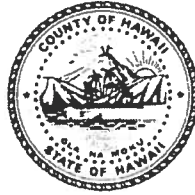


William P. Kenoi
Mayor



Clayton S. Honma
Director

Robert A. Fitzgerald
Deputy Director

County of Hawai'i

DEPARTMENT OF PARKS AND RECREATION

101 Pauahi Street, Suite 6 • Hilo, Hawai'i 96720
(808) 961-8311 • Fax (808) 961-8411

December 19, 2013

Mr. Gary Gill, Deputy Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

FILE COPY

JAN 08 2014

REC'D. OF ENVIRONMENTAL
QUALITY CONTROL
13 DEC 24 AM 10:07
RECEIVED

Subject: Pāhoa Park Expansion Master Plan Final Environmental Assessment (FEA-FONSI)
Puna District on the island of Hawai'i TMK: (3) 1-5-002:020

Dear Mr. Gill:

With this letter, the County of Hawai'i Department of Parks and Recreation hereby transmits the final environmental assessment and finding of no significant impact (FEA-FONSI) for the Pāhoa Park Expansion Master Plan situated at Tax Map Key (3) 1-5-002:020, in the Puna District on the island of Hawai'i for publication in the next available edition of the Environmental Notice.

The Department of Parks and Recreation has included copies of comments and responses that it received during the 30-day public comment period on the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI).

Enclosed is a completed OEQC Publication Form, two copies of the FEA-FONSI, and an Adobe Acrobat PDF file of the same. Simultaneous with this letter, we have submitted the completed OEQC Publication Form in a text file by electronic mail to your office.

If there are any questions, please contact James Komata at (808) 961-8311.

Sincerely,

Clayton S. Honma
Director

Enclosures

**AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (FEBRUARY 2013 REVISION)**

Project Name: Pāhoia Park Expansion Master Plan

Island: Hawai'i

District: Puna

TMK: (3) 1-5-002:020

Permits: NPDES Permit, Grubbing and Grading Permit, Building Permit, Underground Injection Control (UIC) Permit

Proposing/Determination Agency: County of Hawaii Department of Parks and Recreation, 101 Pauahi Street, Suite 6, Hilo, Hawai'i 96720-4224

Contact: James Komata, (808) 961-8311

Consultant: PBR HAWAII & Associations, Inc. 1001 Bishop Street, Suite 650, Honolulu, HI 96813

Contact: Roy Takemoto (808) 521-5631

Status (check one only):

DEA-AFNSI

Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.

FEA-FONSI

Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

FEA-EISPN

Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.

Act 172-12 EISPN

Submit the proposing agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.

DEIS

The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.

FEIS

The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

Section 11-200-23
Determination

The accepting authority simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the proposing agency. No comment period ensues upon publication in the periodic bulletin.

Section 11-200-27
Determination

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

Withdrawal (explain)

OFC. GENERAL INVESTIGATION
QUALITY CONTROL
DEC 11 11 17
PUNAHOU

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The Pāhoia Park Expansion Master Plan is a proposed expansion of an existing County park. The master plan site consists of 71.121 acres. The eastern quarter of this 71 acre parcel is currently developed with park and community facilities including an aquatic center, ball fields, a basketball court, a skate park, a Community Center and a Senior Center.

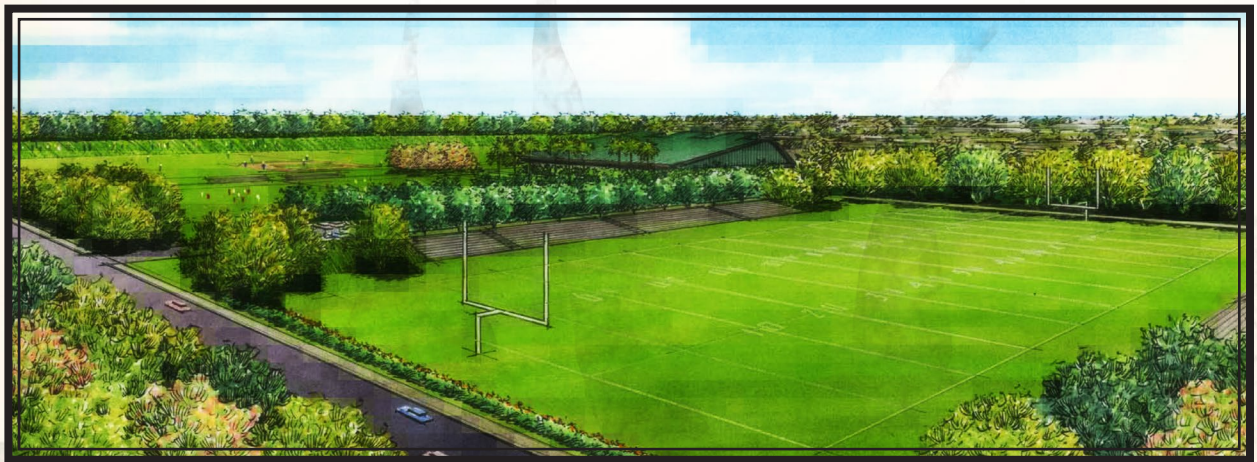
The purpose of this Pāhoia Park Expansion Master Plan is to: 1) provide improved and more diverse athletic and recreational opportunities to Pāhoia Town and the entire Puna District; 2) remedy the existing drainage problems often present at the park; and 3) provide an orderly buildout of the park with appropriate pedestrian and vehicular circulation, and adequate infrastructure to support the master plan buildout.

This master plan implements a course of action of the General Plan to “maximize the use of the Pāhoia Neighborhood Facility site to serve the recreational needs of the lower Puna area” (General Plan §12.5.1.2). The General Plan also recognizes that “cool and rainy weather requires that there be extensive covered and indoor recreational areas.” This master plan also implements an action proposed by the Puna Community Development Plan to expand the existing park and create a regional park.

Final Environmental Assessment/
Finding No Significant Impact

Pāhoā Park Expansion

Master Plan



Prepared For:
County of Hawaii
Department of Parks & Recreation

Prepared By:



December 2013

SUMMARY

Project Name:	Pāhoa Park Expansion Master Plan
Location:	Waiakahiula 2, Puna, Island and County of Hawai‘i, in Pāhoa Town
Judicial District:	Puna
Tax Map Key (TMK):	(3) 1-5-002:020
Land Area:	Approximately 71 acres
Proposing Agency:	County of Hawai‘i Department of Parks & Recreation
Landowner:	County of Hawai‘i
Existing Use:	Pāhoa Senior Center, Pāhoa Community Aquatic Center, Pāhoa Neighborhood Facility, Pāhoa Skatepark, basketball courts, baseball fields, soccer/football fields, parking, undeveloped land
Proposed Action:	The proposed Phase 1 of the master plan keeps the existing facilities, except to expand the playground, demolish the dilapidated basketball courts, and replace the multi-purpose field that currently is often not usable due to drainage problems. Phase 1 also includes new facilities: a covered play court facility for basketball and volleyball, a comfort station, and baseball fields. Future phase(s) includes an additional ballfield, track and/or multi-purpose field, community facilities such as a performing arts center, amphitheater, and library. The entire site is connected with a network of pedestrian paths, fitness stations, and picnic areas.
Current Land Use Designations:	<i>State Land Use:</i> Agricultural & Urban <i>County General Plan LUPAG:</i> Medium Density Urban & Urban Expansion <i>County Zoning:</i> A-1a (Agricultural) & RS-10 (Residential) <i>Special Management Area:</i> Not in SMA
Major Approvals Anticipated:	Plan Approval Grubbing and Grading Permit Building Permit National Pollutant Discharge Elimination System (NPDES) Permit Underground Injection Control (UIC) Permit DCAB Approval Possible Special Permit for Future Phase of Project depending on location, design, and function of proposed community building

Potential Impacts and Mitigation Measures:

The expanded recreational facilities will significantly benefit the growing population of lower Puna. Although the project objectives have an emphasis on active recreational facilities for youth activities, alternative site plans sought to include a balance of passive, fitness, and community facilities for all users. The rainy climate justifies a covered multi-purpose facility. The site design includes open areas that would function as drainage basins. Parking and other impermeable surfaces were minimized. Since the Project Site was not likely settled by pre-contact native Hawaiians due to its remote upland location, and previously cleared for sugar cane, no significant historic or archaeological sites were identified. The vegetation in the undeveloped portion of the Site is dominated by non-native species; no threatened or endangered plant species were found. Although zoned agricultural, the agricultural suitability ratings are LSB D or unclassified (i.e., not agriculturally significant).

The following mitigation measures should be implemented:

- Appropriate measures during construction as recommended by the USFW to avoid impact to the Hawaiian hoary bat;
- Typical use during Phase 1 may require manual traffic controls at the Pāhoa Village Road and Kauhale Street intersection during the afternoon weekday peak hour (e.g., crossing guards and/or police officers directing traffic). However, future connectors (e.g., extension of Post Office Road) may reduce or change mitigation requirements. At full buildout of the Project, a traffic signal may be warranted to accommodate the projected traffic increase;
- To minimize noise impacts, all night activities should end no later than 11:00 p.m.;
- Include in the construction contract standard construction mitigation measures for erosion and sedimentation controls, noise control, dust control, and stop-work and notice for any inadvertent archaeological finds.

The Project Site is located in the lava flow hazard zone 2, similarly to all of Pāhoa Village, but this is an unavoidable impact offset by the significant beneficial impacts.

Determination:

Finding of No Significant Impact

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LIST OF ACRONYMS AND ABBREVIATIONS

ALISH	Agricultural Lands of Importance to the State of Hawai‘i
DOE	State Department of Education
DOH	State Department of Health
DOT	State Department of Transportation
DLNR	State Department of Land and Natural Resources
DPR	County Department of Parks and Recreation
DPW	County Department of Public Works
CWRM	State Commission on Water Resource Management
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
GPD	Gallons per Day
GPM	Gallons per Minute
HAR	Hawai‘i Administrative Rules
HCC	Hawai‘i County Code
HHSAA	Hawai‘i High School Athletic Association
HRS	Hawai‘i Revised Statutes
HVNP	Hawai‘i Volcanoes National Park
LSB	Land Study Bureau
NGPC	Notice of General Permit Coverage
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Natural Resources Conservation Service
SMA	Special Management Area
SO ₂	Sulfur Dioxide

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1 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Chapter 343, Hawai‘i Revised Statutes (HRS) for the proposed Pāhoa Park Expansion Master Plan in Pāhoa, Puna, Island and County of Hawai‘i, State of Hawai‘i. The use of County lands and funds triggers compliance with Chapter 343.

1.1 LANDOWNER

The County of Hawai‘i is the landowner. The County of Hawai‘i also operates and maintains the existing recreational facilities at Pāhoa Park.

1.2 PROPOSING/DETERMINING AGENCY

The County of Hawai‘i Department of Parks & Recreation is the proposing agency.

Contact: County of Hawai‘i Department of Parks & Recreation
ATTN: James Komata, Park Planner
Aupuni Center
101 Pauahi Street, Suite 6
Hilo, Hawai‘i 96720
Phone: (808) 961-8311
Fax: (808) 961-8411

1.3 ENVIRONMENTAL CONSULTANT

The environmental planning consultant is PBR HAWAII & Associates, Inc.

Contact: Roy Takemoto, Managing Director, Hilo Office
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813
Telephone: (808) 521-5631
Fax: (808) 523-1402

1.4 STUDIES CONTRIBUTING TO THIS EA

The information contained in this report has been developed from site visits, generally available information regarding the characteristics of the site and surrounding areas, and technical studies. Technical studies are provided as appendices to this EA. These studies include:

- Preliminary Engineering Report
- Flora and Fauna Survey
- Archaeological Inventory Survey
- Cultural Impact Assessment
- Transportation Impact Analysis Report

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2 PROJECT DESCRIPTION

2.1 BACKGROUND INFORMATION

2.1.1 Location and Property Description

The Pāhoa Park Expansion Master Plan is a proposed expansion of an existing County park located near the intersection of Pāhoa Village Road and Kauhale Street, in the ahupua‘a of Waiakahiula 2, town of Pāhoa, District of Puna, Island and County of Hawai‘i (Figure 1). The master plan site (“Project Site”) is identified as TMK (3) 1-5-002:020, consisting of 71.121 acres) as shown on Figure 2.

The eastern quarter of this 71 acre parcel is currently developed with park and community facilities including an aquatic center, ball fields, a basketball court, a skate park, a Community Center and a Senior Center (Figure 3). The balance of the Project Site consists of forested grasslands. Primary vehicular access to the Project Site is from Kauhale Street to the south of the Kauhale Street/Pāhoa Village Road intersection.

2.1.2 Project History

The ‘Ōla‘a Sugar Company, established in 1899, soon became the largest sugarcane plantation and milling operation in the Puna District. The project area parcel is a portion of a larger area of ‘Ōla‘a Sugar Company sugarcane fields in the Pāhoa area. This particular region of sugarcane fields is recorded on a 1906 Hawai‘i Territory Survey Map. The sugarcane fields are also clearly visible on a USDA aerial photo taken in February of 1965. There are no records of house lots or other types of land use, other than sugarcane agricultural lots, on the project area parcel (Escott, 2013).

Originally, the County Park in Pāhoa consisted of just the neighborhood center and parking lot. The County purchased additional land from the Roman Catholic Church to add the existing outdoor facilities including the courts, ballfields, comfort station, and skatepark. The purchased land increased the total area for the park to approximately nine acres. The purchased area was formerly used as a cinder quarry. As a quarry, the site had highly varied topography evidenced by the terracing of the existing ballfield area (Aotani & Associates, Inc., undated).

In the late 1990’s to early 2000, the County purchased approximately three acres from the Roman Catholic Church and HELCO, and consolidated and resubdivided the purchased area into the park site to construct the existing aquatic facilities (Terry, 1996).

In 2002, the County used State funds to purchase additional land from the Roman Catholic Church to increase the park site from 15.121 acres to its present 71.121 acres, thereby setting the stage for this proposed park expansion master plan.

2.1.3 Surrounding Land Uses and Ownership

Single-family residential use and zoning (RS-15) borders the northern boundary of the Project Site. Commercial use-- including banks, restaurants, convenience and specialty stores-- borders the northeast boundary of the Project Site with the shop fronts facing onto Pāhoa Village Road. To the east of the Project Site along Kauhale Street is Nani O Puna, a multi-family affordable rental housing complex. To the west and south of the Project Site is largely undeveloped pastures and forest in agricultural zoning (A-1a and A-5a) owned by the Roman Catholic Church (Figure 4). Except for the Roman Catholic Church, the lands surrounding the Project Site are not owned by large major landowners.

Although not immediately adjacent to the Project Site, the County's Pāhoa Transfer Station is located to the west of the Project Site along Cemetery Road. Cemetery Road connects to Apana Street and Kaohe Homestead Road to create a loop road system that connects to Pāhoa Village Road. An unimproved 50'-wide road and utility easement connects the Project Site to Cemetery Road on land owned by the Roman Catholic Church.

2.2 PURPOSE AND NEED

The Puna District is the fastest growing district in the County. As a district park, this park is intended to serve the recreational needs of the entire district, particularly lower Puna. Because of the lack of ball fields, youth sports teams must often use the facilities in Hilo. The need is exacerbated by the soggy condition of the existing playfields at the Pāhoa Park due to drainage problems. The purpose of this Pāhoa Park Expansion Master Plan includes: 1) provide improved and more diverse athletic and recreational opportunities to Pāhoa Town and the entire Puna District; 2) remedy the existing drainage problems often present at the park; and 3) provide an orderly buildout of the park with appropriate pedestrian and vehicular circulation, and adequate infrastructure to support the master plan buildout.

This master plan implements a course of action of the General Plan to "maximize the use of the Pāhoa Neighborhood Facility site to serve the recreational needs of the lower Puna area" (General Plan §12.5.1.2). The General Plan also recognizes that "cool and rainy weather requires that there be extensive covered and indoor recreational areas." This master plan also implements an action proposed by the Puna Community Development Plan to expand the existing park and create a regional park.

Figure 1: Regional Location

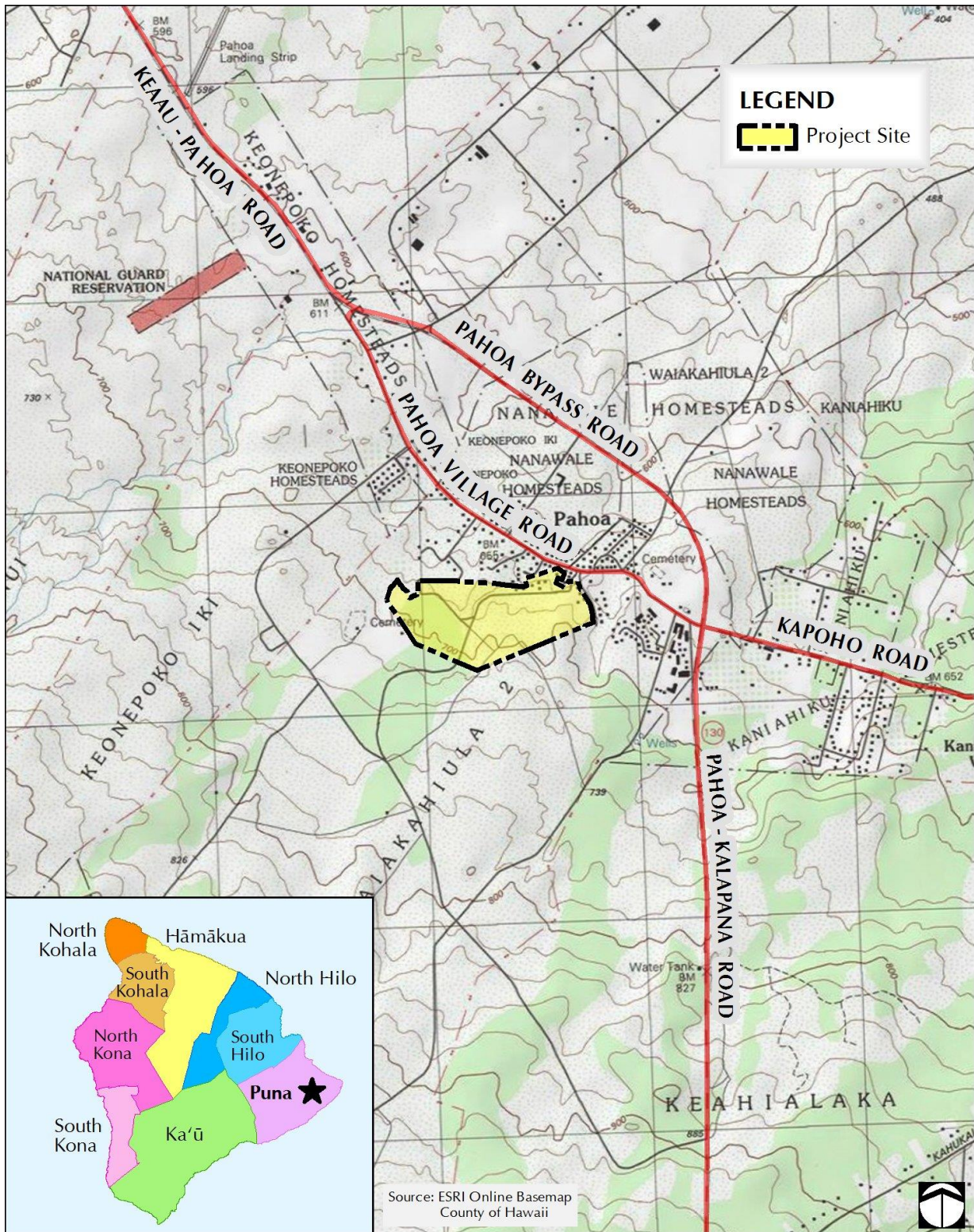


Figure 3: Site Photographs



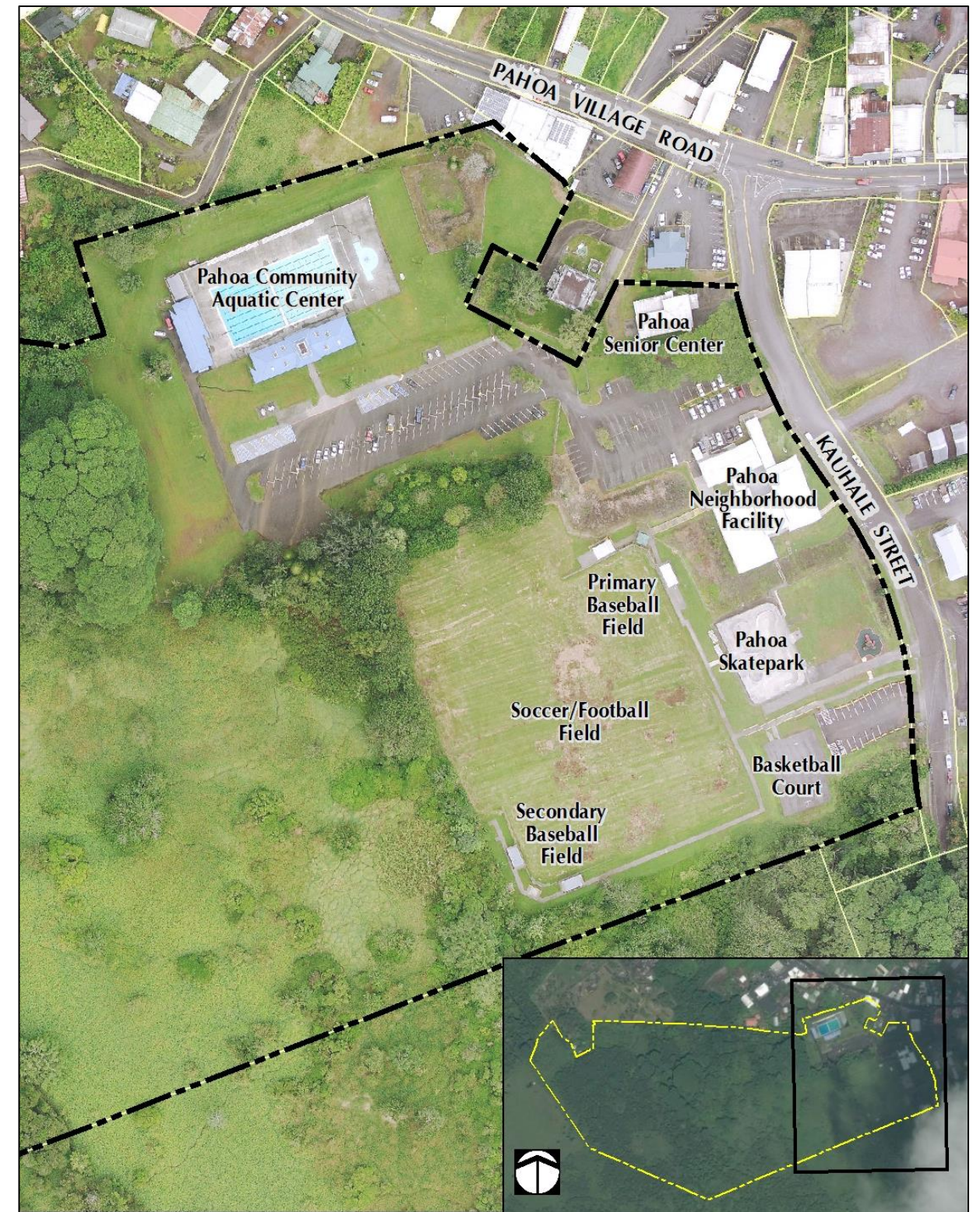
View from ballfield of existing access and parking lot that connects to aquatic facilities.



Skatepark



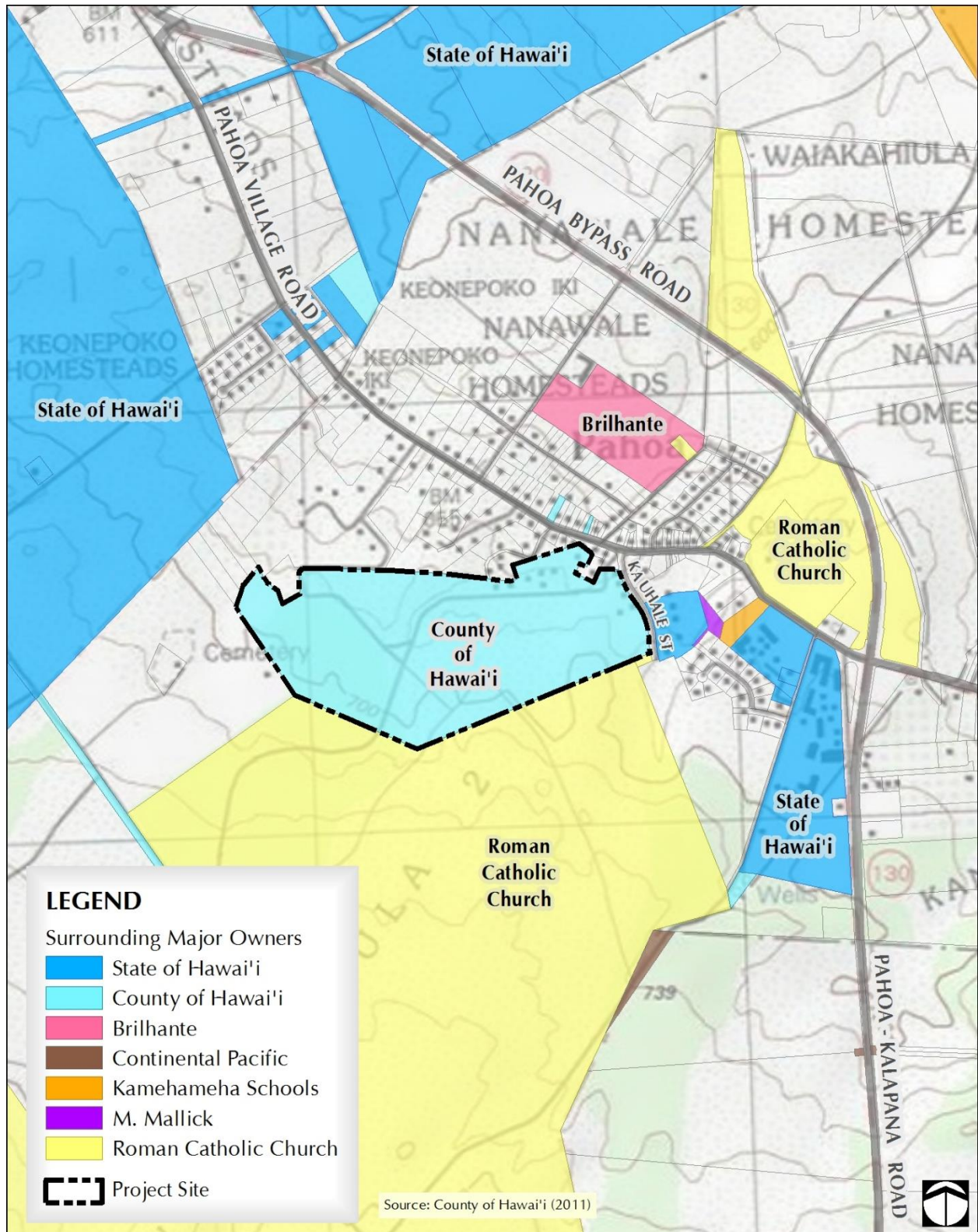
Stairway to access terraced fields



Aerial photograph of existing facilities

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Figure 4: Surrounding Land Uses



2.3 MASTER PLAN FOR PARK EXPANSION

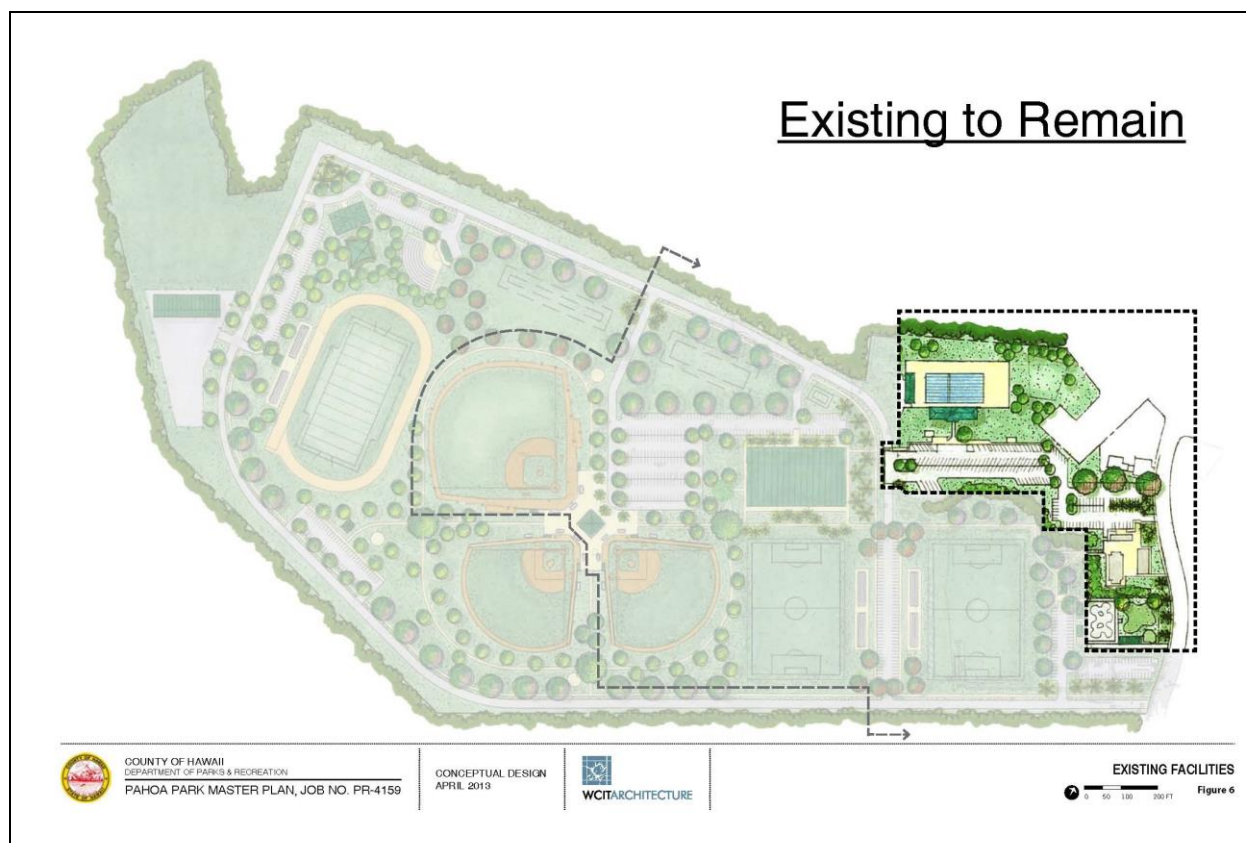
2.3.1 Plans for Existing Facilities

The existing Pāhoā Park consists of:

- Senior center (Pāhoā Senior Center)
- Swimming pool (Pāhoā Community Aquatic Center)
- Community center (Pāhoā Neighborhood Facility)
- Skatepark
- Playground
- Basketball courts
- Multi-purpose field for baseball, soccer, and football.

The master plan will maintain and add to these existing facilities. The playground would be expanded. The multi-purpose field will be replaced since it is often not usable due to drainage problems. The existing basketball courts are dilapidated and will be demolished (Figure 5).

Figure 5. Existing Facilities to Remain



2.3.2 Proposed Facilities

Pāhoa Park will become a district park. A district park has facilities such as: “gymnasium with office, storage, restrooms, showers; a center for community and recreational programs; swimming pool (if justifiable); play area and equipment for young children; courts for basketball, tennis, and volleyball; ballfields for soccer, baseball, softball, and football; night lights; and an adequate parking area” (General Plan §12.4). In lieu of a gymnasium, the master plan includes a covered multi-purpose facility.

The features of the master plan, which could be updated in the future to respond to changing needs, include (Figure 6):

- Playfields (Figure 7)
 - Multi-purpose fields (2) for football, soccer, and other open field sports (e.g., rugby) (Figure 8)
 - Baseball fields (3) of varying sizes to meet different age group or skill level standards (e.g., pony league standard, high-school standard) (Figure 9)
 - Optional track and field (1)-400m track or additional multi-purpose field.
 - Archery range
- Facilities & Restrooms (Figure 10)
 - Covered multi-purpose facility with courts (3) for basketball, volleyball, other court sports (Figure 11)
 - Community facilities such as Amphitheater (1), Community Library and/or Performing Arts Center
 - Maintenance facility
 - Restrooms—near skateboard park, near playground and picnic area, with scorer’s box at baseball fields, at track & field, within community center, within covered court
 - Scorer's booth (1) at baseball fields
- Playgrounds, Fitness Stations, & Picnic Areas (Figure 12)
 - Expanded existing playground and three new playgrounds
 - Fitness stations (2) along internal pedestrian pathways
 - Covered pavilions and picnic areas
- Pedestrian & Bicycle Paths (Figure 13)
 - Spine and internal pedestrian paths
 - Perimeter bicycle & pedestrian path
- Vehicular Circulation & Parking (Figure 14)
 - Perimeter access road
 - Parking
 - Formal Parking—skateboard/playground (77 stalls), multi-purpose fields (86 stalls), picnic area (56 stalls), amphitheater & community center (108 stalls), covered court and baseball (247 stalls).
 - Informal Parking (e.g., grassed areas) -- approximately 925 stalls.

2.3.3 Anticipated Operations

The anticipated typical usage of the existing and master planned facilities is summarized in Table 1 by weekday vs. weekend, morning vs. afternoon vs. night, and special events (“S”).

Table 1. Anticipated Typical Usage of Facilities

Facility	Weekday			Weekend		
	Morning	Afternoon	Night	Morning	Afternoon	Night
Senior Center	x	x				
Community Center	x	x	x	x	x	x
Swimming Pool	x	x		x	x	
Skatepark		x		x	x	
Playgrounds & Picnic Areas		x		x	x	
Covered Court		x		x	x	x
Baseball fields		x		S	S	S
Multi-purpose fields		x		S	S	S
Track & field		x		S	S	
Archery range	x	x		x	x	
Community library	x	x	x	x	x	S
Amphitheater		x	x	x	x	S
Pedestrian paths & fitness stations	x	x		x	x	

Figure 6. Conceptual Master Plan



COUNTY OF HAWAII
DEPARTMENT OF PARKS & RECREATION
PAHOA PARK MASTER PLAN, JOB NO. PR-4159

CONCEPTUAL DESIGN
APRIL 2013



WCITARCHITECTURE

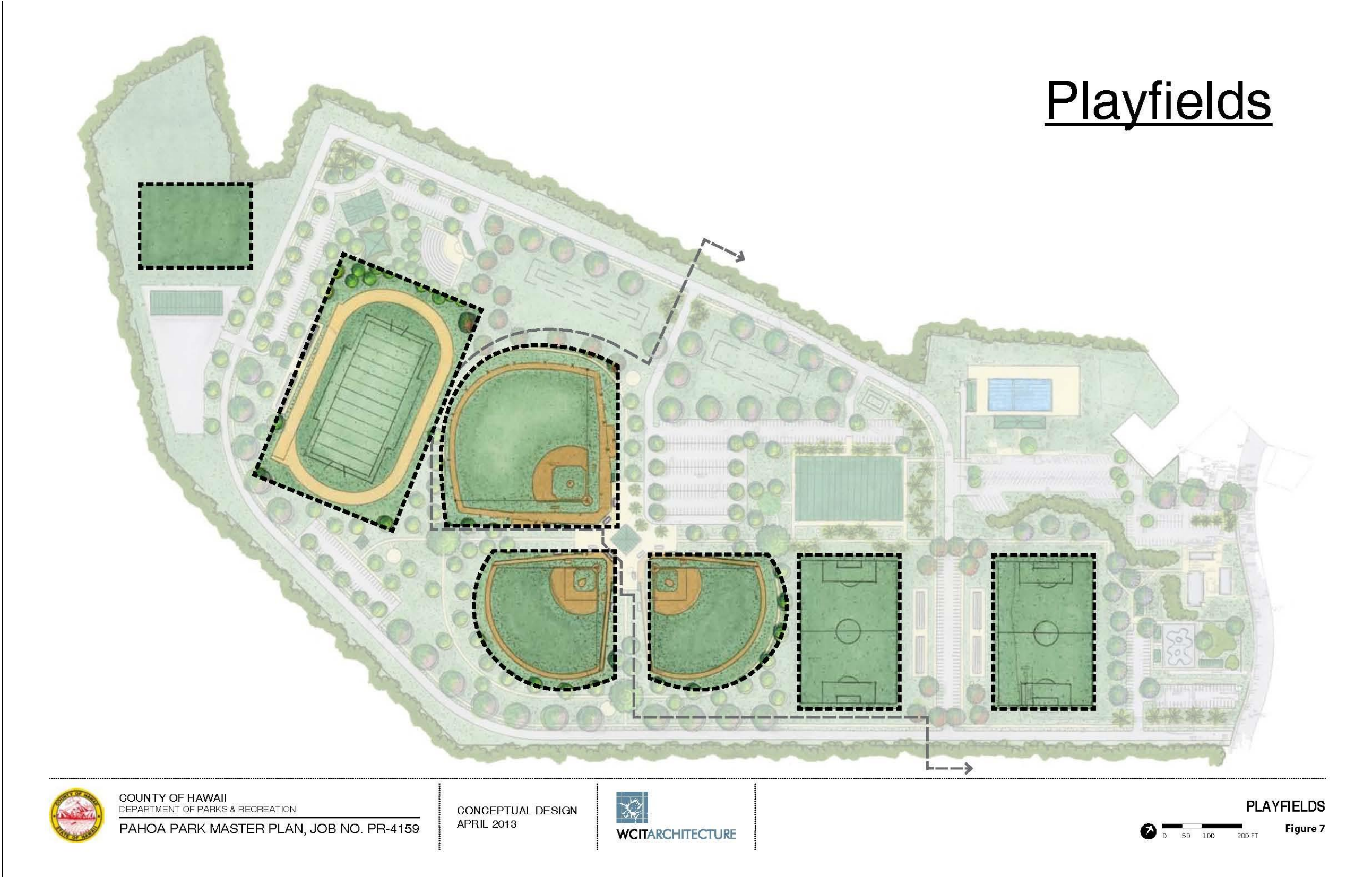
CONCEPTUAL MASTER PLAN



Figure 1

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Figure 7. Playfields



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Figure 8. Artist's Concept of Multi-Purpose Field



Figure 9. Artist's Concept of Baseball Field



Figure 10. Facilities & Restrooms

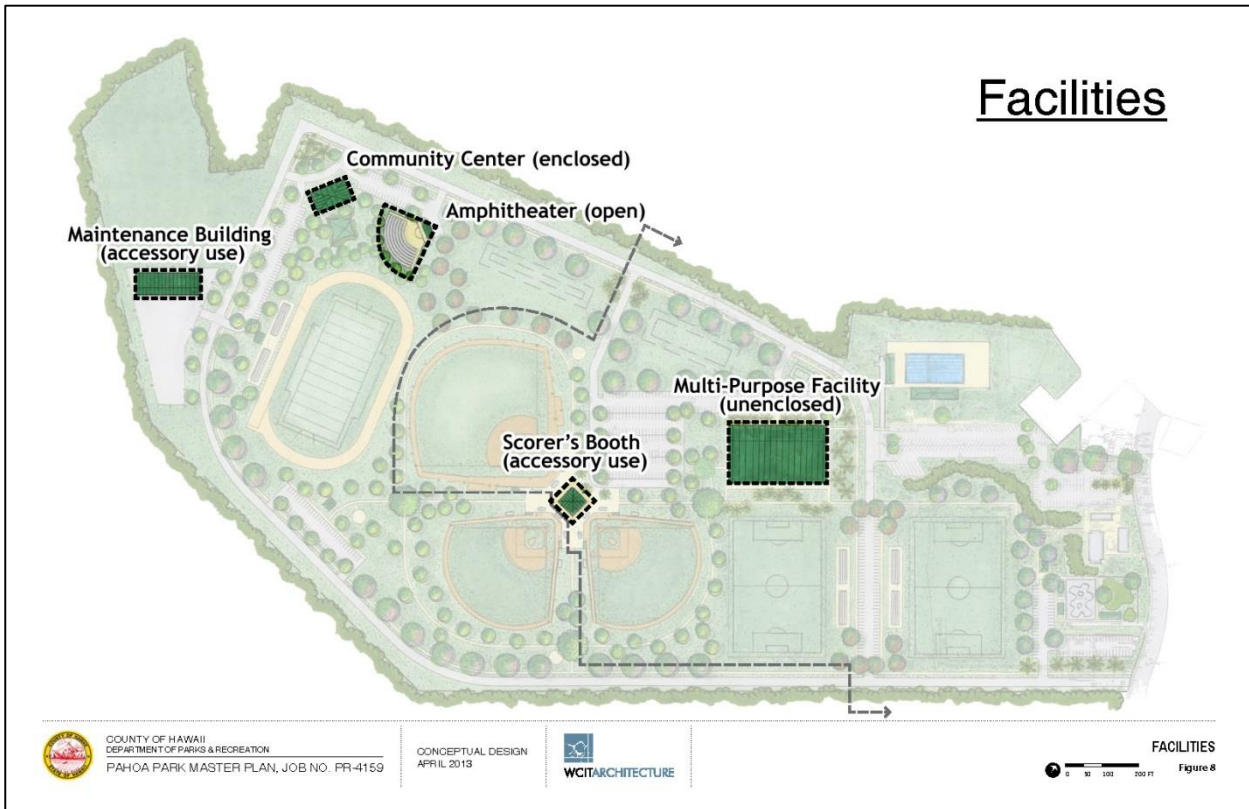


Figure 11. Artist's Concept of Multi-Purpose Covered Court



Figure 12. Playgrounds, Fitness Stations, and Picnic Areas

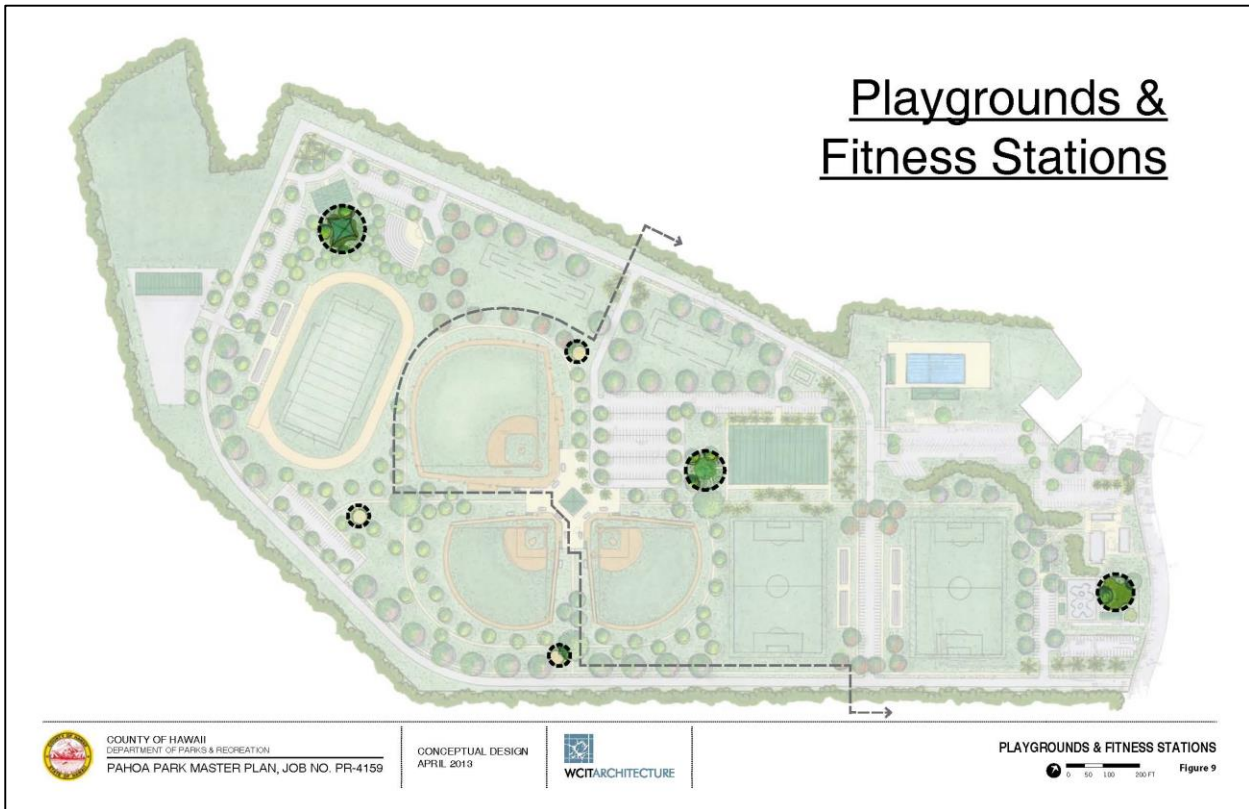


Figure 13. Pedestrian & Bicycle Paths

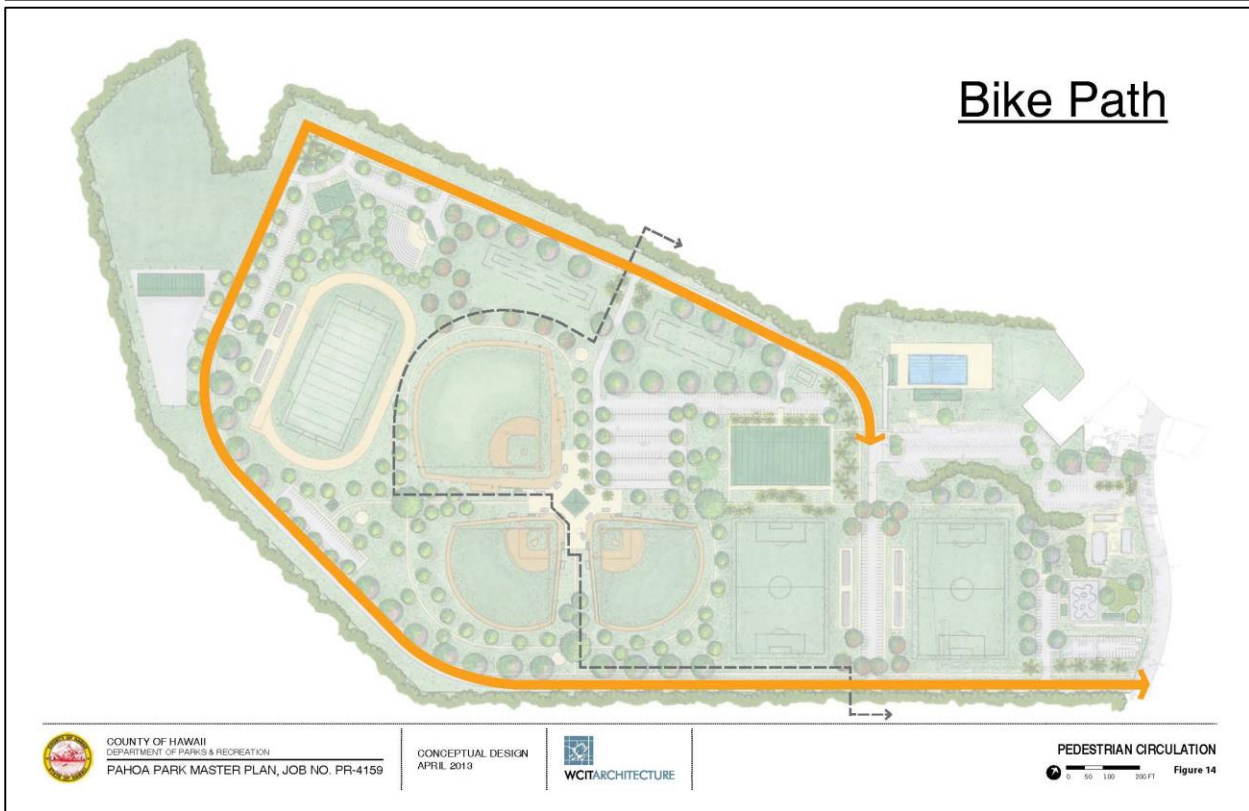
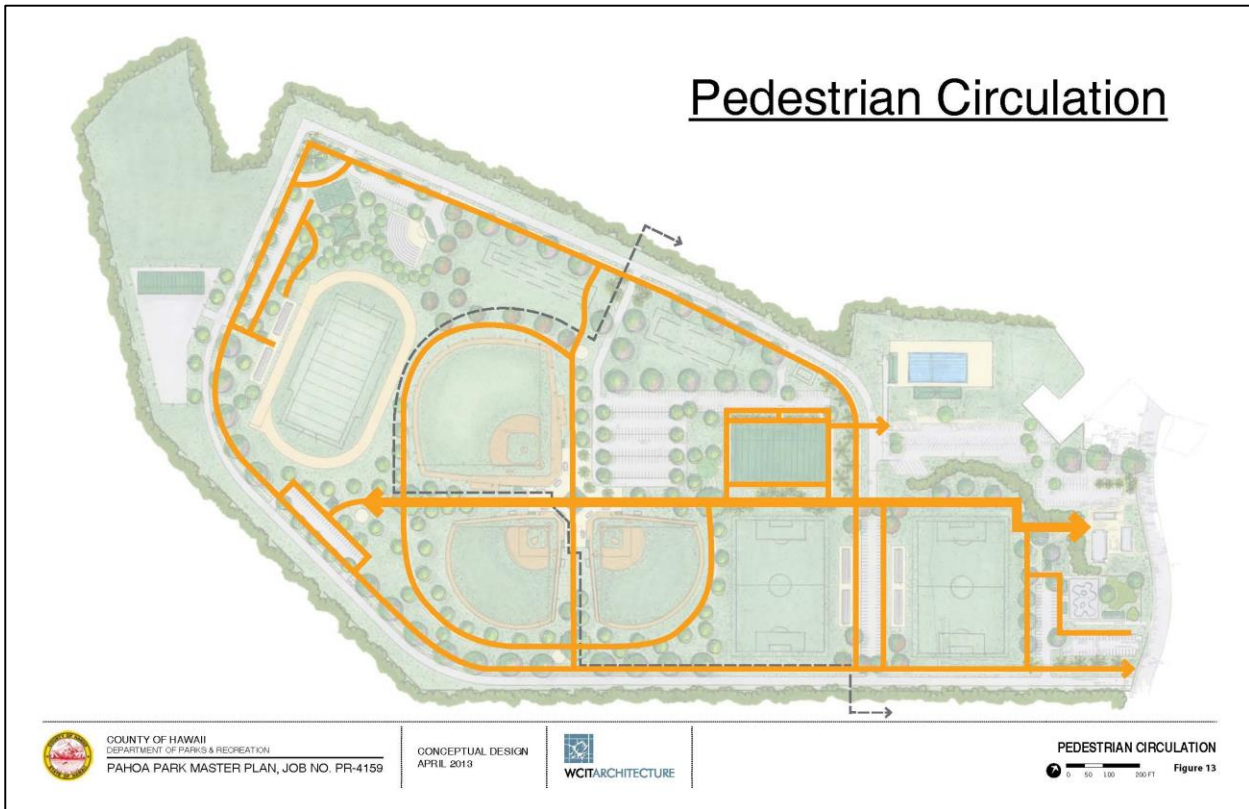
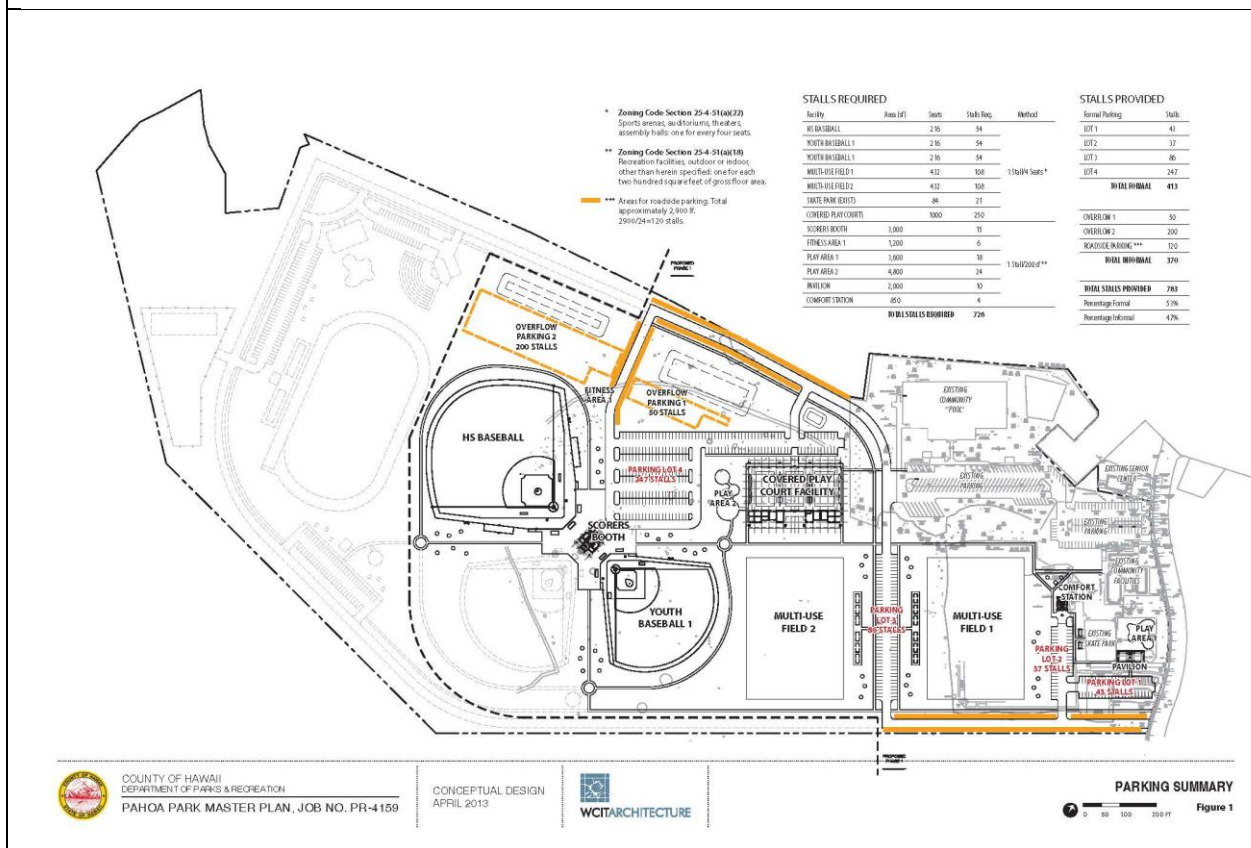
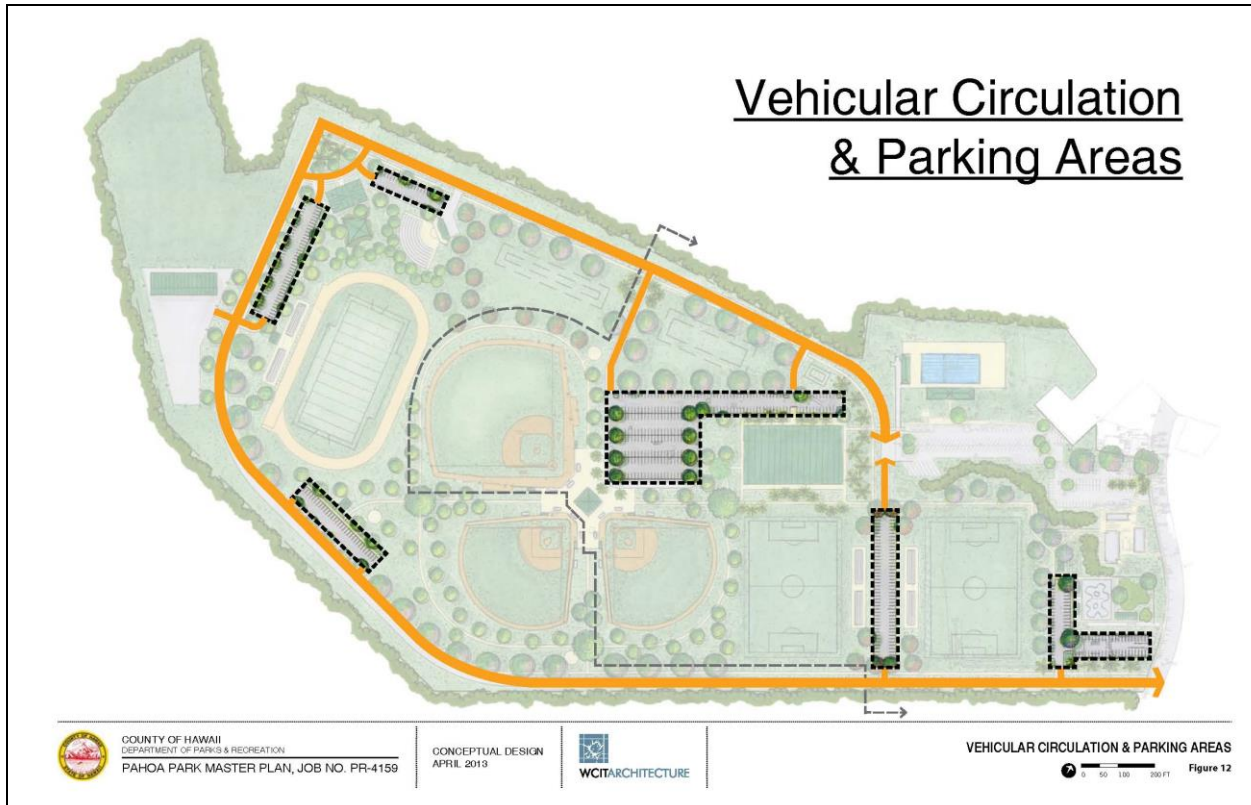


Figure 14. Vehicular Circulation & Parking



2.4 SUSTAINABLE PLANNING AND DESIGN

Since the project consists primarily of outdoor fields, sustainable building certifications such as Leadership in Energy and Environmental Design (LEED), are not readily applicable to this project. The project will apply other sustainable site design principles such as minimizing paved parking and using drainage systems that promote infiltration over runoff.

2.5 DESIGN PROCESS

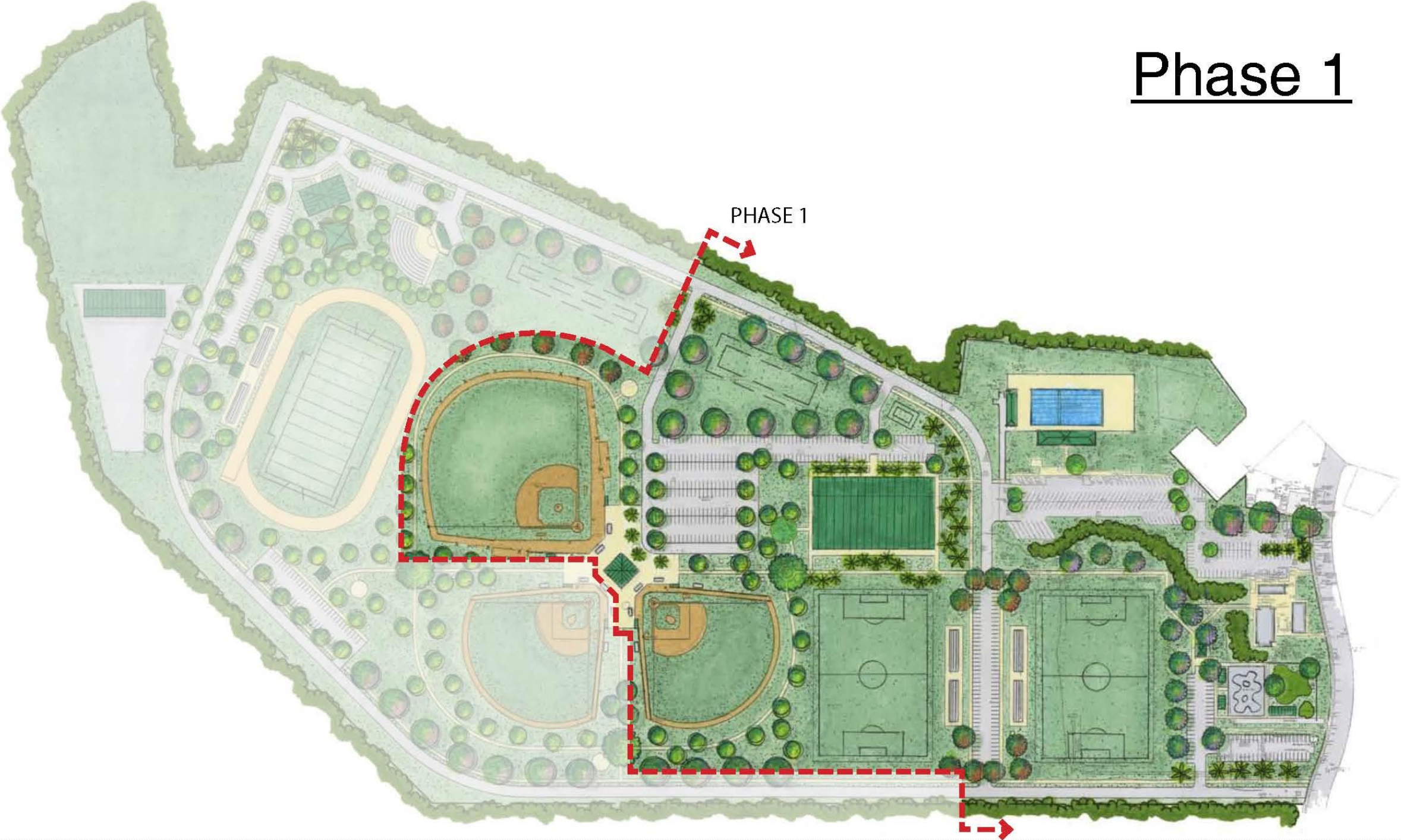
The selected architectural firm for the Project is WCIT Architecture. The architect and County held several meetings with the community. The first meeting was held in February 2012 to kick off the master planning process; a second meeting in September 2012 to obtain feedback to a draft master plan; and a third meeting in April 2013 to discuss the revised master plan presented in this EA. The comments from the key second meeting are compiled as Appendix G.

2.6 PHASING AND ESTIMATED COSTS

The total estimated cost is \$54 million. The master plan would be built in phases. The first phase, estimated at \$25.34 million would include: two ballfields, covered court, two multi-purpose fields, an expanded existing playground and a new playground, one fitness station, and three new restrooms (near skatepark, within covered court, and scorer's box area) (Figure 15). The future phase would remain in its natural state. Phase 1 of the project is estimated to start in the second quarter of 2014, with completion in approximately 12-14 months; the schedule for the future phase(s) has not yet been determined.

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Figure 15. Phasing Plan



Phase 1

PHASE 1



COUNTY OF HAWAII
DEPARTMENT OF PARKS & RECREATION
PAHOA PARK MASTER PLAN, JOB NO. PR-4159

CONCEPTUAL DESIGN
APRIL 2013



CONCEPTUAL MASTER PLAN
0 50 100 200 FT Figure 5

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3 DESCRIPTION OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes existing conditions of the natural environment, Project’s potential impacts and mitigation measures to minimize impacts.

3.1 CLIMATE

The average monthly low temperatures ranges from 62 to 67 degrees Fahrenheit, while the average monthly high temperatures ranges from 80 to 84 degrees Fahrenheit, with the coolest temperatures occurring in January and the warmest month occurring in September. On average, Pāhoa experiences the lowest amount of rainfall (averaging 7.40 inches) in June while the maximum average precipitation occurs in November (approximately 17.0 inches).

Located along the east coast of Hawai‘i Island, Pāhoa is well-ventilated nearly year round. Pāhoa’s climate is significantly influenced by the high mountains of Mauna Loa and Mauna Kea, which modify the trade winds. Mean annual wind speed at the Hilo airport—about 20 miles to the north—is about 8 mph, which is lower than many windward locations in the state. Northeast trade winds typically occur during the daytime, while winds from the southwest typically occur during the nighttime due to cold air drainage from the mountains. Winds from the south or southwest occur occasionally during winter storms.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The wet climate requires the design to address proper drainage, covered all-weather play areas, and all-weather surfacing for pedestrian paths. Construction documents should specify best practices for erosion and sedimentation control.

3.2 GEOLOGY AND TOPOGRAPHY

Hawai‘i Island was formed by five volcanoes – Kōhala, Hualālai, Mauna Kea, Mauna Loa, and Kīlauea and only Mauna Loa and Kīlauea are presently considered active. The other three are considered dormant. There is also a young volcano, Lō‘ihi Seamount, located 35 miles directly south of Kīlauea and 25 miles off of the coast below sea level.

Mauna Loa is located approximately 40 miles west of Pāhoa. It is nearing the end of the shield stage and rises to 13,340 feet. Eruptions are rare, with three occurring in the last 50 years.

Kīlauea has been continuously active throughout recorded history. It has erupted frequently and almost continuously since 1983. Kīlauea is located approximately 20 miles west of Pāhoa. Both volcanoes have northeast and southwest rift zones where land is slipping towards the ocean, generating both small and large earthquakes. The Project Site is located approximately 2 miles above the southwest rift zone in a relatively high hazard volcanic zone (Figure 20).

Elevations across the Project Site range from approximately 660 feet to 700 feet above mean sea level with slopes of generally five to ten percent. The existing ballfield is on a terrace that will be incorporated into the master plan (Figure 16).

POTENTIAL IMPACTS AND MITIGATION MEASURES

The proposed master plan minimizes grading. The grading of the Site will be in conformance with the Hawai‘i County Grading Ordinance. To minimize potential impacts, necessary grading will be segmented and exposed areas will be immediately grassed or landscaped before commencement of grading in the next phase, in compliance with Chapter 10 (Erosion and Sedimentation Control) of the Hawai‘i County Code.

The grading will follow Best Management Practices (BMPs) as described in the National Pollutant Discharge Elimination System (NPDES) Permit. The contractor will submit a site specific construction BMP Plan to the State DOH before grading commences.

3.3 SOILS

There are three soil suitability studies prepared for lands in Hawai‘i whose principal focus has been to describe the physical attributes of land and the relative productivity of different land types for agricultural production; these are: 1) the U.S. Department of Agriculture Natural Resource Conservation Services (NRCS) Soil Survey; 2) the University of Hawai‘i Land Study Bureau (LSB) Detailed Land Classification; and 3) the State Department of Agriculture’s Agricultural Lands of Importance to the State of Hawai‘i (ALISH) system. According to all of these studies, the Project Site has poor suitability for agriculture.

3.3.1 Natural Resource Conservation Service Soil Survey

The NRCS Soil Survey for the Island of Hawai‘i, classifies most of the soil on the Project Site as Keaukaha extremely rocky muck (rKFD) and some as Olaa extremely stony silty clay loam (OID), (Figure 17).

Keaukaha extremely rocky muck, 6 to 20 percent slopes (rKFD), occurs on gently to greatly sloping uplands and consists of well-drained muck soils developed in organic matter and volcanic ash. The surface layer is very dark brown extremely rocky muck about 8 inches thick and underlain by pāhoehoe lava. Permeability is very slow over pāhoehoe lava, runoff is rapid, and the erosion hazard is slight. Keaukaha soils are used primarily for forest and pasture. Capability classification is VIs, nonirrigated.

Figure 16: Topography

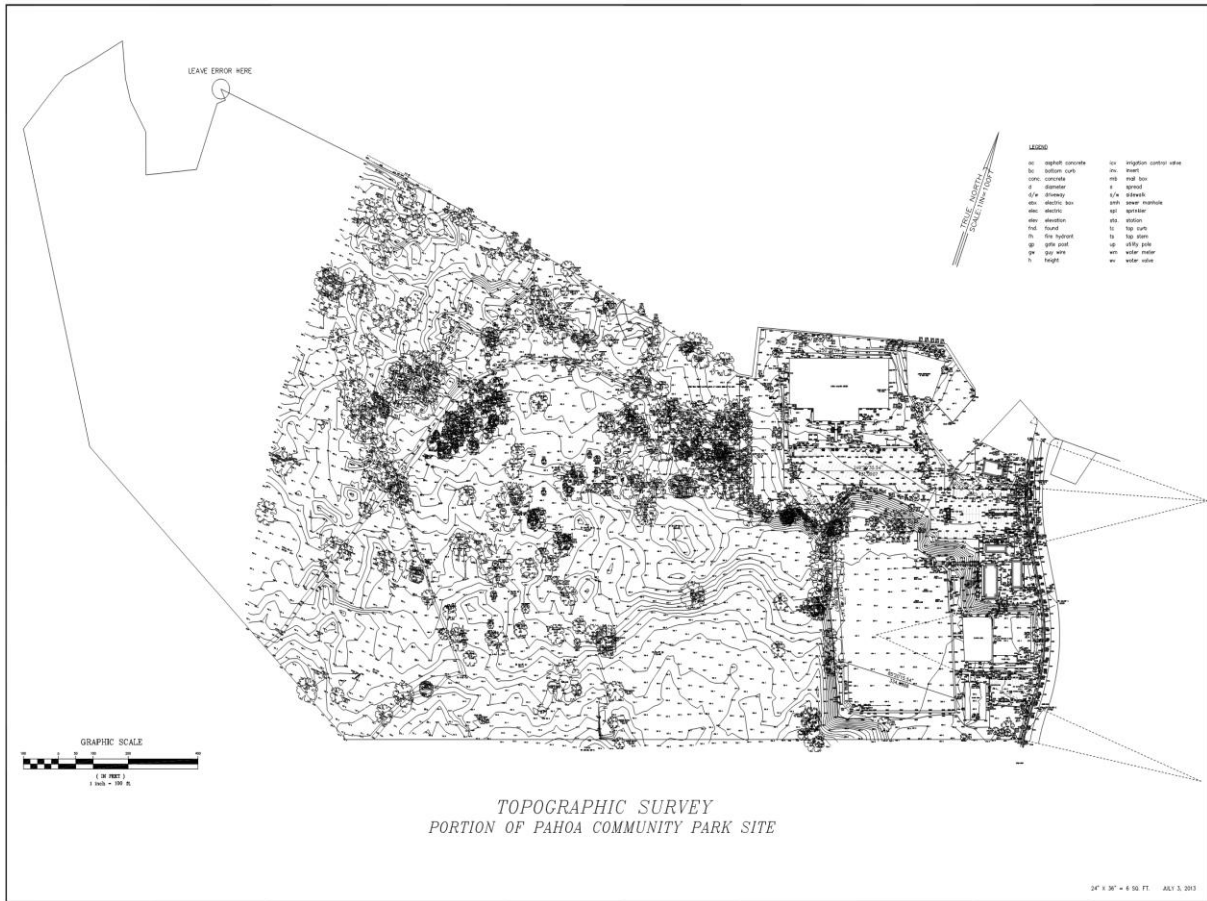
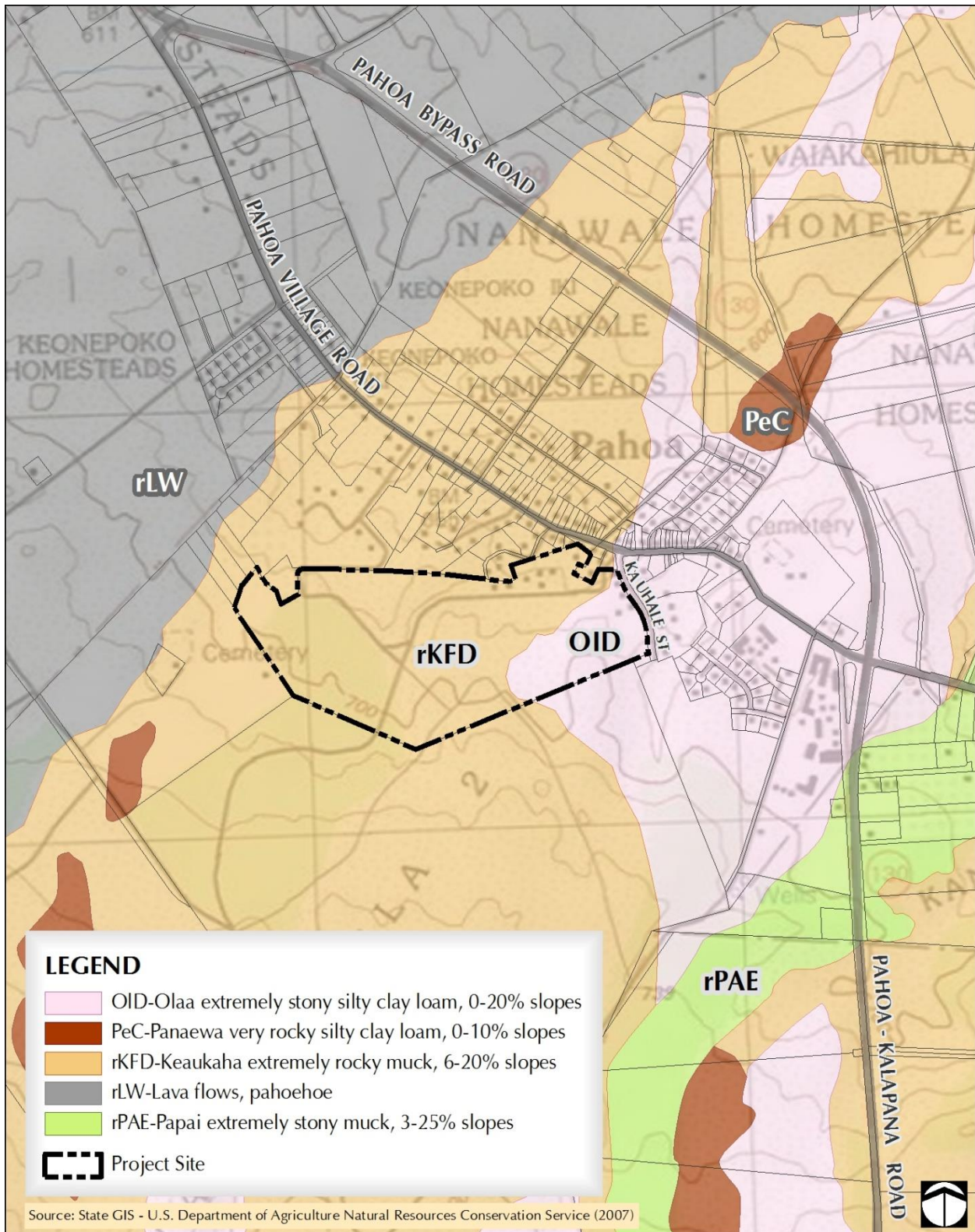


Figure 17: NRCS Soil Survey



Olaa extremely stony silty clay loam, 0 to 20 percent slopes (OID), occurs on uplands at an elevation ranging from 200 to 1,000 feet and receives from 100 to 175 inches of rainfall annually. The soil consists of well-drained silty clay loams that formed in volcanic ash. The surface layer is very dark brown extremely stony silty clay loam about 16 inches thick. The subsoil is dark brown extremely stony silty clay loam about 9 inches thick and it is underlain by a'a lava. The soil dehydrates irreversibly into gravel-size aggregates. Permeability is rapid, runoff is slow, and the erosion hazard is slight. Roots penetrate to the fragmental a'a lava. Olaa soils are used primarily for sugarcane. Capability classification is VIIs, nonirrigated.

