfall in Kahului is about 20 inches. The trade winds usually range from 15 to 25 miles per hour and increase in strength during the day from March to September (Department of Geography, 1998; Munekiyo & Hiraga, 2011).

2. Topography

The lawn area is relatively flat and shaped to slope from south to north. However, the low grade is in the approximate center of the site. The low area is a shallow grass swale that picks up runoff from the site and flows to a low area to the north where it percolates into the ground.

3. Soils

The Soil Conservation Service (1972) maps one soil type---Puuone sand 7 to 30 percent slopes (Symbol: PZUE)---underlying Maui High and subdivision development in the surrounding residential neighborhood. The soil developed from weathered coral and seashells and is characterized as being rapidly permeable, moderate to severe erosion hazard, and slow runoff.

Considering the long period of construction beginning in 1970, site improvements probably have blurred the distinctions between surface and subsurface soil layers. Because of grading, backfilling, and landscaping the existing surface material is a mixture of Puuone sand, imported engineered fill, and imported topsoil.

Soils at the site of the STEM Building and Autism Center and the new parking area were tested for lead, arsenic, and pesticides. Arsenic was detected in samples collected at both locations but at concentrations below standard levels that pose adverse health and environmental effects. Lead was detected at the new parking area at concentrations below standard levels. Lead was not detected at the site of the STEM Building (EMET, 2020)

Pesticides were not detected in samples collected at both sites.

4. Flood Hazard and Drainage

The Flood Insurance Rate Map for this section of Kahului (Figure 3) places Maui High School in Flood Zone "X" which is defined as "Areas determined to be outside the 0.2% annual chance floodplain" (the 500-year flood).

The flood zone information is confirmed by the Zoning Administration Enforcement Division, Planning Department, County of Maui (See Exhibit A).

5. Water Resources

a. Surface Water

There are no freshwater streams, rivers, ponds, or wetlands on-campus.

b. Groundwater

According to groundwater maps prepared by Mink and Lau (1990), the School overlies the Kahului aquifer of the Central aquifer sector (See Table 1). The Kahului aquifer is characterized by an unconfined sedimentary basal aquifer above a confined flank basal aquifer. The sedimentary aquifer is comprised of moderately brackish water, is ecologically important, and is highly vulnerable to contamination. The dike-confined aquifer is currently used, ecologically important, low in salinity, and with a moderate vulnerability to contamination. Groundwater in both aquifers is not potable.

Sustainable yield of the Central Aquifer is estimated at 26 million gallons per day; sustainable yield of the Kahului aquifer is estimated at <1 million gallons per day (Wilson Okamoto, 2008).

Table 1. Aquifer Classification System

Aquifer Code	60301116	60301111
Island Code	6 - Maui	6 - Maui
Aquifer Sector	03 - Central	03 - Central
Aquifer system	01 - Kahului	01 - Kahului
Aquifer Type, hydrogeology	1 - Basal	1 - Basal
Aquifer Condition	1 - Unconfined	1 - Unconfined
Aquifer Type, geology	6 - Sedimentary	1 - Flank
Status Code	**12211**	**12212**
Developmental Stage	1 - Currently Used	1 – Currently Used
Utility	2 – Ecologically Important	2 – Ecologically Important
Salinity (in mg/L Cl^-)	2 – Low (250 – 1,000))	2 - Low (250-1,000)
Uniqueness	1 - Irreplaceable	1 - Replaceable
Vulnerability to Contamination	1 - High	2 - Moderate

Source: Mink and Lau, 1990.

Source: https://msc.fema.gov/portal/search

Legend

Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood

- Zone A — No Base Flood Elevations Determined.
- 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

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.

LINEAL SCALE (FEET)
625 312.5 0 312.5 625 1250

NORTH

Gerald Park
Urban Planner
December 2019

District of Wailuku, Maui

Figure 3
Flood Insurance Rate Map
Maui High School
STEM Building / Autistic Center

Department of Education, State of Hawai'i

6. Biological Resources

The building site and new parking area are planted in several types of grass with Bermuda grass the dominant species. Shrubs and groundcover are minimal. Ficus, shower, plumeria, pink tecoma trees and Manila palms are spotted around the STEM building site.

Cattle egret and mynah were the only birds observed during this author's field inspection.

7. Archaeological Resources

A field investigation was conducted "to determine the likelihood that historic properties may be affected by the project, and, based on findings, consider cultural resource management recommendations" (Cultural Surveys Hawaii, 2020). The entire School (73.64 acres) was considered the project area.

No potential historic resources were observed on the surface of the project area during the field investigation (Ibid).

The consulting archaeologists noted: "No previous archaeological studies were conducted during the initial construction of Maui High School in the 1970s". Since then two archaeological studies have been conducted within the project area with no significant findings. Archaeological monitoring was conducted for installing a scoreboard at the softball field and re-sodding the football field, respectively. Both studies did not reveal the presence of subsurface features.

C. Land Use Controls

State and County land use controls are cited below:

State Land Use Designation: Urban
Maui General Plan: Community Wide Plan
Maui Island Plan
Community Plan: Wailuku-Kahului
Land Use Map: Public/Quasi-Public
Zoning: R-2 Residential

State Land Use Law

Pursuant to Chapter 205 HRS, the Hawaii Land Use Law, the State Land Use Commission classifies all land in the State of Hawaii into one of four classifications: Urban, Agricultural, Conservation, or Rural. The project site is designated Urban. Uses and activities permitted in Urban districts are regulated by the respective counties.

General Plan of the County of Maui

General planning on Maui derives from three general plans adopted by the County of Maui. The overarching plan is the County Wide Policy Plan. The Plan is a series of value statements and an umbrella document that provides direction for island plans (County Wide Policy Plan, 2010). Island plans prepared for Maui, Lanai, and Molokai articulate and refine the policies in the Policy Plan setting forth community-shared objectives and actions for the respective island. The third general plan level is community plans prepared for different

regions or communities on each island. In total there are nine community plans. Each region's community plan specifies implementing actions for achieving the stated objectives. The community plans also include a land use component in the form of land use maps that allocate and designate lands within the region for specific uses.

Each general plan is not presented in this assessment. However, the relevancy of the Maui Island Plan and the Wailuku-Kahului Community Plan relative to public education and their relationship to the STEM Building and Autism Center is cited.

Maui Island Plan

Section 4 Economic Development and Education

§4.7 Goal
Maui will have effective education and workforce development programs and initiatives that are aligned with economic development goals.

§4.7.1 Objective

Improve preschool and K-12 education to allow our youth to develop the skills needed to successfully navigate the 21st century.

§4.73 Objective

Strive to ensure that more of Maui's jobs are developed in STEM-related sectors by 2030.

Science, Technology, Engineering, and Mathematics (STEM) is seen as one of the building blocks in providing residents with skills needed for job opportunities and successful careers in the 21st century. The Department of Education has introduced STEM programs in elementary, intermediate, and high schools throughout the State. A goal is to interest students in STEM so they can pursue their interest in STEM related sectors at higher levels of education.

Wailuku-Kahului Community Plan

Nine community plan regions have been established for Maui County. Each region has a community plan with statements of objectives and policies and implementing actions consistent with the overarching general plans. Unlike the County Wide Policy Plan and Maui Island Plan which are policy plans, the community plans include land use maps that identify by geographical areas where different land uses should occur.

Several objectives and policies relative to the proposed project are cited below. Project plans have been prepared and studies conducted in support of the applicable objective and policy set.

Cultural Resources

- Require development projects to identify all cultural resources located within the project area as part of the initial project studies. Further, require that all proposed activity include recommendations to mitigate potential adverse effects on cultural resources.

Education, Objectives and Policies

- Support the maintenance and improvement of existing school facilities.

Energy

- Promote the use of alternative energy sources such as biomass, wind and solar.
- Expand efforts to utilize environmental and cost-effective renewable resources for energy production such as solar, biomass, and wind energy.
- Encourage energy efficient building design and site development practices.
- Support energy conservation measures, including solar heating and photo-voltaic systems, in conjunction with urban uses.

The land use map of the Wailuku-Kahului Community Plan designates "Maui High School" Public/Quasi-Public (P). This land use designation "includes schools, libraries, fire/police stations, government buildings, public utilities, hospitals, churches, cemeteries, and community centers (Ibid)". School use is thus allowed as a permitted use by the Community Plan. Moreover, the land use designation underscores the desire to site a school at this location.

Zoning is the County's tool for regulating land use, density (for residential, apartment, hotel districts), and prescribing development standards for the zoning district. Maui High School is located in a residential zoning district and zoned R-2 Residential (See Figure 4). Residential zoning allows as permitted property uses, "Day care nurseries, museums, churches, libraries, kindergartens, elementary schools, intermediate schools, high schools and universities (Chapter 19.02.030 A.4, Interim Zoning Provisions). Public owned buildings are also a permitted property use (Chapter 19.02.030 A.5.). The use of the site for a high school is permitted and consistent with zoning.

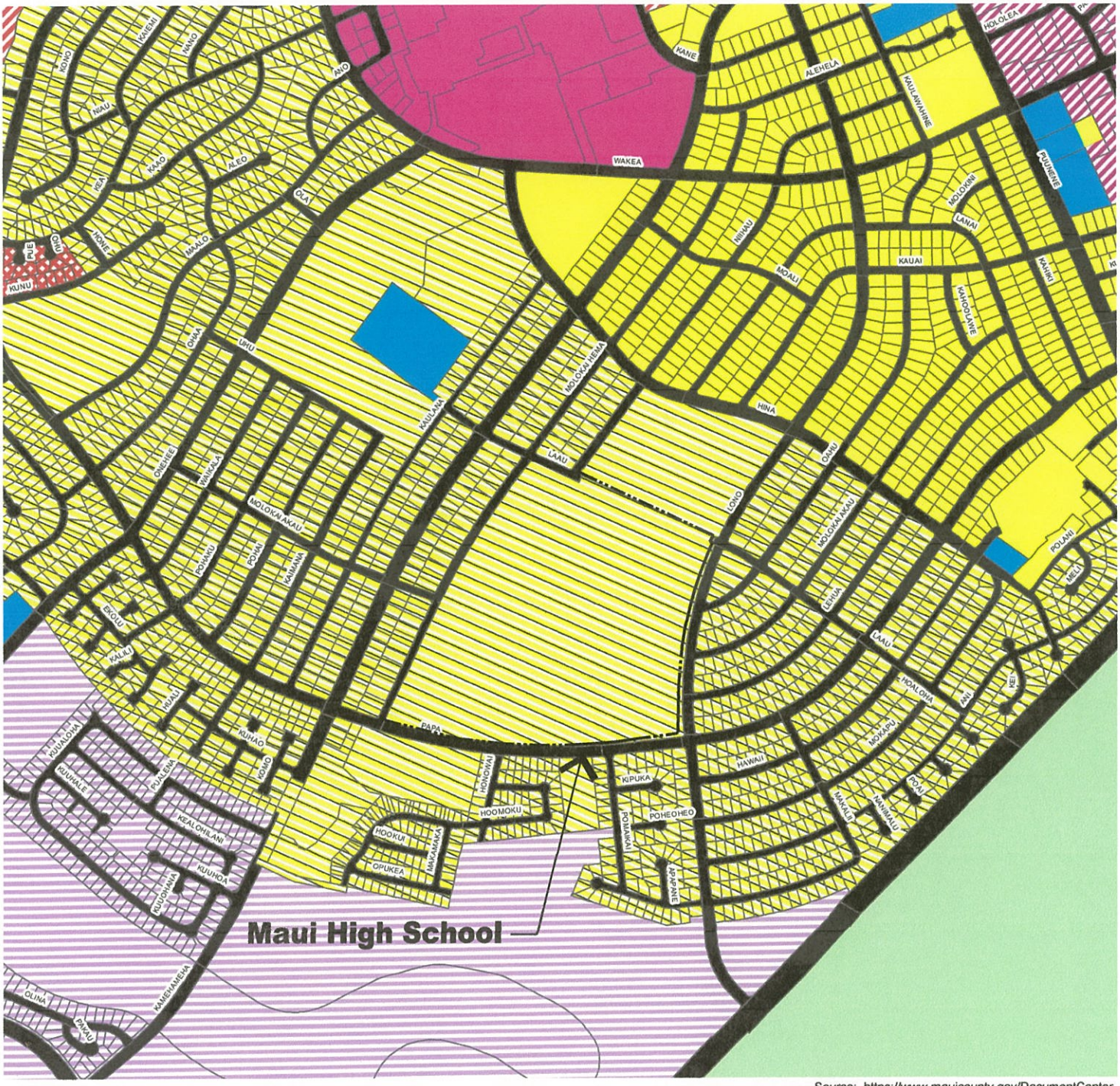
D. Public Facilities

Bordered by streets on three sides, Lono Avenue is the principal access to/from Kahului Town to the north. The two-lane, two-way undivided highway is fully improved with curbs and sidewalks of both sides of the right-or-way. Bike routes on both sides of the travel way are identified by street signs and pavement markings. The posted speed limit is 20 miles per hour in front of the school (and adjoining Kahullui Elementary on the north).

Potable water is supplied by the Department of Water Supply, County of Maui. An on-site water system distributes domestic water throughout the School.

Wastewater is collected through an on-site system and discharged into the municipal system.

Police and Fire services originate from facilities in Kahului Town.



Source: https://www.mauicounty.gov/DocumentCenter

Legend

- R-1 Residential
- R-2 Residential
- R-3 Residential
- Residential - MRA
- Multi Family - MRA
- D-1 Duplex
- A-2 Apartment
- H Hotel
- HM Hotel
- H-2 Hotel
- M-2 Heavy Industrial
- M-3 Heavy Industrial
- AP Airport
- AG Agriculture
- RU-0.5 Rural 1/2 Acre
- PD Project District
- HD-3 Historic District 3
- UR Urban Reserve
- OS-2 Active Open Space
- Drainage
- B-1 Business-Neighborhood
- B-2 Business-Community
- B-3 Business-Central
- B-CT Business-Country Town
- WCT Wailuku Country Town District
- Commercial Mixed Use - MRA
- Business Multi Family - MRA
- SBR Service Business Residential
- M-1 Light Industrial
- P-1 Public/Quasi-Public
- P-2 Public/Quasi-Public
- Public/Quasi Public - MRA
- P Public Use
- PK Park
- PK(GC) Park-Golf Course
- Interim
- Not Zoned
- (road)

LINEAL SCALE (FEET)
500 250 0 250 500 1000

NORTH

Gerald Park
Urban Planner
December 2019

District of Wailuku, Maui

Figure 4
Zoning
Maui High School
STEM Building / Autistic Center

Department of Education, State of Hawai'i

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 and expertise. Time was spent in the field noting site conditions and conditions in the vicinity of Lono Avenue. 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:

- Maui High School has been at this location since 1972;
- There are no historic features on or near the building site;
- There are no rare, threatened, or endangered flora and fauna on or near the building site;
- There are no surface water bodies on the School campus;
- Maui High School is not exposed to the 1% and 0.2% annual chance flood;
- Existing public infrastructure and utilities are adequate to service the new buildings;
- An 18-month construction schedule is projected;
- Construction will not displace any School facility or activity.

B. Short-term Impacts

1. Site Work

The building site will be grubbed of vegetation and graded for foundations, footings, and utility excavations. Earthwork quantities are estimated at 2,000 cubic yards of imported and exported material. Sewer mains will be relocated and trenches for new water and sewer lines dug. Best Management Practices (BMPs) will be implemented to control construction-related and unwanted depositing of soil material on sidewalks and the driveway. Trucks hauling earth will be covered for dust control during transport.

2. 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/m^3 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.

3. 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. After site work is completed, reductions in sound levels, frequency, and duration can be expected as the foundation is formed, concrete footings and matting poured, and the structure erected.

Community Noise Control regulations establish maximum permissible sound levels for construction activities occurring within "acoustical" zoning districts. The school site is zoned residential and 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 modest scale of construction, location of the building site, and the distance from the nearest classroom buildings. In addition, windows and doors in buildings nearest the building site (Buildings A and M) face away from the building site so that noise should not directly enter interior spaces of both buildings. All construction activities will comply with Chapter 46 Community Noise Control, Title 11, Administrative Rules, Department of Health, State of Hawai'i.

Plywood panels and/or dust curtains will be erected around the building site for dust containment, noise attenuation, and overall safety for students, staff, and construction workers. Walkways near the building site will be relocated during construction for safety reasons. The contractor and School administrators will collaborate on a safety plan for the duration of construction.

4. Erosion

Site work will create opportunities for erosion and construction-related runoff. Approximately 0.7 acres will be graded at the building site and parking area. Earthwork quantities are estimated at 2,128 cubic yards of excavation and 1,460 CY of structural fill. Site work impacts can be mitigated by adhering to Best Management Practices (BMPs) specified in Chapter 20.08 of the Maui County Code for drainage and dust, erosion, and sedimentation controls. BMPs will be submitted for review and approval by the Departments of Public Works and Environmental Management. The proposed Erosion and Sediment Control Plan is shown as Sheet C201.

The proposed improvements exceed one (1) acre thus a NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activity will be required from the State Department of Health.

5. Soil Hazard

Soil samples collected at the building site and new parking area revealed traces of arsenic and lead but at concentrations below standards that would produce adverse health and environmental effects. Lead was not detected at the STEM building site. Pesticides were not detected in all samples for both sites.

Based on the soils report that tested for lead, arsenic, and pesticides all of which were below established standards, exposure to soil (e.g. fugitive dust) should not pose adverse environmental or health effects to construction workers and students.

6. 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 Maui and the State of Hawai'i. Impacts on botanical resources are therefore not anticipated.

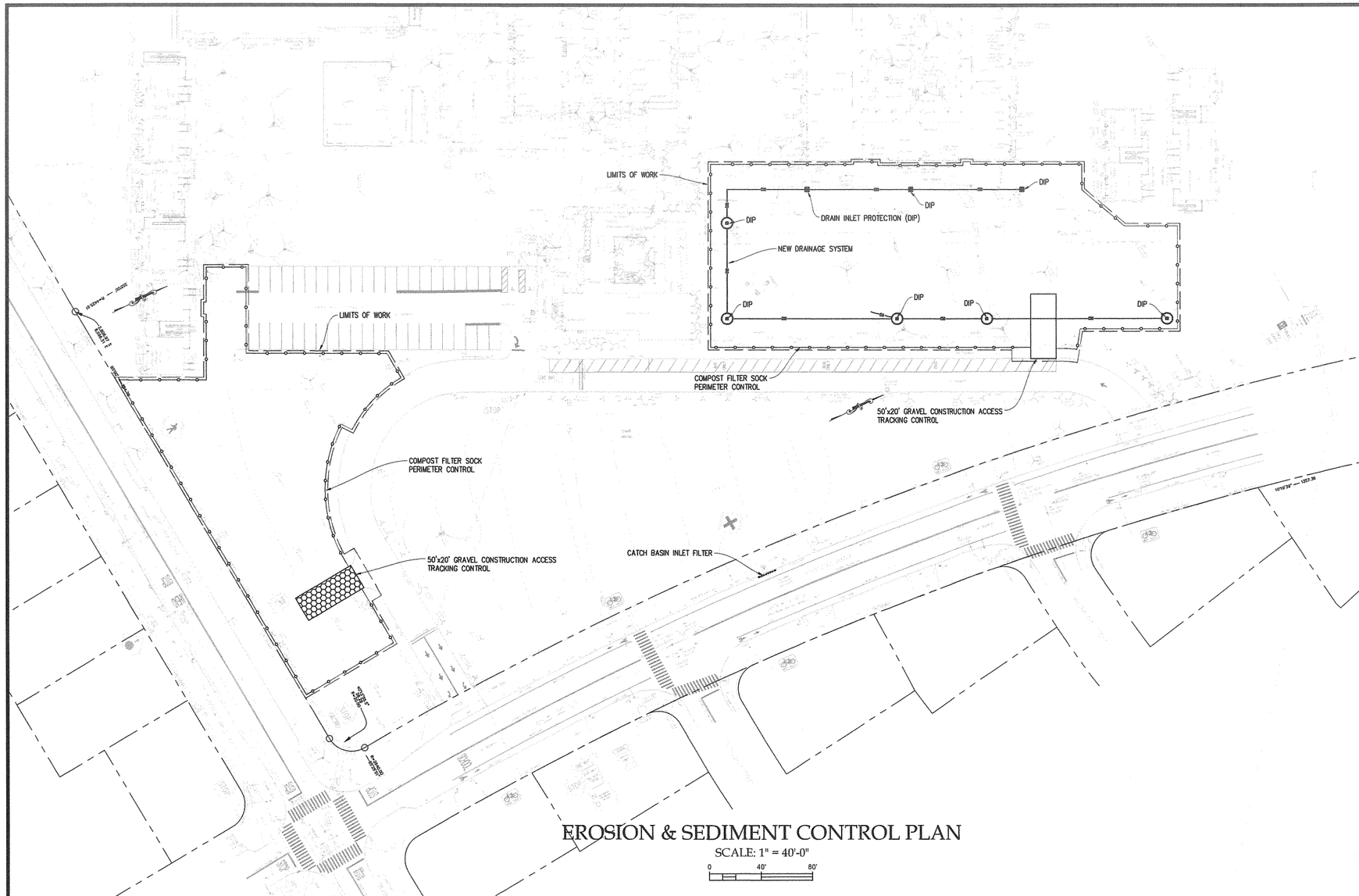
7. Historic Features

An archaeological Literature Review/Field Inspection (Cultural Surveys Hawai'i, 2020) reported "no potential historic properties were observed on the surface of the project area during the field inspection".

The report went on to say that the project area is comprised of Puuone and Jaucus sand. These sandy soils are known to contain human burials and several previous archaeological studies have documented human burials and pre- and post-Contact historic properties within sand deposits to the northwest and southwest.

In the event 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 Maui Police Department.

The consulting archaeologists recommended a) consulting with the State Historic Preservation Division Archaeology Branch to determine appropriate historic preservation



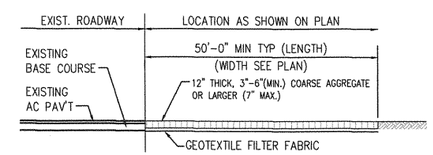
EROSION & SEDIMENT CONTROL PLAN

SCALE: 1" = 40'-0"

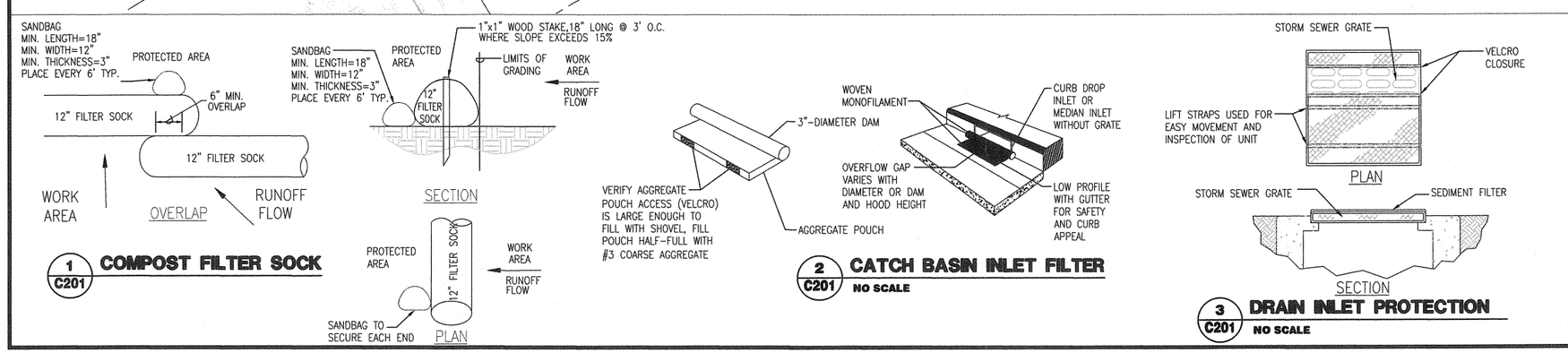
0 40' 80'

GOOD HOUSE KEEPING BMPs:

1. STREET SWEEPING AND VACUUMING. ALL POLLUTANTS DISCHARGED FROM CONSTRUCTION SITE TO OFF-SITE AREAS MUST BE SWEPT OR VACUUMED EACH DAY BEFORE LEAVING THE JOB SITE.
2. MATERIALS DELIVERY, STORAGE AND USE MANAGEMENT. PREVENT, REDUCE, OR ELIMINATE THE DISCHARGE OF POLLUTANTS FROM MATERIAL DELIVERY, STORAGE, AND USE TO THE STORM WATER SYSTEM OR WATERCOURSES BY MINIMIZING THE STORAGE OF HAZARDOUS MATERIALS ONSITE, STORING MATERIALS IN A DESIGNATED AREA, INSTALLING SECONDARY CONTAINMENT. CONSTRUCTION MATERIALS, WASTE, TOXIC AND HAZARDOUS SUBSTANCES, STOCKPILES AND OTHER SOURCES OF POLLUTION SHALL NOT BE STORED IN BUFFER AREAS, NEAR AREAS OF CONCENTRATED FLOW, OR AREAS ABUTTING THE MS4, RECEIVING WATERS, OR DRAINAGE IMPROVEMENTS THAT DISCHARGE OFF-SITE. PRIMARY AND SECONDARY CONTAINMENT CONTROLS AND COVERS SHALL BE IMPLEMENTED TO THE MEP
3. SPILL PREVENTION AND CONTROL. CREATE AND IMPLEMENT SPILL PREVENTION AND RESPONSE PLANS TO ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO THE MS4 AND RECEIVING WATERS FROM LEAKS AND SPILLS BY REDUCING THE CHANCE FOR SPILLS, ABSORBING, CONTAINING, AND CLEANING UP SPILLS AND PROPERLY DISPOSING OF SPILL MATERIALS. AT A MINIMUM, ALL PROJECTS SHALL CLEANUP ALL LEAKS AND SPILLS IMMEDIATELY.
4. HAZARDOUS MATERIALS. PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM HAZARDOUS WASTE THROUGH PROPER MATERIAL USE AND WASTE DISPOSAL. IN THE EVENT THAT HAZARDOUS MATERIALS ARE DISCHARGED TO THE MS4, THE PROPERTY OWNER OR ESCP COORDINATOR SHALL IMMEDIATELY NOTIFY THE DEPARTMENT OF FACILITIES MAINTENANCE, HONOLULU FIRE DEPARTMENT, AND HONOLULU POLICE DEPARTMENT OF THE DISCHARGE BY TELEPHONE. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGED, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE DIRECTOR NO LESS THAN 3 DAYS AFTER NOTIFICATION BY PHONE.
5. NONHAZARDOUS MATERIALS. IN THE EVENT THAT NONHAZARDOUS MATERIALS ARE DISCHARGED TO THE MS4, THE PROPERTY OWNER OR ESCP COORDINATOR SHALL NOTIFY THE CITY DEPARTMENT OF FACILITIES MAINTENANCE BY TELEPHONE NO LATER THAN THE NEXT BUSINESS DAY. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGED, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE DIRECTOR NO LESS THAN 3 DAYS AFTER NOTIFICATION BY PHONE.
6. VEHICLE AND EQUIPMENT CLEANING. ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT CLEANING OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, WASHING IN DESIGNATED, CONTAINED AREAS ONLY, AND ELIMINATING DISCHARGES TO THE STORM DRAIN SYSTEM BY EVAPORATING AND/OR TREATING WASH WATER, AS APPROPRIATE OR INFILTRATING WASH WATER FOR EXTERIOR CLEANING ACTIVITIES THAT USE WATER ONLY.
7. VEHICLE AND EQUIPMENT FUELING. PREVENT FUEL SPILLS AND LEAKS BY USING OFF-SITE FACILITIES, FUELING ONLY IN DESIGNATED AREAS, ENCLOSING OR COVERING STORED FUEL, AND IMPLEMENTING SPILL CONTROLS SUCH AS SECONDARY CONTAINMENT AND ACTIVE MEASURES USING SPILL RESPONSE KITS.
8. VEHICLE AND EQUIPMENT MAINTENANCE. ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT MAINTENANCE OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, PERFORMING WORK IN DESIGNATED AREAS ONLY, USING SPILL PADS UNDER VEHICLES AND EQUIPMENT, CHECKING FOR LEAKS AND SPILLS, AND CONTAINING AND CLEANING UP SPILLS IMMEDIATELY.
9. SOLID WASTE MANAGEMENT. PREVENT OR REDUCE DISCHARGE OF POLLUTANTS TO THE LAND, GROUNDWATER, AND IN STORM WATER FROM SOLID WASTE OR CONSTRUCTION AND DEMOLITION WASTE BY PROVIDING DESIGNATED WASTE COLLECTION AREAS, COLLECT SITE TRASH DAILY, AND ENSURING THAT CONSTRUCTION WASTE IS COLLECTED, REMOVED, AND DISPOSED OF ONLY AT AUTHORIZED DISPOSAL AREAS.
10. SANITARY/SEPTIC WASTE MANAGEMENT. TEMPORARY AND PORTABLE SANITARY AND SEPTIC WASTE SYSTEMS SHALL BE MOUNTED OR STAKED IN, WELL-MAINTAINED AND SCHEDULED FOR REGULAR WASTE DISPOSAL AND SERVICING. SOURCES OF SANITARY AND/OR SEPTIC WASTE SHALL NOT BE STORED NEAR THE MS4 OR RECEIVING WATERS.
11. STOCKPILE MANAGEMENT. STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS, WITHIN 50 FEET FROM AREAS OF CONCENTRATED FLOWS, AND ARE NOT ALLOWED IN THE CITY RIGHT-OF-WAY. SEDIMENT BARRIERS OR SILT FENCES SHALL BE USED AROUND THE BASE OF ALL STOCKPILES. STOCKPILES SHALL NOT EXCEED 15 FEET IN HEIGHT. STOCKPILES GREATER THAN 15 FEET IN HEIGHT SHALL REQUIRE 8 FOOT WIDE BENCHING IN ACCORDANCE WITH ROH CHAPTER 14, ARTICLE 15. STOCKPILES MUST BE COVERED WITH PLASTIC SHEETING OR A COMPARABLE MATERIAL IF THEY WILL NOT BE ACTIVELY USED WITHIN 7 DAYS.
12. LIQUID WASTE MANAGEMENT. LIQUID WASTE SHALL BE CONTAINED IN A CONTROLLED AREA SUCH AS A HOLDING PIT, SEDIMENT BASIN, ROLL-OFF BIN, OR PORTABLE TANK OF SUFFICIENT VOLUME AND TO CONTAIN THE LIQUID WASTES GENERATED. CONTAINMENT AREAS OR DEVICES MUST BE IMPERMEABLE AND LEAK FREE AND SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS.
13. CONCRETE WASTE MANAGEMENT. PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM CONCRETE WASTE BY CONDUCTING WASHOUT OFFSITE OR PERFORMING ONSITE WASHOUT IN A DESIGNATED AREA CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MILLIMETER POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL. CONTAINMENT AREAS OR DEVICES SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75 PERCENT FULL. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED, AND DISPOSED OF AS SOLID WASTES.
14. CONTAMINATED SOIL MANAGEMENT. AT MINIMUM CONTAIN CONTAMINATED MATERIAL SOIL BY SURROUNDING WITH IMPERMEABLE LINED BERMS OR COVER EXPOSED CONTAMINATED MATERIAL WITH PLASTIC SHEETING. CONTAMINATED SOIL SHOULD BE DISPOSED OF PROPERLY IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
15. DUST CONTROL SHALL BE MAINTAINED BY USE OF WATER TRUCKS OR WATER HOSE. WATER SHALL BE APPLIED SUCH THAT AIRBORNE DUST IS CONTROLLED TO A MINIMAL LEVEL WITHOUT OVER APPLICATION SO AS TO CAUSE RUNOFF.
16. THE EXISTING SEDIMENT TRAP SHALL BE MAINTAINED AS LONG AS PRACTICABLE DURING MASS GRADING OPERATIONS.
17. BMPs AS REFLECTED ON THE ESCP SHALL BE INSTALLED BEFORE START OF CONSTRUCTION AND BE MAINTAINED UNTIL THE COMPLETION OF CONSTRUCTION ACTIVITES.