3.3.2 LSB Detailed Land Classification and Agricultural Lands of Importance to the State of Hawai'i

The University of Hawai'i LSB document, Detailed Land Classification, Island of Hawai'i, classifies soils based on a productivity rating. Letters indicate class of productivity with "A" representing the highest class and "E" the lowest. Within the Project Site, most of the land is classified "D" ("very poor"), with some portions "Unclassified". The ALISH system classifies agricultural lands as "Prime," "Unique," or "Other" lands. Neither the ALISH or LSB classification system identifies the land within Pāhoa town, including the Project Site, as suitable agricultural land (Figure 18).

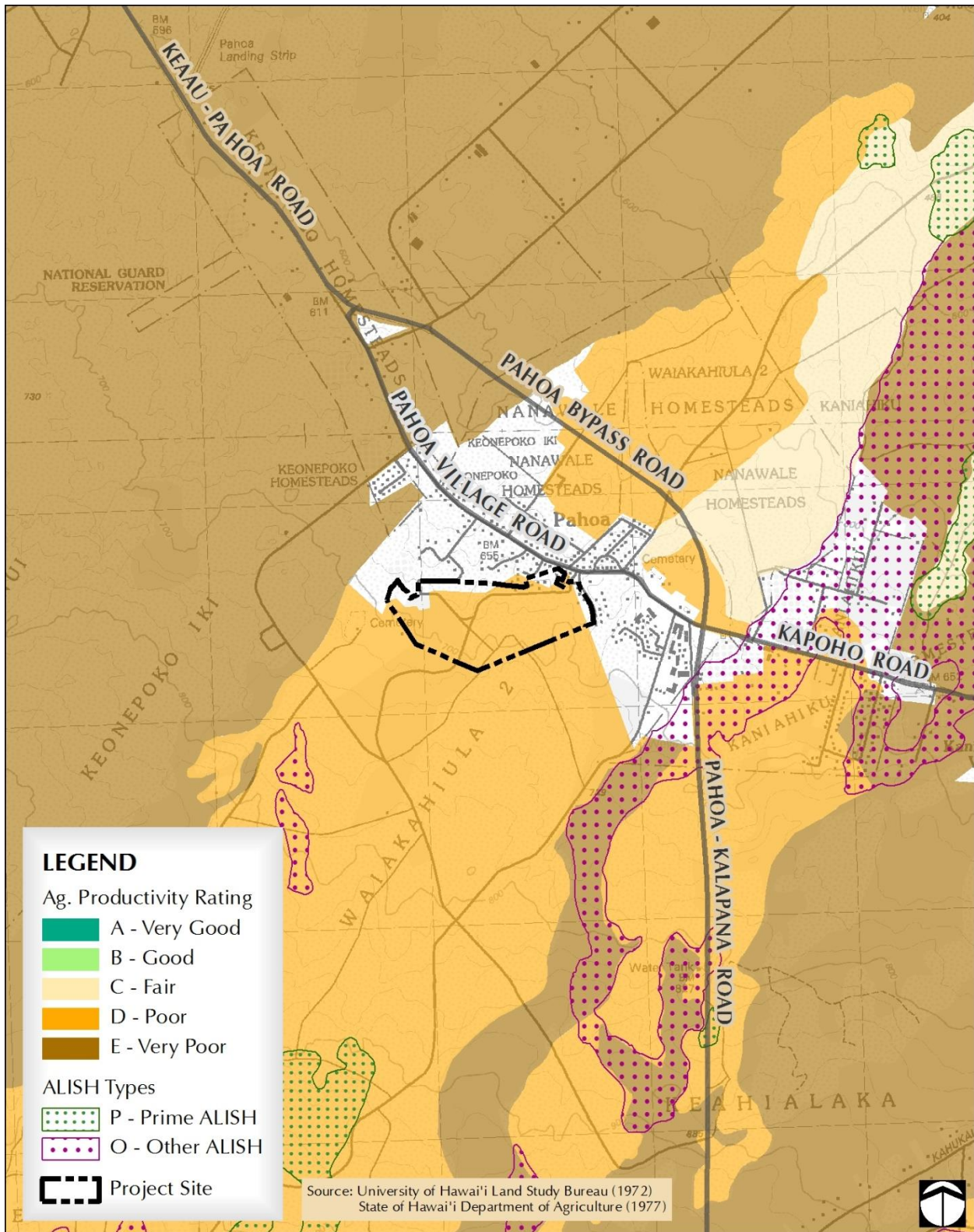
POTENTIAL IMPACTS AND MITIGATION MEASURES

Construction of Pāhoa Park Expansion Master Plan will not reduce the inventory of agriculturally significant land. The Project Site has a NRCS capability classification of VIs and VIIs, meaning both have very severe limitations that make them unsuited to cultivation. VI limits their use mainly to pasture, range, forestland, or wildlife good and cover. VII restricts their use mainly to grazing, forestlands, or wildlife. The subclass (s) explains the soil limitations within rooting zone including shallowness, stones, low moisture-holding capacity, low fertility difficult to correct, and salinity or sodium. The Project Site is classified D (Poor) primarily and unclassified in small areas by the LSB classification. Also, the entire Project Site is unclassified under the ALISH system, indicating that the Project Site is not agriculturally significant.

Impacts to the soils of the Site include the potential for soil erosion and the generation of dust during grading and construction, although the NRCS rates both soils as presenting "slight" erosion hazards. All construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control. As typically required for projects on land greater than one acre in size, a NPDES Notice of General Permit Coverage (NGPC) for Storm Water Associated with Construction Activity will be necessary.

To minimize potential impacts, necessary grading will be segmented and exposed areas will be immediately grassed or landscaped before commencement of grading in the next phase, in compliance with the Chapter 10 (Erosion and Sedimentation Control) of the Hawai'i County Code.

Figure 18: Agricultural Suitability



3.4 HYDROLOGY

The aquifer in the Puna District is believed to contain huge flows of high quality ground water even at very low elevations, due to the permeability of the soil types and the extensive forested watershed. The underlying fresh water basal lens floats or flows on sea water. The basal lens has been measured to reach up to 30 feet above sea level and the lens thickness is estimated up to 1,200 feet.

The State Commission on Water Resource Management (CWRM) established an aquifer coding system to characterize groundwater resources in Hawai‘i. Based on the CWRM’s coding system, the Project Site overlies the Pāhoa Aquifer System of the Kīlauea Aquifer Sector. The system extends to the east from the summit of Kīlauea and generally bound in north by Māmalahoa Highway. Sustainable yield is the amount of groundwater that can be pumped without depleting the source. The sustainable yield of the Pāhoa Aquifer is 437 million gallons per day (MGD), and existing water use is 1.455 MGD or 1,455,000 gallons per day (CWRM 2008).

The closest stream channel lies about a mile to the north of the project area on the Hilo side of Pāhoa Town. This stream is quite small and intermittent in its flow, and drains down into the lava on the east side of Pāhoa and disappears entirely.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The Project is not anticipated to have any significant adverse impact on groundwater resources. The proposed wastewater system will be an approved septic system with leach fields. Potable water will be supplied by the County DWS, which draws water from a network of groundwater wells. Section 4.7.1 (Water System) of this EA provides further information regarding anticipated water demands and water system improvements. The Project will use drywells to dispose the additional runoff generated by the impervious surfaces of the Project. The drywells will require an Underground Injection Well permit. The permit requirements mitigate any impacts on the groundwater.

The Project is not anticipated to adversely impact surface water resources. Construction related water quality impacts will be mitigated by complying with the requirements of the NPDES permit. Mitigation measures that may be implemented include phasing grading activities, installing silt fences and other structural controls, directing runoff to retention/detention basins, and installing temporary groundcover. Section 4.7.3 of this EA includes further information regarding the drainage improvements.

3.5 MARINE WATERS

The Project Site is approximately 6.5 miles inland from the closest coast. Near shore marine waters off the coast of Puna are classified as “AA” by the State Department of Health (DOH). According to DOH Water Quality Standards, “It is the objective of class AA waters that these waters remain

in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions” (HAR §11-54-03(c)(1)).

POTENTIAL IMPACTS AND MITIGATION MEASURES

The Pāhoa Park Expansion Master Plan will increase the amount of impermeable surface area of the Project Site (for the proposed covered play court, parking areas, roads, and new comfort station). Direct discharge of storm water runoff into marine waters during or after construction is not expected due to the distance of the Project Site from the coast and high permeability of lavas in the vicinity of the Project Site. Compliance with NPDES and UIC permit requirements would mitigate the Project generating any contribution to the region’s cumulative nonpoint source pollution.

3.6 NATURAL HAZARDS

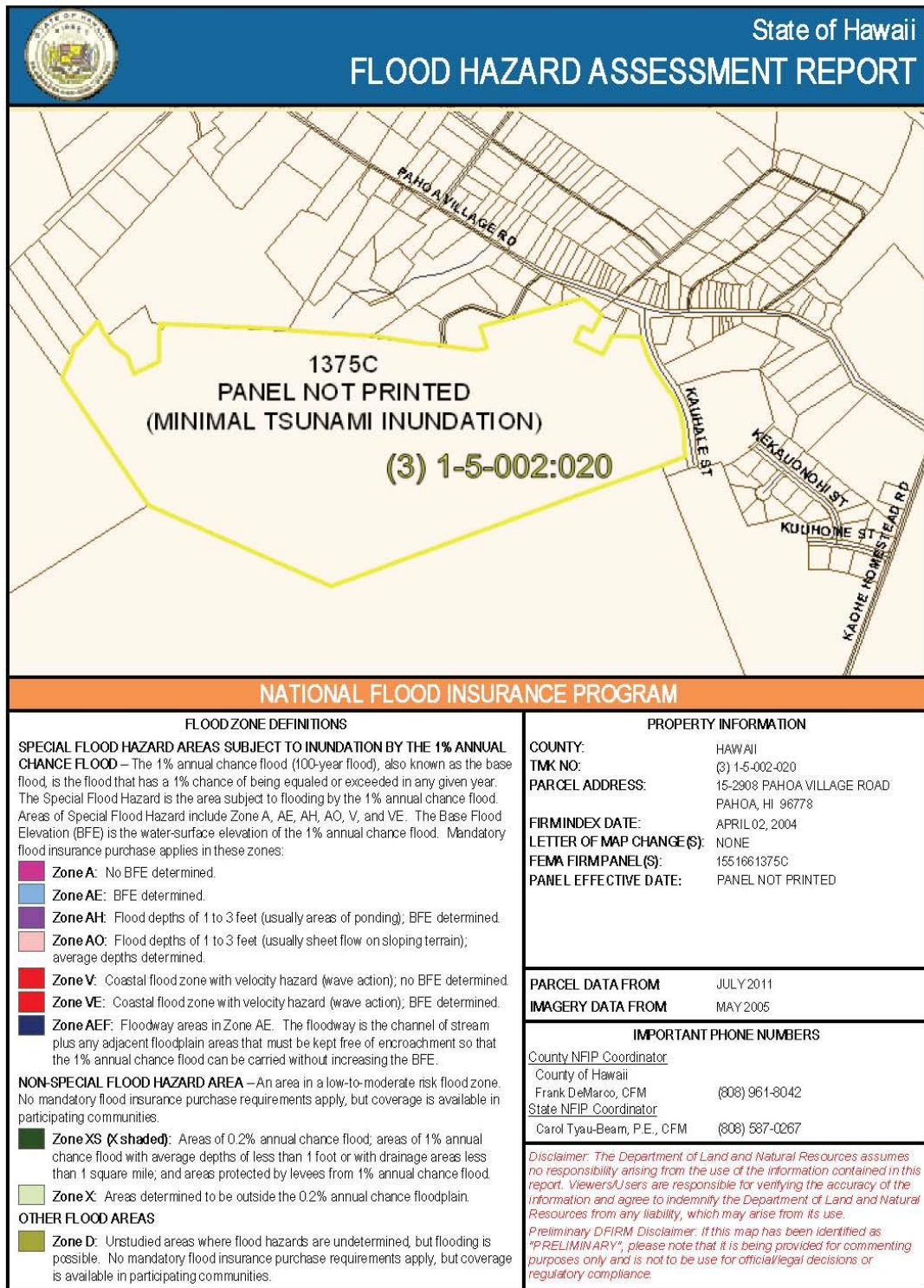
Hawai‘i is susceptible to potential natural hazards, such as flooding, tsunami inundation, hurricanes, volcanic hazards, earthquakes, and wildfires. This section provides an analysis of the Project Site’s vulnerability to such hazards.

The State of Hawai‘i Department of Defense, Office of Civil Defense operates a system of civil defense sirens throughout the State to alert the public of emergencies and natural hazards, particularly tsunamis and hurricanes. The closest siren to the Project Site is HA903 Pāhoa Siren located at the entrance in the parking lot adjacent to the basketball courts at the park. While the Department of Defense submitted a letter during the Draft EA public review period, it had no comments on the proposed project.

3.6.1 Flood

According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program, the Project Site is noted as a minimal tsunami inundation zone (Figure 19). The flood zone closest to the Project Site is approximately 6 miles away and it is Zone A, the 1% annual chance floodplain.

Figure 19: Flood Insurance Rate Map



3.6.2 Tsunami

Twenty-five of the tsunamis recorded since 1812 had an adverse impact on the Island of Hawai‘i; seven caused major damage and three were generated locally. According to the *Hawai‘i County Multihazard Mitigation Plan*, locally generated tsunamis are most frequent along the south coast, and the probability of impacts to the Ka‘ū and Puna districts are higher than in other areas. The 1946, 1960, and 1975 tsunamis generated waves that caused localized inundation and damage in the district of Ka‘ū, east of Ka Lae, South Point and also in Halape. The most recent tsunami to impact Hawai‘i Island, which occurred on March 11, 2011, caused property damage at several locations on the Kona coast.

The current tsunami evacuation zone is in the process of being updated by the Hawai‘i County Civil Defense Agency. At elevation 700’, the Project Site is definitely not in a tsunami evacuation zone.

3.6.3 Hurricane

Since 1980, two hurricanes have had a devastating effect on Hawai‘i. They were Hurricane ‘Iwa in 1982 and Hurricane ‘Iniki in 1992. In 2007, Hurricane Flossie threatened to reach Hawai‘i, putting Hawai‘i on a hurricane watch. The hurricane, however, was downgraded from a hurricane to a tropical storm after passing Hawai‘i Island, 95 miles south of South Point. While it is difficult to predict such natural occurrences, it is reasonable to assume that future incidents are likely, given historical events. Several studies sponsored by the NASA Office of Earth Science have developed new models for estimating the probability of hurricanes in the Pacific. While the Island of Hawai‘i has not been in the direct path of a hurricane since recordation began in 1950, the models indicate that the island has a long-term hurricane hazard higher than any of the other islands.

According to the County of Hawai‘i Multi-Hazard Mitigation Plan, Pāhoa has two shelters, which both fall under the Puna District (Martin & Chock, Inc., 2010):

- Pāhoa Elementary
 - Building A
- Pāhoa High and Intermediate
 - Building Q
 - Building H
 - Building S
 - Building T
 - Building U

3.6.4 Volcanic Hazards

Volcanic hazards include lava flows, emission of volcanic gases (vog), and volcanic tephra.

Lava Flows

The volcanic hazard zone map for Hawai'i Island divides the island into zones ranked from one through nine, with one being the area of greatest hazard and nine being the area of least hazard. The zones are based essentially on the location and frequency of both historic and prehistoric eruptions. According to this map, the Project Site is within Zone 2 (Figure 20), meaning between 15 to 25 percent of area has been covered by lava since 1800 and 25 to 75 percent in the last 750 years (USGS, 1997). Zone 2 indicates a relatively high hazard from lava flows and corresponds to the activity associated with Kīlauea volcano affecting areas adjacent to and down slope of the volcano's active rift zones.

Lava flows present potential threats to homes, infrastructure, natural and historic resources, and entire communities. The areas exposed to the highest risk from lava flows are those situated down slope and in close proximity to the active rift zones. Steep slopes may allow lava flows to move quickly from the summit to the ocean in a matter of hours. Besides the direct threat of inundation, lava flows may also cut across a community's single roadway escape route limiting the amount of time available for evacuation. Between 1868 and 1950, five eruptions from Mauna Loa's southwest rift zone have reached the ocean. These flows traveled quickly and in at least one instance reached the ocean in three hours.

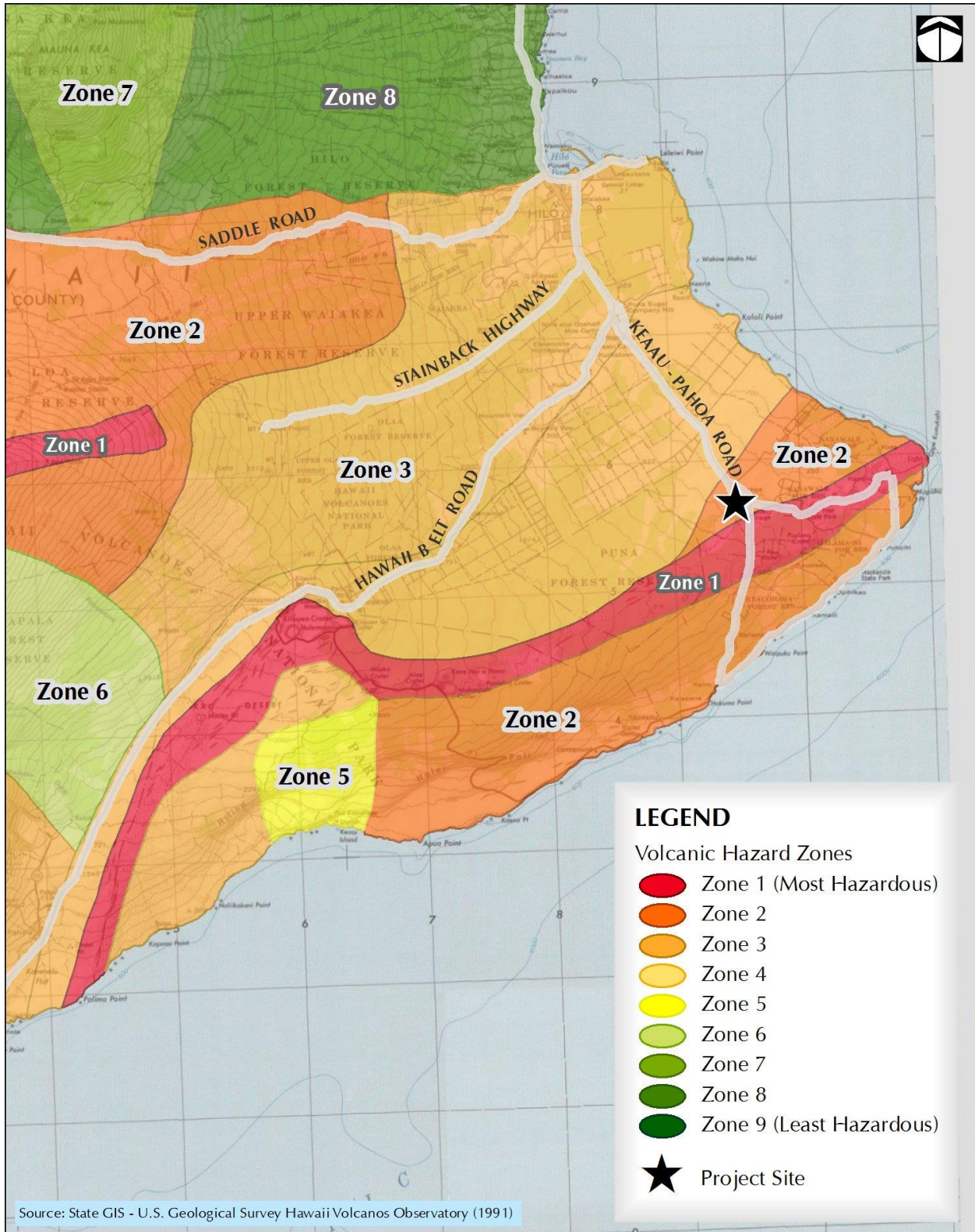
Vog

Volcanic gases (vog) are emitted during all types of eruptions. Gases also can be released during repose periods by inactive eruptive vents and by fumaroles, vents that may never have produced any lava. Any hazard posed by volcanic gases is greatest immediately downwind from active vents; the concentration of the gases quickly diminishes as the gases mix with air and are carried by winds away from the source. Brief exposure to gases near vents generally does not harm healthy people, but it can endanger those with heart and respiratory ailments, such as chronic asthma (USGS, 1997).

Halema'uma'u, the crater located at the summit of Kīlauea is erupting large amounts of volcanic gas and small amounts of volcanic ash. The ash and gas are being transported downwind and can harm human health and agriculture. Pu'u 'Ō'ō, is a vent located further to the east of Halema'uma'u and is also erupting large amount of volcanic gasses.

A common gas produced during Hawaiian eruptions that is potentially harmful to human health is sulfur dioxide (SO₂). Even small concentrations of SO₂ can combine with water to form sulfuric acid, which can attack skin, cloth, metal, and other materials. When a volcanic plume mixes with atmospheric moisture, acid rain results. Acid rain can significantly retard the growth of cultivated or natural plant life downwind of a vent that degasses over a long period of time (USGS, 1997).

Figure 20: Volcanic Hazards



Volcanic Tephra

Most volcanic eruptions produce fragments of lava that are airborne for at least a short time before being deposited on the ground. These fragments are called “tephra,” and include ash, cinders, and Pele’s hair. In Hawai‘i, tephra is usually ejected by lava fountains and poses a serious hazard only in the immediate vicinity of an erupting vent. Windborne tephra, however, can be disruptive at greater distances. The combination of high lava fountains and strong winds may result in tephra being carried many miles downwind of the eruption site. During lava fountaining episodes at Pu‘u ‘Ō‘ō from 1984 to 1986, the prevailing trade winds deposited most of the tephra in remote areas of Hawai‘i Volcanoes National Park, but small particles reached the town of Nā‘ālehu 39 miles away. During the same episodes, Kona winds (from the southwest) occasionally carried tephra to Hilo, 22 miles from the vent (USGS, 1997).

The small amount of tephra that fell on inhabited areas was not harmful to most people, but it was a source of irritation to those with respiratory problems and an inconvenience to the many residents with rain-water-catchment systems. Following at least three high-fountaining episodes, Hawai‘i County Civil Defense recommended that people disconnect and clean their rain-water catchment systems to prevent the particles from washing into their water supply (USGS, 1997).

3.6.5 Earthquake

In Hawai‘i, most earthquakes are linked to volcanic activity, unlike other areas where a shift in tectonic plates is the cause of an earthquake. Each year, thousands of earthquakes occur in Hawai‘i, the vast majority of which are so small they are detectable only with highly sensitive instruments. However, moderate and disastrous earthquakes have occurred in the islands.

Since 1868, nine disastrous earthquakes have occurred in Hawai‘i County. The largest earthquake series occurred between March 27 and April 2, 1868 with an epicenter a few miles north of Pāhala in the district of Ka‘ū. It is estimated that the magnitude of these earthquakes were 7.1 and 7.9. These earthquakes resulted in 77 deaths (46 from tsunami and 31 from landslides triggered by the earthquake). In 1929, an earthquake with an epicenter in Hualālai and a magnitude of 6.5 resulted in extensive damage. Another earthquake in 1951, with its epicenter in Kona area and a magnitude of 6.9 also resulted in extensive damage. A series of earthquakes, with magnitudes of 6.7 and 6.0, occurred at Kīholo Bay on October 15, 2006. These earthquakes resulted in more than \$100 million in damages to the northwest area of the island (USGS, 2006).

The Uniform Building Code (UBC), provided as Chapter 5 of the Hawai‘i County Code, designates Hawai‘i County into five seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10 percent chance of severe shaking in a 50-year interval). The Site is located in Seismic Zone 4 Probability Rating.

3.6.6 Wildfires

Approximately 70 to 80 wildfires occur annually in Hawai‘i County. Droughts increase the vulnerability to wildfires. According to U.S. Drought Monitor website, the Puna District is not under drought conditions.

POTENTIAL IMPACTS AND MITIGATION MEASURES

For users of the Project during an emergency event, the presence of the emergency siren on the Project Site and the proximity of the Pāhoa School emergency shelter ensures that any warnings would be heard and immediate evacuation to a nearby shelter is possible. Since there are pervasive settlements within volcanic lava flow zone 2 including the entire village of Pāhoa, the investment of public infrastructure within this zone to serve the existing and future population is a fact of life for this area.

3.7 BOTANICAL RESOURCES

Robert W. Hobdy conducted a field survey of the Project Site to identify any botanical resources that might be present on the site. Findings of the flora survey are summarized below. His report is attached in Appendix B.

“The area around Pāhoa where soils were deeper were developed for sugar cane agriculture in the early 1900s. Pāhoa became a plantation community. As the sugar era came to a close during the late 1980s land uses converted to ranching and small-scale diverse agriculture. Extensive subdivision communities have sprung up in the Puna area leading to a substantial population increase. All of these changes have resulted in a shift in the biological landscape. Introduced timber trees, ornamental plants, pasture grasses and many weed species have proliferated, replaced native plants, and now dominate the area. The resulting forests and pastures, including the project area, are largely made up of non-native species with only a few native 'ōhi'a trees and ferns species remaining...”

“The vegetation throughout the project area is dominated by non-native grasses, vines, ferns, shrubs and trees. The area has been heavily altered by historical land uses and continues to be invaded by aggressive weed species. All of the 15 native species [identified on the Project Site] are widespread in Hawai‘i.”

No Federally listed Threatened or Endangered plant species were found on the property, nor were any found that are candidates for such status. No special native habitats were found here either.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Because of the above existing conditions, Mr. Hobdy determined that “...the future expansion of park facilities on this 71 acre parcel will not have a significant negative impact on the botanical resources in this part of Hawai‘i Island. No recommendations regarding the botanical resources are deemed appropriate or necessary.”

The Project landscaping will attempt to utilize the maximum amount of native species feasible or plants that have proven to be adaptable to the area.

3.8 WILDLIFE RESOURCES

Robert W. Hobdy conducted a field survey of the Project Site to identify any biological resources that might be present on the site. Findings of the fauna survey are summarized below. His report is attached in Appendix B.

“The fauna of this property are largely made up of non-native species that have been either purposeful or accidental introductions to Hawai‘i. Just two species were found to be native, the Endangered ‘ōpe‘ape‘a or Hawaiian bat and the indigenous globe skimmer dragonfly.

The globe skimmer, as previously discussed, is found throughout the tropics worldwide and is common in Hawai‘i. It is therefore of no heightened conservation concern.

The ‘ōpe‘ape‘a, however, is endemic to the Hawaiian Islands and is an Endangered species as well, carrying with it federal protections wherever it goes. It occurs on at least five of the major Hawaiian Islands and has its largest population on Hawai‘i Island. These bats are highly mobile and are known to move up and down slopes, from about 10,000 feet in the subalpine zone down to sea level. Movements are likely driven by food source availability. They can show up almost anywhere in a wide range of habitats.

A special effort was made to look for any occurrence of the native Hawaiian hoary bat by making an evening survey on the property. When present in an area these bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. In addition, a bat detection device (Batbox IIID) was employed set to the frequency of 27,000 hertz which is used by these bats for echolocation. According to Mr. Hobdy, “No bats were seen at twilight, but two bats were detected later with the Batbox in the area to the west of the ballfield.”

Two native birds, the endemic and Endangered ‘io or Hawaiian hawk (*Buteo solitarius*) and the endemic pueo or Hawaiian owl (*Asio flammeus sandwichensis*), are known to frequent wet windward forests on the Big Island where they prey on rodents and birds. According to Mr. Hobdy, these two birds were looked for but not seen during the survey.

None of the endemic and Endangered nēnē or Hawaiian goose were seen during the survey. Also no ae‘o or Hawaiian stilts were seen on the property. According to Mr. Hobdy, distance from the coast and the lack of preferred habitat make use of the project area by ae‘o unlikely.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The fauna of this property are largely made up of non-native species that have been either purposeful or accidental introductions to Hawai‘i. Just two species were found to be native, the Endangered ‘ōpe‘ape‘a or Hawaiian bat and the indigenous globe skimmer dragonfly.

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On this property at least two ‘ōpe‘ape‘a were detected during the evening survey west of the ballfield during the month of July. What the entire population here is, and how it may vary during the year is unknown. The U.S. Fish and Wildlife Service has jurisdiction over these bats under powers outlined in the Endangered Species Act (1973). They should be consulted before any construction and development occurs on park expansion. They will determine what actions should be taken that will ensure the welfare of the ‘ōpe‘ape‘a. During the Pre-Assessment Consultation period, the USFWS wrote:

“To avoid impact to the Hawaiian hoary bat we recommend the following conservation measure be incorporated into project proposals: trees and shrubs taller than 15 feet should not be trimmed or cleared between June 1 and Sept. 15.”

No other recommendations were offered by the biological consultant regarding the fauna resources on the Pāhoa Regional Park Expansion Project.

During the Draft EA public review period, the Hawaii Volcanoes National Park wrote:

“We appreciate your consideration to protect threatened and endangered nocturnal seabirds that may be transiting the area, such as the endangered Hawaiian petrel, the threatened Newell’s shearwater, and the state-listed band-rumped storm-petrel. While these species may not occur in the project site, they do fly to and from nesting colonies after dark and could be disoriented by artificial lights that are not properly shielded. In order to protect night skies and night-flying birds, it is recommended that only full cut-off, amber, downward directional lighting be considered for this project.”

It is the intent of the County of Hawai‘i to protect all species, especially those threatened or endangered. To minimize the threat of disorientation or downing of night-flying birds, all exterior lighting will be shielded in compliance with Section 14-50, Hawaii County Code, which guides the selection and installation of outdoor lighting fixtures at “Recreational facilities.” In addition, the Department of Parks and Recreation will explore the possibility of cut-off, amber, downward directional lighting to be used at Pāhoa Park to the extent it does not compromise safety criteria for recreational use.

4 DESCRIPTION OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing conditions of the human environment, preliminary potential impacts of Pāhoa Park Expansion Master Plan, and preliminary mitigation measures to minimize any impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey of the Project Site (attached as Appendix C). The Archaeological Inventory Survey was conducted in accordance with Hawai‘i Administrative Rules 13 §13-284 and 13§13-275, and was performed in compliance with the Rules Governing Standards for Archaeological Inventory Surveys and Reports contained in Hawai‘i Administrative Rules 13§13-276. Findings of the archaeological inventory survey are summarized below.

Historic Background

Situated along the windward coast of Hawai‘i Island, the Puna district has been covered by new volcanic lava flows over the past 1,000 years (Cordy 2000: 17 and 22). Village settlement tended to occur inland, where winds were calmer and soils more fertile. Settlement patterns in Puna appear to be dispersed and without a major population center, which resulted in weak ties of allegiances between ali‘i and konohiki. Thus, Puna was often ruled by stronger district leaders in Hilo or Ka‘ū (Kamakau 1992: 17 and 77).

Puna was famous for various products including “hogs, gray tapa cloth (‘eleuli), tapas made of Mamaki bark, fine mats made of young pandanus blossoms (‘ahuhinalo), mats made of young pandanus leaves (‘ahuao), and feathers of the ‘o‘o and mamu birds" (ibid:106)

The current project area is well outside of the narrow coastal band (0-150 feet amsl) where traditional Hawaiian habitation centers are known to have existed in the region. While there may have been pre-contact era travel through the region of the current project area, there were likely no homes or house gardens in the area. There are no early historic accounts pertaining to Waikahiulu 2 Ahupua‘a.

Beginning in 1845, the commercial ranching, agriculture, and logging industries developed. Consequently, new roads and rail lines were installed to transport equipment, workers, and products between fields and distribution points. The Old Puna Trail or Puna Road—which travels from the modern day Lili‘uokalani Gardens to Ha‘ena along the Puna coast—is one such example. The Old Puna Trail likely incorporated segments of the traditional Hawaiian trail system often referred to as the ala loa or ala hele (Hudson 1932:247, Kuykendall 1966:23-25, Lass 1997:15, and Maly 1999:5).

By 1900, sugar was the Island's dominant industry and Hilo was the epicenter for production and export. Railroads connected sugar mills/plantations in Hilo, Hamakua, and Puna. The sugar industry's growth throughout the 20th century greatly impacted regional land use and settlement patterns on the windward side of the Island. Homestead lots and agricultural plots were surveyed and cleared from the surrounding forests; sugar camps, housing, and facilities for workers were constructed; small agricultural lots were eventually bought out by larger companies. When the sugar industry slowed and eventually shut down in the 1980s, much of the infrastructure, facilities, and equipment related to the sugar industry had to be converted or repurposed.

Identified Sites

The project site is a 71.121-acre parcel located in Pāhoa, Waiakahiula 2 Ahupua'a, Puna District, Island of Hawai'i [TMK: (3) 1-5-010:002]. The project area is part of a larger parcel of former 'Ōla'a Sugar Company sugarcane fields. There are no records of house lots or any other types of land use, other than sugarcane agricultural lots on the project area parcel. Today, the project area is owned by the County of Hawai'i and the current Pāhoa Park is located in the northeast corner of the parcel. The existing Pāhoa Park is entirely surrounded by undeveloped land, which was formerly used for sugarcane cultivation. The Archaeological Inventory Survey for the Project Site recorded thirty-nine sites comprising 80 features. All of the features were rock mounds similar to those recorded in archaeological studies at many former sugarcane fields in the Hilo area. The report documented each site.

Previous Archeological Studies

Nineteen previous archaeological studies have been conducted in the Pāhoa district and the surrounding region. Ten of the previous studies did not find any archaeological sites. The other nine studies did uncover various archaeological features that are consistent with the known settlement patterns in the area. However, none of these archaeological sites are located near the current project area.

POTENTIAL IMPACTS AND MITIGATION MEASURES

All of the sites are significant under criterion "D" as they are likely to yield information important to history. However, information recorded at the sites during the current study has adequately ascertained the timing and function of the features, and documentation contained in the report is sufficient to warrant no further work. The State Historic Preservation Division will review the report and verify the conclusion that no further studies are necessary. No adverse impacts to archeological or historic resources are anticipated as a result of the project. No pre-contact era or any other significant archaeological sites were discovered. All of the archaeological sites that were identified during the survey (rock mounds) were associated with the 'Ōla'a sugarcane fields known to have existed there. Based on archival research, it is possible that no pre-contact era sites existed on the project area, given its remote upland location. Moreover, any pre-contact remains would have likely been eliminated by sugar-related field clearing during the historic sugarcane era.

During the Draft EA public review period, SHPD wrote that it was still reviewing the AIS.

The Proposing Agency and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. Should historic sites such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentrations of shell or charcoal be inadvertently encountered during the construction activities, work will cease immediately in the immediate vicinity of the find and the find will be protected. The contractor shall immediately contact the State Historic Preservation Division, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

4.2 CULTURAL RESOURCES

Scientific Consultant Services Inc. prepared a cultural impact assessment for the Site to identify traditional customary practices within the site and in the vicinity of the area. The cultural impact assessment was conducted in accordance with the OEQC Guidelines for Assessing Cultural Impacts and includes archival research of Pāhoa and the surrounding area. Findings of the cultural impact assessment and other relevant information are summarized below. Appendix D contains the complete cultural impact assessment.

Traditional Settlement Patterns

Situated along the windward coast of Hawai‘i Island, the area of Puna (of which Pāhoa is located) is an abundant district with good rainfall, rich soils, and occasional volcanic eruptions. Early settlements in Puna were dispersed and without any large population centers. Rather, villages tended to be spread out over large inland areas, where the soil is better suited for agriculture. The lack of population center had a distinct effect on the development of a hierarchy of district rulers; Puna was often not strongly tied together by allegiances between *ali‘i* and *kono‘hiki*, as other areas were. This allowed for other district leaders, usually from Hilo or Ka‘ū, to conquer and rule over Puna.

Two of the primary *ahupua‘a* in Puna are Waiakahiula 1 and Waiakahiula 2 along the northeastern shore and are bisected by the *ahupua‘a*'s of Keonepoko Iki and Kahuwai. The Pāhoa Park Expansion area is well outside the areas in which traditional Hawaiian habitation centers were located. The area in which the Pāhoa Park Expansion is proposed may have been used for pre-Contact Era travel, but it is very unlikely that there were homes or house gardens in that area.

Waiakahiula 1 and 2 were awarded to Mikahela Kekauonohi and Aaron Keali‘iahonui as part of a large Land Commission Award (LCA 11216) after the Māhele of 1848 and subsequent acts in 1850 authorized the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants.

Changing Land-Use Patterns

With the regular use of Hilo Bay for foreign vessels, an increase in the whaling industry, the addition of missions to the Hilo area, sandalwood trading, the legalization of private land

ownership, the introduction of cattle ranching and sugar cane cultivation, and a push for tourism, there was a distinct change in settlement and overall land-use patterns. Hilo became the area's central hub, and other settlements outside of Hilo declined drastically or disappeared altogether. The area of Puna saw a serious de-population, according to an 1889 description. New roads and railroad lines were developed to transport equipment, people, and agricultural products. The newly constructed Kea'au – Pāhoa Road started in Hilo and traversed through Kea'au to Pāhoa, allowing increased access to the more arable inland areas. The new road, the Pāhoa section of railroad, logging, and sugarcane agriculture all combined to create a growing population in Pāhoa.

Archeological Surveys of the Area

Scientific Consultant Services compiled a list of past archaeological surveys conducted in Pāhoa Town, recording nineteen in total. Ten of these studies did not document any archaeological sites, which is consistent with the settlement pattern data gleaned from historical literature. Nine of the remaining other ten studies documents lava tubes with archaeological sites and features or a limited number of surface archaeological features such as rock mounds, ditches, terraces, modified outcrops, habitation platforms, or petroglyphs. None of these lava tube sites or surface archaeological sites are located near the proposed Pāhoa Park Expansion project area. Based on historic documentation and archaeological data collected in the AIS report, all of the archaeological sites were Historic-era rock clearing mounts associated with the sugarcane fields known to have existed there. No remnants of pre-Contact era sites were recorded on the project area.

Cultural Informant Interviews

Six individuals who either work for the Office of Hawaiian Affairs, are Hawai'i Island Burial Council Members, or have a long-standing connection to the project area through cultural and historical work were contacted for interviews. None of the individuals responded with information concerning cultural activities conducted on the subject parcels. The project area has not been used for traditional cultural purposes in recent times, and the CIA stated that: "it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs."

POTENTIAL IMPACTS AND MITIGATION MEASURES

The cultural impact assessment concludes that the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected. Because there were no cultural activities identified within the project area, there are no adverse effects.

4.3 ROADWAYS AND TRAFFIC

Fehr & Peers conducted a transportation impact analysis to evaluate the potential traffic impacts resulting from the proposed Pāhoa Park Expansion Master Plan. The transportation report includes

an analysis of existing conditions and near-term future conditions without and with the Project in place. Key conclusions of the report are summarized below. Appendix E contains the complete report.

Primary vehicle access to the Site is from Kauhale Street. Kauhale Street has sidewalks on both sides of the street. There are currently three separate parking lots which service the park: Lot 1 (pool parking), Lot 2 (community center parking), and Lot 3 (skate park parking). Lot 1 has 86 stalls, Lot 2 has 80 stalls, and Lot 3 has 22 stalls for a total of 188 current stalls. According to the County Planning Department, the County Hele-On buses stop at a number of locations along roadways where riders tend to congregate to get picked up.

Roadways

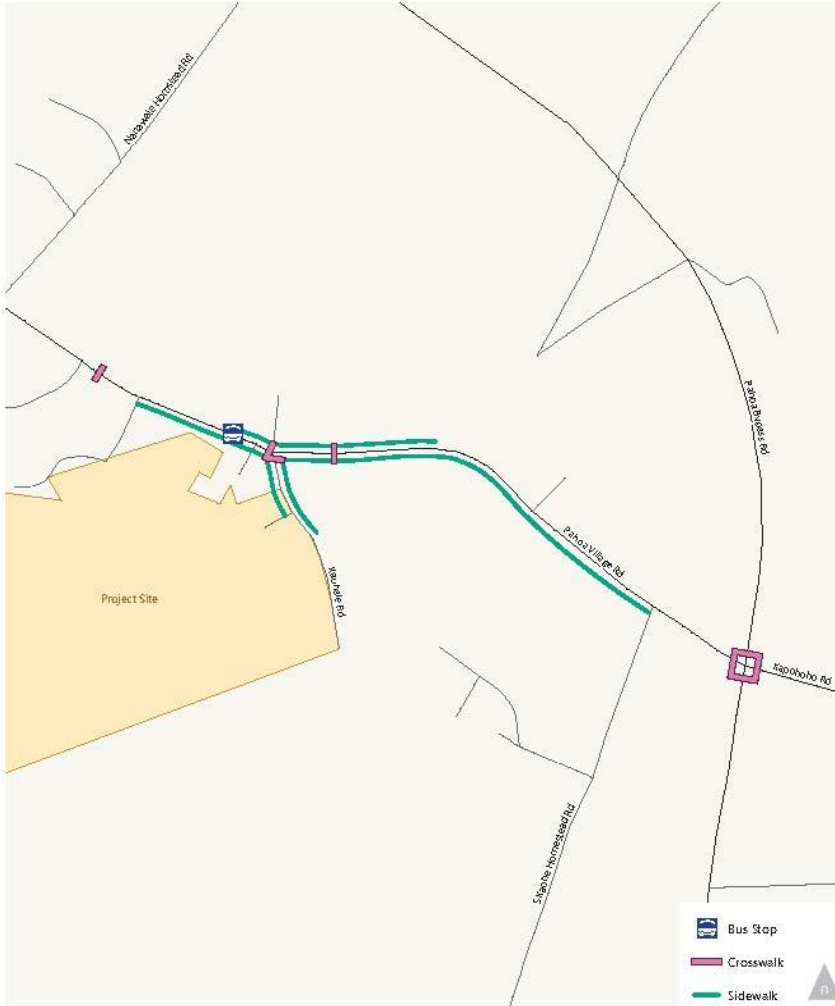
Local access to the project site is provided by Kauhale Street, and the key roadways providing access to the site are described below. Figure 21 illustrates the Pāhoa Park location and the surrounding transportation system including roadways, sidewalks, crosswalks, and bus stops.

Pāhoa Village Road is a two-lane roadway providing direct access to Pāhoa town from Pāhoa Bypass Road (State Highway Route 130). Pāhoa Village Road re-connects with State Highway Route 130 at its southern terminus, east of which it becomes Kapoho Road. This facility serves two-way traffic along its entire length. Pāhoa Village Road is lined with utility poles, and does not include any separate bicycle facilities. While there are few defined sidewalks along the roadway, except for portions through Pāhoa town, mid-block crossings are provided periodically for pedestrians. On-street parking is permitted on the street through Pāhoa town. The posted speed limit is 25 MPH.

Kauhale Street is a two-lane, dead-end road and provides direct access to the park site. Formal sidewalks line both sides of the roadway for pedestrians, but no separate existing bicycle facilities are provided. There is on-street parking on both sides of the street. No posted speed limit along the roadway.

Pāhoa Bypass Road is also known as State Highway Route 130 and is primarily a two-lane roadway. No sidewalks or separate bicycle facilities are provided on this facility, and the posted speed limit is 45 MPH.

Figure 21. Existing Transportation Facilities



Kāohe Homestead Road is a two-lane roadway (near the school) linked to Kauhale Street by Pāhoā Village Road. While, there are no separate pedestrian or bicycle facilities, the roadway does feature mid-block crosswalks near Pāhoā Elementary School. On-street parking is generally permitted at portions. The posted speed limit is 15 MPH (Fehr & Peers 2013).

Post Office Road is a two-lane roadway and one of the three main means of access and egress between Pāhoā Village Road and Pāhoā Bypass Road. According to the County Planning Department, a Capital Improvements Program budget request is being proposed by the Pāhoā Regional Town Center Plan Steering Committee and the Puna CDP Action Committee that would extend Post Office Road from Pāhoā Village Road to Pāhoā Park in order to provide a safer and more direct alternative access to the Park.

Existing Intersection Volumes and Lane Configurations

The operations of the three study intersections were evaluated during the weekday afternoon (2:00 pm to 5:00 pm) and Saturday (10:00 am to 1:00 pm), peak-period conditions. Morning peak hour conditions were not analyzed because the project is expected to create a negligible amount of traffic during that period. The intersection counts were adjusted to account for the additional traffic expected from nearby schools based on a daily traffic count that was obtained in August 2012, while schools were in session.

According to this study, the intersection of Pāhoa Village Road and Kauhale Street and the intersection of Pāhoa Bypass and Pāhoa Village Road – Kapoho Road both meet an acceptable level of service during peak hours. The intersection of Pāhoa Bypass Road and Pāhoa Village Road does not meet an acceptable level of service during peak hours. HDOT is currently working to develop a design at this intersection for a planned roundabout, which is intended to mitigate the poor traffic conditions during peak hours.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Projected Traffic Conditions

The transportation impact analysis looked at two different scenarios: near term (2014) conditions and near term (2014) plus project conditions.

The near term (2014) conditions section summarizes the growth assumptions used to estimate the amount of traffic that will be added to existing intersection volumes to by 2014 and presents the results of the level of service calculations under this scenario. In order to discern the growth in traffic without the project, a comparison study by Fehr & Peers compared the 2007 and 2010 Average Daily Traffic (ADT). This study showed similar traffic volumes between the two sets of data, showing a minimal increase in traffic. A growth factor was applied to all intersections equally to account for future regional growth. An annual growth rate of one percent was applied to the three study intersections, to account for the ambient growth in the immediate area and region. In addition, traffic projections for a proposed project in the area (shopping center proposed by T.T. Kuawahara, LLC) was included in the Near Term (2014) conditions analysis.

The near term (2014) plus project conditions section summarizes the project's travel demand characteristics and presents the results of the level of service calculations under this scenario. This scenario includes existing traffic, added traffic from regional growth, plus new traffic generated by the proposed project. The results of these two studies are listed in the table below:

Table 2: Traffic Study Projections

Intersection	Traffic Control	Peak Hour	Near Term (2014) No Project		Near Term (2014) Plus Project	
			Delay (sec/veh) ¹	LOS ²	Delay (sec/veh) ¹	LOS ²
1. Pahoia Bypass Road / Pahoia Village Road	Roundabout	Wkdy PM	10.8	B	17.5	C
		Saturday	6.7	A	8.4	A
2. Pahoia Village Road / Kauhale Street	Side Street Stop	Wkdy PM	17.5	C	46.4	E
		Saturday	16.4	C	25.3	D
3. Pahoia Bypass Road – / Pahoia Village Road – Kapoho Road	Signalized	Wkdy PM	28.3	C	27.9	C
		Saturday	19.8	B	21.0	C

Source: Fehr & Peers, 2013

Note:

1. Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. Worst-case approach delay for two-way stop controlled intersections.

2. LOS calculations performed using the *2000 Highway Capacity Manual (HCM)* method.

3. Unacceptable LOS highlighted in **bold**.

N/A = Not applicable.

The table above shows that all study intersections operate acceptably under Near Term (2014) plus Project Conditions, with the exception of the Pahoia Village Road/Kauhale Street intersection which operates at LOS E during the Weekday PM peak hour. Therefore, the project is not expected to result in any significant traffic impacts and no roadway improvements are necessary at its typical use. It should be noted that the intersection was also analyzed without the approved B.T Kuwahara Private Commercial Development and without this additional traffic the Pahoia Village Road/Kauhale Street intersection operates acceptably. Under full buildout use conditions, the peak hour signal warrant would be met and a significant impact would occur at the Pahoia Village Road/Kauhale Road intersection during both the weekday afternoon and Saturday peak hours. Depending on the frequency at which the full Park expansion is expected to operate at close to its maximum use, mitigation would include the installation of a traffic signal or manual traffic control.

Internal Circulation

All vehicle access to the site is via Kauhale Street and an internal road which allows for circulation within the site. The existing driveway at the community center will remain as an access point to the site. Once you have entered the park from Kauhale Street, the internal road continues around the edge of the Park, allowing vehicles to circulate to the various facilities and parking lots. This

internal road continues between the two multi-use fields on the eastern half of the Park which will enable vehicles to cut through to the existing community pool, existing community center, and existing driveway without driving all the way around the Park. This internal roadway provides a long stretch of roadway; the installation of speed bumps or speed tables is recommended by Fehr & Peers to encourage drivers to slow down as they circulate through the site.

Parking

The proposed parking site plan parking summary provides a total of 783 parking stalls: 413 formal stalls and 370 informal stalls comprised of overflow areas and the provision of roadside parking. The supply is based on the County code for spectator seating for each facility, as well as assumed seating within the covered court area. In the case of a major event, such as a school commencement, the proposed expansion is still expected to provide sufficient parking given the availability of roadside parking, as well as the existing parking surplus that already exists.

4.4 NOISE

Sources of noise from the Project site include the activity noise from the existing facilities at Pāhoa Park and the traffic noise from vehicles entering and exiting the Park.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Construction activities will inevitably create temporary noise impacts. If necessary contractors will employ mitigation measures to minimize those temporary noise impacts including the use of mufflers and implementing construction curfew periods. Pursuant to Chapter 11-46, HAR, all construction activities must comply with all community noise controls.

Temporary noise impacts will also be generated during the course of community use of the proposed facilities in an area long-used for a park and community use. These noise disturbances are an unavoidable element of Project usage but nonetheless will be intermittent and of short duration. All night activities will end no later than 10:00 p.m., and thereby comply with the community noise regulation that imposes quieter standards after 10:00 p.m.

4.5 AIR QUALITY

According to the Air Quality Study for the Proposed Kea‘au-Pāhoa Road Improvements Project:

It should be noted that Hawai‘i Island is unique from the other islands in the state in terms of the natural volcanic air pollution emissions that occur. Volcanic emissions periodically plague the project area. This is especially so since the latest eruption phase of the Kīlauea Volcano began in 1983. Air pollution emissions from the Hawaiian volcanoes consist primarily of sulfur dioxide. After entering the atmosphere, these sulfur dioxide emissions are carried away by the wind and either washed out as acid rain or gradually transformed into particulate sulfates or acid aerosols. Emissions from Kīlauea are vented to the atmosphere relatively close by (about 20 miles west of the project site), but the prevailing wind patterns carry the emissions away from the project area

much of the time. On occasions when the winds are from the west or south, relatively high concentrations of sulfur dioxide may occur at the project site and volcanic haze (vog) can impact the area.

POTENTIAL IMPACTS AND MITIGATION MEASURES

No State or Federal air quality standards will be violated due to the implementation of the Pāhoa Park Master Plan.

The Hawai'i County Civil Defense Agency has a system in place to issue advisories for vulnerable populations based on these natural conditions. The DOH maintains a toll-free help line that provides daily updates on vog levels and also maintains a website in conjunction with the EPA that provides vog advisory levels based on current sulfur dioxide levels.

Short-term impacts that would result from the implementation of the Pāhoa Park Master Plan would be the emission of fugitive dust during site preparation and construction. An effective dust control plan will be implemented as necessary. All construction activities will comply with the provisions of Section 11-60.1-33, HAR related to Fugitive Dust. Measures to control dust during various phases of construction include:

- Providing an adequate water source at the site prior to start-up construction activities;
- Irrigating the construction site during periods of drought or high winds;
- Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion;
- Providing adequate dust control measures during weekends, after hours, and before daily start-up of construction activities; and
- Installing silt screening in the areas of disturbance.

Long-term negative impacts related to air quality are not expected.

4.6 VISUAL RESOURCES

Most of the developed portion of the Project Site is only visible from Kauhale Street. While the portion of the Project Site along Kauhale Street contains many of the structures of Pāhoa Park (Pāhoa Senior Center, Pāhoa Neighborhood Facility, Pāhoa Skatepark and a basketball court, it is compatible with the two-story structures across Kauhale Street.

Other than the soccer/football/baseball fields and the Pāhoa Aquatic Center, the remainder of the Pāhoa Park and the areas to the west and south of the Project Site is largely heavily vegetated vacant land. Mostly one-story, single-family homes are present to the north and east of the Project Site. Some one- and two-story commercial buildings are also found in the same area along Pāhoa Village Road.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The proposed covered play court facility for basketball and volleyball, a comfort station and new baseball fields will likely not be visible from either Pāhoa Village Road or Kauhale Street, the closest public roads surrounding the Project Site.

4.7 INFRASTRUCTURE AND UTILITIES

Engineering Partners, Inc. prepared a Preliminary Engineering Report for the Pāhoa Park Master Plan. Key findings of the report are summarized in the following sections. Appendix F contains the complete report.

4.7.1 Water System

The Project Site is supplied by the Pāhoa Aquifer System. The system extends to the east from the summit of Kīlauea and generally bound in north by Māmalahoa Highway. The sustainable yield of the Pāhoa Aquifer is 437 million gallons per day (MGD), and existing water use is 1.455 MGD or 1,455,000 gallons per day (CWRM 2008).

The County of Hawai‘i Department of Water Supply (DWS) is the major purveyor for potable water. The most extensive centralized water service area in Puna is the County’s ‘Ōla‘a-Mountain View system including smaller water systems serving the Pāhoa and Kalapana areas.

The Pāhoa water system extends from Keonepoko Homesteads down along portions of Kapoho and Pohoiki Roads to Kapoho. An existing 8-inch water line runs along Kauhale Street adjacent to the Project Site.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The potable water system will connect to the County water system and comply with the current *Water System Standards* and *Standard Details for Water System Construction*, Board of Water Supply. The existing 8-inch water line will provide service for the Project’s potable water supply and fire protection. A new water meter and water line will provide domestic service to the proposed comfort station, and a new 8-inch water meter and 8-inch water line will provide water for the fire sprinklers. Potable water laterals will fulfill all mechanical requirements. New and existing fire hydrants will be accessible onsite in order to meet the Hawai‘i County Fire Department’s coverage requirement.

During the Draft EA public review period, the State Department of Health, Safe Drinking Water Branch wrote: “Since the project will connect to the existing County of Hawaii water system as a service connection, we do not have any comments regarding the subject project at this time.”

Potable water demand for the proposed comfort station is estimated using water consumption assumptions based on Board of Water Supply Planning Guidelines. The greatest water demand is expected to be 2,750 gallons per day (gpd) and is likely to occur on weekends or during multiple

recreational/sporting events. Adequate water is available to service the Project. Based on the estimated demand, the Project will require a 1-inch water meter, with a minimum one (1) 1-1/2" backflow preventer, and one (1) 1-1/2" service lateral.

Due to the large area of the project, various fire protection measures will be incorporated: eight on-site fire hydrants, one 8" DC meter, one 8" DC backflow preventer, and an 8" waterline system will be installed. Per correspondence with the Department of Water Supply, a 1,500 gallons per minute (gpm) flow from the existing 8" water main is acceptable for fire protection purposes.

The assumed water consumption standards are provided below:

Table 3: Water Consumption Standards

Usage	Demand
Average Daily Demand	400 gpd
Maximum Daily Demand	600 gpd
Peak Hour Demand	5x average day demand
Fire Flow at Key Buildings	1,500 gpm

4.7.2 Wastewater System

Three septic systems will handle the wastewater generated from the park. Each septic system will include a 2,000 gallon septic tank (or set of smaller tanks totaling that volume) and a 595-square foot absorption bed.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The anticipated maximum waste flow rate is 2,750 gallons per day. As with the water system, peak flow is likely to occur on weekends or during large sporting/recreational events. The proposed wastewater system has been designed in consultation with the Department of Health.

4.7.3 Drainage System

Site elevations range from approximately 660 to 700 feet above mean sea level with slopes of generally five to ten percent. The Project Site is mostly grassed and areas to the west and south (mauka) are undeveloped and overgrown with vegetation. Residential homes are located in north and east of the Project Site.

Currently, surface runoff sheet flows across the Site. There is an existing drainage system for Kauhale Place that consists of grated inlets, curb inlets, and storm drain pipes.

The Project Site is noted on the FIRM as a minimal tsunami inundation zone and outside the 500-year flood plain. However, the Project Site occasionally experiences localized flooding in the ball fields.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Roadway and parking lot drainage will be designed based on Hawai'i County's 10-year storm standard, and additional runoff generated by new construction for this design storm will be disposed by using drywells on the Site, which will percolate into the ground.

Existing drainage patterns will be maintained, as much as possible, runoff will sheet flow across the Site to landscaped areas, or to proposed drainage structures. The proposed comfort station finished floor will be higher than the surrounding grades and runoff will be directed away from the building. Because the project creates 20.31 acres of new impervious surface, several mitigation methods have been proposed: two infiltration detention basins, shallow drywells, and various piping to connect the drywells and building downspouts.

No off-site drainage improvements are required for the project. However, the park's perimeter roadway will have a 4" interceptor swale line to redirect off-site storm water around the park to the current discharge point of the property.

4.7.4 Solid Waste

The County of Hawai'i Solid Waste Division operates and maintains, either by County personnel or by contracted services, all solid waste collection and disposal facilities on the island. This includes two landfills, twenty-one transfer stations and island wide hauling operations in accordance with local, state and federal guidelines and regulations.

In the Puna District, the nearest transfer station to the Project Site is the Pāhoa Transfer Station, located approximately one mile away on Apa'a Road.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Waste generated by site preparation will primarily consist of green waste from grading, and solid waste during construction. Soil and rocks displaced from grading and clearing will be used as fill within the site as needed. To reduce waste during construction, recycled materials and locally produced products will be used where possible.

After construction, the expanded and improved Pāhoa Park will generate solid waste related to facility operations and events. To minimize waste, recycling bins will be provided for users. Additionally, a septic system will collect food waste from the concession stands. Waste that cannot be recycled will be disposed of at the Pāhoa Transfer Station.

4.7.5 Electrical and Communications System

Electrical power service is available at street frontage through HELCO. Telephone service is available through Hawaiian Telecom. If overhead service extends beyond 300 feet from the highway, additional charges may be assessed. Internet service is also available at the street frontage through Hawaiian Telecom.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The electrical lines for the Project will be underground. Since the manufacturers for the lighting poles and solar lights differed and neither would warrant the assembly, solar lighting proved not feasible at this time.

4.8 SOCIO-ECONOMIC CHARACTERISTICS

4.8.1 Population

The overall population of Hawai‘i County has exhibited relatively stable growth over the past decade. The U.S. Census reported that the population of Hawai‘i County was 185,079 people in 2010, a 24.5 percent increase from the 2000 population of 148,677 people.

Puna has the second largest population in Hawai‘i County. The population of Puna was 45,326 people in 2010, a 45 percent increase from the 2000 population of 31,335 (U.S. Census Bureau).

The Project Site is within the U.S. Census Bureau’s Pāhoa Census Designated Place. According to the data, the population for the Pāhoa Census Designated Place was 945 people in 2010, a 1.8 percent decrease from the 2000 population of 962 (U.S. Census Bureau).

POTENTIAL IMPACTS AND MITIGATION MEASURES

The Pāhoa Park Expansion Master Plan will not affect area population. The construction of the master plan will solve the existing drainage problems in the ball fields, provide a recreational amenity for the entire district, and provide a unified and orderly system of public access and infrastructure improvement at the park.

4.8.2 Economy

The primary local economy in Puna is agriculture. Papayas, bananas, anthuriums and orchids are primarily produced in this district. According to the Hawai‘i County General Plan, a very large percentage of the State’s papaya and banana production comes from Puna. Currently all of the Puna’s papaya, banana, and flower industries are growing at a moderate rate. Geothermal resource utilization is a small part of the existing economy in Puna. Tourism currently makes little contribution to the local economy other than some roadside stands and a few visitor accommodations.

As of June 2012, Hawai‘i County’s unemployment rate was 10.1 percent, compared to the State’s overall rate of 7.1 percent, and it was decreased by 1.1 percent from June 2011 with the Hawai‘i County’s unemployment rate of 11.2 percent (State of Hawai‘i Department of Labor and Industrial Relations, 2012).

In the Pāhoa Census Designated Place, the population ages 18 years and over was 734 people in 2010.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The implementation of the Pāhoa Park Expansion Master Plan will have little impact on the growth of the regional economy. Through its indirect impacts, the expansion of Pāhoa Park will provide positive economic benefits in terms of construction jobs, construction spending, and multiplier effects on the local economy.

After the Project is built, the facilities may be used to generate revenue during paid sporting and community events.

4.9 PUBLIC SERVICES AND FACILITIES

4.9.1 Schools

Presently, DOE operates three public schools in the Pāhoa Village area. They are the combined campus of Pāhoa High and Intermediate School (grades 7-12) and Pāhoa and Keonepoko Elementary Schools (grades K-6). There are two public charter schools in the district of Puna, Hawai‘i Academy of Arts & Science Public Charter School, and Kua o Ka Lā Public Charter School. Table 4 presents current and projected school enrollment information.

Table 4: Enrollment for Public Schools

School	Enrollment in 2011-2012 School Year
Pāhoa High and Intermediate School (grades 7-12)	663*
Pāhoa Elementary School (Grades K-7)	444*
Keonepoko Elementary School (Grades K-7)	593*
Hawai‘i Academy of Arts & Science Public Charter School	368**
Kua o Ka Lā Public Charter School	79**

Source: *(State of Hawai‘i Department of Education, 2012)*

POTENTIAL IMPACTS AND MITIGATION MEASURES

The expansion of Pāhoa Park will provide additional recreational facilities for school-aged children in the Puna District, especially those residing in Pāhoa. During the Draft EA public review period, the County of the Department of Education wrote requesting notification if and

when the County Parks Department will no longer be using the baseball field at Pāhoa Elementary. Additionally, the Department of Education noted the mislabeling of the ownership of four parcels of property shown on Figure 4 of the Draft EA which are currently being used by Pāhoa Elementary and Pāhoa High and Intermediate Schools. According to the County's Real Property Tax Office database, the four parcels are recorded as owned by the State of Hawaii while the State claims that the transfer from County to State has not been perfected. However, the ongoing resolution of tenure of the surrounding properties is not relevant to the Project.

4.9.2 Police, Fire and Medical

The Project Site is served by the Pāhoa District Police Substation and the Pāhoa Fire Station.

The nearest critical access health care facility to the Site is the Hilo Medical Center located at 1190 Waiuanuenue Avenue in Hilo located 21.5 miles or 38 minutes away. The Puna Community Medical Center, provides non-emergency medical care and is located approximately 0.9 miles away on Pāhoa Village Road.

POTENTIAL IMPACTS AND MITIGATION MEASURES

The expansion of Pāhoa Park is not expected to create an increased demand on existing Police, Fire and Medical services. During the Draft EA public review comment period, the Police Department wrote "Staff has no concerns regarding the proposal and feel that this will be a benefit to the community."

4.9.3 Recreational Facilities

In addition to the subject site, park facilities owned and managed by the County of Hawai'i in Puna include Kurtistown Park, Mountain View Park, AJ Watt Gym, Glenwood Park, Herbert Shipman Park, Isaac Kepo'okalani Hale Beach Park, Volcano Community Center, Kea'au Community Center, Kahakai Beach Park, Hawaiian Beaches Park, and Ahalanui Beach Park

State Park facilities, which are operated by the Department of Land and Natural Resources (DLNR) include MacKenzie State Recreation Area and Lava Tree State Monument. The State also manages Nānāwale Forest Reserves, Malama Ki Forest Reserve, Keauohana Forest Reserve, and Wao Kele o Puna Forest Reserve.

A portion of Hawai'i Volcanoes National Park (HVNP), the largest of Hawai'i's eight National Parks, is located in Puna.

POTENTIAL IMPACTS AND MITIGATION MEASURES

According to the General Plan, the existing parks in Puna are inadequate to serve the recreational needs of the communities. Some existing park facilities need improvement. Puna's cool and rainy weather often causes drainage problem on the existing ballfields and requires extensive covered and indoor recreational areas.

5 LAND USE CONFORMANCE

State of Hawai‘i and Hawai‘i County land use plans, policies, and ordinances relevant to the Pāhoā Park Expansion Master Plan are described below.

5.1 STATE OF HAWAI‘I

5.1.1 State Land Use Law, Chapter 205, Hawai‘i Revised Statutes

The State Land Use Law (Chapter 205, HRS), establishes the State Land Use Commission (LUC) and authorizes this body to designate all lands in the State into one of four Districts: Urban, Rural, Agricultural, or Conservation.

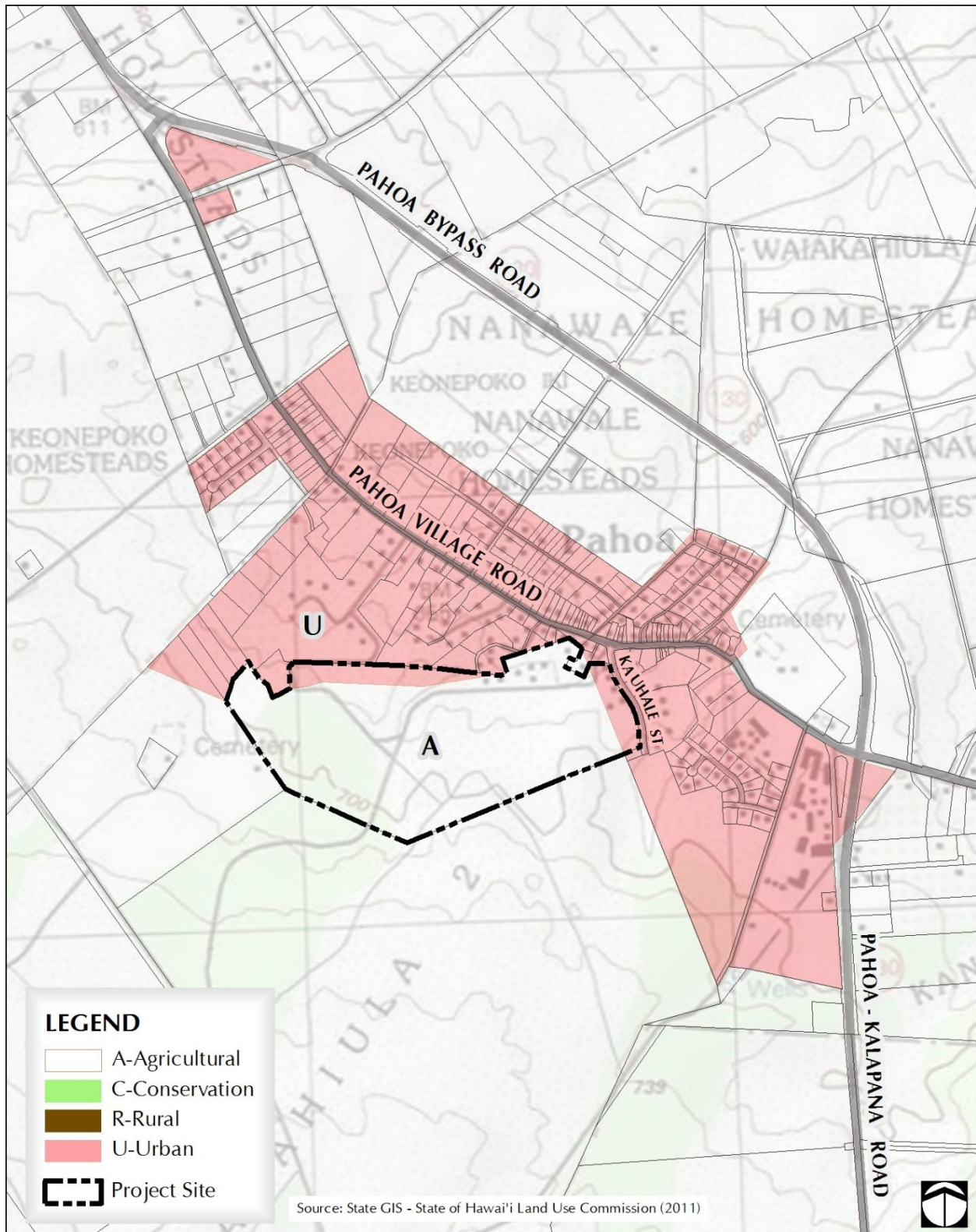
The Project Site is mostly located within the State Land Use Agricultural District. Portions of the northern and western edges of the Project Site are within the State Land Use Urban District (Figure 22). Uses within the State Land Use Urban District are regulated by the County.