4 C201 **GRAVEL CONSTRUCTION ACCESS**
NO SCALE



1 C201 **COMPOST FILTER SOCK**

2 C201 **CATCH BASIN INLET FILTER**
NO SCALE

3 C201 **DRAIN INLET PROTECTION**
NO SCALE

REV. NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ENGINEER

ALAN T. OKAMOTO LICENSED PROFESSIONAL ENGINEER No. 5483-C HAWAII, U.S.A.

DEPARTMENT OF EDUCATION
STATE OF HAWAII

MAUI HIGH SCHOOL
NEW STEM BUILDING AND AUTISM CENTER
KAHULUI, MAUI, HAWAII
TMK: 3-8-007: 098

EROSION & SEDIMENT CONTROL PLAN

DESIGN PARTNERS, INC.

DESIGNED BY	CHECKED BY	DAGS JOB NO.	DRAWING NO.
CYO	CYO	Q55200-19	C201
DRAWN BY CYO	APPROVED BY ATO	DATE MARCH 2020	SHEET OF SHTS.
SCALE			

FILE_____ DRAWER_____ FOLDER_____

requirements and b) archaeological monitoring during project-related ground disturbing activities.

Maui High School was built at this location in 1972 (DOE, 2006). School buildings are not considered to be historic property because they are not 50 years old or older.

8. Traffic

Construction vehicles hauling workers and material will contribute to traffic on Lono Avenue and adjoining streets. The existing driveway at the front of the School is the principal access for vehicles and buses. To minimize impacts on local and on-campus traffic circulation, material deliveries will be scheduled for after morning drop-offs and before afternoon pick-ups. Construction worker traffic should not be an issue during morning and afternoons because school hours and construction work hours start and end at different times.

Materials will be off-loaded at or near the job site and stored in a construction base yard to be located nearby.

School administrators and the contractor will be co-responsible for traffic control. Measures for minimizing traffic impacts during construction include but are not limited to:

- Posting notices alerting drivers of scheduled work on and around the driveway and turnaround;
- Positioning traffic cones or other directional devices to guide vehicles around work areas;
- Posting flagmen for traffic control;
- Covering open trenches with steel plates during non-working hours and post safety devices with warning lights to alert motorists;
- Scheduling work to avoid student drop-off and pick- up times; and
- Coordinating construction activities and traffic movement/mitigation with School administrators.

C. Long-term Impacts

Maui High School already has a functioning STEM program. But it lacks a multi-purpose space where STEM students can engage in collaborative learning, exchange ideas and information, research and design projects, and conduct experiments. The proposed STEM Building fosters the Department of Education goal to expose and develop student interest and grow STEM programs in all public schools.

It is anticipated that the completed structure will meet the objectives of the project stated in Section 1 of this environmental assessment. As such Maui High School's STEM program and the population of autistic children should be the direct beneficiaries of the improvements.

Ambient air quality should not be adversely affected in the long-term. The principal source of air pollution is expected to be exhaust emissions from vehicles queueing when entering and exiting the drop off driveway. Emissions will be dispersed by the prevailing winds.

Generally, schools are not significant noise generators. Noise associated with STEM and Autism Center activities will be confined to the building interior by walls, sealed windows, and doors. The building will be fully air conditioned creating a self-contained setting thereby helping to reduce noise escaping to exterior areas.

The structure will present a new object to be seen from Lono Avenue and the School's driveway. Over time the low-rise structure will blend with the other institutional buildings comprising the campus's architecture. The building's distinguishing feature is its high sloping roof over the STEM portion of the building. The high roof will allow light to enter interior spaces and "break up" the low sloping building roof.

The planting layout and use of vertical elements shown in the Landscape Plan will "soften" building mass and form when viewed from the front of the School and Lono Avenue.

A color palette for exterior areas has not yet been selected. It is anticipated that the color scheme will match that of existing campus buildings.

The drop off area for the Autism Center will provide ready access and a shorter distance for parents to gain the Autism Center. It will also help alleviate vehicle queueing during morning and afternoon drop-off and pick-up times.

The larger parking lot will provide additional staff and visitor parking. Currently visitors do not have a dedicated parking area except to park in a striped area along the School driveway or on-street.

Water use is estimated at 550 gallons per day (rounded). The water system will be designed with low flow fixtures and devices for faucets, toilets, and water closets.

Wastewater flow is projected at 460 gallons per day (rounded). Low flow toilets, urinals, and lavatory fixtures will be provided. Plumbing fixtures will have shut off capabilities to prevent leakage when not in use.

Post-development storm water runoff quantity is expected to increase due to the increase in impervious surfaces. The increase cannot be avoided and the storm water system will be designed for a "net zero increase" in runoff quantity. Runoff will be collected and piped to a series of on-site drywells for percolation into the ground.

In anticipation of an increase in electrical consumption and to help offset the increase the building is designed with insulated materials for walls, energy efficient fixtures, and low-E glazed glass. The electrical system will be designed to accommodate photovoltaic (PV) panels for later installation.

Public schools are a permitted use in the Residential zoning district. A new building added to an existing school will not alter the character of surrounding areas, the zoning of adjacent properties, and the uses and zoning of the property.

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 would suspend the project until such time that it can be constructed.

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

State of Hawai'i

Department of Land and Natural Resources
Historic Preservation Division
Department of Health

County of Maui

Department of Environmental Management
Department of Public Works
Department of Transportation
Department of Water Supply
Planning Department
Fire and Public Safety
Police Department

Other

Maui Electric Company
Kahului Public Library (Placement)

SECTION 6
PERMITS AND APPROVALS

Permits required for the project and responsible authorities are identified below. Additional permits and approvals may be required depending on final construction plans.

State of Hawai'i

Department of Health

Disability and Communication Access Board (Facility Access Review)
Variance from Pollution Controls (Noise Permit)

Department of Land and Natural Resources, Historic Sites Division

Historic Site Review (Chapter 6E)

County of Maui

Department of Water Supply

Temporary Water Permit (To Be Determined)

Department of Public Works

Building Permit
Grading and Grubbing Permit
Certificate of Occupancy

Fire and Public Safety

Fire Protection (Fire Sprinkler Plans)

SECTION 7
DETERMINATION OF SIGNIFICANCE

Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 200.1 (Environmental Impact Statement Rules) establishes criteria for determining whether an action may have significant effects on the environment (§11-200.1-13). The relationship of the proposed project to these criteria is discussed or summarized below.

1) Irrevocably commit a natural, cultural, or historic resource;

   There are no natural, cultural, or historic resource on or associated with the site of the proposed STEM Building and Autism Center.

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

   Maui High School was established at this site in 1972. At the time it was determined that a public high school was the best use of the land (and environment). The STEM Building and Autism Center will add to the School's physical plant and continue the long running beneficial use of the environment as the site of a public school.

3) Conflict with the State's environmental policies or long-term environmental goals established by law;

   The project will not conflict with the State's environmental policies or long-term environmental goals.

4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State;

   Substantial adverse effects on the economic welfare, social welfare, or cultural practices of the community and State are not anticipated.

5) Have a substantial adverse effect on public health;

   Public health will not be adversely affected.

6) Involve adverse secondary impacts, such as population changes or effects on public facilities;

   Adverse secondary impacts are not anticipated.

7) Involve a substantial degradation of environmental quality;

   Substantial degradation of environmental quality is not anticipated. Environmental quality in the area of the building site will be affected temporarily by construction activities. Measures for mitigating effects on air quality, noise, and erosion were disclosed in the environmental assessment. The contractor can also implement other control measures that would minimize disturbances inside the classroom and disruptions to school activities.

8) Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions;

The project will not have substantial adverse environmental effects. A commitment for larger actions may evolve if student interest in the STEM program exceeds educator expectations and if the population and need for educating autistic students exceed Department of Education projections and program space.

9) Have a substantial adverse effect on a rare, threatened or endangered species, or its habitat;

Rare, threatened, or endangered species and habitat were not observed.

10) Have a substantial adverse effect on air or water quality or ambient noise levels;

Substantial effects on air quality, ambient noise levels, and water quality are not anticipated. Short-term construction activities will raise fugitive dust, increase ambient noise levels, and may generate runoff. Acceptable measures for mitigating dust, noise, and construction runoff were presented in this assessment. The contractor could implement other measures as his/her discretion. In the long-term the building is not anticipated to affect the environmental characteristics in this criterion.

11) Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

Maui High School is located in flood zone "X" which is areas outside the 0.2% annual chance flood (the 500-year floodplain).

12) Have a substantial adverse effect on scenic vistas and view planes, day or night, identified in county or state plans or studies, or,

The building will be a new object on campus and one to be seen from adjoining streets and residential areas. Over time its low-rise profile will blend with other campus buildings as part of the architectural landscape.

Scenic vistas and view planes are not identified in the Wailuku-Kahului Community Plan.

13) Require substantial energy consumption or emit substantial greenhouse gases.

The new structure will increase energy use at the School. Design measures for reducing energy use and creating renewable energy were disclosed in the Description of the Proposed Action.

REFERENCES

County of Maui, Planning Department, Long Range Division. No Date. *Maui Island Plan General Plan 2030.* Adopted as Ordinance No. 4004. Effective Date December 28, 2012. Prepared for the People of Maui.

Cultural Surveys Hawai'i. January 2020. *Archaeological Literature Review and Field Inspection Report for the Maui High School STEM & Autism Center Project Wailuku Ahupua'a, District of Wailuku, Maui Island TMK: [2] 3-8-007: 098*

Department of Education, State of Hawai'i. 2006. *Department of Education Facilities Inventory System Comprehensive Report, Maui High School.*

Department of Geography, University of Hawai'i at Hilo. 1998. *Atlas of Hawai'i Third Edition.* University of Hawai'i Press. Honolulu.

EMET EnvironMETeo Services Inc. February 2020. *Maui High School, STEM Building and Autism Center. DOE Job No. Q55200-19-Soil Testing.*

Federal Emergency Management Agency. *September 2009. Flood Insurance Rate Map. Community Panel No. 150030392E.*

Mink, John F. and L. Stephen Lau. February 1990 Revised. *Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawai'i.* Water Resources Research Center, University of Hawaii at Manoa. Technical Report No. 185.

Munekiyo & Hiraga, Inc. March 2011. *Draft Environmental Assessment. Proposed H.P. Baldwin High School Softball Field and Related Improvements 9TMK 92) 3-8-007: 004) (por.).* Prepared for State of Hawaii Department of Education.

Park, Gerald Urban Planner. *September 2019. Field Observation.*

Pukui, Mary K, Samuel H. Ebert, and Esther T. Mookini. 1974. *Place Names of Hawaii.* University of Hawaii Press.

U.S. Department of Agriculture, Soil Conservation Service. August 1972. *Soil Survey Report for Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lāna'i, State of Hawai'i.* In Cooperation with the University of Hawai'i Agricultural Experiment Station.

Wilson Okamoto Corporation. June 2008. *Hawaii Water Plan Water Resource Protection Plan.* Prepared for State of Hawaii Commission on Water Resource Management.

EXHIBIT A

Zoning and Flood Confirmation Form

19/4236

COUNTY OF MAUI
DEPARTMENT OF PLANNING
One Main Plaza Building
2200 Main Street, Suite 315
Wailuku, Hawaii 96793

Zoning Administration and
Enforcement Division (ZAED)
Telephone: (808) 270-7253
Facsimile: (808) 270-7634
E-mail: planning@mauicounty.gov

RECEIVED
AUG 15 2019
COUNTY OF
DEPARTMENT OF PLANNING

ZONING AND FLOOD CONFIRMATION FORM

(This section to be completed by the Applicant)

APPLICANT NAME Gerald Park TELEPHONE 808.625.9626

PROJECT NAME Maui HS STEM Bldg + Autism Ctr. E-MAIL gpark@gpup.biz

PROPERTY ADDRESS 660 South Lono Ave. Kahului TAX MAP KEY 3-8-007: 098

☐ Yes ☑ No **Will this Zoning & Flood Confirmation Form be used with a Subdivision Application?**
IF YES, answer questions A and B below and comply with instructions 2 & 3 below:

A) ☐ Yes ☐ No **Will it be processed under a consistency exemption from** Section 18.04.030(B), MCC?
IF YES, which exemption? (No. 1, 2, 3, 4 or 5) _____

B) State the purpose of subdivision and the proposed land uses (*ie 1-lot into 2-lots for all land uses allowed by law*):

INSTRUCTIONS:
1) **Please use a separate Zoning & Flood Confirmation Form for each Tax Map Key (TMK) number.**
2) **If this will be used with a subdivision application AND the subject property contains multiple districts/designations of (1) State Land Use Districts, (2) Maui Island Plan Growth Boundaries, (3) Community Plan Designations, or (4) County Zoning Districts; submit a signed and dated Land Use Designations Map, prepared by a licensed surveyor, showing the metes & bounds of the subject parcel and of each district/designation including any subdistricts.**
3) **If this will be used with a subdivision application AND the subject property contains multiple State Land Use Districts; submit an approved District Boundary Interpretation from the State Land Use Commission.**

(This section to be completed by ZAED)

LAND USE DISTRICTS/DESIGNATIONS (LUD) AND OTHER INFORMATION: [1]

☐ (SMA) Special Management Area

STATE DISTRICT: ☒ Urban ☐ Rural ☐ Agriculture ☐ Conservation

MAUI ISLAND PLAN Growth Boundary:[2] ☒ Urban ☐ Small Town ☐ Rural ☐ Planned Growth Area ☐ Outside Growth Boundaries

Protected Area:[2] ☐ Preservation ☐ Park ☐ Greenbelt ☐ Greenway ☐ Sensitive Land ☒ Outside Protected Areas

COMMUNITY PLAN:[2] Public/Quasi-Public

COUNTY ZONING: R-2 (residential)

OTHER/COMMENTS:

☐ (PD) Planned Development
☐ (PH) Project District
☐ See Additional Comments (Pg.2)
☐ See Attached LUD Map

FEMA FLOOD INFORMATION: A Flood Development Permit is required if any portion of a parcel is designated V, VE, A, AO, AE, AH, D, or Floodway, and the project is on that portion.

FLOOD HAZARD AREA ZONES [3] & BASE FLOOD ELEVATIONS: Zone X

☐ FEMA DESIGNATED FLOODWAY For Flood Zone AO, FLOOD DEPTH:

SUBDIVISION LAND USE CONSISTENCY: ☐ Not Consistent, (LUDs appear to have NO permitted uses in common).

_____ (Signature) ☐ Not Applicable, (Due to processing under consistency exemption No. ☐1, ☐2, ☐3, ☐4, ☐5).
☐ Interim Zoning, (The parcel or portion of the parcel that is zoned interim shall not be subdivided).

☐ [4] Consistent, (LUDs appear to have ALL permitted uses in common).

☐ [4] Consistent, upon obtaining an SMA, PD, or PH subdivision approval from Planning.

☐ [4] Consistent, upon recording a permissible uses unilateral agreement processed by Public Works (See Pg.2).

NOTES:

1 The conditions and/or representations made in the approval of a State District Boundary Amendment, Community Plan Amendment, County Change In Zoning, SMA Permit, Planned Development, Project District and/or a previous subdivision, may affect building permits, subdivisions, and uses on the land.

2 Please review the Maui Island Plan and the Community Plan document for any goals, objectives, policies or actions that may affect this parcel.

3 Flood development permits might be required in zones X and XS for any work done in streams, gulches, low-lying areas, or any type of drainageway; Flood development permits are required for work in all other zones. Subdivisions that include/adjoin streams, gulches, low-lying areas, or any type of drainageway might require the following designations to be shown on the subdivision map: 100-year flood inundation limits; base flood elevations; drainage reserves.

4 Subdivisions will be further reviewed during the subdivision application process to verify consistency, unilateral agreement requirements, and the conditions associated with a unilateral agreement [Section 18.04.030.D, Maui County Code].

REVIEWED & CONFIRMED BY:

Shelly M. Kan-Hai Shelly M. Kan-Hai (Signature) 8/20/19 (Date)

For: Planning Program Administrator, Zoning Administration and Enforcement Division

EXHIBIT B

Archaeological Literature Review and Field Inspection Report
for the Maui High School STEM & Autism Center Project
Wailuku Ahupua'a, District of Wailuku, Maui Island
TMK: [2] 3-8-007: 098

Draft
Archaeological Literature Review and Field Inspection for the Maui High School STEM Building & Autism Center Project, Wailuku Ahupua‘a, Wailuku District, Maui Island, TMK: [2] 3-8-007:098

Prepared for
Design Partners Incorporated

Prepared by
Josephine M. Yucha, M.S.,
Angela L. Yates, B.S.,
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Wailuku, Hawai‘i
(Job Code: WAILUKU 61)

January 2020

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1860 Main St.
Wailuku, Hawai‘i 96793
Ph.: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Archaeological Literature Review and Field Inspection for the Maui High School STEM Building & Autism Center Project, Wailuku Ahupua‘a, Wailuku District, Maui Island, TMK: [2] 3-8-007:098 (Yucha et al. 2020)
Date	January 2020
Project Numbers	State of Hawai‘i Department of Education (HIDOE) Job No. Q55208-19 Design Partners Incorporated (DPI) Project No. 19007 Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: WAILUKU 61
Investigation Permit Number	CSH completed the fieldwork component of this study under archaeological fieldwork permit number 19-07, issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-13-282.
Agencies	SHPD
Project Funding and Land Jurisdiction	HIDOE
Project Proponent	HIDOE, Maui School District
Project Location	The project area is the Maui High School at 600 Lono Avenue in Kahului, Wailuku Ahupua‘a, Wailuku District, Maui Island, TMK: [2] 3-8-007:098. The school property is within a residential neighborhood largely surrounded by private properties. The high school is bounded by Kahului Elementary School and La‘au Street to the north, West Papa Avenue to the south, Lono Avenue to the east, and Moloka‘i Hema Street to the west. The project area is depicted on a portion of the 1997 Wailuku USGS 7.5-minute topographic quadrangle.
Project Description	The project will consist of the construction of a Maui High School STEM Building & Autism Center. In addition, the project will include development of a paved Autism Center drop-off area, a new parking area containing 26 stalls, three additional parking stalls within the existing parking lot, and widening of the existing driveway. Project-related ground disturbance will include grading and excavations for building footings and utilities (e.g., electric, water, sewer) as well as vegetation removal and landscaping.
Project Acreage	The overall project area, which includes the entire Maui High School campus, is approximately 73.64 acres (29.8 hectares).
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 §13-13-276. Consequently, this report cannot be used to make formal recommendations for SHPD review and acceptance. Two previous archaeological studies have been conducted within the Maui High School project area with no significant findings. In July 2005, Scientific Consultant Services, Inc. (SCS) conducted archaeological monitoring during trenching at the Maui High School softball field (Shefcheck et al. 2005). The project-related excavations reached maximum depths of 80 cm below the previously graded surface. Between September 2006 and July 2007, SCS conducted archaeological monitoring of the grading for re-sodding the football field at Maui High School (Cordle et al. 2007). Ground disturbance occurred within the existing football field and remained shallow with a maximum depth of 36 cm below surface (cmbs). During both studies, ground disturbance only occurred within fill materials. Despite the lack of findings for both studies, SCS recommended archaeological monitoring for any future ground disturbance based on the background research of the area, which includes previously documented human burials southwest of the project area.
Fieldwork Effort	The fieldwork inspection was accomplished on 2 September 2019 by Josephine Yucha, M.S., 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 observed on the surface of the project area during the field inspection. Maui High School was established at the current location in 1972. None of the buildings or structures are older than 50 years. The original Maui High School was founded in 1913 in Hāmākua Poko in the northeastern region of Maui. It was the first public high school on Maui. Background research conducted by CSH indicates that prior to the construction of the school at its current location, the area had been within the fields of the Wai‘ale Pasture, which were previously used for cattle, and south of the growing development of Kahului. The second half of the nineteenth century was marked by commercial development of the Wailuku and Kahului areas. Sugarcane fields were prominent around the Wailuku Sand Hills, east of the current project area. The Kahului Railroad was carrying raw sugar to the port of Kahului from both the Wailuku Sugar

	Company and from the Alexander & Baldwin mills in Pā‘ia and Hāmākua Poko. During the postwar modernization of the 1950s, Hawaiian Commercial & Sugar Company (HC&S) developed a residential and commercial master plan for the “Dream City” of Kahului. Alexander & Baldwin Inc. (A&B), the largest landowner in Kahului, continued to expand residential housing in the “Dream City” incrementally between 1970 and 1990. The project area is east of the Wailuku Sand Hills, and the soils are described as primarily Puuone sand and Jaucas sand. These sandy soils are known to contain human burials, and several previous archaeological studies have documented human burials and pre- and post-Contact historic properties within sand deposits to the northwest and to the southwest. No previous archaeological studies were conducted during the initial construction of the Maui High School in the 1970s. Following the passage of the National Historic Preservation Act in 1966 and HRS Chapter 6E, which established the historic preservation program in 1976, archaeological studies occurred as a condition of development on a more frequent basis. Scientific Consultant Services, Inc. (SCS) conducted two previous archaeological studies within the current project area. In 2005, SCS conducted archaeological monitoring for Maui High School softball field scoreboard (Shefcheck et al. 2005). In 2007, SCS conducted archaeological monitoring for the re-sodding the football field at Maui High School (Cordle et al. 2007). During both projects, ground disturbance was within shallow fill deposits, and no historic properties were encountered. However, both studies recommended archaeological monitoring for future ground disturbances due to the presence of natural sand and human burials in the area.
Recommendations	Consultation with the SHPD Archaeology Branch is recommended to determine appropriate historic preservation requirements for this project. CSH recommends archaeological monitoring during project-related ground disturbance based on previous archaeological finds, including human burials, encountered northwest and southwest of the Maui High School within sand deposits that are also present within the current project area.

Table of Contents

Management Summary ..... **i**

Section 1 Introduction **1**

1.1 Project Background 1
1.2 Document Purpose 7
1.3 Environmental Setting 7
1.3.1 Natural Environment 7
1.3.2 Built Environment 9

Section 2 Methods **10**

2.1 Field Methods 10
2.1.1 Pedestrian Survey 10
2.2 Research Methods 10

Section 3 Background Research **11**

3.1 Traditional and Historical Background 11
3.1.1 Place Names 11
3.1.2 Traditional Accounts 12
3.1.1 Settlement and Subsistence 14
3.1.2 Heiau 18
3.1.3 Politics and Warfare 18
3.1.4 Early Historic Period 21
3.1.5 The Māhele and the Kuleana Act 23
3.1.6 Mid- to Late 1800s 24
3.1.7 Early 1900s 28
3.1.8 World War II 34
3.1.9 Mid-1900s 37
3.1.10 Statehood to the Modern Era 39
3.1.11 Maui High School 42
3.2 Previous Archaeological Research 46
3.2.1 Studies within Current Project Area 46
3.2.2 Modern Studies in Project Area Vicinity 46

Section 4 Results of Fieldwork **53**

4.1 Pedestrian Inspection Results 53

Section 5 Summary and Recommendations **67**

Section 6 References Cited **69**

List of Figures

Figure 1. Portion of the 1997 Wailuku USGS 7.5-minute topographic quadrangle showing the location of the project area (U.S. Geological Survey 1997) 2
Figure 2. Tax Map Key (TMK) [2] 3-8-007 showing the project area (Hawaii TMK Service 2014) 3
Figure 3. 2017 composite aerial image showing the location of the project area (Esri 2017; Resource Mapping Hawai‘i 2017) 4
Figure 4. Conceptual Overall Site Plan showing where the new STEM Building & Autism Center will be constructed and locations of additional paving for drop-off, driveway, and parking (Design Partners Incorporated 2019a) 5
Figure 5. Conceptual Floor Plan for the STEM/ Autism Center Building (Design Partners Incorporated 2019b) 6
Figure 6. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating soil types within and surrounding the project area (U.S. Department of Agriculture 2001) 8
Figure 7. Portion of F.S. Dodge (1885) map showing approximate location of the project area in within Land Grant 3343 and east of labeled “Sand Hills” 17
Figure 8. Newspaper clipping from the 7 January 1927 edition of the Honolulu Advertiser describing an 1841 discovery of human remains in the Sand Hills of Maui (The Honolulu Advertiser 1927) 20
Figure 9. Engraving of Wailuku circa 1880s (Powell 1883) 25
Figure 10. Early 1800s photograph of the Spreckels Mill on Maui’s central plains (Personal Collection of Robert Hill) 27
Figure 11. Immigrant workers planting cane slips in Wailuku, circa 1910 (CSH Archives) 27
Figure 12. Artist rendition of installing railroad tracks in a Hawaiian sugarcane field (Williams 1888:849) 29
Figure 13. Bringing hand-cut cane from the fields to the Spreckelsville mill aboard the HC&S railroad, circa 1882 (Conde 1993) 29
Figure 14. Pu‘unēnē Mill circa 1935 (photo courtesy of A&B Sugar Museum) 31
Figure 15. Pu‘unēnē Mill and camps (foreground); Kahului Town and Bay in background (photo courtesy of A&B Sugar Museum) 31
Figure 16. Shoemaker (1910) map showing current project area within Waiale Pasture south of the development of Kahului; Pu‘unēnē Mill and surrounding plantationa camps are depicted southeast of the project area 32
Figure 17. Artist rendition of Kahului Harbor from a Hilo Drug Co. advertisement (Hilo Drug Company c. 1920) 35
Figure 18. Photograph circa 1925 of the Claudine Wharf with a U.S. Naval Destroyer superimposed against ‘Īao Valley (CSH Archives) 35
Figure 19. Portion of a Wall (1929) map of the Island of Maui, depicting the current project area in relation to the Kahului Harbor; note the railway extending around the harbor 36
Figure 20. Plan of the “modernized” Kahului Harbor area following the turn of the twentieth century (Territorial Planning Board 1939) 38
Figure 21. Kahului Harbor in 1957, with the first two Maui hotels visible in the right of the frame (CSH Archives) 40

Figure 22. Portion of 1977 USGS aerial image showing the current project area, constructed in 1972, within the expanding “Dream City” of Kahului (U.S. Geological Survey 1977)....41
Figure 23. Original Maui High (and Grammar) School, established 1913 in Hāmākua Poko (Maui Historical Society photo reprinted by Engledow and Long [2007:2])....43
Figure 24. Maui High School students exiting Kahului Railroad passenger car, circa 1920s/1930s (Maui Hi-Notes supplement (1963) photo reprinted in Engledow and Long [2007:4])....43
Figure 25. Comparison of the old Maui High School (top) to the new campus (bottom) in 1972 (photo original printed in The Silversword (1972); reprinted by Engledow and Long [2007:85])....45
Figure 26. Portion of 1997 Wailuku USGS 7.5-minute topographic quadrangle depicting previous archaeological studies conducted within or adjacent to the current project area (U.S. Geological Survey 1997)....47
Figure 27. Maui High School campus map marked with locations (dots) and views (arrows) of Figures 20 through 39; note, Figures 40 through 42 were along Moloka‘i Hema Street and not depicted, view to northwest (Maui High School 2018)....54
Figure 28. Banyan trees and ornamental palm tree at edge of property along Lono Avenue in the northeastern portion of the project area, view to south....55
Figure 29. Overview of northwestern portion of the school campus from Lono Avenue showing the parking lot and Patsy Mink Field, baseball field, view to west....55
Figure 30. Overview of portable classrooms near the Staff Parking Lot, south of the Student Parking Lot, view to southeast....56
Figure 31. Construction area on the eastern side of the Building J Chorus Room, view to south 56
Figure 32. Entrance to the Patsy Mink Field baseball field on the western side of the Student Parking Lot, view to northwest....57
Figure 33. Overview of basketball courts and a construction area in the background on the western side of the Gym, view to west....57
Figure 34. Overview of the central lawn from the Gym, view to southwest....58
Figure 35. Overview of central lawn with Building B to the north (left) and Building A at the east (background), view to east....58
Figure 36. Overview of central lawn with Building A to the east (left) and the Library at the south (background), view to east....59
Figure 37. Overview of central lawn near the Library and the space between Building A (left) and Building N (right), view to east....59
Figure 38. Overview of central lawn near the Library (to the left) and the Cafeteria (background), view to west....60
Figure 39. Overview of southwestern corner of the school campus showing part of Building E (at left) and Building F (background), view to west....60
Figure 40. Overview of the throughway along the western side of the school campus showing the garden to the west (left), view to north....61
Figure 41. Overview of space behind (west of) the Cafeteria in the southwestern portion of the school campus, view to southeast....61
Figure 42. Overview of portable classrooms along the western side of the school campus, view to south....62
Figure 43. Overview of the track and field in the northwestern portion of the Maui High School project area, view to west....62

Figure 44. Overview of the construction area behind (west of) the Gym in the northwestern corner of the school campus, view to east 63
Figure 45. Overview of the open space on the southern side of the tennis courts, west of the construction area, view to north.....63
Figure 46. Overview of western side of the central lawn, fronting Building K (at right), view to south.....64
Figure 47. Overview of the student drop-off throughway along Lono Avenue, view to south.....64
Figure 48. Overview of Maui High School campus fronting Lono Avenue, view to west 65
Figure 49. Overview of the lightly forested, undeveloped portion of the project area that is comprised mostly of *koa haole* trees, view to southeast.....65
Figure 50. Overview of the southwestern corner of the Maui High School project area showing the practice baseball fields, view to northeast 66
Figure 51. Overview of the track and field in the northwestern portion of the Maui High School project area, view to east.....66

List of Tables

Table 1. Previous archaeological studies in the vicinity of the project area.....48

Section 1 Introduction

1.1 Project Background

At the request of Design Partners Incorporated (DPI), and on behalf of the Hawai‘i State Department of Education (HIDOE), Maui School District, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological literature review and field inspection report (LRFI) for the Maui High School STEM Building & Autism Center Project, Wailuku Ahupua‘a, Wailuku District, Maui Island, TMK: [2] 3-8-007:098. The project area is the Maui High School at 600 Lono Avenue in Kahului, Wailuku Ahupua‘a, Wailuku District, Maui Island, TMK: [2] 3-8-007:098. The school property is within a residential neighborhood largely surrounded by private properties. The high school is bounded by Kahului Elementary School and La‘au Street to the north, West Papa Avenue to the south, Lono Avenue to the east, and Moloka‘i Hema Street to the west. The project area is depicted on a portion of the 1997 Wailuku U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), a tax map plat (Figure 2), and a 2017 aerial image (Figure 3).