The proposed park facilities are considered permitted “open area recreational facilities” in accordance with HRS Chapter 205-2(d):

“...Agricultural districts shall include... Open area recreational facilities. Agricultural districts shall not include golf courses and golf driving ranges, except as provided in section 205-4.5(d).”

Hawaii County’s zoning code further defines “open area” recreation to mean “where none of the recreational features are entirely enclosed in a building.” (Hawaii County Code §25-5-72(a)(7)). The only proposed recreational facility that is entirely enclosed in a building is the community center. At the time more detailed planning for this structure occurs in future phases of the project, this building could be sited in the Urban District portion of the Project Site. The section on County zoning has more discussion on the need for a Special Permit (see §5.2.3).

Figure 22: State Land Use District



5.1.2 Coastal Zone Management Act, Chapter 205A, Hawai‘i Revised Statutes

The Coastal Zone Management Area as defined in Chapter 205A, HRS, includes all the lands of the State. As such, the Pāhoa Park lies within the Coastal Zone Management Area.

The relevant objectives and policies of the Hawai‘i Coastal Zone Management (CZM) Program, along with a detailed discussion of how the proposed Pāhoa Park Expansion Master Plan conforms with these objectives and policies, is discussed below.

Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policy A: Improve coordination and funding of coastal recreational planning and management; and

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

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

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

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

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

(v) Ensuring public recreational uses of County, State, and Federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

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

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

(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural

resources, and County authorities; and crediting such dedication against the requirements of section 46-6.

Discussion: The proposed Pāhoa Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; therefore, policies regarding shoreline recreation resources are not applicable; however to protect marine water quality the Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to stormwater management including the Hawai‘i County’s grading ordinance, and the DOH NPDES permit program.

Historic Resources

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

Policy A: Identify and analyze significant archaeological resources;

Policy B: Maximize information retention through preservation of remains and artifacts or salvage operations; and

Policy C: Support State goals for protection, restoration, interpretation, and display of historic resources.

Discussion: The cultural impact assessment concluded that “No cultural activities were identified within the project area, and the proposed undertaking will not produce adverse effects to any Native Hawaiian cultural practices” (see Section 4.2 and Appendix D).

Scenic and Open Space Resources

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

Policy A: Identify valued scenic resources in the coastal zone management area;

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

Policy C: Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

Policy D: Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion: The proposed Pāhoa Park Expansion will be located inland, away from the shoreline; therefore, it is anticipated that there will be no effect on the quality of the coastal scenic and open space resources.

Coastal Ecosystems

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

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

Policy B: Improve the technical basis for natural resource management;

Policy C: Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

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

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

Discussion: The proposed Pāhoa Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; therefore, policies regarding coastal ecosystems are not applicable; however to protect marine water quality the Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to stormwater management including the Hawai‘i County’s grading ordinance, and the DOH NPDES permit program.

Economic Uses

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

Policy A: Concentrate coastal dependent development in appropriate areas;

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

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

- (i) Use of presently designated locations is not feasible;
- (ii) Adverse environmental effects are minimized; and
- (iii) The development is important to the State's economy.

Discussion: The proposed Pāhoa Park Expansion is not a coastal dependent development, is not located on the coastline, and is not in the SMA; therefore, these policies are not applicable.

Coastal Hazards

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

Policy A: Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and non-point source pollution hazards;

Policy B: Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point source pollution hazards;

Policy C: Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

Policy D: Prevent coastal flooding from inland projects.

Discussion: The proposed Pāhoa Park Expansion is not located on the coastline or subject to stream flooding, erosion, subsidence, and pollution, therefore, these policies are not applicable.

Managing Development

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

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

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

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

Discussion: The proposed Pāhoa Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; however, the County DPW held several community meetings and provided opportunity for public input in the course of planning the proposed Pāhoa Park Expansion.

Pre-assessment consultation comments were obtained and are reproduced in Appendix A. In addition, this EA discusses potential impacts and mitigation measures of the proposed Pāhoa Park Expansion and provides an opportunity for input.

Public Participation

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

Policy A: Promote public involvement in coastal zone management processes;

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

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

Discussion: The proposed Pāhoa Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; however, the County DPW held several community meetings and provided opportunity for public input in the course of planning the proposed Pāhoa Park Expansion.

Pre-consultation comments were obtained and are reproduced in Appendix A. In addition, this EA discusses potential impacts and mitigation measures of proposed Pāhoa Park Expansion and provides an opportunity for input.

Beach Protection

Objective: Protect beaches for public use and recreation.

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

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

Policy C: Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion: The proposed Pāhoia Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; therefore, this objective and these policies are not applicable.

Marine Resources

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

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

Policy B: Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

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

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

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

Discussion: The proposed Pāhoia Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; therefore, policies regarding shoreline recreation resources are not applicable; however to protect marine water quality the Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to stormwater management including Hawai'i County's grading ordinance, and the DOH NPDES permit program.

5.1.3 Hawai'i State Plan

The Hawai'i State Plan (Chapter 226, HRS), establishes a set of goals, objectives and policies that serve as long-range guidelines for the growth and development of the State. Objectives and policies pertinent to the proposed project are as follows:

HRS § 226-21: Objectives and policies for socio-cultural advancement – education.

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

Policies:

- 1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.
- 2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.
- 8) Emphasize quality educational programs in Hawai‘i’s institutions to promote academic excellence.

Discussion: The proposed Pāhoa Park Expansion provides educational and recreational opportunities for Pāhoa and Puna residents to enable them to fulfill their needs, responsibilities, and aspirations. The proposed Pāhoa Park Expansion will support activities that enhance personal development, physical fitness, recreation, and cultural pursuits. It is designed to provide an adequate and accessible recreational facility to meet individual and community needs.

HRS § 226-23: Objectives and policies for socio-cultural advancement – leisure.

Objective: Planning for the State’s socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.

Policies:

- 2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.
- 3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.
- 5) Ensure opportunities for everyone to use and enjoy Hawai‘i’s recreational resources.

Discussion: The proposed Pāhoa Park Expansion supports planning for the State’s socio-cultural advancement with regard to leisure through the provision of a quality recreational facility meets community needs. The facility will contribute toward fulfilling recreational needs of the Puna community and enhance the enjoyment of recreational experiences by enhancing an existing recreational facility.

5.2 COUNTY OF HAWAI‘I

County-specific land use plans and ordinances pertaining to the Project include the General Plan of the County of Hawai‘i, the Puna Community Development Plan, and the Hawai‘i County Code, and the Special Management Area.

5.2.1 County of Hawai‘i General Plan

The County of Hawai‘i General Plan is the policy document for the long-range comprehensive development of the Island of Hawai‘i. Among the purposes of the General Plan are to guide the pattern of development in Hawai‘i County and to provide the framework for regulatory decisions and capital improvement projects. The General Plan undergoes a comprehensive review every ten years, with the last review being completed in 2005.

The policy land use map, referred to as the Land Use Pattern Allocation Guide (LUPAG) Map, is intended to guide the direction and quality of future developments in a coordinated and rational manner. The Project Site is split-designated as Urban Expansion and Medium Density Urban (Figure 23). A public facility such as a park is an appropriate use in either designation. During the Draft EA public review period, the County of Hawai‘i Planning Department wrote:

“The LUPAG designations for the subject property should be corrected to indicate it is approximately 50% Medium Density Urban and 50% Urban Expansion. The information provided by the Planning Department in its pre-assessment consultation comments dated July 27, 2012 was incorrect as Ordinance 89-12, amending the LUPAG designations affecting the subject property, was adopted on June 27, 2012.”

Specific General Plan goals, policies, and courses of action most applicable to the Project are discussed below.

Recreation

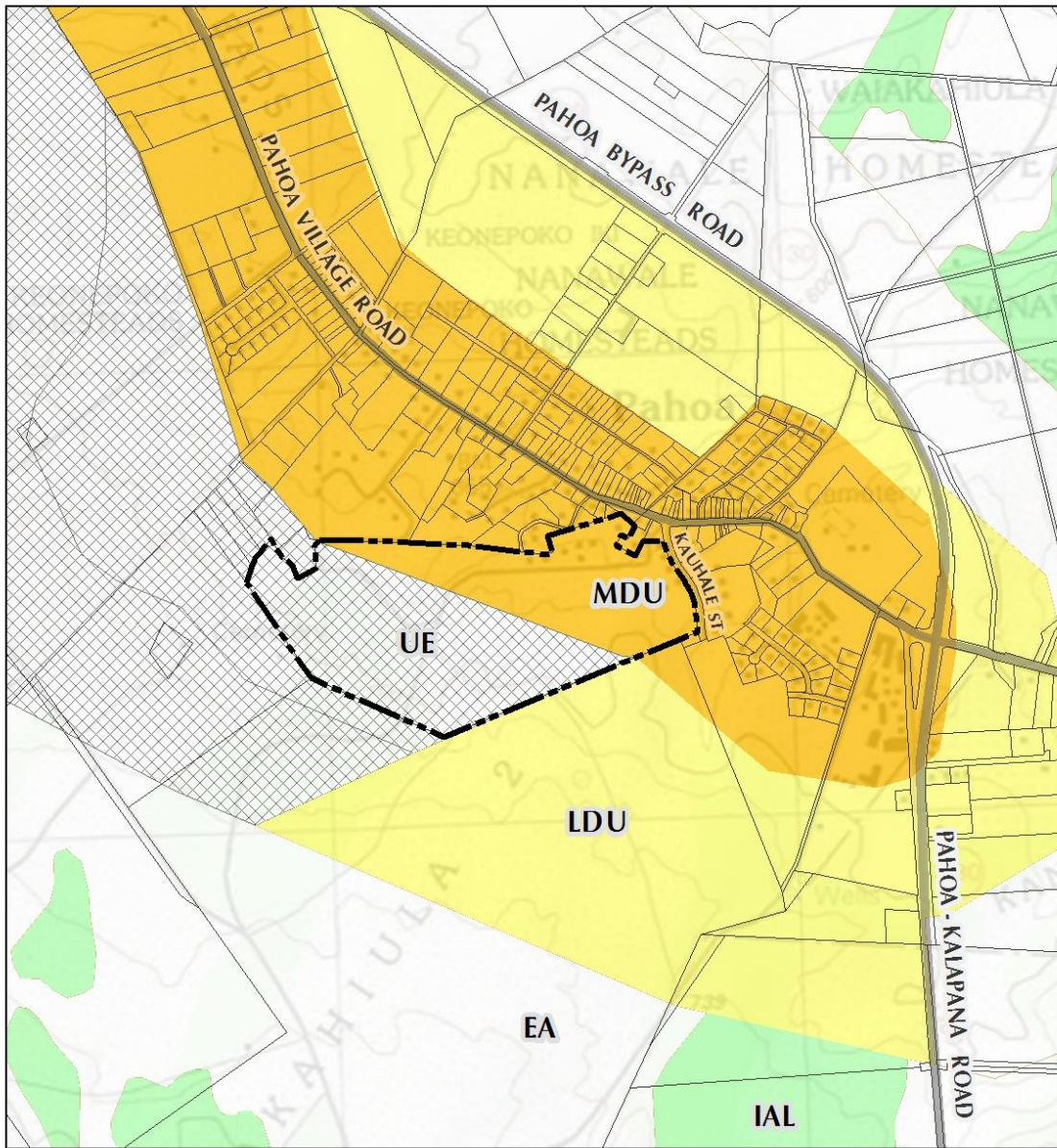
12.2 GOALS

- (a) Provide a wide variety of recreational opportunities for the residents and visitors of the County.
- (b) Maintain the natural beauty of recreation areas.
- (c) Provide a diversity of environments for active and passive pursuits.

12.3 POLICIES

- (a) Strive to equitably allocate facility-based parks among the districts relative to population, with public input to determine the locations and types of facilities.
- (b) Improve existing public facilities for optimum usage.
- (d) The use of land adjoining recreation areas shall be compatible with community values, physical resources, and recreation potential.
- (g) Facilities for compatible multiple uses shall be provided.
- (o) Develop facilities and safe pathway systems for walking, jogging, and biking activities.

Figure 23: County General Plan LUPAG



DATE: 12/18/2013

LEGEND

- IAL-Important Ag. Lands
- EA-Extensive Agriculture
- LDU-Low Density Urban
- MDU-Medium Density Urban
- UE-Urban Expansion

Source: County of Hawaii (2012)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary Interpretations or other spatial analysis.

FIGURE

County General Plan LUPAG
Pāhoā Park Expansion Master Plan

County of Hawaii DPR Puna, Hawaii

North Linear Scale (feet)
 0 250 500 1,000

12.4 STANDARDS

(a) Regional Parks:

- Major recreation area serving several districts and providing indoor and outdoor activities. A major center for spectator sports and cultural activities. May include features of historic, geological, and horticultural interests. Minimum size: 50 acres.
- Vicinity of major populated areas.
- Facilities include: multi-purpose building, auditorium, gymnasium, swimming pool, adequate parking areas, and facilities for spectator sports: football, baseball, softball, track field, tennis, basketball and volleyball.

(b) District Parks:

- Offer diversified types of recreational activities to an entire district that include indoor and outdoor sports. Minimum size: 10 to 30 acres.
- Within a district consisting of several populated communities.
- Facilities include: gymnasium with office, storage, restrooms, showers; a center for community and recreational programs; swimming pool (if justifiable); play area and equipment for young children; courts for basketball, tennis, and volleyball; ballfields for soccer, baseball, softball, and football; night lights; and an adequate parking area.

Discussion: The proposed Pāhoa Park Expansion Master Plan will remedy the deficiencies for a district park and equip the district park. The land area of the Project Site meets the standards of a regional park should the need grow in the area for a regional park.

5.2.2 Puna Community Development Plan

The County of Hawai‘i General Plan authorizes Community Development Plans (CDP) to translate broad General Plan goals, policies and standards as they apply to specific geographic regions on Hawai‘i Island. The CDPs are also intended to serve as a forum for community input into land use, delivery of government services, and other land use issues relating to the CDP area. The Project Site is located within the Puna CDP (PCDP) planning area. The final PCDP was adopted in 2008 and amended in 2010 and 2011.

During the Pre-Assessment Consultation period, the County of Hawai‘i Planning Department wrote:

“The Puna Community Development Plan (PCDP), as amended, was adopted by Ordinance no. 08-116 on September 10, 2008 and identifies “village centers” or “town centers” as the model on which Puna’s future land use pattern will be based. The PCDP designates Pāhoa as a Regional Town Center meant to provide a wide range of services and amenities to the communities in the

region. The PCDD further stipulates that development of regional town centers should be guided by a plan “prepared through an inclusive community based process that involves stakeholders, including landowners, community representatives and public agencies.”

At its February 14, 2012 meeting, the PCDD Action Committee voted to form a Pāhoa Plan Subcommittee that includes all members of the Pāhoa Community Plan Steering Committee as well as four Action Committee Members. This subcommittee for the development of a Pāhoa Regional Town Center Plan (Pāhoa Plan) has been actively soliciting community input through an on-going public survey. Also, citizen-based working groups have organized to begin formulating recommendations for elements of the plan guided by that community input. The Pāhoa Plan Steering Committee should be consulted in the drafting of the Pāhoa Park EA.”

Discussion: As recommended by the County of Hawai‘i Planning Department, representatives of the PCDD Action Committee and the Pāhoa Regional Town Center Plan Steering Committee were sent written requests to participate in the Pāhoa Park EA Pre-Assessment Consultation.

Relevant Goals, Objectives and Actions of the PCDD include:

Sec. 3.1.1.c. Services and community facilities are more accessible in village/town centers that are distributed throughout the region...

Sec. 3.1.2.e. Target investments in public services and infrastructure to promote the development of village/town centers and, secondarily, to serve the peripheral subdivision areas.

Sec. 3.5.1.c. The development of future parks supports the growth management goals, objectives and actions set forth in Section 3.1 of this plan.

Sec. 3.5.3c. Improve and expand Community Parks as follows:

2)Pāhoa Regional Park:

(1) Convert the existing fire station into a one-stop community center providing, but not limited to, a senior center with certified kitchen for congregate meals program and activities/dining room, linkages, support and advocacy for affordable housing, employment, home bound access, child care, teen pregnancy, substance abuse and domestic violence intervention; (2) Repair pump and provide solar heating system and heat-retaining cover for swimming pool; (3) Provide art center and covered performance stage; (4) Provide children’s museum and playground; (5) Develop skateboard park; (6) Provide sheltered picnic areas; (7) Build loop access road to lessen traffic on Pāhoa main street; and (8) Provide lighted parking areas and walking paths linked to Pāhoa village center.

7) Expand hours of operation and night lighting for some outdoor activities at regional and larger community parks to serve working adults and young retirees.

Sec. 3.6.3.a. Apply Leadership in Energy and Environmental Design (LEED) standards for public buildings, with minimum goal of silver leaf.

Sec. 3.6.3.b. Investigate the use of ground-water cooling systems for public buildings.

Sec. 4.2.2.c Provide park-and-ride lots at key regional sites to promote commuter ridership.

Sec. 4.2.3.c. Develop transit hubs at the following locations:

2) Pāhoa (Secondary Hub): On County-owned sites, either adjacent to Pāhoa Community Center...

Sec. 4.5.1.d. Village/town centers incorporate walking and bicycling paths.

Sec. 4.5.3.c. Invest in walkways, bicycle facilities, “park-once” lots, landscape improvements, themed signage programs and transit stops in approved village/town centers.

Discussion: The PCDP recommends Pāhoa to serve as a regional town center to provide a wide range of services for the Puna district. The community profile in the Puna CDP recognizes a need to expand the existing parks and recreational facilities as the population increases. The growth management for parks and recreation in the PCDP list the courses of action specifically for Pāhoa Park (listed above).

Subsequent to the completion of the PCDP, some of the above courses of action have been implemented. The proposed Pāhoa Park Expansion Master Plan includes repairing pump and providing solar heating system and heat-retaining cover for swimming pool; providing sheltered picnic areas; building loop access road to reduce traffic on the main streets; and providing lighted parking areas and walking paths linked to Pāhoa village center.

5.2.3 County of Hawai‘i Zoning

The Hawai‘i County Code (HCC) regulates the type and location of development permitted on the island, especially within the State Land Use Urban District. Hawai‘i County zoning designations, Chapter 25 HCC, are more specific in terms of describing permitted land uses. Most of the Project Site is zoned A-1a (Agricultural District) and a small portion is zoned RS-10 (Single-Family Residential District) (Figure 24).

During the Pre-Assessment Consultation period, the County of Hawai‘i Planning Department wrote:

“The subject 71.121-acre parcel is primarily zoned by the County of Hawai‘i as Agricultural (A-1a) with an approximately 150-200 foot wide strip along the eastern portion being zoned Single-Family Residential (RS-10).”

The Agricultural district provides for agricultural and very low density agriculturally-based residential use, including rural areas of good to marginal agricultural and grazing land, forest land, game habitats, and areas where urbanization is not found to be appropriate. HCC section 25-5-

72(a)(7) permits “campgrounds, parks, playgrounds, tennis courts, swimming pools, and other similar open area recreational facilities, where none of the recreational features are entirely enclosed in a building.” None of the proposed facilities *in Phase I* are entirely enclosed in a building. At the time the community facility proposed in future phases go forward, the Planning Department would need to determine whether that enclosed public use that is not agriculturally-related is located in the State Land Use Urban or Agricultural District and, if Agricultural, whether it requires a Special Permit pursuant to HCC section 25-5-72(c).

The zoning code specifies building height limits, minimum building site areas, minimum building site average widths and minimum yard widths. The height limit for non-residential buildings is 45 feet (Section 25-5-73 HCC). The minimum yard widths are 35 feet for front and rear yards, and 25 feet for side yards (Section 25-5-76 HCC).

5.2.4 Special Management Area

The Project Site is not located within the Special Management Area (SMA).

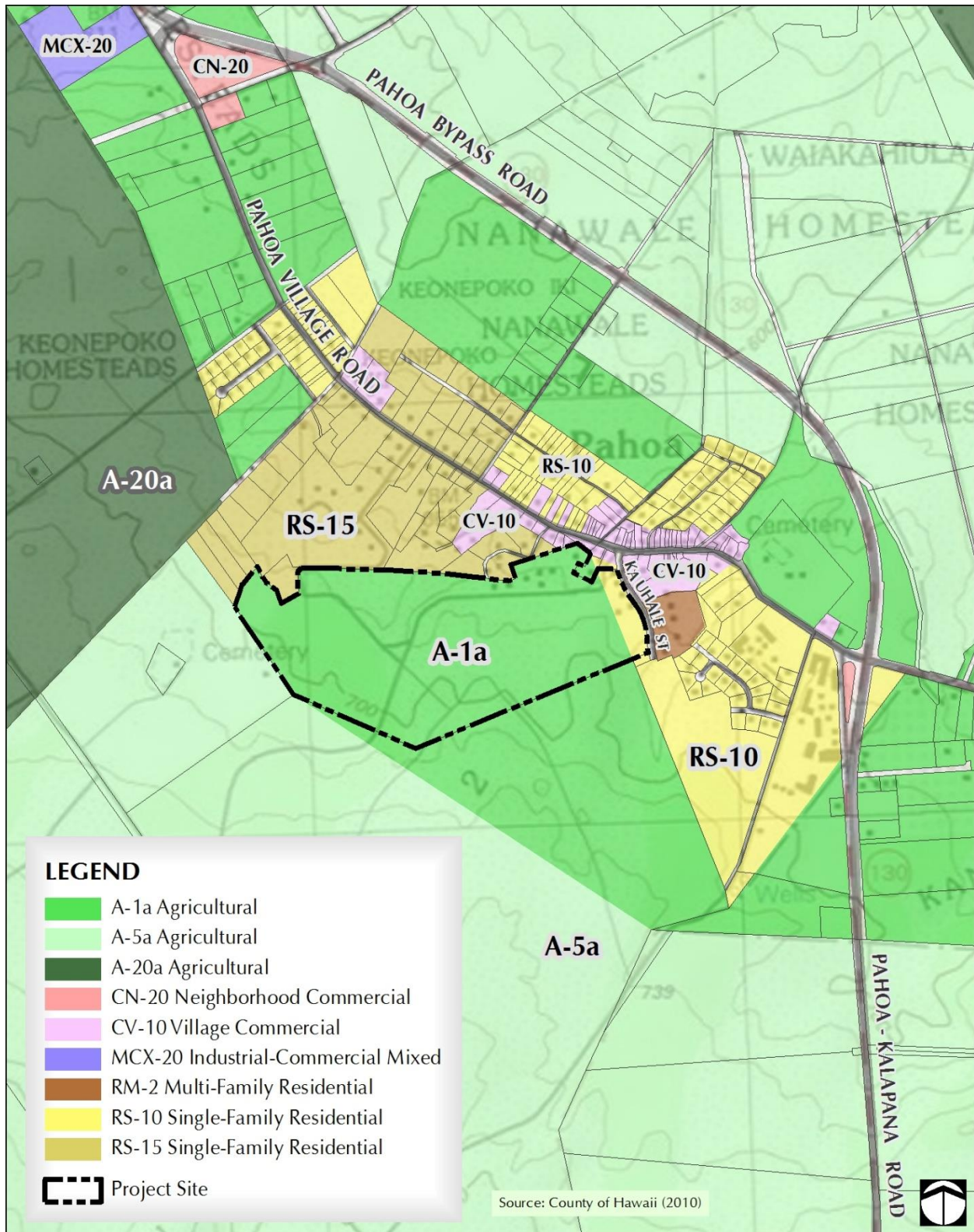
5.3 APPROVALS AND PERMITS

A listing of anticipated permits and approvals required for the Project is presented below:

Table 5: Anticipated Approvals and Permits

Permit/Approval	Responsible Agency
Chapter 343, HRS Compliance	Hawai‘i Parks and Recreation Department Office of Environmental Quality Control
National Pollutant Discharge Elimination System (NPDES) Permit	State Department of Health
Plan Approval	Hawai‘i Planning Department
Possible Future Special Permit for Community Buildings (depending on specific location, design, and function)	Hawai‘i Planning Department
Grading/Building Permits	Hawai‘i Department of Public Works
Underground Injection Control (UIC) Permit	State Department of Health
DCAB – Disability and Communication Access Board	State Department of Health

Figure 24: County of Hawai'i Zoning



6 ALTERNATIVES

This section identifies and evaluates a range of alternatives that could meet the purpose and need and possibly avoid, reduce, or minimize adverse environmental effects. The purpose and need for the Project, as discussed in Section 2.2 **Error! Reference source not found.**, include: 1) providing improved and more diverse athletic and recreational opportunities to Pāhoa Town and a larger residential community in Puna; 2) solving the existing drainage problems often present at the park; and 3) providing a unified and orderly system of public access, onsite pedestrian and vehicular circulation, and infrastructure improvement and expandability for the park. The reference point to compare alternatives is the “no action” alternative.

6.1 NO ACTION ALTERNATIVE

Under the “no action” alternative, the opportunity for providing improved and more diverse athletic and recreational opportunities to Pāhoa Town and the growing residential community in Puna would not occur. Also, under the “no action” alternative, the existing drainage problems often present at the park would not be solved. In addition, under the “no action” alternative, the opportunity for providing a unified and orderly system of public access, onsite pedestrian and vehicular circulation, and infrastructure improvement and expandability for the park would not be implemented. With “no action,” the district needs for better recreational facilities with adequate capacity for a growing residential District would not be met.

6.2 ALTERNATIVE SITES

Alternative locations include existing parks sites within the Puna District, including Kurtistown Park, Mountain View Park, Glenwood Park, Herbert Shipman Park, Isaac Kepo’okalani Hale Beach Park, Volcano Community Center, and Kea’au Community Center. A new County park was proposed at Hawaiian Paradise Park, but the community declined. Funding for that proposed park became available for the subject Project. According to the Puna Community Development Plan, the growth management for land use pattern recommends Pāhoa to serve as a regional town center to provide a wide range of services for the Puna district. The proposed expansion of Pāhoa Park is consistent with the Puna Community Development Plan and provides justification why the proposed improvements should occur at Pāhoa Park (and not other parks within the Puna District).

6.3 ALTERNATIVE SITE PLANS

Major variables raised by community comments that could influence the master plan primarily include the balance between active and passive recreational spaces, location and extent of community facilities such as a library and performing arts center, and alternative vehicular access points. The first version of the master plan weighed heavily in favor of active recreation, particularly baseball fields. The community facilities, which potentially could be connected with pedestrian ways to the commercial area, were tucked into a corner of the Site furthest from the commercial area along Pāhoa Village Road.

The revised master plan presented in this EA responded to community comments by relocating the community facilities to an area that could be more directly connected to the commercial area. One ballpark was deleted to add more passive open space that would double as drainage infiltration basins. Because the project will be developed in phases, the Phase 2 area would be an undeveloped natural area until Phase 2 is implemented.

Although multiple vehicular access points in and out of the park would be ideal, additional road improvements would significantly add to the cost. The traffic study opined that the current Kauhale Street access is adequate to accommodate the master plan uses, albeit with some possible improvements to the intersection with Pāhoa Village Road at some future point in time. For these reasons, the master plan does not include the 50' easement connecting to Cemetery Road nor the proposed Post Office Road extension. However, the master plan also does not prevent the use of these potential future road connections should there be an unforeseen need in the future and could easily accommodate these access points with the current site plan.

7 FINDINGS AND DETERMINATION

To determine whether the implementation of the Project may have a significant impact on the physical and human environment, all phases and expected consequences of the proposed project have been evaluated, including potential primary, secondary, short-range, long-range, and cumulative impacts. Based on this evaluation, the Proposing Agency (County of Hawai‘i Department of Parks and Recreation) anticipates issuing a Finding of No Significant Impact (FONSI). The supporting rationale for this anticipated finding is presented in this chapter.

7.1 SIGNIFICANCE CRITERIA

The discussion below evaluates the significance of the Project’s impacts based upon the Significance Criteria set forth in Hawai‘i Administrative Rules section 11-200-12.

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

Discussion: While the Project Site contains some built facilities (Pāhoā Senior Center, Pāhoā Community Aquatic Center, Pāhoā Neighborhood Facility, Pāhoā Skatepark, basketball courts, and parking), much of the Project Site is either grassed fields or undeveloped land. Environmental and cultural studies conducted in and around the Site reveal the absence of any resources potentially subject to irrevocable loss as a result of construction.

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

Discussion: The proposed master plan will increase access to the Site and the range of beneficial recreational uses.

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

Discussion: The Environmental Policies enumerated in Chapter 344, HRS, promote conservation of natural resources, and an enhanced quality of life for all citizens. The proposed Pāhoā Park Expansion Master Plan is not expected to significantly impact any natural resources and is expected to enhance the quality of life of Puna citizens with its recreational benefits.

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

Discussion: The proposed Pāhoā Park Expansion Master Plan’s impact on the social welfare of the community is beneficial in that the proposed project will enhance recreational opportunities for Pāhoā and Puna residents.

(5) *Substantially affects public health;*

Discussion: The proposed Pāhoa Park Expansion’s recreational facilities will promote exercise and a healthy lifestyle.

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

Discussion: The proposed Pāhoa Park Expansion responds to an existing recreational deficiency in a District projected for population growth, and itself does not generate or stimulate growth.

(7) *Involves a substantial degradation of environmental quality;*

Discussion: Wherever possible, green materials like recycled flooring, paints with low volatile organic compounds, solar hot water panels and photovoltaic panels will be integrated into the ultimate design of the proposed Pāhoa Park Expansion facilities. Landscaping will attempt to utilize native trees and shrubbery. No substantial environmental degradation is anticipated as a result of the Project. Also, as the Project will be in compliance with all pertinent statutes and regulations (e.g., regulations pertaining to grading), no substantial environmental degradation is anticipated.

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

Discussion: The proposed Pāhoa Park Expansion Master Plan is not part of a larger project, nor does it commit the State or County to any other larger actions, and will not generate any additional actions having a cumulative effect on the environment.

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

Discussion: Except for the native hoary bat which impacts will be mitigated, no rare, threatened or endangered species or its habitat were discovered during the flora and fauna surveys. Exterior lighting mitigation measures (Hawaii County has an Outdoor Lighting Ordinance - Chapter 14, Article 9. Outdoor Lighting) will minimize impact on night-flying birds.

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

Discussion: No State or Federal air quality standards will be violated during or after the construction of the Project. The only anticipated issues related to air quality would be during construction; however, construction activities would be temporary. Long-term negative impacts related to air quality are not expected.

No State or Federal water quality standards will be violated during or after the construction of the Project; the Project will be required to comply with nonpoint source prevention measures through the NPDES permit.

Construction activities will inevitably create temporary noise impacts. If necessary, contractors will employ mitigation measures to minimize those temporary noise impacts including the use of

mufflers and implementing construction curfew periods. Pursuant to Chapter 11-46, Hawai'i Administrative Rules, all construction activities must comply with all community noise controls.

Temporary noise impacts will also be generated during the course of regular operations and events. These noise disturbances are an unavoidable element of the facility usage but nonetheless will be intermittent and of short duration. Mitigation measures specify that operational policies not allow activities after 11:00 p.m. to curtail activity and vehicular noise in compliance with nighttime noise standards pursuant to the community noise controls.

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

Discussion: The Project Site does not lie in an environmentally sensitive area such as a tsunami zone, geologically hazardous area, beach, erosion-prone area, estuary, freshwater or coastal waters. Although in the lava hazard zone 2, the entire village of Pāhoa is in that zone.

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

Discussion: None of the proposed structures (e.g., comfort stations, covered court) will exceed the zoning code height limit of 45' and will not significantly alter the views of neighboring residents towards the mountains or ocean.

(13) Requires substantial energy consumption.

Discussion: The preliminary engineering analysis finds that power is currently available in the area and the capacity can support the proposed comfort station. Energy saving design elements will be integrated into building design.

7.2 DETERMINATION

Pursuant to Chapter 343, HRS, the determining agency, the County of Hawai'i Department of Parks and Recreation has issued a Finding of No Significant Impact (FONSI) for this environmental assessment. This finding is founded on the basis of impacts and mitigation measures examined in this document, public comments received during the pre-assessment consultation and public review phases, and analyzed under the above criteria.

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8 CONSULTATION

8.1 INDIVIDUALS AND ORGANIZATIONS CONSULTED WITH PRIOR TO THE EA PROCESS

In the course of planning for the proposed Pāhoa Park Expansion Master Plan, the Project team held community meetings, pre-assessment consultation letters were mailed to solicit comments to be addressed in the Draft EA, and several articles were published in the (local newspaper).

The Environmental Consultant mailed letters to the following individuals, community organizations, private groups, and government agencies notifying them that an EA was being prepared for the Project and soliciting any concerns or comments. The comments received and corresponding responses are reproduced in Appendix A.

Agencies/Organizations/Individuals	Pre-Consultation Sent	Comment Date	Reply
Department of Parks & Recreation (Determining Agency)	Yes		
OEQC	Yes		
STATE			
Department of Agriculture	Yes		
Department of Accounting and General Services	Yes		
DBEDT	Yes		
DBEDT - Energy Division	Yes		
DBEDT - Office of Planning	Yes	08-14-2012	Yes
Department of Defense	Yes	08-13-2012	Yes
Department of Education	Yes	08-24-2012	Yes
Department of Hawaiian Home Lands	Yes		
Department of Health	Yes	07-25-2012	Yes
Department of Health - Environmental Planning Office	Yes	07-23-2012	Yes
Department of Human Services	Yes	07-31-2012	Yes
Department of Labor and Industrial Relations	Yes	08-08-2012	Yes
Department of Land and Natural Resources - Land Division	Yes	08-14-2012	Yes
Department of Land and Natural Resources - Land Division (Hawai'i District)	Yes	07-23-2012	No
Department of Land and Natural Resources - Engineering	Yes	07-23-2012	No
Department of Land and Natural Resources - State Parks	Yes	07-23-2012	No

Pāhoa Park Expansion Master Plan *Final Environmental Assessment*

Agencies/Organizations/Individuals	Pre-Consultation Sent	Comment Date	Reply
Department of Land and Natural Resources - Historic Preservation	Yes		
SHPD	Yes		
SHPD (Hawai'i Island)	Yes		
Department of Transportation	Yes	08-29-2012	No
HHFDC	Yes	08-03-2012	Yes
Office of Hawaiian Affairs	Yes		
UH Environmental Center	Yes	07-27-2012	Yes
FEDERAL			
U.S. Army - Engineer Division	Yes	08-06-2012	Yes
U.S.G.S. - Hawaiian Volcano Observatory	Yes		
U.S. Fish and Wildlife Service	Yes	08-13-2012	Yes
U.S. NPS – Hawai'i Volcanoes National Park	Yes		
COUNTY			
Department of Environmental Management	Yes	07-26-2012	Yes
Department of Public Works	Yes		
Department of Research and Development	Yes		
Department of Water Supply	Yes	10-25-2012	No
Fire Department	Yes	07-25-2012	Yes
Office of Housing and Community Development	Yes		
Planning Department	Yes	07-27-2012	yes
Police Department	Yes	07-27-2012	Yes
Puna CDP Steering Committee	Yes		
Civil Defense	Yes		
ELECTED OFFICIALS			
State Senator	Yes		
State Representative	Yes		
County Council Member	Yes		
CITIZEN GROUPS/INDIVIDUALS			
Malama i Ka Aina Working Group	No	08-01-2012	Yes
Malama O Puna	No	08-16-2012	No
Richard Bidleman	No	08-13-2012	No

8.2 INDIVIDUALS AND ORGANIZATIONS CONSULTED DURING THE EA PROCESS

The Draft EA was distributed to the following agencies, organizations and individuals. Comments received on the Draft EA are reproduced in Appendix A.

Agencies/Organizations/Individuals	Draft EA/AFONSI Sent	Comment Date	Reply
Department of Parks & Recreation (Determining Agency)	Yes		
OEQC	Yes	12-06-2013	Yes
STATE			
Department of Agriculture	Yes		
Department of Accounting and General Services	Yes		
DBEDT	Yes		
DBEDT - Energy Division	Yes		
DBEDT - Office of Planning	Yes		
Department of Defense	Yes	12-09-2013	Yes
Department of Education	Yes	11-08-2013	Yes
Department of Hawaiian Home Lands	Yes	12-09-2013	Yes
Department of Health – Clean Water Branch	Yes	11-18-2013	Yes
Department of Health - Environmental Planning Office	Yes	11-05-2013	Yes
Department of Health – Safe Drinking Water Branch	Yes	11-13-2013	Yes
Department of Human Services	Yes	11-11-2013	Yes
Department of Labor and Industrial Relations	Yes	11-05-2013	Yes
Department of Land and Natural Resources (DLNR) - Land Division	Yes	11-29-2013	Yes
DLNR – Land Division, Hawai‘i Island Office	Yes		
DLNR – Historic Preservation Division	Yes	12-10-2013	Yes
Department of Transportation	Yes		
HHFDC	Yes		
Office of Hawaiian Affairs	Yes		
Office of Planning	Yes	12-09-13	Yes
UH Environmental Center	Yes		
Hilo Public Library	Yes		
UH Hilo Library	Yes		
Pāhoa Public Library	Yes		
FEDERAL			
U.S. Army - Engineer Division	Yes		
U.S. Federal Emergency Management Agency	Yes	12-13-2013	Yes
U.S.G.S. - Hawaiian Volcano Observatory	Yes		
U.S. Fish and Wildlife Service	Yes		

Pāhoa Park Expansion Master Plan *Final Environmental Assessment*

Agencies/Organizations/Individuals	Draft EA/AFONSI Sent	Comment Date	Reply
U.S. Pacific Islands Water Service Center	Yes	12-05-2013	Yes
U.S. Hawaii Volcanoes National Park	Yes	11-21-2013	Yes
COUNTY			
Department of Environmental Management	Yes	11-05-2013	Yes
Department of Public Works	Yes		
Department of Research and Development	Yes		
Department of Water Supply	Yes		
Fire Department	Yes		
Planning Department	Yes	12-13-2013	Yes
Police Department	Yes	11-05-2013	Yes
Puna CDP Steering Committee	Yes		
Civil Defense	Yes		
ELECTED OFFICIALS			
State Senator	Yes		
State Representative	Yes		
County Council Member	Yes		
CITIZEN GROUPS/INDIVIDUALS			
Malama i Ka Aina Working Group	Yes		
Malama O Puna	Yes	12-09-2013	Yes
Richard Bidleman	Yes		

9 REFERENCES

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- B.D. Neal & Associates, Inc. (2010). *Air Quality Study for the Proposed Keaau-Pahoā Road Improvements Project*.
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- Martin & Chock, Inc. (2010). *County of Hawaii Multi-Hazard Mitigation Plan*. Prepared for County of Hawaii Civil Defense Agency.
- Pukui, M. S. (1974). *Place Names of Hawaii*. Honolulu: University of Hawaii Press.
- Terry, R. P. (1996). *Pahoā Swimming Pool Final Environmental Assessment (Negative Declaration)*. Prepared for the County of Hawai'i.
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- Wilson Okamoto Corporation. (2008). *Hawaii Water Plan. Water Resource Protection Plan*. Prepared for State of Hawaii Commission on Water Resource Management.

Appendix **A**

COMMENTS AND RESPONSES

PRE-CONSULTATION COMMENTS AND RESPONSES

Agencies/Organizations/Individuals	Pre-Consultation Sent	Comment Date	Reply
Department of Parks & Recreation (Determining Agency)	Yes		
OEQC	Yes		
STATE			
Department of Agriculture	Yes		
Department of Accounting and General Services	Yes		
DBEDT	Yes		
DBEDT - Energy Division	Yes		
DBEDT - Office of Planning	Yes	08-14-2012	Yes
Department of Defense	Yes	08-13-2012	Yes
Department of Education	Yes	08-24-2012	Yes
Department of Hawaiian Home Lands	Yes		
Department of Health (DOH)	Yes	07-25-2012	Yes
DOH Environmental Planning Office	Yes	07-23-2012	Yes
Department of Human Services	Yes	07-31-2012	Yes
Department of Labor and Industrial Relations	Yes	08-08-2012	Yes
DLNR Land Division	Yes	08-14-2012	Yes
DLNR Land Division (Hawai'i District)	Yes	07-23-2012	No
DLNR Engineering	Yes	07-23-2012	No
DLNR State Parks	Yes	07-23-2012	No
DLNR Historic Preservation	Yes		
SHPD	Yes		
SHPD (Hawai'i Island)	Yes		
Department of Transportation	Yes	08-29-2012	No
HHFDC	Yes	08-03-2012	Yes
Office of Hawaiian Affairs	Yes		
UH Environmental Center	Yes	07-27-2012	Yes
FEDERAL			
U.S. Army - Engineer Division	Yes	08-06-2012	Yes
U.S.G.S. - Hawaiian Volcano Observatory	Yes		
U.S. Fish and Wildlife Service	Yes	08-13-2012	Yes
U.S. NPS – Hawai'i Volcanoes National Park	Yes		
COUNTY			
Department of Environmental Management	Yes	07-26-2012	Yes
Department of Public Works	Yes		
Department of Research and Development	Yes		
Department of Water Supply	Yes	10-25-2012	No
Fire Department	Yes	07-25-2012	Yes
Office of Housing and Community Development	Yes		
Planning Department	Yes	07-27-2012	yes

PRE-CONSULTATION COMMENTS AND RESPONSES

Agencies/Organizations/Individuals	Pre-Consultation Sent	Comment Date	Reply
Police Department	Yes	07-27-2012	Yes
Puna CDP Steering Committee	Yes		
Civil Defense	Yes		
ELECTED OFFICIALS			
State Senator	Yes		
State Representative	Yes		
County Council Member	Yes		
CITIZEN GROUPS/INDIVIDUALS			
Malama i Ka Aina Working Group	No	08-01-2012	Yes
Malama O Puna	No	08-16-2012	No
Richard Bidleman	No	08-13-2012	No



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

August 6, 2012

Regulatory Branch

File Number **POH-2012-00189**

PBR Hawaii
ATTN: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Takemoto:

This responds to your letter dated July 17, 2012 requesting review comments for the proposed Pahoia Park Expansion at Pahoia, Puna, Hawaii Island, Hawaii. We have assigned this project the reference number **POH-2012-00189**. Please cite this reference number in any future communications with this office regarding this project.

We have completed our review of the submitted documents pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404). Section 10 requires that a Department of the Army (DA) permit be obtained from the U.S. Army Corps of Engineers (Corps) prior to undertaking any construction, dredging, or other activity occurring in, over, or under or affecting navigable waters of the U.S. For tidal waters, the shoreward limit of the Corps jurisdiction extends to the Mean High Water Mark. Section 404 requires that a DA permit be obtained for the discharge (placement) of dredged and/or fill material into waters of the U.S., including wetlands. For tidally influenced waters, in the absence of adjacent wetlands, the shoreward limit of the Corps jurisdiction extends to the High Tide Line, which in Hawaii may be approximated by reference to the Mean Higher High Water Mark. For non-tidal waters, the lateral limits of the Corps jurisdiction extend to the Ordinary High Water Mark or the approved delineated boundary of any adjacent wetlands.

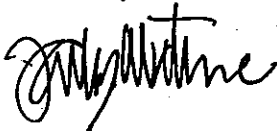
Based on the information provided, there is insufficient information provided to determine if the project site will be absent of navigable waters subject to the Corps jurisdiction and if the proposed project will involve activities under Section 404. Fill material, permanent or temporary, may include, but is not limited to: rock, dirt, sandbags, silt fences or concrete. To avoid unintentional violation to federal regulation and law, we advise you to contact our office prior to conducting any activity that may result in the discharge or dredged and/or fill material. Section 10 and Section 404 authorization may be required for this action.

When developing the Environmental Assessment, we recommend you conduct a thorough aquatic resource survey describing information regarding any potential water bodies, including wetlands, drainage ditches, gulches, stream, etc., on-site, especially those that may be impacted by the proposed project. The survey should include descriptions of aquatic features proposed for impact, flow duration, and the flow path of each feature into navigable waters.

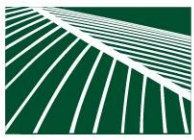
We recommend you contact the Corps to determine if any of the proposed work constitutes a "discharge of fill" and submit an application with associated drawings that meet our drawing recommendations found at <http://www.poh.usace.army.mil/Missions/Regulatory.aspx>. Click on "Apply for Permit" on the right-hand side, and then click on "Rec - Sect 404 Clean Water Act Drawings." Providing photographs of the parcel would also expedite our review. As a reminder, only the Corps has the authority to determine if any of these features are or are not waters of the U.S. and, potentially subject to regulations. A request for an approved Jurisdictional Determination can be submitted prior to, or concurrently with, an application for the proposed work.

Thank you for giving us the opportunity to review this proposal and providing us with the opportunity to comment. Should you have any questions, please contact Ms. Michelle Lazaro at (808) 835-4307, or through email at Michelle.K.Lazaro@usace.army.mil. You are encouraged to provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at <http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,



for
George P. Young, P.E.
Chief, Regulatory Branch



PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

George P. Young, P.E.
Chief, Regulatory Branch
Department of the Army
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawaii 96858-5440

Attn: Ms. Michelle Lazaro

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI‘I, TMK: (3) 1-5-002:020**

Dear Mr. Young:

On behalf of the County of Hawai‘i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoia Park Expansion Master Plan. We sent a request for pre-consultation comments to the U.S. Army Corps of Engineers in July 2012 and received your comments in the letter dated August 6, 2012 (File Number POH-2012-00189). Per your agency’s comments, the Draft EA will address whether there any potential water bodies, including wetlands, drainage ditches, gulches, streams, etc. on-site, especially those that may be impacted by the proposed development.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai‘i Department of Public Works

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
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1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai‘i 96707-2005
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Fax: (808) 535-3163

O:\Job29\2926.01 Pahoia Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-12 Reply to USACOE.docx

NEIL ABERCROMBIE
GOVERNOR

MAJOR GENERAL DARRYLL D. M. WONG
DIRECTOR OF CIVIL DEFENSE

DOUG MAYNE
VICE DIRECTOR OF CIVIL DEFENSE



PHONE (808) 733-4300
FAX (808) 733-4287

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

August 13, 2012

Mr. Roy Takemoto
Managing Director
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

Pre-Assessment Consultation
for Pahoia Park Expansion Master Plan
Tax Map Key: 3-1-5-002:020 Pahoia, Puna, Hawaii

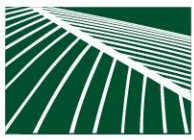
Thank you for the opportunity to comment on this proposed project. The proposed area falls within coverage arcs of existing warning sirens.

We defer to the Department of Land and Natural Resources on proposed mitigation actions pertaining to any archeological, historical, and cultural discoveries made during the Draft Environmental Assessment (DEA) process. We look forward to the opportunity to review and comment on the completed DEA.

If you have any questions, please contact Ms. Havinne Okamura, Hazard Mitigation Planner, at (808) 733-4300, extension 556.

Sincerely,

DOUG MAYNE
Vice Director of Civil Defense



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

Doug Mayne, Vice Director of Civil Defense
State of Hawai'i
Department of Defense
Office of the Director of Civil Defense
3949 Diamond Head Road
Honolulu, Hawai'i 96816-4495

Attn: Ms. Havinne Okamura

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAII'I, TMK: (3) 1-5-002:020**

Dear Mr. Mayne:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the State of Hawaii Department of Defense in July 2012 and received your comments in the letter dated August 13, 2012. We appreciate the information provided that the project area falls within coverage arcs of existing warning sirens.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\Job29\2926.01 Pahoā Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-15 Reply to DOD.docx



DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

NEIL ABERCROMBIE
GOVERNOR
RICHARD C. LIM
DIRECTOR
MARY ALICE EVANS
DEPUTY DIRECTOR
JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-13690

August 14, 2012

Mr. Roy Takemoto
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

Subject: Pahoa Park Expansion Master Plan
TMK: (3) 1-5-002: 020, Pahoa, Puna, Hawaii
Pre-Assessment Consultation

Thank you for the opportunity to provide comments on the Pre-Assessment Consultation for the subject project. It is our understanding that the County of Hawaii, Department of Parks and Recreation, is proposing to develop a master plan to expand Pahoa Park which is located on a 72-acre parcel identified as TMK: (3) 1-5-002: 020. The park currently consists of a community center, senior center, skate park, swimming pools, and ball fields. The master plan will explore alternative facilities and layouts, including a covered play court facility for basketball and volleyball, a comfort station, and new ball fields.

The Office of Planning has reviewed the material provided in your letter dated July 19, 2012, and has the following comment to offer:

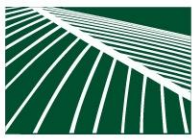
1. The entire state is defined to be within the Coastal Zone Management Area (Hawaii Revised Statutes (HRS) Section 205A-1 - definition of "coastal zone management area"). The Draft Environmental Assessment should include a discussion of the proposed project's consistency with the objectives and policies set forth in HRS Section 205A-2.

Thank you for the opportunity to comment on the Pre-Assessment Consultation for the proposed project.

Should you have questions or require clarification, please do not hesitate to contact Leo Asuncion, Coastal Zone Management Program Manager, at 587-2875.

Sincerely,

Jesse K. Souki
Director



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

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Honolulu, Hawai'i 96813-3484
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KAPOLEI OFFICE

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Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Jesse K. Souki, Director
Office of Planning
State of Hawai'i
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawai'i 96804

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Mr. Souki:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoa Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Business, Economic Development & Tourism in July 2012 and received your comments in the letter dated August 14, 2012 (your Ref. No. P-13690). As suggested, the Draft EA will include a discussion of the proposed project's consistency with the objectives and policies set forth in HRS Section 205A-2.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

O:\Job29\2926.01 Paho Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-16 Reply to DBEDT.docx

William P. Kenoi
Mayor

William T. Takaba
Managing Director



Dora Beck, P.E.
Acting Director

County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
25 Aupuni Street • Hilo, Hawai'i 96720
(808) 961-8083 • Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_envmng.htm

July 26, 2012

Mr. Roy Takemoto
Managing Director
Hilo Office
PBR HAWAII & Associates, Inc.
1719 Haleloke Street
Hilo, HI 96720-01553

RE: Pre-Assessment Consultation for Pāhoa Park
Expansion Master Plan Located at Pāhoa, Puna, HI
TMK: (3) 1-5-002:020

Our department has no comments to provide at this time on the subject project.

Thank you for allowing us to review and comment.

Sincerely,

A handwritten signature in blue ink that reads "Dora Beck".

Dora Beck, P.E.
ACTING DIRECTOR



PBR HAWAII & ASSOCIATES, INC.

July 19, 2012

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
Principal

W. FRANK BRANDT, FASLA
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Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

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Kapolei, Hawai'i 96707-2005
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Fax: (808) 535-3163

HILO OFFICE

1719 Haleloke Street
Hilo, Hawai'i 96720-1553
Tel/Cel: (808) 315-6878

Ms. Dora Beck
Department of Environmental Management
25 Aupuni Street
Hilo, Hawai'i 96720

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Ms. Beck,

PBR HAWAII will be preparing an Environmental Assessment for the proposed Pāhoa Park Expansion Master Plan. As part of the scoping process, we are writing to consult with your agency or organization.

The County of Hawai'i Department of Parks & Recreation is proposing to develop a master plan to expand Pāhoa Park. Existing facilities include a community center, senior center, skatepark, swimming pool, and ballfields. The existing ballfields are often not usable due to drainage problems. The master plan will explore alternative facilities and layouts including a covered play court facility for basketball and volleyball, a comfort station, and new ballfields. The park is accessed from Kauhale Street and located on an approximately 72-acre parcel (TMK 1-5-002:020) (see attached Regional Location map). The master plan will study the entire site but may propose new facilities in phases for this large parcel.

With this letter, we seek your comments as to whether the proposed project may have an impact on any of your existing or proposed projects, plans, policies, or programs that we should consider when preparing the Draft Environmental Assessment.


Please send us any comments you may have by August 17, 2012 by mail or email to the following address:

PBR HAWAII
ATTN: Roy Takemoto
1001 Bishop Street, Suite 650 or rtakemoto@pbrhawaii.com
Honolulu, HI 96813-3484

If you need any additional information or have any questions, please contact me at (808) 521-5631.

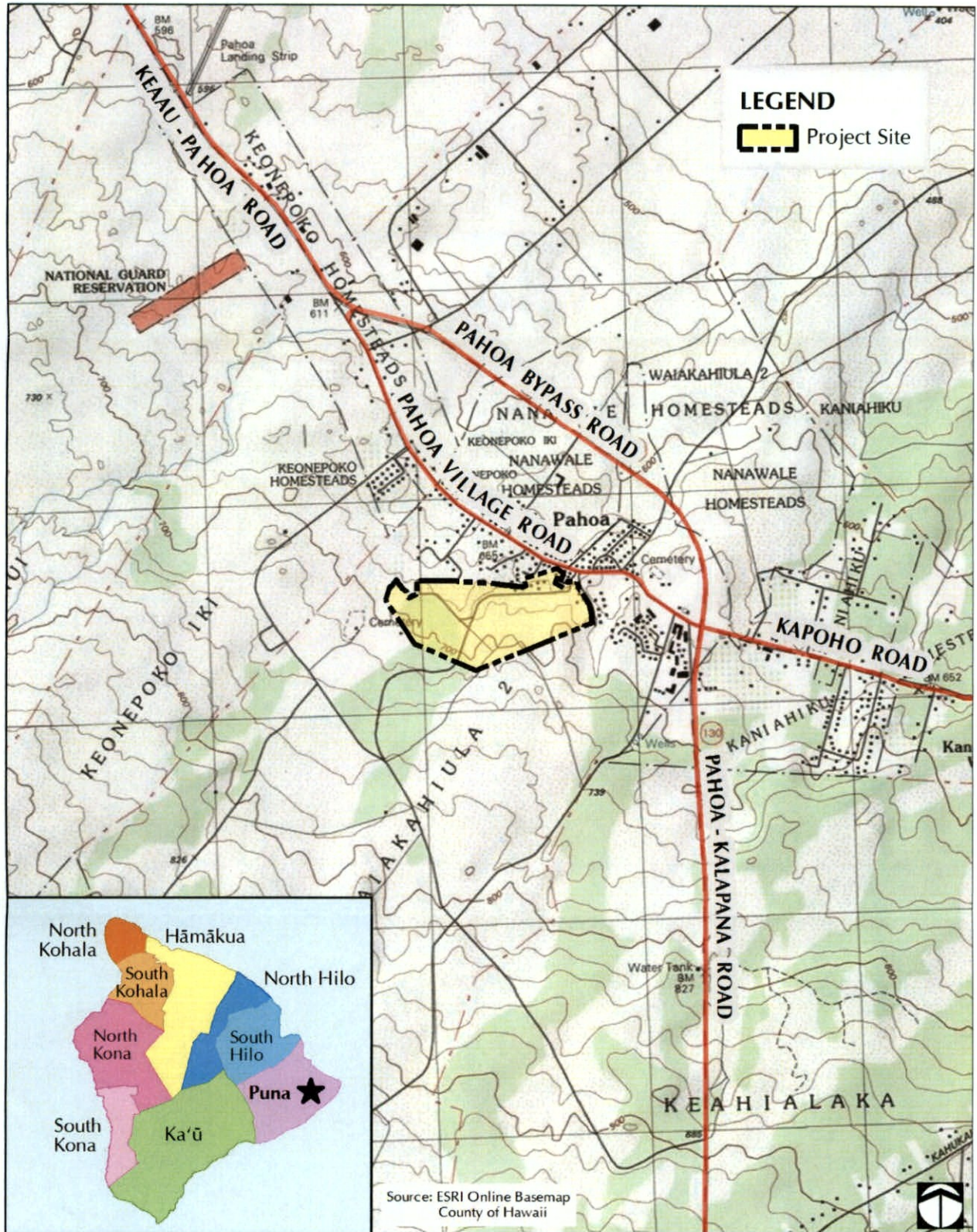
Sincerely,

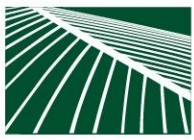
PBR HAWAII


Roy Takemoto
Managing Director, Hilo Office

XC: Department of Parks & Recreation
WCIT Architects

Figure 1. Regional Location Map





PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
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W. FRANK BRANDT, FASLA
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Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Dora Beck, Acting Director
County of Hawai'i
Department of Environmental Management
25 Aupuni Street
Hilo, Hawai'i 96720

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Ms. Beck:

On behalf of the County of Hawaii Parks and Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Environmental Management (DEM) in July 2012 as part of the scoping process. DEM provided comments in the letter dated July 26, 2012.

We acknowledge that DEM has no comments to provide at this time on the subject project. We appreciate DEM's participation in the environmental review process. DEM's letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\Job29\2926.01 Pahoā Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-01 Reply to DEM.docx



STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES

Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, Hawaii 96813

Refer to 12:0469

July 31, 2012

Mr. Roy Takemoto
Managing Director, Hilo Office
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

**SUBJECT: Pre-Assessment Consultation For Pahoia Park Expansion Master Plan
Located At Pahoia, Puna, Hawai'i TMK: (3) 1-5-002:020**

The Department of Human Services (DHS) received the letter informing us about your plans to complete an Environmental Assessment for the proposed development of a master plan to expand Pahoia Park.

Thank you for the opportunity to comment on whether the proposed project may have an impact on any of our existing or proposed projects, plans, policies, or programs. The Director, Patricia McManaman, has forwarded your letter to us for a response.

At this time DHS does not have any existing programs, nor proposed projects, plans, policies, or programs that would be affected by the proposed plans as identified in your correspondence. However, we are aware of the Puna district's lack of programs for the children under kindergarten age and the need for preschool and special education services, due largely to the lack of space at existing facilities to provide these services.

If the County of Hawai'i Department of Parks & Recreation is proposing to expand Pahoia Park, which currently includes a community center, senior center, skate park, swimming pool and ball fields, we would like to recommend that the County survey the community's need and support for additional programs that would serve the families with young children. With a senior center already on site, consider the possibility of expanding on it to provide inter-generational care, "kupuna" and "keiki" services for

Mr. Takemoto
PBR Hawaii & Associates, Inc.
July 31, 2012
Page 2

instance. We hope that the master plan for Pahoia Park will include sufficient space for adding new programs that would support the health, safety and economic future of the whole community. Starting with an environmental assessment that includes the views of families, educators, and service providers in the community should ensure the resulting master plan is well supported.

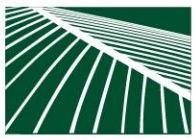
If you have any questions or need further information, please contact Ms. Marja Leivo, Child Care Program Specialist, at (808) 586-7112.

Sincerely,



Scott Nakasone
Assistant Division Administrator

c: Patricia McManaman, Director



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
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KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Scott Nakasone, Assistance Division Administrator
State of Hawai'i
Department of Human Services
Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, Hawai'i 96813

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Mr. Nakasone:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoa Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Human Services (DHS) in July 2012 as part of the scoping process. DHS provided comments in the letter dated July 31, 2012.

As a note to your recommendations for surveying community needs and addressing those needs at Pāhoa Park (if compatible with park use), the County held several meetings with the community to solicit the community's input.

We appreciate DHS' participation in the environmental review process. DHS' letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\Job29\2926.01 Pahoia Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-02 Reply to DHS.docx

NEIL ABERCROMBIE
GOVERNOR



DWIGHT TAKAMINE
DIRECTOR

AUDREY HIDANO
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

830 PUNCHBOWL STREET, ROOM 321
HONOLULU, HAWAII 96813
www.hawaii.gov/labor
Phone: (808) 586-8844/Fax: (808) 586-9099

August 8, 2012

PBR Hawaii
Attn: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

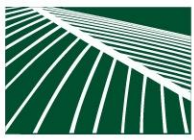
Dear Mr. Takemoto:

This is in response to your request for comments dated July 19, 2012 on the Pre-Assessment Consultation for the Pahoia Park Expansion Master Plan located in Pahoia, Puna, island of Hawaii.

The Department of Labor and Industrial Relations has no comments, and we foresee no impact on our existing or proposed programs. Should you have any questions, please call me at (808) 586-8844.

Sincerely,

DWIGHT TAKAMINE
Director



PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

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Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Dwight Takamine, Director
State of Hawai'i
Department of Labor and Industrial Relations
830 Punchbowl Street, Room 321
Honolulu, Hawai'i 96813

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Mr. Takamine:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Labor and Industrial Relations (DLIR) in July 2012 as part of the scoping process. We received your comments in the letter dated July 26, 2012.

We acknowledge that DLIR foresees no impact on its existing or proposed programs. We appreciate DLIR's participation in the environmental review process. DLIR's letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
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Fax: (808) 535-3163

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NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AHA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 14, 2012

PBR Hawaii & Associates, Inc.
Attn: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

via email: rtakemoto@pbrhawaii.com

Dear Mr. Takemoto:

SUBJECT: Pre-Assessment Consultation for Pahoia Park Expansion Master Plan, PBR Hawaii & Associates, Inc. for County of Hawaii Department of Parks and Recreation, Pahoia, Puna, Hawaii; TMK: (3) 1-5-002:020

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

At this time, enclosed are comments from: (1) the Engineering Division, (2) the Hawaii District Land Office, and (3) the Division of State Parks on the subject matter. Should you have any questions, please feel free to call Kevin Moore at 587-0426. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)



2 JUL 24 PM 03:06 ENGINEERING



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 23, 2012

MEMORANDUM

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

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for Pahoia Park Expansion Master Plan
LOCATION: Pahoia, Puna, Hawaii; TMK: (3) 1-5-002:020
APPLICANT: PBR Hawaii & Associates, Inc. for County of Hawaii Department of Parks and Recreation

RECEIVED
LAND DIVISION
2012 JUL 31 A 6:55 PM
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 14, 2012.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: _____

Print name: CARTY CHANG, CHIEF ENGINEER

Date: 7/30/12

cc: Central Files

**DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION**

LM/KevinMoore
Ref.: PreAssessConsultationPahoaParExpansion
Hawaii.572

COMMENTS

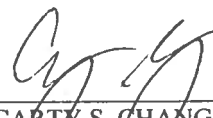
- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- (X) **Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in an area of Minimal Tsunami Inundation. The National Flood Insurance Program does not have any regulations for developments within the Minimal Tsunami Inundation areas.**
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- () Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting.
- () Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
- () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- () Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
- () Additional comments : _____

- () Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: 
CARTY S. CHANG, CHIEF ENGINEER

Date: 1/30/12



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

2012 JUL 25 P 3:04

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
HILO, HAWAII

July 23, 2012

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division - Hawaii District
- Historic Preservation

RECEIVED
LAND DIVISION
2012 JUL 30 A 10:52
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Pre-Assessment Consultation for Pahoia Park Expansion Master Plan

LOCATION:

Pahoia, Puna, Hawaii; TMK: (3) 1-5-002:020

APPLICANT:

PBR Hawaii & Associates, Inc. for County of Hawaii Department of Parks and Recreation

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 14, 2012.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Print name:

GORDON C. HEIF

Date:

7/27/12

cc: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



RECEIVED
LAND DIVISION

RECEIVED
STATE PARKS DIV



2012 AUG 1 P 2:36
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

12 JUL 24 12:49

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DEPT. OF LAND & NATURAL RESOURCES

July 23, 2012

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District
- Historic Preservation

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Pre-Assessment Consultation for Pahoia Park Expansion Master Plan

LOCATION:

Pahoia, Puna, Hawaii; TMK: (3) 1-5-002:020

APPLICANT:

PBR Hawaii & Associates, Inc. for County of Hawaii Department of Parks and Recreation

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 14, 2012.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

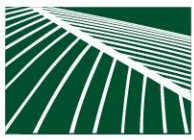
- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Print name: Daniel S. Quinn

Date: 7/30/12

cc: Central Files



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

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Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
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SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Russell Y. Tsuji, Land Administrator
Land Division
State of Hawai'i
Department of Land and Natural Resources
Post Office Box 621
Honolulu, Hawai'i 96809

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Mr. Tsuji:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Land and Natural Resources (DLNR) in July 2012 and received your comments in the letter dated August 14, 2012. We appreciate comments from those Divisions that responded and acknowledge that the Hawaii District Land Office and the Division of State Parks had no comments. Per the comments from Engineering Division, the Draft EA will note that according to the Flood Insurance Rate Map, the project site is located in an area of Minimal Tsunami Inundation.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

O:\Job29\2926.01 Pahoā Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-11 Reply to DLNR.docx



STATE OF HAWAII
DEPARTMENT OF EDUCATION

P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

August 24, 2012

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

Subject: Pre-Assessment Consultation for Pahoa Park, Puna, TMK: 1-5-002:020


The Department of Education (DOE) does not have any concerns or comments about the proposed improvements to Pahoa Park. The park's facilities have not been used by either Pahoa Elementary or Pahoa High and Intermediate School on a regular basis. The schools could become interested in occasional or special event use of the improved facilities, but the schools will be able to work out agreements with the County of Hawaii Department of Parks and Recreation (DPR).

The DOE would like to raise the issue of the lack of closure on other County park land in the vicinity. This is not directly related to proposed improvements to the 72-acres in Pahoa, but it is related to other County park land and facilities in Pahoa.

The DOE takes full management responsibility for the three County-owned parcels that make up the campus of Pahoa Elementary, TMK parcels 1-5-014: 002, 025, and 026. Parcels 25 and 26 are the sites of former DPR parks and facilities. The County operates under the belief that these parcels were transferred by the legislature through Act 154, Session Laws of Hawaii 2003. In fact these parcels have not been legally transferred to the State of Hawaii. We request that any reference in the Environmental Assessment (EA) to County park history or inventory be clear about the lands' legal status.

The DOE looks forward to reviewing the EA. If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 377-8301.

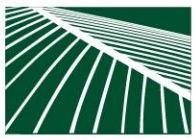
Very truly yours,



Kathryn S. Matayoshi
Superintendent

KSM:jmb

c: Mary Correa, CAS, Ka`u/Kea`au/Pahoa Complex Areas
Raymond L'Heureux, Asst. Supt., OSFSS



PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
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SCOTT ALIKA ABRIGO, LEED® AP
Associate

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DACHENG DONG, LEED® AP
Associate

HONOLULU OFFICE

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E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Kathryn S. Matayoshi, Superintendent
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, Hawai'i 96804

Attn: Ms. Heidi Meeker

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Ms. Matayoshi:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Education in July 2012 and received your comments in the letter dated August 21, 2012. We appreciate the information provided that the Department of Education does not have any concerns or comments about the proposed improvements to Pāhoā Park. We acknowledge that the public schools in the area do not use the park facilities on a regular basis, and that special event use would be worked out as needed with the County. We will forward your Department's questions about other County park land and facilities in Pāhoā.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

O:\Job29\2926.01 Pahoā Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-17 Reply to DOE (DRAFT).docx



STATE OF HAWAII
DEPARTMENT OF HEALTH

P. O. BOX 3378
HONOLULU, HI 96801-3378

July 23, 2012

In reply, please refer to:
File:

12-130
Pahoa Park

PBR HAWAII
ATTN: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

**SUBJECT: Pre-Assessment Consultation for Pahoa Park Expansion Master Plan
located at Pahoa, Puna, Hawaii, TMK: (3) 1-5-002: 020**

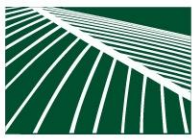
The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter, dated **July 19, 2012**. Thank you for allowing us to review and comment on the subject document. The document was routed to the various branches of the Environmental Health Administration. We have no comments at this time, but reserve the right to future comments. We strongly recommend that you review all of the Standard Comments on our website: www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this application should be adhered to.

The United States Environmental Protection Agency (EPA) provides a wealth of information on their website including strategies to help protect our natural environment and build sustainable communities at: <http://water.epa.gov/infrastructure/sustain/>. The DOH encourages State and county planning departments, developers, planners, engineers and other interested parties to apply these strategies and environment principles whenever they plan or review new developments or redevelopments projects. We also ask you to share this information with others to increase community awareness on healthy, sustainable community design. If there are any questions about these comments please contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Laura Leialoha Phillips McIntyre".

Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office Manager
Environmental Health Administration
Department of Health
919 Ala Moana Blvd., Ste. 312
Honolulu, Hawaii 96814
Phone: 586-4337
Fax: 586-4370
laura.mcintyre@doh.hawaii.gov



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
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Fax: (808) 535-3163

Laura McIntyre, Manager
State of Hawai'i
Department of Health
Environmental Planning Office
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Ms. McIntyre:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Health (DOH) in July 2012 as part of the scoping process. DOH provided comments in the letter dated July 23, 2012.

We noted in the Draft EA that any additional wastewater systems that may be needed to accommodate additional wastewater flows from the proposed project must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems."

We have reviewed the Environmental Planning Office's standard comments. Responses are provided below for comments specifically applicable to the Draft EA.

Waterbody type and class

1. The Draft EA identifies the type and class of all potentially affected water bodies. Nearshore marine waters off of the coast are classified as "AA" by the State Department of Health. However, direct discharges of stormwater runoff into marine waters are not expected to occur due to the project's distance to the coast and high permeability of lavas in the vicinity of the site.

Existing water quality actions

2. A National Pollutant Discharge Elimination System (NPDES) Notice of General Permit Coverage (NGPC) for Storm Water Associated with Construction Activity will be sought.
3. The NPDES permit will include requirements to maintain water quality after construction. All runoff due to the Project will be detained on-site in accordance with County standards.

Pending water quality management actions

4. There are no listed impaired water bodies within the vicinity of the project that appear on the current *List of Impaired Waters in Hawaii Prepared under Clean Water Act §303(d)*.

U.S. Environmental Protection Agency

Ms. McIntyre

SUBJECT: PRE-CONSULTATION FOR PĀHOA PARK EXPANSION MASTER PLAN
ENVIRONMENTAL ASSESSMENT LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020

August 14, 2012

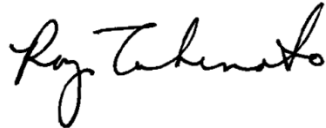
Page 2 of 2

In the preparation of the Draft EA, we reviewed the U.S. Environmental Protection Agency (EPA) website (<http://water.epa.gov/infrastructure/sustain/>) to assess whether these strategies and environmental principles could apply to this project.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

A handwritten signature in black ink, appearing to read "Roy Takemoto". The signature is written in a cursive, flowing style.

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

LUD-3 1 5 002 020-ID1037
PreAssmnt Pahoia Park

July 25, 2012

Mr. Roy Takemoto
PBR Hawaii & Associates
Honolulu Office
1001 Bishop Street Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

Subject: Pre-Assessment Consultation for Pahoia Park Expansion Master Plan located at Pahoia Village Road, Pahoia, Puna, Hawaii TMK (3) 1-5-002: 020

Thank you for allowing us the opportunity to review the above subject project which requests comments on the Pahoia Park Expansion Master Plan. We have the following comments and information on the above subject property.

Our records indicate that there are two septic tank systems that are located on the subject property. Additional wastewater systems may be required to be constructed for the proposed development to accommodate the additional wastewater flows from the project. Please be informed that all wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems."

Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at 586-4294 or fax to 586-4300.

Sincerely,

A handwritten signature in blue ink, appearing to read "Sina Pruder".