The current project will consist of the construction of a Maui High School STEM Building & Autism Center. The new 14,160-square-ft (SF) building will be built on a grassy area north of Building M, between Building A and the main driveway at the front (east side) of the campus (Figure 4). The new STEM/Autism Center building will include a 2,500-SF STEM/Science laboratory, three math classrooms, a faculty center, seven restroom facilities, a shower room, a faculty training room with adjoining classroom, a 1,560-SF Family Support Center (FSC) with a kitchen and sanctuary, and building support spaces, including janitor, mechanical, electric, storage, and telecommunications rooms (Figure 5). In addition, concrete walkways will adjoin existing sidewalks and concreted outdoor areas will be developed on the north and south sides of the new building. The project will also include development of a paved Autism Center drop-off area in front of the north side of the new building, a new parking area containing 26 stalls, three additional parking stalls within the existing parking lot south of Building M, and widening of the existing driveway (see Figure 4). The new 36-stall parking lot will be developed east of the existing parking lot, on a grassy area in the southeast corner of the campus. Project-related ground disturbance will include grading and excavations for building footings and utilities (e.g., electric, water, sewer) as well as vegetation removal and landscaping.

Two previous archaeological studies have been conducted within the Maui High School property. Both projects involved relatively shallow ground disturbance that remained within fill material, and no historic properties were identified. From 20 through 22 July 2005, Scientific Consultant Services, Inc. (SCS) conducted archaeological monitoring during trenching at the Maui High School softball field (Shefcheck et al. 2005). Project-related excavations included three utility trenches, six utility pole holes, and four holes for the scoreboard. Trenches were excavated within fill layers to maximum depths of 0.80 m below the previously graded surface.

Between September 2006 and July 2007, SCS conducted archaeological monitoring of the grading for re-sodding the football field at Maui High School (Cordle et al. 2007). Ground disturbance occurred within the existing football field and remained shallow with a maximum depth of 36 cm below surface (cmbs). No historic properties were identified; all excavations were within base fill. Following both projects, archaeological monitoring was recommended for future ground disturbance due to previously documented human burials near the project area.

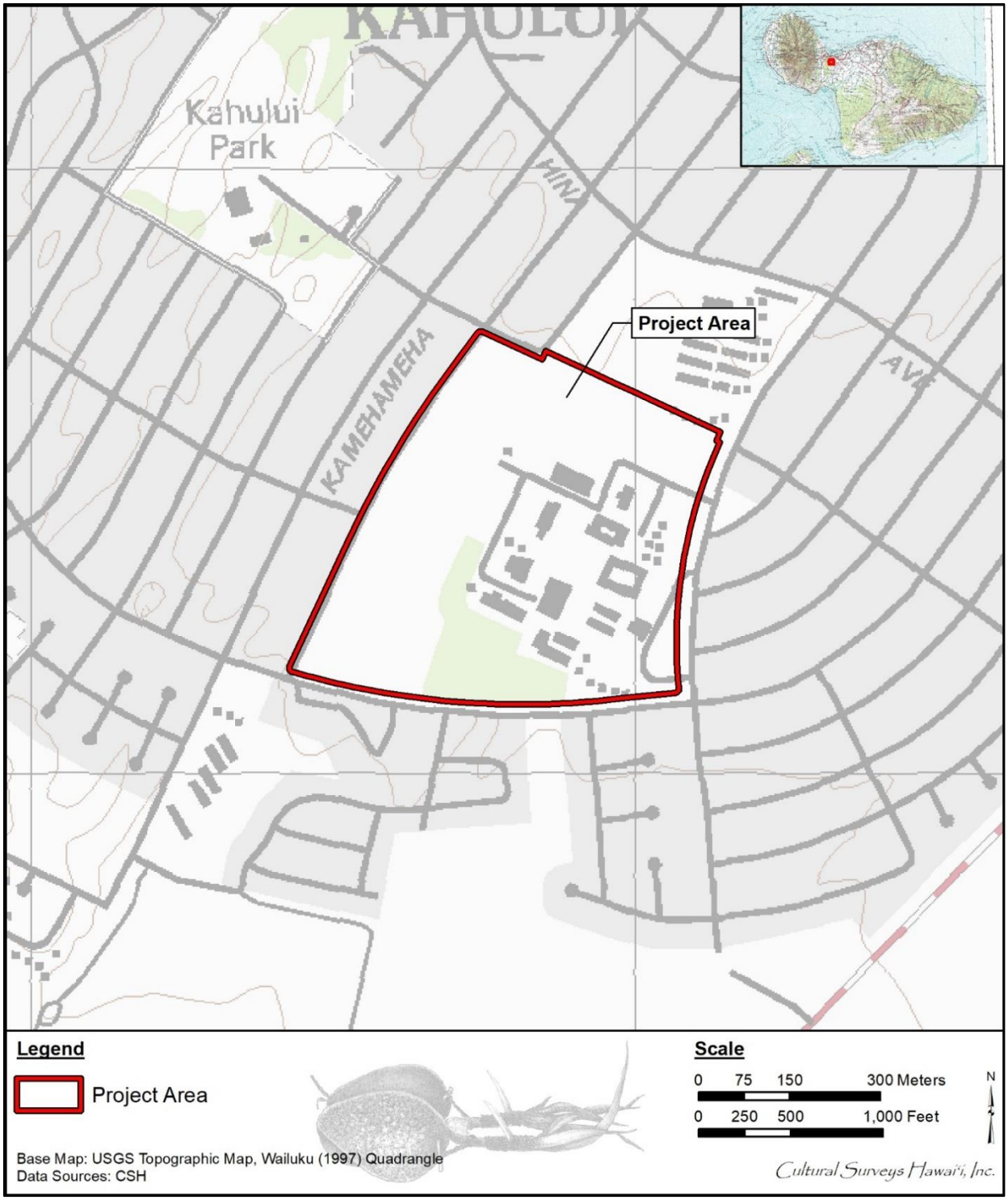


Figure 1. Portion of the 1997 Wailuku USGS 7.5-minute topographic quadrangle showing the location of the project area (U.S. Geological Survey 1997)

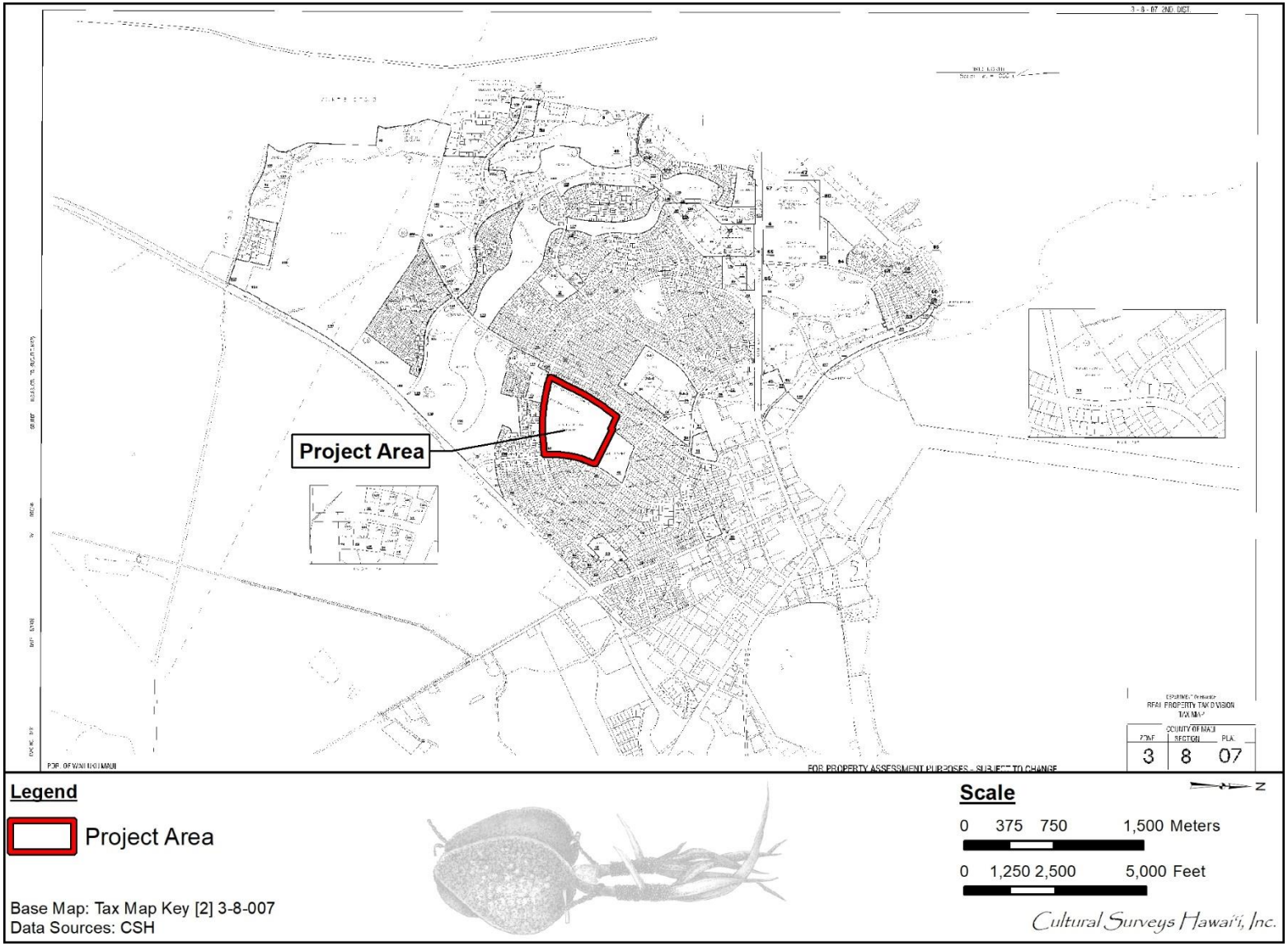


Figure 2. Tax Map Key (TMK) [2] 3-8-007 showing the project area (Hawaii TMK Service 2014)

Figure 3. 2017 composite aerial image showing the location of the project area (Esri 2017; Resource Mapping Hawai‘i 2017)

Figure 4. Conceptual Overall Site Plan showing where the new STEM Building & Autism Center will be constructed and locations of additional paving for drop-off, driveway, and parking (Design Partners Incorporated 2019a)

Figure 5. Conceptual Floor Plan for the STEM/ Autism Center Building (Design Partners Incorporated 2019b)

1.2 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 (AIS) investigation, per HAR §13-13-276. Consequently, this report cannot be used to make formal recommendations for SHPD review and acceptance.

1.3 Environmental Setting

1.3.1 Natural Environment

The current project area is the Maui High School campus, which is located on the isthmus of Central Maui, west of Mauna Kahalawai (commonly known as West Maui Mountains). The topography of the project area is a relatively flat and ranges between 13 and 23 m above mean sea level (AMSL). The campus is approximately 1.47 km (0.9 mi) south of Kahului Harbor.

In 2014, the average annual air temperature for the project area was between 21.6°C (70.9°F) in February and 25.7°C (78.3°F) in August with an average annual air temperature of 23.7°C (74.7°F) (Giambelluca et al. 2014). The vicinity of the project area received a mean annual rainfall of 431.2 mm (16.98 in) between 1978 and 2007 according to the University of Hawai‘i 2011 *Rainfall Atlas of Hawaii* (Giambelluca et al. 2013). The mean monthly rainfall varied between 4.2 mm (0.17 inches) in June and 88.7 mm (3.49 inches) in January.

Pleistocene sand dunes once stretched for 8.5 mi from Kahului toward the south shore (Stearns and Macdonald 1942) These sand dunes were likely formed by windblown sand originating from wide beach exposures located inland during a time when sea levels were lower (Macdonald and Abbot 1974). Larger dunes were formed along the north coast, diminishing in size and height as they stretched south toward Kīhei (Stearns and Macdonald 1942). According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), soil within the project area consists largely of Puuone sand, 7 to 30 percent slopes (PZUE) with areas of Jaucas sand, 0 to 15 percent slopes at the southern and southeastern boundaries (Figure 6).

Puuone sand, 7 to 30 percent slopes (PZUE) is described as follows:

> This series consists of somewhat excessively drained soils on low uplands on the island of Maui. These soils developed in material derived from coral and seashells. They are moderately sloping to moderately steep. …Puuone soils are geographically associated with Iao and Jaucas soils.
>
> … This soil is on sandhills near the ocean. Included in mapping were small areas of Iao and Jaucas soils. Also included were small areas where the cemented layer is less than 20 inches below the surface.

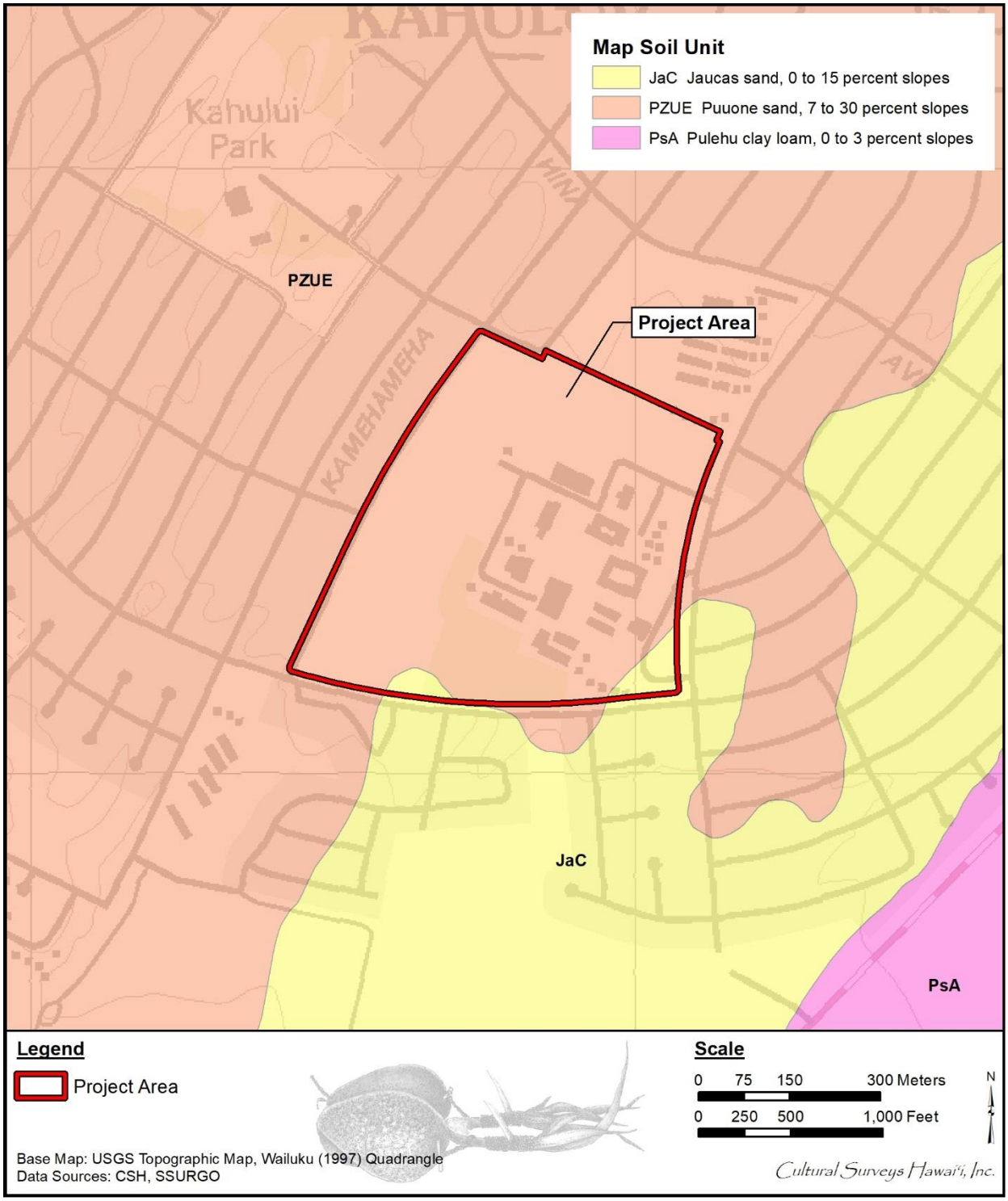


Figure 6. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating soil types within and surrounding the project area (U.S. Department of Agriculture 2001)

Jaucas sand, 0 to 15 percent slopes (JaC) is described as follows:

> The slope range of this soil is 0 to 15 percent, but in most places the slope does not exceed 7 percent. Included in mapping were narrow strips of Beaches and areas of Pulehu, Mokuleia, and Keaau soils.
>
> In a representative profile the soil is single grain, pale brown to very pale brown, sandy, and more than 60 inches deep. In many places the surface layer is dark brown as a result of accumulation of organic matter and alluvium. The soil is neutral to moderately alkaline throughout the profile
>
> Permeability is rapid, and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion is a severe hazard where vegetation has been removed. The available water capacity is 0.5 to 1.0 inch per foot of soil. In places roots penetrate to a depth of 5 feet or more. Workability is slightly difficult because the soil is loose and lacks stability for use of equipment. (Foote et al. 1972:48)

1.3.2 Built Environment

The Maui High School campus is partially developed with buildings primarily in the central and eastern portions and a parking lot, tennis courts, and baseball field along the northern section. The western side of the campus is a park with practice baseball fields and a track. Overall, the high school campus features 12 major buildings and 36 portable classrooms in addition to baseball fields, tennis courts, a track field, parking lots, and manicured lawns and landscaping (Maui High School 2019). Kahului Elementary School campus is located along the northern border of the project area. The general area surrounding the campus consists of paved roads and utilities associated with the school and with the surrounding residential and commercial neighborhood.

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of this study under archaeological permit # 19-07, issued by the SHPD pursuant to HAR §13-13-282. A field inspection was conducted on 2 September 2019 by CSH archaeologists Josephine Yucha, M.S., 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.

In general, fieldwork included a reconnaissance-level pedestrian inspection of the project area, photographic documentation using an Apple iPad equipped with digital form applications, and hand-written notes.

2.1.1 Pedestrian Survey

A reconnaissance-level pedestrian inspection of the project area was undertaken for the purpose of historic property identification and documentation. Two CSH archaeologists walked all portions of the project area to complete the visual inspection and photographed the general areas.

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 Archives of the Bishop Museum; study of historic photographs at the Hawai‘i State Archives and the Archives of the Bishop Museum; 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 (2000) database.

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

The division of Maui's lands into several *moku* (political districts) occurred during the rule of Kaka‘alaneo, under the direction of his *kahuna*, Kalaiha‘ōhi‘a (Beckwith 1970:383). This division resulted in 12 *moku* during traditional times: Kula, Honua‘ula, Kahikinui, Kaupō, Kīpahulu, Hāna, Ko‘olau, Hāmākua Loa, Hāmākua Poko, Wailuku, Kā‘anapali, and Lāhainā. The current project area is located on the western side of Mauna Kahalawai, or the West Maui Mountains as they are commonly called today, in the *moku* of Wailuku.

3.1.1 Place Names

Pukui et al. (1974) cite a description by Samuel Elbert:

> Hawaiians named taro patches, rocks and trees that represented deities and ancestors, sites of houses and *heiau*, canoe landings, fishing stations in the sea, resting places in the forests, and the tiniest spots where miraculous or interesting events are believed to have taken place.
>
> Place names are far from static… names are constantly being given to new houses and buildings, land holdings, airstrips, streets, and towns and old names are replaced by new ones… it is all the more essential, then to record the names and the lore associated with them now. (Pukui et al. 1974:x)

Inherent in the statements of Elbert is the knowledge that the oldest place names held meaning and told the story of an area prior to Western contact.

The lands of Wailuku are traditionally known as the "locality of flying clouds" (Fornander 1916-1917:286). The *ahupua‘a* of Wailuku, Waikapū, Waiehu, and Waihe‘e were collectively referred to as "Na Wai Eha" or "The Four Waters" (Handy et al. 1991:496). Nā Wai ‘Ehā consisted of four deep valley streams that watered four distinct areas of *kalo* (taro) land which spread out fanwise to the shoreline (Handy et al. 1991:272). According to Kame‘eleihiwa (1992:241), the combined area of the four *ahupua‘a*, Wailuku, Waikapū, Waiehu, and Waihe‘e, was once known as "Pu‘ali Komohana," which comprised the four windward valleys of Mauna Kahalawai. "Pu‘ali Komohana" means "western sun-setting isthmus" (Andrews 1865:73).

The creation of the district, or *moku*, of Wailuku would come later with Māhele as explained by the government surveyors:

> On Maui are some smaller divisions than the Moku called kalana, Lahaina being one of these. Wailuku, Waikapu, Waiehu and Waihee, were independent, belonging to no Moku. On the map it is necessary to form a new district, and call it Wailuku, Nawaieha being too cumbersome, and ill understood. (Lyons 1875)
>
> On Maui the lands of Waikapu and Wailuku appropriated almost the whole of the isthmus so as to cut off half of the lands in the district of Kula from access to the sea. These two ahupuaas [*sic*], together with Waiehu and Waihee, which were independent, belonging to no Moku, were called Na Poko, and have been formed into a district in modern times. (Alexander 1890:106)

3.1.2 Traditional Accounts

One traditional account relates the naming of the *moku* of Wailuku and of a local hill named Pueokaia. In *The Water of Kāne* (Pukui 1951) the naming of Wailuku is recounted in the *mo‘olelo* of the battle of the owls. Mistaking owl eggs for duck eggs, a woman of Maui brings home seven owl eggs to her husband, Kapoi. Kapoi in disgust, proclaims that the eggs are of an owl and no good to eat. At this moment the mother owl, to whom the eggs belonged, appears and appeals to the husband that the eggs be returned to her nest. The husband laughed as he smashed the seven owl eggs, leaving the mother owl with only bits of shell (Pukui 1951:188). Uaua (1871) recounts the reaction of the mother owl:

> The owl gathered up the broken shells and the yokes that were dashed against the stone wall and took them all. She flew with them in tears, to the presence of Pueokaia on the western side of Wailuku. He was her husband and the seven eggs that were mercilessly smashed by Kapoi were theirs. (W. H. Uaua in Sterling 1998:89)

According to Pukui (1951), the travesty toward their offspring would not be tolerated:

> Her mate was very angry. “Cruel man!” he shouted.
> “We shall punish him!”
> “What can two owls do against a man?”
> “Two owls? Four hundred owls! Four thousand owls! Fly to the west and tell all owls of this cruel deed. I shall fly to Hawai‘i. Let us gather the owls of every island to our aid.”
> The owls of every island came. Those of Ni‘ihau and Kaua‘i met the owls of O‘ahu. Flying together in a great flock they joined the owls of Moloka‘i, Lāna‘i, and Kaho‘olawe. When they were united with the flocks from Hawai‘i and from Maui their numbers filled the sky and shut out the sun’s light. A fierce battle followed. (Pukui 1951:188-189)

Following the unification of their flocks, Uaua (1871) recounts the ensuing Battle of the Owls:

> “…the battle began at Wailuku. …How the owls and men fought! The men and chiefs were destroyed; many men of the Four-Waters. Kapoi and his wife were also killed. Because the owls caused such destruction the place was called Wai-luku (Water-of-destruction) to this day. (W. H. Uaua in Sterling 1998:74)

The home of the father owl, Pueokaia, was rumored to be on a small hill above a place named Awau in Wailuku, and the hill still bears the owl’s name to this day (W. H. Uaua in Sterling 1998:89)

Another traditional story, concerning a beautiful woman named Luahinepii, takes its setting in the ‘Īao valley of Wailuku. According to a story by Field (1912:149) in Sterling (1998):

> At the base of this noble perpetual sentinel to Iao Canyons *[Kukaemoku—‘Iao Needle]* lived, a few centuries ago, a most beautiful maiden. Her figure and form were so near perfection that a Raphael or a Michael Angelo [*sic*] might have selected her for a model representing a Hawaiian Venus. Her name was Luahinepii (climbing old woman), a name most unsuitable to a maiden so beautifully fair. She

> possessed, however, a voice so unpleasant and hideous that other maidens, jealous of her unsurpassed natural beauty, made fun of her.
>
> Luahinepii had a lover who lived at the beach near Paukukalo. Other maidens looked upon him as a possible suitor, but like all true lovers he turned a deaf ear to their entreaties.
>
> The rival belles met and agreed to circulate a report to this wise: “Ua lohe-ia ko leo kapu e ko ipo i Moealoha” (Your sacred voice has been heard by your lover at Lover’s-Dream). This soon reached the ear of Luahinepii. She felt deeply these to her, most humiliating words. In her frantic moments she sought to end her life and to free herself from the cares and woes of this deceptive world. …Luahinepii scaled to the top of Kukaemoku, called Nanahoa, and from its dizzy height dashed herself headlong to the valley beneath, and the waters of Iao were made incarnadine with her blood. (W. H. Field in Sterling 1998:83)

A traditional story concerning the construction and dedication of the fish ponds named Mau‘oni and Kanahā (SIHP # 50-50-05-1783) at Kahului appears in Sterling (Sterling 1998), based on an interview with Mrs. Rosalie Blaisdell in 1923 by J.F.G. Stokes (BPBM Anthropology Department archives, Grp 7, 10.10.C9). According to the story, construction of the pond walls was begun by an O‘ahu chief but finished by Kamehamehanui, *mō‘ī* of Maui in the mid-1700s. The story established that Kapi‘ioho‘okalani, the original architect of the two ponds and one-time ruler of O‘ahu and half of Moloka‘i, was killed in battle before he could complete the construction of the pond walls. The walls were finished by Kamehamehanui, who placed a *kapu* (taboo) on the bank, or *kuapā*, dividing the two ponds. The chiefess Kahamaluihi was born of such high rank that she was able to break the *kapu* by walking on the center *kuapā* of the ponds. Following this act, Kamehamehanui allowed her to name them. She named Kanahā for her brother, and Mau‘oni for the identity she travelled by to protect her status as a chiefess of the highest rank. Sterling (1998) also noted two references by Samuel Kamakau (Kamakau 1992), each of which credited Kihapi‘ilani as having originally built the stonework separating the two ponds at a much earlier time than the work performed by Kamehamehanui. These ponds were the subject of many legends and sayings, including in the “Battle of the Owls,” above (Clark 1989:8).

King David Kalākaua (Kamehameha IV), in his collection of Hawaiian oral traditions *The Legends and Myths of Hawai‘i*, recounts a “remarkable event [that] had occurred at Wailuku” during the late fourteenth or fifteenth centuries when Wakalana, the principal chief of West Maui, was in residence there. According to Kalākaua (1990:182) there was an “appearance in the [Hawaiian] group of a vessel bearing people of a strange race, described by tradition as ‘white, with bright, shining eyes.’” This had been the second time that a vessel had arrived in Hawai‘i with non-Polynesian people.

> It was a Japanese vessel that had been dismantled by a typhoon, driven toward the North American coast until it encountered the northwest trade-winds, and then helplessly blown southward to the coast of Maui... It was hazardous to approach the wreck too nearly, but Wakalana succeeded in rescuing from the waves and returning to Wailuku with five persons, but not before he saw the last fragment of the wreck disappear in the abyss of raging waters. (Kalākaua 1990:183)

3.1.1 Settlement and Subsistence

The relative scarcity of recorded place names for Kahului may be an indication of a population that was widely spread out between settlements with denser populations at Wailuku and settlements further east beginning at Hāmākua Loa. The upland portion of Wailuku Ahupua‘a was resplendent with vast taro fields fed by the ‘Īao Stream. The fertile valleys of four major perennial streams of windward West Maui Mountains formed the largest continuous area of wet-taro cultivation in the Hawaiian Islands (Handy 1940:496). The high degree of cultivation within Wailuku Ahupua‘a, along the flood plain of ‘Īao Stream, gives evidence that a substantial population would have been established in the region during the pre-Contact period.

During an 1828 tour around Maui, missionaries Richards and Green noted the fertility of the Wailuku region. In an excerpt from a letter penned in 1830 and published in the Missionary Herald in 1831, Richards and Green (1831:182) described Wailuku as “a populous and fertile district on the windward side of the island, … a very desirable place for a new station…” They further relayed their observations as follows:

> No district of equal extent on the islands, produces more abundantly the necessaries of life, than Wailuku. Indeed, many districts on Maui and some parts of Hawaii depend for sustenance on this favored valley. It contains of course a numerous population… The district of Wailuku would furnish sustenance for an immense population. (Richards and Green 1831:182)

Handy et al. (1991) describe the stream of Wailuku as the great torrent that drains the highest cloud-capped uplands of western Maui through the deep ‘Iao Valley. The agricultural landscape of much of the upper section of present-day Wailuku is built on old terrace sites. Two named Native Hawaiian ‘*auwai* (irrigation ditches), Kalaniauwai and Kamaauwai, were constructed for irrigating *kalo* on the alluvial plains that stretch both north and south of the Wailuku River (Lonoaea v. Wailuku Sugar Co. [9 Haw. 654] in Sterling 1998:86), the latter of which is a contributing feature to Maui Historic District 3 and still in existence.

Beyond the alluvial sediments of the stream valley as the lower elevations lead into the central isthmus of Maui, the landscape was once dominated by windswept Pleistocene sand dune deposits. The following excerpt of a newspaper article published in *Pacific Commercial Advertiser* distinguishes the differences between the two areas:

> The isthmus of Waikapu [and Wailuku] lies but little above the level of the sea, and is composed of dry sand. Since the goats and cattle have been allowed to run there, they have destroyed the vines and bushes which served to confine the sand on the windward side, and the “dunes” have been driven nearly to the leeward beach, and will soon usurp the whole of the lower part of the isthmus. The wind here rushes across in fierce gusts between the two divisions of the island, and renders the navigation of the bay at times quite dangerous. On the western slope of the isthmus, and towards the windward side, lie the cultivated portions of Waikapu and Wailuku, which, with the valleys behind them, are very fertile. (Anonymous 1858:409)

3.1.1.1 Ke Kula o Kama'oma'o

Traditional habitation and cultural activities centered on 'Iao Valley and present-day Wailuku Town vicinity. However, most Wailuku Ahupua‘a lands lay in the large eastern extension, which includes Kahului Harbor and continues east beyond Sprecklesville. This approximately 24,000-acre eastern portion of Wailuku Ahupua'a, known as *Ke Kula o Kama'oma'o,* or the Plains of Kama‘oma‘o, and also referred to as Wailuku Commons, differs pronouncedly from the western portion of the *ahupua‘a* in the virtual absence of permanent habitations until the very late nineteenth century.

A description of Wailuku Ahupua'a configuration was given by W. D. Alexander in *A Brief History of Land Titles in the Hawaiian Kingdom*: "On Maui the lands of Waikapu and Wailuku appropriated almost the whole of the isthmus so as to cut off half of the lands in the district of Kula from access to the sea" (Alexander 1890:106). A possible explanation for this might include an effort by the politically powerful Wailuku to secure valued resources in the eastern portion of greater Kahului Bay. In addition to common marine resources, drift resources, such as drift logs from the Pacific Northwest, ivory from drifting whale carcasses, and iron embedded in drifting ships or flotsom, may have also been collected in Kahului Bay due to its exposure to trade winds.

Another possible explanation is that the northeastern portion of the isthmus was held by Wailuku for political purposes. Ross Cordy (1981:198-200) suggested a "buffer zone" extended across the central portion of Maui Island., which presumably served as a relatively unoccupied border or "no man's land" between the two powerful competing societies of Maui (West Maui and East Maui) until the unification of Maui under the ruling chief Pi'ilani circa 1600. Cordy's theory suggests that Wailuku held the northeastern portion of the isthmus in order to minimize conflict with the forces of East Maui. Evidence suggests that the Hawaiians of Wailuku were not particularly interested in living in the eastern portion of the *ahupua 'a,* strongly favoring the vicinity of 'Iao Stream instead. Economic reasons certainly would have existed for excluding Kula people, particularly by reserving access to marine resources. Politically, by limiting coastal access, the population of Kula was kept low, and tensions with East Maui were minimized.

Notably, the sandy plains of Ke Kula o Kama‘oma‘o were known by Hawaiians in traditional times as a wandering place of the souls (Beckwith 1970), a place where dead spirits waited for a friendly escort, perhaps a family *‘aumakua* (guardian spirit embodying an animal form), to show them the way to eternity:

> The worst fate that can befall a soul is to be abandoned by its aumakua and left to stray, a wandering spirit (kuewa) in some barren and desolate place, feeding upon spiders and night moths. Such spirits are believed to be malicious and to take delight in leading travelers astray; hence the wild places which they haunt on each island are feared and avoided. Such are the plains of Kama‘oma‘o on the island of Maui. (Beckwith 1970:154)

According to Helen P. Hoyt (1976), Kama‘oma‘o is also a region where the “Marchers of the Night,” or *Ka huaka‘i o ka Po*, are sometimes heard and seen. When these spiritual “Night Marchers” appear, according to Beckwith (1932:199), “It is said that such a sight is fatal unless one has a relative among the dead to intercede for him.”

> The marchers carried candlenut torches which burned brightly even on a rainy night. They might even be seen in broad daylight and were followed by whirlwinds such as come one after another in columns. They cried “Kapu o moe!” as a warning to stragglers to get out of the way or to prostrate themselves with closed eyes until the marchers passed. (Beckwith 1932:199)

Such beliefs and residential patterns were likely mutually reinforcing. Because people did not live in any numbers in areas such as Kama'oma'o, these locales became associated with *po'e auana wale* (spirits of the dead). The cultural association with these spirits discouraged subsequent residence in such places. Conceptions of abodes of the dead were not so much ideas of discrete specific spots but were rather perceptions of vast desolate areas which might extend over tens of thousands of acres.

The current project area is located within the sandy plains of Kama'oma'o, just east of the northern extent of Wailuku Sand Hills (Figure 7). The Sand Hills stretch across Kama‘oma‘o and are traditionally, historically, and archaeologically known for the presence of numerous Hawaiian burials.

3.1.1.2 Fishing

The Kahului Harbor area traditionally was known for its fishing grounds. Inland of the Kahului Harbor are the fishponds described by Ashdown as “Kahana and Ma‘oni at Kahului.” The traditional fishing culture of this region includes the belief that “Ai‘ai [who had been bequeathed with] his magic fishhook named Mana-i‘a-ka-lani,” caused the schools of fish known to this region to proliferate as long as those who used the fisheries made the proper use of fishing shrines erected along the shoreline, which were dedicated to the father of Ai‘ai – Ku-ula (Ashdown 1970:24). The *ko‘a o Ku-ula* (the fishing shrines of Ku-ula) of this region, as well as all of East Maui, were reputedly constructed by Ai‘ai in ancient times (Ashdown 1970:24).

The type of fishing performed at Kahului was net fishing, according to Kahā‘ulelio (Kahā‘ulelio 2006:163), as he observed this type of fishing in 1874, the fishermen utilized *kolo* nets, and the process was described:

> …at Kahului fishing with draw nets for *‘ō‘io* [*Albula vulpes*] was done. The nets were like the *papa* net, from a fine mesh smaller than a fingertip to two, three and four fingers’ width. Long curtain nets were affixed to the sides.” (Kahā‘ulelio 2006:163)

Successful fishing occurred along the coastline of Kahului, Kaunoa, and Pā‘ia because of the shallow, ancient, consolidated calcareous reef that provided shelter for octopus and juvenile stages of large pelagic fish, such as the ‘*ulua* or island trevally (*Carangoides orthogrammus* and *Carangoides ignobilis*). The current project area is approximately 1.47 km (0.9 mi) south of Kahului Harbor. Due to its proximity to the coast, fishing would have contributed to the subsistence of any settlements that may have been within the project area and vicinity.

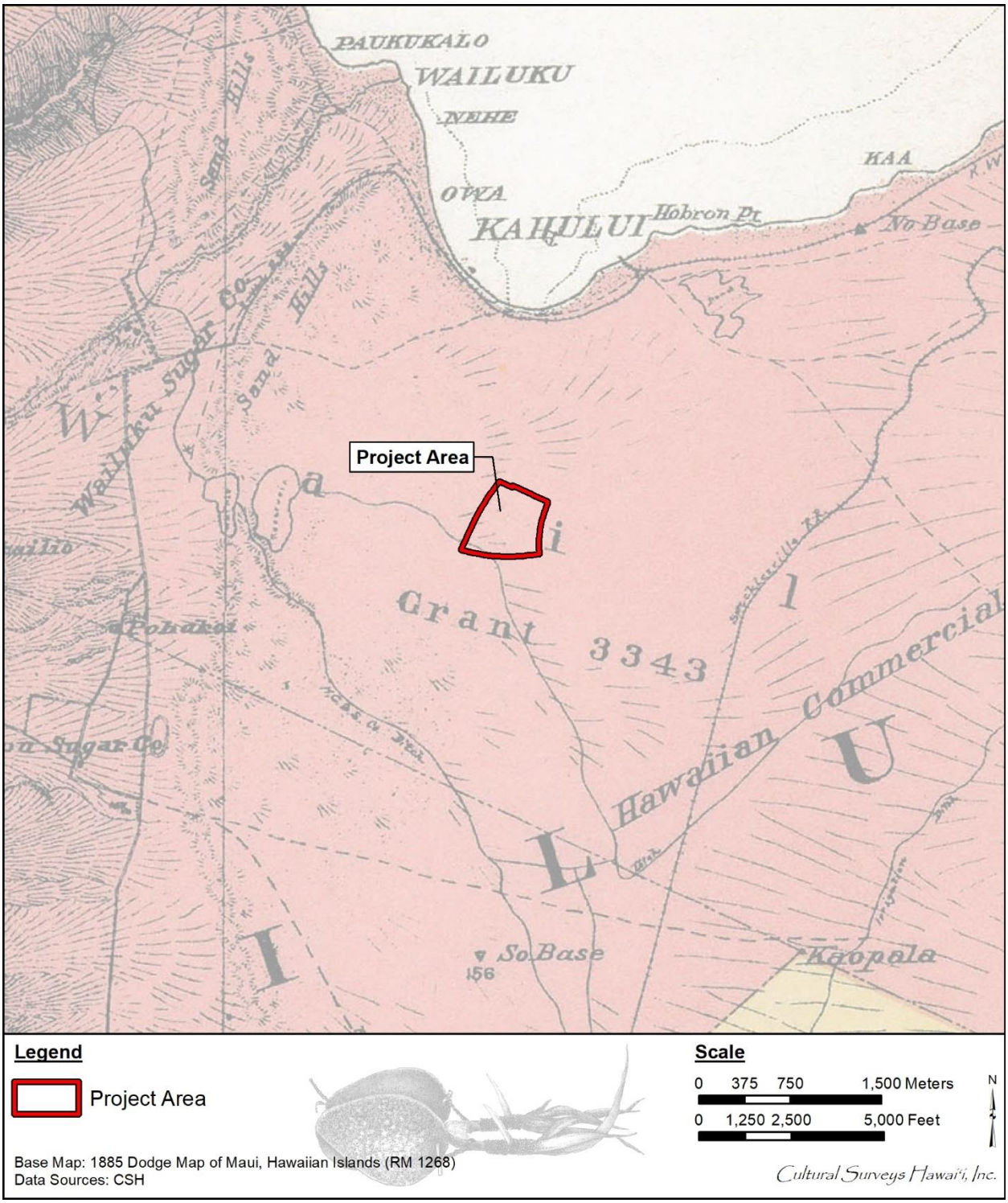


Figure 7. Portion of F.S. Dodge (1885) map showing approximate location of the project area in within Land Grant 3343 and east of labeled “Sand Hills”

3.1.2 Heiau

In addition to the myriad of traditional land boundaries for taro *lo‘i* arranged along the flow of ‘Īao Stream, two *heiau*, Haleki‘i and Pihana, were constructed atop a low ridge immediately west of the ‘Īao Stream in Paukūkalo, overlooking the fertile coastal plains of Wailuku, Waihe‘e, and Waiehu (Kirch 1997:67). Both Haleki‘i and Pihana were *luakini heiau* with important traditional linkages to famous chiefs (Kirch 1997). Pihana is noted as the birthplace of Keōpuōlani in 1778, a woman descended from a lineage of *tabu* chiefs of divine rank, and raised in Wailuku, Olowalu, and Hāmākua on Maui (Kamakau 1992:259). She gave birth to two royal male heirs of Kamehameha I, Liholiho (Kamehameha II [Reign: 1819-1824]) and Kauikeaouli (Kamehameha III [Reign: 1825-1854]). Additional, though less historically prominent, *heiau* existed in relative abundance within Pu‘ali Komohana. Within Wailuku alone stood 11 additional *heiau*: Kaluli, Keahuku, Olokua, Olopio, Malena, Pohakuokahi, Lelemako, Kawelowelo, Kaulupala, Palamaihiki, and Oloolokalani. These *heiau* were said to have been consecrated by Liholiho (Kamehameha II) in his tour of Maui in 1801 but were destroyed in the following century by agrarian development across the central isthmus.

According to Sterling (1998), oral traditions place the initial construction of the Pihana-Haleki‘i *heiau* complex in the sand dunes of east Wailuku as having occurred during the reign of Kaka‘e, or about AD 1510. Radiocarbon dates from the *heiau* complex, giving a date range of between AD 1400-1600 (Kirch 2010), appear to agree with the time-frame of traditional stories consistent with the chronology of Fornander (1919a). In later centuries, the *heiau* complex was rebuilt and rededicated by succeeding chiefs, most notably Kamehameha following his success at the battle of *Ke pani wai o ‘Īao* in 1790 (Fornander 1880).

3.1.3 Politics and Warfare

The presence of ceremonial structures, such as *heiau*, provides evidence that Wailuku was a place of political stability. The agricultural region of Wailuku was the most politically important division of all the *Na Wai ‘Eha*. The royal compound of the chiefs of Wailuku once lay at the foot of ‘Īao Valley. From this region, the chiefs of Wailuku ruled Maui for 15 centuries. According to Kamakau (1991) the earliest of the chiefs of ‘Īao was perhaps Kaha‘i. In the 1450s, the chief Pi‘ilani ruled over all of Maui and the islands of Lāna‘i and Moloka‘i. He was succeeded by his son, Kihapi‘ilani, followed by his son, Kamalālāwalu; a chief so highly regarded that ever since his time, the island has been spoken of with esteem as “Maui o Kama” or “Royal Maui”. Chief Kekaulike remained in power until the chiefdom was passed to his son Kamehameha-nui in 1690 (Fornander 1880:314). By the second half of the eighteenth century, Maui *ali‘i* - including the ruling chief Kahekili – reportedly had been residing at Wailuku enjoying the surf of Kehu and Ka‘akau (Kamakau 1992).

The *moku* of Wailuku and Hāna comprised the two rival societies on Maui Island. During the mid-sixteenth century and the reign of Wailuku Chief Pi‘ilani, “Hana chiefs finally acknowledged the West Maui king’s rule” (Cordy 1981). While the chiefly intra-island rivalry between East and West Maui was settled, the political rivalry between the *ali‘i* of Hawai‘i Island and Maui Island continued. Where Hāna had been the primary stage of battle, Wailuku would come to take a central role in the fight for political gain during the latter half of the eighteenth century. It was in the sand hills of Wailuku that Kahekili and his forces from O‘ahu and Maui would do battle with the armies of Kalani‘opu‘u, chief of Hawai`i, that had invaded Maui.

Between the years 1775 to 1779 there was continual fighting between Kalani‘opu‘u of Hawai‘i and Kahekili of Maui (Kamakau 1992:84). King Kahekili had become a renowned warrior. Kahekili was the son of Kekaulike and younger brother of Kamehameha-nui (Kamakau 1992:87). His army of hand-picked warriors were known by their tattoos; half their bodies were tattooed black, even the inside of their eyelids and their gums. Following a losing battle at Kaupō in 1775, Kalani‘opu‘u dedicated several war *heiau* on Hawai‘i Island to aid in the defeat of Kahekili. Upon hearing this news, Kahekili sent for the *kahuna* Kaleopu‘upu‘u, who directed construction of the *heiau* of Kaluli and Pu‘uohala on the north side of Wailuku. When Kaluli Heiau was completed, Kaleopu‘upu said to Kahekili, “This is the house of your god; open the sluice gate that the fish may enter” (Kamakau 1992:85).

In 1776, Kalani‘opu‘u’s warriors landed at Keoneo‘o‘io, with war canoes extending all the way to Mākena, and proceeded to ravage the countryside.

> There, the invading army proceeded to ravage the countryside. Kalani‘opu‘u then landed with additional forces at Kīhepuko‘a at Kealia, (at the area where the Waikapū Stream meets the ocean) with his invading force beached along the Mā‘alaea coastline. His advance regiment of 800 men made ready to battle Kahekili, chief of Maui, at his stronghold across the isthmus at Wailuku. The invading army was “eager to drink the waters of the Wailuku [Stream].”
>
> Across the plains of Pu‘u‘ainako and Kama‘oma‘o shone the feather cloaks of the soldiers… Ka-hekili was at Kalanihale just below Kihahale and above the plateau of Ka‘ilipoe at Pohakuokahi… Kaleopu‘upu‘u [said] to Ka-hekili, “The fish have entered the sluice; draw in the net.” (Kamakau 1992:85)

The forces of Kahekili descended on and destroyed the soldiers of Kalaniopu‘u, slaying the elite soldiers of Kalaniopu‘u on the sand hills at the southeast of Kalua:

> ...the Maui army had the advantage of a well-chosen position. The Hawaiians had to fight uphill or else drift down to the sand hills. In either case advance was difficult… There was a full day of savage fighting, marked by inhuman acts of awful brutality. The native account of the battle says: “It was not a war characterized by deeds of princely courtesy.” Many noted names of valiant chiefs were never again mentioned in Hawaiian story. The story and the life ended together in this Wailuku battle. (Westervelt 1977:139-140)

The battle that took place received the name “The furious destruction at Kakanilua,” named after the sand hills below Wailuku. Only two men escaped to Kīheipuko‘a [Kīhei] to tell Kalaniopu‘u the news of their defeat. After a second day of warfare, Kalaniopu‘u sued for peace and was granted such by Kahekili and his messengers. Kalaniopu‘u then returned home to Hawai‘i Island (Kamakau 1992:88-89).

An 1841 account of Commodore Charles Wilkes of the American Navy published in the 7 January 1927 edition of the Honolulu Advertiser provides an early description of “a mound of human bones” thought to be the bodies of fallen warriors in the Sand Hills of Wailuku (Figure 8). The articles refers to the accounts of past battles fought in Central Maui.

The Sand-Hills of Maui in 1841

By EDWIN NORTH M'CLELLAN

Commodore Charles Wilkes, of the American Navy, visited the Sand Hills of Maui in 1841. "In the center of the Sand Hills, we stopped on a mound of human bones—a perfect Golgotha," wrote the Commodore. "There appears to be no tradition respecting this accumulation of mortal relics. By some it is supposed to have been a burying-place after a battle. Bloody contests, indeed, must have taken place here, if we are to judge from the number of skeletons which are exposed. Some of these are in a state of perfect preservation, and I regretted not being able to transport one to the ship."

* * * *

The Commodore also referred to "the sand" drifting "like snow," and affording "a good illustration of the rapidity with which it changes its place by the effects of the winds."

* * * *

If you are curious as to how this "mound of human bones" came to the Sand Hills, read W. D. Westervelt's interesting description of the Alapa regiment and the battle called by the Hawaiians "The Furious Destruction at Kakanilua—"Kakanilua was the name of the sand hills below Wai-luku," Maui. This account forms chapter thirteen in Mr. Westervelt's "Hawaiian Historical Legends."

Figure 8. Newspaper clipping from the 7 January 1927 edition of the Honolulu Advertiser describing an 1841 discovery of human remains in the Sand Hills of Maui (The Honolulu Advertiser 1927)

3.1.4 Early Historic Period

Kahekili was at Wailuku when Captain James Cook and his ships *Resolution* and *Discovery* encountered Maui. Cook first sighted the island on 26 November 1778 with his ship *Resolution* positioned three miles off the Wailuku shore. Cook recorded the encounter in his logbook:

> In the country was an elevated saddle hill, whose summit appeared above the clouds. From this hill, the land fell in a gentle slope, and terminated in a steep rocky coast, against which the sea broke in a dreadful surf. Finding that we could not weather the island, I bore up, and ranged along the coast to the Westward. It was not long before we saw people on several parts of the shore, and some houses and plantations. The country seemed to be both well wooded and watered; and running streams were seen falling into the sea in various places. (Speakman 1978)

Cook records that the Hawaiians who came out in canoes to trade for supplies appeared “to be of the same nation with the inhabitants of the islands more to leeward [i.e., O‘ahu and Kaua‘i] which we had already visited [ten months earlier in January 1778]; and… they knew of our having been there” (in Speakman 1978:23-24).

By early 1786, Chief Kahekili of Maui had defeated the forces of O‘ahu, and consolidated his control over all of the islands except Hawai‘i. Peace did not prevail for long. In 1790, ‘Īao Valley was the site of the last great conflict on Maui. Kamehameha I of the island of Hawai‘i landed at Kahului, in Wailuku, to battle the army commanded by Kahekili’s son Kalanikūpule. Kamehameha’s warriors used small cannons, muskets, and ammunition obtained from an American trading ship to rout the Maui defenders. Kamehameha’s modern weapons struck terror into the hearts of the Maui warriors. The Maui defenders were swept across the isthmus from Pu‘unēnē to Wailuku, and were destroyed at ‘Īao Valley. The battle that followed was so great that ‘Īao Stream was said to have been choked with the corpses of the vanquished defenders, giving the campaign the name “Battle of Kepaniwai,” (the damming of the waters). The high chiefs and royalty of Maui fled to other islands. Kamehameha I went on to defeat the combined forces of Kahekili and Kalanikupule at Nu‘uanu, on O‘ahu in 1795. (Alexander 1899:129).

With the death of Kamehameha I in 1819, warfare between the ranking Hawaiian chiefs was set aside by powerful changes within traditional Hawaiian society. Four decades of interaction with American, Russian, British, and French traders had opened the way for Christianity. The establishment of a system of schools throughout the islands was vigorously pursued by the governing kings and queens of Hawai‘i, aided by the newly-arrived American Protestant missionaries beginning in 1820 (Kuykendall 1938).

Estimates of the early nineteenth century population of Kahului are difficult to find. In regions where Protestant missionaries had been stationed, statistical records were updated often, but the missionary out-station region of Kahului appeared to have received scant attention during the early years of the Protestant missions. In 1830, Protestant missionaries recorded school attendance figures for the out-stations of Wailuku as: Waihu [Waihe‘e] at 612 students, Waikepu [Waikapū] at 329 students, and Waiehu at 103 students, with no mention of Kahului (Richards and Green 1831). In 1831, the missionaries stationed on Maui began to advocate for the conversion of the Wailuku branch-station of the Lahaina Mission to be a standalone mission station. In this same year, Auwae the *konohiki* (overseer of an *ahupua‘a*) at that time, began collecting materials for a

“good stone and lime meeting-house” (Richards et al. 1832:251). In 1832, 12 years after the arrival of the first missionaries in Hawai‘i (American Board of Commissioners for Foreign Missions 1820; Bennet 1893:14) and nine years following the establishment of the Lahaina Mission Station (The Friend 1878), the official Wailuku Mission Station was formed by the Reverend Jonathan Smith Green (Tracy et al. 1894:231). A larger meeting house with a thatched roof was erected by the congregation in 1834, and in 1836, under the direction of Reverend Jonathan Green, the construction of a stone meeting house designed by Reverend Edward Baily was started and subsequently brought to completion in 1840 (Cummins and Fox 1973).

The initial documentation of life in Wailuku during the first half of the nineteenth century was recorded by the Protestant missionaries from their station at Wailuku in 1832. The missionary census of 1831-1832 recorded a total population of 2,256 in Wailuku Ahupua‘a, comprising 918 adult males, 860 adult females, and 478 children (Schmitt 1973). By 1840, the Wailuku population had dropped to 1,364, representing a diminution of 892 in just four years (Schmitt 1973).

In January 1836, Princess Nahi‘ena‘ena and her husband Leleiohoku went to live in Wailuku. The Princess died less than a year later during the birth of a child, and she was buried in Lāhainā. In the years following the loss of Princess Nahi‘ena‘ena, the remaining chiefs and *ali‘i* of Maui continued to make Lāhainā their official residence (Kamakau 1992:340-349).

Use of the northern coastline landing at Kahului by early Europeans must have been difficult, for far more records exist of early explorers and merchant ships at anchor off the southern, more protected coastline of Maui than along the exposed, northern coast. In 1840, American scientists aboard the U.S. Navy ship “*Vicennes*” landed at Lāhainā and travelled overland to the district of Wailuku, where they noted Native Hawaiian timber grew in sizes suitable for the construction of canoes (Wilkes 1845). The described the central isthmus as “too dry to be fit for cultivation: it is in extent about twenty by fifteen miles. During nine months of the year it is a fine grazing country, and feeds large herds of cattle, that are mostly owned by foreigners” (Wilkes 1845).

James Jackson Jarves, first editor of *The Polynesian*, the third English-language newspaper in the Hawaiian Islands, included news about events in Kahului. He noted a “remarkable oscillation of the ocean” that occurred at Kahului on 7 November 1837:

> At Maui, the sea retired about 20 fathoms, and returned with great speed, in one immense wave, which swept before it houses, trees, canoes, and all else exposed to its fury. At the village of Kahului, the inhabitants, as at Honolulu, followed with rapturous delight the retreating wave, when suddenly it turned upon them, rising like a steep wall, rushed forward to the shore, burying the natives in its foam, and destroying the whole hamlet (Jarves 1843:19-20).