SINA PRUDER, P.E., ACTING CHIEF
Wastewater Branch

LM:cle

Attachments: One Stop Database screens

c: DOH-Environmental Planning Office (12-130), Ms. Laura McIntyre
DOH-WWB's Hilo Staff, Ms, Naomi Tsutsui

IWS Permits

Permit

IWS Permit Status

- Pending
- Review
- Plan Approved
- Use Approved
- Terminated
- Show All

TMK/Street Search

TMK/Street

General Search

TMK/Street

Building Permits

BPA

Show All

Cesspool Cards

Cesspool Card

Show All

AU Inspection

AU Inspections

- AU Inspect Types
- Initial Inspection
- Follow Up Inspection
- 1st INOV
- 2nd INOV
- Show All

CWDA Zones

CWDA Zone

Show All

General Site Info IWS System Compliance Documents BPA Notes

IWS Application Information

Permit ID: 12446 IWS Type: Septic Tank Assigned To: Pruder, Sina
 Legacy File#: 6658 Island: Hawaii Source: WWB
 eHawaii ID: N/A Status: Use Approved Description:
 Variance ID:

Project Information

Engineer: Martin Nakasone, P.E.
 TMK: 315002020
 Street Address: 15-2908 PAHOA VILLAGE ROAD
 Street Address 2:
 Suite/Apt.:
 City: PAHOA, HI
 Zip Code: 96778

Review Information

Submit Date: 12/22/2005
 Reviewed: 12/22/2005 Done
 Plan Approved: 1/10/2006 Done
 No Final Approval Ltr: Done
 Inspection Date: 9/19/2006
 Final Approval: 4/30/2007 Done
 Termination Date: Done

Payment Information

Payment Type: Check Check Number: 203708 Amount: 100.00
 Check Date: 12/22/2005 Payor: M&E

Approval to Build Approve To Use Exception Report Inspection Deficiency Report Save

Added By: pshieh 2/26/2007 10:52 AM Last Modified: spruder 4/30/2007 2:05 PM

WVB - OneStop - Windows Internet Explorer

http://10.164.30.59/WVB/OneStop.aspx?fileMode=&fileModeID=

File Edit View Favorites Tools Help

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IWS Permits
 Permit
 IWS Permit Status
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 Plan Approved
 Use Approved
 Terminated
 Show All

TMK/Street Search
 TMK/Street

General Search
 TMK/Street

Building Permits
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Cesspool Cards
 Cesspool Card
 Show All

AU Inspection
 AU Inspections
 AU Inspect Types
 Initial Inspection
 Follow Up Inspection
 1st INOV
 2nd INOV
 Show All

CWDA Zones
 CWDA Zone
 Show All

General Site Info IWS System Compliance Documents BPA Notes

Site Information

Property Owner		Dwelling Information	
First Name:	COUNTY OF HAWAII -	Lot Size (sq ft.):	
Last Name:	PAHOA FIRE STATION	CPR Lot:	<input type="checkbox"/>
Street Address:		Dwelling Type:	Existing Dwelling/New Addition
Street Address 2:		Existing IWS:	<input type="checkbox"/>
Suite/Apt#:		# of Existing IWS:	
City:		Other Wastewater Bldgs:	<input type="checkbox"/>
State:		Total Bedrooms:	
Zip Code:		Designed Flow Rate (gpd):	1000
Email Address:		Building Type:	Commercial
Use Project Address:	<input type="checkbox"/>	LCC:	<input checked="" type="checkbox"/>
		Potable Well within 1,000ft?:	<input type="checkbox"/>

Added By: phsieh 2/26/2007 10:52 AM Last Modified: spruder 4/30/2007 2:05 PM

Save

WWB - OneStop - Windows Internet Explorer

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File Edit View Favorites Tools Help

Home IWS BPA Enforcement Complaints WWTP Reuse Variance Land Use Sludge Reports My Profile

IWS Permits

- Permit
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 - Use Approved
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 - Show All
- TMK/Street Search
 - TMK/Street
- General Search
 - TMK/Street
- Building Permits
 - BPA
 - Show All
- Cesspool Cards
 - Cesspool Card
 - Show All
- AU Inspection
 - AU Inspections
 - AU Inspect Types
 - Initial Inspection
 - Follow Up Inspection
 - 1st INOV
 - 2nd INOV
 - Show All
- CWDA Zones
 - CWDA Zone
 - Show All

General Site Info **IWS Sys.** Compliance Documents BPA Notes

IWS System Information

Septic Tank Information

Septic Tank Liquid Volume: gal. Manufacturer:

6" Inspection Port(s) to grade: Disposal Type:

Manhole openings brought to grade:

Remarks:

Soil Profile Information

Percolation Rate: Minimum Soil Absorption: sq. ft./bd 3' Groundwater Setback:

Total Soil Absorp. Provided: 302 sq. ft.

Soil Absorption Information

Soil Absorption Bed	Soil Absorption Trenches	Seepage Pit
Length: <input type="text"/> ft	Length: <input type="text"/> ft	Diameter: <input type="text" value="6"/> ft Depth: <input type="text" value="16"/> ft
Width: <input type="text"/> ft	Width: <input type="text"/> ft	Lining Type: <input type="text"/>
3' Soil Replacement: <input type="checkbox"/>	# of Trenches: <input type="text"/>	Access Opening: <input type="text"/> inches
	3' Soil Replacement: <input type="checkbox"/>	Cover Diameter: <input type="text"/> ft
		6" Inspection Port: <input type="checkbox"/>
		Total Pit Area: 302 sq. ft.

Added By: phsieh 2/26/2007 10:52 AM Last Modified: spruder 4/30/2007 2:05 PM

WWB - OneStop - Windows Internet Explorer

http://10.164.30.59/WWB/OneStop.aspx?fileMode=8&fileModeID=

File Edit View Favorites Tools Help

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AU Inspect Types

Initial Inspection
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1st INOV
2nd INOV
Show All

CWDA Zones

CWDA Zone
Show All

General Site Info IWS System Compliance Documents BPA Notes

IWS Application Information

Permit ID: 12449 IWS Type: Septic Tank Assigned To: Pruder, Sina
 Legacy File#: 6658 A Island: Hawaii Source: WWB
 eHawaii ID: N/A Status: Use Approved Description:
 Variance ID:

Project Information

Engineer: Martin Nakasone, P.E.
 TMK: 315002020
 Street Address: 15-2910 PAHOA VILLAGE ROAD
 Street Address 2:
 Suite/Apt.:
 City: PAHOA, HI
 Zip Code: 96778

Review Information

Submit Date: 12/22/2005
 Reviewed: 12/22/2005 Done
 Plan Approved: 1/10/2006 Done
 No Final Approval Ltr: Done
 Inspection Date: 9/19/2006
 Final Approval: 4/30/2007 Done
 Termination Date: Done

Payment Information

Payment Type: Check Check Number: 203708 Amount: 100.00
 Check Date: 12/22/2005 Payor: M&E

Approval to Build Approve To Use Exception Report Inspection Deficiency Report Save

Added By: phsieh 2/26/2007 10:52 AM Last Modified: spruder 4/30/2007 2:14 PM

WBB - OneStop - Windows Internet Explorer

http://10.164.30.59/WWB/OneStop.aspx?fileMode=&fileModeID=

File Edit View Favorites Tools Help

Search: pinterest

Home IWS BPA Enforcement Complaints WWTP Reuse Variance Land Use Sludge Reports My Profile

General Site Info IWS System Compliance Documents BPA Notes

Site Information

<p>Property Owner</p> <p>First Name: COUNTY OF HAWAII -</p> <p>Last Name: PAHOA COMMUNITY CENTER</p> <p>Street Address:</p> <p>Street Address 2:</p> <p>Suite/Apt#:</p> <p>City:</p> <p>State:</p> <p>Zip Code:</p> <p>Email Address:</p> <p>Use Project Address:</p>	<p>Dwelling Information</p> <p>Lot Size (sq ft.):</p> <p>CPR Lot:</p> <p>Dwelling Type: Existing Dwelling/New Addition</p> <p>Existing IWS:</p> <p># of Existing IWS:</p> <p>Other Wastewater Bldgs:</p> <p>Total Bedrooms:</p> <p>Designed Flow Rate (gpd): 1000</p> <p>Building Type: Park</p> <p>LCC:</p> <p>Potable Well within 1,000ft?:</p>
--	--

Added By: phsieh 2/26/2007 10:52 AM Last Modified: spruder 4/30/2007 2:14 PM

Save

Done

start Inboxes - Microsoft ... 4 Internet Explorer Spider WordPerfect 9 - [D... LUD - 3 1 5 002 02... 2012 TMK - 0 P#.d... 1:17 PM

- IWS Permits**
- Permit
- IWS Permit Status
- Pending
- Review
- Plan Approved
- Use Approved
- Terminated
- Show All
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- TMK/Street
- General Search**
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- Initial Inspection
- Follow Up Inspection
- 1st INOV
- 2nd INOV
- Show All
- CWDA Zones**
- CWDA Zone
- Show All

General Site Info **IWS Sys.** Compliance Documents BPA Notes

IWS System Information

Septic Tank Information

Septic Tank Liquid Volume: gal. Manufacturer:

6" Inspection Port(s) to grade: Disposal Type:

Manhole openings brought to grade:

Remarks:

Soil Profile Information

Percolation Rate: Minimum Soil Absorption: 125 sq. ft./bd 3' Groundwater Setback:

Total Soil Absorp. Provided: 1050 sq. ft.

Soil Absorption Information

Soil Absorption Bed	Soil Absorption Trenches	Seepage Pit
Length: <input type="text" value="50"/> ft	Length: <input type="text"/> ft	Diameter: <input type="text"/> ft Depth: <input type="text"/> ft
Width: <input type="text" value="21"/> ft	Width: <input type="text"/> ft	Lining Type: <input type="text"/>
3' Soil Replacement: <input type="checkbox"/>	# of Trenches: <input type="text"/>	Access Opening: <input type="text"/> inches
Total Bed Area: 1050 sq. ft.	3' Soil Replacement: <input type="checkbox"/>	Cover Diameter: <input type="text"/> ft
		6" Inspection Port: <input type="checkbox"/>

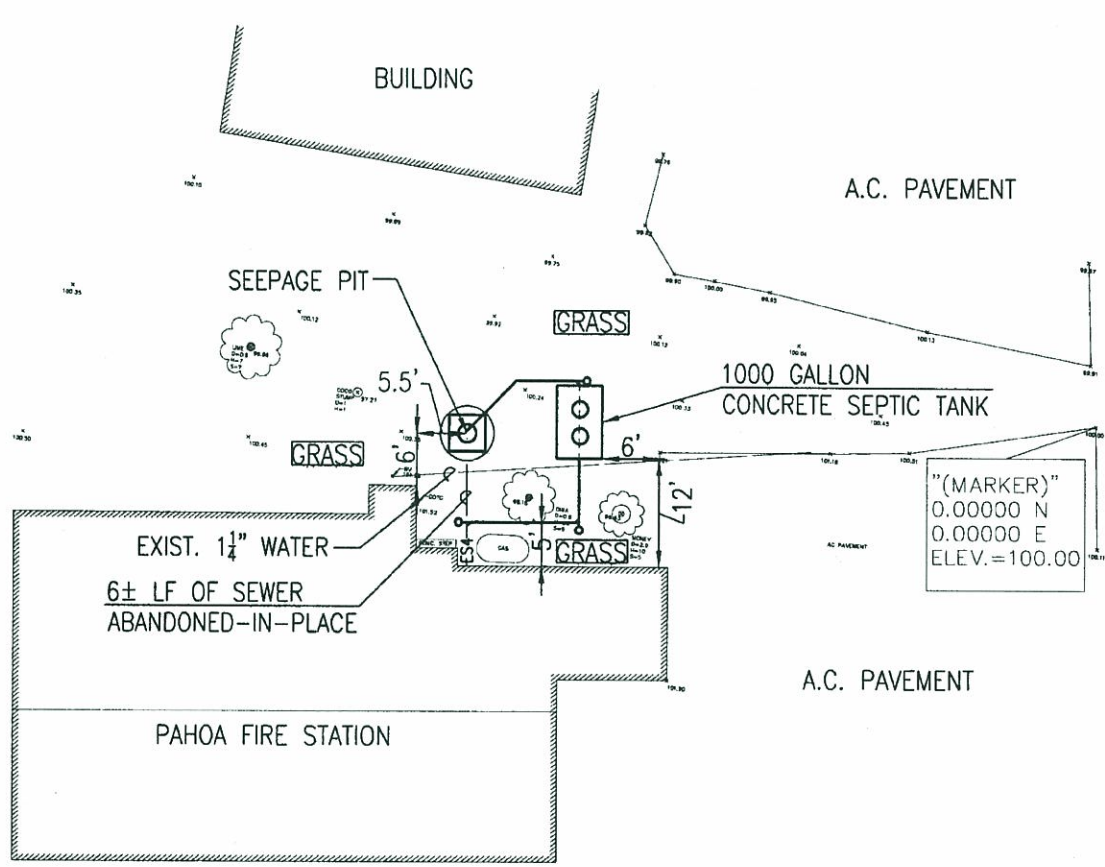
Added By: phsieh 2/26/2007 10:52 AM Last Modified: spruder 4/30/2007 2:14 PM

Print Job Completed
 As Built.pdf was sent to \\emd-ps1\WWB\Xerox\WC7765BW

PROJECT DATE: April 04, 2007 @ 02:26:55 pm

LAST UPDATE: April 02, 2007 @ 10:21:01 am

PATH/FILENAME: F:\Project\New\PAHOA\DWG\PAHOA\PAHOA_Sepic.dwg



M.A. Nakasono 4/18/07



THIS WORK WAS DONE BY ME OR UNDER MY SUPERVISION

M&E Pacific, Inc.
 METCALF & EDDY | AECOM
 DAVIES PACIFIC CTR, STE 1900 • 841 BISHOP ST, HONOLULU, HAWAII 96813

**PAHOA FIRE STATION
 SEPTIC TANK SYSTEM**
 Individual Wastewater System As-Built
 County of Hawaii LCC Conversion
 March 2007

Cert. to S. Yoshina 9/18/69-hy

San Form 40
WHL

STATE OF HAWAII - DEPARTMENT OF HEALTH
ENVIRONMENTAL HEALTH DIVISION - SANITATION BRANCH
SANITARIAN'S REPORT OF CESSPOOLS

Dist 47 Puna

Date 9-8-69

Property Owner County of Hawaii Paha Fire Station Address Paha, Hawaii (Pax Key 1-5-02-20)

New Construction gas cesspool, fire station bldg Intended for house sewage

Builder or Contractor S. Yoshina Cesspool Contract

Distance from building 12' Boundary 12' Stream or well —

Diameter (clear)-ft 6' Depth-ft 16' No ft down to water if any —

Capacity (Gallons) 3067 Ground slope Level

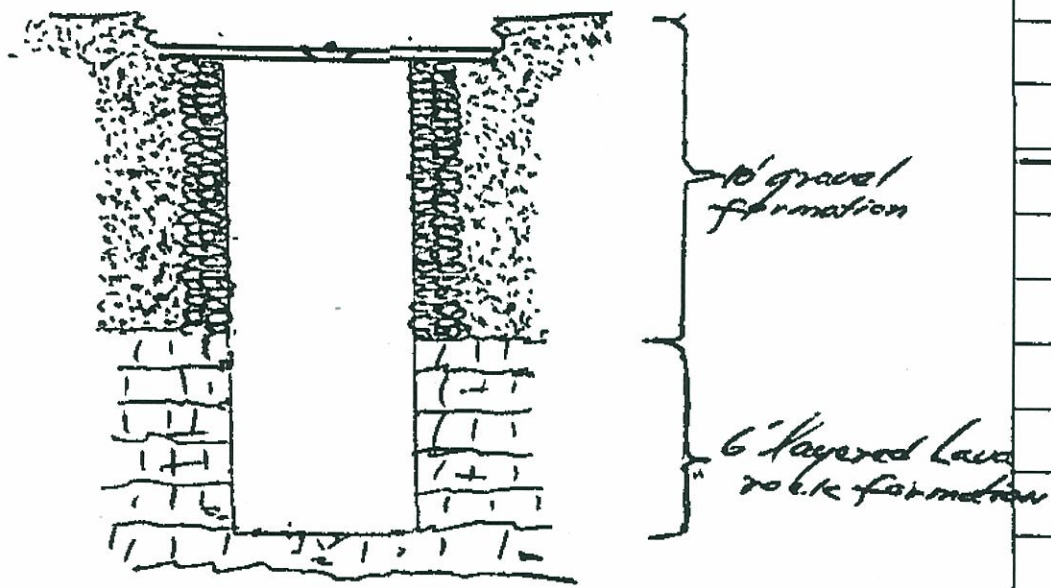
State soil or rock formation starting from surface 10' loose gravel formation, 6ft layered lava rock formation.

Kind of wall or curb 9ft. built-up rock and cement lining wall Kind of cover concrete

Distance from surface of ground to top of cover-ft 1ft

Approved 9-15 19 69

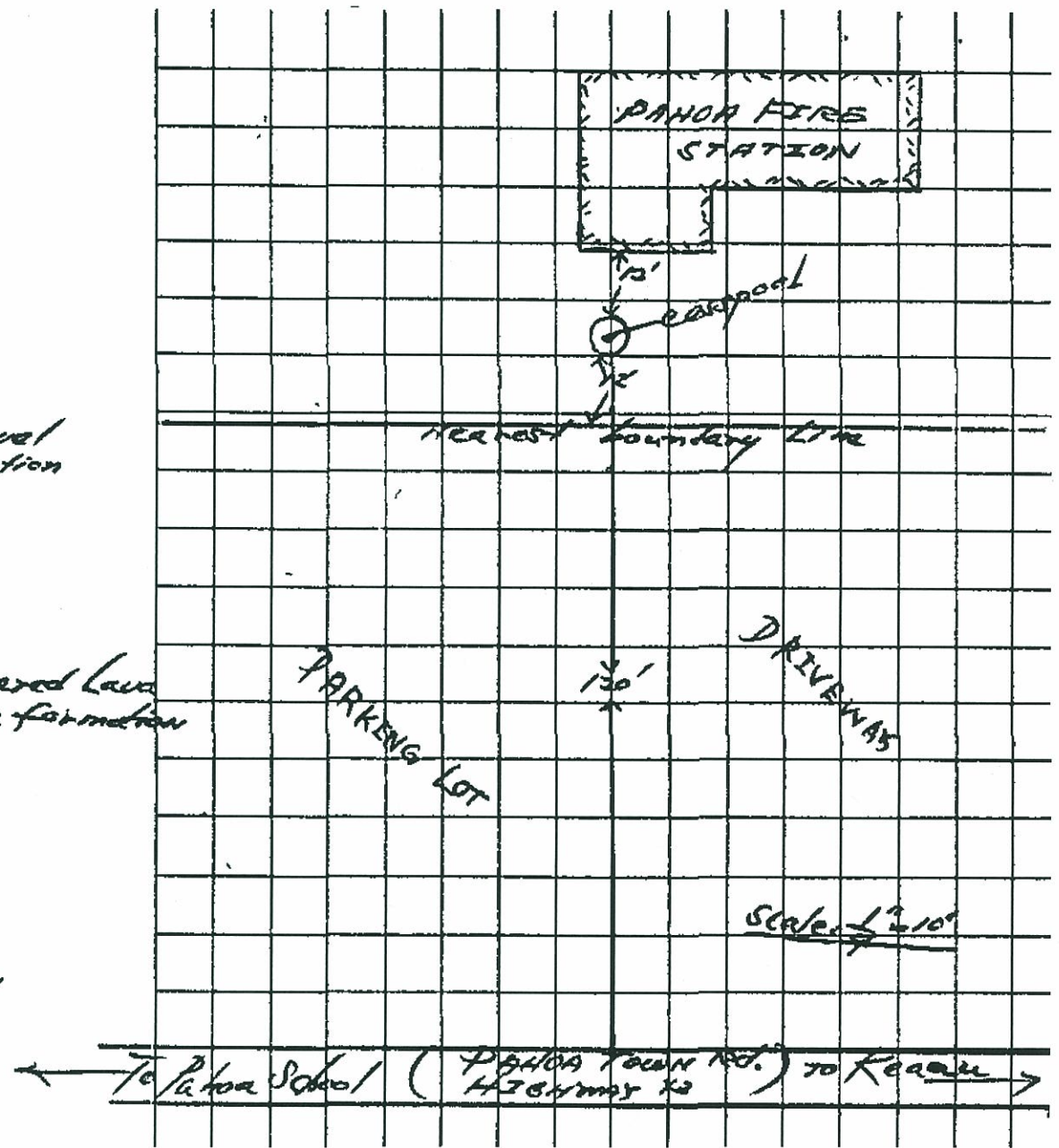
San Dong Ko
SANITARIAN



10' gravel formation

6' layered lava rock formation

scale: $\frac{1}{4}'' = 1'$



PANORA FIRE STATION

ear pool

nearest boundary line

PARKING LOT

DRIVEWAY

130'

Scale: $\frac{1}{2}'' = 10'$

To Palhoa School (PANORA TOWN RD.) HIGHWAY 12 to Keauhou

STATE OF HAWAII - DEPARTMENT OF HEALTH
ENVIRONMENTAL HEALTH DIVISION - SANITATION BRANCH
SANITARIAN'S REPORT OF CESSPOOLS

San. Form 40

Dist H. Puna

Date 6-26-74

Property Owner County of Hawaii (Paloa Address Paloa, Puna

New Construction yes - l.p. & hedge Intended for Neighborhood Facilities, Tax Key P-5-2-20

Builder or Contractor Huan Sewage

Distance from building 20 Boundary over 9 ft Stream or well —

Diameter (clear) - ft 8 Depth - ft 23 No ft down to water if any —

Capacity (Gallons) 56 x 8 Ground slope level

State soil or rock formation starting from surface 4 ft loose gravel, 19 ft layered

Kawa soil

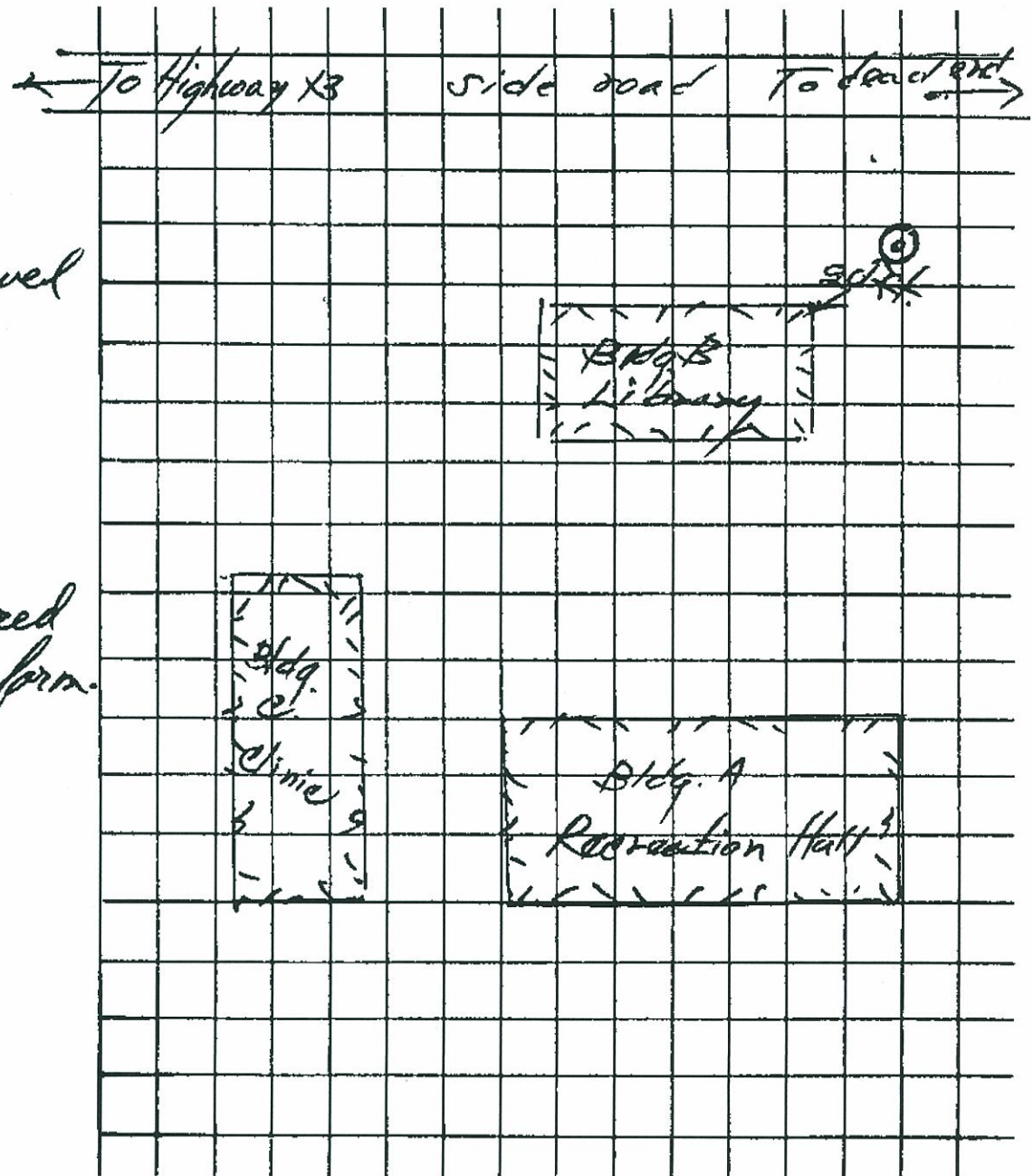
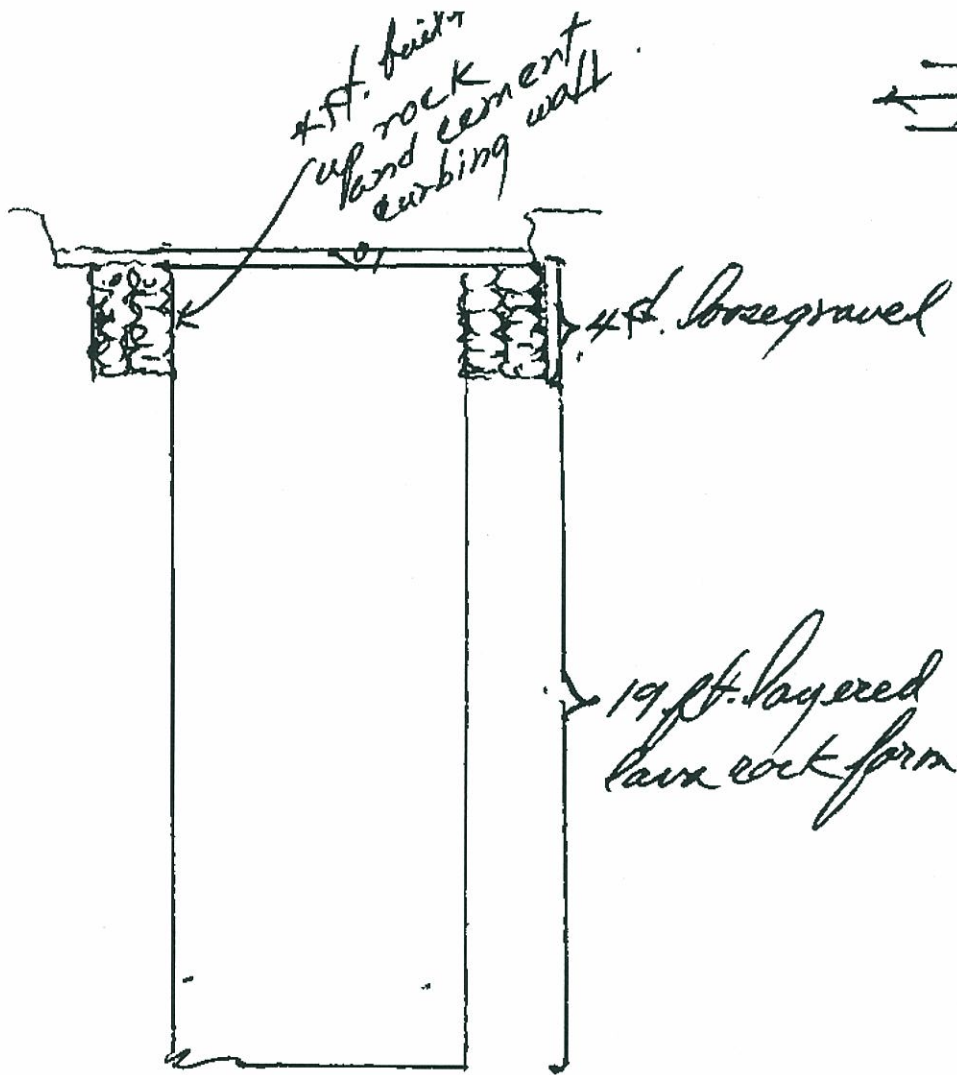
Kind of wall or curb 4 ft built up rock Kind of cover concrete

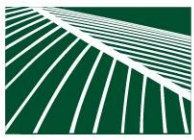
Distance from surface of ground to top of cover - ft 14 ft

Approved F-5- 19 74

San Dong Fo

SANITARIAN





PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

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VINCENT SHIGEKUNI
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SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Sina Pruder, P.E., Acting Chief
State of Hawai'i
Department of Health
Wastewater Branch
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK EXPANSION
MASTER PLAN ENVIRONMENTAL ASSESSMENT LOCATED AT
PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Ms. Pruder:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoia Park Expansion Master Plan. We sent a request for pre-consultation comments to the Department of Health (DOH) in July 2012 as part of the scoping process. DOH provided comments in the letter dated July 25, 2012.

As noted by your comments that any additional wastewater systems to accommodate additional wastewater flows from the proposed project must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems," the civil engineer for this project has proposed a septic system. The Draft Environmental Assessment will describe the proposed system.

We appreciate DOH's participation in the environmental review process. DOH's letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE
1001 Kamokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

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William P. Kenoi
Mayor



Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

County of Hawai'i
HAWAII FIRE DEPARTMENT
25 Aupuni Street • Room 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

July 25, 2012

Mr. Roy Takemoto
PBR Hawaii
1001 Bishop Street
Suite 650
Honolulu, Hawai'i 96813-3484

Dear Mr. Takemoto,

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PAHOA PARK
EXPANSION MASTER PLAN LOCATED AT PAHOA, PUNA,
HAWAII
TMK: (3) 1-5-002:020

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced early consultation on Environmental Assessment.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in cursive script, appearing to read "Darren J. Rosario".

DARREN J. ROSARIO
Fire Chief

GA:lc





August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
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Fax: (808) 535-3163

Darren J. Rosario
Fire Chief
County of Hawai'i
Hawai'i Fire Department
25 Aupuni Street, Room 2501
Hilo, Hawai'i 96720

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Chief Rosario:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the County of Hawaii Fire Department in July 2012 as part of the scoping process. We received your comments in the letter dated July 25, 2012 and acknowledge that your Department does not have any comments to offer at this time.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

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FAX TRANSMITTAL SHEET

ENVIRONMENTAL CENTER

University of Hawaii at Manoa, Water Resources Research Center
2500 Dole Street, Krauss Annex 19, Honolulu, HI 96822
Telephone: (808) 956-7361 Fax: (808) 956-3980

DATE: July 27, 2012

FROM: David Penn
956-3974

TO: Mr. Roy Takemoto
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484
rtakemoto@pbrhawaii.com
FAX: 808 523-1402

SUBJECT: Pre-Assessment Consultation for Pahoa Park Expansion Master
Plan located at
Pahoa, Puna, Hawaii TMK: (3) 1-5-002:020



UNIVERSITY
of HAWAII
MĀNOA

July 27, 2012
NC PAC: 2012-07-19

Mr. Roy Takemoto
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Takemoto:

**Pre-Assessment Consultation for Pahoia Park Expansion Master Plan located at
Pahoia, Puna, Hawaii TMK: (3) 1-5-002:020**

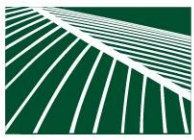
Thank you for your letter dated July 19, 2012 inviting the Environmental Center to comment on the Pre-Assessment Consultation for the proposed Park Expansion Master Plan, in Pahoia, Hawaii. We will not comment at this time due to resource constraints; however we look forward to reading the EA when it becomes available.

Sincerely,

A handwritten signature in cursive script that reads "David Penn".

David Penn
Assistant Specialist

copy: Chittaranjan Ray, Interim Director, Water Resources Research Center, UH Manoa
Sara Bolduc, Environmental Center



PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

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Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

David Penn, Assistant Specialist
Water Resources Research Center
University of Hawaii at Manoa
2540 Dole Street, Holmes 283
Honolulu, HI 96822

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI‘I, TMK: (3) 1-5-002:020**

Dear Mr. Penn:

On behalf of the County of Hawai‘i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoia Park Expansion Master Plan. We sent a request for pre-consultation comments to the University of Hawaii Environmental Center (UHEC) in July 2012 as part of the scoping process. UHEC provided comments in the letter dated July 27, 2012 (your reference #NC PAC:2012-07-19).

We acknowledge that the now Water Resources Research Center will not comment at this time. We appreciate your participation in the environmental review process. UHEC’s letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai‘i Department of Public Works

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
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Fax: (808) 535-3163

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NEIL ABERCROMBIE
GOVERNOR



KAREN SEDDON
EXECUTIVE DIRECTOR

STATE OF HAWAII

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:

12:PEO/43

August 3, 2012

PBR Hawaii
Attn: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

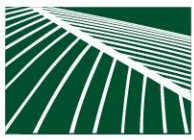
Re: Pre-Assessment Consultation for Proposed Pahoia Park Expansion Master Plan,
Pahoia, Puna, Hawaii TMK: (3) 1-5-002:020

The proposed Pahoia Park Expansion Master Plan would include additional recreational amenities for residents of Nani O Puna. Therefore, we are supportive of the master plan.

Thank you for the opportunity to comment.

Sincerely,

Karen Seddon
Executive Director



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

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Associate

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Kapolei, Hawai'i 96707-2005
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Fax: (808) 535-3163

Karen Seddon, Executive Director
Hawai'i Housing Finance and Development Corporation
State of Hawai'i
Department of Business, Economic Development & Tourism
677 Queen Street, Suite 300
Honolulu, Hawai'i 96813

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Ms. Seddon:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to Hawai'i Housing Finance and Development Corporation in July 2012 as part of the scoping process. You provided comments in the letter dated August 3, 2012 (your reference number 12:PEO/43).

We acknowledge your support of the proposed additional recreational amenities that would likely benefit residents of Nani O Puna. We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

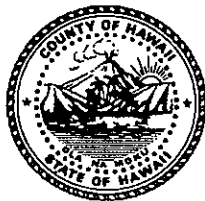
PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

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William P. Kenoi
Mayor



Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT

349 Kapi`olani Street • Hilo, Hawai`i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

July 27, 2012

PBR HAWAII & ASSOCIATES, INC.
Attention: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PAHOA PARK
EXPANSION MASTER PLAN LOCATED AT PAHOA, PUNA, HAWAII
TMK: (3) 1-5-002:020**

Dear Mr. Takemoto:

Staff, upon reviewing the provided documents and visiting the proposed site, does not anticipate any significant impact to traffic and/or public safety concerns.

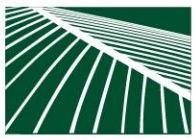
Thank you for allowing us the opportunity to comment.

If there are any further inquiries, please contact Captain Samuel Jelsma or Lieutenant Reed Mahuna of the Puna District at 965-2716.

Sincerely,


PAUL K. FERREIRA
DEPUTY POLICE CHIEF

SJ:lli
120449



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

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Paul K. Ferreira
Deputy Police Chief
County of Hawai'i
Police Department
349 Kapiolani Street
Hilo, Hawai'i 96720-3998

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Chief Ferreira:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the County of Hawaii Police Department in July 2012 as part of the scoping process. The County of Hawaii Police Department provided comments in the letter dated July 27, 2012.

We acknowledge that the Police Department does not anticipate any significant impact to traffic and/or public safety concerns as a result of the project. We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE

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Dear Mr Take moto,

Our Committee wants to keep as many
trees + Plants + Rocks as possible in the
Pahoa Park *

* add Dog Park

PAHOA PARK EXPANTION MASTER PLAN; MALAMA I KA 'AINA WORKING GROUP, August 2012

Toby S. Hazel, Chairperson...RR4 Box 2298, Pahoia, Hi.,96778,(808)965-0084, Astronona@hotmail.com

The County of Hawaii introduced the idea that residents of each Big Island district would be able to participate in their Community Development Plan as partners in reaching agreements concerning the growth, shape and content of their perspective districts. "WE THE PEOPLE" are reaching beyond our individual rights as citizens toward involvement in the planning of our towns and districts where we are residents and tax payers.

In the rural district of Puna, residents have committed their time and considerable energy to the Puna CDP and now, the Pahoia Regional Town Center Plan. The Malama I Ka 'Aina working group was assigned the areas of the Parks, Green Spaces, Cultural and Historical aspects of the plan. Our group's first consideration will be the new Pahoia 56 acre park since the Department of Parks and Recreation has begun planning and surveying the property as well as hiring a consultant to plan the park.

In previous public meetings there have been several requests from the general public to include a children's playground, a Hawaiian Village, a Performing Arts Center, a Public Library, a walking and bike paths, gardens and a sports arena.

Residents who have joined the working group for the park have developed ideas from the Pahoia survey:

An eighteen basket Disk Golf course with yearly Tournament games

Adopt-A-Garden for clubs and residents based on Adopt-A-Highway, State Dept. of Transportation

Labyrinth in the Park for walking meditation with personal commemoration bricks

Walking & Bike Paths around the park and to Pahoia shopping centers, off road from the back of the park

Sports Center with bathrooms and roof water catchment for Adopt-A-Garden program

Camping and Picnic Areas with barbeques

All planning of Pahoia and its parks to be reviewed by the Design Working Group

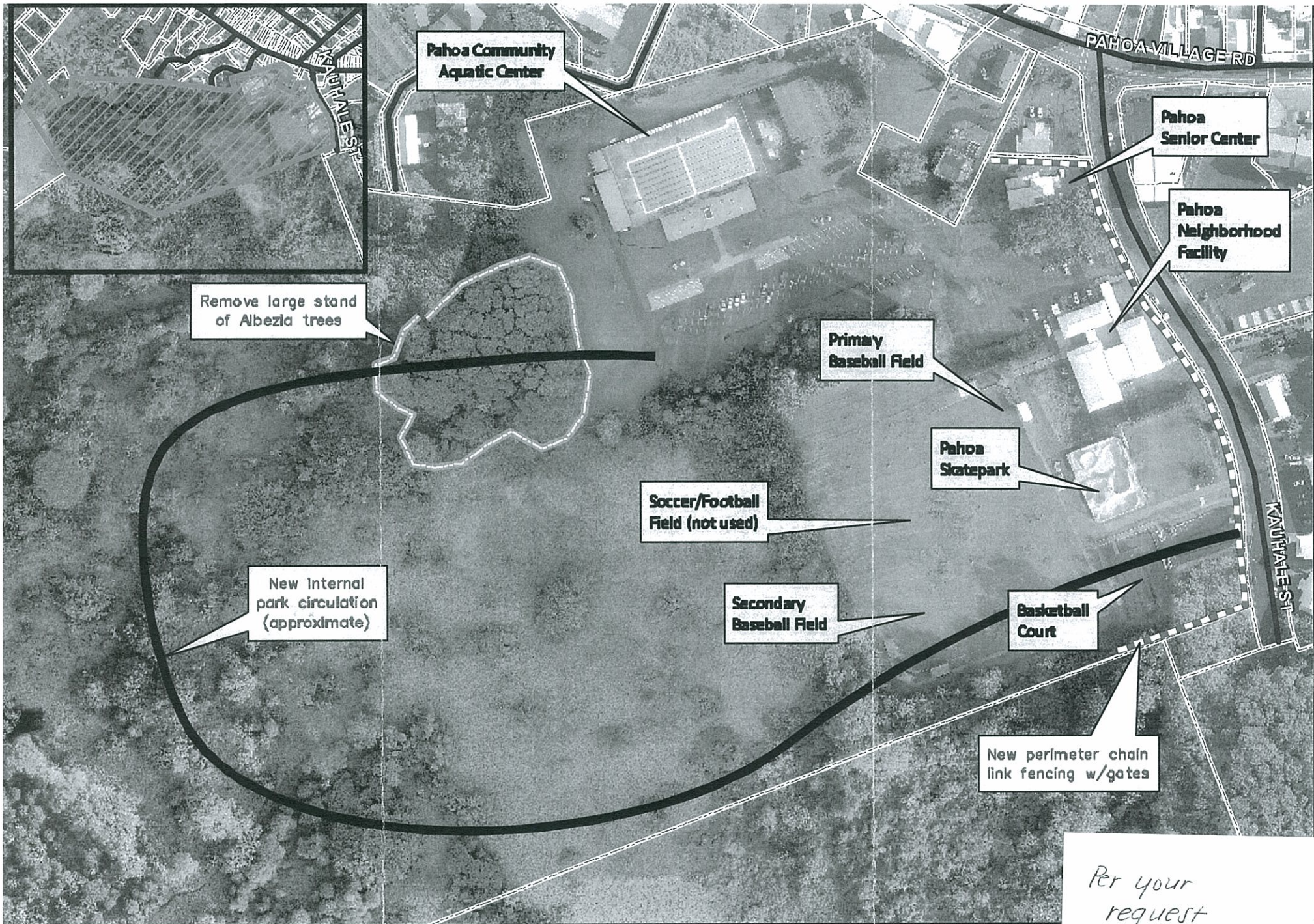
Delete the proposed fencing of the entire front face of the Park, proposed by the County of Hawaii

Pahoa Regional Town Center/Pahoa Park Expansion Master Plan

Malama I Ka 'Aina Working Group

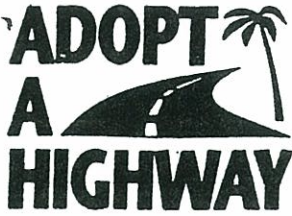
For the following reasons we are opposed to the fence around the front of the Park Area:

1. The fence will not keep out pigs and the homeless.
2. The fence creates a new prison like perimeter and is not a welcoming addition to the center of town for visitors or residents.
3. The fence impedes easy access from the Neighborhood and Senior Centers to the rest of town.
4. The fence could be placed further back behind the neighborhood center to keep the back portion of the park safe at night.
5. The fence creates a parking problem at night and on weekends if it were locked to cars.



Per your
request
of
June 14, 2012

EXHIBIT A



State of Hawaii Department of Transportation
County of Hi Dept of Parks + Rec

ADOPT A GARDEN

APPLICATION

The Department of Transportation will work with the adopting group to determine the specific section of state highway to be adopted. Interstate highways, divided highways and roadways that lack sufficiently wide right-of-way that pose safety hazards will not be considered for adoption.

I. GENERAL INFORMATION

_____		_____	
Name of Adopting Organization		Date of Application	
_____		_____	
Mailing Address	City	Zip	
_____		_____	
Type of Organization		No. of Members	

President, Chair			

Contact Person			
_____		_____	
Contact Person's Mailing Address	City	Zip	
_____		_____	
Contact Person's Day Phone	Evening Phone		

Approximate no. of people participating in each cleanup _____

II. ADOPT-A-HIGHWAY SIGN

GARDEN

Organization name you'd like on Adopt-A-Highway sign (limit 23 letters, including spaces.)
Names of individuals and/or political groups are not permitted. Logos are not permitted.

III. SELECTING A HIGHWAY TO ADOPT

GARDEN

Which 2-mile highway section(s) are you interested in adopting?

1. _____
2. _____
3. _____

Garden

ADOPT-A-HIGHWAY AGREEMENT

The Department of Transportation, hereinafter called the "Department", and _____, hereinafter called the "Group", recognize the need and desirability of reducing litter along state highways. This Agreement allows the Group to adopt a section of state highway in an effort to reduce litter along state highways.

TERMS AND CONDITIONS

The Group agrees to the following terms and conditions:

1. The Group shall provide adequate and necessary supervision to all participants under the age of 18 years. All participants must be at least 12 years of age. There must be at least two adult supervisors for every ten workers between 12 and 17. A signed parental release form must be obtained for every person 12 - 17 years.
2. The Group shall conduct at least two safety meetings per year. All participants must attend a safety meeting conducted by the Group before participating in a roadside clean up.
3. The Group shall adopt a section of state highway that is a minimum of two miles in length.
4. The Group shall adopt that section of state highway for a minimum of two years.
5. The Group shall pick up litter along the adopted section a minimum of four times a year.
6. The Group shall obtain required supplies and materials from the Department during regular business hours (7:00 am - 3:30 pm).
7. During a clean up, the Group shall properly maintain all necessary traffic control.
8. The Group shall place filled trash bags at one location of the adopted site for pickup and disposal by the Department on the next workday. The Group shall notify the Department of the date and location for pick up. The Group shall not remove hazardous items from the area but notify the Department of such items.

WHAT IS ADOPT-A-HIGHWAY? *Garden*

→ It's a public service program for volunteers to pick up litter along Hawaii's state highways.

→ It's a way for environmentally conscious citizens to make a personal contribution to a cleaner state.

HOW DOES IT WORK?

Community groups, churches or businesses adopt a highway by agreeing to pick up litter on a section of highway they adopt for at least two years.

Adopt-A-Highway groups agree to:

→ Adopt a 2 mile portion of state highway for a minimum of 2 years.

→ Pick up litter on that highway at least 4 times per year.

→ Provide safety training for their volunteers before each cleanup.

The state Department of Transportation will:

→ Provide high-visibility vests, trashbags and safety information.

→ Remove filled bags from the roadsides and remove heavy or hazardous items.

→ Erect a highway sign to recognize your group's cleaning efforts.

WHAT ELSE SHOULD I KNOW?

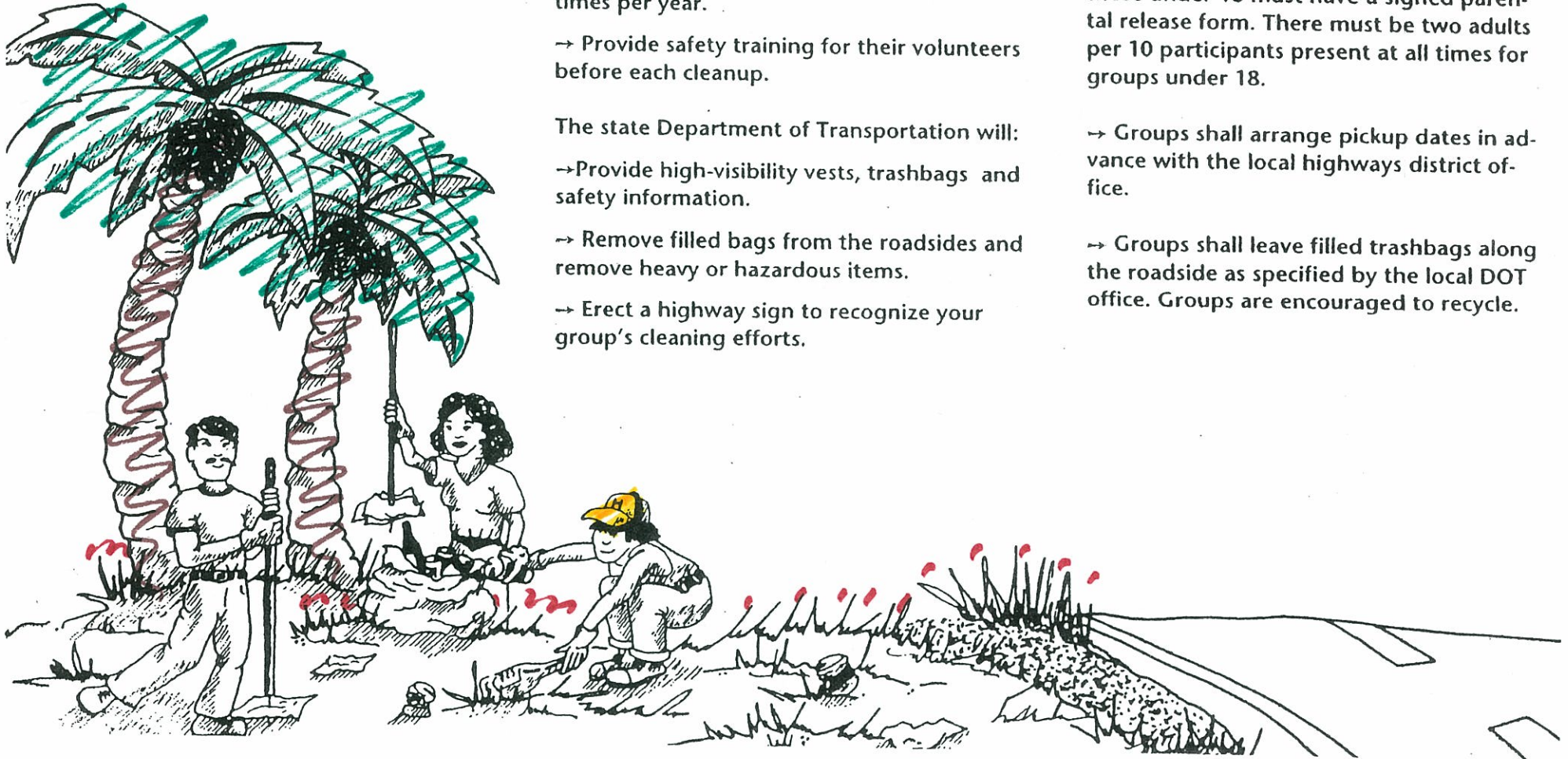
→ The DOT will help you select a highway to adopt.

→ Your group's representative will sign an agreement on behalf of your entire group.

→ All participants must be a minimum of 12 years old. Participants 17 years old or younger must have adult supervision, and those under 18 must have a signed parental release form. There must be two adults per 10 participants present at all times for groups under 18.

→ Groups shall arrange pickup dates in advance with the local highways district office.

→ Groups shall leave filled trashbags along the roadside as specified by the local DOT office. Groups are encouraged to recycle.



forty years, those that prove popular have survived and indeed receive regular attention as well as visitors, which has ensured that they have joined the collection of forty or so labyrinths that are recorded on this one small island. This collection of labyrinths, devotional, educational, and recreational, provides one of the most fascinating examples of the enduring appeal of the labyrinth across a broad spectrum of cultural contexts and interests over a considerable period of time.

Not surprisingly, these stone labyrinths, as easy to build now with little more than a pile of rocks as they have been throughout their long history, are proving popular with modern labyrinth creators. Equally appealing for most gardeners is their low maintenance requirements, providing the stones are firmly bedded at the outset of the project. These stone labyrinths are appearing in both public settings and in private gardens across Europe and the Americas, and, indeed around the world.

TAKING IT TO THE SCHOOLHOUSE

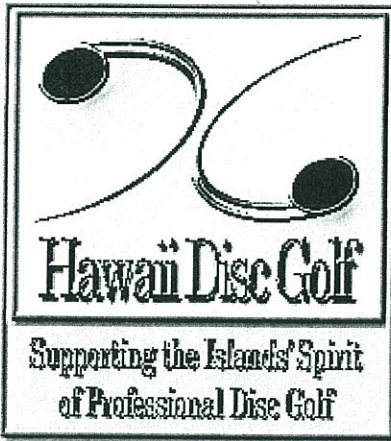
The appreciation of mazes and labyrinths in educational settings has indeed become an important aspect of this current revival of interest in the subject. The work of the Dane Jørgen Thordrup is a good example. A retired schoolteacher and leading researcher of the history of labyrinths in his native Scandinavia, Thordrup has been responsible for building a number of replicas of historic stone labyrinths both on school playing fields and in children's playgrounds in parks and gardens. Introducing the children of the school to the labyrinth symbol and its widespread occurrence and forms in a historical context, he then teaches the method of their construction and the mathematical and geometric principles that underlie it. The process is completed with construction of the labyrinth, where the children are able to put their new-found knowledge and labyrinth-building skills to the test. The resulting labyrinths are surprisingly popular with the children and are seen very much as "their labyrinth," not just installations provided for their enlightenment or entertainment. They also provide important springboards for other projects, notably historical and especially arts-based.

Likewise, Adrian Fisher has taken mazes and labyrinths into schools in England with some considerable success. Fisher's take on the subject is often more mathematically based than Thordrup's, and some of his paving installations in schools feature his innovative conditional movement mazes, with colour-coded pathways that provide the key to the rules of movement within the maze. Although only two-dimensional, many of these apparently simple maze designs are in fact as complicated as any three-dimensional puzzle and are capable of containing very sophisticated mathematical concepts and movement modes.

Their own imaginations stirred, creative teachers around the world are bringing labyrinths into the school curriculum to enliven young minds and capture the interests of students by using them as a case for lessons in subjects as diverse as art, drama, psychology, history, maths, and geography. In addition to marking the labyrinth's relevance as a historical object, progressive teachers and administrators have found it a useful addition to the playground, not only as a course to be run, but also as a refuge for worn-out students who needs a few minutes alone to regroup their thoughts and renew themselves before returning







Hawaii Disc Golf is a Community based organization created in 1999 to support and facilitate the "Public" expansion and exposure of the Sport of Disc Golf in Puna and the State of Hawaii.

Yearly PDGA Sanctioned and Year Round Local events and merchandizing will ensure an increased visitor/tourism flow for Pahoia, and create ongoing opportunities for promoters and merchants; Initial course Set-up and Maintenance is very inexpensive; Sport is very Eco-Friendly and adaptive to nature and hiking trails, with "Official" rules dedicated to preservation of nature; Extremely low impact on land and watersheds, with minimum impervious ground cover; Easily co-exists and coordinated with re-planting of Native, and Canoe species.

Disc Golf has gained a solid reputation of turning less attractive Parks into inviting and Family Friendly spaces for the whole community. The Sport has a unique position of cutting across all age groups. It is excellent in helping youth recognize and develop their own limits and self discipline, and is especially beneficial for senior generations due to low impact on body, and the very Zen and relaxing nature of the Sport.

To discover more about the world-wide explosion of Disc Golf, The Professional Disc Golf Association (PDGA), Hawaii Disc Golf, Bobby Garner (Elected PDGA State Coordinator for Hawaii 2012-2014), or the growing Community of mainland and local Dgers in support of Pahoia Village Disc Golf, then we ask you to please explore the resources listed below.

If you have any questions, suggestions and/or concerns, please don't hesitate to make further contact.
Mahalo

Informational Resources

Hawaii Disc Golf Community

<http://HawaiiDG.com>

<http://facebook.com/HawaiiDiscGolf>

Pahoia Disc Golf Community

<http://facebook.com/PahoiaDiscGolf>

Disc Golf Education

<http://www.discgolf.com/education/index.html>

Parks and Recreation Resources

<http://www.discgolf.com/park-recreation/index.html>

Disc Golf and PDGA Demographics

These indicators highlight the growth of disc golf and are taken from the PDGA database, the on-line Course Directory at www.pdga.com, and periodic PDGA membership surveys.

http://www.pdga.com/files/documents/Disc_Golf_and_PDGA_Demographics.pdf

Member Demographics

File containing member demographic data. Last updated 8-25-2010.

http://www.pdga.com/files/documents/MemberDemographics_08252010.pdf

The PDGA Rules of Play and Competition Manual combined into one document in PDF format. Revised January 1, 2011. Uploaded 12-21-2010.

http://www.pdga.com/files/documents/PDGA_Rules_CompetitionManual_Combined_2011.pdf

Results from the 2010 Audit performed by Barry and Associates. Uploaded 7-19-2011.

<http://www.pdga.com/files/documents/2010-Audit-Results.pdf>

PDGA Championships Hole Lengths and Pars Uploaded 9-19-2011

http://www.pdga.com/files/documents/Hole_Lengths_and_Pars.pdf

Inexpensive to Install

A disc golf course is inexpensive to install and can make use of land unsuitable for other sports, activities or development. This differentiates disc golf from most other outdoor sports that require specialized sport facilities, buildings or extensive land development. Once installed, a disc golf course has few maintenance costs associated with upkeep and operation. In addition disc golf can be played year round, rain (snow), or shine. A full championship course usually is built on one to two acres per hole.

Benefits to the Community and the Park

Low impact exercise for all ages enhancing your park and community

Disc golf is found in state, county and neighborhood parks and private property in diverse climates and terrain. A disc golf course brings the local community to your parks as well as attracting disc golfers from the surrounding areas.

Schools have been increasingly adding disc golf to their curriculum. Schools are finding that kids not only love the sport but that it helps developed critical thinking through scrutinizing and negotiating obstacles, it provides a safe means of exercise and can be used for other life lessons like ecology, planning and socialization.

Disc Golf Courses are Environmentally Friendly

There is no clear-cutting of trees, grading of land, costly fertilizer, or mowing maintenance necessary.

Low Cost and a Positive Investment

Players tend to take an active role in the course and the surrounding areas

A disc golf course provides bang for the buck allowing dozens of players to play the same time. A successful disc golf course like two local courses [De Laveaga in Santa Cruz, California](#) and [San Francisco Golden Gate Park disc golf Course](#) can have over a hundred players playing the course at the same time on a given weekend. In contrast, a tennis court that costs more to install only has two or at most, four players at a time. In addition, the sport attracts positive and dedicated disc golf players and disc golf clubs who bring a beneficial element to the area. The players tend to take an active role in the course and the surrounding areas, making sure the course is in good shape and taken care of.

<http://www.discgolf.com/disc-golf-course-design/benefits-of-disc-golf/>

PDGA Disc Golf Course Design Standards

Disc Golf Course Design Goals

Satisfy the design requirements of the people and organizations who approve use of the land and fund the equipment for the course.

Design course to be safe for both players and non-players who may pass near or through the course.

Design course with the potential for multiple configurations to serve not only beginners but players with advanced skills; consistent with the budget and design needs expressed in Goal A above.

Design a well balanced course with a wide range of hole lengths and a good mixture of holes requiring controlled left, right and straight throws.

Utilize elevation changes and available foliage as well as possible. Take care to minimize potential damage to foliage and reduce the chances for erosion.

ADA COMPLIANCE:

Sections of most disc golf courses are accessible to many people with a disability. The normal challenges presented by the types of holes intrinsic to the sport plus the sometimes rough terrain utilized for courses make it unrealistic to accommodate everyone everywhere. Efforts should be made to try and provide a legitimate opportunity to play for those with disabilities, even if not all holes can be made accessible. In some cases, a several hole loop on part of the course may provide that opportunity.

Source: <http://www.discgolf.com/disc-golf-course-design/pdga-disc-golf-course-design-standards/>

Proposed Performing Arts Center in New Pahoa Park

Submitted by Richard Bidleman, Pahoa, August 13, 2012

When I served on the Puna Community Medical Center board as treasurer a number of years ago, we had several fund raising events. Collin John, a well known blues guitar player, offered to do a benefit for PCMC. We needed a bigger venue than the Akebono, so we checked around in Hilo. All the venues were booked out two years for Friday and Saturday evenings. Only the UH performing arts center is a truly performing arts theater. With this revelation, we decided that Puna needed its own performing arts center. Our district has great musical talent, the HASS charter school needs a theatre as part of its instructional program, and a performing arts center would be a great boon to Pahoa Businesses. It would probably be booked out every weekend.

When County Parks and Rec announced the expansion of the 57 acres behind the current park, we began to think about locating the theater there. On the back of this proposal is a print of the Kilauea Military Camp Theater, which seats 250 people. After consultation with Graham Ellis at Space, who in another life was a performing arts promoter, we decided on a 500-seat theater. Given the growth of Puna, Graham thinks that is the right size.

Zendo Kern and I met with Clayton Honma, Deputy Director, and James Komata, Park Planner, at County Parks & Rec several months ago. They both stated a performing arts theater in the Pahoa Park is entirely appropriate. Most of the performing arts venues in Hilo come under Parks & Rec. The money to build it is another issue. We are suggesting establishment of a non-profit foundation for the sole purpose of making a performing arts center a reality. I told Clayton we would have more traction with our efforts if Parks and Rec could send us a letter indicating that a performing arts center is appropriate for the park. He agreed to do so once we have established an organization. Our thought is a 501 (c)3 for that purpose. Perhaps a letter could be sent to the Pahoa Planning group. There are a number of organizations that secure funds through federal "Our Town" grants, which include expanding business opportunities as well. Puna would have a true performing arts theater that would benefit both residents and local businesses.

If this idea goes forward with the Pahoa Planning Group, the next step will be the formation of an organization to carry it forward.

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If this idea goes forward with the Pahoa Planning Group, the next step will be the formation of an organization to carry it forward.

Restrooms

KMC Theater, Volcano National Park
seating for 250 people

Additional
Stage
Space

STAGE

43'

Door

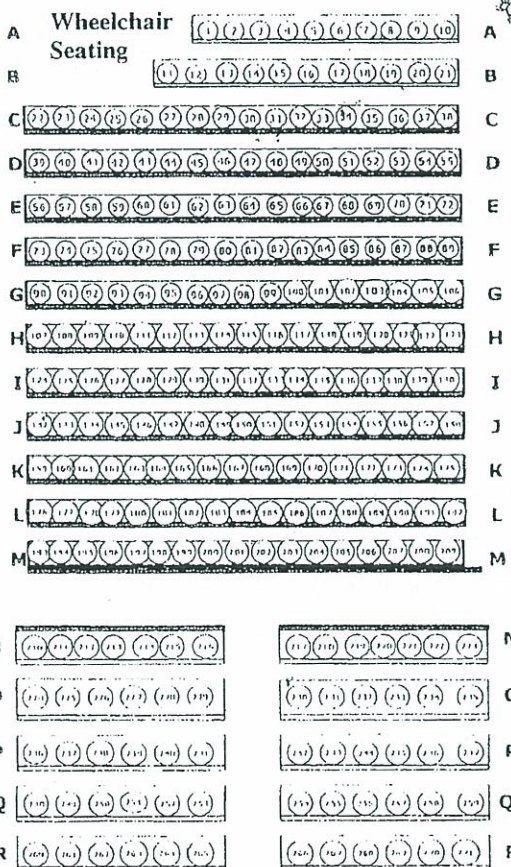
Door

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Door

Door

Refreshment Area

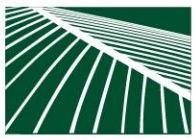


Door

Entrance

36' 6"

Box Office



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

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DACHENG DONG, LEED® AP
Associate

Toby S. Hazel, Chairperson
Malama i Ka Aina Working Group
RR4 Box 2298
Pahoa, Hawai'i 96778

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Ms. Toby Hazel:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoia Park Expansion Master Plan. We received your submittal dated August 2012 regarding the proposed Pāhoia Park Expansion Master Plan, which was considered in developing the master plan.

We appreciate your participation in the environmental review process. Your submittal will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

HONOLULU OFFICE

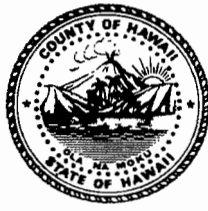
1001 Bishop Street, Suite 650
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Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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William P. Kenoi
Mayor



BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

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Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

July 27, 2012

Mr. Roy Takemoto
Managing Director, Hilo Office
PBR Hawaii & Associates, Inc.
1719 Haleoke Street
Hilo, Hawai'i 96720-1553

Dear Mr. Takemoto:

**SUBJECT: Pre-Assessment Consultation for Pāhoā Park Expansion Master Plan
Located at Pāhoā, Puna, Hawai'i
Tax Map Key: (3) 1-5-002:020**

This is in response to your letter dated July 19, 2012 requesting our comments regarding the Environmental Assessment (EA) being prepared for the proposed expansion of the Pāhoā Park.

The subject 71.121-acre parcel is primarily zoned by the County of Hawai'i as Agricultural (A-1a) with an approximately 150-200 foot wide strip along the eastern portion being zoned Single-Family Residential (RS-10). The State Land Use designations are Agricultural and Urban corresponding to the A-1a and RS-10 County zoning. Approximately 25% of the eastern portion of the parcel is designated by the Hawai'i County General Plan for medium density urban uses with the remainder of the parcel being designated for low density urban uses.

The Puna Community Development Plan (PCDP), as amended, was adopted by Ordinance No. 08-116 on September 10, 2008 and identifies "village centers" or "town centers" as the model on which Puna's future land use pattern will be based. The PCDP designates Pāhoā as a Regional Town Center meant to provide a wide range of services and amenities to the communities in the region. The PCDP further stipulates that development of regional town centers should be guided by a plan "prepared through an inclusive community based process that involves major stakeholders, including landowners, community representatives, and public agencies."

At its February 14, 2012 meeting, the PCDP Action Committee voted to form a Pāhoā Plan Subcommittee that includes all members of the Pāhoā Community Plan Steering Committee as well as four Action Committee Members. This subcommittee for the development of a Pāhoā Regional Town Center Plan (Pāhoā Plan) has been actively soliciting community input through an on-going

Mr. Roy Takemoto
Managing Director, Hilo Office
PBR Hawaii & Associates, Inc.
July 27, 2012
Page 2

public survey. Also, citizen-based working groups have organized to begin formulating recommendations for elements of the plan guided by that community input. The Pāhoa Plan Steering Committee should be consulted in the drafting of the Pāhoa Park EA.

Specific Goals, Objectives and Actions of the Puna CDP that should be considered in the preparation of the Pāhoa Park EA include:

Sec. 3.1.1.c. Services and community facilities are more accessible in village/town centers that are distributed throughout the region...

Sec. 3.1.2.e. Target investments in public services and infrastructure to promote the development of village/town centers and, secondarily, to serve the peripheral subdivision areas.

Sec. 3.5.1.c. The development of future parks supports the growth management goals, objectives and actions set forth in Section 3.1 of this plan.

Sec. 3.5.3c. Improve and expand Community Parks as follows:

2) Pāhoa Regional Park: (1) Convert the existing fire station into a one-stop community center providing, but not limited to, a senior center with certified kitchen for congregate meals program and activities/dining room, linkages, support and advocacy for affordable housing, employment, home bound access, child care, teen pregnancy, substance abuse and domestic violence intervention; (2) Repair pump and provide solar heating system and heat-retaining cover for swimming pool; (3) Provide art center and covered performance stage; (4) Provide children's museum and playground; (5) Develop skateboard park; (6) Provide sheltered picnic areas; (7) Build loop access road to lessen traffic on Pāhoa main street; and (8) Provide lighted parking areas and walking paths linked to Pāhoa village center.

7) Expand hours of operation and night lighting for some outdoor activities at regional and larger community parks to serve working adults and young retirees.

Sec. 3.6.3.a. Apply Leadership in Energy and Environmental Design (LEED) standards for public buildings, with minimum goal of silver leaf.

Sec. 3.6.3.b. Investigate the use of ground-water cooling systems for public buildings.

Sec. 4.2.2.c. Provide park-and-ride lots at key regional sites to promote commuter ridership.

Mr. Roy Takemoto
Managing Director, Hilo Office
PBR Hawaii & Associates, Inc.
July 27, 2012
Page 3

Sec. 4.2.3.c. Develop transit hubs at the following locations:

2) *Pāhoa (Secondary Hub): On County-owned sites, either adjacent to Pāhoa Community Center...*


Sec. 4.5.1.d. Village/town centers incorporate walking and bicycling paths.

Sec. 4.5.3.c. Invest in walkways, bicycle facilities, "park-once" lots, landscape improvements, themed signage programs and transit stops in approved village/town centers.

Thank you for the opportunity to provide these pre-consultation comments and look forward to the opportunity to review and comment on the Draft EA when it is published. Should you have questions, please feel welcome to contact Larry Brown of my staff at 961-8135 or lbrown@co.hawaii.hi.us.

Sincerely,



 BJ LEITHEAD TODD
Planning Director

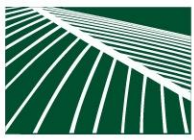
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\\Coh33\planning\public\wpwin60\Larry\EA-EIS Comments\PBR-P&R Paho Park Expansion EA precon.doc

cc: Director, Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu HI 96813

Mr. Dan Taylor, Chair
PCDP Action Committee

Mr. Mark Hinshaw, Chair
Paho Regional Town Center Plan Steering Committee
RR 2, Box 4585
Pāhoa, HI 96778



PBR HAWAII

& ASSOCIATES, INC.

August 14, 2013

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Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

Mr. Duane Kanuha
Planning Director
County of Hawai'i
Planning Department
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720

Attn: Larry Brown

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Mr. Kanuha:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoa Park Expansion Master Plan. We sent a request for pre-consultation comments to the County of Hawaii Planning Department in July 2012 as part of the scoping process. The County of Hawaii Planning Department provided comments in the letter dated July 27, 2012.

We greatly appreciate the information provided on the existing County zoning and the Puna Community Development Plan. We consulted with the Pāhoa Plan Steering Committee in drafting the EA. Please note that both Mark Hinshaw and Dan Taylor were sent similar requests for Pre-Assessment Consultation.

We appreciate the Planning Department's participation in the environmental review process. The Planning Department's letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

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Fax: (808) 535-3163

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850



In Reply Refer To:
2012-SL-0400

AUG 13 2012

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96850

Subject: Pre-Assessment Consultation for Pahoa Park Expansion Master Plant Located at
Pahoa, Puna, Hawaii

Dear Mr. Takemoto:

Thank you for your letter dated July 19, 2012, received on July 23, 2012, requesting information on listed species that may occur in the vicinity of Pahoa Park on Hawaii Island. The purpose of the proposed master plan expansion is to explore alternative facilities and layouts including a covered play court facility for basketball and volleyball, a comfort station, and new ball fields. The proposed master plan will study the entire site but may propose new facilities in phases for this large parcel.

Typically master plans are used for conceptual planning purposes and do not provide enough site-specific information to determine potential impacts to Federal trust resources. In order to determine impacts to Federal trust resources, we will need to review specific projects when more detailed plans are available. If the proposed projects are funded, authorized, or permitted by a Federal agency and there is a potential to affect listed species, then the Federal agency should consult with our office pursuant to section 7 of the ESA. If no Federal agency is involved with the proposed projects, the applicant may need to apply for an incidental take permit under section 10(a)(1)(B) of the ESA.

We have reviewed the information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program as it pertains to listed species and designated critical habitat. No federally designated or proposed critical habitat occurs within the proposed project footprint. Our data indicate the endangered Hawaiian goose (*Branta sandvicensis*), the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*) (collectively referred to as Hawaiian waterbirds), and the federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) may be present in the vicinity of the proposed project site. We recommend you address the current drainage problems on the existing ball fields to prevent attracting Hawaiian waterbirds to flooded habitats. Attraction to flooded fields could result in failed nesting attempts and adult mortality through attraction to unmanaged areas. Failed nesting and adult mortality creates what is referred to as a "population sink" and can result in declines of waterbird populations.

To avoid impacts to the Hawaiian hoary bat, we recommend the following conservation measure be incorporated into project proposals: trees and shrubs taller than 15 feet should not be trimmed or cleared between June 1 and September 15.

If it has been determined Hawaiian waterbirds may be present within project boundaries, we recommend the following measures be incorporated into project proposals to avoid and minimize impacts to federally endangered Hawaiian waterbirds.

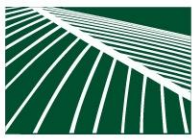
- In areas where Hawaiian waterbirds have been observed, nest searches should be conducted prior to any work being conducted and after any subsequent delay in work of three or more days (during which birds may attempt nesting).
- If a nest is discovered, work should cease in the vicinity for a minimum of seventy days (10 weeks); if a nest with chicks/ducklings is discovered, work should cease for a minimum of 49 days (7 weeks). These guidelines are intended to protect chicks/ducklings, and may be shortened if monitoring is conducted often enough to note when chicks/ducklings have fledged (usually five to six weeks after hatching).
- If a previously undiscovered nest is found after work begins, all work should cease within a minimum radius of 150-feet (ft) of the nest and the Service should be contacted within 24-hours. Please see below for contact information.
- If an endangered Hawaiian waterbird is found in the project's action area during on-going work, then all activities within 50-ft of the bird should cease; work may continue after the bird leaves the area of its own accord. If a bird is seen in a similar location for more than two consecutive days, project managers should contact the Service for specific guidance.

If you have questions regarding this letter, please contact Jiny Kim, Fish and Wildlife Biologist, Consultation and Technical Assistance Program (phone: 808-792-9400; fax: 808-792-9581).

Sincerely,



Jiny Kim
Field Supervisor



PBR HAWAII
& ASSOCIATES, INC.

August 14, 2013

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VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

Loyal Mehrhoff
Field Supervisor
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard
Room 3-122, Box 50088
Honolulu, Hawaii 96850

Attn: Ms. Jiny Kim

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR PĀHOA PARK
EXPANSION MASTER PLAN ENVIRONMENTAL ASSESSMENT
LOCATED AT PUNA, HAWAI'I, TMK: (3) 1-5-002:020**

Dear Mr. Mehrhoff:

On behalf of the County of Hawai'i Parks & Recreation Department, PBR HAWAII is preparing a Draft Environmental Assessment (EA) for the proposed Pāhoā Park Expansion Master Plan. We sent a request for pre-consultation comments to the United States Fish and Wildlife Service (USFWS) in July 2012 and received your comments in the letter dated August 13, 2012 (your reference number: 2012-SL-0400).

We greatly appreciate the information your agency has provided on federally designated or proposed critical habitat within the proposed project footprint. Please be assured that the results of a fauna survey will be reported in the EA and will address the Endangered Hawaiian goose, the Endangered Hawaiian stilt, and the federally Endangered Hawaiian hoary bat, and as relevant, what measures should be incorporated into the project to avoid or minimize impacts to any of the above species (that could be impacted). In addition, the proposed project includes addressing the slow drainage of the existing ball fields. Implementation of drainage improvements to the existing ball fields will prevent attracting Hawaiian waterbirds to potential flooded habitats.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact (AFNSI). We will send you a copy of the Draft EA/AFNSI when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director

cc: WCIT Architecture
County of Hawai'i Department of Public Works

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1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
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Fax: (808) 535-3163

O:\Job29\2926.01 Pahoā Park Expansion\EA\PreConsultation\Draft Replies to Pre-Consultation Letters\BL-13 Reply to USFWS.docx

DRAFT EA COMMENTS AND RESPONSES

Agencies/Organizations/Individuals	Draft EA/AFONSI Sent	Comment Date	Reply
Department of Parks & Recreation (Determining Agency)	Yes		
OEQC	Yes	12-06-2013	Yes
STATE			
Department of Agriculture	Yes		
Department of Accounting and General Services	Yes		
DBEDT	Yes		
DBEDT - Energy Division	Yes		
DBEDT - Office of Planning	Yes		
Department of Defense	Yes	12-09-2013	Yes
Department of Education	Yes	11-08-2013	Yes
Department of Hawaiian Home Lands	Yes	12-09-2013	Yes
Department of Health – Clean Water Branch	Yes	11-18-2013	Yes
Department of Health - Environmental Planning Office	Yes	11-05-2013	Yes
Department of Health – Safe Drinking Water Branch	Yes	11-13-2013	Yes
Department of Human Services	Yes	11-11-2013	Yes
Department of Labor and Industrial Relations	Yes	11-05-2013	Yes
Department of Land and Natural Resources (DLNR) - Land Division	Yes	11-29-2013	Yes
DLNR – Land Division, Hawai‘i Island Office	Yes		
DLNR – Historic Preservation Division	Yes	12-10-2013	Yes
Department of Transportation	Yes		
HHFDC	Yes		
Office of Hawaiian Affairs	Yes		
Office of Planning	Yes	12-09-13	Yes
UH Environmental Center	Yes		
Hilo Public Library	Yes		
UH Hilo Library	Yes		
Pāhoā Public Library	Yes		
FEDERAL			
U.S. Army - Engineer Division	Yes		
U.S. Federal Emergency Management Agency	Yes	12-13-2013	Yes
U.S.G.S. - Hawaiian Volcano Observatory	Yes		
U.S. Fish and Wildlife Service	Yes		
U.S. Pacific Islands Water Service Center	Yes	12-05-2013	Yes
U.S. Hawaii Volcanoes National Park	Yes	11-21-2013	Yes
COUNTY			
Department of Environmental Management	Yes	11-05-2013	Yes
Department of Public Works	Yes		

DRAFT EA COMMENTS AND RESPONSES

Agencies/Organizations/Individuals	Draft EA/AFONSI Sent	Comment Date	Reply
Department of Research and Development	Yes		
Department of Water Supply	Yes		
Fire Department	Yes		
Planning Department	Yes	12-13-2013	Yes
Police Department	Yes	11-05-2013	Yes
Puna CDP Steering Committee	Yes		
Civil Defense	Yes		
ELECTED OFFICIALS			
State Senator	Yes		
State Representative	Yes		
County Council Member	Yes		
CITIZEN GROUPS/INDIVIDUALS			
Malama i Ka Aina Working Group	Yes		
Malama O Puna	Yes	12-09-2013	Yes
Richard Bidleman	Yes		

NEIL ABERCROMBIE
GOVERNOR



VACANT
DIRECTOR

**State of Hawai'i
Office of Environmental Quality Control
Department of Health**

December 6, 2013

Mr. Clayton S. Honma, Director
County of Hawai'i, Department of Parks and Recreation
101 Pauahi Street, Suite 6
Hilo, Hawai'i 96720

Dear Mr. Honma:

Thank you for your kind letter of October 23, 2013, transmitting your draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI) for the Master Plan for Pāhoa Park Expansion, Tax Map Key (3) 1-5-002: 020 in the judicial district of Puna.

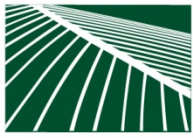
Having reviewed DEA-AFNSI, we respectfully inform you that we have no comments to offer at this time. Thank you for the opportunity to provide comments.

Sincerely,

Leslie Segundo
Environmental Health Specialist

Lelopāpā Ā Kamehameha
235 S. Beretania St., Room 702
Honolulu, Hawai'i 96813

Phone: 808-586-4185
Fax: 808-586-4186
E-mail: oeqchawaii@doh.hawaii.gov



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Tel/Cel: (808) 315-6878

December 24, 2013

Mr. Leslie Segundo
Environmental Health Specialist
State of Hawai'i
Office of Environmental Quality Control
Department of Health
235 S. Beretania Street, Room 702
Honolulu, HI 96813

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAII**
TMK: (3) 1-5-002:020

Dear Mr. Segundo,

Thank you for your letter dated December 6, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the Office of Environmental Quality Control has no comments to offer at this time.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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NEIL ABERCROMBIE
GOVERNOR



DARRYLL D. M. WONG
MAJOR GENERAL
ADJUTANT GENERAL

JOSEPH K. KIM
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495
November 27, 2013

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Subject: Draft Environmental Assessment (EA) for the Pahoia Park Expansion Master Plan
Tax Map Key: 3-1-5-002:020 Pahoia, Puna, Hawaii

Dear Mr. Takemoto:

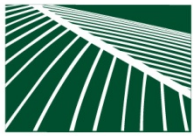
Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.

Please contact this office upon completion of the Environment Assessment/Finding of No Significant Impact. Should you have any questions or concerns, please have your staff contact Mr. Lloyd Maki, our Acting Chief Engineering Officer at (808) 733-4250.

Sincerely,

DARRYLL D.M. WONG
Major General
Hawaii National Guard
Adjutant General

c: Mr. Ian Duncan, SCD



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& ASSOCIATES, INC.

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Tel/Cel: (808) 315-6878

December 24, 2013

Major General Darryll D.M. Young
State of Hawai'i
Department of Department of Defense
Office of the Adjutant General
3949 Diamond Head Road
Honolulu, HI 96816-4495

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAII
TMK: (3) 1-5-002:020**

Dear Major General Young,

Thank you for your letter dated November 27, 2013 regarding the Pāhoia Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the State of Hawai'i Department of Defense has no comments to offer relative to the project at this time.

Your letter and our response will be included in the Final Environmental Assessment (FEA). In response to your request to receive notice of the FEA when it is completed, please note that it will be published in DOH's Office of Environmental Quality Control's (OEQC) *Environmental Notice*. As you know, Chapter 343, HRS, directs the OEQC to publish a periodic bulletin, known as *The Environmental Notice*. This bi-monthly document announces the availability of EAs and EISs for public review (including Final EAs/Findings of No Significant Impact (FONSI)). *The Environmental Notice* is published on the eighth and twenty-third day of each month and posted on DOH's OEQC's website.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

November 8, 2013

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

**Subject: Draft Environmental Assessment (DEA) for Pahoia Park Expansion
Master Plan, Puna, TMK: 1-5-002:020**

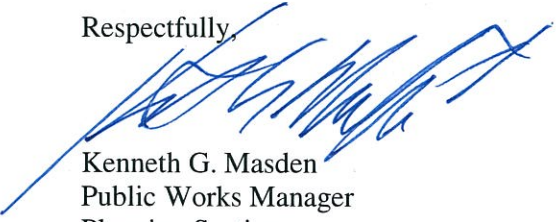
The Department of Education (DOE) has reviewed the Draft Environmental Assessment (DEA) for the Pahoia Park Expansion Master Plan in Puna, Hawaii.

The DOE would like to be notified if and when the County Parks Department will no longer be using the baseball field at Pahoia Elementary.

The DOE would also like to point out that Figure 4: Surrounding Land Uses, page 8, incorrectly identifies the State of Hawaii as the owner of four parcels of property which the State does not own. These parcels are being used by Pahoia Elementary and Pahoia High and Intermediate Schools but they belong to the County of Hawaii. This concern was also raised in our August 24, 2012 letter with comments for your pre-assessment consultation.

Thank you for the opportunity to provide comments. If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 377-8301.

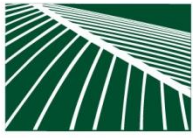
Respectfully,



Kenneth G. Masden
Public Works Manager
Planning Section

KGM:jmb

c: Raymond L'Heureux, Asst. Supt., OSFSS
Duane Kashiwai, Public Works Administrator, FDB
Mary Correa, CAS, Ka`u/Kea`au/Pahoia Complex Areas
Clayton Honma, Hawaii County, Dept. of Parks and Recreation



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Hilo, Hawai'i 96720-1553
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December 24, 2013

Mr. Kenneth G. Masden, Public Works Manager
Planning Section
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, HI 96804

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAII
TMK: (3) 1-5-002:020**

Dear Mr. Masden,

Thank you for your letter dated November 8, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

The County of Hawaii, Department of Parks & Recreation will continue to coordinate use of the baseball/softball field at the campus of Pāhoa Elementary with the Department of Education per the current arrangement. Should a situation arise that would lead to modification of the County's use of said field, this will be coordinated in advance with the State. Additionally, while we appreciate your comments regarding the apparent mislabeling of the ownership of four parcels of property (as shown on Figure 4) which are currently being used by Pāhoa Elementary and Pāhoa High and Intermediate Schools, according to the County's Real Property Tax Office database, the four parcels are still recorded to be owned by the State of Hawaii. As a result, the Final EA will state that title is in question, and that the resolution of tenure is ongoing but not relevant to the Project.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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NEIL ABERCROMBIE
GOVERNOR
STATE OF HAWAII



JOBIE M. K. MASAGATANI
CHAIRMAN
HAWAIIAN HOMES COMMISSION

DARRELL T. YOUNG
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

P. O. BOX 1879
HONOLULU, HAWAII 96805

November 21, 2013

PBR HAWAII & ASSOCIATES, INC.

Attn: Mr. Roy Takemoto
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813

Dear Mr. Takemoto:

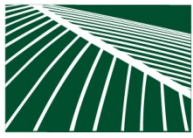
Subject: Pahoa Park Expansion Master Plan
Island: Hawai'i District: Puna
Tax Map Keys: (3) 1-5-002:020

Thank you for the opportunity to review the subject Expansion Master Plan. The Department of Hawaiian Home Lands has no comment to offer at this time.

If you have any questions, please contact our Planning Office at 620-9480

Aloha,

Darrell C. Yagodich,
Planning Program Manager



PBR HAWAII
& ASSOCIATES, INC.

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ROY TAKEMOTO
Managing Director - Hilo

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December 24, 2013

Mr. Darrell Yagodich, Planning Program Manager
State of Hawai'i
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Mr. Yagodich,

Thank you for your letter dated November 21, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the Department of Hawaiian Home Lands has no comments to offer at this time.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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

In reply, please refer to:
EMD/CWB

11048PCM.13

November 18, 2013

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Takemoto:

**SUBJECT: Comments on the Draft Environmental Assessment for the
Pahoa Park Expansion Master Plan
Puna, Island of Hawaii, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated October 28, 2013, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/10/CWB_Oct22.pdf

1. Any project and its potential impacts to State waters must meet the following criteria:

- a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
- b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
- c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the CWB Individual NPDES Form through the e-Permitting Portal and the hard copy certification statement with \$1,000 filing fee. Please open the [e-Permitting Portal](https://eha-cloud.doh.hawaii.gov/epermit/View/home.aspx) website at: <https://eha-cloud.doh.hawaii.gov/epermit/View/home.aspx>. You will be

Mr. Roy Takemoto
November 18, 2013
Page 2

11048PCM.13

asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the "CWB Individual NPDES Form." Follow the instructions to complete and submit this form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommend that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their permitting requirements.

Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.

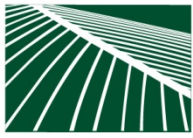
If you have any questions, please visit our website at:
<http://health.hawaii.gov/cwb>, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,


ALEC WONG, P.E., CHIEF
Clean Water Branch

CM:jst

- c: Mr. Clayton Honma, Hawaii County Department of Parks and Recreation
[via email only]
DOH-EPO #13-159 [via email only]



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December 24, 2013

Mr. Alec Wong, P.E., Chief
State of Hawai'i
Department of Health – Clean Water Branch
P.O. Box 3378
Honolulu, HI 96801-3378

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I, TMK: (3) 1-5-002:020

Dear Mr. Wong,

Thank you for your letter (EMD/CWB 11048PCM.13) dated November 18, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We have reviewed the Clean Water Branch's standard comments and Pāhoa Park will comply with all requirements of Hawai'i Administrative Rules (HAR), Chapters 11-54 and 11-55.

1. We acknowledge that the Pāhoa Park project and its potential impacts to State Waters must meet the following criteria, as applicable:
 - a. Antidegradation policy (HAR, Section 11-54-1.1)
 - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
 - c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8)
2. As discussed in Section 3.5.2 (Surface Water Resources) of the Draft EA, a National Pollutant Discharge Elimination System (NPDES) permit will be necessary. We note that an NPDES permit is required before the start of construction.
3. At the appropriate time we will contact the United States Corp of Engineers Regulatory Branch regarding their permitting requirements.
4. The Pāhoa Park Master Plan will comply with the State's Water Quality Standards contained in HAR Chapter 11-54 and permitting requirements specified in HAR Chapter 11-55.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

13-159
Pahoa Park DEA

November 5, 2013

✓ PBR HAWAII & Associates, Inc.
ATTN: Mr. Roy Takemoto
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813

Hawai'i County Department of Parks & Recreation
as the Mayor's Designee
ATTN: Mr. Clayton Honma, Director
Aupuni Center
101 Pauahi Street, Suite 6
Hilo, Hawai'i 96720-4224

Dear Sirs:

**SUBJECT: Draft Environmental Assessment for the Pahoa Park Expansion Master Plan
Puna, Hawai'i, TMK: (3) 1-5-002: 020**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter dated October 28, 2013. Thank you for allowing us to review and comment on the subject document. The document was routed to DOH's Clean Water and Safe Drinking Water Branches and the island of Hawai'i's District Health Office. They will provide specific comments to you if necessary. EPO recommends that you review the Standard Comments found on our website: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/>. You are required to adhere to all Standard Comments specifically applicable to this application.

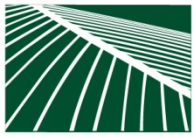
EPO appreciates your work to create healthy, active, and sustainable communities.

We wish to receive notice of the environmental assessment's availability when it is completed. We request a written response confirming receipt of this letter and any other letters you receive from DOH in regards to this submission. You may mail your response to: 919 Ala Moana Blvd., Ste. 312, Honolulu, Hawaii 96814. However, we would prefer an email submission to: epo@doh.hawaii.gov. We anticipate that our letter(s) and your response(s) will be included in the final document. If you have any questions, please contact me at (808) 586-4337.

Mahalo,

A blue ink signature of Laura Leialoha Phillips McIntyre.

Laura Leialoha Phillips McIntyre, AICP
Manager, Environmental Planning Office



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& ASSOCIATES, INC.

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1719 Haleloke Street
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December 24, 2013

Ms. Laura Leialoha Phillips McIntyre, AICP
Manager
State of Hawai'i
Department of Health – Environmental Planning Office
919 Ala Moana Blvd., Ste. 312
Honolulu, HI 96814

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAII
TMK: (3) 1-5-002:020**

Dear Ms. McIntyre,

Thank you for your letter (your reference number 13-159 Pahoia Park EA) dated November 5, 2013 regarding the Pāhoia Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

As recommended, we have reviewed EPO's standard comments and will address those applicable to the proposed park. The information regarding strategies to support the sustainable design of communities, and health impact assessments has also been reviewed. We consulted with the project architect, WCIT Architecture and confirmed that since the project consists primarily of outdoor fields, sustainable building certifications such as Leadership in Energy and Environmental Design (LEED), are not readily applicable to this project. The project will apply other sustainable site design principles such as minimizing paved parking and using drainage systems that promote infiltration over runoff.

Your letter and our response will be included in the Final Environmental Assessment (FEA). In response to your request to receive notice of the FEA when it is completed, please note that it will be published in DOH's Office of Environmental Quality Control's (OEQC) *Environmental Notice*. As you know, Chapter 343, HRS, directs the OEQC to publish a periodic bulletin, known as *The Environmental Notice*. This bi-monthly document announces the availability of EAs and EISs for public review (including Final EAs/Findings of No Significant Impact (FONSI)). *The Environmental Notice* is published on the eighth and twenty-third day of each month and posted on DOH's OEQC's website.

Per Hawaii Administrative Rules §11-200-9.1, C (Public Review and Response Requirements for Draft Environmental Assessments for Anticipated Negative Declaration Determinations and Addenda to Draft Environmental Assessments):

“For agency actions, the proposing agency shall respond in writing to all comments received or postmarked during the thirty-day review period, incorporate comments as appropriate, and append the comments and responses in the final environmental assessment. Each response shall be sent directly to the person commenting, with copies of the response also sent to the office.”

Ms. Laura Leialoha Phillips McIntyre, AICP

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR PĀHOA PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI‘I

TMK: (3) 1-5-002:020

December 24, 2013

Page 2 of 2

As requested, this response is being mailed to the street address you provided in your letter and not DOH's general post office box.

Thank you for reviewing the DEA/AFONSI. Your letter will be included in the Final Environmental Assessment (FEA)/Finding of No Significant Impact (FONSI).

Sincerely,

PBR HAWAII

A handwritten signature in black ink, appearing to read "Roy Takemoto". The signature is written in a cursive style with a large, looped initial "R".

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai‘i Department of Parks and Recreation



STATE OF HAWAII
DEPARTMENT OF HEALTH
SAFE DRINKING WATER BRANCH

919 ALA MOANA BLVD., ROOM 308
HONOLULU, HI 96814-4920

In reply, please refer to:
File: SDWB
PahoaPark01.docx

November 13, 2013

PBR HAWAII & Associates, Inc.
Attn: Mr. Roy Takemoto
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Takemoto:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PAHOA PARK EXPANSION MASTER PLAN
PUNA, ISLAND OF HAWAII, HAWAII

The Safe Drinking Water Branch (SDWB) acknowledges receipt of the letter dated October 28, 2013, from your office requesting our comments regarding the subject project.

Since the project will connect to the existing County of Hawaii water system as a service connection, we do not have any comments regarding the subject project at this time.

If there are any questions, please call Mr. Craig Watanabe of the SDWB Engineering Section, at 586-4258.

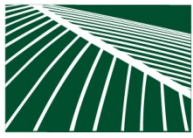
Sincerely,

JOANNA L. SETO, P.E., CHIEF
Safe Drinking Water Branch

CW:slm

c: EPO #13-159 [via email only]

Hawaii County Department of Parks & Recreation
Attn: Mr. Clayton Honma, Director
Aupuni Center
101 Pauahi Street, Suite 6
Hilo, Hawai'i 96720-4224



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December 24, 2013

Ms. Joanna L. Seto, P.E., Chief
Safe Drinking Water Branch
State of Hawai'i
Department of Health
919 Ala Moana Blvd., Room 308
Honolulu, HI 96814-4920

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Ms. Seto,

Thank you for your letter (File: SDWB PahoPark01.docx) dated November 13, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the Department of Health – Safe Drinking Water Branch has concluded that since the project will connect to the existing County of Hawai'i water system as a service connection, it does not have any comments regarding the subject project at this time.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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NEIL ABERCROMBIE
GOVERNOR



PATRICIA McMANAMAN
DIRECTOR

BARBARA A. YAMASHITA
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES

Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, Hawaii 96813

November 6, 2013

Refer to 13:0685

Mr. Clayton Honma,
Director, Aupuni Center
Hawaii County Dept. of Parks & Recreation
101 Pauahi Street, Suite 6
Hilo, Hawai'i 96720-4224

Dear Mr. Honma:

SUBJECT: Draft Environmental Assessment For Pahoia Park Expansion Master Plan
Located At Pahoia, Puna, Hawai'i TMK: (3) 1-5-002:020

The Department of Human Services (DHS) received a request from Mr. Roy Takemoto, of PBR Hawaii & Associates, Inc., to review and send comments to you on the Draft Environmental Assessment for the proposed Pahoia Park Expansion Master Plan.

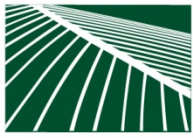
Mr. Takemoto's letter and attachment were forwarded by the Director, Patricia McManaman, to us for the response. After a review of the documents, DHS has no comment on the proposed Pahoia Park expansion plans as identified on the CD (PDF file) attachment.

If you have any questions or need further information, please contact Ms. Marja Leivo, Child Care Program Specialist, at (808) 586-7058.

Sincerely,

Scott Nakasone
Assistant Division Administrator

c: Patricia McManaman, Director
Roy Takemoto, PBR Hawaii & Associates, Inc.



PBR HAWAII

& ASSOCIATES, INC.

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December 24, 2013

Mr. Scott Nakasone, Assistant Division Administrator
State of Hawai'i
Department of Human Services
Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, HI 96813

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/FINDING OF NO
SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Mr. Nakasone,

Thank you for your letter dated November 6, 2013 regarding the Pāhoā Park Expansion Master Plan (reference 13:0685). As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that after a review of the documents, the Department of Human Service has no comment on the proposed Pāhoā Park expansion plans.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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NEIL ABERCROMBIE
GOVERNOR



DWIGHT TAKAMINE
DIRECTOR

AUDREY HIDANO
DEPUTY DIRECTOR

**STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS**

830 PUNCHBOWL STREET, ROOM 321
HONOLULU, HAWAII 96813
www.hawaii.gov/labor
Phone: (808) 586-8844/Fax: (808) 586-9099

November 5, 2013

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813

Dear Mr. Takemoto:

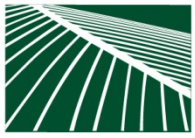
This is in response to your request for comments dated October 28, 2013, for the Pahoia Park Expansion Master Plan for the District of Puna on the Island of Hawai'i.

The Department of Labor and Industrial Relations has no comments, and we foresee no impact on our existing or proposed programs. Should you have any questions, please call me at 586-8844.

Sincerely,

DWIGHT TAKAMINE
Director

cc: Hawai'i County Department of Parks &
Recreation, as the Mayor's Designee
Attn: Mr. Clayton Honma, Director



PBR HAWAII

& ASSOCIATES, INC.

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December 24, 2013

Mr. Dwight Takamine, Director
State of Hawai'i
Department of Labor and Industrial Relations
830 Punchbowl Street, Room 321
Honolulu, HI 96813

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020

Dear Mr. Takamine,

Thank you for your letter dated November 5, 2013 regarding the Pāhoā Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the Department of Labor and Industrial Relations has no comments and that it foresees no impact on its existing or proposed programs.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION**

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 27, 2013

PBR Hawaii & Associates, Inc.
Attn: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

via email: rtakemoto@pbrhawaii.com

Dear Mr. Takemoto:

SUBJECT: Draft Environmental Assessment / Anticipated Finding of No Significant Impact for Pahoia Park Expansion Master Plan, PBR Hawaii & Associates, Inc. on behalf of County of Hawaii, Applicant, Pahoia, Puna, Hawaii, TMK: (3) 1-5-002:020

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

At this time, enclosed are comments from the (i) Engineering Division; (ii) Commission on Water Resource Management, (iii) Hawaii District Land Office, and (iv) Division of State Parks on the subject matter. Should you have any questions, please feel free to call Kevin Moore at 587-0426. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell Y. Tsuji".

**Russell Y. Tsuji
Land Administrator**

Enclosure(s)



RECEIVED
LAND DIVISION



2013 NOV -7 AM 10:54

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

13 NOV 4 PM 3 21 ENGINEERING

November 1, 2013

MEMORANDUM

TO: JR

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division**
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District
- Historic Preservation

TO: D

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Draft Environmental Assessment / Anticipated Finding of No Significant Impact for Pahoia Park Expansion Master Plan

LOCATION: Pahoia, Puna, Hawaii, TMK: (3) 1-5-002:020

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment is information on the above referenced project. One CD of the environmental assessment is also available for review in the Land Division office in Honolulu. We would appreciate your comments on this project. Please submit any comments by November 26, 2013. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Print name: Cary S. Chong, Chief Engineer

Date: 11/7/13

cc: Central Files

**DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION**

LD/KevinMoore

**RE: PahoaParkExpansionDEA
Hawaii.629**

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- () Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone ____.
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- () Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 748-8296 of the City and County of Honolulu, Department of Planning and Permitting.
 - () Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
 - () Mr. Carolyn Cortez at (808) 270-7813 of the County of Maui, Department of Planning.
 - () Mr. Stanford Iwamoto at (808) 241-4884 of the County of Kauai, Department of Public Works.
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
 - () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
 - () Additional Comments: _____

- (X) **Other: Our previous comments dated July 30, 2012, which were included in the Draft Environmental Assessment document, still apply.**

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: 
CARTY S. CHANG, CHIEF ENGINEER

Date: 11/7/13



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 1, 2013

MEMORANDUM

2013 NOV -5 AM 11:36

From:

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District
- Historic Preservation

To:

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Draft Environmental Assessment / Anticipated Finding of No Significant Impact for Pahoia Park Expansion Master Plan

LOCATION:

Pahoia, Puna, Hawaii, TMK: (3) 1-5-002:020

APPLICANT:

PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment is information on the above referenced project. One CD of the environmental assessment is also available for review in the Land Division office in Honolulu. We would appreciate your comments on this project. Please submit any comments by November 26, 2013. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: W. Roy Hardy

Print name: W. Roy Hardy

Date: 11/1/13

cc: Central Files

RECEIVED
LAND DIVISION
2013 NOV 13 PM 3:02
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

2013 NOV -5 P 1:25

RECEIVED
LAND DIVISION
HILO, HAWAII

November 1, 2013

MEMORANDUM

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

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2013 NOV 20 AM 9:55

RECEIVED
LAND DIVISION

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Assessment / Anticipated Finding of No Significant Impact for Pahoia Park Expansion Master Plan
LOCATION: Pahoia, Puna, Hawaii, TMK: (3) 1-5-002:020
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment is information on the above referenced project. One CD of the environmental assessment is also available for review in the Land Division office in Honolulu. We would appreciate your comments on this project. Please submit any comments by November 26, 2013. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

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

Signed: [Signature]

Print name: GORDON C. HEIT

Date: 11/18/13

cc: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 1, 2013

MEMORANDUM

DEPT. OF LAND &
NATURAL RESOURCES

13 NOV -5 AM 1:26

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STATE PARKS

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NATURAL RESOURCES
STATE OF HAWAII

2013 NOV 14 PM 2:16

RECEIVED
LAND DIVISION

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District
- Historic Preservation

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Draft Environmental Assessment / Anticipated Finding of No Significant Impact for Pahoia Park Expansion Master Plan

LOCATION:

Pahoia, Puna, Hawaii, TMK: (3) 1-5-002:020

APPLICANT:

PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment is information on the above referenced project. One CD of the environmental assessment is also available for review in the Land Division office in Honolulu. We would appreciate your comments on this project. Please submit any comments by November 26, 2013. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

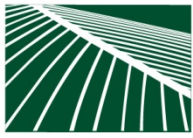
- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Print name: Daniel S. Quinn

Date: 11/14/13

cc: Central Files



PBR HAWAII

& ASSOCIATES, INC.

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED®AP BD+C
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED®AP BD+C
Vice-President

W. FRANK BRANDT, FASLA
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Senior Associate

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Senior Associate

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Managing Director - Kapolei

ROY TAKEMOTO
Managing Director - Hilo

SCOTT MURAKAMI, ASLA, LEED®AP
Associate

DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

MICHAEL SHIBATA, AICP
Associate

CATIE CULLISON, AICP
Associate

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Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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1001 Kamokila Boulevard
Kapolei Building, Suite 313
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Tel: (808) 521-5631
Fax: (808) 535-3163

HILO OFFICE
1719 Haleloke Street
Hilo, Hawai'i 96720-1553
Tel/Cel: (808) 315-6878

December 24, 2013

Mr. Russell Tsuji
State of Hawai'i
Department of Land and Natural Resources – Land Division
P.O. Box 621
Honolulu, HI 96809

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Mr. Tsuji,

Thank you for your letter dated November 27, 2013 regarding the Pāhoia Park Expansion Master Plan and coordinating the comments from the various DLNR Divisions. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the Commission on Water Resource Management, Hawaii District Land Office, and the Division of State Parks has no comments. Per the comments from Engineering Division, we note that the Draft EA addressed previous comments, which still apply.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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**HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

WILLIAM J. AHLA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

November 29, 2013

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street, ASB Tower Suite 650
Honolulu HI 96813

LOG NO: 2013.6129
2013.6211
DOC NO: 1311SN12
Archaeology

Aloha Mr. Takemoto,

**SUBJECT: Chapter 6E-42 Historic Preservation Review -
Draft Environmental Assessment, Pāhoa Park Expansion Master Plan
Waiakahiula 2 Ahupua'a, Puna District, Island of Hawaii
TMK (3) 1-5-002:020**

Thank you for the opportunity to comment on the submittal for the proposed project, which we received on October 30, 2013. The project area in parcel is presently owned by the County of Hawaii and is undeveloped. This parcel is adjacent to existing community activity areas. The total project area consists of 71 acres. Plans for the project area include the expansion of the playground, demolition of old basketball courts and replacement of a multi-purpose field currently unused due to drainage problems. Also included in Phase 1 is the building of new facilities: a covered sports court, a comfort station, and baseball fields. Future development is also planned for the parcel. Archaeological work has been conducted by Scientific Consulting Services, Inc. and is currently under review.

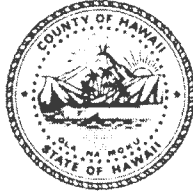
The version of the AIS (Escott Sept. 2013) included in the current DEA is currently under review and has not been accepted by our office. I have contacted Mr. Escott to discuss the needed revisions to the current AIS prior to its being accepted. Once historic properties have been adequately identified during the AIS, additional mitigation measures will need to be agreed upon to avoid or minimize potential impacts to archaeological, cultural and historic resources.

Please contact Sean Nāleimaile at (808) 933-7651 or Sean.P.Naleimaile@Hawaii.gov if you have any questions or concerns regarding this letter.

Mahalo,

Theresa K. Donham
Archaeology Branch Chief

William P. Kenoi
Mayor



Clayton S. Honma
Director

Robert A. Fitzgerald
Deputy Director

County of Hawai'i

DEPARTMENT OF PARKS AND RECREATION

101 Pauahi Street, Suite 6 • Hilo, Hawai'i 96720
(808) 961-8311 • Fax (808) 961-8411

December 20, 2013

Mr. Alan Downer, Administrator
State of Hawai'i
Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707

Attention: Ms. Theresa K. Donham, Archaeological Branch Chief

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING OF NO SIGNIFICANT
IMPACT FOR THE PĀHOA PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA, PUNA,
HAWAII (TMK: (3) 1-5-002:020)

Dear Ms. Donham,

Thank you for your letter (your reference numbers LOG NO: 2013.6129, 2013.6211, DOC NO. 1311SN12) dated November 29, 2013 regarding the Pāhoa Park Expansion Master Plan. Although your letter cited your review as a Chapter 6E-42 Historic Preservation Review, it is more appropriately a Chapter 6E-8 Historic Preservation Review since our department is proposing the project.

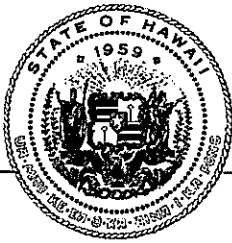
We consider the filing of the draft Archaeological Inventory Survey (AIS) report as our Chapter 6E-8 notification and request for concurrence. We trust you will be able to provide your concurrence (or non-concurrence) within the ninety-day period commencing on the October 30, 2013 filing.

If you have any questions or concerns, please contact James Komata, Park Planner in our office (email jkomata@co.hawaii.hi.us or (808) 961-8311).

Sincerely,

Clayton S. Honma
Director

Copy: Ms. Theresa K. Donham [Theresa.K.Donham@hawaii.gov]
Roy Takemoto, PBR Hawai'i
Jason Antonio, WCIT Architects, Inc.



OFFICE OF PLANNING STATE OF HAWAII

NEIL ABERCROMBIE
GOVERNOR

JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: <http://planning.hawaii.gov/>

Ref. No. P-14196

December 9, 2013

Mr. Clayton Honma, Director
Department of Parks and Recreation
County of Hawaii
101 Pauahi Street, Suite 6
Hilo, Hawaii 96720-4224

Dear Mr. Honma:

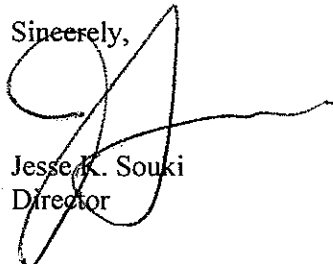
Subject: Draft Environmental Assessment
Pahoa Park Expansion Master Plan
TMK: (3) 1-5-002:020

Thank you for the opportunity to provide comments on the Draft Environmental Assessment (Draft EA) for the Pahoa Park Mater Plan. The Office of Planning has reviewed the Draft EA received by letter on October 31, 2013, and offers the following comments:

1. The Final EA should include an Existing Site Plan. Although a portion of the existing facilities is shown on the Conceptual Master Plan (Figure 5 on page 5), it would be helpful to see the overall existing site in its entirety.
2. The Final EA should have an expanded discussion on the enclosed structures for future phases, as it relates to the criteria for permissible uses in the Agricultural District under the HRS §205-4.5(6).
3. The Facilities Map (Figure 10 on page 15) should include the labeling of the facility names/future uses since these enclosed structures will require subsequent land use review.

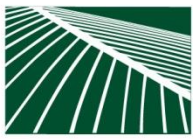
If you have any questions regarding this comment letter, please contact Jenny Lee of our Land Use Division at (808) 587-2805.

Sincerely,



Jesse K. Souki
Director

c: ✓ Mr. Roy Takemoto, PBR HAWAII & Associates, Inc.



PBR HAWAII & ASSOCIATES, INC.

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED®AP BD+C
Executive Vice-President

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Vice-President

GRANT T. MURAKAMI, AICP, LEED®AP BD+C
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W. FRANK BRANDT, FASLA
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TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KIMI MIKAMI YUEN, LEED®AP BD+C
Senior Associate

SCOTT ALIKA ABRIGO, LEED®AP BD+C
Managing Director - Kapolei

ROY TAKEMOTO
Managing Director - Hilo

SCOTT MURAKAMI, ASLA, LEED®AP
Associate

DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

MICHAEL SHIBATA, AICP
Associate

CATIE CULLISON, AICP
Associate

HONOLULU OFFICE
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E-mail: sysadmin@pbrhawaii.com

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Tel: (808) 521-5631
Fax: (808) 535-3163

HILO OFFICE
1719 Haleloke Street
Hilo, Hawai'i 96720-1553
Tel/Cel: (808) 315-6878

printed on recycled paper

December 24, 2013

Mr. Jessie Souki, Director
State of Hawai'i
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/FINDING OF NO
SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAII
TMK: (3) 1-5-002:020**

Dear Mr. Souki,

Thank you for your letter dated December 9, 2013 regarding the Pāhoa Park Expansion Master Plan (Ref. No. P-14196). As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

1. **Existing Site Plan.** The Final EA will include an existing site plan keyed to the site photographs in Figure 3.
2. **Permissible Uses.** As requested, section 5.1.1 of the EA will be revised to clarify that Hawaii County's zoning code further defines "open area" recreation to mean "where none of the recreational features are entirely enclosed in a building." (Hawaii County Code §25-5-72(a)(7). This zoning code provision will be cross-referenced in section 5.1.1.
3. **Facilities Map.** As requested, the top half of Figure 10 will be revised to include labels for the proposed enclosed recreational facilities.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052



November 7, 2013

Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Takemoto:

This is in response to your request for comments on the Pahoa Park Expansion Master Plan, Island of Hawaii, Puna District.

Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Hawaii (Community Number 155166), Maps revised April 2, 2004. Please note that the County of Hawaii, State of Hawaii is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.
- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any **development** must not increase base flood elevation levels. **The term development means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

Roy Takemoto
Page 2
November 7, 2013

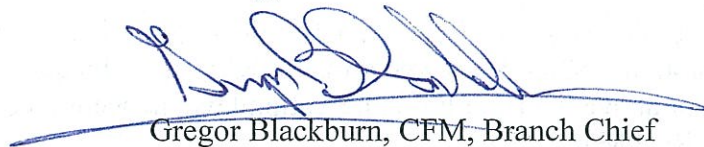
- All buildings constructed within a coastal high hazard area, (any of the “V” Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.
- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA’s Flood Map Revision Application Packages, please refer to the FEMA website at <http://www.fema.gov/business/nfip/forms.shtm>.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community’s floodplain manager for more information on local floodplain management building requirements. The Hawaii County floodplain manager can be reached by calling Carter Romero, Director, Department of Public Works, at (808) 961-8943.

If you have any questions or concerns, please do not hesitate to call Sarah Owen of the Mitigation staff at (510) 627-7050.

Sincerely,



Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

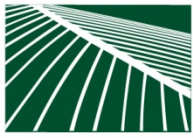
cc:

Clayton Honma, Director, Hawaii County Department of Parks & Recreation, Aupuni Center
Carter Romero, Director & Floodplain Administrator, Department of Public Works, Hawaii
County

Carol L. Tyau-Beam, Hawaii Department of Land & Natural Resources

Sarah Owen, NFIP Planner, DHS/FEMA Region IX

Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX



PBR HAWAII

& ASSOCIATES, INC.

December 24, 2013

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Chairman Emeritus

Gregor Blackburn, CFM, Branch Chief
U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

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DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

MICHAEL SHIBATA, AICP
Associate

CATIE CULLISON, AICP
Associate

Dear Mr. Blackburn:

Thank you for your letter dated November 7, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

As shown on Figure 19 of the Draft EA, we have reviewed the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Hawai'i and note that the project site is indicated as "1375C, Panel Not Printed, (Minimal Tsunami Inundation)". As noted in the Draft EA: "The flood zone closest to the Project Site is approximately 6 miles away and it is Zone A, the 1% annual chance floodplain."

Thank you for reviewing the DEA/AFONSI. Your letter will be included in the Final Environmental Assessment (FEA)/Finding of No Significant Impact (FONSI).

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
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United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

Phone: (808) 587-2400/Fax: (808) 587-2401

December 5, 2013

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813

Dear Mr. Takemoto:

Subject: Draft Environmental Assessment (EA) for the Pāhoia Park Expansion Master Plan, Puna
Hawai'i, Tax Map Keys: (3) 1-5-002:020

Thank you for forwarding the subject Draft EA for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff time, we are unable to review this document.

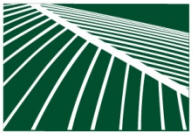
We appreciate the opportunity to participate in the review process.

Sincerely,


Stephen S. Anthony
Center Director

cc: Mr. Clayton Honma, Director, Aupuni Center

Hawai'i County Department of Parks & Recreation, as the Mayor's Designee
101 Pauahi Street, Suite 6
Hilo, Hawai'i 96720-4224



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December 24, 2013

Stephen S. Anthony, Center Director
United States Department of the Interior
U.S. Geological Survey
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Mr. Anthony:

Thank you for your letter dated December 5, 2013 regarding the Pāhoā Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that due to prior commitments and lack of available staff time, your agency was unable to review the Draft EA.

Your letter will be included in the Final Environmental Assessment (FEA)/Finding of No Significant Impact (FONSI).

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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United States Department of the Interior



NATIONAL PARK SERVICE
Hawai'i Volcanoes National Park
Post Office Box 52
Hawaii National Park, Hawai'i 96718

IN REPLY REFER TO:
HAVO 1.D. (L7621)

November 21, 2013

PBR Hawaii & Associates, Inc.
Attn: Mr. Roy Takemoto
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813

Subject: Draft Environmental Assessment for Pāhoā Park Expansion Master Plan

Thank you for your letter dated 10/28/2013 requesting comments on the Draft Environmental Assessment for the Pāhoā Park Expansion Master Plan which proposes the expansion of an existing county park in the town of Pāhoā, HI.

The Draft EA discusses night lighting for parking areas and walking paths for the project site, but does not provide details on these lights. The DEA simply states that "Exterior lighting mitigation measures will minimize impact on night-flying birds."

We appreciate your consideration to protect threatened and endangered nocturnal seabirds that may be transiting the area, such as the endangered Hawaiian petrel, the threatened Newell's shearwater, and the state-listed band-rumped storm-petrel. While these species may not occur on the project site, they do fly to and from nesting colonies after dark and could be disoriented by artificial lights that are not properly shielded. In order to protect night skies and night-flying birds, it is recommended that only full cut-off, amber, downward directional lighting be considered for this project.

An excellent resource for seabird friendly lighting can be found at the following website:
<http://www.kauai-seabirdhcp.info/minimization/lights/index.html>

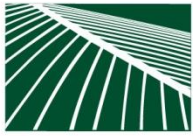
We look forward to working with you in the future on jointly shared resources of concern such as protection of the dark night skies.

Sincerely,

Cynthia L. Orlando
Superintendent

cc: Hawaii County Dept of Parks and Recreation





PBR HAWAII

& ASSOCIATES, INC.

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December 24, 2013

Ms. Cynthia L. Orlando, Superintendent
United States Department of the Interior
National Parks Service
Hawai'i Volcanoes National Park
P.O. Box 52
Hawai'i National Park, HI 96718

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAII'I
TMK: (3) 1-5-002:020**

Dear Ms. Orlando,

Thank you for your letter dated November 21, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We appreciate your concerns regarding the protection of threatened and endangered nocturnal seabirds that may be transiting the area. We would like to note that as reported in the Draft EA, a fauna survey was conducted, and no threatened and endangered nocturnal seabirds were observed during the survey. We would like to acknowledge and thank you for your helpful recommendation that only full cut-off, amber, downward directional lighting be considered for the project. It is the intent of the County of Hawai'i to protect all species, especially those threatened or endangered. To minimize the threat of disorientation or downing of night-flying birds, all exterior lighting will be shielded in compliance with Section 14-50, Hawaii County Code, which guides the selection and installation of outdoor lighting fixtures at "Recreational facilities." In addition, the Department of Parks and Recreation will explore the possibility of cut-off, amber, downward directional lighting to be used at Pāhoa Park to the extent it does not compromise safety criteria for recreational use.

Additionally, we thank you for the excellent web resource for seabird friendly lighting.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

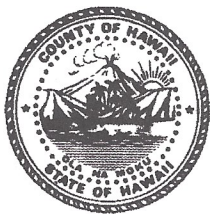
Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

William P. Kenoi
Mayor



BJ Leithead Todd
Director

John A. Medeiros
Deputy Director

County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
345 Kekūanaō'a St., Suite B• Hilo, Hawai'i 96720
(808) 961-8083 · Fax (808) 961-8086
<http://www.hawaiicounty.gov/environmental-management/>

November 5, 2013

PBR Hawai'i & Associates
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813
Attention: Ms. Tammy Kapali

Hawai'i County Department of Parks & Recreation
Aupuni Center
101 Pauahi Street, Suite 6
Hilo, HI 96720
Attention: Mr. Clayton Honma, Director

RE: Pāhoa Park Expansion Master Plan

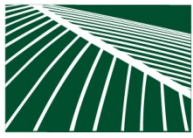
We have no comments to offer on the subject project.

Thank you for allowing us to review and comment.

Sincerely,

A handwritten signature in cursive script that reads "BJ Leithead Todd".

BJ Leithead Todd
DIRECTOR



PBR HAWAII

& ASSOCIATES, INC.

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December 24, 2013

Ms. BJ Leithead Todd, Director
County of Hawai'i
Department of Environmental Management
345 Kukūanaō'a Street, Suite B
Hilo, HI 96720

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAII
TMK: (3) 1-5-002:020**

Dear Ms. Leithead Todd,

Thank you for your letter dated November 5, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that your Department has no comments to offer at this time.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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William P. Kenoi
Mayor



Duane Kanuha
Director

Bobby Command
Deputy Director

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
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Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

December 5, 2013

Mr. Roy Takemoto
Managing Director, Hilo Office
PBR Hawaii & Associates, Inc.
1719 Haleoke Street
Hilo, Hawai'i 96720-1553

Mr. James Komata, Park Planner
Department of Parks and Recreation
101 Pauahi Street, Ste. 6
Hilo, Hawai'i 96720

Dear Mr. Takemoto and Mr. Komata:

**SUBJECT: Draft Environmental Assessment (DEA) for the Pāhoa Park Expansion
Master Plan
Location: Pāhoa, Puna, Hawai'i
Tax Map Key: (3) 1-5-002:020**

We have reviewed the prepared DEA for the subject project, which is enthusiastically supported by the Planning Department, and offer the following comments.

1. Pg. 23, Sec. 3.2 - Geology and Topography, par. 2: Correction should be made to the statement that Mauna Loa is located approximately 40 miles "east" of Pāhoa when it is actually west of Pāhoa.
2. Pg. 43, Sec. 4.3 - Roadways and Traffic, par. 2: The 2nd sentence says no sidewalks are provided within the vicinity of the site on Kauhale Street when in fact sidewalks do currently exist along both sides of Kauhale Street. This statement is also contrary to the description of Kauhale Street on page 44 of the DEA.

The last sentence in this same paragraph states that there is a bus stop located along Pāhoa Bypass Road (Highway 130) when in fact there is no marked official bus stop or bus shelter anywhere along the Pāhoa Bypass Road. The County Hele-On buses do stop at a number of locations along roadways where riders tend to congregate to get picked up.

3. Pg. 44, Sec. 4.3 - Roadways, par. 3: The first sentence states that Kauhale Street links Pāhoa Village Road with Kaohe Homestead Road. Kauhale Street is a dead-end road that does not connect with Kaohe Homestead Road.
4. Pg. 45, Sec. 4.3 - Roadways, par.4: This paragraph states that this roadway (Pāhoa Bypass Road) is also known as "*County Route 130*" and that it becomes a four-lane roadway south of Pāhoa Village Road. The Pāhoa Bypass Road, as is all of Highway 130, a State highway. Also, Highway 130 does not become a four-lane roadway anywhere along its alignment south of the Kea'au Bypass.
5. Pg. 45, Sec. 4.3 - Roadways, par. 5: This paragraph states that Kaohe Homestead Road links Pāhoa Village Road with Kauhale Street south of Pāhoa Park. Actually, it is Pāhoa Village Road that links Kaohe Homestead Road with Kauhale Street.
6. Pg. 45, Sec. 4.3 – Existing Intersection Volumes and Lane Configurations: We suggest that this section should have included discussion on the impacts on the Post Office Road and Pāhoa Village Road intersection. Post Office Road being one of the three main means of access and egress between Pāhoa Village Road and the Pāhoa Bypass Road bears considerable traffic between the village and the highway. A CIP budget request is also being proposed by the Pāhoa Regional Town Center Plan Steering Committee and the Puna CDP Action Committee that would extend Post Office Road from Pāhoa Village Road to Pāhoa Park in order to provide a safer and more direct alternative access to the park.
7. Pg. 45, Sec. 4.3 – Projected Traffic Conditions, par. 2: The statement in this section that no approved or pending development projects should be corrected to account for the recently approved State Land Use Boundary Amendment (SLU 12-033) and Change of Zone (REZ 12-155) applications to allow for the development of a major shopping center by T. T. Kuwahara, LLC at the intersection of Kahakai Blvd. and Pāhoa Village Rd. was initially applied for in June 2012. Amendments to the discussion on how this impacts the growth assumptions and conclusions may be warranted.
8. Pg. 46, Sec. 4.3 – Projected Traffic Conditions, par. 4: It is unclear what intersection(s) are being referenced in the 2nd sentence for installation of a traffic signal or use of manual traffic controls.
9. Pg. 51, Sec. 4.7.5 – Electrical and Communications System, par. 1: The reference to telephone service being available "*at highway frontage*" should be amended since this suggests telephone service would have to be run to the Pāhoa Park site from Highway 130.
10. Pg. 52, Sec. 4.8.2 – Economy, par.1: The suggestion in the 2nd to last sentence that "*the future expansion looks promising*" for geothermal resource utilization is probably not a very realistic statement given the extent of local public opposition to the proposal by HELCO

Mr. Roy Takemoto
Mr. James Komata
Page 3
December 5, 2013

to expand geothermal energy utilization, which HELCO has recently put on hold.

11. Pg. 53, Sec. 4.9.1 – Schools, par. 1: The 1st sentence incorrectly states that DOE operates three public schools in the district of Puna. The DOE actually operates three public schools within the Pāhoa Village area. DOE also operates public schools in Kea’au and Mt. View.
12. Pg. 53, Sec. 4.9.2 –Police, Fire and Medical, par.1: This paragraph suggests that the County of Hawai’i Police Substation and Pāhoa Fire Station are located approximately ½ mile apart on the Kea’au-Pāhoa Road. In fact they are next door to each other on the same TMK parcel.
13. Pg. 54, Sec. 4.9.5 – Police, Fire and Medical – Potential Impacts and Mitigation Measures: While the existing police, fire and medical services may be adequate to meet the initial demand from the operation of Phase I of the Pāhoa Park, the discussion in this section fails to support the conclusion stated, especially once the park is fully developed and operational.
14. Pg. 63, Sec. 5.2.1 – County of Hawai’i General Plan, par. 2: The LUPAG designations for the subject property should be corrected to indicate it is approximately 50% Medium Density Urban and 50% Urban Expansion. The information provided by the Planning Department in its pre-assessment consultation comments dated July 27, 2012 was incorrect as Ordinance 89-12, amending the LUPAG designations affecting the subject property, was adopted on June 27, 2012.
15. Pg. 65, Sec. 5.2.1 – County of Hawai’i General Plan, par. 4: The statement that LUPAG designations do not generally apply to public facilities is incorrect since these designations do not regulate specific uses. LUPAG designations identify what zoning designations are appropriate in different areas of the County.

Thank you for the opportunity to comment on this DEA. Should you have questions, please feel welcome to contact Larry Brown of my staff at 961-8135 or lbrown@co.hawaii.hi.us.

Sincerely,



DUANE KANUHA
Planning Director

LMB:mad

\\Coh33\planning\public\wpwin60\Larry\EA-EIS Comments\PBR-P&R Pahoia Park Expansion EA precon.doc

Mr. Roy Takemoto

Mr. James Komata

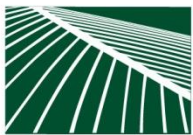
Page 4

December 5, 2013

cc: Director, Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Ms. Patti Pinto, Chair
PCDP Action Committee
P.O. Box 830
Kea'au, HI 96749

Mr. Mark Hinshaw, Chair
Pahoa Regional Town Center Plan Steering Committee
RR 2, Box 4585
Pāhoa, HI 96778



PBR HAWAII

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December 24, 2013

Mr. Duane Kanuha, Director
County of Hawai'i
Planning Department
101 Pauahi Street, Suite 3
Hilo, HI 96720

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Mr. Kanuha,

Thank you for your letter dated December 5, 2013 regarding the Pāhoā Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We greatly appreciate the detailed comments provided and will make the appropriate revisions which will be reflected in the Final EA.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

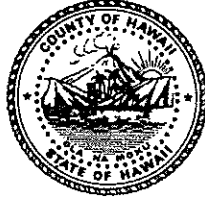
PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

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William P. Kenoi
Mayor



Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT

349 Kapi`olani Street • Hilo, Hawai`i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

November 5, 2013

PBR Hawai`i & Associates, Inc.
Attention: Mr. Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813

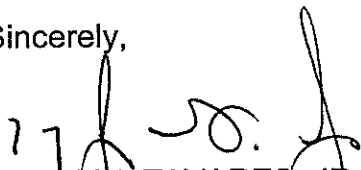
Dear Mr. Takemoto:

SUBJECT: PAHOA PARK EXPANSION MASTER PLAN

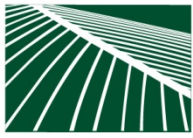
Staff has reviewed the Draft Environmental Assessment (EA) for the Pāhoa Park Expansion Master Plan. This EA is inclusive of the playground, demolishing dilapidated basketball courts, constructing a covered play court for basketball, volleyball, comfort station, and baseball field. Staff has no concerns regarding the proposal and feel that this will be a benefit to the community.

If you have any further inquiries regarding this topic, please contact Captain Samuel Jelsma at the Puna Police Station at (808) 965-2716.

Sincerely,


HENRY J. TAVARES, JR.
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

SJ:lli
120449



PBR HAWAII

& ASSOCIATES, INC.

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December 24, 2013

Mr. Henry J. Tavares, Jr.
Assistant Police Chief
County of Hawai'i
Police Department
349 Kapi'olani Street
Hilo, HI 96720-3998

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED
FINDING OF NO SIGNIFICANT IMPACT FOR THE PĀHOA
PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA,
PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Assistant Police Chief Tavares,

Thank you for your letter dated November 5, 2013 regarding the Pāhoia Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments.

We acknowledge that the Police Department staff has no concerns regarding the proposal and feel that this will be a benefit to the community.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

O:\Job29\2926.01 Pahoia Park Expansion\EA\Draft EA\Comments\Response Letters to Comments\County of Hawaii PD.docx



MALAMA O PUNA
P. O. Box 1520
Pāhoa, Hawai'i, 96778
(808) 965-2000

www.malamaopuna.org * malamaopuna@yahoo.com

Preserving Hawai'i's precious natural heritage

December 2, 2013

Roy Takemoto
PBR HAWAII
1001 Bishop St., Ste. 650
Honolulu, HI 96813-3484

RE: PAHOA PARK EXPANSION MASTER PLAN DRAFT EA - CORRECTIONS

Dear Mr. Takemoto:

After having mail^{ed} you my comment letter dated December 1, 2013, I discovered two typos which are somewhat substantive:

1. page 2, 4th line from bottom, change "expect" to "except".
2. page 3, 7th line from top, change "between and and" to "between one and".

Please correct your copy accordingly.

Also, there is some question about the lava zone designation for the park. I know that not all of Pāhoa is in zone 2, but I am unclear about the park. Please double check this to be sure.

Kala mai for my errors. Malama O Puna is strongly in favor of the park expansion, which will provide the level of service needed in the Pāhoa area. Thank you for your efforts.

Malama pono,

René Siracusa, President

cc: County Dept. of Public Works
County Dept. of Parks & Recreation



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Preserving Hawai'i's precious natural heritage

December 1, 2013

Roy Takemoto

PBR HAWAII
1001 Bishop St., Ste. 650
Honolulu, HI 96813-3484

RE: PAHOA PARK EXPANSION MASTER PLAN DRAFT EA

Dear Mr. Takemoto:

Although Malama O Puna was not sent pre-consultation information (see page 78), we did attend three town meetings on the subject of the plans for the park, and submitted input at that time. Very little of the input that we submitted, or that was submitted by other members of the public at these meetings, appears to have been incorporated in the EA. There are also a considerable number of factual errors that we feel obliged to correct. Our detailed comments follow:

2.3.2 Proposed Facilities

Facilities mentioned in the first paragraph include "swimming pool (if justifiable)". There is already an olympic size swimming pool that has been open to the public for quite a few years. There is no need to "justify" it or to build another one or even to mention it in this plan. The matter never came up at the public meetings.

- **Pedestrian and Bicycle Paths**
"Perimeter pedestrian path separated by vehicles" makes no sense. Replace "by" with "from"; and since Figure 6 does not have a separate listing item for bicycle paths, refer to #3 as "pedestrian and bicycle paths" and eliminate the separate "Perimeter bicycle path" bullet.
- **Vehicular Circulation & Parking**
There is insufficient formal parking if all the facilities are in use at the same time, such as can be expected with future population growth, especially for weekends and holiday events. Informal parking on the grass, considering the annual 200" rainfall, will turn all

the grassy areas into virtual pig wallows and result in continual maintenance costs to fix the resulting muddy ruts.

2.4 SUSTAINABLE PLANNING AND DESIGN

“minimizing paved parking and using drainage systems that promote infiltration over runoff” should include the new type of paving that allows water to percolate down.

2.6 PHASING AND ESTIMATED COSTS

Considering the amount of work needed to complete Phase 1, and the number of rain days that will preclude work, the estimate of “by the fourth quarter of 2014”, while a nice goal, is highly unrealistic.

3.2 GEOLOGY AND TOPOGRAPHY

“Mauna Loa is located approximately 40 miles east of Pahoa.” This is not true. A glance at any map will show that that is the location of the Pacific Ocean. Mauna Loa is northwest of Pahoa.

I believe that part of the project site is in lava zone 3, contrary to the statement “in a relatively high hazard volcanic zone”. Please re-check the accuracy of your statement.

4.3 ROADWAYS AND TRAFFIC

“No sidewalks...are provided within the vicinity of the site.” The exception is that there are sidewalks on Kauhale Street. This should be clarified.

“A bus stop is located along Pahoa Bypass Road (Highway 130) between Hilo, to the north, and Pohoiki to the south, “. The bus does not run along the Bypass Road; all of its stops are in Pahoa itself. The Bypass does not run between Hilo and Pohoiki - although Highway 130 does. The Bypass runs from the southern to the northern ends of Pahoa itself.

Roadways

Mention should be made that there is a proposal by the Pahoa Plan Steering Committee (a subcommittee of the Puna Community Development Plan Action Committee) to widen Post Office Road and extend it to the eastern boundary of the park, in order to provide an alternate access/egress. This is making its way through the CIP process and should be included in your discussion.

“Kauhale Street is a two-lane road linking Pahoa Village Road with Kaohe [sic] Homestead Road and provides direct access to the park site.” This is not the case. Kauhale links the Project Site with Pahoa Village Road, but neither it nor the site connect to Ka’ohe Homestead Road. “On-street parking is generally prohibited.” There is parking on both sides of Kauhale except where there are entrances and exits to parcels.

“Kaohe [sic] Homestead Road is a two-lane roadway which links Pahoa Village Road with Kauhale Street south of Pahoa Park.” Not so. The two roads do not connect. Further, Ka’ohe

Homestead Road is two-lane right by the school, but becomes a single lane just below the school ballfield, and continues as such until it crosses Cemetary Road.

“According to this study [referring to the traffic study], the intersection of Pahoia Village Road and Kauhale Street and the intersection of Pahoia Bypass and Pahoia Village Road - Kapoho Road both meet an acceptable level of service during peak hours.” Since there are two intersections where Pahoia Village Road and the Bypass meet, it is not clear which one is being discussed. The northern one is the most dangerous intersection in the County, with between and and three accidents per week. It does not meet acceptable LOS guidelines, due to the merging of highway traffic, Pahoia Village Road traffic, and shopping center traffic. This is where a roundabout was originally intended, except that State DOT has now decided to move it further south to Kahakai Boulevard. However, the intersection of the Bypass with Pahoia Villagae Road on the southern end of town does meet the acceptable standards, but no roundabout is planned there. There is a traffic light in that location.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Projected Traffic Conditions

As stated above, location of intersection studied is unclear. Also, the statement, “Because there are no approved or pending development projects in the area, “ is false. There is the Bryson Kuwahara project, which has been approved, and the Souza project which is pending before the Planning Department. It should also be noted that although the TIAR for the Kuwahara development used the annual growth rate of one percent, this figure has been hotly contested by community members who cite the US Census data showing a 24% exponential growth rate for Puna. This discrepancy should be discussed in the EA.

Internal Circulation

The EA discussion of the internal road that “will enable vehicles to cut through to the existing community pool, existing community center, and existing driveway without driving all the way around the Park” is not well thought out. There is a lot of foot traffic in these areas, including small children attending events at the community center, and turning the area into a major roadway will require considerable mitigation to make safe. Again, no mention is made of the plans to add another access/egress via the Post Office Road extension, which will take some of the traffic away from the existing access.

4.7.5 Electrical and Communications System

At the community meetings it was made very clear that no one wants to see power poles and utility lines running through the park. The community has asked for solar panels to be placed on the light poles and undergrounding of other utilities. This is not even mentioned.

4.8.2 Economy

“The future papaya production is expected to increase with the introduction of disease-resistant variety and recent irradiation and processing facilities”. This must have been taken

from some old data, because it is woefully out of date. The disease-resistant variety, genetically-modified, has caused a decrease in sales volume, price (\$4.00 +/-lb. to currently less than \$1.00/lb.) and public acceptance, and the irradiation plant proposal was shot down years ago.

"Geothermal resource utilization ... future expansion is promising" is also way out of date. Large public outcries and the mayor's agreement with the Working Group's recommendations will create many more baseline studies and hoops that will not be very promising for that industry. The statement in the EA is obviously not up-to-date on the current situation.

"The Puna Community Medical Center, [sic] provides non-emergency medical care during regular business hours." Actually they are also open on weekends and all holidays, so the statement is inaccurate.

5.1.2 Coastal Zone Management Act, Chapter 205A, Hawai'i Revised Statutes

"The Coastal Zone Management Area as defined in Chapter 205A, HRS, includes all the lands of the State. As such, the Pahoia Park lies within the Coastal Zone Management Area." This is not accurate. §205A-1 Definitions states: "Coastal zone management area" means all the lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the United States territorial sea;" Pahoia is more than eleven miles from the coast and more than 800 feet above the shoreline. It does not come under the Act. Therefore, all the EA had to do was make the statement (see page 57) that "The proposed Pahoia Park Expansion is not a coastal development, is not located on the coastline, and is not in the SMA; therefore, policies regarding shoreline resources are not applicable." Thus, pages 55 through 65 could easily have been eliminated.

5.2.2 Puna Community Development Plan

Final paragraph re Kauhale Street access is adequate has been discussed above. It would conflict with many of the current uses unless some major mitigation efforts are undertaken. These should be identified.

"Although in the lava hazard zone 2, the entire village of Pahoia is in that zone". This is inaccurate. Part of the village as well as part of the site are in lava zone 3.

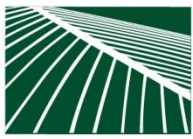
Please ensure that the corrections are incorporated in your Final EA, and that items requiring clarification and expansion are dealt with.

Mahalo,



René Siracusa, President

cc: County Dept. of Public Works
County Dept. of Parks and Recreation



PBR HAWAII

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December 24, 2013

Ms. René Siracusa, President
Malama O Puna
P.O. Box 1520
Pāhoa, HI 96778

**SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING
OF NO SIGNIFICANT IMPACT FOR THE PĀHOA PARK EXPANSION
MASTER PLAN LOCATED AT PĀHOA, PUNA, HAWAI'I
TMK: (3) 1-5-002:020**

Dear Ms. Siracusa,

Thank you for your letters dated December 1 and 2, 2013 regarding the Pāhoa Park Expansion Master Plan. As the planning consultant for the County of Hawai'i Department of Parks and Recreation, we are responding to your comments as follows:

- **Proposed Facilities.** The reference to “swimming pool (if justifiable)” is a verbatim quote of the District Park standard in the General Plan. This standard applies to the Project. The Final EA (FEA) incorporates your suggested clarification of the pedestrian and bike paths. The grassed overflow parking will be designed to withstand the rainy conditions.
- **Sustainable Planning and Design.** Unfortunately, porous paving is still not cost-effective. Hence, paving will be minimized to meet typical needs and overflow parking would be grassed in a manner to withstand rainy conditions.
- **Phasing and Estimated Costs.** The FEA will revise the start of Phase 1 construction as 2nd quarter 2014 with completion in approximately 12-14 months.
- **Geology and Topography.** The FEA will correct the mistake relating to Mauna Loa. The lava hazard zone is Zone 2.
- **Roadways and Traffic.** The FEA and appended Traffic Impact Assessment Report will correct the description of existing conditions for roadways and transit, clarify the referenced intersections where past studies were conducted, address the proposed Kuwahara project in the project traffic conditions, and address pedestrian traffic safety within the park.
- **Electrical and Communications System.** Solar-powered lighting was investigated but the solar panels and field light come from different manufacturers and neither would warrant the combined assembly. Utilities will be underground.
- **Economy.** The FEA will update the information.
- **Coastal Zone Management Act.** The definition you cited in Hawaii Revised Statutes §205A-1 does say *all* lands in the State are within the Coastal Zone Management Area (“CZM Area”). The CZM Area is different from the Special Management Area (“SMA”), which is a defined area along the coastline. The CZM permit regulations apply to the SMA, but the CZM policies apply to the entire CZM Area, i.e., all lands within the State; hence, the need to address the CZM policies in the EA.
- **Significance Criteria.** In discussing the significance criteria, the EA stated that the entire Pāhoa Village is in lava hazard zone 2. If Pāhoa Village is defined by one end to the other end of Pāhoa Village Road, then the GIS data shows the entire Village in zone 2.

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René Siracusa, President, Malama O Puna

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT/ANTICIPATED FINDING OF NO SIGNIFICANT
IMPACT FOR THE PĀHOA PARK EXPANSION MASTER PLAN LOCATED AT PĀHOA, PUNA,
HAWAI'I, TMK: (3) 1-5-002:020

December 24, 2013

Page 2 of 2

We acknowledge your statement that: "Malama O Puna is strongly in favor of the park expansion, which will provide the level of service needed in the Pahoia area." I'm sure the County is appreciative of your support.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

A handwritten signature in black ink, appearing to read "Roy Takemoto". The signature is fluid and cursive, written in a professional style.

Roy Takemoto
Managing Director – Hilo

cc: County of Hawai'i Department of Parks and Recreation

Appendix **B**

FLORA AND FAUNA SURVEY

FLORA AND FAUNA SURVEY AND ASSESSMENT

for the

PAHOA REGIONAL PARK EXPANSION

PAHOA, PUNA, HAWAII

by

**ROBERT W. HOB DY
ENVIRONMENTAL CONSULTANT
Kokomo, Maui
August 2012**

**Prepared for:
PBR HAWAII**

**FLORA AND FAUNA SURVEY AND ASSESSMENT
PAHOA REGIONAL PARK EXPANSION, PAHOA, HAWAII COUNTY**

INTRODUCTION

The Pahoia Regional Park Expansion Project lies on a 71.121 acre parcel of partially developed land (TMK (3) 1-5-02:020) in the town of Pahoia in Puna District, Hawaii (see Figure 1). This parcel abuts Pahoia Town on its north and east sides and is flanked by undeveloped pastures and forest on its south and west sides. This study was initiated by Hawaii County in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

The eastern quarter of this 71 acre parcel is currently developed with park and community facilities including an aquatic center, ball fields, a basketball court, a skate park, a Community Center and a Senior Center. The rest of the parcel consists of forested grasslands. The terrain is gently sloping with no discernible ridges or gulches but with occasional lava outcrops. Soils are soft and loamy and are often damp to wet. Rainfall averages 150 to 160 inches per year with an even distribution throughout the year (Armstrong, 1983). Elevations range between 660 feet and 700 feet above sea level.

BIOLOGICAL HISTORY

The gentle slopes of lower Puna were once clothed in a dense native forest of 'ōhi'a (*Metrosideros polymorpha*) trees, uluhe (*Dicranopteris linearis*) fern, 'ie'ie (*Freycinetia arborea*) vines and a great variety of other native species.

Hawaiian communities were scattered throughout this area where the soil was deep enough for farming, and forest products were harvested for timbers, medicines, fibers and weapons. Their activities had a moderate effect on the environment, but the forests remained largely intact.

The area around Pahoia where soils were deeper were developed for sugar cane agriculture in the early 1900s. Pahoia became a plantation community. As the sugar era came to a close during the late 1980s land uses converted to ranching and small-scale diverse agriculture. Extensive subdivision communities have sprung up in the Puna area leading to a substantial population increase. All of these changes have resulted in a shift in the biological landscape. Introduced timber trees, ornamental plants, pasture grasses and many weed species have proliferated, replaced native plants, and now dominate the area. The resulting forests and pastures, including the project area, are largely made up of non-native species with only a few native 'ōhi'a trees and ferns species remaining.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the Pahoa Regional Park Expansion project which was conducted on July 24 – 27, 2012. The objectives of the survey were to:

1. Document what plant, and animal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used following routes to ensure that all parts of this large property were covered. Areas most likely to harbor native or rare plants such as the rocky outcrops and gullies were more intensively examined. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The vegetation on the property is dominated by non-native species that have grown into grasslands and forests on the former sugar cane lands. The most abundant species is the large grass, stalk leaved muraina grass (*Ischaemum timorense*), which covers most of the area. Also common are: Asian sword fern (*Nephrolepis brownii*), rabbit's foot fern (*Phlebodium aureum*), (*Christella parasitica*) no common name, a sedge (*Cyperus polystachyos*), gunpowder tree (*Trema orientalis*), autograph tree (*Clusia rosea*), parasol leaf tree (*Macaranga tanarius*), Greenleaf ticktrefoil (*Desmodium intortum*), albizia (*Falcataria moluccana*), melastoma (*Melastoma candida*), Chinese banyan (*Ficus microcarpa*), Strawberry guava (*Psidium cattleianum*) and cecropia (*Cecropia obtusifolia*).

A total of 184 plant species were recorded across the property during five site visits. Of these 15 species were native to Hawaii:

<u>Endemic to Hawaii only</u>	<u>Indigenous in Hawaii and elsewhere</u>
Loulu palm (<i>Pritchardia beccariana</i>)	pākahakaha (<i>Lepisorus thunbergianus</i>)
'ohe (<i>Tetraplasandra hawaiiensis</i>)	'ōkupukupu (<i>Nephrolepis exaltata</i>)
koa (<i>Acacia koa</i>)	uluhe (<i>Dicranopteris linearis</i>)
'ōhi'a (<i>Metrosideros polymorpha</i>)	(<i>Crepidomanes minutum</i>) no common name
koki'o 'ula (<i>Hibiscus kokio</i>)	(<i>Cyperus polystachyos</i>) no common name
māmane (<i>Sophora chrysophylla</i>)	(<i>Fimbristylis dichotoma</i>) no common name
papala kepau (<i>Pisonia brunoniana</i>)	naio (<i>Myoporum sanwicense</i>)
hō'awa (<i>Pittosporum glabrum</i>)	

All of the above 8 endemic species plus the indigenous naio were found planted in the landscape around the developed facilities. The only native species found growing wild in the undeveloped portion of the property were the 'ōhi'a, pākahakaha, ōkupukupu, uluhe, *Crepidomanes minutum*, *Cyperus polystachyos* and *Fimbristylis dichotoma*.