An account by one of the missionaries in Wailuku, Rev. Richard Armstrong, gives a vivid picture of the same tsunami at Kahului where an entire village was carried away; in his journal entry on November 8th, Armstrong recorded:

> A strange phenomenon appeared last evening in our neighborhood. About seven o’clock in the evening, the waves of the ocean just opposite our station, at a small harbor [i.e., Kahului], gradually receded from the shore to a distance of some 15 or 20 rods leaving multitudes of fishes upon the ground, so that the children observing it ran and picked up some of them; leaving a small schooner also, which was at

> anchor in the harbor, without sufficient water to float her completely, and the wave slowly formed itself as it were into an embankment, or as the natives said, a “steep precipice.” Then, as if having collected strength enough for the onset, the wave rushed back upon the beach, overflowed the banks, and carried away the entire village of 26 native grass houses with all their effects and inhabitants, some 40 or 50 rods inland, throwing most of the wrecks of houses, broken canoes, fowls, beasts, men, women, and children into a small lake of perhaps three miles circumference, which lay immediately inland from the village.
>
> The rush of the wave was so sudden and unexpected, that the inhabitants of the village, unlike Lot in Sodom, had no warning whatever, except a few who seeing the sea receding from the shore suspected a corresponding reflux, and fled inland in season. But it is not easy for water to baffle a Hawaiian, this being the element with which he is most familiar. Some swam single handed with the waves. Others took their children in their arms. Others the sick on their backs and bore them up until the waters ceased from the earth. One man took his old mother on his back and swam with her until he reached the dry land, but, laying her down on the ground, he found she was dead. Another poor old woman, having no one to assist her, and it being dark got into the small lake and was drowned. These are all the lives that were lost. (*Maui News* Nov. 10, 1937)

Three years later, Armstrong reported on the first effort to grow sugar at Wailuku; in a letter dated 7 July 1840 he wrote:

> By request of the King I have taken some part in inducing the people about me to plant sugar cane. A fine crop of 60 or 70 acres is now on the ground ripe, and a noble water mill set up by a Chinaman is about going into operation to grind it. I keep one plow a-going constantly with a view to the support of the schools. We shall get in 10 acres of cane the present season. (*Maui News* March 22, 1941)

One of the schools to be supported was likely the girls’ school which had opened at Wailuku in 1836 (Kamakau 1992).

According to the diary of the Catholic priest, Father Favens, he first visited Wailuku on 15 June 1846. By the end of 1847, a small Catholic chapel had been constructed at Wailuku. Stormy weather soon destroyed this native-style frame chapel. The first solid-frame church at Wailuku was constructed by the Mission Brothers of Honolulu and dedicated to St. Anthony on 5 March 1854 (Schoofs 1978:291-292). The St. Anthony School held classes as early as 1848, and by 1855, the school had its own resident priest. The large premises of St. Anthony’s Church and School were the center of Catholic life in Wailuku.

3.1.5 The Māhele and the Kuleana Act

The most significant change in land-use patterns and land allocation came with the Māhele and the privatization of land in Hawai‘i. The establishment in 1839 by Kamehameha III (Kauikeaouli) of a Bill of Rights for the people of Hawai‘i, followed by a formal constitution in 1840, hastened the shift of the Hawaiian economy from subsistence-based to market-based. During the Māhele, all of the lands in the Kingdom of Hawai‘i were divided between the *mō‘ī* (king), *ali‘i* (royalty), *konohiki*, and *maka‘āinana* (common people/tenants of the land) and passed into the Western land

tenure model of private ownership (Chinen 1958). On 8 March 1848, Kauikeaouli (Kamehameha III) further divided his personal holdings into lands he would retain as private holdings and parcels he would give to the government. This act paved the way for government land sales to foreigners. In 1850, the legislature granted resident aliens the right to acquire fee simple land rights (Moffat and Fitzpatrick 1995). Wailuku was declared as “Crown Land” to be used to support the Kingdom of Hawai‘i (Zambucka 1977:48).

Ruth Ke‘elikolani, half-sister of Kamehameha V (Lot Kapuāiwa), inherited the *ahupua‘a* of Wailuku from Lot Kapuāiwa on his death in 1872. Ruth Ke‘elikolani then sold a portion of her Wailuku land holdings to the sugar-industrialist Claus Spreckels in 1882. Spreckels subsequently received Land Grant 3343 from King Kalakaua, that consisted of 24,000 acres of the southeastern portion of the Wailuku Ahupua‘a (Zambucka 1977:48) . Spreckels’ acquisition of the 24,000-acre parcel in fee simple occurred when he agreed to purchase a part-interest in Crown Lands of the Kingdom of Hawai‘i from Princess Ruth Ke‘elikolani. This agreement allowed the Commission of Crown Lands to exchange Spreckels’ part-interest for the fee-simple title to central Maui lands he had previously leased from the Kingdom in 1877 (Daws 1968). The current project area is located within Land Grant 3343 (see Figure 7).

Although almost 300 subsequent awards to individuals were awarded by the Land Commission for *kuleana* lands within the *ahupua‘a* of Wailuku, a majority of these claims represented lands located in the upland portion of the *ahupua‘a* focused along the flood plain of the ‘Īao Valley Stream, as well as *mauka* of the area identified as the “Sand Hills” (see Figure 7). The disposition of these awards may reflect a continuation into the post-Contact era of the traditional Hawaiian settlement of Wailuku and avoidance of the Sand Hills area.

3.1.6 Mid- to Late 1800s

As land sales by the Government of Hawai‘i to Claus Spreckels indicate, the second half of the nineteenth century is marked by commercial development of the Wailuku and Kahului areas. During the American Civil War in the 1860s, Hawaiian sugar prices rose significantly, leading to the formation of 12 large sugar plantations on the island of Maui; the most of any Hawaiian Island.

Wailuku Sugar Company was organized in 1862 James Robinson & Company, Thomas Cummins, J. Fuller, and agent C. Brewer & Company. The Catholic Mission agreed to give the Wailuku Sugar Company a right-of-way across their property for a railroad. In this manner, the enterprise laid a railway line to Waiehu and Waihe‘e, by way of Lower Wailuku (Condé and Best 1973:267). Among the early government grants in the upland area of Wailuku Ahupua‘a were lands set aside for the Wailuku Sugar Company.

With the success of sugar and Wailuku’s economic expansion came the need for the importation of foreign labor. In short order, Portuguese, Japanese, and Filipino immigrants increased the population of the district, which made the need for development and larger churches necessary. The first Western-style structure in Kahului was a warehouse built in 1863; a nearby store was recorded as having been built in 1873. The Catholic St. Anthony church in Wailuku became the first stone church erected in central Maui. It was dedicated on 3 May 1873 (Schoofs 1978). An early engraving *circa* 1883 of the view from the Wailuku Sand Hills shows sugarcane fields encompassing all sides of the town of Wailuku with St. Anthony’s Church in the foreground and ‘Īao Valley in the background (Figure 9).

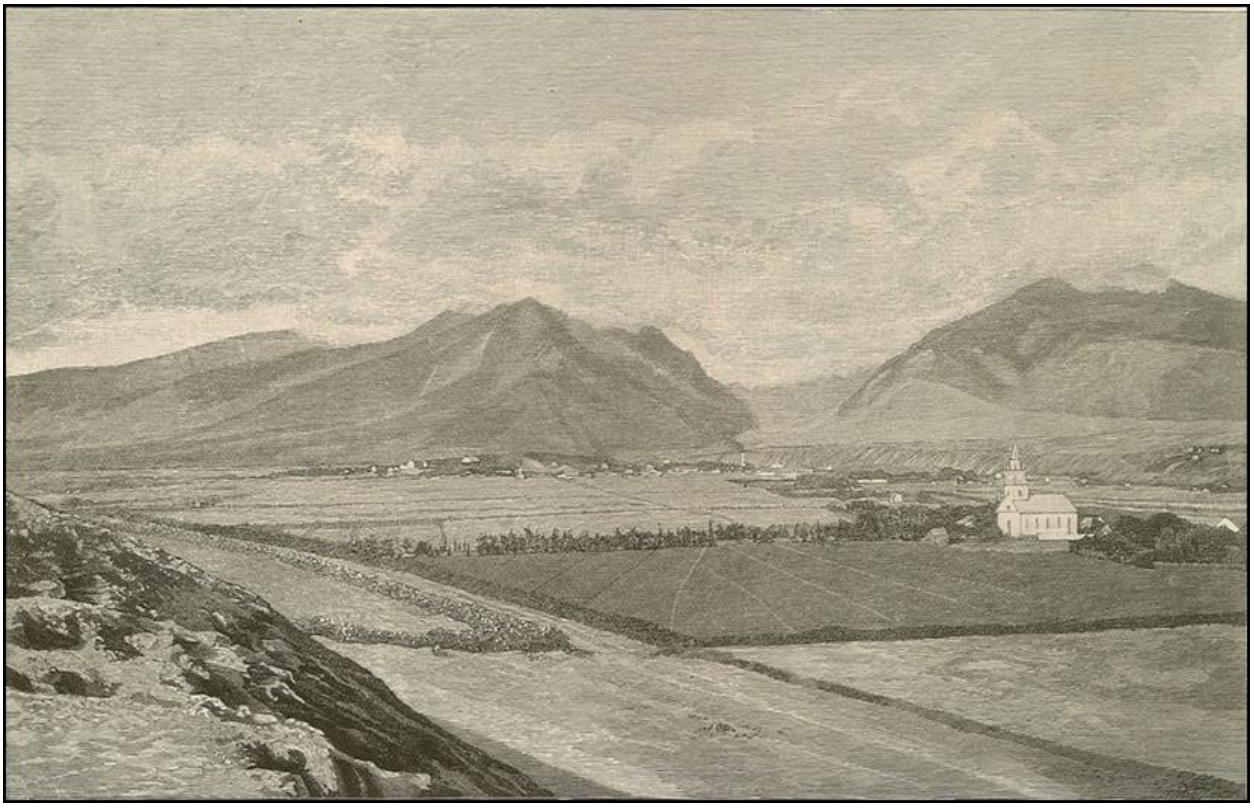


Figure 9. Engraving of Wailuku circa 1880s (Powell 1883)

The success of sugar grown in the region also resulted in a second large plantation, in Waihe‘e, producing over 757 tons of sugar and 45,000 gallons of molasses in 1865. Waihe‘e Mill manager Samuel T. Alexander, and the mill’s head foreman, Henry P. Baldwin, both later resigned to establish a small sugar enterprise of their own in upper Pā‘ia (Abner Blanks Gilmore 1936). In 1869, on land located just west of Pā‘ia, a small *kuleana* of 11.94 acres was purchased by Alexander and Baldwin, both eager to apply their agricultural experience to their own plantation. This initial land purchase was the beginning of the development of the entire central isthmus for sugar cultivation. In rapid succession, the partnership of Alexander & Baldwin expanded its operations by purchasing other small *kuleana,* setting up a mill, and attracting more investment capital (Dean 1950).

In 1876, a treaty was signed between the Kingdom of Hawai‘i and the United States, which opened larger and more lucrative markets for Hawaiian sugar. Plans were immediately drawn up by the partnership of Alexander & Baldwin to finance a ditch to bring water from the Hāna region of East Maui into the dry plains of Pā‘ia. The Kingdom of Hawai‘i issued a lease for the construction right-of-way, and in 1879, the successful venture delivered millions of gallons of water to the Pā‘ia region via the Hāmākua Ditch (Wilcox 1996).

Competition was supplied by Claus Spreckels, who engineered a similar irrigation ditch from Honomanū in East Maui to lands located just inland of Kahului, where the Spreckelsville mill and plantation camp were built (Figure 10). Spreckels invested three million dollars in the Hawaiian Commercial & Sugar Company, and competed for sugar lands, warehouse space, railway lines, and shipping schedules with the Alexander & Baldwin venture (Dorrance and Morgan 2000).

By 1881, Spreckels had installed electric lighting in his mill to grind cane at night; the first of his many innovations to make sugar more profitable. Following his success in building the Honomanū Ditch linking East Maui water sources with his sugar fields in the central isthmus, Spreckels engineered the Waihe‘e Ditch (also named the Spreckels Ditch) in 1882, to tap water resources from West Maui. The 15-mile-long ditch started at the 435-ft elevation of Waihe‘e Stream, and carried 60 million gallons of water (per 24-hour day) to the Wai‘ale Reservoir at the 214-ft elevation of Wailuku. Spreckels became the first plantation owner to irrigate his fields with mountain water from both East and West Maui. By 1888, the Spreckels plantation covered 28,000 acres, making it the largest sugar plantation in the world (Wilcox 1996).

In a report appearing in *Harper’s Weekly*, Meriwether (1888:849) stated the Spreckels plantation “yielded as much as 14,000 tons in one year; the average yearly yield is from six to eight thousand, or several thousand tons more than the highest yield of the Khedive’s plantation [in Egypt].” The same article also describes expenses of Spreckels’ plantation:

> Planks of which the flumes are constructed are all brought from the forests of California and Oregon, three thousand miles away… The expense of importing the lumber from America is not the main expense of flume-building. It costs thousands of dollars to keep the flumes and ditches in order. The head ‘ditch-minder’ on the Spreckels plantation is paid $115 a month and furnished a horse and board besides. His twenty assistants each receive $60. (Meriwether 1888:849)

Government censuses document population growth in Wailuku during later decades of the nineteenth century, reflecting the influx of immigrant workers to the burgeoning sugar plantations of Maui (Figure 11). In 1853, the total population was recorded as 4,463; in 1872, it had dropped

Figure 10. Early 1800s photograph of the Spreckels Mill on Maui’s central plains (Personal Collection of Robert Hill)

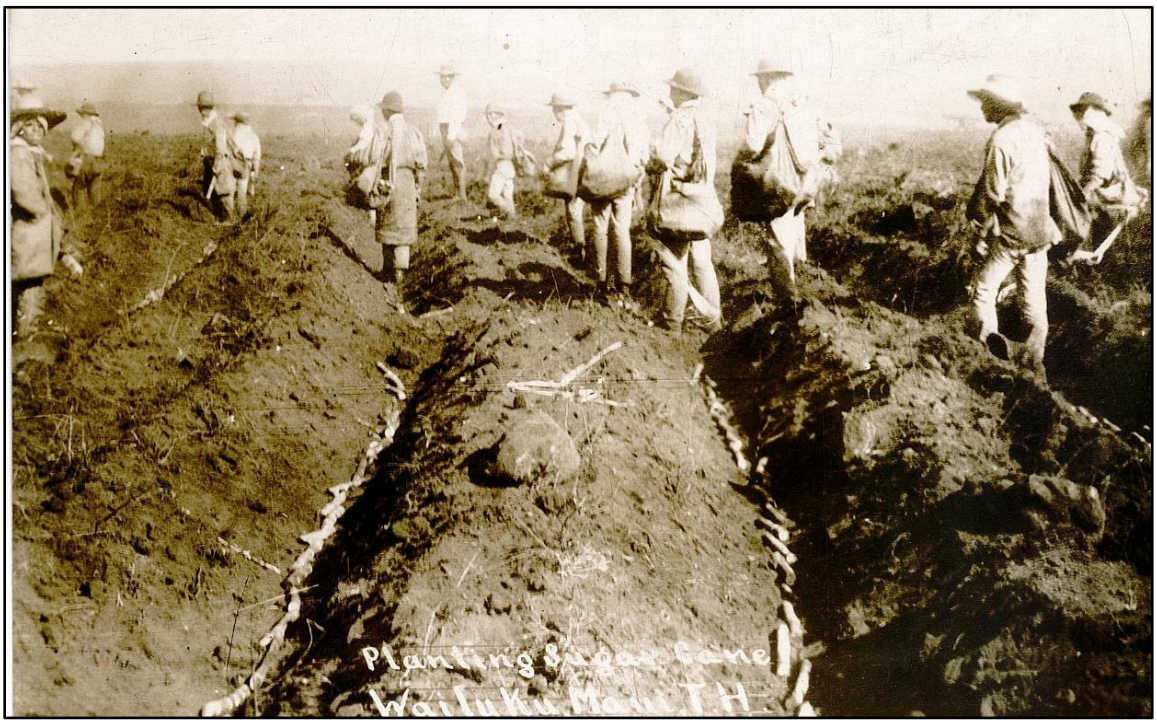


Figure 11. Immigrant workers planting cane slips in Wailuku, circa 1910 (CSH Archives)

to 3,002; in 1878, it increased to 4,186; in 1890, it was 6,708; and by 1900, the population was 7,953 (Schmitt 1973).

During this period, the major enterprise out of Kahului was Kahului Railroad Company, which was formed in 1879 by Thomas H. Hobron, William O. Smith, and William H. Bailey. The first rails were laid at a small wharf at Kahului on 30 June 1879. Three miles of track to the village of Wailuku were completed by 10 September 1879. By 1881, Kahului Railroad was carrying raw sugar to the port of Kahului from both Wailuku Sugar Company and the Alexander & Baldwin mills in Pā‘ia and Hāmākua Poko (Figure 12 and Figure 13). In 1884, Kahului Railroad became a freight forwarder and subsidiary of the Wilder Steamship Company (Best 1978).

By 1897, the Spreckels-owned Hawaiian Commercial & Sugar Company (HC&S) attempted a blockade of the Kahului wharf to drive Wilder Steamship Company out of business. To circumvent the blockade, directors of Alexander & Baldwin purchased the disputed 5.47-acre harbor-front parcel owned by Spreckels and created a partnership of other plantations to drive Spreckels out of business. By 1898, financial pressures forced Spreckels cede control of HC&S to a partnership headed by Samuel T. Alexander and Henry P. Baldwin after a long and fierce battle. In less than a year, the Alexander and Baldwin-owned HC&S was shipping sugar from landings at Pā‘ia, Huelo, Kīhei and Nāhiku to the newly-formed California & Hawaiian Sugar Refining Company in California. By 1899, Alexander & Baldwin had successfully taken over the sugar interests of Claus Spreckels and had negotiated purchase of Kahului Railroad Company (Dean 1950).

The HC&S Lowrie Ditch Project began in 1898. This project brought an additional source of water to the arid plains south of Kahului. William J. Lowrie’s plan was to begin the ditch at the Pāpa‘a‘ea Reservoir, deep in East Maui at the 1,000 ft elevation, and maintain a 4-ft drop per mile following the ditch’s initial plunge from the Kailua reservoir. Steep mountain gulches were traversed using the force of the constant weight of water flowing in a series of siphons. The Halehaku Gulch, at 250 ft deep, and the Māliko Gulch, at over 350 ft deep, were both crossed by giant siphons fabricated of three-eighths-inch iron pipelines that were set in place by Japanese laborers. The allocation of water began at a weir located above Pā‘ia. The first tenth of the water flow in the Lowrie Ditch was divided out to the Pā‘ia Plantation (an 11/20ths share) and the Ha‘ikū Plantation (a 9/20ths share). The distance traveled, from Kailua to the plantation’s Kīhei boundary, was 21.9 miles (Thrum 1900:155-157).

3.1.7 Early 1900s

The bubonic plague broke out in Kahului in the year 1900. The first recorded death caused by the plague occurred on Saturday, February 4th. An article in the *Maui News* from 17 February 1900 documents effects of the plague at the time:

> The plague has reached Maui. Six deaths have occurred and the whole of Chinatown [in Kahului] is a heap of ashes. The people of Maui are aroused to action and feel confident of being able to control and stamp out the pest in a short time...
>
> ...Sheriff Baldwin at once established a strict quarantine at Kahului which is still maintained. The Maui Board of Health met at once and selected a site for a pest house and one for a detention camp, the latter being established at the race track of the Maui Racing Association...

Figure 12. Artist rendition of installing railroad tracks in a Hawaiian sugarcane field (Williams 1888:849)

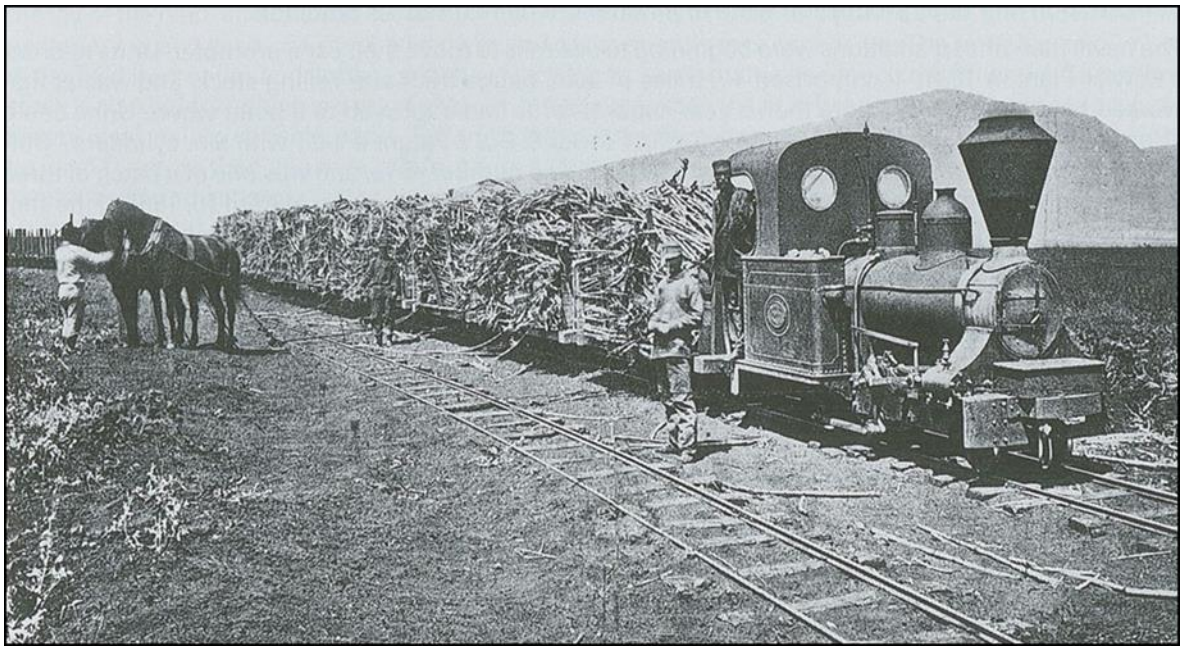


Figure 13. Bringing hand-cut cane from the fields to the Spreckelsville mill aboard the HC&S railroad, circa 1882 (Conde 1993)

> ...by noon on Monday [Feb. 13] the detention camp was ready for its occupants. Over 200 Chinese, Japs and natives were fumigated and dressed in new suits, and at two o’clock the procession quickly moved out to their new quarters. Scarcely had they reached their destination before everything was prepared for the destruction of their old quarters. At three o'clock a cloud of dust and broken timbers leaped into the air, accompanied by the savage roar of dynamite; then another and another, being the exterior houses of the doomed district. Soon dense volumes of smoke, through which pierced yellow shafts of flame, told that the work of destruction was begun. In two hours, the whole block from the Kahului saloon to the Custom House was a heap of glowing ashes. The breeze was from the sea and no trouble was experienced in holding the fire within the prescribed district. Kahului town was entirely cordoned off with corrugated iron fences and, before the year was out, the plague had been eradicated. (Bartholomew 1985)

Prior to 1900, development in the port town of Kahului was likened to a “squatter’s town.” After the bubonic plague outbreak led to the decision to burn most of Kahului, the street alignments were rebuilt as “blocks.” By 1905, dredged harbor coral had been used to fill and level much of the Kahului water-front to create a more orderly and sanitary business district. Early structures constructed within this waterfront business district included the Baldwin National Bank of Maui (constructed in 1906) and the Pu‘unene Store at Kahului (constructed in 1908) (Burns 1991).

In 1901, a well-drilling company from Honolulu, operated by the McCandless Brothers, was retained by the HC&S plantation to drill 12 wells at the site for a new mill at Pu‘unēnē. The water was to be used for mill operations as well as for irrigation. All 12 wells were successes, according to the records of the head engineer, James Sutton McCandless (McCandless 1936). The new sugar mill at Pu‘unēnē (Figure 14) began operations in 1902 (Dean 1950), supplementing the work done by the Pā‘ia Mill. Both mills, and the network of railroad lines connecting the company’s fields and villages, continued to grow. Between 1900 and 1905, acreage harvested doubled, from 2,484 to 4,827 acres, and sugar production more than doubled, from 17,857 to 39,411 tons (A. B. Gilmore 1936). The adoption of heavier rails and a wider rail gauge caused HC&S to completely renovate the plantation railroad (Condé and Best 1973).

The plantation villages of the Pu‘unēnē area grew quickly to surround the new mill (Figure 15). Between a huge influx of immigrant workers in 1909, and the burning of village areas of Pā‘ia and Kahului to control smallpox in 1910, changes to the camp system were in full swing. The plantation workforce continued to expand until 1917, when the United States entered World War I, and the accompanying draft seriously depleted the labor pool. By 1919, postwar requirements for sugar had driven the price to $471.40 per ton: an all-time high (Burns 1991). Nine main camps existed across the Pu‘unēnē plains by the 1920s, including MeGerrow Camp, Yung Hee Camp, Afong Camp, Spanish B Camp, Alabama Camp, Green Camp, Camp 4, Sam Sing Camp and Camp 8. These camps are depicted southeast of the current project area on a 1910 Pu‘unēnē Sugar Plantation map (Figure 16).

Increased production of sugar by HC&S and its subsidiaries required large improvements to the harbor facilities at Kahului. Kahului Railroad Company began construction on the East Breakwater soon after Hawai‘i’s annexation by the United States in 1898. Expenses for the 1,800-ft breakwater and dredging had risen to about $335,000 by 1910, at which time the federal government assumed

Figure 14. Pu‘unēnē Mill circa 1935 (photo courtesy of A&B Sugar Museum)

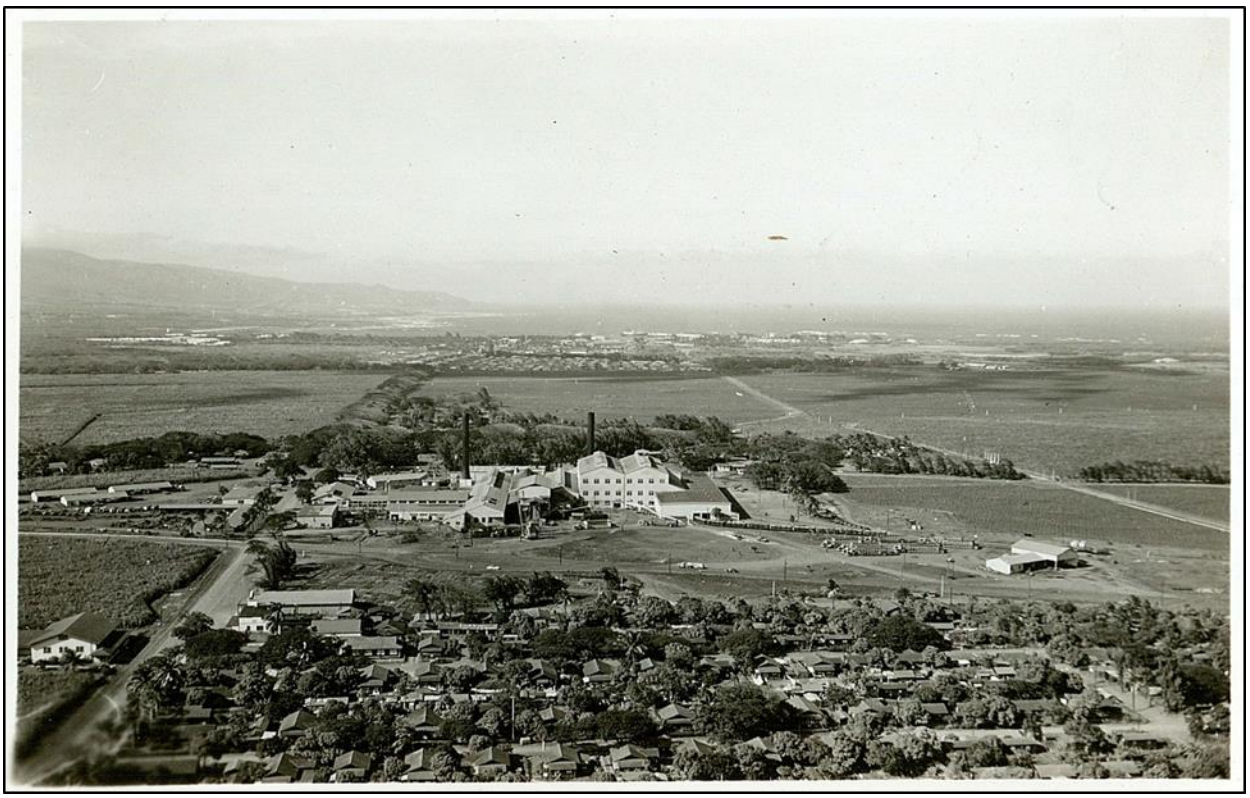


Figure 15. Pu‘unēnē Mill and camps (foreground); Kahului Town and Bay in background (photo courtesy of A&B Sugar Museum)

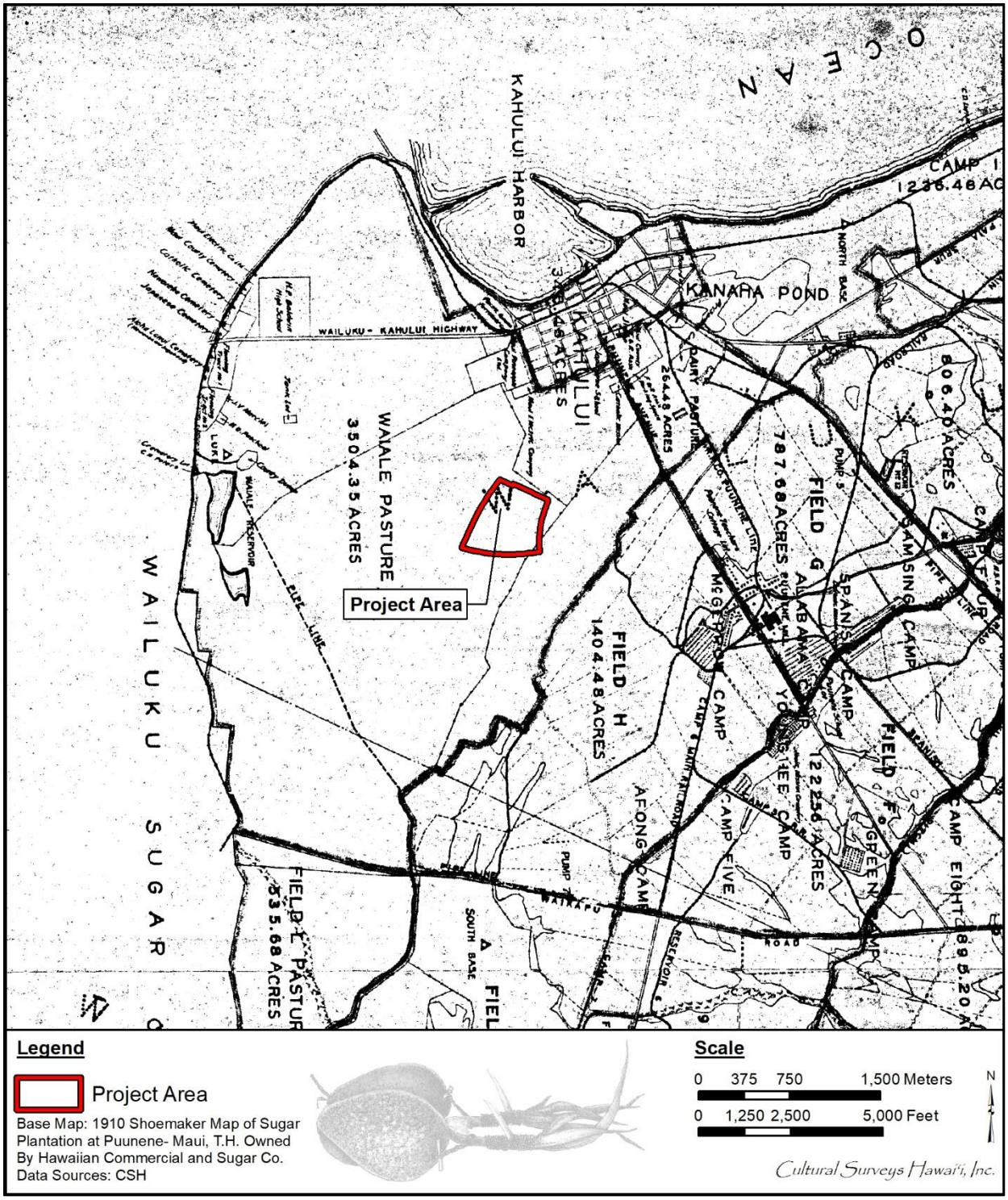


Figure 16. Shoemaker (1910) map showing current project area within Waiale Pasture south of the development of Kahului; Pu‘unēnē Mill and surrounding plantationa camps are depicted southeast of the project area

responsibility for continuing improvements to the harbor (Best 1978). The superintendent of the Kahului Railroad Company, Richard Walther Filler, worked to redesign railroad access to the harbor following the demise of Spreckels' operations at the waterfront (Condé and Best 1973).