Five plant species were of Polynesian origin: niu or cocnut (*Cocos nucifera*), ki or ti (*Cordyline fruticosa*), awapuhi (*Zingiber zerumbet*), wauke (*Broussonetia papyrifera*) and kukui (*Aleurites moluccana*). The remaining 164 plant species were non-native plants that are of no particular conservation interest or concern.

DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the project area is dominated by non-native grasses, vines, ferns, shrubs and trees. The area has been heavily altered by historical land uses and continues to be invaded by aggressive weed species. All of the 15 native species are widespread in Hawaii.

No Federally listed Threatened or Endangered plant species (USFWS, 2009) were found on the property, nor were any found that are candidates for such status. No special native habitats were found here either.

Because of the above existing conditions, it is determined that the future expansion of park facilities on this 71 acre parcel will not have a significant negative impact on the botanical resources in this part of Hawaii island. No recommendations regarding the botanical resources are deemed appropriate or necessary.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within four groups: Conifers, Ferns, Monocots and Dicots. Taxonomy and nomenclature of the ferns follow Palmer (2003), while the Conifers, Monocots and Dicots are in accordance with Wagner et al. (1999) and Staples and Herbst (2005).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

Polynesian = all those plants brought to Hawaii during the course of Polynesian migrations.

non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

abundant = forming a major part of the vegetation within the project area.

common = widely scattered throughout the area or locally abundant within a portion of it.

uncommon = scattered sparsely throughout the area or occurring in a few small patches.

rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
FERNS			
ATHYRIACEAE (Lady Fern Family)			
<i>Diplazium esculentum</i> (Retz.) Sw.	paca	non-native	uncommon
GLEICHENIACEAE (False Staghorn Fern Family)			
<i>Dicranopteris linearis</i> (Burm.f.) Underw.	uluhe	indigenous	rare
HYMENOPHYLLACEAE (Filmy Fern Family)			
<i>Crepidomanes minutum</i> (Blume) K. Iwatsuki	-----	indigenous	rare
NEPHROLEPIDACEAE (Sword Fern Family)			
<i>Nephrolepis brownii</i> (Desv.) Hovencamp & Miyamoto	Asian sword fern	non-native	common
<i>Nephrolepis exaltata</i> (L.) Schott	'ōkupukupu	indigenous	uncommon
POLYPODIACEAE (Polypody Fern Family)			
<i>Lepisorus thunbergianus</i> (Kaulf.) Ching	pākahakaha	indigenous	uncommon
<i>Phlebodium aureum</i> (L.) J. Sm.	rabbits foot fern	non-native	common
<i>Phymatosorus grossus</i> (Langsd. & Fisch.) Brownlie	laua'e	non-native	uncommon
PTERIDACEAE (Brake Fern Family)			
<i>Pityrogramma calomelanos</i> (L.) Link	silver fern	non-native	rare
THELYPTERIDACEAE (Marsh Fern Family)			
<i>Christella dentata</i> (Forssk.) Brownlie & Jermy	-----	non-native	rare
<i>Christella parasitica</i> (L.) H. Lev.	-----	non-native	common
CONIFERS			
ARAUCARIACEAE (Araucaria Family)			
<i>Araucaria columnaris</i> (G.Forster) J.D. Hooker	Cook pine	non-native	rare
MONOCOTS			
ARACEAE (Aroid Family)			
<i>Epipremnum pinnatum</i> (L.) Engl.	taro vine	non-native	rare
<i>Philodendron pinnatifidum</i> (Jacq.) Schott	-----	non-native	rare
<i>Xanthosoma roseum</i> Schott	'ape	non-native	rare
ARECACEAE (Palm Family)			
<i>Archontophoenix alexandrae</i> (v. Muell.) Wendl. & Drude	king palm	non-native	uncommon
<i>Caryota mitis</i> Loureiro	clumping fishtail palm	non-native	rare
<i>Cocos nucifera</i> L.	niu, coconut	Polynesian	rare
<i>Pritchardia beccariana</i> Rock	loulu	endemic	rare
<i>Pritchardia thurstoni</i> F. Mueller & Drude	Lau Islands palm	non-native	rare
<i>Roystonea regia</i> (Kunth) O.F. Cook	royal palm	non-native	rare
<i>Syagrus romanzoffiana</i> (Chamisso) Glassman	monkey nut palm	non-native	rare
<i>Veitchia merrillii</i> (Becc.) H.E. Moore	Manila palm	non-native	rare
ASPARAGACEAE (Asparagus Family)			
<i>Cordyline fruticosa</i> (L.) A. Chev.	ki, ti	Polynesian	rare
COMMELINACEAE (Spiderwort Family)			
<i>Commelina diffusa</i> N.L. Burm.	honohono	non-native	rare
CYPERACEAE (Sedge Family)			
<i>Cyperus difformis</i> L.	-----	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Cyperus haspan</i> L.	-----	non-native	uncommon
<i>Cyperus polystachyos</i> Rottb.	-----	indigenous	common
<i>Fimbristylis dichotoma</i> (L.) Vahl.	-----	indigenous	rare
<i>Kyllinga brevifolia</i> Rottb.	<i>kili'o'opu</i>	non-native	uncommon
<i>Kyllinga nemoralis</i> (Forster & Forster) Dandy ex Hutchinson&Dalziel	<i>kili'o'opu</i>	non-native	uncommon
HELICONACEAE (Heliconia Family)			
<i>Heliconia</i> sp.	-----	non-native	rare
MUSACEAE (Banana Family)			
<i>Musa acuminata x balbisiana</i>	banana	non-native	rare
ORCHIDACEAE (Orchid Family)			
<i>Arundina graminifolia</i> (D.Don) Hochr.	bamboo orchid	non-native	uncommon
<i>Epidendrum x obrienianum</i> Rolfe	butterfly orchid	non-native	rare
<i>Phaius tankarvilliae</i> (Banks ex L'Her.) Blume	ground orchid	non-native	rare
POACEAE (Grass Family)			
<i>Andropogon virginicus</i> L.	broomsedge	non-native	rare
<i>Axonopus compressus</i> (Sw.) P. Beauv.	broad-leaved carpet grass	non-native	uncommon
<i>Axonopus fissifolius</i> (Raddi) Kuhlman	narrow-leaved carpetgrass	non-native	uncommon
<i>Cenchrus purpureus</i> (Schumach.) Morrone	Napier grass	non-native	uncommon
<i>Coix lacryma-jobi</i> L.	Job's tears	non-native	rare
<i>Digitaria ciliaris</i> (Retz.) Koeler	Henry's crab grass	non-native	rare
<i>Digitaria violascens</i> Link	<i>kukae pua'a</i>	non-native	rare
<i>Eleusine indica</i> (L.) Gaertn.	wiregrass	non-native	rare
<i>Eremochloa ophiuroides</i> (Munro) Hackel	centipede grass	non-native	rare
<i>Eragrostis unioloides</i> (Rtez.) Nees ex Steud	Chinese love grass	non-native	rare
<i>Ischaemum timorense</i> Kunth	stalked muraina grass	non-native	abundant
<i>Megathyrsus maximus</i> (Jacq.) Simon & Jacobs	Guinea grass	non-native	uncommon
<i>Oplismenus hirtellus</i> (L.) P. Beauv.	bamboo grass	non-native	rare
<i>Panicum repens</i> L.	torpedo grass	non-native	uncommon
<i>Paspalum conjugatum</i> Bergius	Hilo grass	non-native	uncommon
<i>Paspalum paniculatum</i> L.	arrocillo	non-native	rare
<i>Paspalum urvillei</i> Steud.	Vasey grass	non-native	uncommon
<i>Sacciolepis indica</i> (L.) Chase	Glenwood grass	non-native	uncommon
<i>Schizachyrium condensatum</i> (Kunth) Nees	bushy beardgrass	non-native	rare
<i>Setaria palmifolia</i> (J. Kong) Stapf	palm grass	non-native	uncommon
<i>Setaria parviflora</i> (Poir.) Kerguelen	yellow foxtail	non-native	rare
<i>Sporobolus indicus</i> (L.) R.Br.	West Indian dropseed	non-native	rare
ZINGIBERACEAE (Ginger Family)			
<i>Hedychium coronarium</i> J. Konig	white ginger	non-native	rare
<i>Zingiber zerumbet</i> (L.) Sm.	'awapuhi	Polynesian	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
DICOTS			
ANACARDIACEAE (Mango Family)			
<i>Mangifera indica</i> L.	mango	non-native	rare
ARALIACEAE (Ginseng Family)			
<i>Tetraplasandra hawaiiensis</i> A. Gray	'ohe	endemic	rare
ASTERACEAE (Sunflower Family)			
<i>Ageratum conyzoides</i> L.	<i>maile hohono</i>	non-native	uncommon
<i>Ageratum houstonianum</i> Mill.	<i>maile hohono</i>	non-native	rare
<i>Conyza canadensis</i> (L.) Cronq.	horseweed	non-native	uncommon
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	redflowered ragweed	non-native	uncommon
<i>Emilia sonchifolia</i> (L.) DC.	violet pualele	non-native	rare
<i>Erechtites valerianifolia</i> (Wolf) DC.	fireweed	non-native	uncommon
<i>Galinsoga parviflora</i> cav.	blanket flower	non-native	rare
<i>Sphagneticola trilobata</i> (L.) Pruski	wedelia	non-native	rare
<i>Youngia japonica</i> (L.) DC.	Oriental hawkweed	non-native	rare
BEGONIACEAE (Begonia Family)			
<i>Begonia hirtella</i> Link	Brazilian-begonia	non-native	rare
BIGNONIACEAE (Bignonia Family)			
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	non-native	rare
<i>Tabebuia chrysotricha</i> (DC.) Standly	yellow trumpet tree	non-native	rare
CANNABACEAE (Hemp Family)			
<i>Trema orientalis</i> (L.) Blume	gunpowder tree	non-native	common
CARYOPHYLLACEAE (Pink Family)			
<i>Drymaria cordata</i> (L.) Willd ex Roem. Schult.	<i>pilipili</i>	non-native	rare
CLUSIACEAE (Mangosteen Family)			
<i>Clusia rosea</i> Jacq.	autograph tree	non-native	common
CUCURBITACEAE (Gourd Family)			
<i>Momordica charantia</i> L.	bitter melon	non-native	rare
EUPHORBIACEAE (Spurge Family)			
<i>Aleurites moluccana</i> (L.) Willd.	kukui	Polynesian	rare
<i>Euphorbia hirta</i> L.	hairy spurge	non-native	rare
<i>Euphorbia hypericifolia</i> L.	graceful spurge	non-native	rare
<i>Euphorbia prostrata</i> Aiton	prostrate spurge	non-native	rare
<i>Euphorbia thymifolia</i> L.	thyme-leaved spurge	non-native	rare
<i>Macaranga tanarius</i> Mull. Arg.	parasol leaf tree	non-native	common
<i>Phyllanthus debilis</i> Klein ex Willd.	niruri	non-native	rare
FABACEAE (Pea Family)			
<i>Acacia koa</i> A. Gray	<i>koa</i>	endemic	rare
<i>Bauhinia x blakeana</i> Dunn	Hong Kong orchid tree	non-native	rare
<i>Cassia x nealiae</i> H.S. Irwin & Barneby	rainbow shower tree	non-native	rare
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	non-native	rare
<i>Crotalaria micans</i> Link	rattlepod	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Desmodium cajanifolium</i> (Kunth) DC.	tropical tick trefoil	non-native	rare
<i>Desmodim incanum</i> DC.	Spanish clover	non-native	rare
<i>Desmodium intortum</i> (Mill.) Urb.	greenleaf ticktrefoil	non-native	common
<i>Desmodium triflorum</i>	three-flowered beggarweed	non-native	uncommon
<i>Falcataria moluccana</i> (Mig.) Barneby & Grimes	albizia	non-native	common
<i>Mimosa pudica</i> L.	<i>hilahila</i>	non-native	rare
<i>Sophora chrysophylla</i> (Salisb.) Seem.	<i>māmane</i>	endemic	rare
HYPERICACEAE (Hypericum Family)			
<i>Hypericum mutilum</i> L.	dwarf St. Johnswort	non-native	rare
LAURACEAE (Laurel Family)			
<i>Persea americana</i> Mill.	avocado	non-native	rare
LENTIBULARIACEAE (Bladderwort Family)			
<i>Utricularia gibba</i> L.	bladderwort	non-native	rare
LYTHRACEAE (Loosestrife Family)			
<i>Cuphea carthagenensis</i> (Jacq.) Macbr.	tarweed	non-native	rare
MALVACEAE (Mallow Family)			
<i>Hibiscus kokio</i> Hillebr.	<i>koki'o 'ula</i>	endemic	rare
<i>Malvaviscus penduliflorus</i> DC.	turk's cap	non-native	rare
<i>Sida rhombifolia</i> L.	Cuban jute	non-native	rare
MELASTOMATACEAE (Melastoma Family)			
<i>Clidemia hirta</i> (L.) D. Don	Koster's curse	non-native	rare
<i>Dissotis rotundifolia</i> (Sm.) Triana	dissotis	non-native	rare
<i>Melastoma candidum</i> D. Don	melastoma	non-native	common
<i>Miconia calvescens</i> DC.	miconia	non-native	rare
<i>Pterolepis glomerata</i> (Rottb.) Mig.	false meadowbeauty	non-native	rare
MELIACEAE (Mahogany Family)			
<i>Toona ciliata</i> M. Roem.	Australian red cedar	non-native	rare
MORACEAE (Mulberry Family)			
<i>Broussonetia papyrifera</i> (L.) Venten.	<i>wauke</i>	Polynesian	rare
<i>Ficus microcarpa</i> L. fil.	Chinese banyan	non-native	common
MYOPORACEAE (Myoporum Family)			
<i>Myoporum sandwicense</i> A. Gray	<i>naio</i>	indigenous	rare
MYRTACEAE (Myrtle Family)			
<i>Callistemon citrinus</i> (Curtis) Skeels	red bottlebrush	non-native	rare
<i>Callistemon viminalis</i> (Gaertnen) Loudon	weeping bottlebrush	non-native	rare
<i>Metrosideros polymorpha</i> Gaud.	<i>'ōhi'a</i>	endemic	uncommon
<i>Psidium cattleianum</i> Sabine	strawberry guava	non-native	common
<i>Psidium guajava</i> L.	common guava	non-native	uncommon
NYCTAGINACEAE (Four-o'clock Family)			
<i>Pisonia brunoniana</i> Endl.	pāpala kepau	indigenous	rare
OLEACEAE (Olive Family)			
<i>Fraxinus uhdei</i> (Wenzig) Lingelsh.	tropical ash	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
OROBANCHACEAE (Broomrape Family)			
<i>Castilleja arvensis</i> Cham. & Schlecht.	indian paint brush	non-native	rare
OXALIDACEAE (Wood Sorrel Family)			
<i>Oxalis corniculata</i> L.	yellow wood sorrel	indigenous	rare
PASSIFLORACEAE (Passion Flower Family)			
<i>Passiflora edulis</i>	passion fruit	non-native	rare
PITTOSPORACEAE (Pittosporum Family)			
<i>Pittosporum glabrum</i> Hook. & Arn.	<i>hō'awa</i>	endemic	rare
PLANTAGINACEAE (Plantain Family)			
<i>Lindernia crustacea</i> (L.) F.v. Muell.	<i>false pinpernel</i>	non-native	uncommon
<i>Plantago major</i> L.	broad-leaved plantain	non-native	uncommon
<i>Torenia asiatica</i> L.	<i>ola'a beauty</i>	non-native	uncommon
POLYGALACEAE (Milkwort Family)			
<i>Polygala paniculata</i> L.	<i>polygala</i>	non-native	uncommon
ROSACEAE (Rose Family)			
<i>Rubus rosifolius</i> Sm.	thimbleberry	non-native	uncommon
RUBIACEAE (Coffee Family)			
<i>Paederia foetida</i> L.	<i>maile pilau</i>	non-native	common
SCROPHULARIACEAE (Figwort Family)			
<i>Buddleia asiatica</i> Lour.	<i>huelo 'ilio</i>	non-native	uncommon
URITACEAE (Nettle Family)			
<i>Cecropia obtusifolia</i> Bertol.	cecropia, guarumo	non-native	common
VERBENACEAE (Verbena Family)			
<i>Citharexylum spinosum</i> L.	fiddlewood	non-native	rare
<i>Stachytarpheta australis</i> Moldenke	ōwī	non-native	rare
<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Jamaica vervain	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through fauna survey method was conducted in conjunction with the botanical survey. All parts of the project area including all habitat types were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area.

RESULTS

MAMMALS

Two mammals were seen and signs of five additional mammals were observed during five site visits to the property. Taxonomy and nomenclature follow Tomich (1986). These included mongoose (*Herpestes auro punctatus*), domestic cat (*Felis catus*), feral pig (*Sus scrofa*), domestic dog (*Canis familiaris*), cattle (*Bos Taurus*), horse (*Equus caballus*) and the 'ōpe'ape'a or Hawaiian hoary bat (*Lasiurus cinereus semotus*). Not seen, but to be expected were mice (*Mus domesticus*) and rats (*Rattus* spp.). Only the feral pigs were common. Their rooting and diggings were everywhere, even on the park ballfields. All the other mammals were of uncommon to rare occurrence.

A special effort was made to look for any occurrence of the native Hawaiian hoary bat by making an evening survey on the property. When present in an area these bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. In addition a bat detection device (Batbox IIID) was employed set to the frequency of 27,000 hertz which is used by these bats for echolocation. No bats were seen at twilight, but two bats were detected later with the Batbox in the area to the west of the ballfield.

BIRDS

Birdlife was moderate in both diversity and in numbers on this property. Eight non-native species were observed during five site visits. Taxonomy and nomenclature follow American Ornithologists' Union (2011). Five bird species were common throughout the property: common myna (*Acridotheres tristis*), zebra dove (*Geopelia striata*), northern cardinal (*Cardinalis cardinalis*), nutmeg manikin (*Lonchura punctulata*) and hwamei (*Leucodioptron canorum*).

Two native birds, the endemic and Endangered 'io or Hawaiian hawk (*Buteo solitarius*) and the endemic pueo or Hawaiian owl (*Asio flammeus sandwichensis*), are known to frequent wet windward forests on the Big Island where they prey on rodents and birds. These two birds were looked for but not seen during the survey.

Had the survey been extended, no doubt a few other non-native birds would have been seen, but the habitat is largely unsuitable for Hawaii's native forest birds which presently occupy forested uplands beyond the elevational range of mosquitoes and the avian diseases they carry and transmit.

None of the endemic and Endangered nēnē or Hawaiian goose were seen during the survey. Also no ae'o or Hawaiian stilts were seen on the property. Distance from the coast and the lack of preferred habitat make use of the project area by ae'o unlikely.

INSECTS

There were moderate amounts of insect life on this property mostly observed in the undeveloped grasslands and forests. Twelve insect species were found during five site visits. Taxonomy and nomenclature follow Nishida et al (1992). Two of these species were of common occurrence, the Asian tiger mosquito (*Aedes albopictus*) and the small rice grasshopper (*Oxya japonica*). One species was native in Hawaii, as well as in the tropics worldwide, the dragonfly known as the globe skimmer (*Pantala flavescens*).

No Endangered insects were observed during the survey. None of the host plants of Blackburn's sphinx moth (*Manduca blackburni*) were found on the property and none of the moths or their larvae were seen. None of the three Endangered Big Island fruit flies, *Drosophila heteroneura*, *D. mulli* or *D. Ochrobasis* (or any other *Drosophila* species) were seen. The three Endangered species are known from good native forests at much higher elevations in other parts of the Big Island. No Hawaiian damselflies were seen during the survey. Two Big Island species, *megalagrion nesiotes* and *M. Xanthomelas* are Endangered. This property lacks the aquatic habitat suitable for these damselflies.

AMPHIBIANS

Just one non-native amphibian was found during the survey, the Puerto Rican coqui frog (*Eleutherodactylus coqui*). This frog was found to be abundant across the entire property, and indeed has become abundant across the entire wet windward side of the Big Island. It is considered to be a pest because of its extremely loud nocturnal calls.

REPTILES

Just one non-native reptile, the Jackson's chameleon (*Trioceros Jacksonii*) was found during the survey. This chameleon, which has been spread around by humans, has now spread into the wild in a variety of habitats.

DISCUSSION AND RECOMMENDATIONS

The fauna of this property are largely made up of non-native species that have been either purposeful or accidental introductions to Hawaii. Just two species were found to be native, the Endangered 'ōpe'ape'a or Hawaiian bat and the indigenous globe skimmer dragonfly.

The globe skimmer, as previously discussed, is found throughout the tropics worldwide and is common in Hawaii. It is therefore of no heightened conservation concern.

The 'ōpe'ape'a, however, is endemic to the Hawaiian Islands and is an Endangered species as well, carrying with it federal protections wherever it goes. It occurs on at least five of the major Hawaiian islands and has its largest population on Hawaii Island. These bats are highly mobile and are known to move up and down slopes, from about 10,000 feet in the subalpine zone down to sea level. Movements are likely driven by food source availability. They can show up almost anywhere in a wide range of habitats.

On this property at least two 'ōpe'ape'a were detected during the evening survey west of the ballfield during the month of July. What the entire population here is, and how it may vary during the year is unknown.

The U.S. Fish and Wildlife Service has jurisdiction over these bats under powers outlined in the Endangered Species Act (1973). They should be consulted before any construction and development occurs on park expansion. They will determine what actions should be taken that will ensure the welfare of the 'ōpe'ape'a.

No other recommendations are offered regarding the fauna resources on the Pahoia Regional Park Expansion Project.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within five groups: Mammals, Birds, Insects, Amphibians and Reptiles.. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:
 - endemic = native only to Hawaii; not naturally occurring anywhere else in the world.
 - indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).
 - non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.
 - migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.
4. Abundance of each species within the project area:
 - abundant = many flocks or individuals seen throughout the area at all times of day.
 - common = a few flocks or well scattered individuals throughout the area.
 - uncommon = only one flock or several individuals seen within the project area.
 - rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
<i>Sus scrofa</i> L.	pig	non-native	common
<i>Bos taurus</i> L.	cattle	non-native	uncommon
<i>Equus caballus</i> L.	horse	non-native	uncommon
<i>Felis catus</i> L.	domestic cat	non-native	uncommon
<i>Canis familiaris</i> L.	domestic dog	non-native	rare
<i>Lasiurus cinereus semotus</i> H.Allen	Hawaiian hoary bat	endemic	rare
BIRDS			
<i>Acridotheres tristis</i> L.	common myna	non-native	common
<i>Geopelia striata</i> L.	zebra dove	non-native	common
<i>Leucodioptron canorum</i> L.	hwamei	non-native	common
<i>Cardinalis cardinalis</i> L.	northern cardinal	non-native	common
<i>Lonchura punctulata</i> L.	nutmeg mannikin	non-native	common
<i>Zosterops japonicus</i> Temminck & Schlegel	Japanese white-eye	non-native	uncommon
<i>Streptopelia chinensis</i> Scopoli	spotted dove	non-native	uncommon
<i>Passer domesticus</i> L.	house sparrow	non-native	rare
REPTILES			
<i>Trioceras jacksonii</i> Boulenger	Jackson's chameleon	non-native	common
AMPHIBIANS			
<i>Eleutherodactylus coqui</i> Dumeril & Bibron	coqui frog	non-native	abundant

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
INSECTS			
CALLIPHORIDAE (Blow Fly Family)			
<i>Calliphora vomitoria</i> L.	blow fly	non-native	uncommon
CULICIDAE (Mosquito Family)			
<i>Aedes albopictus</i> Skuse	Asian tiger mosquito	non-native	common
MUSCIDAE (House Fly Family)			
<i>Musca sorbens</i> Wiedemann	dung fly	non-native	uncommon
TACHINIDAE (Tachinid Fly Family)			
<i>Lespesia archippivora</i> Riley	tachinid fly	non-native	rare
Order HEMIPTERA - true bugs			
CICADELLIDAE (Plant Hopper Family)			
<i>Draeculacephala minerva</i> Ball	grass sharpshooter	non-native	uncommon
Order HYMENOPTERA - wasps, bees and ants			
APIDAE (Honeybee Family)			
<i>Xylocopa sonorina</i> Smith	Sonoran carpenter bee	non-native	rare
VESPIDAE (Vespid Wasp Family)			
<i>Polistes aurifer</i> Saussure	golden paper wasp	non-native	uncommon
Order LEPIDOPTERA - butterflies & moths			
LYCAENIDAE (Gossamer-winged Butterfly Family)			
<i>Lampides boeticus</i> L.	long tail blue butterfly	non-native	uncommon
PIERIDAE (White and Sulphur Butterfly Family)			
<i>Pieris rapae</i> L.	cabbage butterfly	non-native	uncommon
Order ODONATA - dragonflies & damselflies			
LIBELLULIDAE (Skimmer Dragonfly Family)			
<i>Pantala flavescens</i> Fabricius	globe skimmer	indigenous	rare
Order ORTHOPTERA - grasshoppers & crickets			
ACRIDIDAE (Grasshopper Family)			
<i>Oxya japonica</i> Thunberg	small rice grasshopper	non-native	common
TETTIGONIIDAE (Katydid Family)			
<i>Elimaea punctifera</i> Walker	narrow-winged katydid	non-native	uncommon

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Appendix **C**

ARCHEOLOGICAL INVENTORY SURVEY

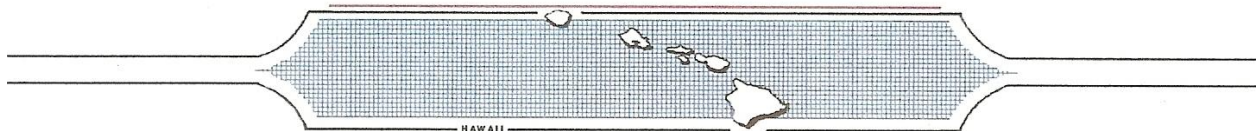
**ARCHAEOLOGICAL INVENTORY SURVEY REPORT FOR
THE 71.121-ACRE PĀHOA PARK EXPANSION PARCEL IN
WAIAKAHIULA 2 AHUPUA‘A, PUNA DISTRICT,
HAWAI‘I ISLAND, HAWAI‘I
[TMK: (3) 1-5-002:020]**

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September 2013
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INTRODUCTION

PROJECT AREA DESCRIPTION

At the request of PBR Hawai'i, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey of a 71.121-acre parcel located in Pāhoa, Waiakahiula 2 Ahupua'a, Puna District, Island of Hawai'i [TMK: (3) 1-5-010:002] (Figures 1 through 3). The project area parcel is owned by the County of Hawai'i and the existing Pāhoa Park is located in the northeast corner of the parcel. The undeveloped remainder of the parcel is being considered for the proposed Pāhoa Park Expansion project. The project area parcel is bounded to the north by Kea'au-Pāhoa Road and residential property, is bounded to the east by businesses and residential property, and is surrounded on all other sides by undeveloped land. The undeveloped land within the project area and surrounding it were formerly used to cultivate sugarcane.

SCOPE OF WORK

The Archaeological Inventory Survey was undertaken in accordance with Hawai'i Administrative Rules 13§13-284 and 13§13-275, and was performed in compliance with the Rules Governing Standards for Archaeological Inventory Surveys and Reports contained in Hawai'i Administrative Rules 13§13-276.

METHODS

The archaeological inventory survey was undertaken in accordance with Hawai'i Administrative Rules 13§13-284 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports contained in Hawai'i Administrative Rules 13§13-276. SCS conducted historical and archaeological archival research including a search of historic maps, aerial photos, written records, Land Commission Award documents, and State and County Planning and Tax Records documents. informants.

Three hundred and thirty hours of AIS fieldwork was conducted between July 2012 and December, 2012 by Glenn Escott, M.A.; Suzan Keris, B.A.; Jahnkotta Burrell Lewis, B.A.; and Chris Aruda, B.A.. Glenn Escott served as the Principal Investigator. There were three field components to the inventory survey fieldwork: a pedestrian survey of the entire project area, plotting located sites on a project area map with Global Position System (GPS) Universal Transverse Mercator (UTM) units (Zone 5 North) using

WSGS84 datum; mapping, photographing, and documenting features; and subsurface testing.

The project area was surveyed by walking east-west transects spaced ten meters apart. The transects were walked to view the entire property and a short distance beyond the boundaries of the project area property. Ground visibility was good in most areas, except in old cane fields where the grass was tall and thick.

All of the features identified during the current AIS study were rock mounds. The mounds are similar to those recorded in archaeological studies at many former sugarcane fields in the Hilo area (Borthwick et al. 1993, Hunt and McDermott 1994, Haun 2002, Escott 2004). The project area rock mounds are similar to documented sugarcane field rock clearing mounds in shape, size, distribution, and construction method.

Site boundaries were defined in the field and by studying feature distribution based on GIS data. All of the rock clearing mounds are within sugarcane fields once owned by the 'Ōla'a Sugar Company. Technically, the mounds could all be grouped together into one site. However, there are clusters of features with large areas of space between them. In fact, the southeast quadrant of the project area has very few archaeological features. The features were grouped together into sites in order to better describe them to the reader.

Thirteen stratigraphic trenches (ST) were excavated through surface and subsurface feature architecture to examine stratigraphy, to investigate feature construction, and to determine the base of architecture depth. They were also excavated to assess the presence or absence of cultural deposits, and to determine feature functional and temporal associations. ST excavation summaries in this report document the number of layers and the depth at base of excavation for all stratigraphic trenches. Soil colors were recorded using Munsell color charts, and soil composition was recorded with the aid of the U.S. Department of Agriculture Soil Survey Manual. Profiles were drawn for all stratigraphic trenches. The excavated matrix was not screened though artifacts observed during excavation were recorded and collected. No cultural material was identified in any of the stratigraphic trenches. Pre- and post-excavation photographs were taken of stratigraphic trenches.



Figure 1: Project Area Location on Hawai'i Island Map.

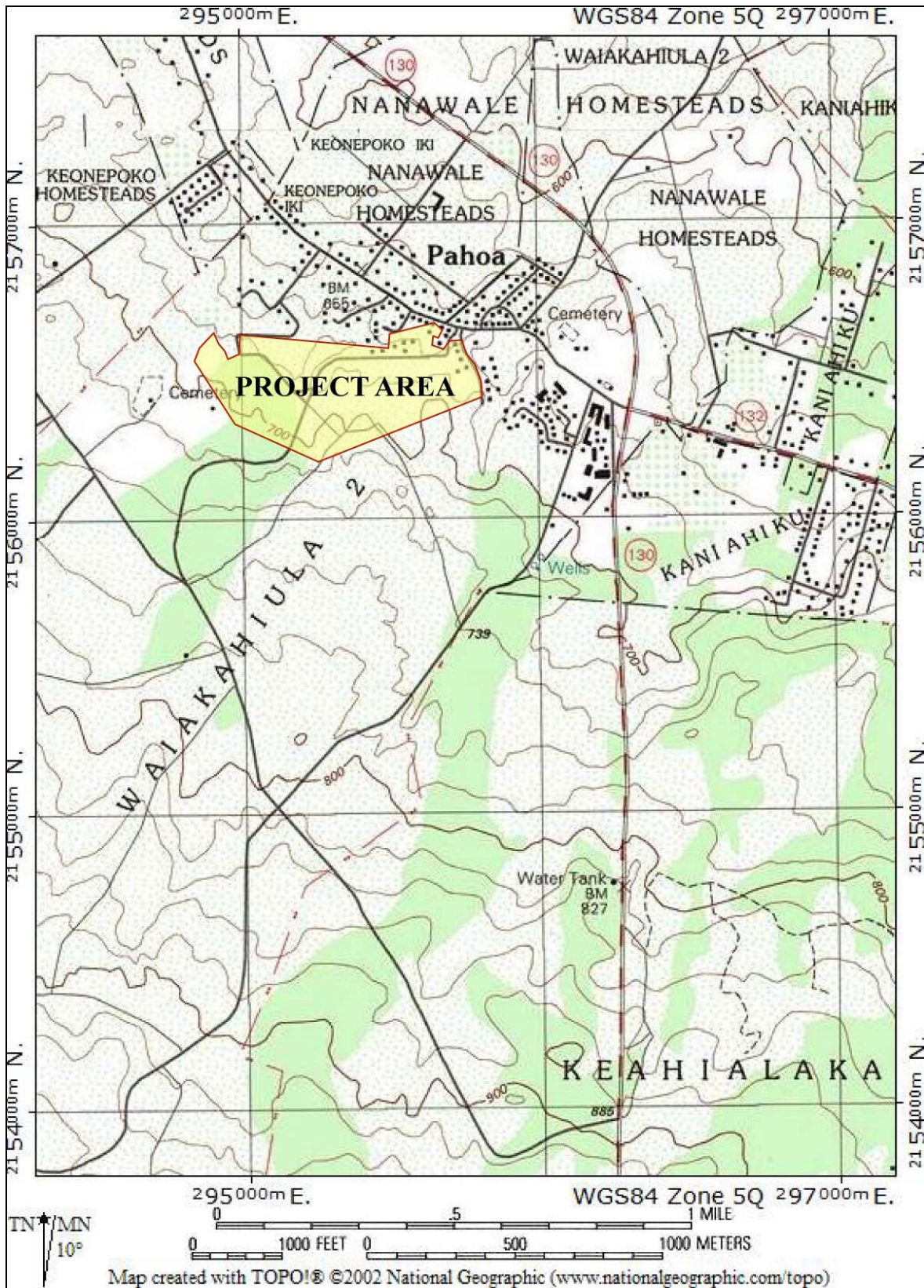


Figure 2: Project Area Location on USGS Map (Pāhoa South, 2005).

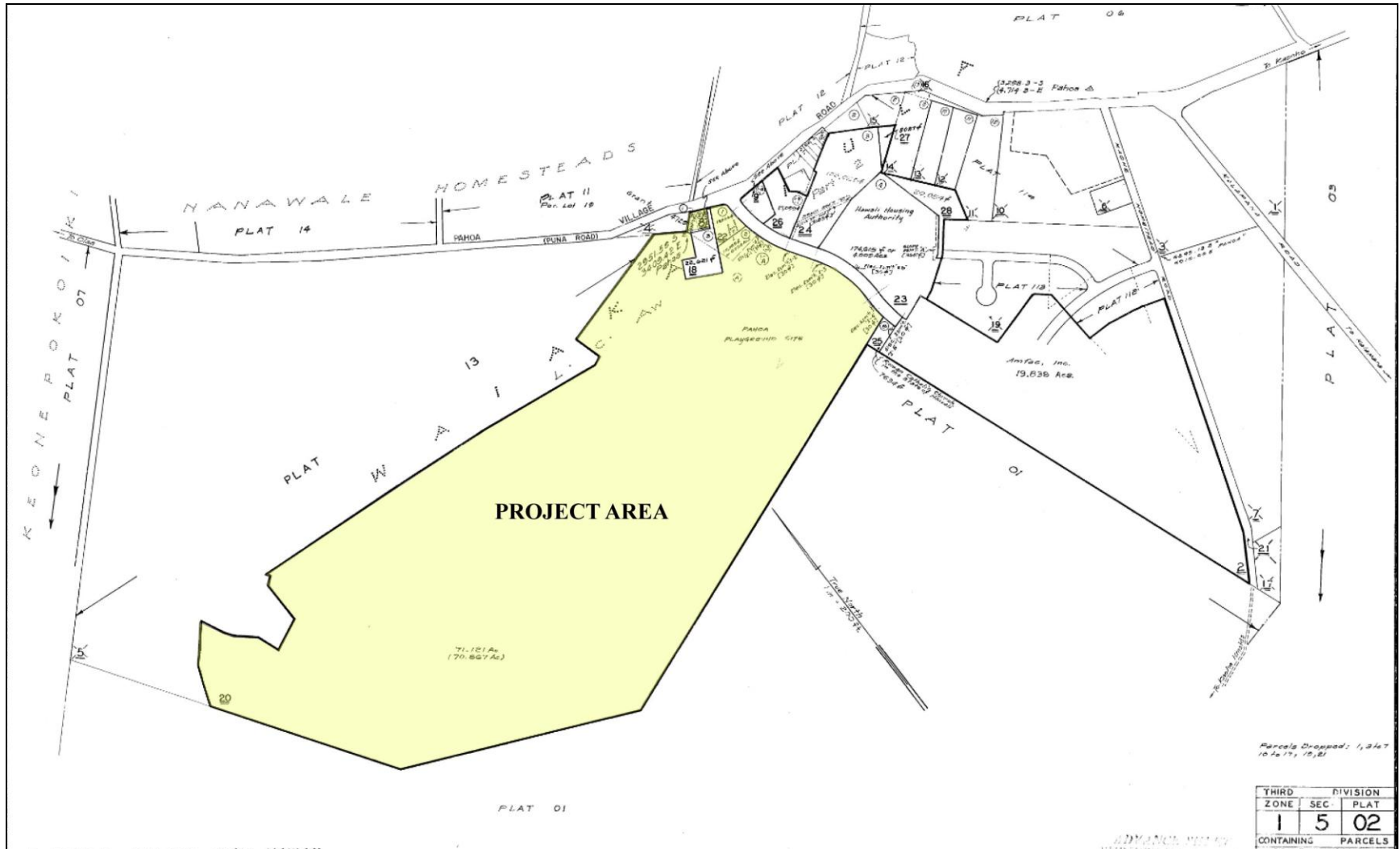


Figure 3: Project Area Location on Portion of TMK (3) 1-5-002 Map.

ENVIRONMENTAL SETTING

The current project area consists of a single parcel situated on level to gently sloping land between 650 and 720 feet (198-219 m) above mean sea level (amsl). The project area is on a Kīlauea lava flow dated between 400 and 750 years before present (ybp) (Wolfe and Morris 1996). Soil in the project area (Figure 4) is Keaukaha Series extremely rocky muck (rKFD) (Sato 1973:27) and ‘Ōla‘a Series extremely stony silty clay loam (OID) (*ibid*:42). The ground surface is level shallow soil with undulating pāhoehoe bedrock outcrops. Drainage is from south to north with large puddles forming along the northern boundaries of the project area during rainy season. Rainfall in the project area is high, averaging 130 inches per year.

Vegetation in the project area is a suite of invasive disturbance species that have replaced the sugarcane fields once planted on the property. The primary tree species are guava (*Psidium* sp.), banyan (*Ficus* sp.), and autograph tree (*Clusia rosea*). Ground cover plants include Asian Melastoma (*Melastoma septemnerium*), ‘okupukupu fern (*Doodia kunthiana*), and several varieties of grass.

HISTORICAL AND CULTURAL CONTEXTS

Initial settlement of the Hawaiian Islands is believed to have occurred along the wetter and more fertile windward coasts where conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia. This exploitation involved inshore and pelagic fishing, gathering shellfish from the shore and strand, plant and animal husbandry, and the utilization of natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson *et al.* 1971; Kirch 1985). The pattern of this early settlement is thought to have consisted of widely spaced, permanent home bases that gradually expanded to form a nearly continuous zone of permanent settlement along the windward coasts as local populations grew.

TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE

Situated along the windward coast of Hawai‘i Island, Puna is a verdant and abundant district with good rainfall and rich soils. However, it is also subject to volcanic eruptions and has been covered by new lava in many places over the last 1,000 years (Cordy 2000:17, and 22). Much of the district's coastal areas have thin soils and there are

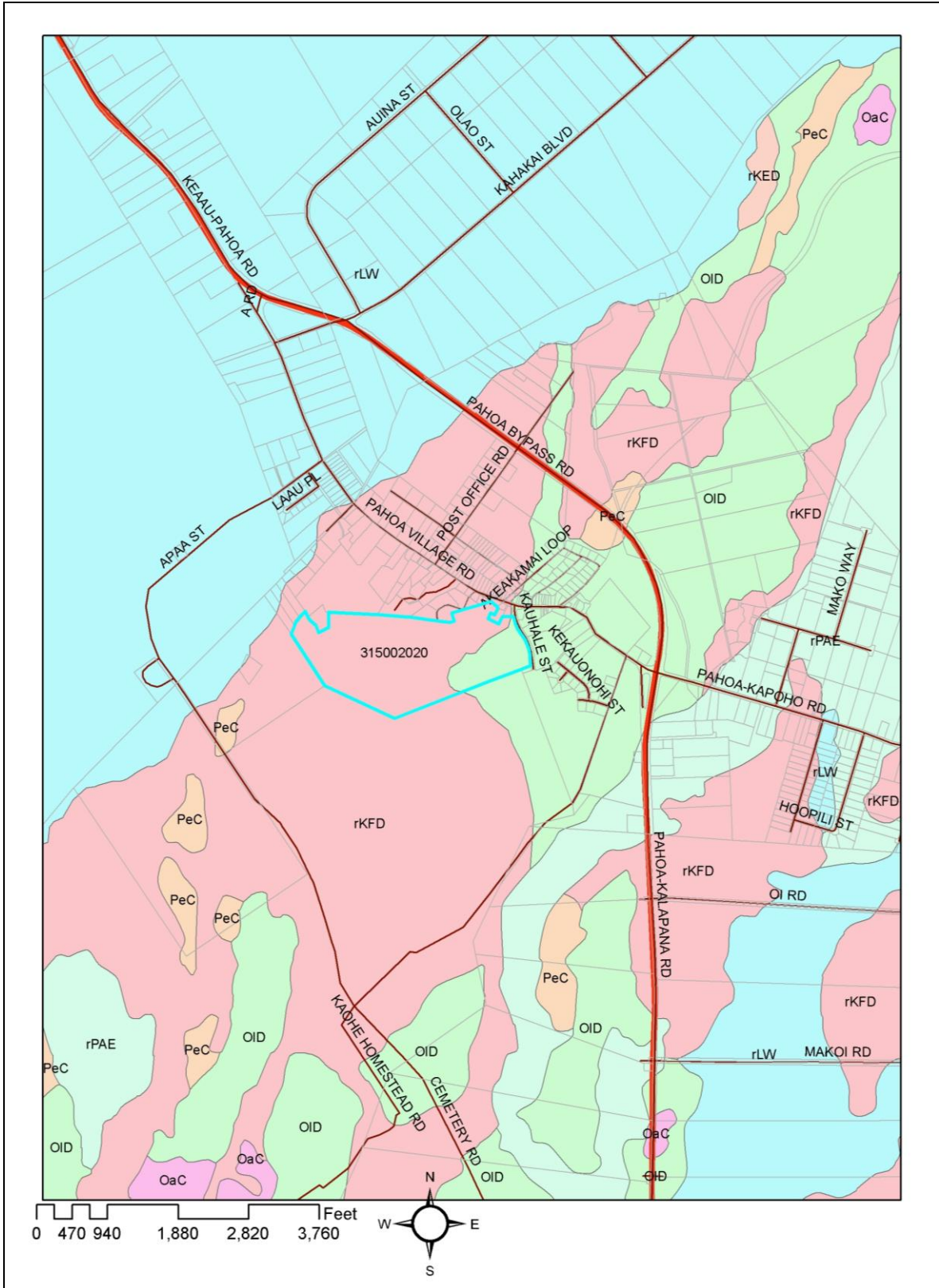


Figure 4: Map of Project Area Soil Series.

no good deep water harbors. The ocean along the Puna coast is often rough and wind-blown.

As a result of these two factors, settlement patterns in Puna tend to be dispersed and without major population centers. Villages in Puna tend to be spread out over larger areas and often are inland, and away from the coast, where the soil is better for agriculture (*ibid*: 45). The lack of population centers also had an effect on the development of a hierarchy of district rulers. Puna was often not strongly tied together by a tight web of allegiances between *ali'i* and *konohiki*. As a result, Puna was often conquered and ruled by stronger district leaders in Hilo or Ka'ū (Kamakau 1992:17 and 77).

Puna was famous as a district for some of its valuable products, including "hogs, gray tapa cloth ('*eleuli*), tapas made of *mamaki* bark, fine mats made of young pandanus blossoms ('*ahuhinalo*), mats made of young pandanus leaves ('*ahua*o), and feathers of the 'o'o and *mamo* birds" (*ibid*:106).

Waiakahiula 1 and Waiakahiula 2 Ahupua'a are located along the northeastern shore of Puna District (Figure 5). Waiakahiula 1 stretches from the coastline up to 400 feet in elevation, some four miles inland. Waiakahiula 2 is located just south of the modern Pāhoa Town center. It is situated between 600 and 1000 feet amsl, roughly six miles inland. Waiakahiula 1 and 2 cut off from each other by Keonepoko Iki and Kahuwai Ahupua'a.

Historical accounts pertaining to Waiakahiula and the project area region are scarce but provide some information on traditional residence patterns, land-use, and subsistence horticulture in the Waiakahiula Ahupua'a area. Waiakahiula is translated as Kahiula's water (Andrews and Parker 1922:672). William Ellis passed through Waiakahiula 1 Ahupua'a in 1823 while travelling along the coast from Kilauea to Waiākea Ahupua'a, Hilo. Ellis' journey took him along the coast of Kahuwai, Wa'awa'a, and Nānāwale Ahupua'a just south of Waiakahiula 1 Ahupua'a (see Figure 5). Ellis and his party then turned *mauka* and proceeded inland to a village in Honolulu Ahupua'a (Ellis 1963:294). The village was small and set in the forest. The next morning Ellis traveled to the shore at Waiakahiula Ahupua'a and rested in the shade of a canoe house there. His travelling companions walked inland about a half mile to preach to the people

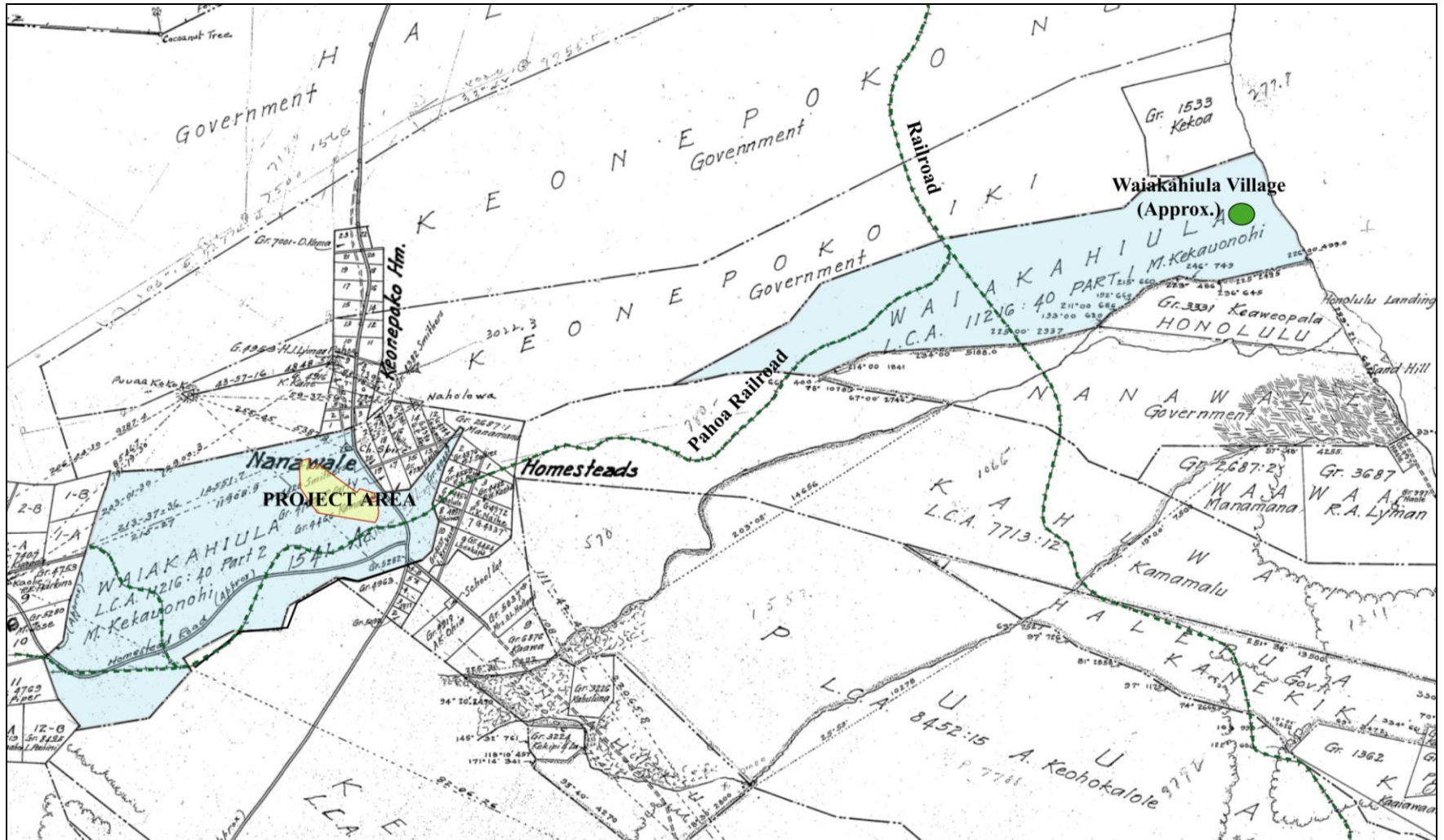


Figure 5: Project Area and Waiakahiula 1 and 2 Locations (Shaded Blue) on W.E. Wall 1927 Map (Reg. Map 2753).

there (ibid: 295). The village would have been located at approximately 100 feet amsl, almost 5.5 miles northeast of the current project area.

The current project area is well outside of the narrow coastal band (0-150 feet amsl) where traditional Hawaiian habitation centers are known to have existed in the region. While there may have been pre-Contact Era travel through the region of the current project area, there were likely no homes or house gardens in the area. There are no early historic accounts pertaining to Waikahiulu 2 Ahupua‘a.

TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Māhele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). Waiakahiula 1 and 2 Ahupua‘a were awarded to Mikahela Kekauonohi and Aaron Keali‘iahonui as part of a large Land Commission Award (LCA 11216) that included parcels on several islands (waihona.com). Mikahela Kekauonohi was the granddaughter of Kamehameha I, and wife of Liholiho, Kamehameha II. Aaron Keali‘iahonui was the son of the last ruling chief of Kaua‘i. A small portion of the 277.8-acre Land Grant 1533 awarded to Keko in also appears to be partially in Waiakahiula 1 Ahupua‘a (Figure 6). A second grant (LG 3331) was awarded to Keaneopala in Honolulu Ahupua‘a to the southeast.

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1865)

Between 1845 and 1865 traditional land-use and residential patterns underwent a change. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, the introduction of sugar cane cultivation, and a push to develop tourism all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al.* 1981).

Hilo became the center of population and settlements in outlying regions declined or disappeared. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements, respectively.

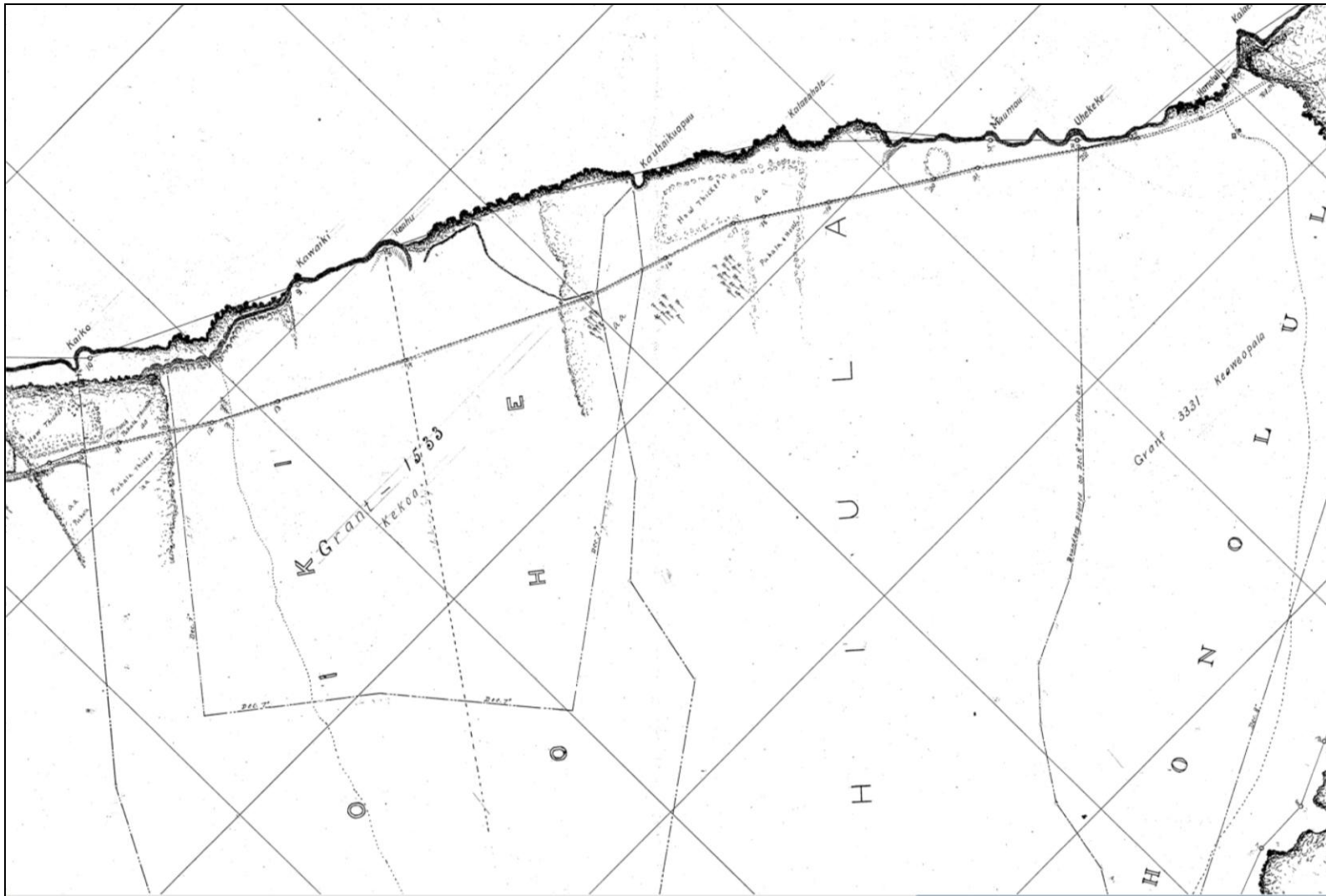


Figure 6: Land Grant 1533 in a Portion of Waiakahiula Shown on Registered Map 2258 By JH Moragne (1903).

As commercial ranching, agricultural pursuits, logging, and tourism ventures were developed, there were concerted moves to develop new transportation infrastructure. New roads and railroad lines were developed to transport farm equipment to fields, agricultural products to harbors, and workers and travelers alike used the new transportation routes to reach their destinations. As new ventures and new routes prospered, the age old trails and travel routes, and even settlement patterns were abandoned.

The historic trail that leads from the modern day Lili'uokalani Gardens area to Hā'ena along the Puna coast was one such casualty. The trail is often called the old Puna Trail and/or Puna Road. There is an historic trail/cart road that is also called the Puna Trail (*Ala Hele Puna*) and/or the Old Government Road that continues from the south end of the Puna Trail through Waiakahiula 1 Ahupua'a heading to points south. Lass also refers to the entire route from Hilo to Ka'ū as the Puna-Ka'ū trail.

Whatever name the trail/cart road alignment is called by, it likely incorporated segments of the traditional Hawaiian trail system often referred to as the *ala loa* or *ala hele* (Hudson 1932:247, Kuykendall 1966:23-25, Lass 1997:15, and Maly 1999:5). Lass suggests the full length of the Puna Trail, or Old Government Road, might have been constructed or improved just before 1840 (Lass 1997:15). The trail was called the Old Government Road, or *Ala Nui Aupuni* (Maly 1999:5). The alignment was mapped by the Wilkes Expedition of 1804-41 (Figure 7).

A general description of the area between the Old Government Road and the newer upper road (Kea'au - Pāhoa Road) from Hilo through Kea'au to Pāhoa was recorded in 1889 by the Surveyor General of the Hawaiian Government Survey. The description affords a glimpse into inland and coastal settlement patterns and land use.

The first settlement met with after leaving Hilo by the sea coast road, is at Keaau, a distant 10 miles where there are less than a dozen inhabitants; the next is at Makuu, distant 14 miles where there are a few more, after which there is occasionally a stray hut or two, until Halepuaa and Koaie are reached, 21 miles from Hilo, at which place there is quite a village; thence to Kaimu there are only a few scattered settlements here and there. A good many of those living along the lower road have their cultivating

patches in the interior, along or within easy accessibility to the new road (Alexander 1891, cited in Maly 1999:107).

The 1889 description contrasts with Ellis' in which he documented a small village in Waiakahiula 1 just sixty-six years earlier. The 1889 description suggests a depopulation along the majority of the Puna near-coastal area. In both descriptions, the people in this area appear to have lived somewhat inland, between the coast and the inland gardens. In 1889 people were cultivating small patches of *kalo*, *awa*, and coffee as well as other food items in the inland gardens. The patches were placed in pockets of soil in holes amidst the lava flows. Additionally, sweet potatoes were grown on rock mounds. By 1889, it appears that very few people lived along the Old Government Road (Maly 1999:6). The Surveyor General stated,

The old sea coast road cannot be kept in repair with the means now at its disposal and its condition each year is becoming more unsafe and ruinous, there is but little travel over it; it has been shown that there is little land capable of cultivation or development either side of it and whatever travel there is now over it would soon be entirely diverted to the upper road (Alexander 1891, cited in Maly 1999:107).

The new Kea'au - Pāhoa Road (Figure 8) being constructed from Hilo through Kea'au to Pāhoa was designed to allow access to the more arable inland areas. People who traditionally had lived along the Puna coast were moving toward Hilo and into the more fertile upland areas of Puna in order to find paid work and to produce cash crops for local markets and for export. In particular, people began to work in the inland areas to grow sugarcane. The new road, the Pāhoa branch of the railroad, sugarcane agriculture, and a logging venture all combined to create Pāhoa as a population in the region.

SUGARCANE, LOGGING, AND THE RAILROAD

By 1901 sugar dominated the island's industry, and Hilo was the epicenter of production and export. Railroads connected sugar mills and sugar plantations in Hilo, the Hāmākua and Puna. The railroad also connected the mills to the wharves at Hilo Bay. The railroad began operation in the Hilo area in 1899, and was abandoned in 1946 (Kelly *et al.* 1981). A main railroad line and several feeder lines were constructed in the early 1900s from Kea'au to locations in lower Puna District.

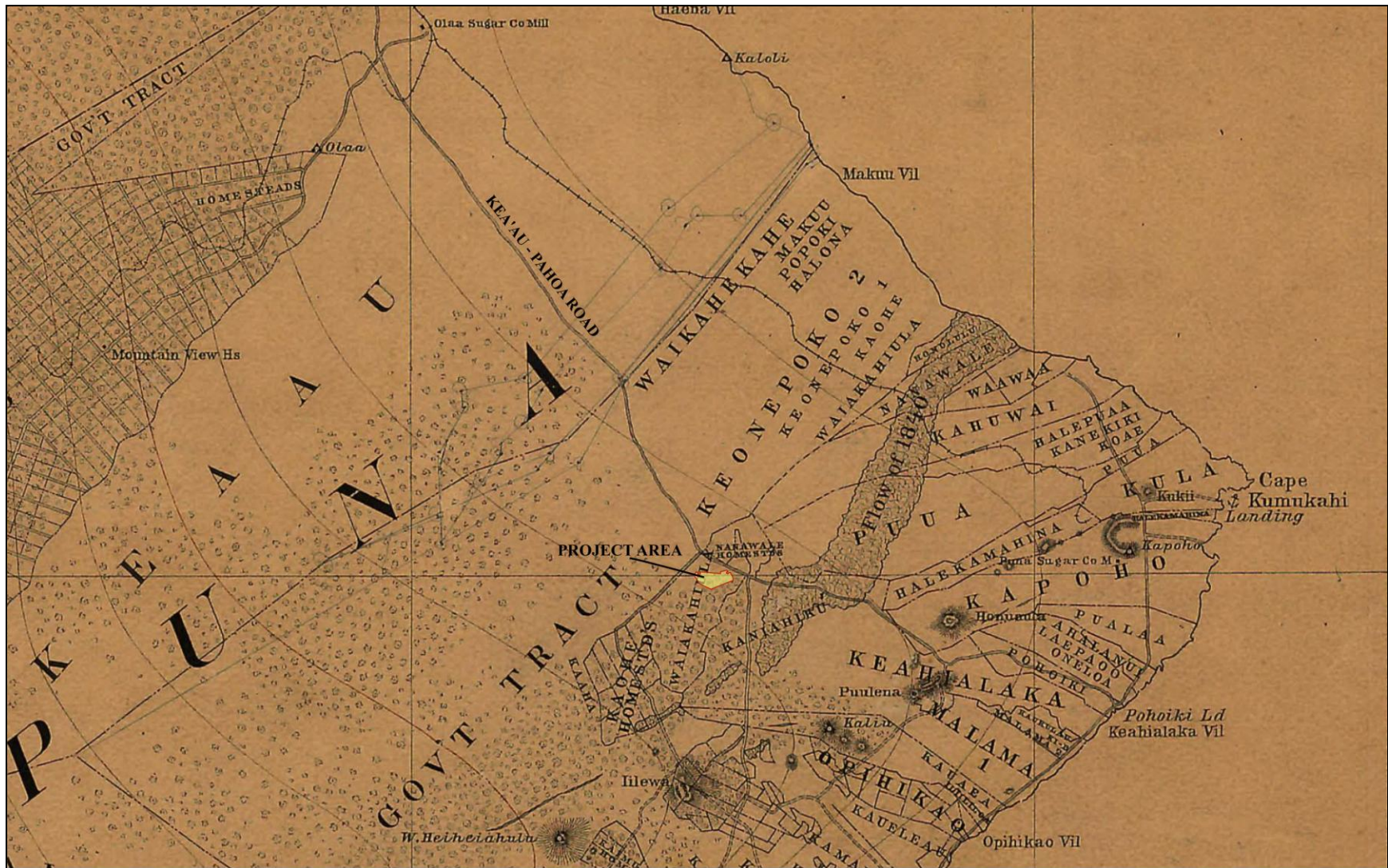


Figure 8: Project Area and Kea'au - Pāhoa Highway Locations on Donn 1901 Map (Reg. Map 2060).

The major line ran from Hilo through Kea‘au to the Kapoho area. A branch line ran from the ‘Ōla‘a Sugar Mill up past present day Glenwood. A second branch line ran to Pāhoa town. The junction of the Hilo to Kapoho line and the Pāhoa branch was located in Waiakahiula 1 Ahupua‘a (see Figure 5). The trains provided transportation for sugarcane as well as for passengers traveling through Puna and on to other destinations such as Hilo and the Hāmākua coast.

Early on, one of the major export items transported by the railroad was timber. The Hawaiian Mahogany Company began cutting timber in Puna District in 1907. Trees were felled in areas to be cleared for sugarcane agriculture. The logs were brought to Pāhoa Town to be milled, sent to Hilo Harbor, and eventually shipped to the U.S. Mainland as railroad ties for the Santa Fe Railroad. The lumber mill facilities and the railroad line that served them were located just east of the current project area, where the present day Pāhoa Farmer's Market is held and where the Akebono Theater is located.

In 1909, the company was renamed Pāhoa Lumber Company. In 1913 the main mill facilities burned to the ground. That same year, the mill was rebuilt and the company was renamed the Hawaiian Hardwood Company. The company's main export was milled *‘ōhia* lumber. The company had several large clients in California and even sold lumber to the U.S. Navy. The company closed down in 1916 when the Santa Fe Railroad ended its contract to buy lumber. The defunct company then leased its mill facilities, buildings, and railroad tracks to the expanding ‘Ōla‘a Sugar Company.

The ‘Ōla‘a Sugar Company, established in 1899, soon became the largest sugarcane plantation and milling operation in Puna District. According to the Hawai‘i Sugar Planter's Association, Plantation Archives,

[The] Olaa Sugar Company was located on the Island of Hawaii just nine miles from Hilo on the road to Volcano and the National Park [Figure 9]. The plantation fields extended for ten miles along both sides of this highway as well as in the Pahoia and Kapoho areas of the Puna District. The elevation of the land ranged from sea level to 2,200 feet. The area was in the wet belt of Hawaii amid forests of fern trees and ohia with an average monthly rainfall of 18-30 inches. Finding varieties of cane that would thrive on forest soil in a cloudy district at various elevations was a major problem.

In 1899, B.F. Dillingham, Lorrin A. Thurston, Alfred W. Carter, Samuel M. Damon, and Wm. H. Shipman pooled their resources and started what they believed would become Hawaii's largest and most prosperous sugar plantation. Their original plan was that Olaa would be instrumental in bringing about the Americanization of Hawaii by fostering a home owning class of small farmers who would grow cane for the mill. The venture was planned as a demonstration of a plantation as small farming enterprise in which a large portion of the crop would be cared for by laborers on shares. L.A. Thurston believed that Hawaii's future prosperity depended in the long run on the production of crops by small independent farmers who owned or leased the land they cultivated. The corporation would operate the mill and assure a market for produce. The promoters predicted that Olaa would become the banner plantation for all Hawaii. This was a radical departure from the ideas of the old plantation system, which opposed both independent cane growers and diversification.

On May 3, 1899, the Olaa Sugar Company was incorporated. With a \$5,000,000 investment, the promoters purchased 16,000 acres in fee simple land and nearly 7,000 acres in long leasehold from W.H. Shipman. They also purchased 90% of the stock in the adjacent Puna Plantation, adding another 11,000 acres to the holdings. Olaa Sugar Company began as one of Hawaii's largest sugar plantations with much of its acreage covered in trees.

The task of setting up the plantation was enormous. Before 1900, coffee was the chief agricultural crop in the area. Over 6,000 acres of coffee trees were owned by approximately 200 independent coffee planters and 6 incorporated companies. The coffee trees were uprooted to make way for cane. Ohia forests had to be cleared, field rock piled, land plowed by mules or dug up by hand with a pick, quarters for laborers and staff had to be built, the mill constructed, and the first cane planted.

On July 1, 1899, active operations began under the management of Frank B. McStocker. In his first report, he stated, "As soon as the planting of the main crop begins, which will be about the month of March [1900], arrangements will be made by which a large portion of the crop will be cared for by laborers on shares." From this early start of "share planting,"

the company branched out into the leasing of land to individuals to raise cane and to making contracts to purchase cane from persons who owned or leased their own land. In most cases, the company carried the financial burden for the planter until he was paid for his cane and then recovered the advances made. Other independent cane farmers lived in their own homes, used their own work animals and tools, and supplied their own fertilizers.

In 1900, a twelve-roller, 2,000 ton mill was erected at Olaa. The mill was planned for a 60,000-ton crop and was of a size to accommodate future expansion. Everything was planned for a large-scale production, unlike most sugar companies, which expanded as the output increased.

The cane from the adjacent plantation, the Puna Plantation, was ground at the Olaa mill. Puna Plantation Company, established in the late 1890s, was taken over by Olaa Sugar Company in 1905.

A succession of experiments molded the history of Olaa Sugar Company. Because of heavy rains, numerous cane varieties were tried out. Lahaina cane was abandoned early because of being particularly susceptible to root diseases due to moisture. New varieties were constantly being planted. The weather was also conducive to the growth of weeds. An experiment in paper mulching was started in 1916. The object of the paper mulch was to suppress the weed growth and keep the soil warm. But it also reduced labor costs for hoeing by 50% and provided an extra application of fertilizer.

In 1919, Olaa Sugar Company had the distinction of operating the first bagasse paper mill in the Territory and the only one of its kind in the United States at that time. The mill was erected alongside the sugar factory where bagasse was converted into mulching paper. C.F. Eckart, manager, originated the idea. The mill produced enough paper daily to cover 9 to 11 acres, with about 1,600 lbs. of paper per acre. The paper was used over the young ratoons, which pierced their way through to the light, while the weeds died. This asphalt-saturated paper used at Olaa became a forerunner of mulch paper developed for use in Hawaii's pineapple industry. Eventually the paper mill was dismantled, but mulching was still used for weed control.

The cane was transported to the mill by fluming and by railroad. Although Oloa Sugar Company had 72 miles of flumes, it had no dependable water source for their operation. The railroad was relied upon for delivery of 60% of the cane. In addition to its own standard gauge 35 miles of railway track, the company ran cars over the Consolidated Railway tracks to bring its cane in from more distant fields. The history of Oloa Sugar Company is closely connected with the southern branches of the Hawaii Consolidated Railway Co. because they were interdependent from the start. The cane fields were in four widely separated areas cut off from each other by stretches of barren lava. The railroad was therefore vital to the plantation, which in turn helped support the railroad. When a tidal wave on April 1, 1946 destroyed much of the Hawaii Consolidated Railway Company's tracks, it ceased operations. The plantation was then forced to convert to trucks in order to transport sugar and molasses to the Hilo wharf.

Fortunately, under the management of Wm. L.S. Williams, a major road-building program had been started in 1939 for the purpose of eliminating the portable track. He started the plantation on its way to modernization by laying a network of 500 miles of roads for hauling cane. Since 1948, all the cane hauling has been by truck.

By the end of 1947, Oloa Sugar Company owed its agents, American Factors, Ltd., \$2,000,000. Sugar prices, the tariff, rationing, epidemics of leafhoppers and armyworms, and volcanic eruptions had taken their toll on company profits. Manager C.E. Burns surmised that the only way for the plantation to stay alive was to mechanize harvesting operations. Because of the rocky and uneven condition of the land, Oloa was one of the last sugar companies to eliminate hand-cutting of cane. This conversion to mechanical harvesting was a turning point in cost reduction in the fields, but became a problem in the mill as a result of all the trash and rocks coming in with the cane. Cane cleaners were installed but the conventional cleaners could not remove the fine volcanic cinders. Oloa Sugar Company solved the grit problem with an ingenious flotation tank.

Another problem, which resulted when mechanical harvesting went into effect, was a need to layoff laborers. Manager Burns worked out an equitable schedule of layoffs. The first severance pay and repatriation

formulas, which were later to serve as patters for the sugar and pineapple industries, were agreed to. In addition, both management and union members located new jobs in the Islands for most of those who were laid off. As a result, the transition from hand to mechanical harvesting was achieved without labor grievances.

Attention to employee welfare was demonstrated by Olaa Sugar Company in the housing program, free medical attention, and recreational facilities. Manager A.J. Watt modernized the housing by building new family units and relocating outlying houses scattered about the plantation into nine main villages. They became miniature towns with running water, electric lights, schools, churches, stores, clubhouses, theaters, parks and ball fields. The plantation roads radiated from these nine camps to cover the cane areas where the men worked. The 1930 plantation census noted a total of 5,999 men, women and children residing in 1,098 houses at Olaa.

In spite of Olaa Sugar Company's efforts to reduce operating costs, the plantation was still in debt. In 1953, a minority stockholders' suit was brought against American Factors, Ltd. The suit alleged that the plantation company paid "excessive" commissions to AMFAC and insufficient dividends to stockholders. By this time Olaa Sugar Co. was over \$4.1 million in debt to the agency and possible liquidation of the company was being considered. After six years of litigation, the suit was finally dismissed by the court in 1959. In the wake of statehood, it was decided that the company would take advantage of the land boom and sell some of its fee simple land. By this time, the plantation had accumulated 35,700 acres of which 22,000 were used by Olaa and the remainder by independent planters. They also offered employees the opportunity to purchase their houses.