All the early infrastructure of Kahului Harbor was constructed and financed by Kahului Railroad Company, but by 1910, under the terms of annexation as a Territory of the United States, a Board of Harbor Commissioners was appointed to supervise the territorial harbor development program in Hawai‘i. From this point on, Lyman Herbert Bigelow, Territorial Superintendent of Public Works, took charge of on-going modernization plans for the Kahului Harbor well into the 1920s (Nellist 1925). By 1910, over 300,000 cubic yards of fill had been deposited on the windward side of the breakwater, creating a landfill area of over 12 acres. Dredging at the entrance to the harbor and in the area alongside the pier continued to a depth of 35 ft (United States Army 1913). The current project area is shown in relation to the Kahului Harbor on a portion of a Shoemaker (1910) map of the sugar plantation at Puunene (see Figure 16)..

At the turn of the century, freight and passengers were handled by small rowboats, or lighters, transferring goods between the Kahului derrick and lighter landing to large freighters anchored further offshore. A 200-ft long wharf, allowing ships with a draft of 20 ft to tie up directly alongside, was largely completed by Kahului Railroad Company about 1905 and improved again in 1909. It was named the Claudine Wharf, after the Inter-Island Steam Navigation Company ship of the same name (Territory of Hawaii 1910).

The subsequent increase in shipping required the territorial government to establish a collector of customs at the port of Kahului. Between the years 1904 and 1912, Worth Osbun Aiken served in this capacity. Following the death of Henry P. Baldwin in 1911, his son Frank F. Baldwin became president of both the HC&S and the Kahului Railroad. William Walsh was made superintendent of Kahului Railroad in 1913, having spent the previous 12 years with the railway. A worldwide increase in demand for sugar and pineapple followed the end of World War I. Shipping at the port of Kahului had risen to 81 vessels with an annual gross tonnage of over 370,500 entering and leaving the port by 1920 (Bigelow 1920).

By late 1914, the Kahului Railroad Company ceded all responsibility for the breakwater to the U.S. Government. An increase in ship traffic caused by the opening of the Panama Canal made it imperative that the Kahului Harbor be deepened, the Claudine Wharf improved, and the west breakwater started. Most of these improvements involved contracts between the U.S. Army Corps of Engineers and the Kahului Railroad Company. The volume of freight handled at the Kahului Harbor tripled after the opening of the Panama Canal. By 1910 the harbor was handling 100,000 tons of outgoing sugar and incoming goods. By 1920, that number had grown to over 370,000 tons (Bigelow 1920).

Work to reinforce both breakwaters and dredge the harbor interior was almost continuous from 1910 to 1931. Two competing inter-island passenger service and shipping lines merged in 1905, and by 1925, the Inter-Island Steam Navigation Company passenger traffic at the Kahului Harbor numbered almost 25,000 (Schmitt 1977). The east breakwater was completed in 1913 and the dredged basin and west breakwater in 1919. Both breakwaters were extended with additional dredging completed in 1925.

Construction of a modern concrete wharf at the east breakwater began in 1910 with various additions continuing until completion in 1923 (Figure 17). Originally known as Territorial Wharf, the 500-ft structure was topped with a single-story steel-framed transit shed measuring 375 by 100 ft. It was equipped with two electrically operated sugar conveyors, each capable of handling 250 tons of raw sugar per hour. Kahului Railroad Company had three tracks on the wharf, two running the length of the wharf and one running to the transit shed. Oil pipelines allowed for both offloading and loading. Molasses pipelines delivered molasses from storage tanks along the harbor property. Other pipelines were used for gasoline, kerosene, and water (Taylor 1926).

Large-scale repairs to the Claudine Wharf (Figure 18) were required following a tidal wave on 3 February 1923. In 1924, the Claudine Wharf was purchased by the Board of Harbor Commissioners for the Territory of Hawaii, giving the territorial government sole ownership of all harbor facilities at the Kahului port. Partly due to the tidal wave damage, and partly because additional wharf space was required by a new pineapple cannery at Kahului, a project to entirely replace the Claudine Wharf with a modern concrete pier was completed in 1927 (Dean 1950).

Over the intervening years, Kahului Railroad Company retained ownership of most of the land adjacent to the harbor. A portion of a Wall (1929) map of the Island of Maui depicts the railway line surrounding the harbor and along Kanahā Pond (Figure 19). Construction in the town of Kahului continued to expand the port city. The former Kahului Lyceum Theater, at the corner of Pu‘unēnē and Ka‘ahumanu avenues, burned down in 1917 and was replaced by Kahului Theater. Other structures built inland from the harbor included the race track and grandstand of the Kahului Fairgrounds, built in 1916; the Kahului Store, built in 1916; Kahului School, built in 1922; and Christ the King Church, built in 1932 (Bartholomew 1985). In 1936, construction of the present Ka‘ahumanu Avenue linking Wailuku and Kahului was finished. Completion of the roadway initiated the development along its route during subsequent decades, including the Maui Memorial Hospital, the Maui County Police Station, and the Henry Perrine Baldwin High School.

3.1.8 World War II

During World War II, the shoreline area west of Pier 2 at Kahului Harbor contained 20 buildings either constructed or improved by the U.S. Navy as a base of operations for military shipping. Nine structures were built by U.S. Navy Construction Battalion (“SeaBee”) workers, and eleven structures were refurbished for military service (U.S. Navy 1943). Supplies for military bases including the 4th Marine Division camp at Kokomo, the 10th Amphibious Training Battalion at Mā‘alaea, the Underwater Demolition Team training base at Kīhei, Naval Air Station (NAS) Puunene and NAS Kahului, were transferred directly to each base or were stored at either the 18th Service Battalion Storage Depot at Kahului Harbor or an ammunition depot above Makawao town.

On 16 November 1942, construction work commenced on NAS Kahului by Pacific Naval Advanced Base (PNAB) personnel, who were soon replaced by the 39th SeaBees. By 20 September 1943, the first aircraft of VC-23 (Composite Squadron 23) landed with personnel and gear on hand for duty. Carrier Air Service Unit 32 assumed command of modifying and maintaining the aircraft of each visiting training squadron for combat duty in the Pacific Theater of Operations (Eggertsen 1947). The 39th SeaBees built 19 concrete ammunition storage magazines in Kanahā Pond, structures that remain today as storage bunkers for the County of Maui and the State of Hawai‘i. Construction of NAS Kahului continued in mid-June 1944 with the arrival of the 142nd SeaBees (United States Department of the Navy 1947).

Figure 17. Artist rendition of Kahului Harbor from a Hilo Drug Co. advertisement (Hilo Drug Company c. 1920)

Figure 18. Photograph circa 1925 of the Claudine Wharf with a U.S. Naval Destroyer superimposed against ‘Īao Valley (CSH Archives)

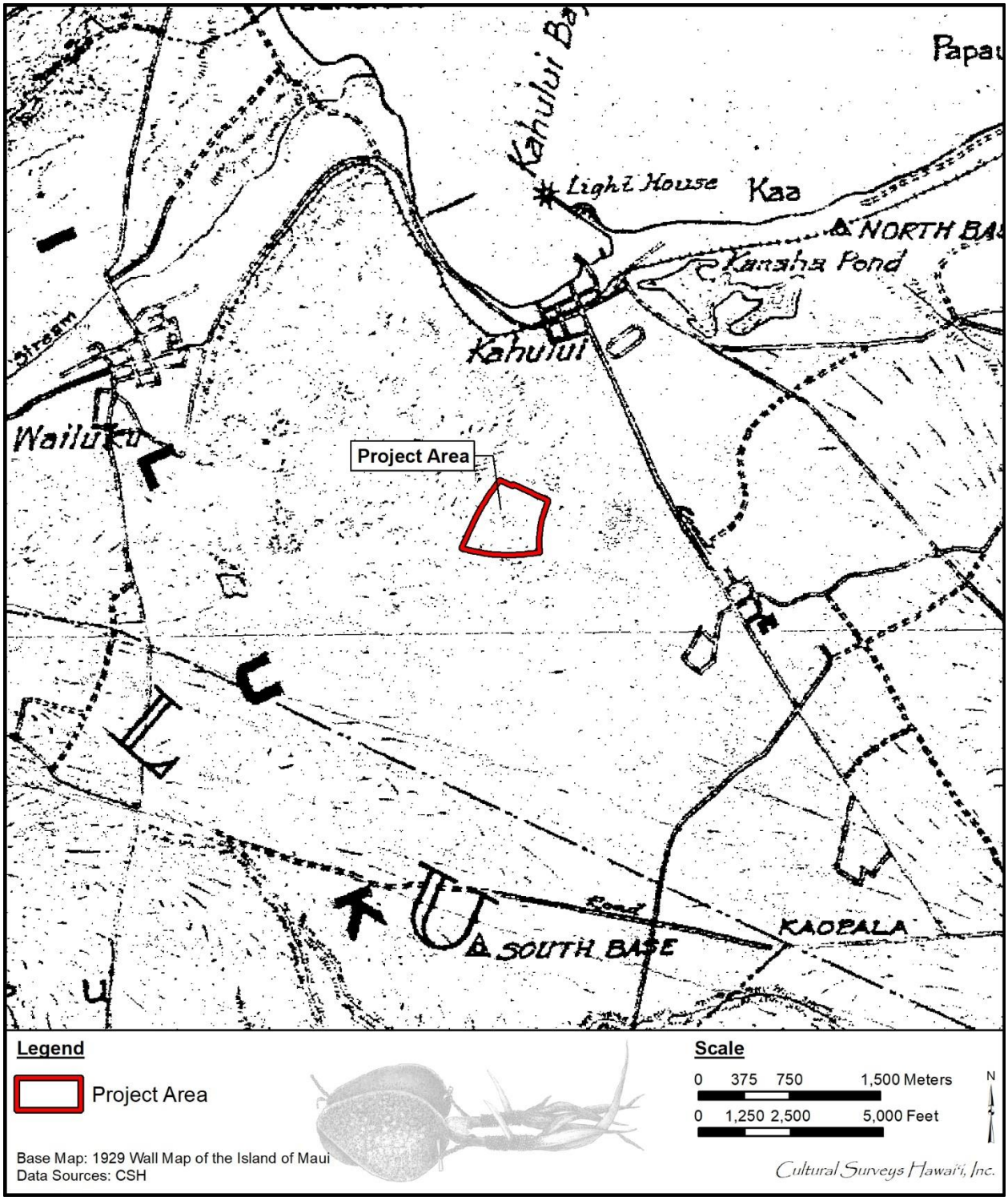


Figure 19. Portion of a Wall (1929) map of the Island of Maui, depicting the current project area in relation to the Kahului Harbor; note the railway extending around the harbor

In full operation, both NAS Puunene and NAS Kahului were virtual cities in themselves. Each employed hundreds of civilian clerical and maintenance workers and provided housing to thousands of U.S. military personnel. At NAS Kahului, Construction Battalion Maintenance Unit (CBMU) personnel from CBMU 563 arrived 29 December 1943. The unit was responsible for the continued operation of refrigeration, water purification and electrical components in kitchens, hospitals, churches, barracks and offices. The open coastline at NAS Kahului allowed for live-fire training areas, where gunners practiced firing machine guns from turrets constructed to duplicate those on board scout-bombers and torpedo bombers (U.S. Navy 1945).

Immediately following the August 1945 surrender of Japan to the military forces of the United States, additional facilities essential to the operation of NAS Kahului were removed from NAS Puunene. A bowling alley, bakery, and other specialized structures at NAS Puunene were relocated to NAS Kahului, only to be partially or entirely destroyed by a series of tidal waves that struck NAS Kahului facilities in 1946. On 1 April 1946, the Kahului Harbor and NAS Kahului suffered serious damage after a tidal wave generated in the Aleutian Islands, Alaska, struck the north coast of Maui. Kahului Harbor was left empty when the water receded. The Coast Survey tide gage recorded 5 waves with heights in excess of 9 ft during the first 90 minutes of the tsunami, two of the waves being greater than 11 ft (Green 1946).

At the end of World War II, the small harbor landing at Kā‘anapali closed. All pineapple shipments from the Baldwin Packers cannery in Lāhainā were trucked to the port of Kahului for shipment. The systematic closing of all military installations on Maui saw the departure of over 15,000 men from “Maui’s Own” 4th Marine Division. During October and November 1945, Marines of the 23rd, 24th, and 25th Regimental Combat Teams, plus their attached support groups, boarded aircraft carriers docked at the port of Kahului for deactivation in California (Proehl 1946). By 30 June 1947, the transfer of NAS Kahului to the Civilian Aviation Authority for the Territory of Hawai‘i was well underway, and virtually all military equipment of NAS Kahului had been shipped to military installations in Guam, Okinawa, or Midway Island (Eggertsen 1947).

3.1.9 Mid-1900s

Buildings erected during the reconstruction of Kahului in the 1910s and 1920s were slowly gave way to postwar modernization (Figure 20). HC&S camp housing for employees of Kahului Store, including housing along Mill Street and Pu‘unēnē Avenue for stevedores and railroad workers, began to be dismantled. Trucks and buses replaced passenger transportation once provided by railroads. Cars that had been set up on blocks and stripped of their rubber tires as a wartime rationing measure were back on Maui’s roads (Bartholomew and Bailey 1994).

By 1950, Kahului Railroad Company locomotives had been relegated to shuttling dockside cargo, such as fertilizer, between the Pacific Chemical and Fertilizer Company warehouses along the Kahului Harbor (Gilmore 1954). A modern drive-in movie theater was constructed in the *kiawe* and sand dunes just west of Raw Fish Camp, which had been located just inland and north of the present-day Harbor Lights Condominiums.

HC&S developed a residential and commercial master plan for the “Dream City” of Kahului at the end of World War II, which allowed for both fee-simple ownership or rental of single-family homes (Dean 1950). Kahului Shopping Center opened in 1951 to serve the needs of the area’s new residents. By 1960, 150 acres of waterfront land adjacent to Kahului Harbor had been designated

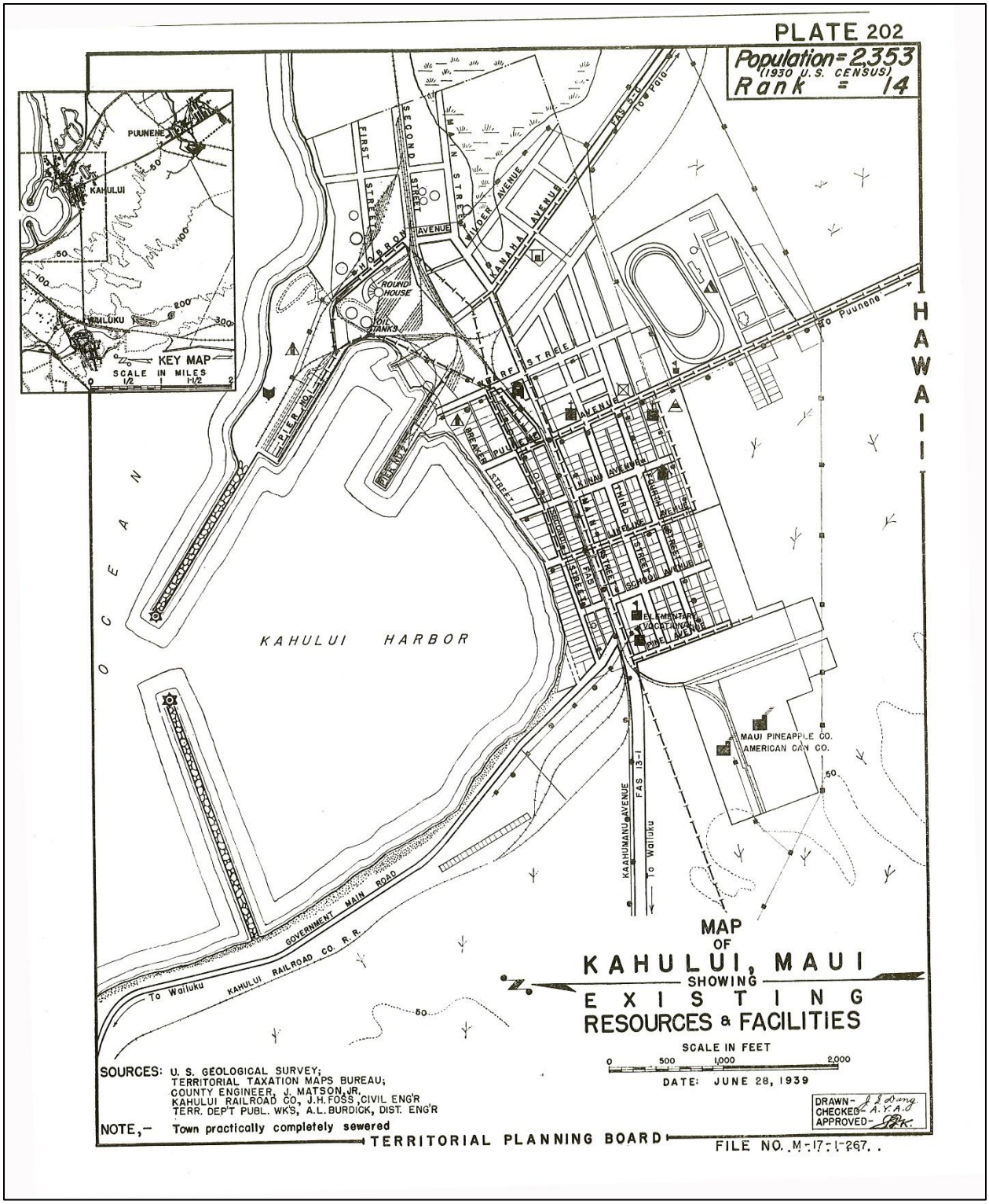


Figure 20. Plan of the “modernized” Kahului Harbor area following the turn of the twentieth century (Territorial Planning Board 1939)

for light industrial use. Buildings constructed in Kahului for the Maui branch of the Honolulu Paper Company, the Arisumi Brothers Construction Company, and Central Pacific Bank were among the first of many modern structures in the region (Hawaii Business and Industry 1966).

The first two hotels built in Kahului, Maui Palms and Maui Hukilau, both opened in the mid-1950s, sharing a thin stretch of beach at the south shore of the harbor west of the former military buildings of the Kahului Section Base (Figure 21). On 23 May 1960, a warehouse and half a dozen houses were demolished, while other warehouses, stores, offices, and houses were heavily damaged when a tidal wave originating along the coast of Chile hit the Kahului area. A church floated 6.1 m away from its foundation, and other buildings were damaged at Paukūkalo, just beyond and west of the harbor (Lander and Lockridge 1989).

3.1.10 Statehood to the Modern Era

On 12 March 1959, Hawai‘i became the 50th State of the Union. With labor costs for both sugar and pineapple steadily rising in the postwar years, driven primarily by labor union demands, both industries responded by adopting new technical innovations. Containerized shipping revolutionized the freight industry in the early 1960s, leading to the redesign of gantry systems and hardstand support areas to facilitate the moving and storage of the new containers at theKahului Harbor. Matson Navigation Company, a subsidiary of Alexander & Baldwin, became the leader in the development of an industry-wide standard for intermodal containers (Dean 1950).

As Maui’s visitor industry strengthened, plans for two new resort areas featuring some of the world’s best beaches in Kīhei and Lāhainā were announced. Visitor arrivals at the Kahului Airport steadily increased following statehood, requiring the State Department of Transportation to appropriate funds for a new terminal building at the Kahului Airport in 1964. Dedication ceremonies for the new terminal took place on 25 June 1966, with further plans to accommodate the new generations of jet aircraft (State of Hawai‘i 2019).

Kahului Railroad Company sold off its locomotives and rolling stock and became the Kahului Trucking and Storage Company in 1966. The Haleakala Storage & Transfer Company, a privately-owned company, took over much of the specialized freight-forwarding operations once done by the railroad (Hawaii Business and Industry 1966).

In 1966, new construction began on the Kahului campus of Maui Community College, following the transfer of the former vocational school from the State Department of Education to the University of Hawai‘i. Funded by a fixed percentage of Hawai‘i state revenues, construction spending at the Kahului campus accelerated through the mid-1970s (Roth 1992). Maui Mall, the second of three regional shopping centers to serve the Kahului area, opened in 1971, replacing a sprawling HC&S lumber yard. It was joined a year later by the Ka‘ahumanu Shopping Center. Alexander & Baldwin Inc., the largest landowner in Kahului, continued to expand residential housing in “Dream City” incrementally between 1970 and 1990 (Hooser and Stewart 1995).

In the early 1900s, much of the land, including the current project area had been part of Waiale Pasture and used for cattle (see Figure 16). A portion of Waiale Pasture was used by the Army Reserve for automatic weapons training during at least the late 1970s (Honolulu Advertiser 1977). Maui High School was established at the current project area in 1972 and can be seen within the ever-expanding Kahului residential area in a 1977 aerial image (Figure 22).

Figure 21. Kahului Harbor in 1957, with the first two Maui hotels visible in the right of the frame (CSH Archives)

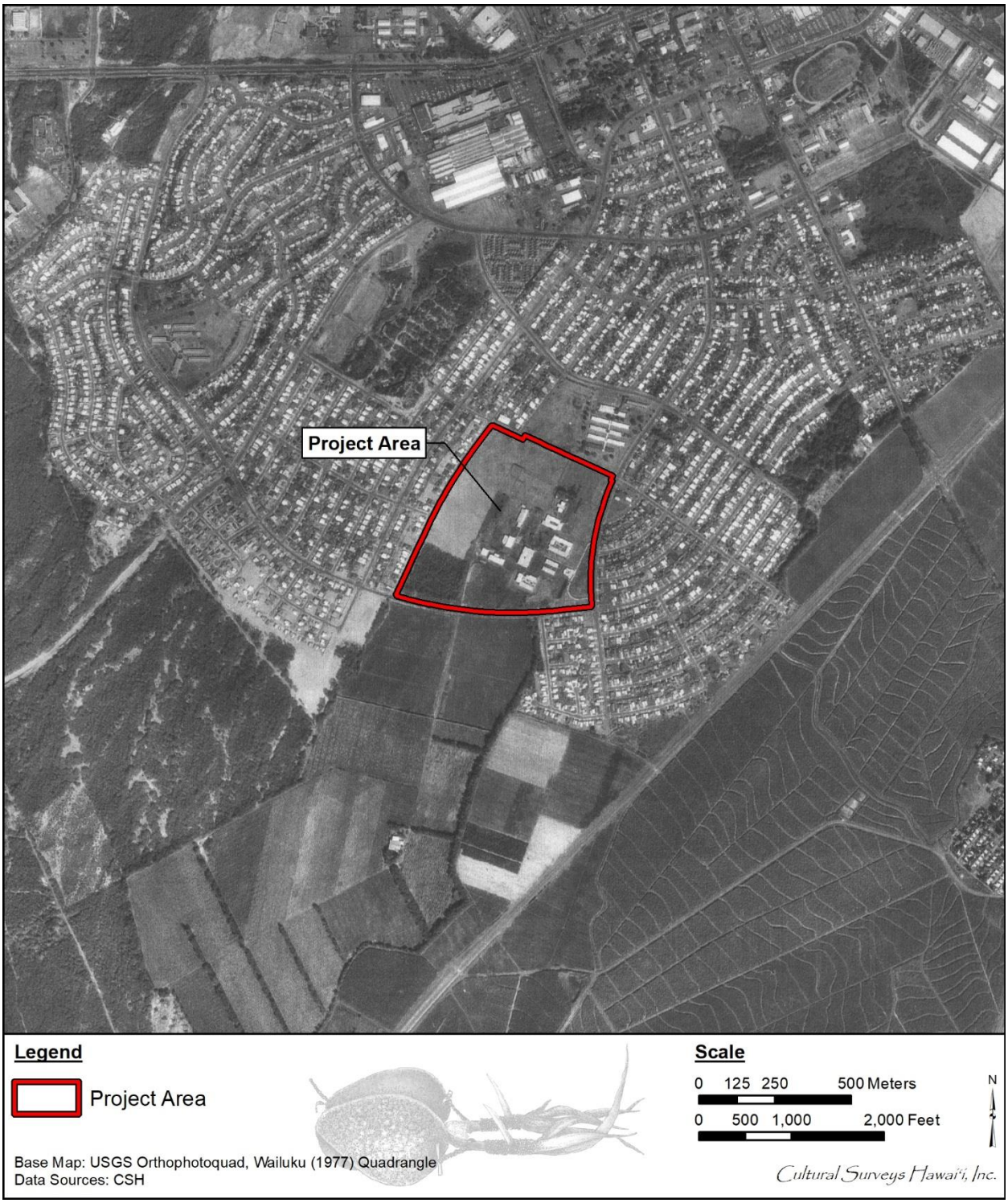


Figure 22. Portion of 1977 USGS aerial image showing the current project area, constructed in 1972, within the expanding “Dream City” of Kahului (U.S. Geological Survey 1977)

Large-scale construction projects in Central Maui, such as The Maui Arts and Cultural Center (MACC) (constructed in 1993), Keopuolani Park (constructed in 1999), the Maui Lani Dunes golf course (constructed in 1989) and the residential build-out of Maui Lani (1996-present) were precursors for light industrial development in the Wailuku Town portion of the *ahupua‘a*. Following the closing of the Wailuku Sugar Company mill in 1989, much of the former agricultural land along the eastern banks of ‘Īao Stream was developed as the Iao Parkside Condominium: a development consisting of 47 buildings constructed in phases between 1992 and 2002, with large-scale light industrial development utilizing much of the remainder of the former sugar lands of Wailuku along the western bank of the ‘Īao Stream (Hooser and Stewart 1995).

Design of a new Kahului Airport Terminal Complex began in 1985. Consisting of three phases, the $36.5 million complex took five years to complete. Work included additions and alterations to existing structures, roads, parking areas, aprons, a new terminal, taxiways, runways, landscaping, cargo terminal, and relocation of the FAA tower. Support facilities included a new helipad and cargo terminal (Schlapak and Kali 2006). By 1995, after the completion of these facilities, the Kahului Airport was ranked as one of the busiest small airports in the United States, logging over 4 million passengers (Hooser and Stewart 1995). By 2005, the number of passengers travelling through the Kahului Airport had more than doubled, to 8.5 million (Hawaii Small Business Development Center Network 2006).