On March 28, 1960, a name change from Olaa Sugar Company, Ltd. to Puna Sugar Company, Ltd. was voted on at a stockholders meeting. Apparently, the directors felt "Olaa" was jinxed and that a name change might erase the failures of the past. With a new name and the monies accrued from land sales, the company did make a comeback and by 1963 had the best year ever with a 36% profit gain. In 1966, Puna Sugar Company was free of debt for the first time in its history. The reduction in

the cost of operations and the improvements in the field and mill were regarded throughout the industry as a major accomplishment. American Factors offered to buy out the minority shareholders and by 1969 Puna Sugar Company was a wholly owned AMFAC subsidiary.

AMFAC launched an expansion program by converting to the diffusion method of cane processing and by installing a modern steam generating facility. A \$4.5 million power plant was built at Puna, which used bagasse and trash fuel to generate 15,000 kilowatts of electricity. Hilo Electrical Light Co. contracted to purchase 12,500 kilowatts.

The 1980's brought bleak prospects to the company once again. The sugar industry could no longer depend on government subsidies or tax breaks. High fructose corn syrup, a low cost substitute, and artificial sweeteners were hurting the sugar market. On January 7, 1982, AMFAC announced that it would be shutting down Puna Sugar Company.

The chore of closing down was phased out over a two-year period. It involved negotiating leases and contracts, disposing of equipment, and the most difficult of all, working out employee layoffs. Once again in an unprecedented move, AMFAC included in the severance package a gift of five acres of land for each employee. They also donated \$2 million towards improvement costs of the land and offered to help locate other agricultural related jobs for the employees, if they desired. The last worker was gone by December 1, 1984. The entire sugar mill was sold to Fiji Sugar Corporation, Ltd. in 1988 and Hawaiian Electric Light Company took over the power plant (Campbell and Ogburn 2004).

The growth of the 'Ōla'a Sugar Company impacted the development of regional land-use, tenure, and the transportation network. Homestead lots and agricultural plots were surveyed and cleared from the surrounding forests. Sugar camps, housing and facilities for workers, were constructed. Over time, many of the smaller agricultural lots initially purchased by private owners to grow sugarcane were bought up by the large sugar plantation.

The project area parcel is a portion of a larger area of ‘Ōla‘a Sugar Company sugarcane fields in the Pāhoa area. This particular region of sugarcane fields is recorded on a 1906 Hawai‘i Territory Survey Map (Figure 9). The sugarcane fields are also clearly visible on a USDA aerial photo taken in February of 1965 (Figure 10). There are no records of house lots or other types of land use, other than sugarcane agricultural lots, on the project area parcel.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

There are nineteen previous archaeological studies conducted in the broader region surrounding Pāhoa (Table 1 and Figure 11).

Table 1: Previous Archaeological Studies in the Broader Pāhoa Region.

AUTHOR	STUDY	LOCATION	FINDINGS
Bordner 1977	Archaeological Reconnaissance Survey	TMK: (3) 1-5-010:017	A single rock mound marker recorded
Kam 1982	Field Inspection	Pāhoa Cave TMK: (3) 1-5-009:009	Description of cave inspection
Yent 1983	Archaeological Survey	Lava tube in Waikahiula Ahupua‘a TMK: (3) 1-5-008:001	Documented lava tube Site 50-10-45-14900.
Komori 1987	Cultural and Biological Resources Survey	Puna Electrical Power Line Corridor	Eleven archaeological sites and three historical sites documented, including agricultural features (ditches, terraces, modified outcrops) and habitation platforms, burial caves, and petroglyphs
Rosendahl 1986	Archaeological Reconnaissance Survey	Pāhoa Post Office TMK: (3) 1-5-007: 008	No sites documented
Rosendahl 1988	Archaeological Reconnaissance Survey	Keonepoko Iki and Keonepoko Nui Ahupua‘a TMK: (3) 1-5-008:001,	No sites documented

AUTHOR	STUDY	LOCATION	FINDINGS
		006; 1-5-009: 009; and 1-5-010: 003	
Bonk 1989A	Archaeological Reconnaissance Survey	TMK: (3) 1-2-010: 001	No Sites documented
Bonk 1989B	Archaeological Monitoring and Survey	TMK: (3) 1-2-010: 003	No sites documented
Stone & Tashima 1989	Field Survey	Pāhoā Cave TMK: (3) 1-5-010: 003; 1-5-116: 030, 031, 049-057	Eight sites documented within cave
Bonk 1990	Archaeological Reconnaissance Survey	TMK: (3) 1-2-010: 003	No sites documented
Kennedy 1991	Archaeological Inventory Survey	TMK: (3) 1-2-010: 001	No sites documented
McEldowney & Stone 1991	Lava Tube Survey	TMK: (3) 1-2-010: 002, 003	Four sites recorded
Conte et al. 1994	Archaeological Inventory Survey	TMK: (3) 1-5-008: 003; 1-5-010: 004	No sites documented
Clark et al. 2001	Archaeological Inventory Survey	TMK: (3) 1-5-002: 024	Two historic sites related to the Pahoā Lumber Company property
Rechtman 2003	Archaeological and Cultural Assessment	TMK: (3) 1-5-008: 001	No sites documented
Rechtman 2004	No Effect Letter	TMK: (3) 1-5-07: 017	No sites documented
Rechtman & Desilets 2004	Archaeological Inventory Survey	TMK: (3) 1-5-008: 003	Two sites, an enclosure complex and a terrace recorded
Runyon et al. 2008	Archaeological Monitoring	TMK (3) 1-5-114: 002, 025	No sites documented
Wilkinson et al. 2010	Archaeological Inventory Survey	Kea'au - Pāhoā Highway (Route 130)	Two Historic Era sites documented

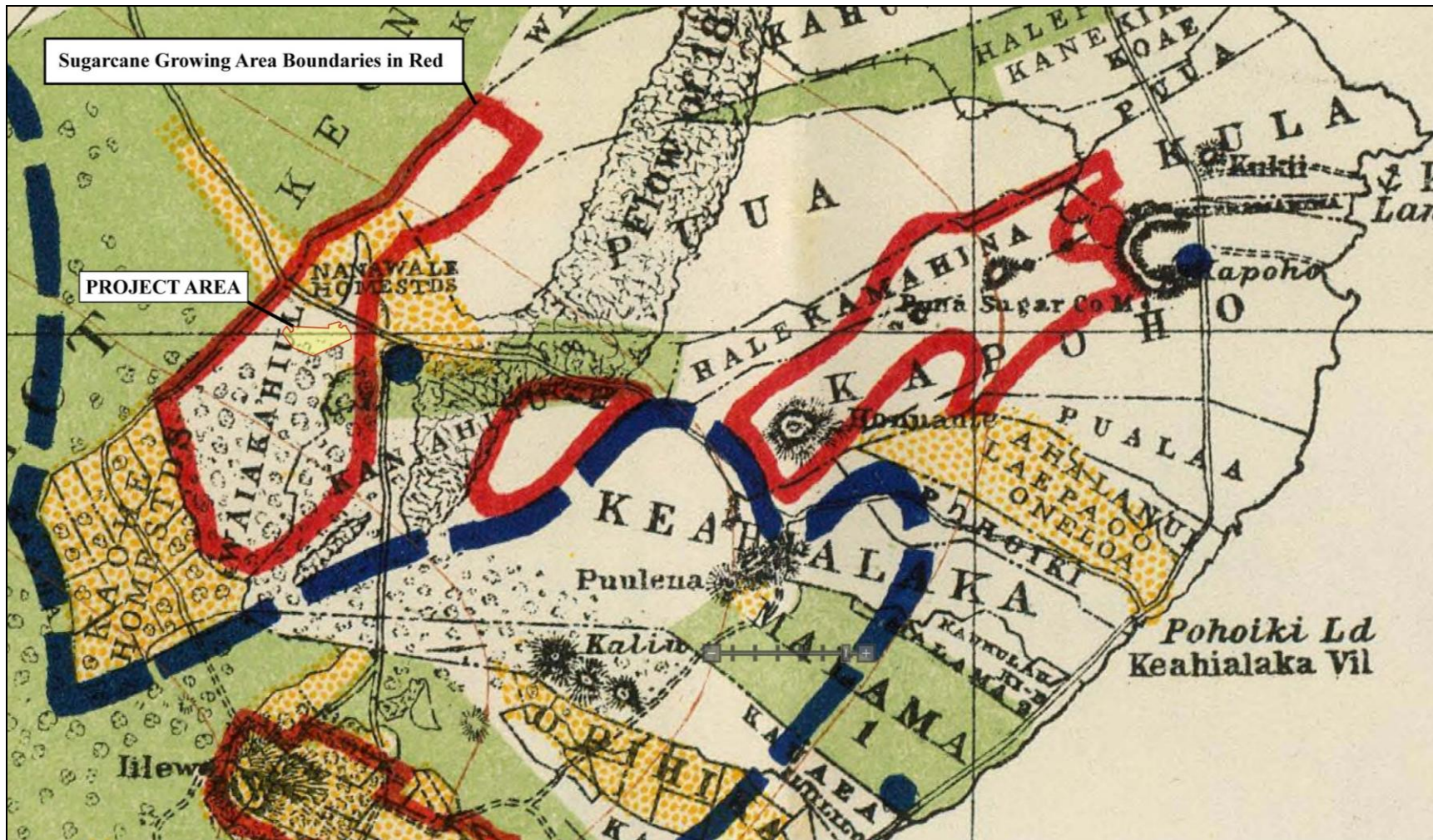


Figure 9: Project Area and Pāhoā Area Sugarcane Fields on Portion of Donn and Wall Map (1906).

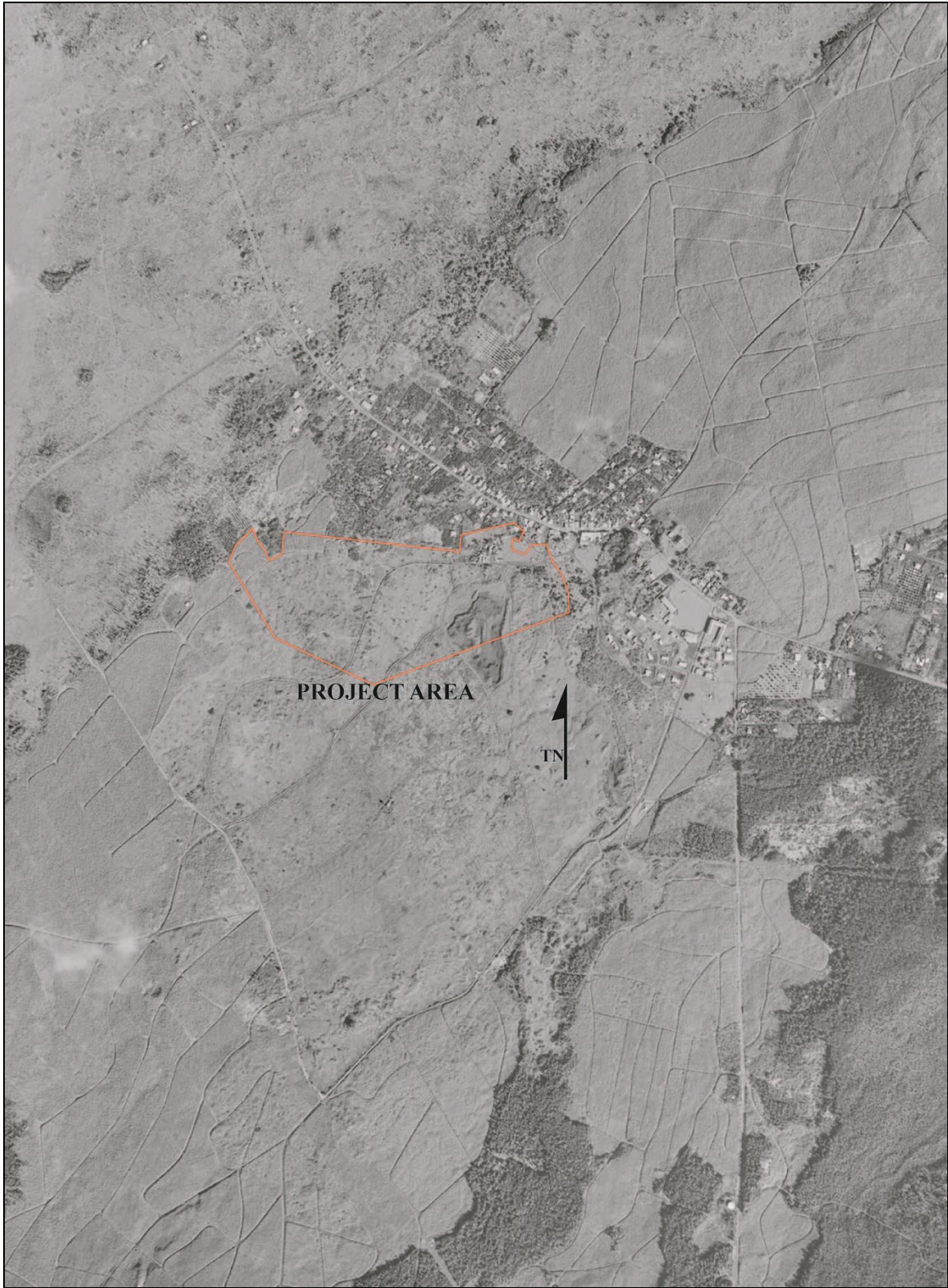


Figure 10: Aerial Photo Showing Project Area (Red Boundary) and Sugarcane Fields (USDA 1965).

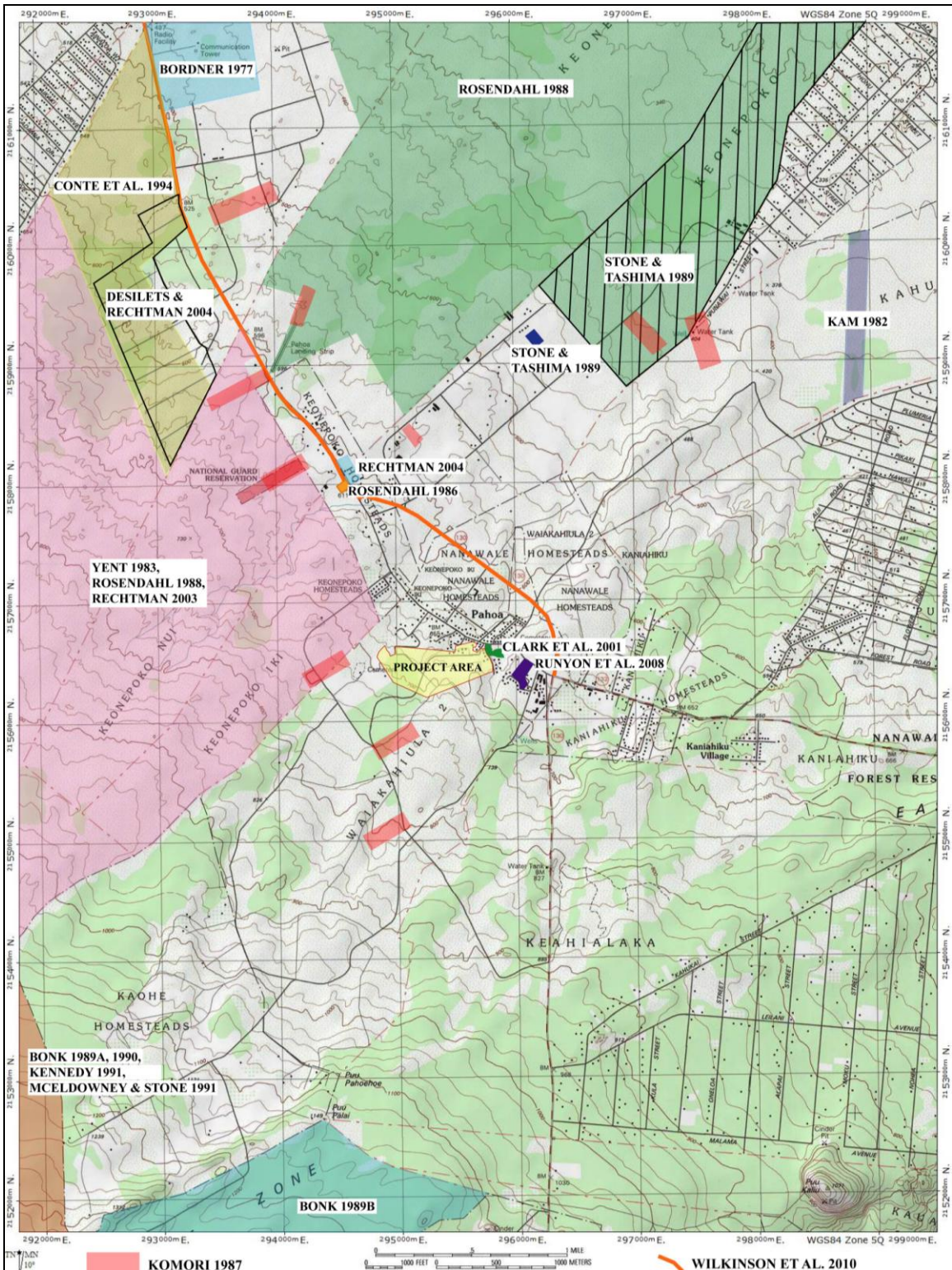


Figure 11: Previous Archaeological Studies on USGS Map (Pahoa South Quad, 2005).

More than half (n=10) of the previous archaeological studies did not document any archaeological sites. These findings are consistent with settlement pattern data gleaned from historical literature sources. The upland elevations of this part of Puna District was not known to be settled or used for gardens during the pre-Contact era.

The other ten studies did document lava tubes with archaeological sites and features (Kam 1982, Yent 1983, Stone & Tashima 1989, and McEldowney & Stone 1991), or they documented a limited number of surface archaeological features (Bordner 1977, Komori 1987, and Rechtman & Desilets 2004). Surface archaeological features included agricultural features such as rock mounds, ditches, terraces, and modified outcrops as well as other feature types including habitation platforms and petroglyphs. None of the lava tube sites or surface archaeological sites are located near the current project area.

There are three previous archaeological studies in Waiakahiula 2 Ahupua‘a, and in the immediate vicinity of the current project area (see Figure 11). One of the studies, an archaeological monitoring project at the Pāhoia Elementary School, did not document archaeological sites (Runyon et al. 2008). Two of the studies documented historic era sites associated with Pāhoia Town. The first study, just west of the current project area, documented the remains of a railroad turntable (SIHP 50-10-55-22966) and a railroad bed (SIHP 50-10-55-22967) associated with the Pāhoia Lumber Company property (Clark et al. 2001:14-19) (Figure 12). The second study mentions the presence of the Pāhoia Historic and Commercial District (SIHP 50-10-55-7388) that fronts both sides of the Kea‘au - Pāhoia Road through the center of Pāhoia Town (Wilkinson et al. 2010). The current project area is well south of the Kea‘au - Pāhoia Road and the Historic District.

EXPECTED ARCHAEOLOGICAL PATTERNS

Based on historical research for this study, and on the previous archaeological studies for the broader region, it is most likely that all of the archaeological features that exist on the project area will be associated with sugarcane agriculture. This is likely since the project area and surrounding environs were sugarcane fields from the early 1900s through, at least the late 1960s (see Figure 10), and likely longer. Bulldozing and plowing to create the fields, as well as harvesting activities are likely to have destroyed any archaeological features that might have existed. Moreover, the previous archaeological studies point to a paucity of surface archaeological features in the area.

The historic record too points to this area as unoccupied and little used prior to the early post-Contact Era.

It is most likely that field clearing rock mounds associated with the clearing of sugarcane fields will be identified on the project area. Rock clearing mounds have been identified during numerous archaeological studies on former sugarcane agricultural fields in the Hilo area (Borthwick et al. 1993, Hunt and McDermott 1994, Haun 2002, Escott 2004).

It is also possible that some archaeological remains associated with traditional Hawaiian travel and resources gathering might remain on the project area. However, based on land-use records and maps from the post-Contact and Historic eras, it is more likely that sugarcane agriculture has removed any traditional features that may have once existed on the project area. Aerial photographs taken in 1954 and 1965 support this probability as the property has been bulldozed to create sugarcane fields. Therefore, based on historical documents and archaeological studies, archaeological features will most likely consist of rock clearing mounds.

RESULTS OF FIELDWORK

Thirty-nine sites comprising 80 features were recorded during the course of the current archaeological inventory survey (Figure 12 and Table 2). All of the features at all of the sites consisted of rock mounds and modified outcrops. In addition, two garden beds (Temporary Site #14) were recorded and determined to be modern based on the results of excavation. The data recorded for TS-14 is included in this report.

Thirteen stratigraphic trenches were excavated at twelve sites to determine the function and approximate age of the features. All of the archaeological features at all of the sites are associated with historic era sugarcane cultivation. The rock mounds and modified outcrops documented below are the results of clearing rocks from the sugarcane fields that once covered the entire project area parcel. None of the sites were interpreted as pre-Contact.

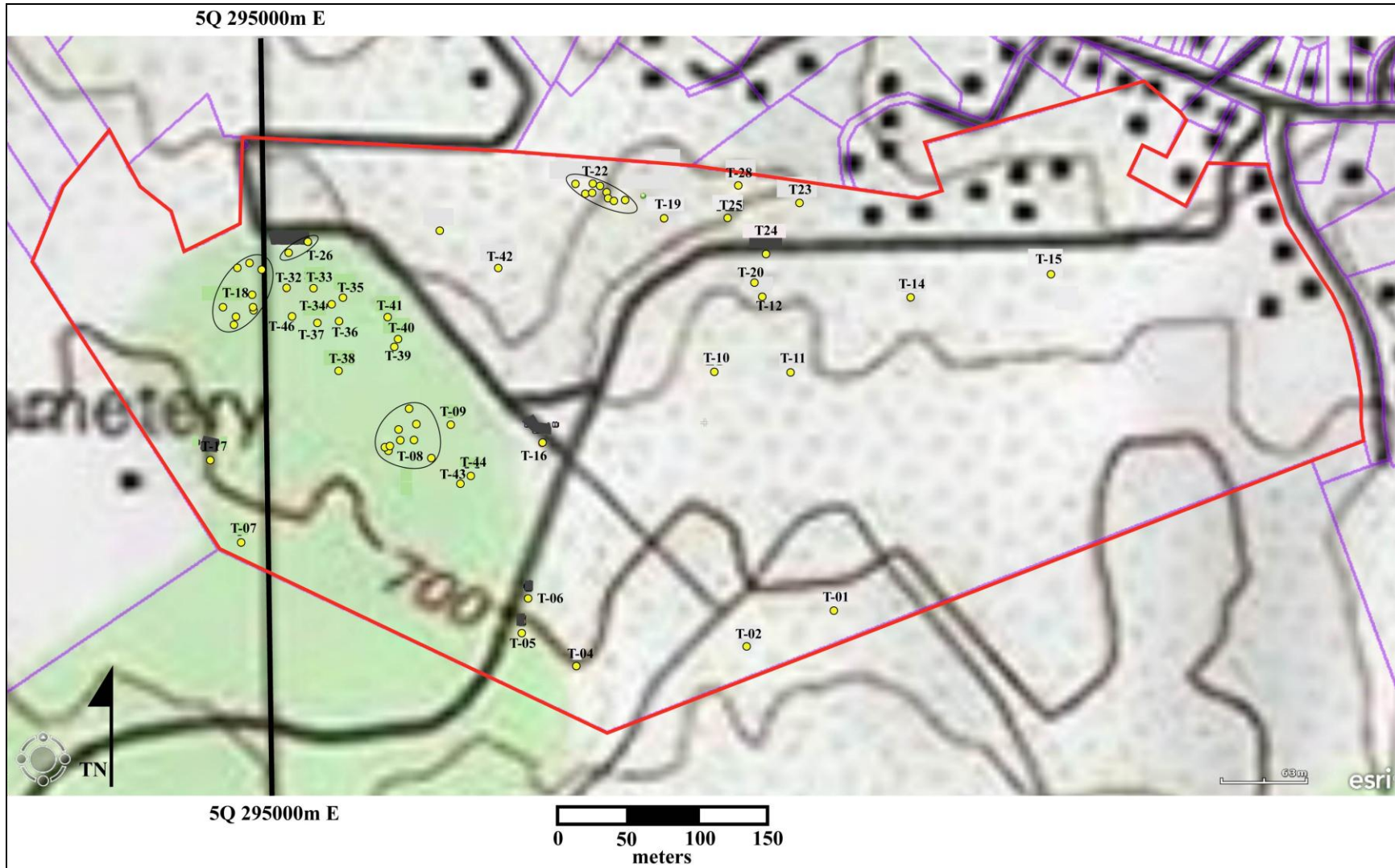


Figure 12: Archaeological Sites Located on USGS Map (Pāhoa South Quad, 2005).

Table 2: Inventory of Sites in Project Area.

Site*	Features	LxWxH (meters)	Type	Function	Age
29900	2	35.0 x 7.0 x 2.0	Rock Mound & Modified Outcrop	Agricultural	Historic
29901	1	2.5 x 2.5. x 1.6	Modified Outcrop	Agricultural	Historic
29902	1	5.3 x 1.3 x 1.2	Modified Outcrop	Agricultural	Historic
29903	1	2.5 x 2.0 x2.6	Rock Mound	Agricultural	Historic
29904	1	18.0 x 15.0 x 2.0	Modified Outcrop	Agricultural	Historic
29905	1	5.4 x 5.4 x 1.2	Rock Mound	Agricultural	Historic
29906	9	40.0 x 40.0 x1.5	Rock Mounds & Modified Outcrops	Agricultural	Historic
29907	1	3.0 x 3.0 x 1.2	Rock Mound	Agricultural	Historic
29908	5	40.0 x 30.0 x 1.5	Rock Mounds	Agricultural	Historic
29909	1	2.6 x 2.4 x 1.4	Rock Mound	Agricultural	Historic
29910	6	55.0 x 25.0 x 1.6	Rock Mounds	Agricultural	Historic
29911	2	30.0 6.0 x 1.9	Rock Mounds	Agricultural	Historic
T-14	2	10.0 x 9.0 x 0.15	Garden Beds	Agricultural	Modern
29912	1	2.6 x 1.7 x 0.9	Rock Mound	Agricultural	Historic
29913	1	18.0 x 3.6 x 1.7	Modified Outcrop	Agricultural	Historic
29914	1	5.0 x 5.0 x 1.4	Rock Mound	Agricultural	Historic
29915	8	50.0 x 25.0 x 1.5	Rock Mounds and Modified Outcrops	Agricultural	Historic
29916	1	14.0 x 0.9 x 0.8	Rock Mound	Agricultural	Historic
29917	1	4.0 x 3.0 x 2.0	Rock Mound	Agricultural	Historic
29918	10	50.0 x 25.0 x 1.4	Rock Mounds and Modified Outcrops	Agricultural	Historic
29919	4	20.0 x 10.0 x 0.7	Rock Mounds	Agricultural	Historic
29920	1	6.0 x 2.3 x 1.5	Rock Mound	Agricultural	Historic
29921	1	3.7 x 2.1 x 0.8	Modified Outcrop	Agricultural	Historic
29922	2	20.0 x 10.0 x 1.1	Rock Mounds	Agricultural	Historic
29923	1	2.0 x 1.4 x 0.6	Modified Outcrop	Agricultural	Historic
29924	1	6.0 x 2.0 x 0.4	Modified Outcrop	Agricultural	Historic
29925	1	4.2 x 4.2 x 1.6	Rock Mound	Agricultural	Historic
29926	1	3.4 x 3.0 x 1.1	Rock Mound	Agricultural	Historic

Site*	Features	LxWxH (meters)	Type	Function	Age
29927	1	5.1 x 4.5 x 0.9	Rock Mound	Agricultural	Historic
29928	1	3.5 x 3.5 x 1.2	Rock Mound	Agricultural	Historic
29929	2	6.8 x 5.0 x 0.6	Rock Mounds	Agricultural	Historic
29930	1	3.0 x 2.7 x 0.5	Rock Mound	Agricultural	Historic
29931	1	3.6 x 2.6 x 0.4	Rock Mound	Agricultural	Historic
29932	1	3.4 x 1.1 x 0.8	Modified Outcrop	Agricultural	Historic
29933	1	5.5 x 2.6 x 0.5	Rock Mound	Agricultural	Historic
29934	1	2.0 x 2.0 x 0.7	Rock Mound	Agricultural	Historic
29935	1	5.4 x 2.5 x 0.3	Rock Mound	Agricultural	Historic
29936	1	1.7 x 1.7 x 0.4	Rock Mound	Agricultural	Historic
29937	1	3.0 x 2.2 x 0.3	Rock Mound	Agricultural	Historic
29938	2	8.0 x 3.0 x 0.5	Rock Mounds	Agricultural	Historic

* The complete State Inventory of Historic Properties Number is 50-10-55-XXXXX.

SITE 29900

Modified Outcrops

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

35.0 meters (N/S) by 7.0 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

ST-1

DESCRIPTION:

Site 29900 consists of a modified outcrop (Features A) and a rock mound (Feature B) recorded along the south edge of the project area (see Figure 12). The features are located in a thicket of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular modified outcrop located at the north end of the site (Figure 13). The modified outcrop is 5.5 m long (N/S) by 3.6 m wide and is 1.9 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop (Figure 14). The feature is conical in shape. No stacking or facing is evident in the feature construction. Feature A has been altered by banyan trees and weathering and is in fair condition.

Feature B consists of a roughly rectangular rock mound located approximately twenty meters south of Feature A. Feature B measures 5.2 m long (N/S) by 4.3 m wide and is 2.0 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders piled and stacked up to six courses high onto the ground surface (Figure 15). The southern end of Feature B is roughly faced. Feature B has been altered by banyan trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 1.0 meter long (N/S) by 1.0 m wide unit excavated in the south side of Feature B.. ST-1 contained an architectural layer and two natural stratigraphic layers, was excavated to a maximum depth of 80 cmbs, and terminated on bedrock (Figure 16).

The Architectural Layer (0-110 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 17). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in the top surface of Layer I sediment.

Layer I (0-50 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 10% angular and subangular cobbles and pebbles, and 10% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on Layer II sediment.

Layer II (50-80 cmbs) was soft dark brown (7.5YR3/3) sandy silt with 5% angular and subangular cobbles and pebbles, and 5% small roots. Layer II did not contain cultural material. The base of Layer II was clear and even, and terminated on bedrock (Figure 18).

The modified outcrop and rock mound at Site 29900 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

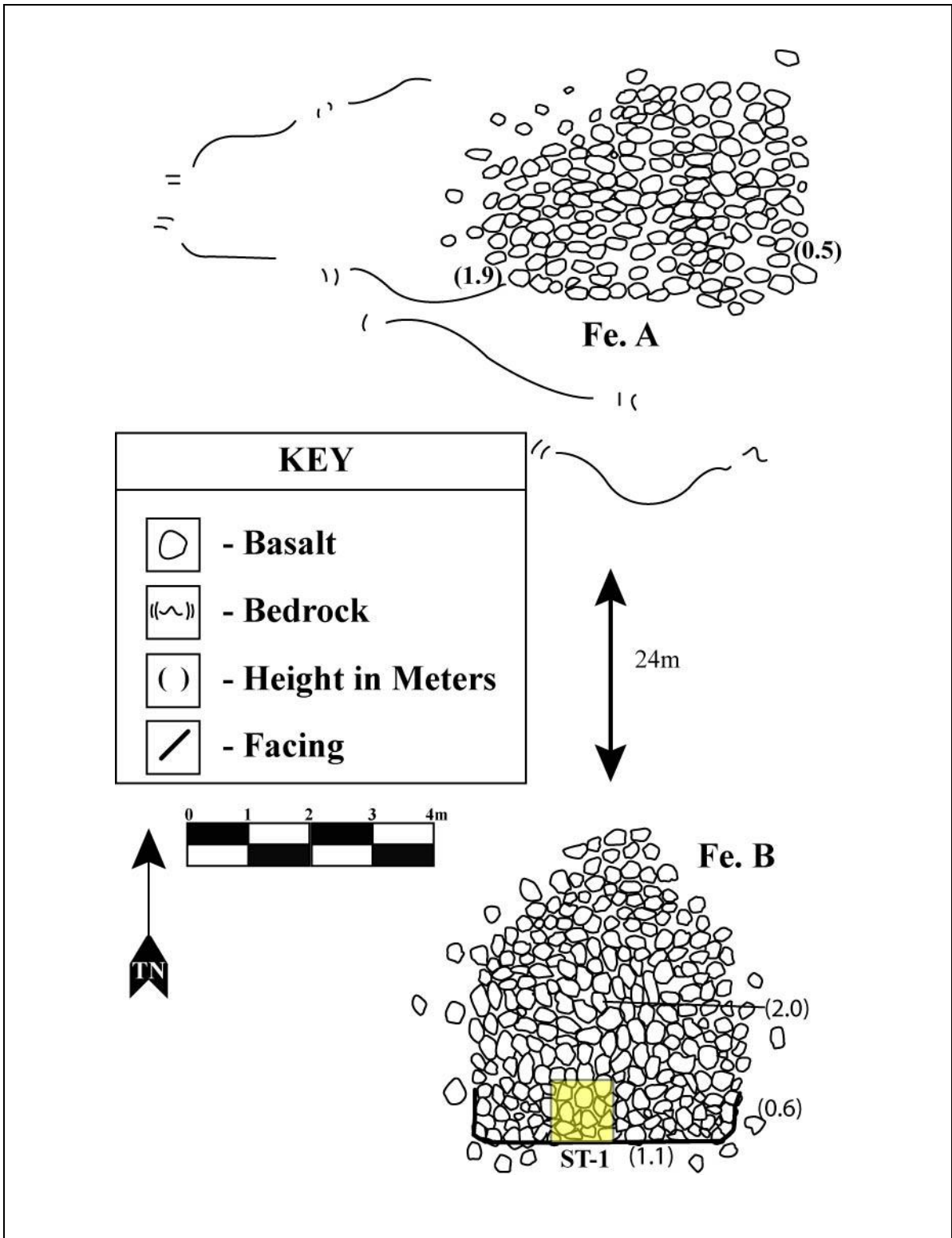


Figure 13: Site 29900 Plan View Map.



Figure 14: Photograph of Site 29900 Feature A Looking West.



Figure 15: Photograph of Site 29900 Feature B Looking Northeast.

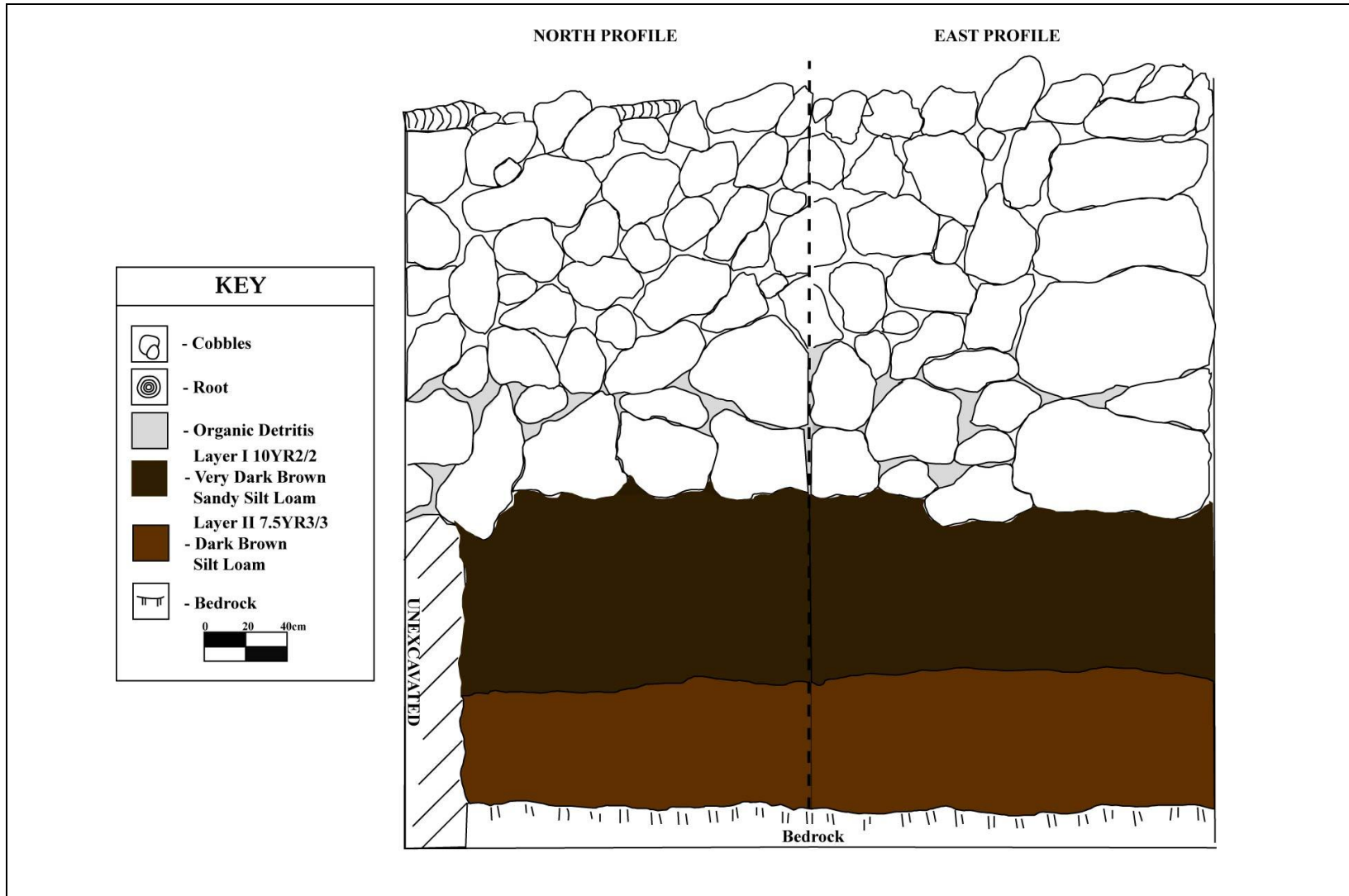


Figure 16: Site 29900 Feature B ST-1 Profile.



Figure 17: Photograph of Site 29900 Feature B ST-1 Showing Architectural Layer, Looking Northeast.



Figure 18: Photograph of Site 29900 Feature B ST-1 Showing Base of Excavation Looking North.

SITE 29901**Modified Outcrop**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 35.0 meters (N/S) by 7.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29901 consists of a roughly square modified outcrop located approximately sixty meters southwest of Site 29900 (see Figure 12 and Figure 19). The feature is located in a thicket of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

The modified outcrop is 2.5 m long (N/S) by 2.5 m wide and is 1.6 meters in maximum height. The feature is constructed of angular and subangular cobbles and small boulders loosely piled on an exposed bedrock outcrop (Figure 20). No stacking or facing is evident in the feature construction. The feature has been slightly altered by weathering and is in fair condition.

The modified outcrop at Site 29901 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

SITE 29902**Modified Outcrop**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 5.3 meters (N/S) by 1.3 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None

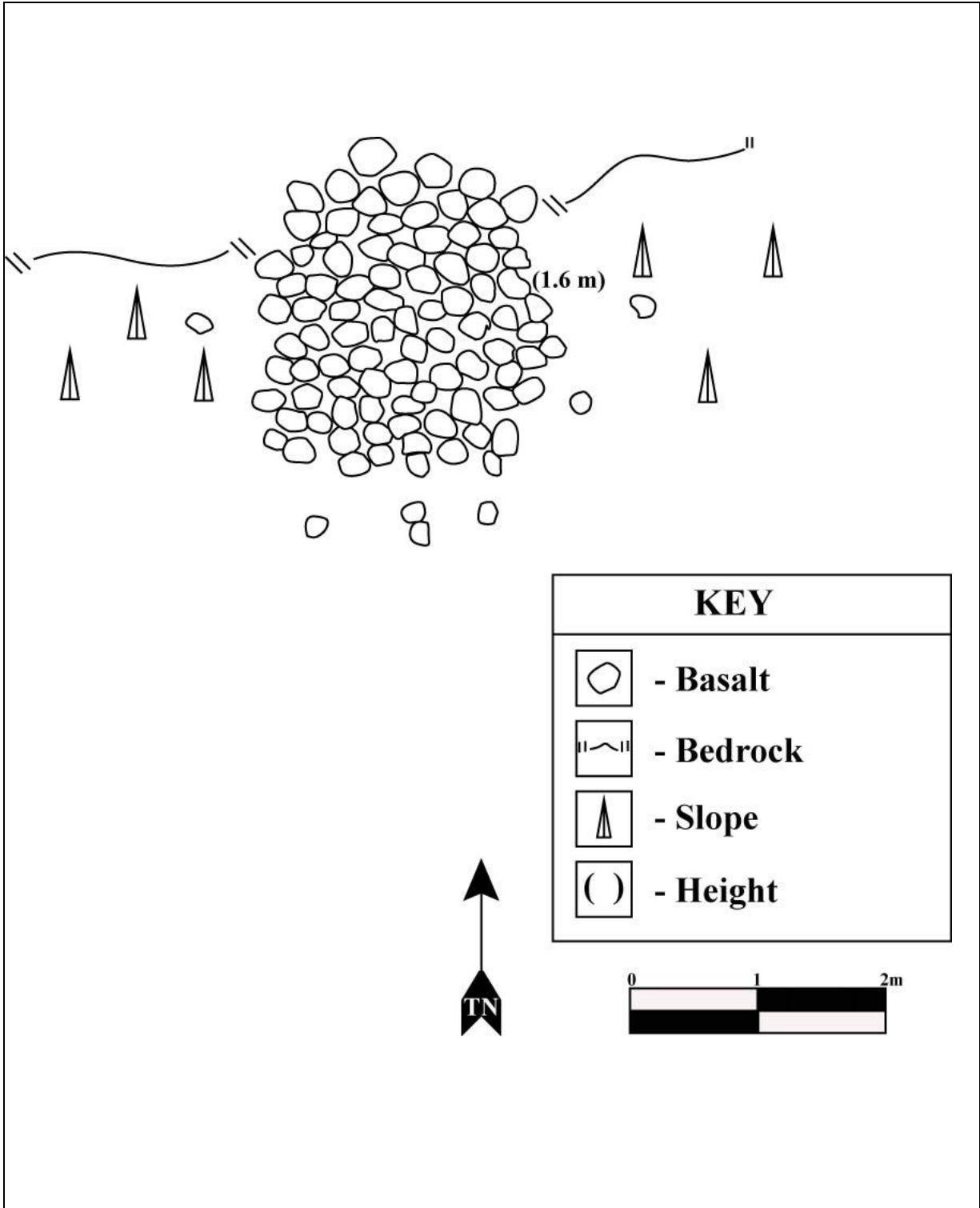


Figure 19: Site 29901 Plan View Map.



Figure 20: Photograph of Site 29902 Looking West.

DESCRIPTION: Site 29902 consists of a linear modified outcrop located approximately 130 meters southwest of Site 29901 (see Figure 12). The feature is located in a thicket of *'ōhia* trees and ferns in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

The modified outcrop is 5.3 m long (N/S) by 1.3 m wide and is 1.2 meters in maximum height (Figure 21). The feature is constructed of angular and subangular cobbles and small boulders loosely piled on an exposed bedrock outcrop (Figure 22). No stacking or facing is evident in the feature construction. The feature has been slightly altered by weathering and is in fair condition.

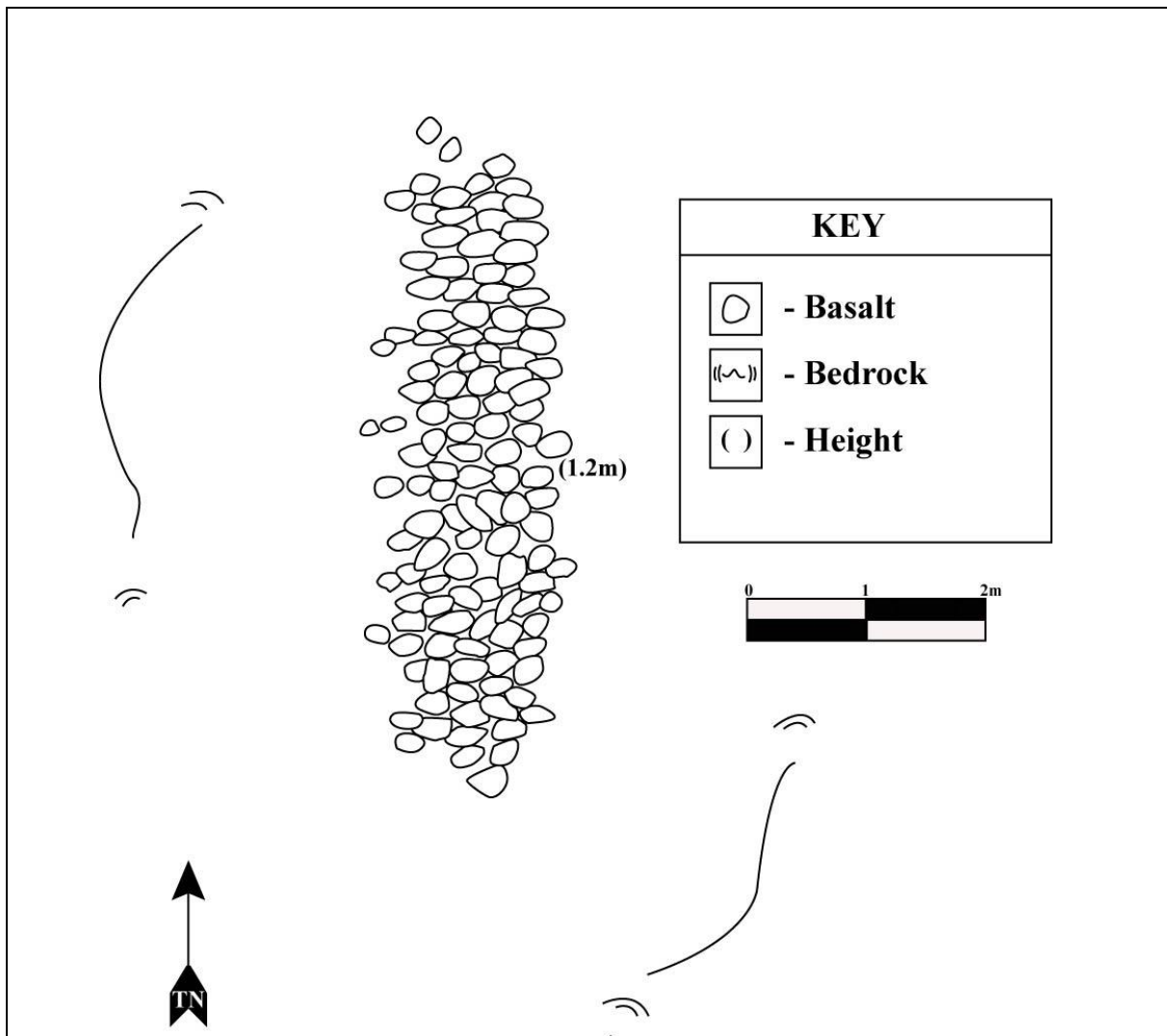


Figure 21: Site 29902 Plan View Map.



Figure 22: Photograph of Site 29902 Looking East.

The modified outcrop at Site 29902 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29903

Rock Mound

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 5.3 meters (N/S) by 1.3 meters
CONDITION: Good
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29903 consists of a rectangular rock mound located

approximately 50 meters northwest of Site 29902 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The terrain to the west is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 2.5m long (N/S) by 2.0 m wide and is 2.6 meters in maximum height (Figure 23). The feature is constructed of angular and subangular cobbles and small boulders stacked up to thirteen courses high on the ground surface (Figure 24). The feature is conical in shape and is well faced . The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29903 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

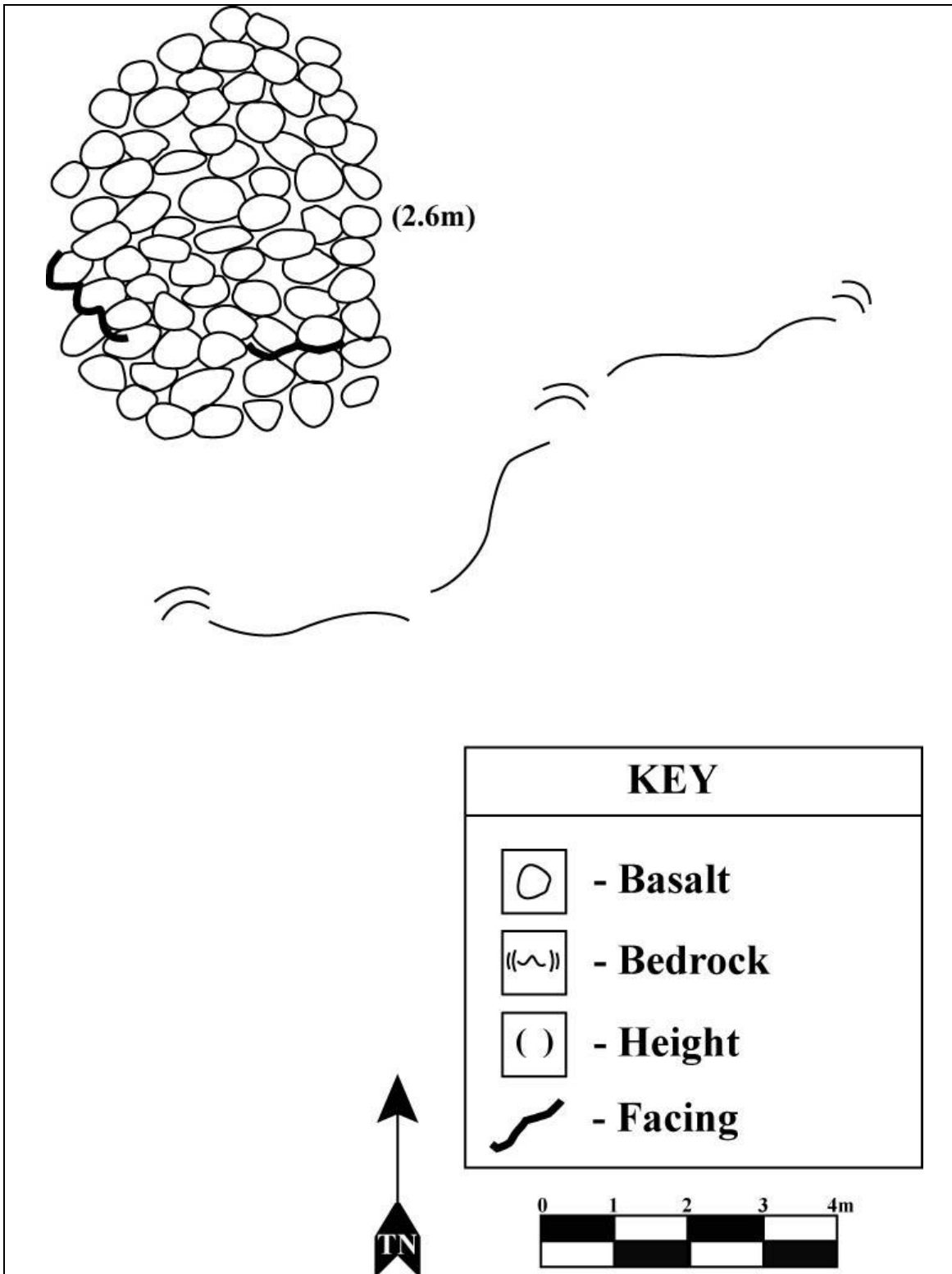


Figure 23: Site 29903 Plan View Map.



Figure 24: Photograph of Site 29903 Looking North.

SITE 29904**Modified Outcrop**

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	18.0 meters (N/S) by 15.0 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29904 consists of an irregularly shaped modified outcrop located approximately twenty-five meters north of Site 29903 (see Figure 12). The feature is located in an area of guava, 'ōhia, and Alexander palm trees growing around exposed bedrock outcrops and thin soil. The surrounding terrain to the west is level grassy fields that appear to have been bulldozed.

The modified outcrop is 18.0 m long (N/S) by 15.0 m wide and is 2.0 meters in maximum height (Figure 25). The feature is constructed of angular and subangular cobbles and small boulders loosely piled on an exposed bedrock outcrop (Figure 26). No stacking or facing is evident in the feature construction. The feature has been slightly altered by weathering and is in fair condition.

The modified outcrop at Site 29901 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

SITE 29905**Rock Mound**

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	5.4 meters Diameter
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None

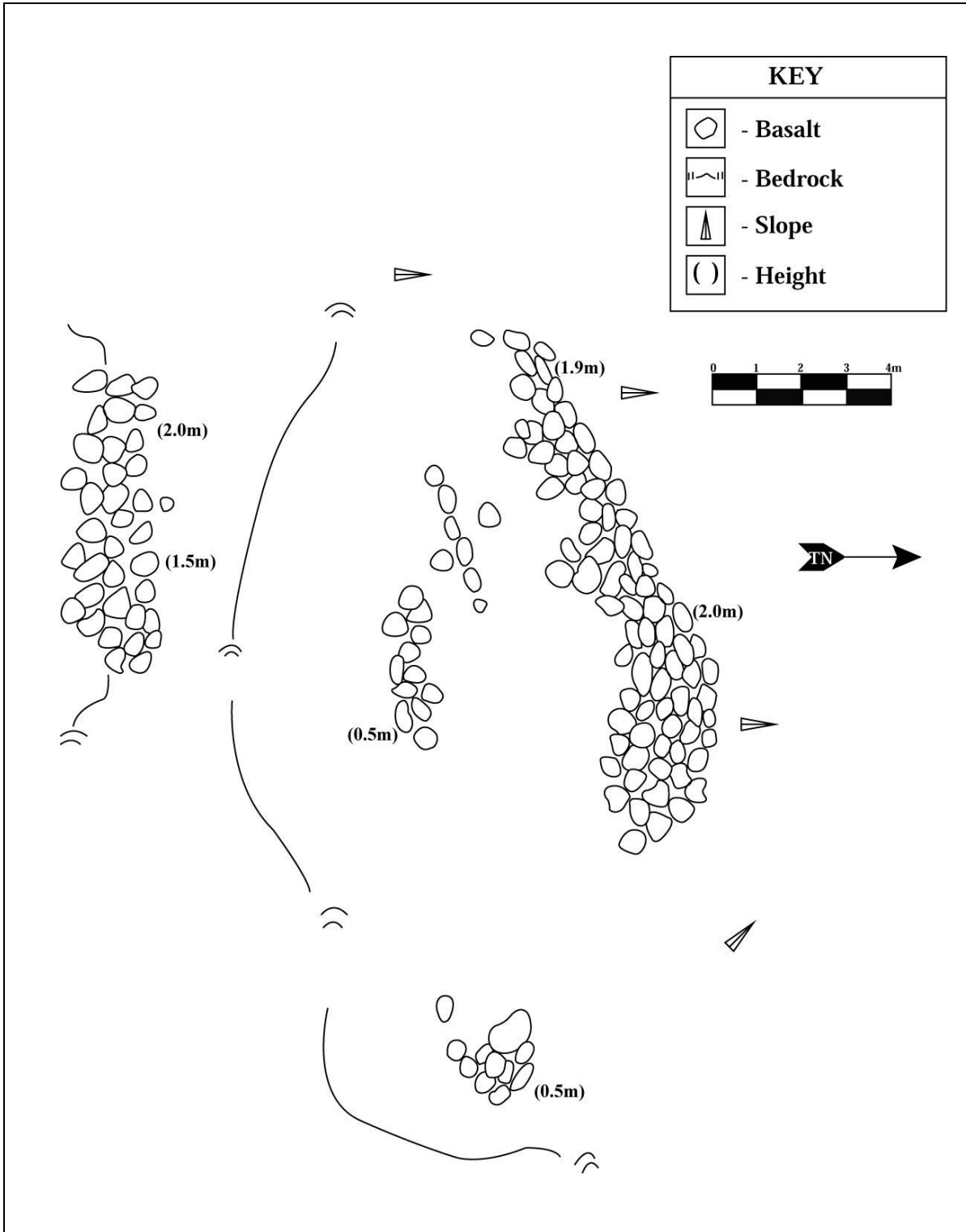


Figure 25: Site 29904 Plan View Map.



Figure 26: Photograph of Site 29904 Looking East.

DESCRIPTION: Site 29905 consists of a roughly circular rock mound located along the western edge of the project area (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 5.4 meters in diameter and is 1.2 meters in maximum height (Figure 27). The feature is constructed of angular and subangular cobbles and small boulders stacked up to six courses high on the ground surface (Figure 28). The top surface of feature is un even and the north, east, and south sides are well faced. The feature has been slightly altered by guava trees and weathering and is in fair condition.

The rock mound at Site 29905 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

SITE 29906

Rock Mounds and Modified Outcrops

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 40.0 meters (N/S) by 40.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: ST-1 & ST-2
DESCRIPTION: Site 29906 consists of seven modified outcrops (Features A, B, C, D, E, H, and I) and two rock mounds (Feature F and G) recorded roughly 130 meters northeast of Site 29905 (see Figure 12 and Figure 29). The features are located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular modified outcrop located at the south end of the site. The modified outcrop is 3.6 m long (E/W) by 2.2 m wide and is 0.8 m in maximum height (Figure 30).

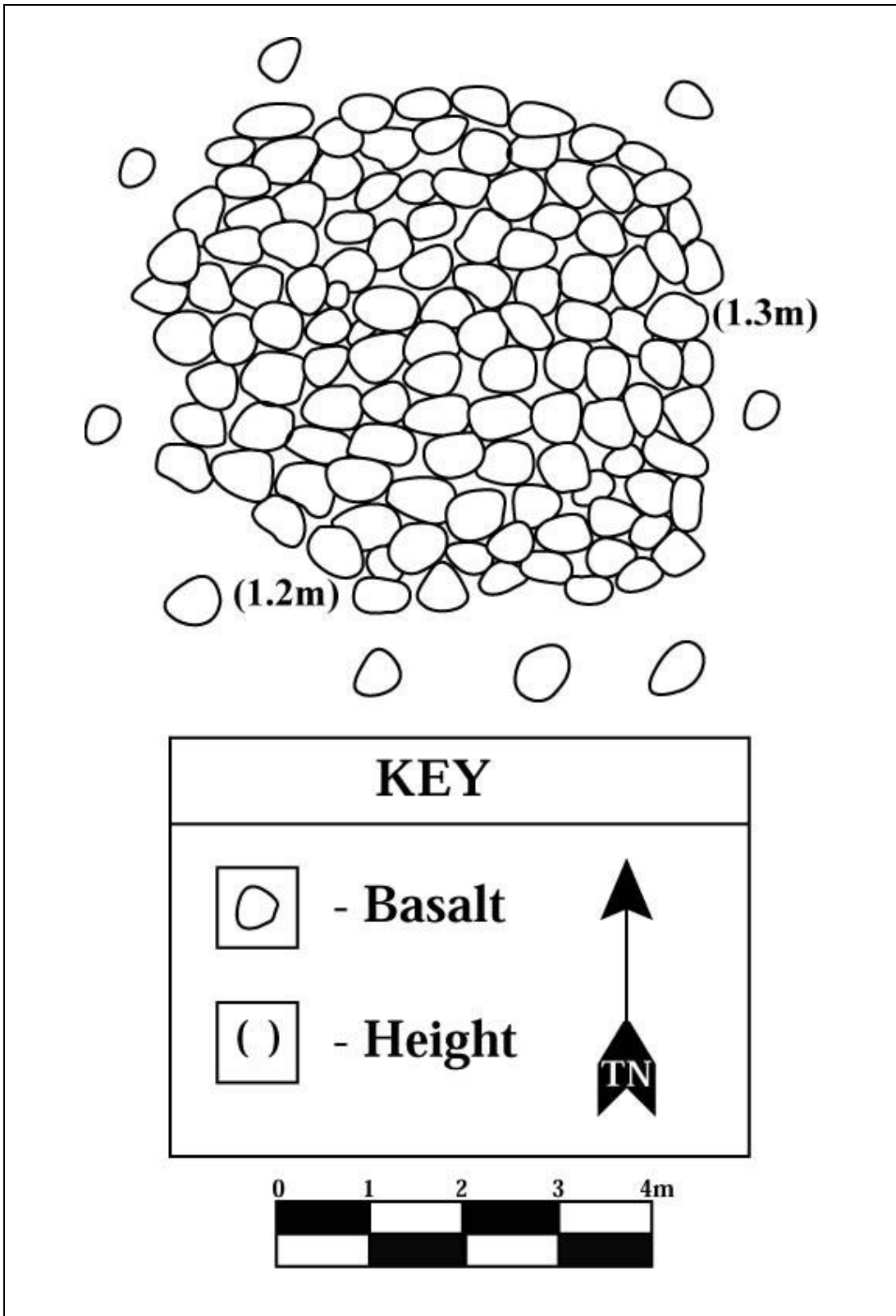


Figure 27: Site 29905 Plan View Map.



Figure 28: Photograph of Site 29905 Looking West.

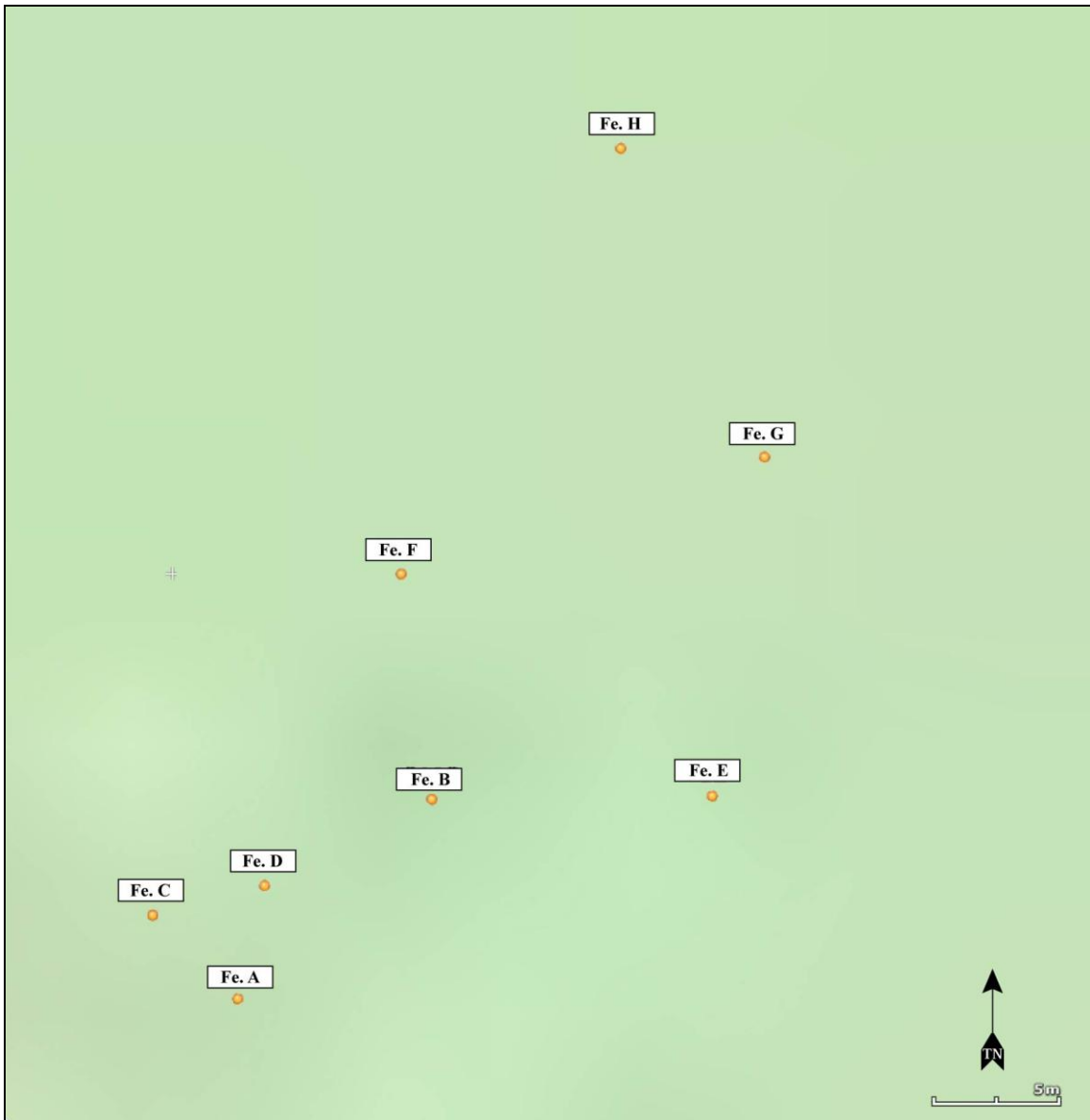


Figure 29: Site 29906 Plan View Showing Feature Locations.

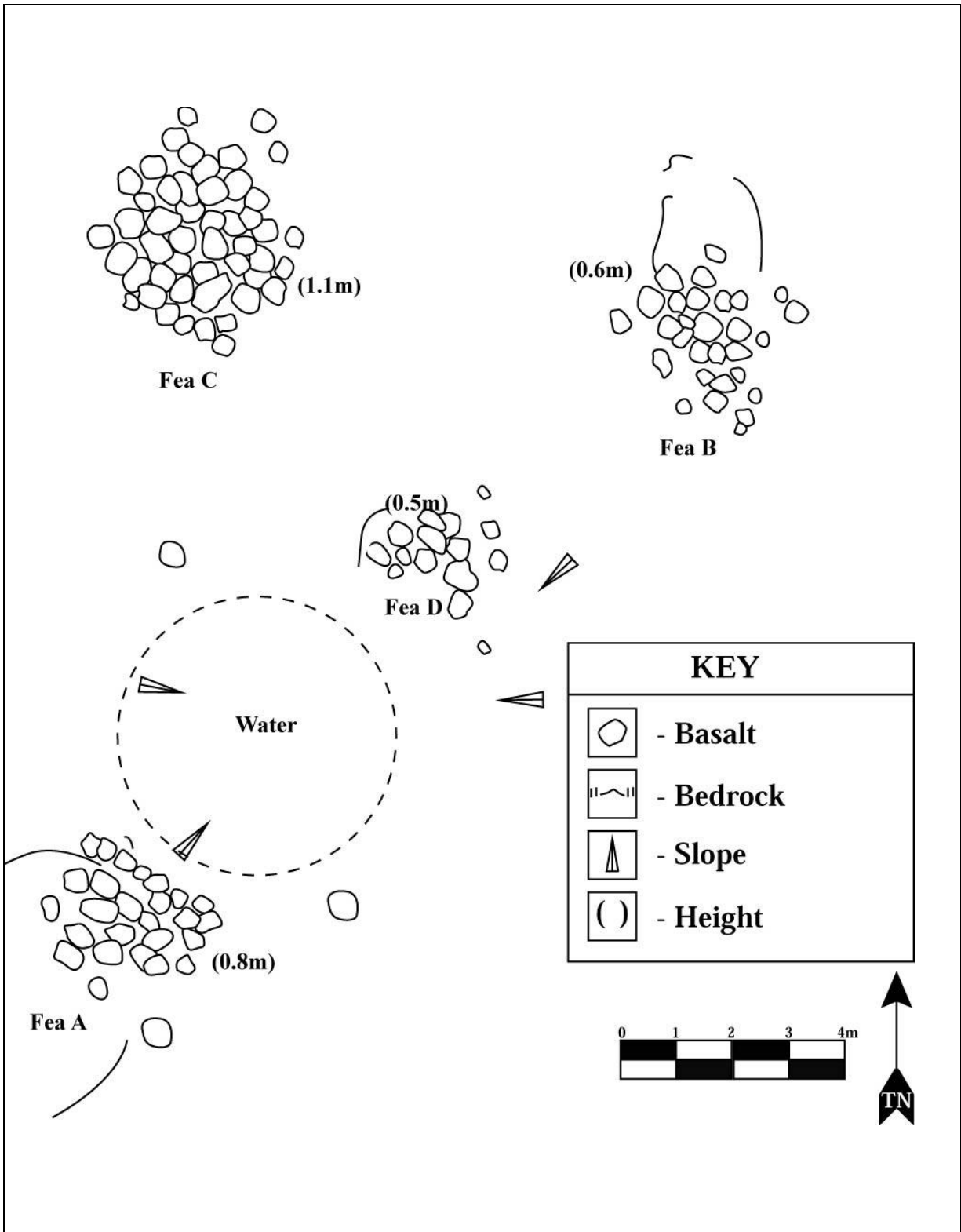


Figure 30: Site 29906 Feature A, B, C, and D Plan View Map.

Feature A is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop (Figure 31). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature A has been altered by guava trees and weathering and is in fair condition.

Feature B is an irregularly shaped modified outcrop located 10.0 meters north of Feature A. The modified outcrop is 2.4 m long (NW/SE) by 1.6 meters and is 0.6 m in maximum height. Feature B is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop (Figure 32). No stacking or facing is evident in the feature construction. Feature B has been altered by guava trees and weathering and is in fair condition.

Feature C is a roughly square modified outcrop located 4.0 meters northwest of Feature B. The modified outcrop is 3.4 m long (NW/SE) by 3.4 m wide and is 1.1 m in maximum height. Feature C is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop (Figure 33). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature C has been altered by guava trees and weathering and is in fair condition.

Feature D is a roughly circular modified outcrop located 5.0 meters north of Feature A. The modified outcrop is 1.6 m in diameter and is 0.5 m in maximum height. Feature D is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop (Figure 34). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature D has been altered by guava trees and weathering and is in fair condition.

Feature E is roughly rectangular modified outcrop located thirteen meters northeast of Feature D (Figure 35). The modified outcrop is 6.1 m long (NW/SE) by 1.5 meters and is 0.5 m in maximum height. Feature E is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop (Figure 36). No stacking or facing is evident in the feature construction. Feature E has been altered by guava trees and weathering and is in fair condition.



Figure 31: Photograph of Site 29906 Feature A Looking West.



Figure 32: Photograph of Site 29906 Feature B Looking East.



Figure 33: Photograph of Site 29906 Feature C Looking Northeast.



Figure 34: Photograph of Site 29906 Feature D Looking East.