3.1.11 Maui High School

The original Maui High School opened in 1913 in Hāmākua Poko, a plantation village in the northeastern region of Maui. It was the first public high school on Maui and had an initial enrollment class of 16 students (Maui High School 2019). The school began as a seven-room, two-story, wooden building (Figure 23) that served both high school and grammar school students (Engledow and Long 2007). News of the school’s opening quickly spread throughout the plantation camps, and parents were eager to send their children, who began willingly traveling to and from school by foot, horseback, buggies, and/or train. Kahului Railroad even added a passenger car to their freight train to enable children from Wailuku, Kahului, Pu‘unēnē, and Pā‘iā to attend the school (Figure 24). Kahului Railroad trains also transported students from villages in Ha‘ikū, Pauwela, and Kuiaha.

By 1920, high school enrollment had increased to about 100 students and continued to grow to nearly 500 students by 1930. The influx of student attendance led to the hiring of more teachers and construction of additional accommodations for both teachers and students. Teachers cottages, an auditorium, cafeteria, kitchen, and a U-shaped single-story Spanish Mission style concrete building that housed classrooms, administrative offices, a school store, and library were all constructed prior to 1930.

Central Maui’s expanding and diversifying economy during the 1920s contributed to the increased enrollment at Maui High School. Despite the weakening effect on Maui’s economy from the Great Depression in 1929, attendance remained strong at Maui High through the 1930s, and students were successful after graduation. Renovations to the campus in the 1930s included an expansion to the cafeteria and construction of a tennis court, sidewalks, an athletic field, restrooms, music and science classrooms, and an agriculture building. By 1940, approximately 1,000 students were enrolled at Maui High School.

Figure 23. Original Maui High (and Grammar) School, established 1913 in Hāmākua Poko (Maui Historical Society photo reprinted by Engledow and Long [2007:2])

Figure 24. Maui High School students exiting Kahului Railroad passenger car, circa 1920s/1930s (Maui Hi-Notes supplement (1963) photo reprinted in Engledow and Long [2007:4])

Despite all the infrastructure built over the years, by 1963, plans to close and move the school were underway. Closing of the Hāmākua Poko plantation village had affected he school’s water supply. Maui High was one of the last consumers of a potable, albeit “foul-tasting,” water system that the plantation wanted to convert to irrigation (Engledow and Long 2007:81-82). In 1965, the estimated cost of improving the water system was $75,000. In addition, by 1967, the school needed repairs and upgrades estimated to cost approximately $1.5 million. Possible locations for the new school included Pukalani and an area near Baldwin High School that would “create a sort of super campus;” however, most people favored Kahului, and the current location of Maui High School was decided in 1966.

Maui High School moved to 80 acres on the plains of Central Maui in 1972, a stark contrast to the architecture and green landscape formerly enjoyed by students (Figure 25). During winter break in 1971, students and faculty packed supplies from the old high school to bring to the new school, which lacked many amenities to which students had grown accustomed, including furnishings, shop equipment, a public address system, and a gym. Though promised rooms equipped with televisions and a large lecture hall, when classes began, students had no lecture hall, and several years passed before television wiring was installed. Old Maui High students brought with them the school’s alma mater, committees, clubs, *The Silversword* and *Maui Hi-Notes* school papers, Saber/Saberette athletics, and “indomitable school spirit” (Engledow and Long 2007:84).

Since its opening in 1972, present-day Maui High School has undergone several renovations. Numerous campus construction projects occurred in the 1970s, including landscaping and drainage improvements, installation of a sprinkler system, electrical and other utility work, paving, renovations to existing science classrooms, relocation of language laboratory equipment from the old high school, upgrades to the language laboratory (e.g,, air conditioning, paint, carpentry, etc.), and construction of sidewalks, four one-story classroom wings, and facilities for homemaking and business administration classes, a math/science center, and a music center (The Honolulu Advertiser 1972a, 1972b, 1972c, 1972d, 1972e). In 1977, two works of art were constructed on the campus landscape: “Carolina,” a 280 ft long by 140 ft wide earthworks sculpture featuring three waves of earth mounds and depressions, and “A Path Through Trees,” a copper metal sculpture consisting of four trees and three associated abstract features (Maui High School 2020). Some renovations to the campus during the 1980s and 1990s included re-carpeting the library, replacing transformers, exterior painting, special education classroom improvements, air conditioning upgrades, and new parking lot lighting (The Honolulu Advertiser 1985, 1987, 1988, 1990, 1993a, 1993b).

The school campus currently features 12 major buildings and 36 portable classrooms in addition to baseball fields, tennis courts, a track field, parking lots, and manicured lawns and landscaping (Maui High School 2019). Upon completion of the current project, a STEM Building & Autism Center will also be constructed. Maui High School is known throughout the community for its many student achievements, including awards and participation in state, national, and global science competitions. Currently, Maui High has an enrollment of over 1,900 students, mostly from the Kahului area but also includes students from Kīhei and Wailea.

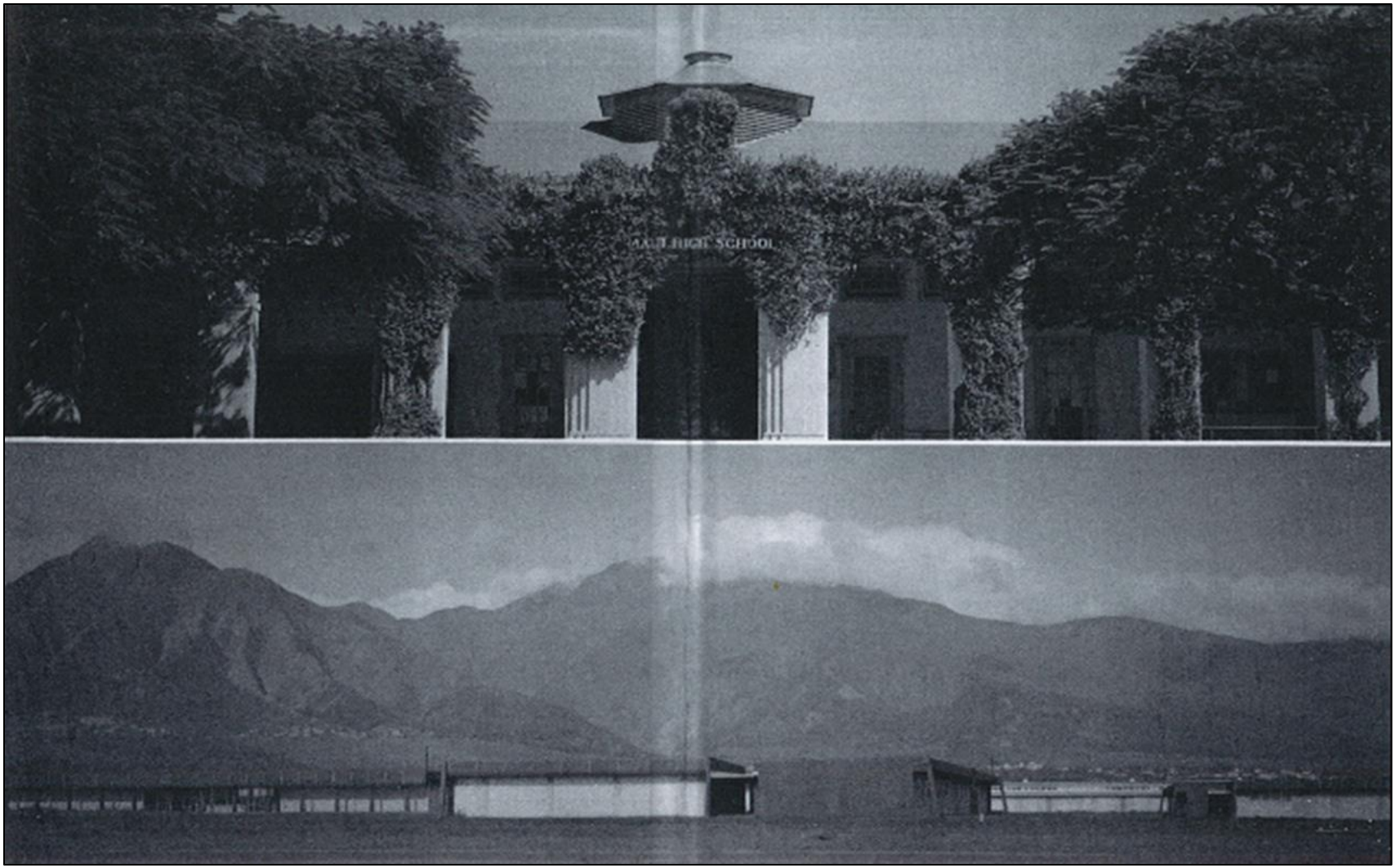


Figure 25. Comparison of the old Maui High School (top) to the new campus (bottom) in 1972 (photo original printed in The Silversword (1972); reprinted by Engledow and Long [2007:85])

3.2 Previous Archaeological Research

Between 1931 and 1976, only sporadic archaeological studies were undertaken in the area. Following the passage of the National Historic Preservation Act in 1966 and HRS Chapter 6E, which established the historic preservation program in 1976, archaeological studies occurred as a condition of development on a more frequent basis. Under the guideline established by national and state legislation, the lands surrounding the current project area have been subject to a variety of studies including archaeological reconnaissance surveys, AIS investigations, archaeological data recovery, and archaeological monitoring programs (Figure 26 and Table 1). No historic properties have been identified in the immediate vicinity of the current project area. However, many burials and pre- and post-Contact historic properties have been found within in the vicinity to the southwest, within dune sand deposits.

3.2.1 Studies within Current Project Area

3.2.1.1 Shefcheck et al. (2005)

From 20 through 22 July 2005, SCS conducted archaeological monitoring during trenching at the Maui High School softball field in Kahului (Shefcheck et al. 2005). Project-related excavations included three utility trenches, six utility pole holes, and four holes for the scoreboard. Trenches were excavated within fill layers to maximum depths of 80 cm below the previously graded surface. No historic properties were identified. However, archaeological monitoring was recommended due to previously documented human burials near the project area.

3.2.1.2 Cordle et al. (2007)

Between September 2006 and July 2007, SCS intermittently conducted archaeological monitoring of the grading for re-sodding the football field at Maui High School (Cordle et al. 2007). Ground disturbance occurred within the existing football field and remained shallow with a maximum depth of 36 cm below surface (cmbs). No historic properties were identified; all excavation occurred within base fill. Archaeological monitoring for future ground disturbance was recommended due to the presence of sands known to contain human burials in the area.

3.2.2 Modern Studies in Project Area Vicinity

3.2.2.1 Barrera (1976)

In August 1976, Chiniago Enterprises conducted a reconnaissance survey to locate exposed subsurface materials at Waiale in Maui Lani for Belt Collins Associates and Alexander and Baldwin Inc. (Barrera 1976). The pedestrian survey concentrated on areas of ground disturbance that may have exposed subsurface materials. One piece of flaked basalt and a possible hammer stone were identified. No further archaeological surveys were recommended due to the low probability of finding pre-Contact or historic archaeological materials. Because of previous inadvertent discoveries of human skeletal remains in nearby sugar fields and the high potential of encountering human burials in the area, archaeological monitoring for the duration of the construction project was recommended.

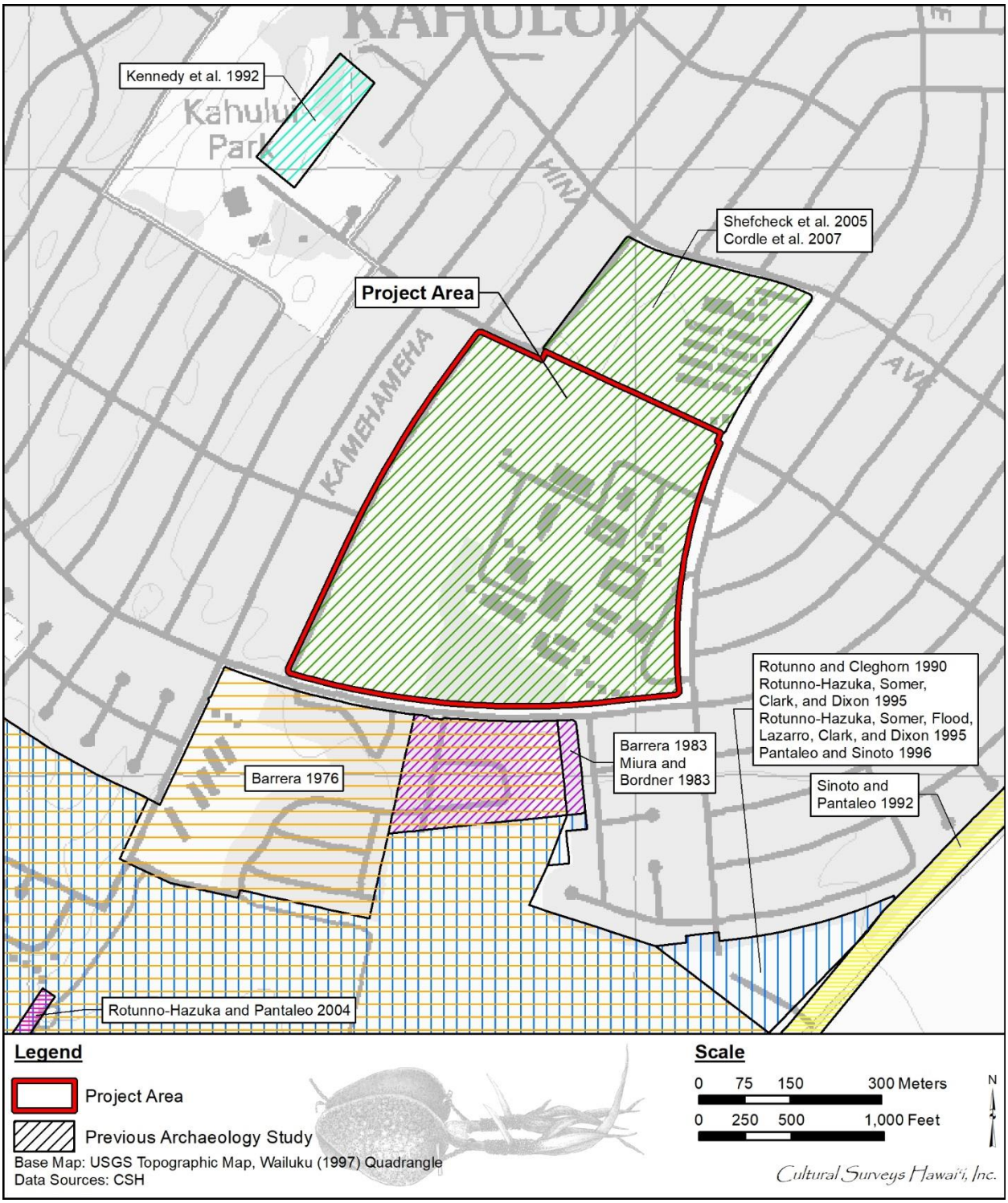


Figure 26. Portion of 1997 Wailuku USGS 7.5-minute topographic quadrangle depicting previous archaeological studies conducted within or adjacent to the current project area (U.S. Geological Survey 1997)

Table 1. Previous archaeological studies in the vicinity of the project area

Reference	Type of Study	Location	Results
Barrera (1976)	Archaeological reconnaissance survey	Waiale, Maui Lani; TMK: [2] 3-8-007	No historic properties identified; observed two surface artifacts (basalt flake and hammerstone)
Miura and Bordner (1983)	Archaeological reconnaissance survey	Hale Laulea Subdivision; TMK: [2] 3-8-07:106	No historic properties identified
Barrera (1983)	Backhoe excavations	Hale Laulea Subdivision; TMK: [2] 3-8-07:106	No historic properties identified
Rotunno and Cleghorn (1990)	Archaeological reconnaissance survey	Maui Lani Subdivision; TMKs: [2] 3-8-007:002 and 110	Identified two potential historic properties and assigned temporary site numbers T-1 (parallel cobble alignments/ possible walkway) and T-3 (rock mound); documented additional human remains associated with SIHP # -2797
Kennedy et al. (1992)	AIS	Hale Makua; TMK: [2] 3-8-007:097 por	No historic properties identified
Sinoto and Pantaleo (1992)	AIS	20-mi long East Maui waterline near Kuihelani Hwy	No historic properties identified
Rotunno-Hazuka, Somer, Clark, et al. (1995)	Archaeological test excavations	Maui Lani Subdivision and Sand Borrow Site; TMKs: [2] 3-8-007:002 and 110	Determined insignificance for two temporary sites (T-1 and T-3) previously recorded by Rotunno and Cleghorn (1990); identified and determined an additional temporary site (T-4) insignificant; documented at least three additional human burials associated with SIHP # -2797
Rotunno-Hazuka, Somer, Flood, et al. (1995)	Archaeological research, test excavations, and burial investigations	Maui Lani Subdivision; TMKs: [2] 3-8-007:002 and 110	Newly identified 10 burial features with a minimum number of individuals (MNI) of 12 associated with SIHP # -2797

Reference	Type of Study	Location	Results
Pantaleo and Sinoto (1996)	Supplemental surface survey and archaeological subsurface testing	Maui Lani Subdivision Phase 1 and Phase 1A; TMKs: [2] 3-8-007:002 and 110	Identified four human burials associated with burial complex SIHP # -2797 and two distinct human burials: SIHP #s -4146 and -4147
Rotunno-Hazuka and Pantaleo (2004)	Archaeological monitoring	The Bluffs at Maui Lani subdivision and portion of Maui Lani Parkway; TMKs: [2] 3-8-007:121 pors, 130, 131	Identified one partial *in situ* human burial, which was disinterred and relocated to burial preserve SIHP # -4146; identified and preserved in place SIHP # -5404, a scattered human infant burial
Shefcheck et al. (2005)	Archaeological monitoring	Maui High School; TMK: [2] 3-8-007:098	No historic properties identified
Cordle et al. (2007)	Archaeological monitoring	Maui High School; TMK: [2] 3-8-007:098	No historic properties identified

3.2.2.2 Barrera (1983); Miura and Bordner (1983)

In June 1983, the Environment Impact Study Corp. conducted an archaeological reconnaissance survey for the proposed Kahului Housing – Phase I (Hale Laulea Subdivision) Project, TMK: [2] 3-8-07:106 (Miura and Bordner 1983). The project area previously had been pasture land and had been disturbed by several clearing and grubbing activities in the recent past. The area had been part of the dune land prior to pasture use. A subsurface archaeological investigation was recommended due to the present of dune sand known to contain human burials in the area.

In December 1983, Chiniago Inc. summarized the backhoe trench findings at the proposed Hale Laulea Subdivision (TMK: [2] 3-8-07:106) in a letter report to Fong Construction Co. (Barrera 1983). Chiniago Inc. had documented 35 backhoe trenches for the project and concluded that there was no evidence of pre-Contact or significant historic activities; such that, no historic properties were identified.

3.2.2.3 Kennedy et al. (1992)

On 12 through 14 August 1992, Archaeological Consultants of Hawaii, Inc. conducted an AIS for a proposed extension to Hale Makua (Kennedy et al. 1992), a health services facility located near Kahului Community Park. The AIS included a surface survey and a subsurface testing of nine backhoe trenches. Testing occurred in areas not previously disturbed; although, topography of the project area prohibited some portions from being tested. No historic properties were identified. Archaeological Consultants of Hawaii, Inc. determined that future construction projects would have no effect on pre-Contact or historic properties and did not recommend further archaeological procedures.

3.2.2.4 Rotunno and Cleghorn (1990)

Between 16 and 31 January 1990, the Public Archeology Section, Applied Research Group of the Bishop Museum conducted an archaeological reconnaissance survey of approximately 1,000 acres for Horita Homes in Maui Lani Subdivision in Wailuku (Rotunno and Cleghorn 1990). Three potential historic properties were identified and given temporary site numbers TS1 through TS3. TS1 was identified as a possible walkway located in the northern portion of the project area. It was constructed of compacted sand cobbles observed in a 15-m long parallel alignment. The northern alignment was recorded as being intact, the southern alignment appeared to be more disturbed. The possible rock walkway did not appear to lead to structural remains. Because of the locality and easy access, the alignment was noted as possibly modern, and the eastern half of the feature was covered in heavy vegetation, which indicates a non-recent focus of activities. TS2 was initially recorded as a possible disturbed rock wall located in the northern portion of the project area; however, TS2 was removed as a site after further investigation indicated it to be remnants of bulldozer tailings. TS3 was designated as a rock mound located on the top of the knoll in the northern portion of the project area. The 2.90-m by 1.48-m rock mound consisted of compact sand cobbles piled approximately 0.30 m high and did not appear to extend subsurface. Due to dense vegetation cover and the high probability of burials being present, archaeological investigations and monitoring associated with any ground disturbances prior to construction were recommended.

3.2.2.5 Sinoto and Pantaleo (1992)

Between June and September 1992, Aki Sinoto Consulting conducted an AIS for the proposed East Maui Waterline Project that extended over 20 miles long from East Maui to an existing Central Maui Transmission Pipeline near Kuihelani Highway (Sinoto and Pantaleo 1992). The waterline would include several additional connections to the water system and new well sites in northeast Maui. The existing transmission line along Kuihelani Highway is in the vicinity of the current project area. However, no apparent connections to or extensions from the line were in the immediate vicinity to the current project. Much of the waterline project area consisted of paved roads or areas of sugarcane production. No subsurface testing was conducted. No historic properties were identified. On-site and on-call monitoring was recommended for the project.

3.2.2.6 Rotunno-Hazuka, Somer, Clark, et al. (1995)

Between 23 May and 14 June 1990, Applied Research Group of the Bernice Pauahi Bishop Museum conducted test excavations at two possible historic properties previously documented by Rotunno and Cleghorn (1990) as temporary site numbers T-1 and T-4. An additional potential historic property was recorded as temporary site T-4 and tested. Test excavations also occurred at the established SIHP # -2797 burial complex located approximately 75 m southwest of the Maui Waena Intermediate School (Rotunno-Hazuka, Somer, Clark, et al. 1995).

Significant cultural resources were not identified on the surface or within test excavations at the three temporary sites. Therefore, these features were determined archaeologically insignificant. T-1 represents parallel cobble alignments that were interpreted as features recently constructed, possibly by people using off-road vehicles in the sand dunes. T-3, consisting of two rock mounds, was explained as most likely natural features created by sand dune erosion. The mound features were not consistent with known traditional Hawaiian burial markers or trail markers (*ahu*). T-4 appeared to be a recent campfire remnant based on the observed piled of rocks covering a modern trash pit proximal to dirt bike trails.

No human burial features were identified during the subsurface testing at SIHP # -2797. However, varying concentrations of fragmented human skeletal remains were observed both on the surface and within test excavations at the western periphery of the sand borrow pit near the approximate location of where Neller (1984) first documented burials at SIHP # -2797. The recovered remains represented an MNI of at least three individuals. Rotunno-Hazuka, Somer, Clark, et al. (1995) recommended SIHP # -2797 be considered significant. Additional recommendations included that all construction related to the project area cease until formulation of a burial treatment plan, future ground disturbance in the project area be monitored by an archaeologist, and that a burial preserve plan be created and implemented for future development of the project area.

3.2.2.7 Rotunno-Hazuka, Somer, Flood, et al. (1995)

In 1992, the Anthropology Department for the Bernice Pauahi Bishop Museum researched historical documents and maps for the Maui Lani Development area and conducted archaeological test excavations for burial investigations near SIHP # -2797, a burial complex previously identified at the western periphery of a sand borrow site on the development parcel’s eastern boundary (Rotunno-Hazuka, Somer, Flood, et al. 1995). The test excavations resulted in the identification of

ten burial features representing at least 12 additional human burials associated with SIHP # -2797. Six of the burial features were preserved *in situ*, while one individual was disinterred because it had already been exposed in the sandpit. Recovered skeletal remains were handled by the SHPD on Maui. The documentation of additional skeletal remains at SIHP # -2797 prompted the SHPD to request a more intensive AIS of the proposed development area. The results of this AIS are presented by Pantaleo and Sinoto (1996).

3.2.2.8 Pantaleo and Sinoto (1996)

Between 8 and 28 March 1995, Aki Sinoto Consulting conducted a supplemental surface survey and archaeological subsurface testing for Maui Lani Partners, Ltd. for development in the Maui Lani area of Wailuku (Pantaleo and Sinoto 1996). Intensive subsurface testing occurred at Maui Lani Development Phase 1 parcel, Phase 1A parcel, and SIHP # -2797, a human burial complex located approximately 75 m southwest of Maui Waena Intermediate School. The investigation included 90 machine excavated trenches, two shovel scrapes, and 1 manually excavated trench in a total of 58 localities. During the archaeological investigation, six human burials were identified in the Phase 1A parcel and designated as SIHP #s -4146 and -4147, and four additional burials were designated as components of SIHP #-2797. Ten trenches were manually excavated in the 80 acres of the Phase 1 parcel, and no historic properties were identified.

Twelve trenches were placed in and around a sand borrowing pit and known burial complex SIHP # -2797. Four additional human burials and a scatter of human remains on the surface were identified in association with SIHP # -2797 Six machine excavated trenches were tested to investigate the origin of the scattered surface human remains; neither human burials nor non-burial cultural deposits were identified within any of these six test excavations.

The lack of apparent predictability in locating subsurface cultural remains, specifically human burials, based upon surface features (man-made or natural), led researchers to conclude no effective predictive method for avoiding burials, and thus the parcel was cleared for continued development with an archaeological monitor present to help mitigate potential impacts. Archaeological monitoring was recommended for future ground disturbance associated with development within the project area due to the high potential for encountering burials.

3.2.2.9 Rotunno-Hazuka and Pantaleo (2004)

Between 1999 and 2003, Archaeological Services Hawaii, LLC (ASH) completed archaeological monitoring connected to sand mining operations located at The Bluffs, a subdivision of Maui Lani (Rotunno-Hazuka and Pantaleo 2004). During the three years of project duration, researchers monitored the cutting of access roads to access the sand mining site in addition to the sand mining operations. Monitoring during the mining portions of the project resulted in identification of two human burials (FS54 and FS62), both initially assigned to SIHP # -5404. Burial (FS54), a partial *in situ* sand burial identified within a truncated pit, was disinterred and relocated to a nearby burial preserve on The Dunes golf course, currently assigned SIHP # -4146. Burial (FS62), the scattered remains of an infant burial displaced during grubbing activities, were preserved in place and retains SIHP # -5404. No additional historic properties were identified during grading and road cutting portions of the project. Researchers recommended archaeological assessment and monitoring of all ground disturbances within the Maui Lani area, regardless of initial surface findings.

Section 4 Results of Fieldwork

4.1 Pedestrian Inspection Results

CSH archaeologists Josephine Yucha, M.S., and Trevor Yucha, B.S., completed a field inspection of the project area on 2 September 2019. The field inspection consisted of a reconnaissance-level pedestrian inspection of the project area and photographic documentation using an Apple iPad equipped with digital form applications, and hand-written notes.

The school campus features 12 major buildings and 36 portable classrooms in addition to several baseball fields, tennis courts, a track field, parking lots, and manicured lawns and landscaping (Maui High School 2018) (Figure 27 through Figure 51). The campus of Kahului Elementary School is along the northern border of the project area. The pedestrian inspection of the project area comprised the main Maui High School throughways that includes school buildings, paved walkways, and parking lots, and along the exterior perimeter. Maui High School was established at the current location in 1972. As such, none of the buildings or structures are older than 50 years.

The buildings primarily are within the central portion of the project area with paved walkways or sidewalks connecting the campus and manicured lawns landscaped with trees in between. Overall, the campus is relatively flat, although, the elevation is higher in the west, and certain sections, such as the ball fields, are raised compared to others. A sand-based sediment was visible in high traffic areas of the lawns with exposed tree roots. Banyan (*Ficus benghalensis*) trees, ficus trees, and various ornamental palm trees, among others, provided shade over the lawns and walkways. The buildings in the southern portion of the project area, Buildings E, F, and L, were gated shut and the surrounding area was not inspected further (see Figure 39). The buildings are on the northern side of the lightly forested area in the southern portion of the campus. The undeveloped area was comprised of *koa haole* and tall grass and brush. It was not thoroughly traversed, as it was not believed to be affected by the proposed project (see Figure 49). No historic properties were observed during the pedestrian survey. There is a school garden in between the practice baseball field and the western side of the central campus buildings. The garden contained star fruit, papaya, and banana trees, bamboo, various palm trees, and a row of plumeria trees along the edge (see Figure 40).

Two construction areas on the school campus are bound by black fabric fencing screens. The interiors of the construction areas were not inspected. One construction area is on the eastern side of the Building J Chorus Room, which is near the Student and Staff Parking Lots in the northeastern portion of the project area (see Figure 31). A second construction area is in the open space on the western side of the back of the Gym and south of the paired basketball and tennis courts (see Figure 44 and Figure 45).

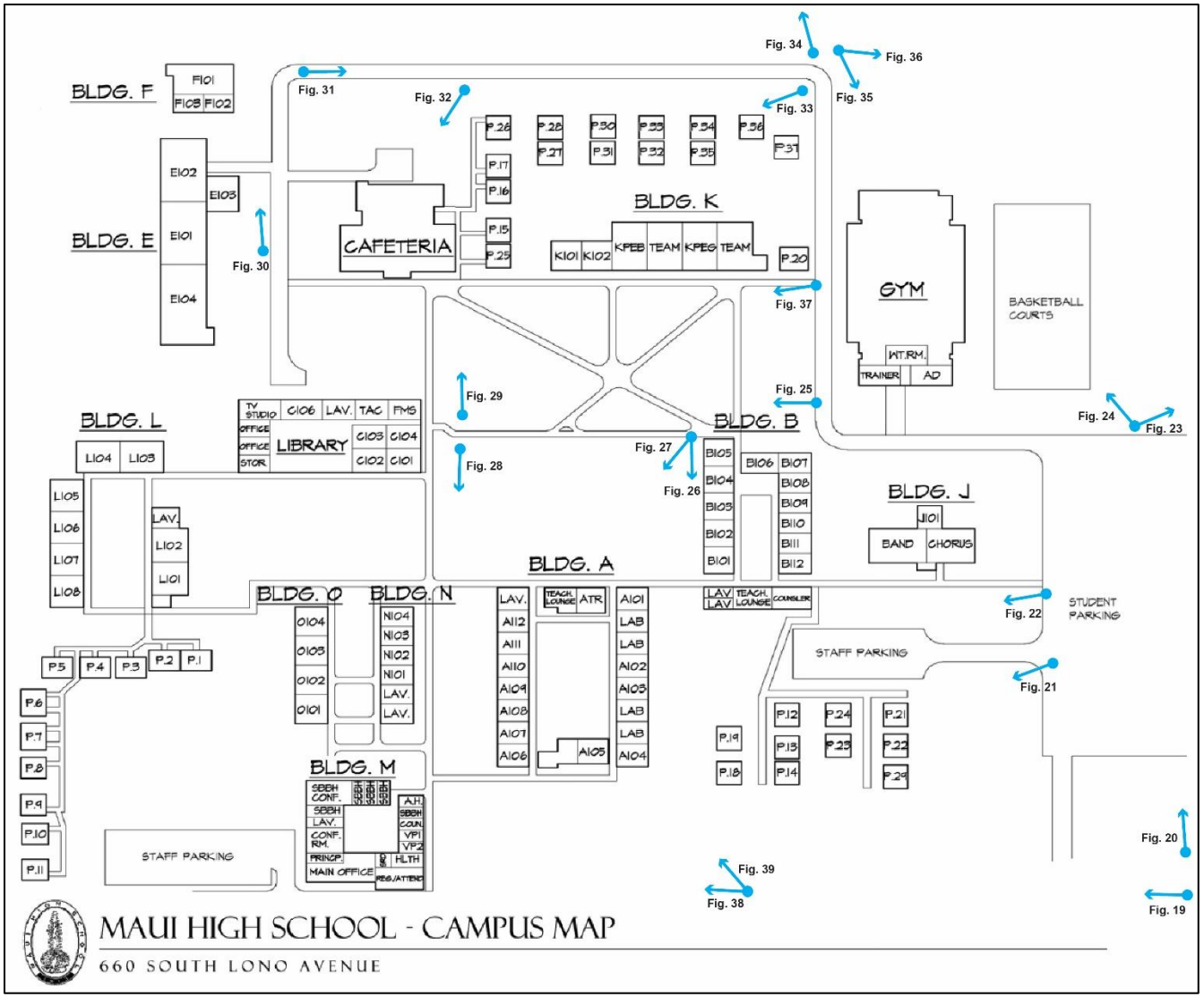


Figure 27. Maui High School campus map marked with locations (dots) and views (arrows) of Figures 20 through 39; note, Figures 40 through 42 were along Moloka‘i Hema Street and not depicted, view to northwest (Maui High School 2018)

Figure 28. Banyan trees and ornamental palm tree at edge of property along Lono Avenue in the northeastern portion of the project area, view to south

Figure 29. Overview of northwestern portion of the school campus from Lono Avenue showing the parking lot and Patsy Mink Field, baseball field, view to west

Figure 30. Overview of portable classrooms near the Staff Parking Lot, south of the Student Parking Lot, view to southeast

Figure 31. Construction area on the eastern side of the Building J Chorus Room, view to south

Figure 32. Entrance to the Patsy Mink Field baseball field on the western side of the Student Parking Lot, view to northwest

Figure 33. Overview of basketball courts and a construction area in the background on the western side of the Gym, view to west

Figure 34. Overview of the central lawn from the Gym, view to southwest

Figure 35. Overview of central lawn with Building B to the north (left) and Building A at the east (background), view to east

Figure 36. Overview of central lawn with Building A to the east (left) and the Library at the south (background), view to east

Figure 37. Overview of central lawn near the Library and the space between Building A (left) and Building N (right), view to east

Figure 38. Overview of central lawn near the Library (to the left) and the Cafeteria (background), view to west

Figure 39. Overview of southwestern corner of the school campus showing part of Building E (at left) and Building F (background), view to west

Figure 40. Overview of the throughway along the western side of the school campus showing the garden to the west (left), view to north

Figure 41. Overview of space behind (west of) the Cafeteria in the southwestern portion of the school campus, view to southeast

Figure 42. Overview of portable classrooms along the western side of the school campus, view to south

Figure 43. Overview of the track and field in the northwestern portion of the Maui High School project area, view to west

Figure 44. Overview of the construction area behind (west of) the Gym in the northwestern corner of the school campus, view to east

Figure 45. Overview of the open space on the southern side of the tennis courts, west of the construction area, view to north

Figure 46. Overview of western side of the central lawn, fronting Building K (at right), view to south

Figure 47. Overview of the student drop-off throughway along Lono Avenue, view to south

Figure 48. Overview of Maui High School campus fronting Lono Avenue, view to west

Figure 49. Overview of the lightly forested, undeveloped portion of the project area that is comprised mostly of *koa haole* trees, view to southeast

Figure 50. Overview of the southwestern corner of the Maui High School project area showing the practice baseball fields, view to northeast

Figure 51. Overview of the track and field in the northwestern portion of the Maui High School project area, view to east

Section 5 Summary and Recommendations

CSH has prepared this LRFI for the Maui High School STEM Building & Autism Center Project. The project area is 600 Lono Avenue in Kahului, Wailuku Ahupua‘a, Wailuku District, Maui Island, TMK: [2] 3-8-007:098. The school property is within a residential neighborhood largely surrounded by private properties. The high school is bounded by Kahului Elementary School and La‘au Street to the north, West Papa Avenue to the south, Lono Avenue to the east, and Moloka‘i Hema Street to the west. The project will consist of the construction of a Maui High School STEM Building & Autism Center. In addition, the project will include development of a paved Autism Center drop-off area, a new parking area containing 26 stalls, three additional parking stalls within the existing parking lot, and widening of the existing driveway. Project-related ground disturbance will include grading and excavations for building footings and utilities (e.g., electric, water, sewer) as well as vegetation removal and landscaping.

Background research suggests that pre-Contact battles may have been fought within this region of Central Maui. During the early historic period, while much of the surrounding lands were being utilized for commercial sugarcane production, the current project area was located within the fields of the Waiale Pasture. The second half of the nineteenth century was marked by commercial development of the Wailuku and Kahului areas. During postwar modernization of the 1950s, HC&S developed a residential and commercial master plan for the “Dream City” of Kahului. A&B, the largest landowner in Kahului, continued to expand residential housing in the “Dream City” incrementally between 1970 and 1990.

The original Maui High School was founded in 1913 in Hāmākua Poko in the northeastern region of Maui. It had been the first public high school on Maui. Maui High School was constructed in Kahului in 1972 and currently features 12 major buildings and 36 portable classrooms in addition to several baseball fields, tennis courts, a track field, parking lots, and manicured lawns and landscaping. None of the buildings or structures are older than 50 years. A small portion along the southern boundary is an undeveloped and overgrown with *koa haole* trees and brush.

The project area is east of the Wailuku Sand Hills, and the soils are described as primarily Puuone sand and Jaucas sand. These soil types are associated with traditional Native Hawaiian burials and non-burial cultural deposits. Several previous archaeological studies have documented human burials and pre- and post-Contact historic properties within sand deposits to the northwest and southwest of the project area.

A review of previous archaeological studies in the immediate vicinity of the project area indicates that no surface or subsurface historic properties have been identified within the Maui High School campus or the parcels directly to the south. A study by Archaeological Consultants of Hawaii, Inc. for the Hale Makua near Kahului Park to the northwest also had no significant archaeological findings (Kennedy et al. 1992). However, many human burials have been found within sand dunes in the region to the southwest.

No previous archaeological studies were conducted during the initial construction of the Maui High School in the 1970s. Following the passage of the National Historic Preservation Act in 1966 and HRS Chapter 6E, which established the historic preservation program in 1976, archaeological studies occurred as a condition of development on a more frequent basis. However, only two

previous archaeological studies have been conducted within the Maui High School project area. In 2005, SCS conducted archaeological monitoring for Maui High School softball field scoreboard (Shefcheck et al. 2005). In 2007, SCS conducted archaeological monitoring for the re-sodding the football field at Maui High School (Cordle et al. 2007). During both projects, ground disturbance was within shallow fill deposits, and no historic properties were encountered. Both studies recommended archaeological monitoring for future ground disturbances due to the presence of natural sand and human burials in the area.

Consultation with the SHPD Archaeology Branch is recommended to determine appropriate historic preservation requirements for this project. CSH recommends archaeological monitoring for project-related ground disturbance based on previous archaeological finds, including human burials, encountered southwest of the Maui High School within dune sand that also is present within the current project area.

Section 6 References Cited

Alexander, W.D.

1890 A Brief History of Land Titles in the Hawaiian Kingdom. In *Hawaiian Almanac and Annual for 1891: A Hand Book of Information on Interesting Matters Relating to the Hawaiian Islands*, Vol Seventeen, edited by Thos. G. Thrum, pp. 105-124. Press Publishing Company Print, Honolulu.

Alexander, William DeWitt

1899 *A Brief History of the Hawaiian People*. Brief historical series. American Book Co., New York.

American Board of Commissioners for Foreign Missions

1820 Mission to the Sandwich Islands. *The Missionary Herald* 16(12):280-282.

Andrews, Lorrin

1865 *A Dictionary of the Hawaiian Language: To which is Appended an English-Hawaiian Vocabulary and Chronological Table of Remarkable Events*. Printed by Henry M. Whitney, Honolulu.

Anonymous.

1858 The Hawaiian or Sandwich Islands. *The Pacific Commercial Advertiser* February 25, 1858:1. Honolulu, Hawai‘i.

Ashdown, Inez

1970 *Ke Alaloa O Maui (The Broad Highway of Maui)*. Ace Printing Company, Wailuku.

1971 *Ke Alaloa O Maui: The Broad Highway of Maui*. Ace Printing Company, Wailuku, Hawai‘i.

Barrera, William, Jr.

1976 *Archaeological Survey at Waiale, Maui*. Chiniago, Inc., Kamuela, Hawai‘i.

1983 *Backhoe Excavations at Hale Laulea Subdivision, Kahului, Maui*. Chiniago, Inc., Kamuela, Hawai‘i.

Bartholomew, Gail

1985 *The Index to the Maui News 1900-1932*. Maui Historical Society, Wailuku, Maui.

Bartholomew, Gail, and Bren Bailey

1994 *Maui Remembers: A Local History*. Mutual Publishing, Honolulu.

Beckwith, Martha W.

1970 *Hawaiian Mythology*. University of Hawai‘i Press, Honolulu.

Bennet, Chauncey C.

1893 *Lecture and Sketches of Life on the Sandwich Islands and Hawaiian Travel and Scenery*. The Bancroft Company, San Francisco, California.

Best, Gerald M.

1978 *Railroads of Hawaii*. Golden West Books, Santa Monica, California.

Bigelow, Lyman H.

1920 *Annual Report of the Board of Harbor Commissioners of the Territory of Hawaii*. The New Freedom Press, Honolulu, Territory of Hawai‘i.

Burns, Irma Gerner

1991 *Maui’s Mittee and the General, A Glimpse into the Lives of Mr. and Mrs. Frank Fowler Baldwin*. Ku Pa‘a Inc., Honolulu.

Chinen, Jon J.

1958 *The Great Mahele: Hawaii's Land Division of 1848*. University of Hawai‘i Press, Honolulu.

Clark, John R.K.

1989 *The Beaches of Maui County*. Second ed. University of Hawai‘i Press, Honolulu.

Condé, Jesse C., and Gerald M. Best

1973 *Sugar Trains: Narrow Gauge Rails of Hawaii*. Glenwood Publishers, Felton, California.

Cordle, Shayna, William Fortini, Jr. , and Michael F. Dega

2007 *Archaeological Monitoring Report for Maui High School Kahului, Wailuku Ahupua`a, Wailuku District Island of Maui, Hawai`i [TMK: 3-8-007:098]*. Scientific Consultant Services, Inc., Honolulu, Hawai‘i

Cordy, Ross

1981 *A Study of Prehistoric Social Change: The Development of Complex Societies in the Hawaiian Islands*. Academic Press, New York, NY.

Cummins, Gary, and Robert M. Fox

1973 Kaahumanu Church (Wailuku Ekalaseia Hoole Pope). In *Hawaii Register of Historic Places*. State of Hawai‘i Department of Land and Natural Resources, Division of State Parks, Honolulu, Hawai‘i

Daws, Gavan

1968 *Shoal of Time: A History of the Hawaiian Islands*. University of Hawai‘i Press, Honolulu, Hawai‘i

Dean, Arthur L.

1950 *Alexander & Baldwin, Ltd. and the Predecessor Partnerships*. Alexander & Baldwin Ltd. and Advertiser Publishing Company, Honolulu.

Dodge, F.S.

1885 *Maui, Hawaiian Islands. Registered Map 1268*, 1:90,000. Hawaiian Government Survey. Library of Congress Geography and Map Division Washington, D.C. 20540-4650.

Dorrance, William H., and Francis Swanzy Morgan

2000 *Sugar Islands : The 165-year Story of Sugar in Hawai‘i*. Mutual Publishing, LLC, Honolulu.

Eggertsen, Claude A.

1947 Appendix: Naval Air Station Kahului Historical Report. U.S. Navy, Washington D.C.

Esri, Inc.

2017 Map Image Layer. Esri, Inc., Redlands, California.

Field, W. H.

1912 Iao Valley *Mid-Pacific Magazine.* .

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

1972 *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. Soil Conservation Service, United States Department of Agriculture, Washington, D.C.

Fornander, Abraham

1880 *An Account of the Polynesian Race, its Origins and Migrations, and the Ancient History of the Hawaiian People to the Times of Kamehameha I*. 6 vols. Trubner & Co., London.

1916-1917 *Hawaiian Antiquities and Folk-Lore, The Hawaiian Account of the Formation of the Islands and Origin of their Race, with the Traditions of their Migrations, Etc., as Gathered from Original Sources*. Memoirs of the Bernice Pauahi Bishop Museum. Bishop Museum Press, Honolulu.

1919a Chronological List. In *Fornander Collection of Hawaiian Antiquities and Folk-Lore, The Hawaiians account of the formation of their islands and origin of their race, with the traditions of their migrations, etc., as gathered from original sources.*, edited by Thomas Thrum. Bishop Museum Press, Honolulu.

1919b Traditional and Genealogical Notes. In *Fornander Collection of Hawaiian Antiquities and Folk-Lore the Hawaiians' Account of the Formation of Their Islands and Origin of Their Race*, Vol VI, edited by T. G. Thrum, Vol. Memoirs of the Bernice Pauahi Bishop Museum. Bernice Pauahi Bishop Museum, Honolulu, Hawai`i.

Giambelluca, Thomas W., Q. Chen, A.G. Frazier, J.P. Price, Y.L. Chen, P.S. Chu, J.K. Eischeid, and D.M. Delparte

2013 Online The Rainfall Atlas of Hawai‘i. In *Bull. Amer.Meteor. Soc.*, pp. 313-316. Vol. 94. University of Hawai‘i at Mānoa, Honolulu.

Giambelluca, Thomas W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger

2014 Evapotranspiration of Hawai‘i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai‘i. University of Hawai‘i at Mānoa, Honolulu.

Gilmore, Abner Blanks

1936 The Hawaii Sugar Manual, New Orleans.

1954 *The Gilmore Hawaii Sugar Manual*, New Orleans, Louisiana.

Green, Charles K.

1946 Seismic Wave of April 1, 1946, as recorded on tide gages. In *Transactions, American Geophysical Union*, Vol 27. American Geophysical Union.

Handy, E.S. Craighill, Elizabeth Green Handy, and Mary Kawena Pukui

1991 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Revised ed. Bernice P. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.

Hawaii Business and Industry

1966 *Maui Issue*. Hawaii Business Publishing Corporation, Honolulu.

Hawaii Small Business Development Center Network

2006 Maui County Data Book. State of Hawaii Department of Business Economic Development and Tourism, Hilo, Hawaii.

Hawaii TMK Service

2014 *Tax Map Key [2] 3-8-007*. Hawai‘i TMK Service. Honolulu.

Honolulu Advertiser.

1977 Arms training held at Wailuku by Reserve. *The Honolulu Advertiser* 15 February 1977. Honolulu.

Hooser, Gary, and Donna Stewart

1995 *Maui Data Book and Newcomers Guide*. H & S Publishing, Wailuku, HI.

Jarves, James Jackson

1843 *History of the Sandwich Islands, Embracing their Antiquities, Mythology, Legends, Discovery by Europeans in the Sixteenth Century, Re-Discovery by Cook, with their Civil, Religious, and Political History, from the Earliest Traditionary Period to the Present Time*. Edward Moxin, Dover Street, London.

Kalākaua, David

1990 *The Legends and Myths of Hawaii. The fables and folk-lore of a strange people*. C.L. Webster & Company, New York,.

Kamakau, Samuel Mānaiakalani

1991 *Tales and Traditions of the People of Old: Nā Mo‘olelo a ka Po‘e Kahiko*. Translated by Mary Kawena Pukui. Bernice P. Bishop Museum Special Publication 51. Bishop Museum Press, Honolulu.

1992 *Ruling Chiefs of Hawaii*. Revised ed. The Kamehameha Schools Press, Honolulu.

Kame‘eleihiwa, Lilikalā

1992 *Native Land and Foreign Desires. Pehea Lā E Pono Ai?* Bishop Museum Press, Honolulu, Hawai‘i.

Kennedy, Joseph, Peter Brennan, and David Soldo

1992 *Inventory Survey with Subsurface Testing Report for a Property Located at TMK: 3-8-07:97 (por.), in the Ahupua'a of Wailuku, District of Wailuku, on the Island of Maui. September 1992*. Archaeological Consultants of Hawaii, Inc., Haleiwa, Hawai‘i.

Kirch, Patrick V.

1997 *Feathered Gods and Fishhooks, An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawaii Press, Honolulu.

2010 *How Chiefs Became Kings: Divine Kingship and the Rise of Archaic States in Ancient Hawai'i*. University of California Press, Berkeley, California.

Kuykendall, R.S.

1938 *The Hawaiian Kingdom: 1778-1854, Foundation and Transformation*. University of Hawaii Press, Honolulu.

Lander, James F., and Patricia A. Lockridge

1989 *Tsunamis in Hawaii*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Washington, D.C.

Lyons, Curtis Jere.

1875 Land Matters in Hawaii. -- No. 3. *The Islander* July 16:119. Honolulu, Hawai‘i.

Macdonald, Gordon A., and Agatin T. Abbot

1974 *Volcanoes in the Sea*. University of Hawaii Press, Honolulu.

Maui High School

2018 Maui High School: About Us https://www.mauihigh.org/apps/pages/index.jsp?uREC_ID=329952&type=d, accessed 19 August 2019.

McCandless, James Sutton

1936 *Development of Artesian Well Water in the Hawaiian Islands, 1880-1936*. Advertiser Publishing Company, Honolulu.

Meriwether, Lee

1888 A Plantation in Hawaii. *Harper's Illustrated Weekly* XXXII(No. 1664):849-850.

Miura, Marvin T., and Richard Bordner

1983 Archaeological Reconnaissance Kahului Housing - Phase I (Hale Laulea Subdivision) TMK 3-8-07-106. Environment Impact Study Corp., Honolulu.

Moffat, Riley M., and Gary L. Fitzpatrick

1995 *Surveying the Mahele: Mapping the Hawaiian Land Revolution*. Palapala‘āina. Editions Limited, Honolulu.

Nellist, George F.

1925 *The Story of Hawaii and Its Builders*. Honolulu Star Bulletin, Honolulu.

Pantaleo, Jeffrey, and Aki Sinoto

1996 Archaeological Subsurface Sampling of the Proposed Maui Lani Development Phases 1 and 1a Wailuku Ahupua'a, Wailuku District, Maui Island (TMK 3-8-07:2, 110). Aki Sinoto Consulting, Honolulu.

Powell, J.W.

1883 *Report of the Director of the United States Geological Survey*. Report of the Secretary of the Interior; Being Part of the Message and Documents Communicated to the Two Houses of Congress at the Beginning of the First Session of the Forty-Eighth Congress. 4 vols. Government Printing Office, Washington, D.C.

Proehl, Carl W.

1946 The Fourth Marine Division in World War II. Infantry Journal Press, Washington D.C.

Pukui, Mary Kawena

1951 *The Water of Kāne: And Other Legends of the Hawaiian Islands*. Kamehameha Schools Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther K. Mookini

1974 *Place Names of Hawaii*. Rev. and enl. ed. University Press of Hawaii, Honolulu.

Resource Mapping Hawai‘i

2017 Hawai‘i Orthos; Hawai‘i Schools. Resource Mapping Hawai‘i vols. Kea‘au, Hawai‘i.

Richards, William, Lorrin Andrews, Reuben Tinker, and Stephen Shepard

1832 Extracts from a Joint Letter of Missionaries on the Island of Maui, Dated Nov. 29, 1831. In *The Missionary Herald, Proceedings At Large of the American Board of Commissioners for Foreign Missions with a General View of Other Benevolent Operations for the Year 1832.*, Vol 28. Crocker and Brewster, Boston, MA.

Richards, William, and Jonathan Smith Green

1831 Extracts from a Letter of Messrs. Richards and Green, Dated at Lahaina, Oct. 2, 1830. In *The Missionary Herald Containing the Proceedings at Large of the American Board of Commissioners for Foreign Missions; with a General View of Other Benevolent Operations for the Year 1831*, Vol XXVII, edited by American Board of Commissioners for Foreign Missions, pp. 180-184. Samuel T. Armstrong, Crocker & Brewster, Printers, Boston.

Roth, Randall W.

1992 *The Prince of Paradise*. Mutual Publishing, Honolulu, HI.

Rotunno-Hazuka, Lisa, and Jeffrey Pantaleo

2004 Archaeological Monitoring Report for Maui Lani Development at The Bluffs Subdivision, Kamehameha Avenue and Maui Lani Parkway Extensions (TMK 3-8-07:121 pors, 130, 131,) Wailuku Ahupua‘a District, Island of Maui. Archaeological Services Hawaii, LLC., Wailuku, Hawai‘i.

Rotunno-Hazuka, Lisa, Lonnie Somer, Stephan D. Clark, and Boyd Dixon

1995 Archaeological Testing of Four Sites on the Maui Lani Property in Wailuku Ahupua'a, Wailuku District, Island of Maui, Hawai'i. Bishop Museum, Honolulu.

Rotunno-Hazuka, Lisa, Lonnie Somer, Krista Flood, Darrin Lazzaro, Stephan D. Clark, and Boyd Dixon

1995 *Historical Research for the Proposed Maui Lani Project and Test Excavations at Site 50-50-04-2797, Wailuku, Maui*. Bernice Pauahi Bishop Museum, Honolulu.

Rotunno, Lisa J., and Paul L. Cleghorn

1990 *Archaeological Reconnaissance Survey of TMK 3-8-07: 2 and 110 Wailuku, Maui*. Bishop Museum, Honolulu.

Schlapak, Benjamin R., and Marilyn Kali

2006 Kahului Airport. In *Hawaii Aviation - An Archive of Historic Photos and Facts*. Vol. 2011. Hawaii State Department of Transportation - Airports Division, Honolulu, HI.

Schmitt, Robert C.

1973 *The Missionary Censuses of Hawaii*. Pacific Anthropological Records No. 20. Bernice Pauahi Bishop Museum, Department of Anthropology, Honolulu.

1977 *Historical Statistics of Hawaii*. University Press of Hawaii, Honolulu.

Schoofs, Robert

1978 *Pioneers of the Faith. History of the Catholic Mission in Hawaii (1827-1940)*. Sturgis Printing Co, Honolulu.

Shefcheck, Donna M., William Fortini, Jr., and Michael F. Dega

2005 *Archaeological Monitoring Report for the Maui High School Softball Field Kahului, Wailuku Ahupua‘a, Wailuku District Island of Maui, Hawai‘i. TMK 3-8-007:098*. Scientific Consultant Services, Inc., Honolulu.

Shoemaker, H.I.

1910 *Map of Sugar Plantation at Puunene, Maui, T.H., Owned by Hawaiian Commercial and Sugar Company*, 1:1200.

Sinoto, Aki, and Jeffrey Pantaleo

1992 *Archaeological Inventory Survey of the East Maui Waterline Project, Wailuku and Makawao, Maui Island (TMK 2-5-03 thru 05; 2-7-03; 2-7-07 thru 11; 2-7-13, 2-7-16 thru 20; 3-8-01; 3-8-06 thru 07, 3-8-59; 3-8-61, 3-8-71)*. Aki Sinoto Consulting, Honolulu.

Speakman, Cummins E.

1978 *Mowee: An Informal History of the Hawaiian Island*. Peabody Museum of Salem, Salem, Massachusetts

State of Hawai‘i

2019 Kahului Airport. hawaii.gov http://aviation.hawaii.gov/airfields-airports/maui/kahului-airport/, accessed 16 May 2019.

Stearns, Harold T., and Gordon A. Macdonald

1942 *Geology and Ground-Water Resources of the Island of Maui, Hawaii*. Bulletin 7 vols. Territory of Hawaii, Division of Hydrography, Advertiser Publishing Company, Honolulu.

Sterling, Elspeth P.

1998 *Sites of Maui*. Bishop Museum Press, Honolulu.

Taylor, H.

1926 The Ports of the Territory of Hawaii. U.S. Army Corps of Engineers, Washington D.C.

Territorial Planning Board

1939 *Map of Kahului Maui Showing Existing Resources & Facilities* Kahului, Maui.

Territory of Hawaii

1910 *Private Wharves and Landings in Hawaii, Report of the Commission Appointed to Investigate Private Wharves and Landings Throughout the Territory of Hawaii, in Conformity with Joint Resolution No. 2 of the Legislative Session of 1909*. Hawaiian Gazette Company, Honolulu.

The Friend

1878 Chronological Table of Important Events in Hawaiian History *The Friend*: 4-5.

Thrum, Thomas G.

1900 Lowrie Irrigating Canal. In *Hawaiian Almanac and Annual for 1901*. Hawaiian Gazzette Company, Honolulu.

Tracy, Joseph, Solomon Peck, Enoch Mudge, William Cutter, and Enoch Mack

1894 *History of American Missions to the Heathen, from their Commencement to the Present Time*. Spooner & Howland, Worcester, MA.

U.S. Department of Agriculture, Natural Resources Conservation Service

2001 Soil Survey Geographic (SSURGO) database for Island of Lanai, Hawaii (hi970). U.S. Department of Agriculture, Natural Resources Conservation Service.

U.S. Geological Survey

1977 *USGS Orthophotoquad, Wailuku Quadrangle*. United States Department of the Interior, USGS.

1997 *Wailuku quadrangle, Hawaii*, 1:24,000. United State Department of the Interior, USGS. Reston, Virginia.

U.S. Navy

1943 *Kahului Harbor Section Base* Washington Navy Yard.

1945 Seabees Worked and Fought on Global Front. In *Sea Bee*. U.S. Navy, Washington D.C. .

Uaua, W.H.

1871 Ka moolelo kaao o ka hoouka kaua o na Pueo, a lukuia na kanaka a me nalii o Maui. *Ke Au Okoa* June 29, 1871. Honolulu, Hawai‘i.

United States Army

1913 *Annual Report of the Chief of Engineers United States Army*. War Department, Washington, D.C.

United States Department of the Navy

1947 *Building the Navy's Bases in World War II, History of the Bureau of Yards and Docks and the Civil Engineer Corps 1940-1946*. U.S. Government Printing Office, Washington, DC.

Waihona ‘Aina

2000 Mahele Database. Waihona ‘Aina Corporation.

Wall, Walter E.

1929 *Map of the Island of Maui: Compiled from all Available Data*, 1:5000. Hawaii Territory Survey. Honolulu.

Westervelt, W.D.

1977 *Hawaiian Historical Legends*. Charles E. Tuttle, Rutland, Vermont.

Wilcox, Carol

1996 *Sugar Water: Hawaii's Plantation Ditches*. University of Hawai‘i Press, Honolulu.

Wilkes, Charles

1845 *Narrative of the United States Exploring Expedition During the Years 1838, 1839, 1840, 1841, 1842*. Lea and Blanchard, Philadelphia, Pennsylvania.

Williams, J.J.

1888 Laying a Railroad Track in the Cane Fields. Cane Sugar Culture in Hawaii. Harper's Weekly, Volume 32, New York.

Zambucka, Kristin

1977 *The High Chiefess Keelikolani*. Mana Publishing Co., Honolulu, Hawaii.