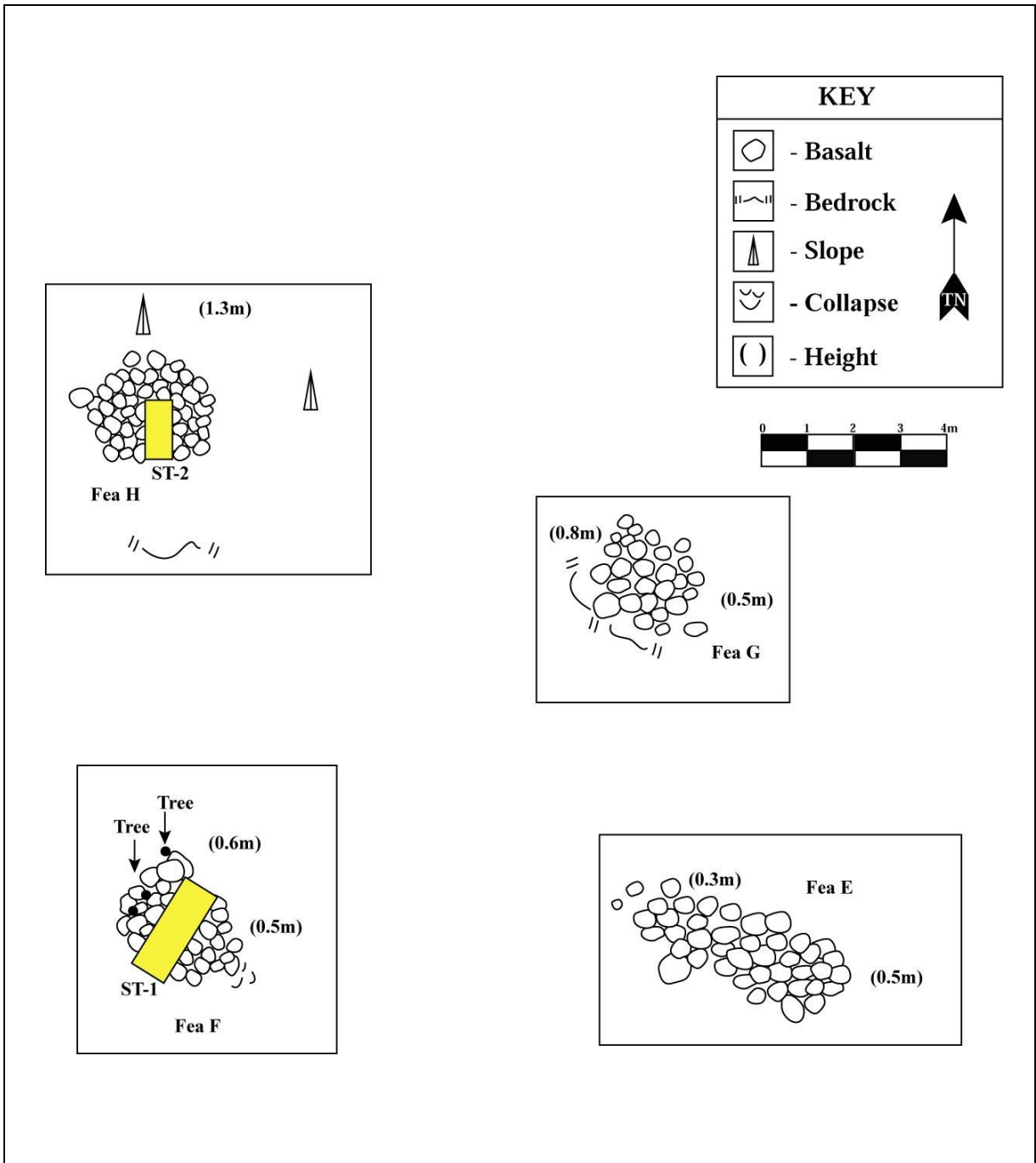


Figure 35: Site 29906 Feature E, F, G, and H Plan Views.



Figure 36: Photograph of Site 29906 Feature E Looking East.

Feature F consists of a roughly rectangular rock mound located approximately twelve meters northeast of Feature D (see Figure 29 and Figure 35). Feature F measures 2.6 m long (NW/SE) by 2.4 m wide and is 0.6 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders piled onto the ground surface. Feature F has been altered by guava trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 2.20 meter long (NE/SW) by 1.0 m wide unit excavated through the center of Feature F. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 20 cmbs, and terminated on bedrock (Figure 37).

The Architectural Layer (0-92 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus. The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-12 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 20% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock (Figure 38).

Feature G consists of a roughly rectangular rock mound located approximately seven meters north of Feature E (see Figure 29 and Figure 35). Feature G measures 1.9 m long (NW/SE) by 1.7 m wide and is 0.9 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders piled onto the ground surface. Feature G has been altered by guava trees and weathering and is in fair condition.

Feature H is roughly square modified outcrop located nine meters northwest of Feature G (see Figure 26 and Figure 32). The modified outcrop is 2.5 m long (N/S) by 2.5 meters and is 1.3 m in maximum height. Feature H is constructed of angular and subangular cobbles and small boulders piled on an exposed bedrock outcrop.

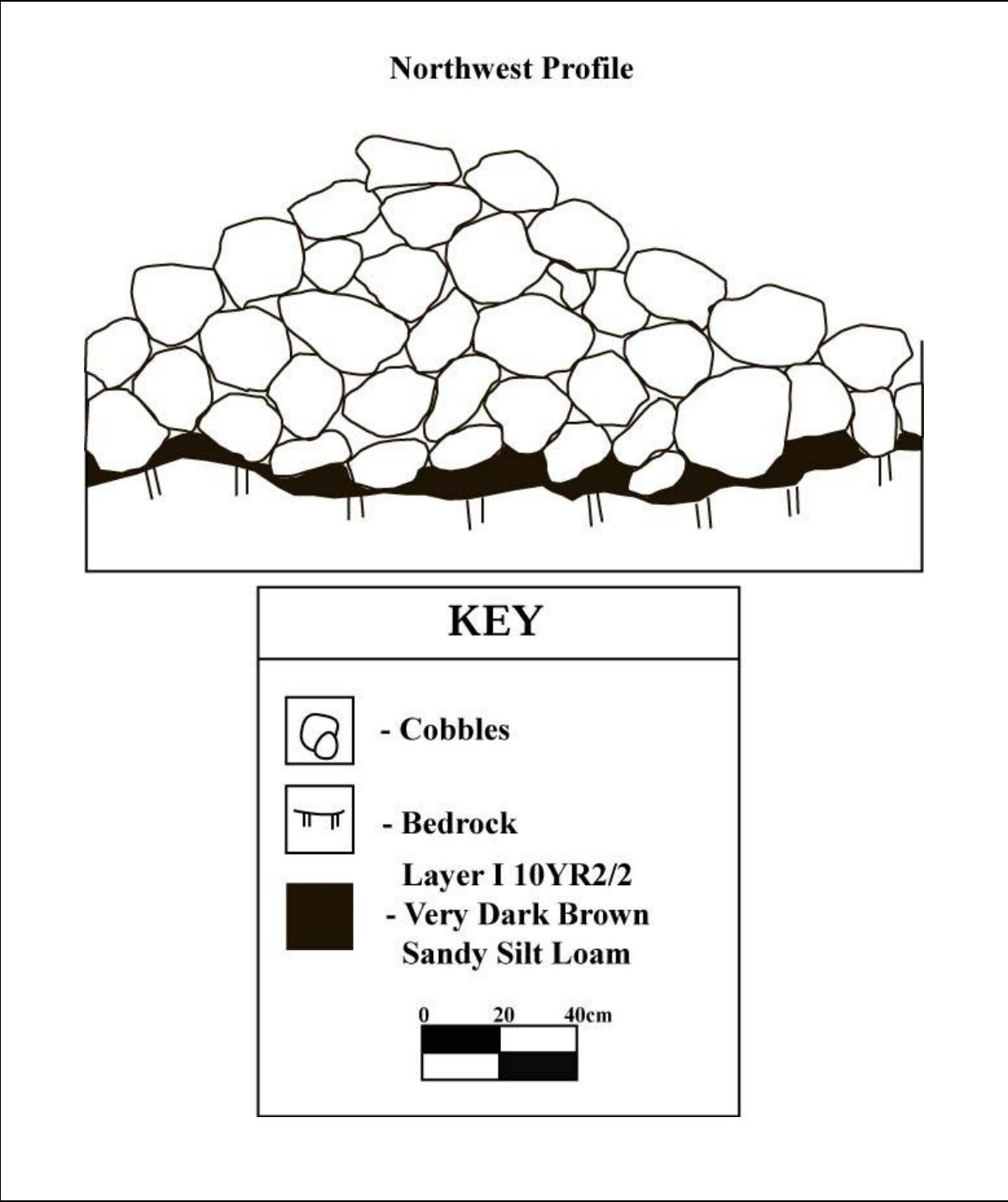


Figure 37: Site 29906 Feature F ST-1 Northeast Profile.



Figure 38: Photograph of Site 29906 Feature F ST-1 Southwest Profile.

No stacking or facing is evident in the feature construction. Feature H has been altered by guava trees and weathering and is in fair condition.

Stratigraphic Trench 2

ST-2 was a 1.0 meter long (N/S) by 0.5 m wide unit excavated through the center of Feature H. ST-2 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 25 cmbs, and terminated on bedrock (Figure 39).

The Architectural Layer (0-60 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus. The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-26 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 5% angular and subangular pebbles, and 5% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock (Figure 40).

Feature I is an irregularly shaped modified outcrop located along the east side of the site. Feature I measures 23.0 m long (NE/SW) by 18.0 m wide and is 1.5 m in maximum height (Figure 41). The feature is constructed of angular and subangular cobbles and small boulders piled onto a long, irregularly shaped, exposed bedrock outcrop. Feature I has been altered by guava trees and weathering and is in fair condition.

The modified outcrops and rock mounds at Site 29906 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

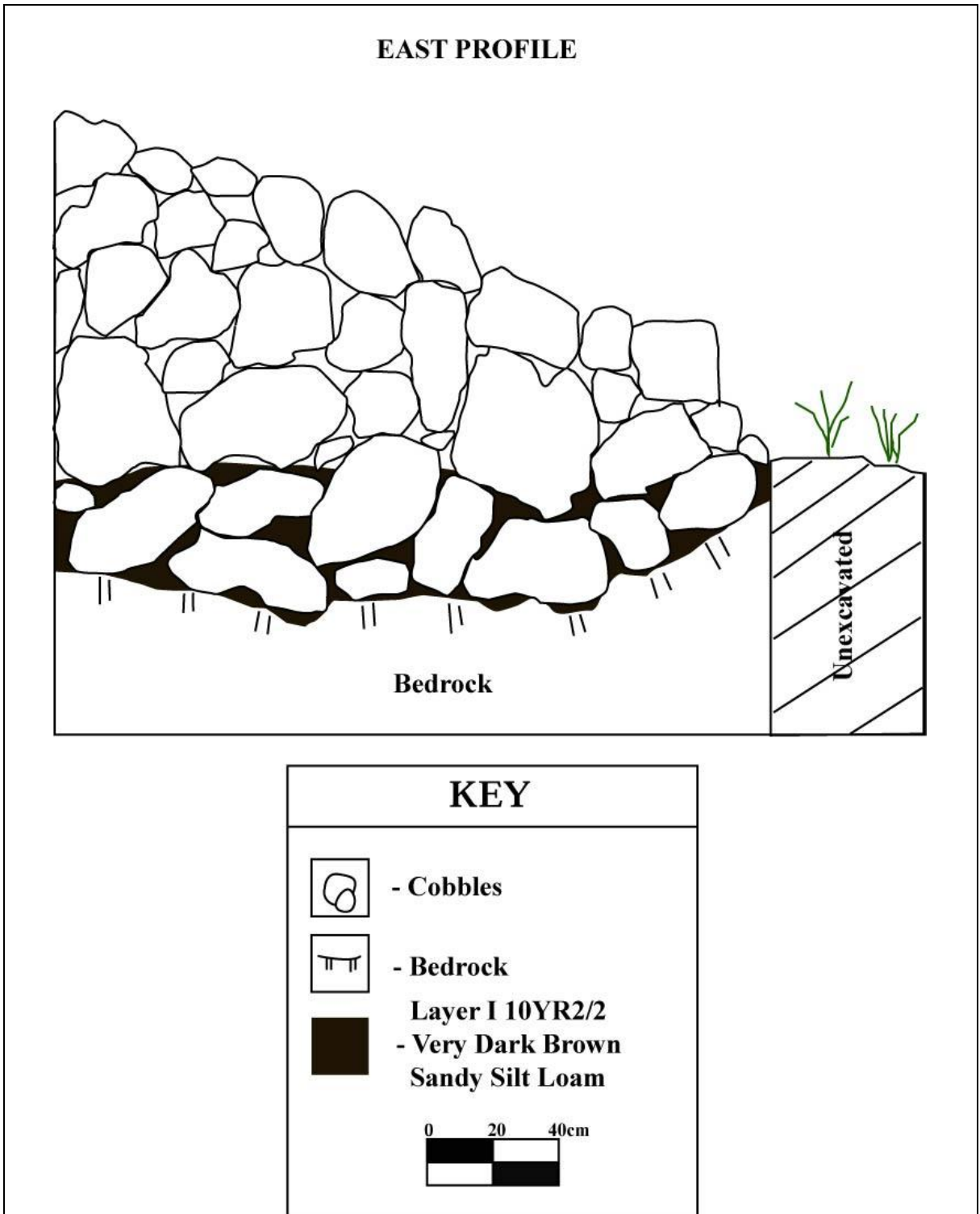


Figure 39: Site 29906 Feature H ST-2 East Profile.



Figure 40: Site 29906 Feature H ST-2 Post-Excavation Photograph.

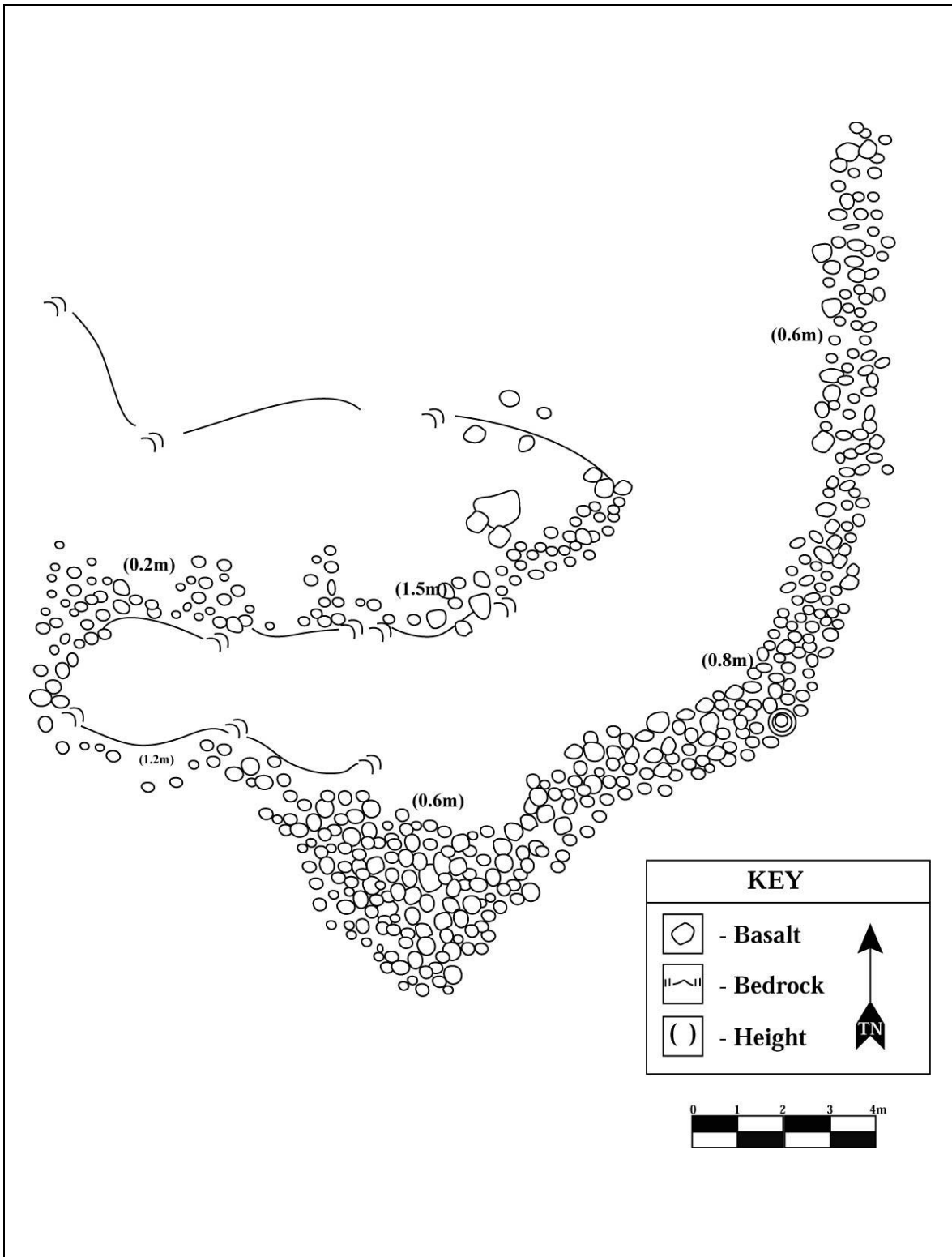


Figure 41: Site 29906 Feature I Plan View.

SITE 29907**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 3.0 meters (N/S) by 3.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29907 consists of a roughly square rock mound located approximately 50 meters northeast of Site 29906 (see Figure 12). The feature is located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 3.0 m long (N/S) by 3.0 m wide and is 1.2 meters in maximum height (Figure 42). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 43). The feature is conical in shape and is not faced. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29907 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29908**Rock Mounds**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 40.0 meters (N/S) by 30.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: ST-1
DESCRIPTION: Site 29908 consists of five rock mounds (Features A through E) recorded forty meters south of Site 29909 (see Figure 12). The features are

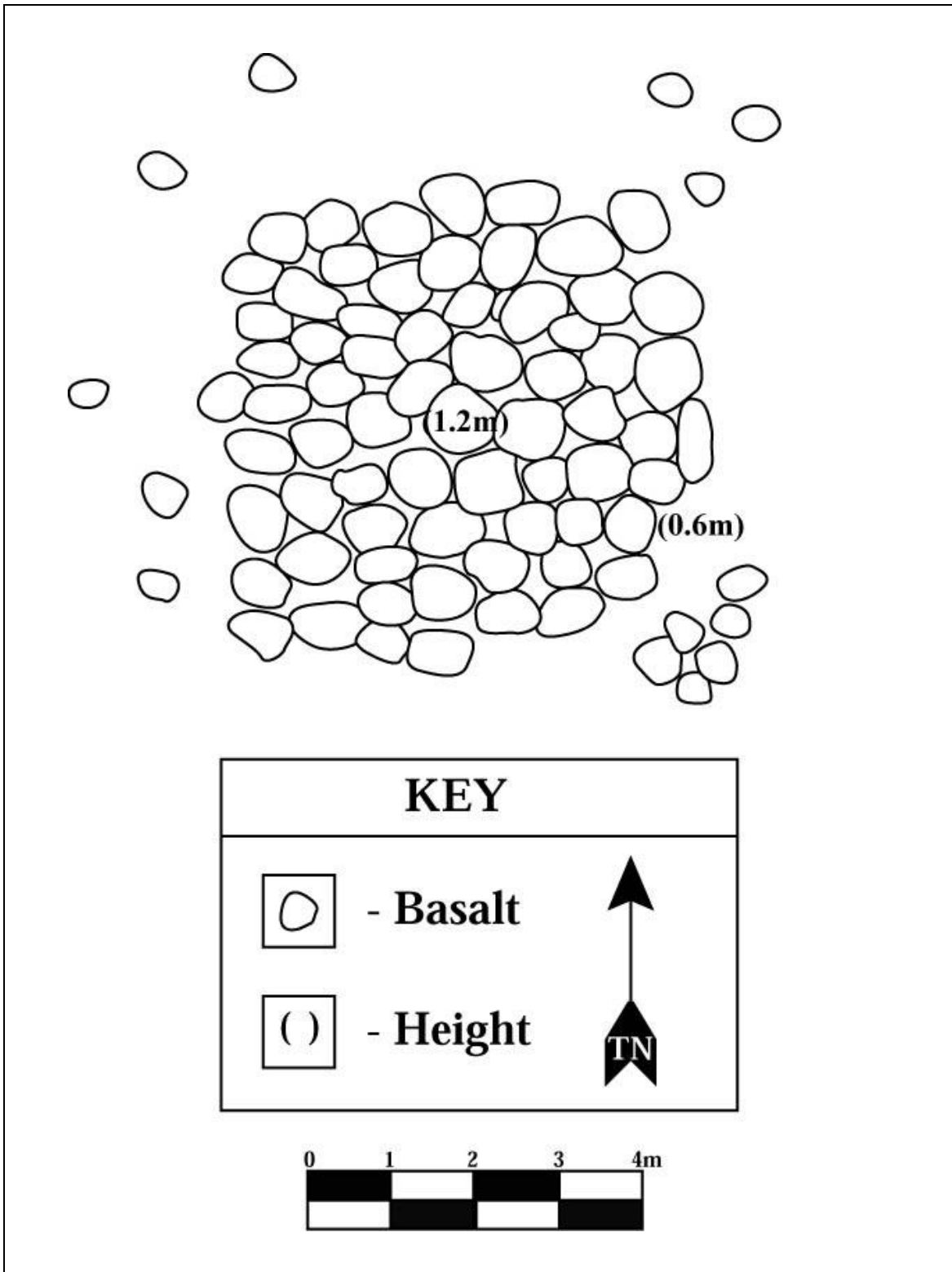


Figure 42: Site 29907 Plan View Map.



Figure 43: Photograph of Site 29907 Looking West.

located in a thicket of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular rock mound located at the north end of the site (Figure 44). The rock mound is 2.5 m long (N/S) by 1.8 m wide and is 1.5 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled and stacked up to five courses high on the ground surface (Figure 45). The feature is slightly mounded in shape. The southern end of the feature is well faced. Feature A has been altered by banyan trees and weathering and is in fair condition.

Feature B consists of a roughly rectangular rock mound located approximately fifteen meters southwest of Feature A. Feature B measures 2.2 m long (N/S) by 2.2 m wide and is 1.0 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 46). No stacking or facing is evident on the ground surface. Feature B has been altered by banyan trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 1.50 meter long (E/W) by 0.8 m wide unit excavated through the center of Feature B. ST-1 contained an architectural layer and two natural stratigraphic layers, was excavated to a maximum depth of 38 cmbs, and terminated on bedrock (Figure 47).

The Architectural Layer (0-0.5 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus. The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and continued below Layer I sediment.

Layer I (0-20 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and small boulders, and 5% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and wavy, and terminated on Layer II sediment.

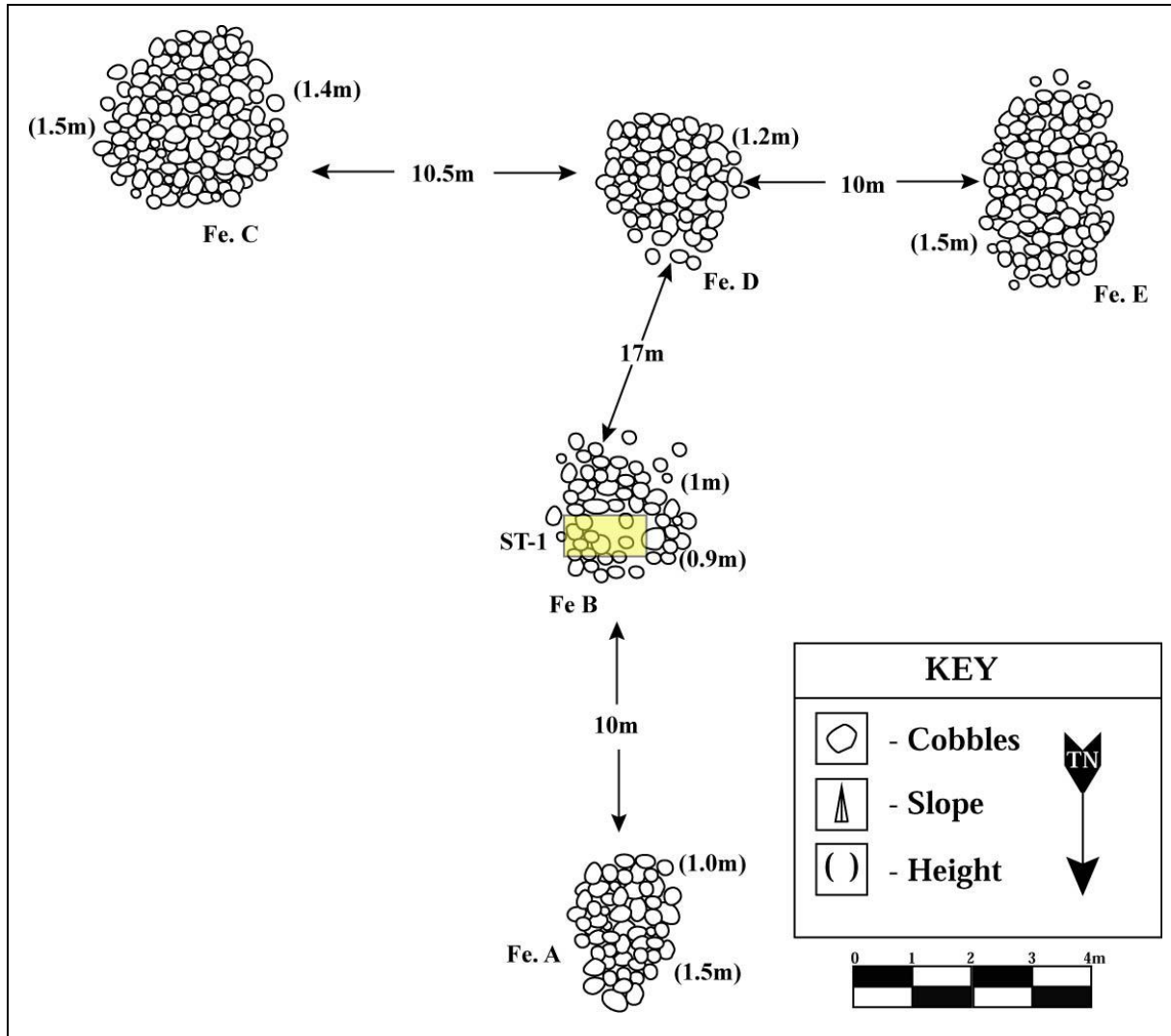


Figure 44: Site 29908 Plan View Map.



Figure 45: Photograph of Site 29908 Feature A Looking North.



Figure 46: Photograph of Site 29908 Feature B Looking North.

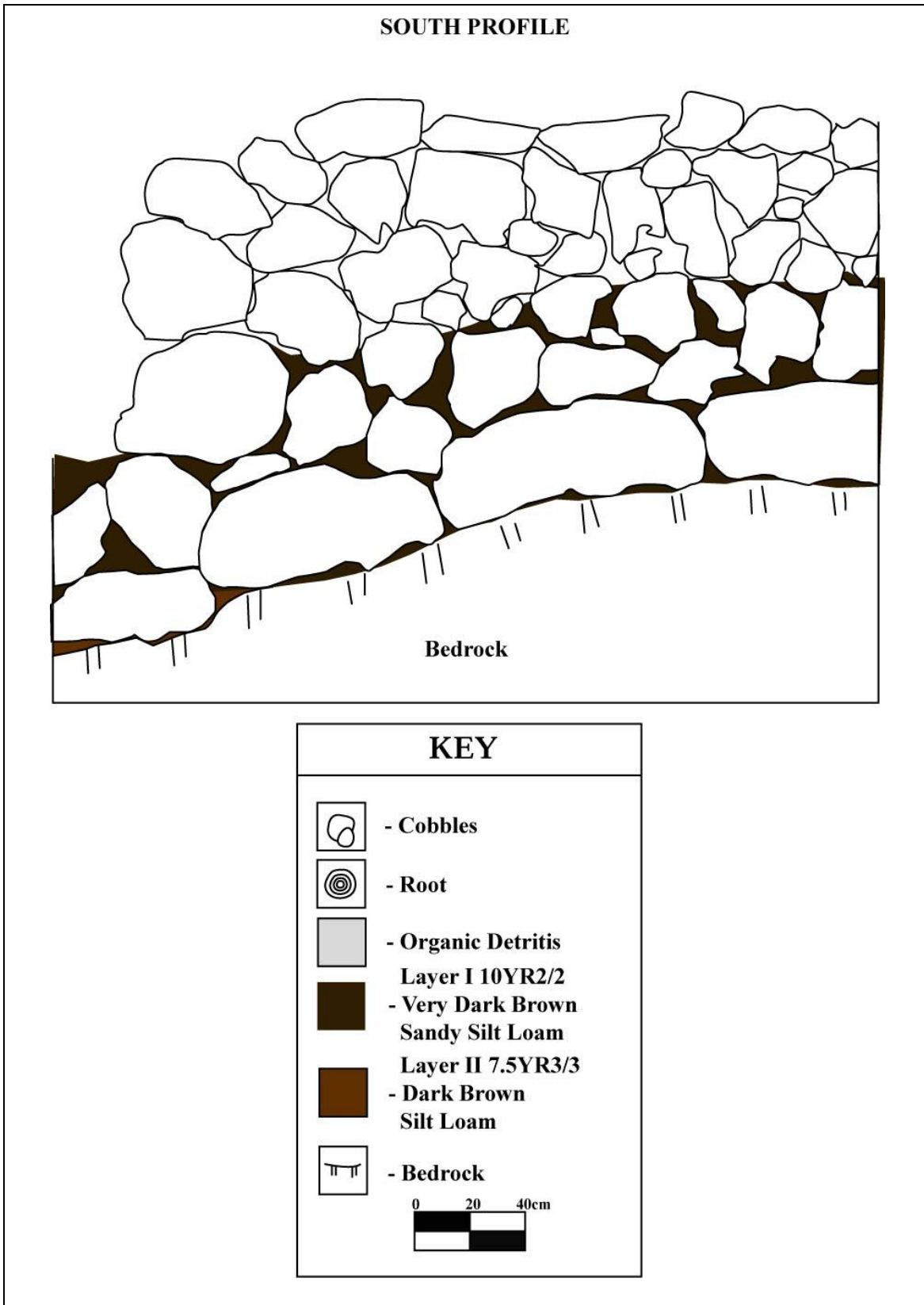


Figure 47: Site 29908 Feature B ST-1 South Profile.

Layer II (20-38 cmbs) was soft dark brown (7.5YR3/3) sandy silt with no rock, and 5% small roots. Layer II did not contain cultural material. The base of Layer II was clear and even, and terminated on bedrock.

Feature C is a roughly circular rock mound located seventeen meters southeast of Feature B. The rock mound is 3.0 meters in diameter and is 1.5 m in maximum height. Feature C is constructed of angular and subangular cobbles and small boulders piled and loosely stacked on the ground surface (Figure 48). The feature is slightly mounded in shape. There is some rough facing on the north side of the rock mound. Feature C has been altered by banyan trees and weathering and is in fair condition.

Feature D is a roughly circular rock mound located ten meters west of Feature C. The rock mound is 2.4 meters in diameter and is 1.2 m in maximum height. Feature D is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 49). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature D has been altered by banyan trees and weathering and is in fair condition.

Feature E is a roughly circular rock mound located ten meters west of Feature D. The rock mound is 3.6 meters Long (N/S) by 1.9 m wide and is 1.5 m in maximum height. Feature E is constructed of angular and subangular cobbles and small boulders piled and stacked on the ground surface (Figure 50). The feature is slightly mounded in shape. The rock mound is roughly faced along a portion of its northeast side. Feature E has been altered by banyan trees and weathering and is in fair condition.

The rock mounds at Site 29908 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.



Figure 48: Photograph of Site 29908 Feature C Looking East.



Figure 49: Photograph of Site 29908 Feature D Looking East.



Figure 50: Photograph of Site 29908 Feature E Looking Southwest.

SITE 29909**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 2.5 meters (E/W) by 2.2 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29909 consists of a rectangular rock mound located in the center of the project area (see Figure 12). The feature is located in a stand of guava and banyan trees in an area of exposed bedrock outcrop. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 2.5 m long (E/W) by 2.2 m wide and is 1.4 meters in maximum height (Figure 51). The feature is constructed of angular and subangular cobbles and small boulders piled and stacked up to nine courses high on the ground surface (Figure 52). The feature is well faced. The feature has been slightly altered by banyan trees and weathering and is in good condition.

The rock mound at Site 29909 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

SITE 29910**Rock Mounds**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 55.0 meters (E/W) by 25.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: ST-1
DESCRIPTION: Site 29910 consists of five rock mounds (Features A through E) recorded thirty-five meters east of Site 29909 (see Figure 12, Figure 53 and

Figure 54). The features are located in a thicket of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

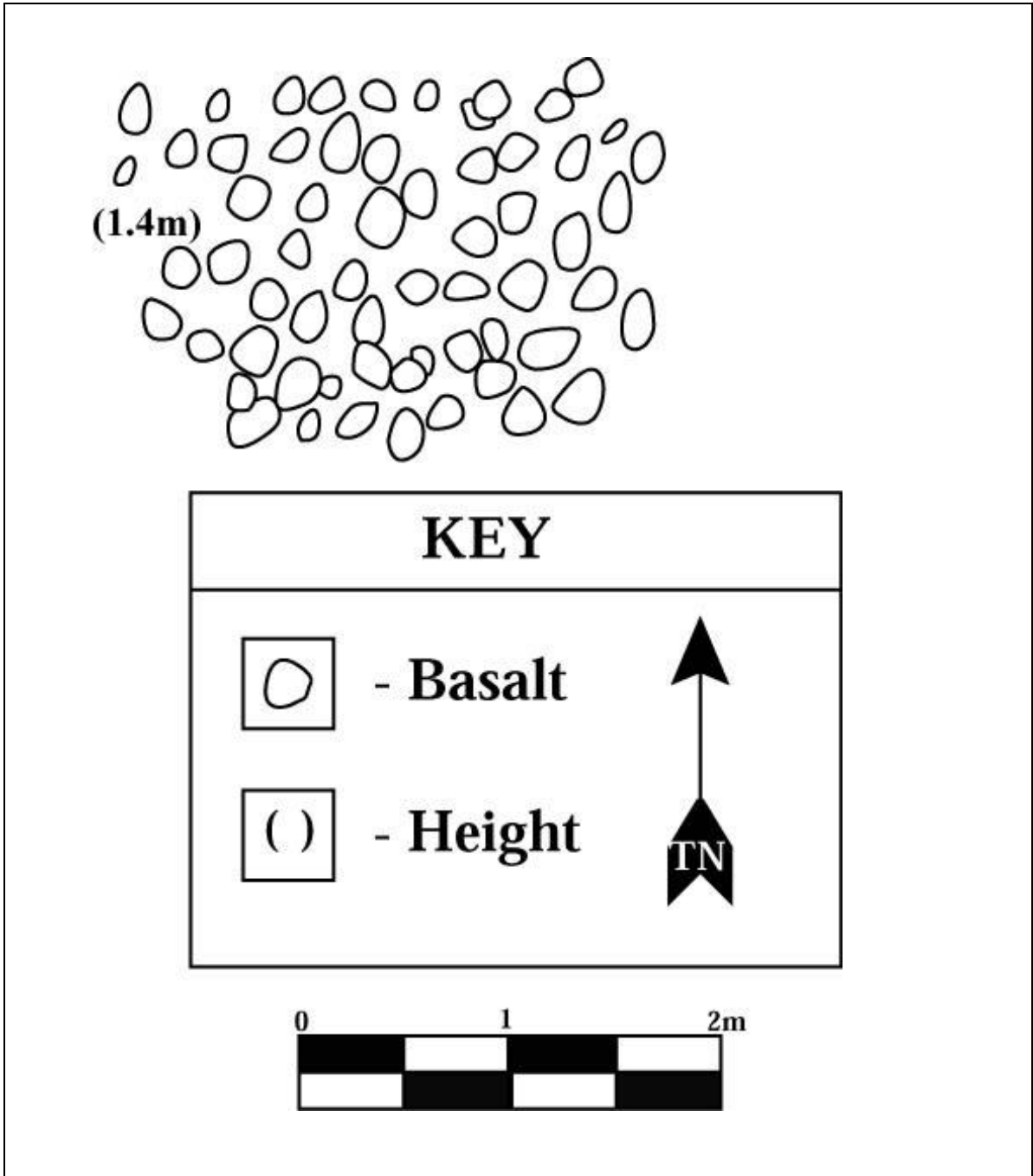


Figure 51: Site 29909 Plan View Map.



Figure 52: Photograph of Site 29909 Looking Northwest.

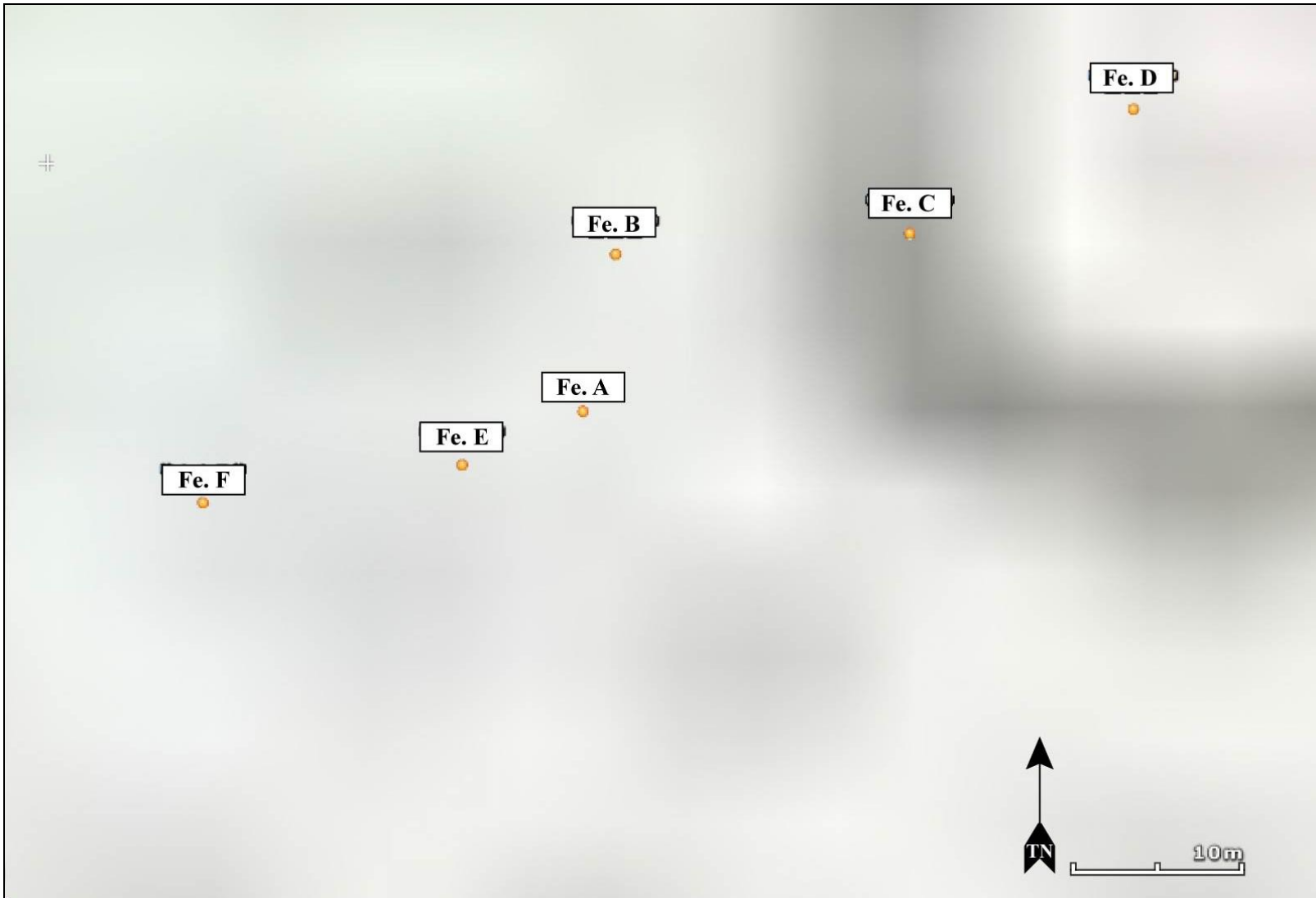


Figure 53: Site 29910 Plan View Map.

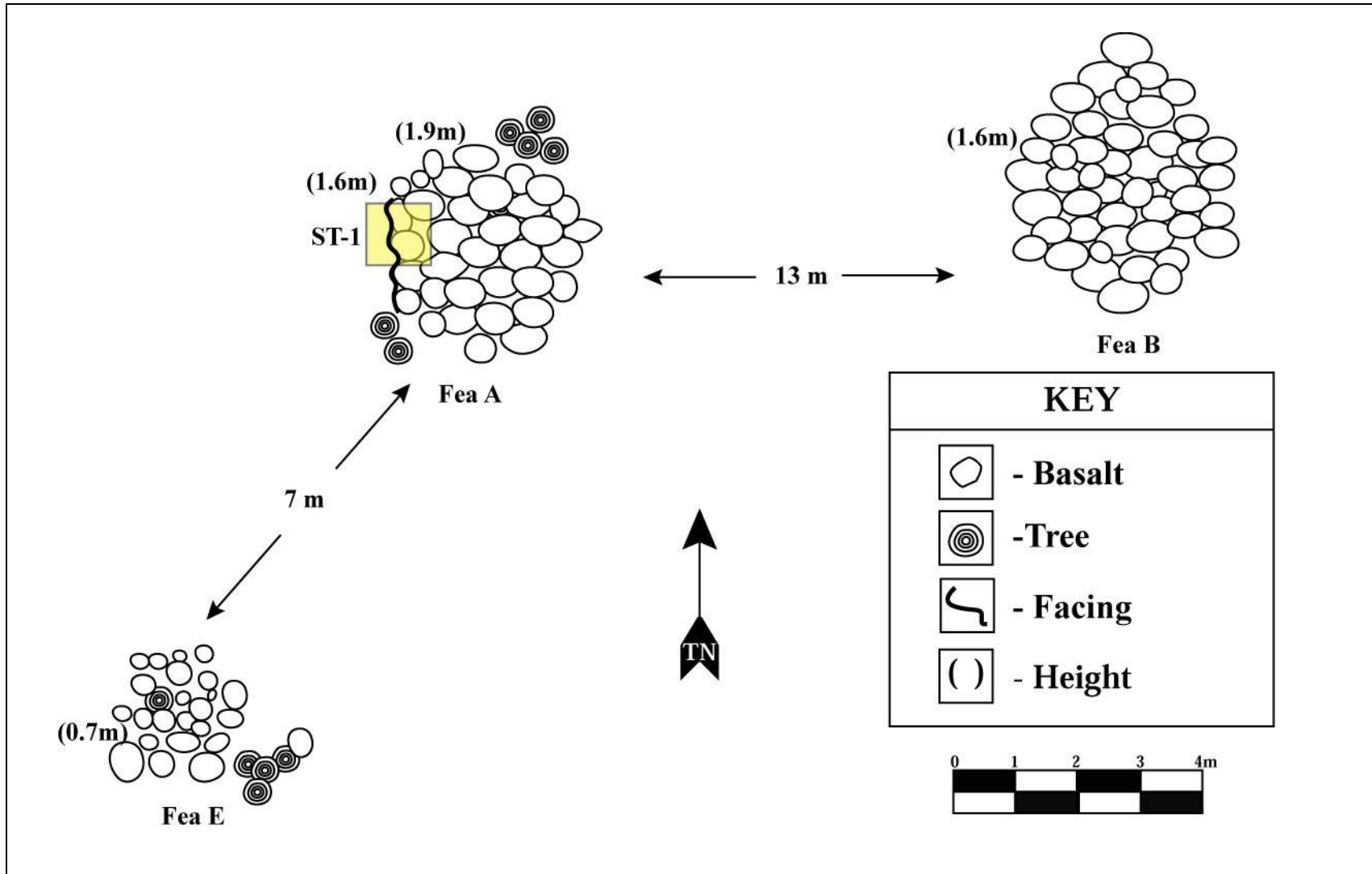


Figure 54: Site 29910 Feature A, B, and E Plan View Map.

Feature A is a roughly rectangular rock mound located at the north end of the site (see Figure 54). The rock mound is 3.5 m long (E/W) by 3.2 m wide and is 1.6 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled and stacked up to five courses high on the ground surface (Figure 55). The feature is slightly mounded in shape. Portions of the west and south sides are well faced. Feature A has been altered by guava trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 1.0 meter long (N/S) by 1.0 m wide unit excavated into the west side of Feature A. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 20 cmbs, and terminated on bedrock (Figure 56).

The Architectural Layer (0-85 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 57). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-20 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 10% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and wavy, and terminated on bedrock (Figure 58).

Feature B consists of an oval rock mound located approximately nine meters northeast of Feature A. Feature B measures 4.3 m long (N/S) by 3.8 m wide and is 1.6 m in maximum height (see Figure 54). The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 59). The feature is slightly mounded in shape. No stacking or facing is evident in the ground surface. Feature B has been altered by guava trees and weathering and is in fair condition.

Feature C is a roughly circular rock mound located seventeen meters east of Feature B (Figure 60). The rock mound is 4.2 meters in diameter and is 1.8 m in maximum height. Feature C is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 61).



Figure 55: Photograph of Site 29910 Feature A Looking East.

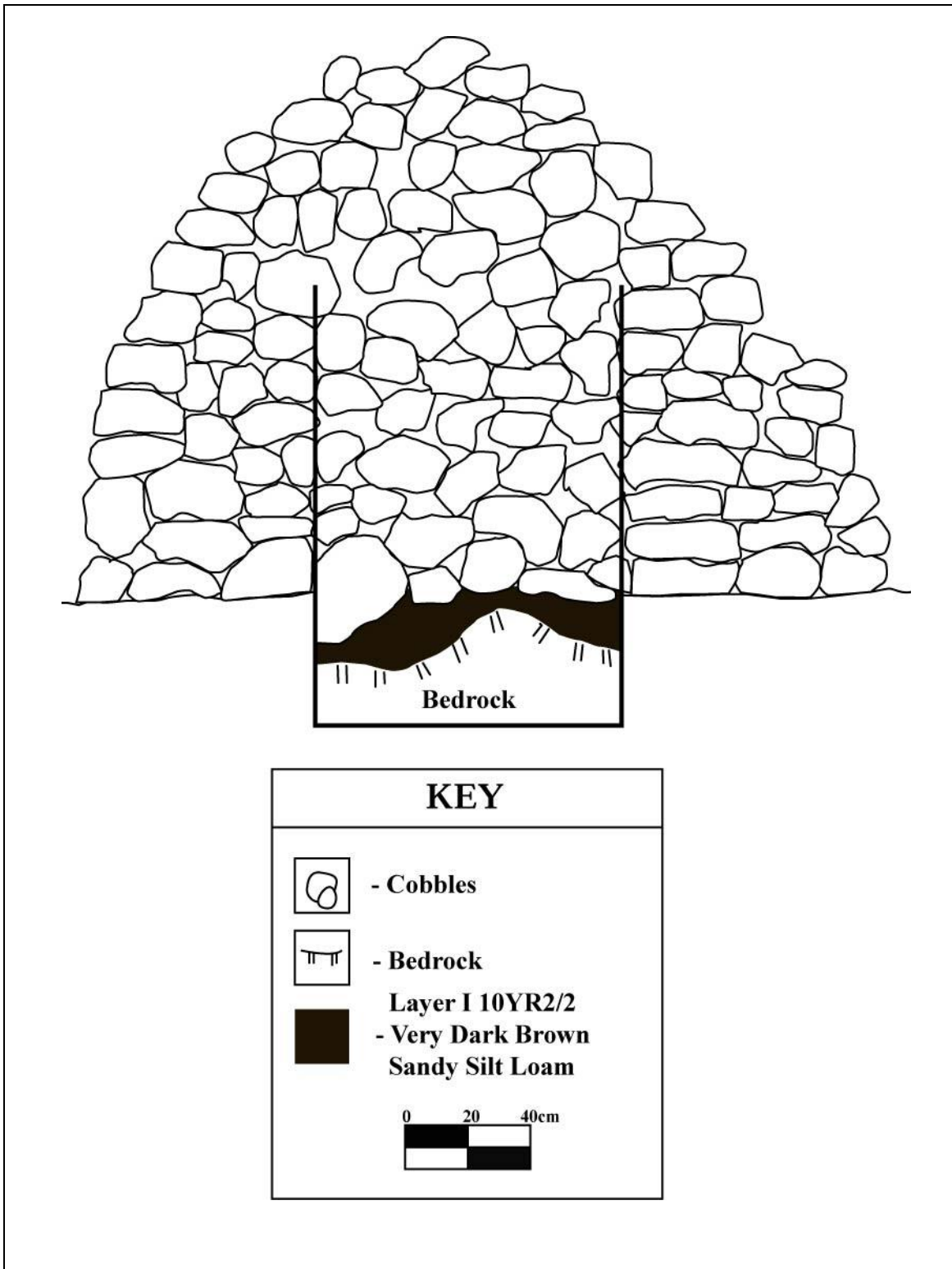


Figure 56: Site 29910 Feature A ST-1 East Profile.



Figure 57: Site 29910 Feature A ST-1 Profile Showing Architectural Layer, Looking Southeast.



Figure 58: Site 29910 Feature A ST-1 Base of Excavation Looking Southeast.



Figure 59: Photograph of Site 29910 Feature B Looking West.

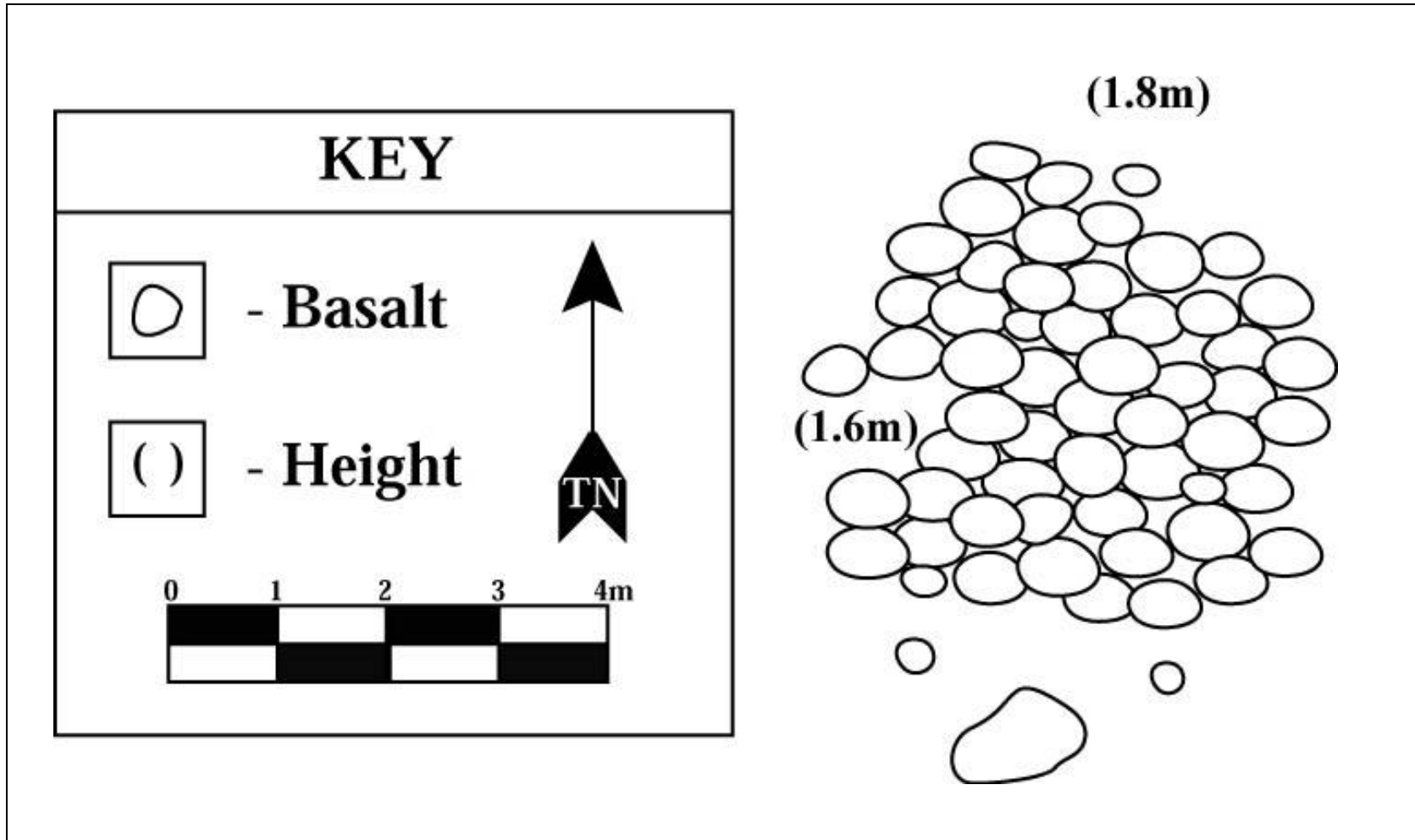


Figure 60: Site 29910 Feature C Plan View Map.



Figure 61: Photograph of Site 29910 Feature C Looking East.

The feature is slightly mounded in shape. No stacking or facing is evident in the ground surface. Feature C has been altered by guava trees and weathering and is in fair condition.

Feature D is a roughly rectangular rock mound located fifteen meters northeast of Feature C. The rock mound is 4.8 meters long (E/W) by 2.4 meters wide and is 1.5 m in maximum height (Figure 62). Feature D is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 63). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature D has been altered by guava trees and weathering and is in fair condition.

Feature E is a roughly rectangular rock mound located seven meters southwest of Feature A. The rock mound is 1.8 meters Long (N/S) by 1.4 m wide and is 0.7 m in maximum height (see Figure 54). Feature E is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 64). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature E has been altered by guava trees and weathering and is in fair condition.

Feature F is a roughly rectangular rock mound located fifteen meters southwest of Feature E. The rock mound is 4.7 meters Long (E/W) by 2.6 m wide and is 1.6 m in maximum height (Figure 65). Feature F is constructed of angular and subangular cobbles and small boulders piled and stacked up to five courses on the ground surface. The rock mound is roughly faced along portions of its north and south sides. Feature E has been altered by guava trees and weathering and is in fair condition.

The rock mounds at Site 29910 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

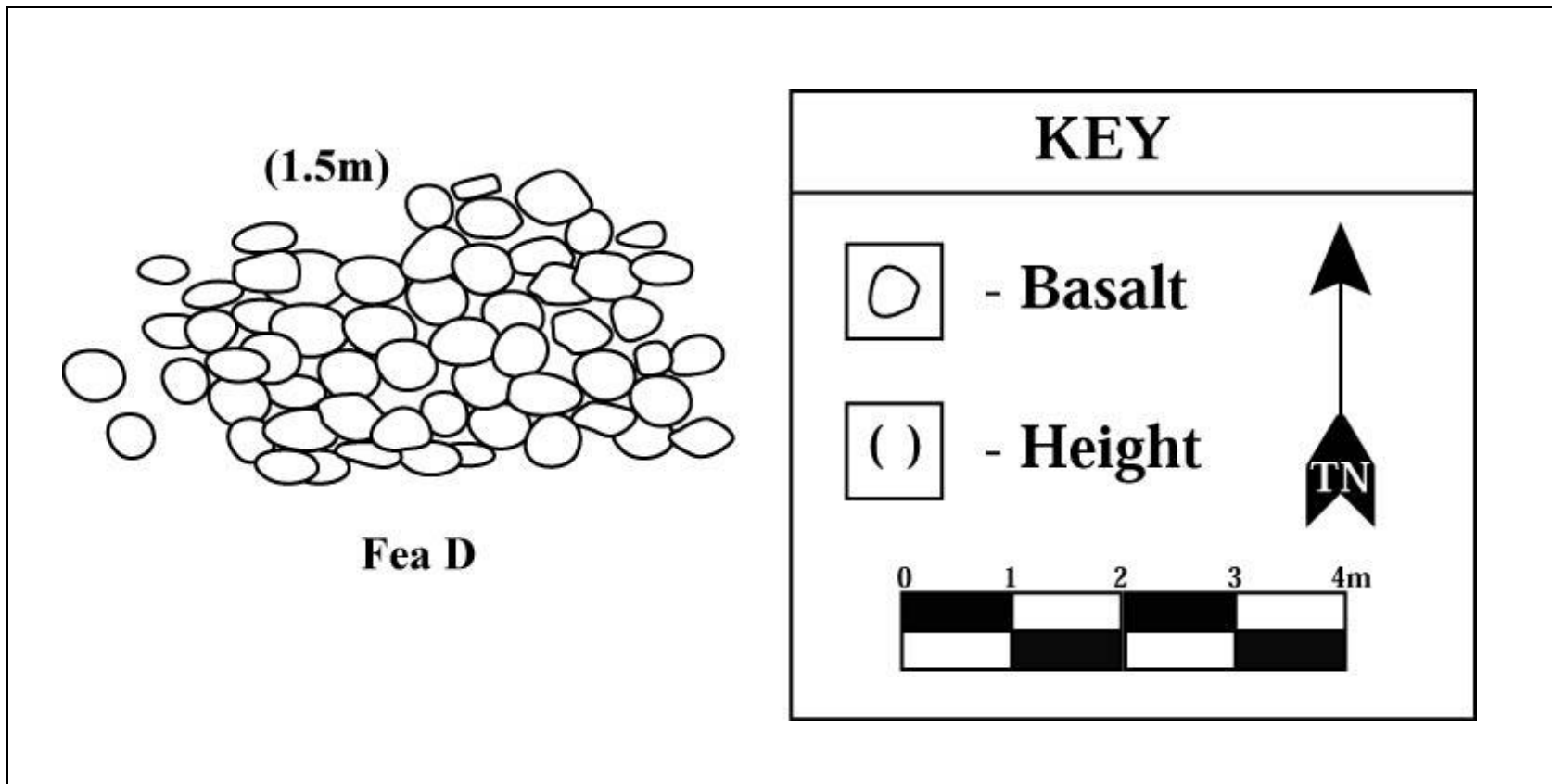


Figure 62: Site 29910 Feature D Plan View Map.



Figure 63: Photograph of Site 29910 Feature D Looking East.



Figure 64: Photograph of Site 29910 Feature E Looking Northwest.

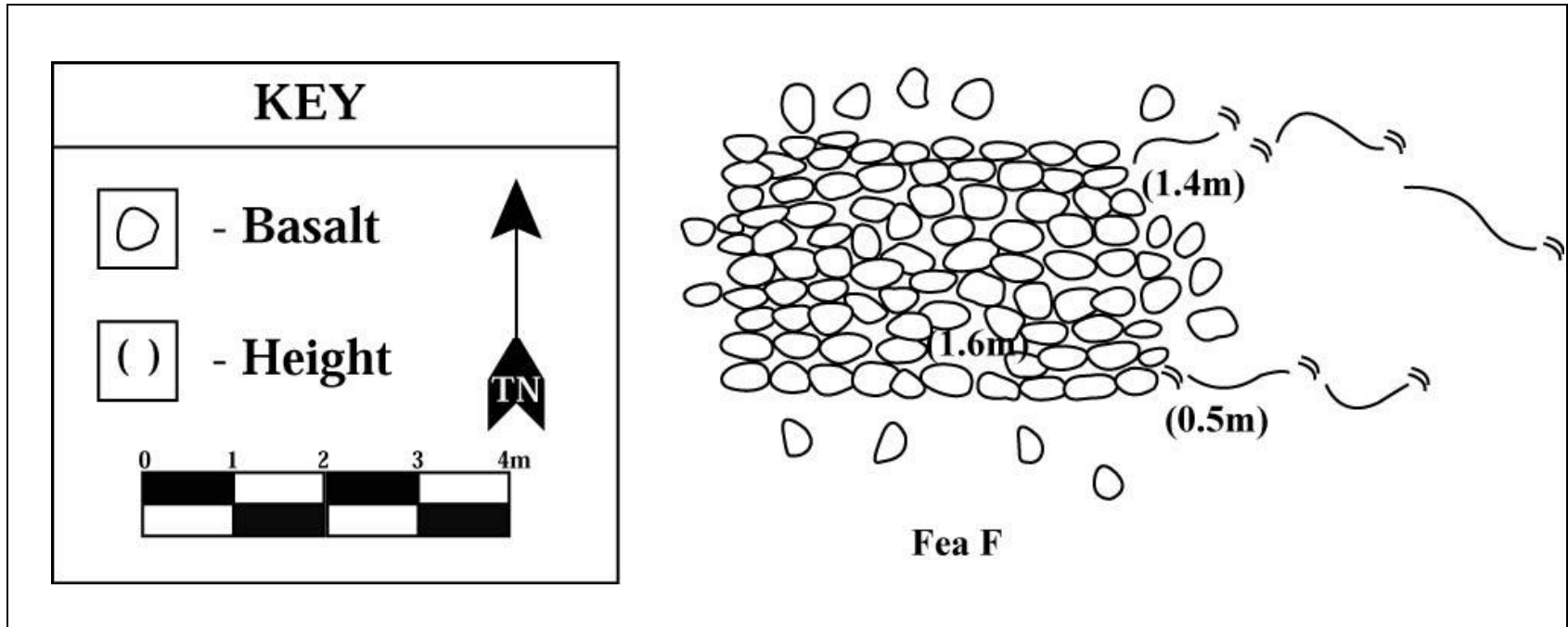


Figure 65: Site 29910 Feature F Plan View Map.

SITE 29911**Rock Mounds**

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	30.0 meters (E/W) by 8.0 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29911 consists of two rock mounds (Feature A and Feature B) recorded fifty meters northwest of Site 29910 (see Figure 12). The features are located in a stand of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Site 29911 consists of two rock mounds (Feature A and Feature B) recorded fifty meters northwest of Site 29910 (see Figure 12). The features are located in a stand of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular rock mound located at the west end of the site (Figure 66). The rock mound is 4.4 m long (N/S) by 3.8 m wide and is 1.9 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled and stacked up to six courses high on the ground surface (Figure 67). There rock mound is faced along portions of its west side. Feature A has been altered by banyan trees and weathering and is in fair condition.

Feature B consists of a roughly rectangular rock mound located approximately eighteen meters east of Feature A. Feature B measures 5.2 m long (N/S) by 3.9 m wide and is 0.8 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 68). No stacking or facing is evident in the ground surface. Feature B has been altered by guava trees and weathering and is in fair condition.

The rock mounds at Site 29911 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

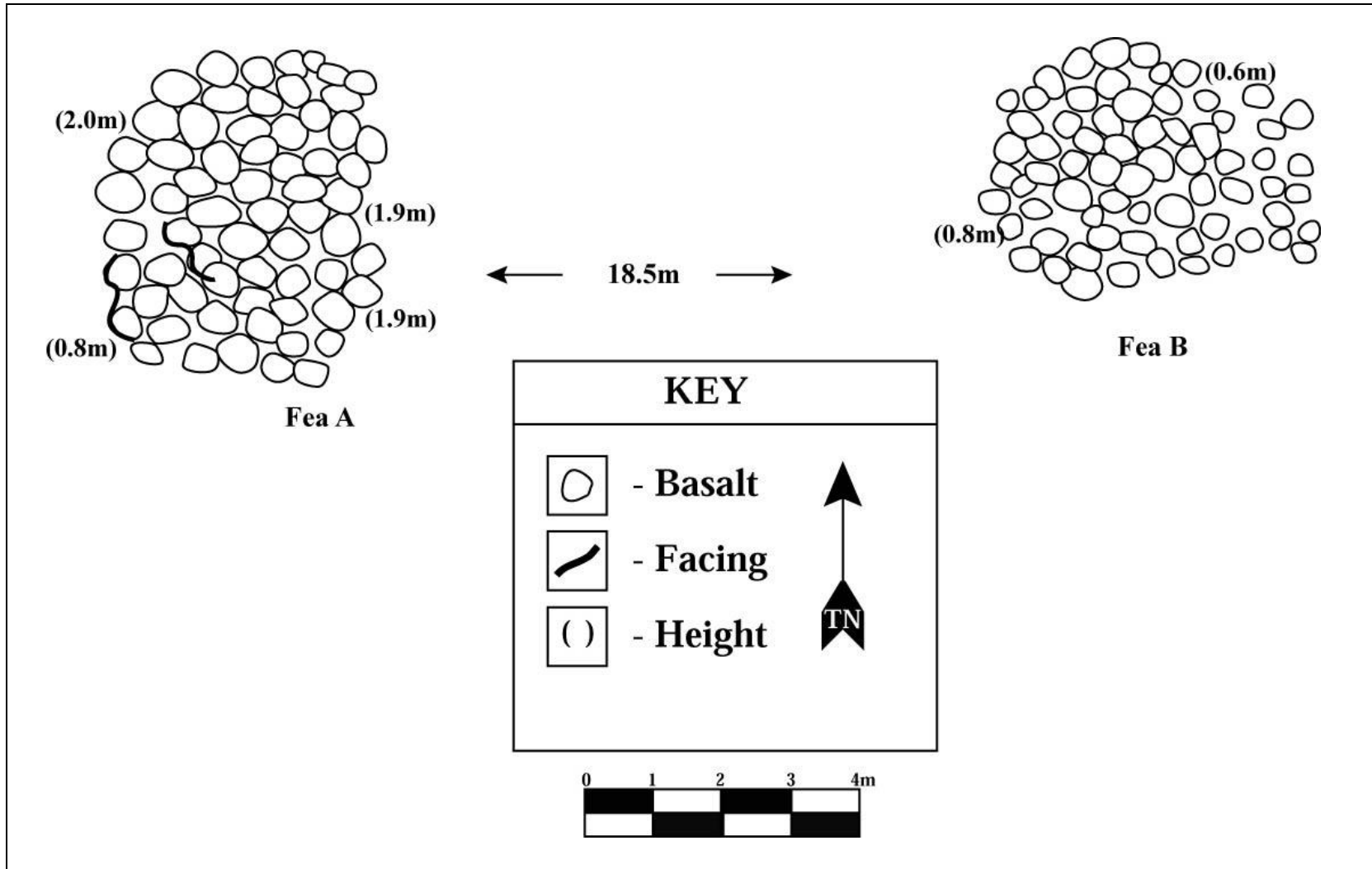


Figure 66: Site 29911 Plan View Map.



Figure 67: Photograph of Site T29911 Feature A Looking North.



Figure 68: Photograph of Site 29911 Feature B Looking Northeast.

SITE TS-14**Garden Bed**

FUNCTION: Agriculture
AGE: Modern
DIMENSIONS: 10.0 meters (NW/SE) by 9.0 meters
CONDITION: Good
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site TS-14 consists of two raised garden beds located approximately 100 meters east of Site 29911 (see Figure 12). The feature is located in a grassy area just west of a chain link fence marking the western edge of the existing amenities at the Pāhoa Park. The terrain is level grassy field that appears to have been bulldozed for sugarcane fields.

Both of the raised beds are approximately 8.0 m long (NW/SE) by 3.0 m wide and are 0.15 meters in maximum height (Figure 69). The features are constructed of a perimeter of angular and subangular cobbles and small boulders placed one course high on the ground surface (Figure 70). The interior is level soil. The feature has been slightly altered by weathering and is in good condition.

The features at Site TS-14 are modern raised garden beds. The results of excavation determined that the interior soil consisted of mechanically crushed red cinder soil, mechanically crushed gray sand, and there were pieces of modern trash within the soil. The features have been slightly impacted by weathering and are in good condition. No further work is recommended at the site.

SITE 29912**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 2.6 meters (N/S) by 1.7 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29912 consists of a rectangular rock mound located approximately 100 meters east of Site TS-14 (see Figure 12). The feature is located

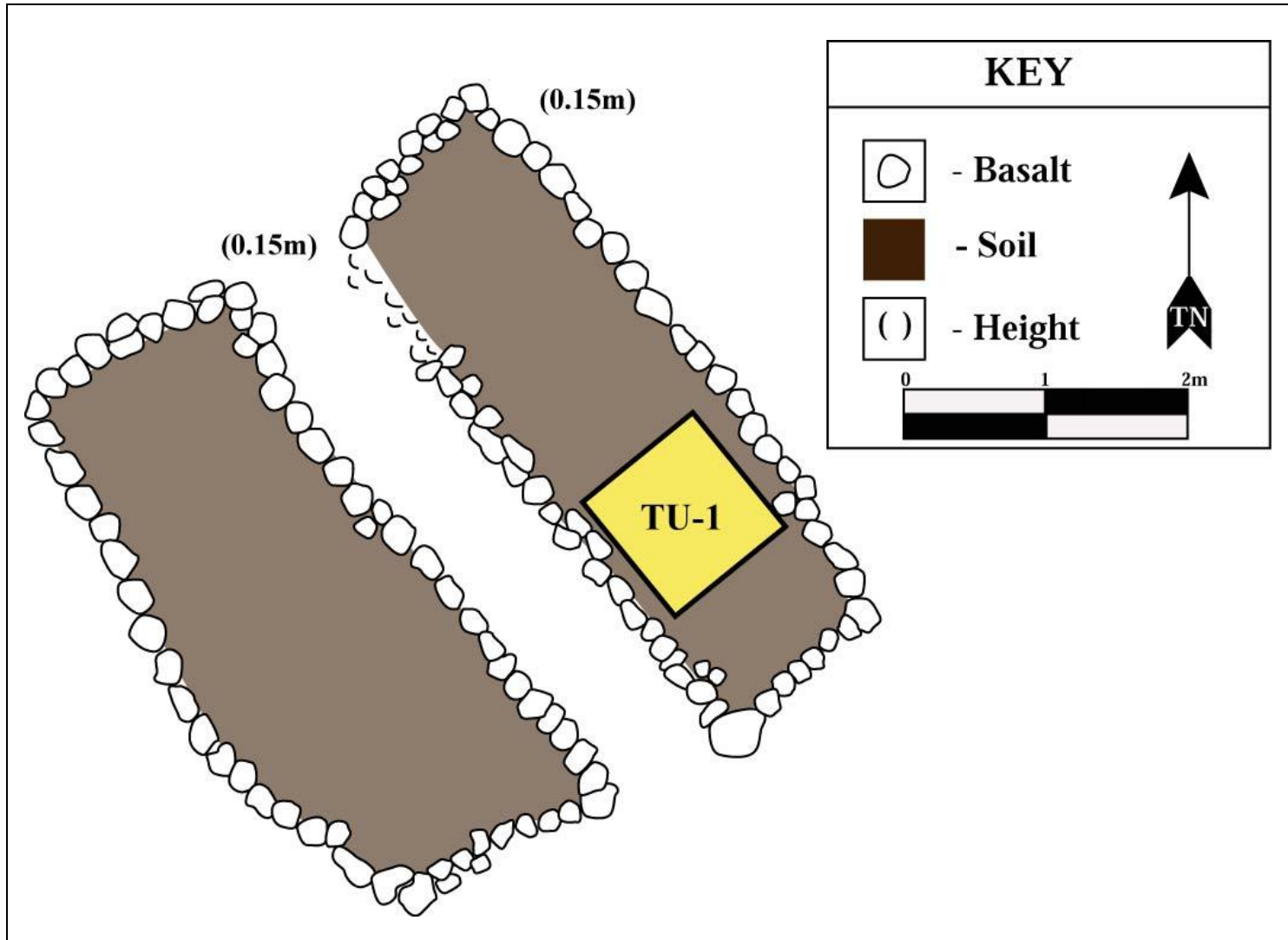


Figure 69: Site TS-14 Plan View Map.



Figure 70: Photograph of Site TS-14 Looking South.

just south of the parking the pool parking lot. The rock mound is located on a slope under avocado trees.

The rock mound is 2.6 m long (N/S) by 1.7 m wide and is 0.9 meters in maximum height (Figure 71). The feature is constructed of angular and subangular cobbles and small boulders stacked up to six courses high on the ground surface (Figure 72). The feature is well faced. The feature has been slightly altered by a banyan tree and by weathering, and is in good condition.

The rock mound at Site 29912 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29913

Modified Outcrop

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

18.0 meters (NE/SW) by 3.6 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 29913 consists of an irregularly shaped modified outcrop located approximately 100 meters west of Site 29908 (see Figure 12). The feature is located in a stand of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

The modified outcrop is 18.0 m long (NE/SW) by 3.6 m wide and is 1.7 meters in maximum height (Figure 73). The feature is constructed of angular and subangular cobbles and small boulders loosely piled and stacked on an exposed bedrock outcrop (Figure 74). Portions of the feature are roughly stacked. The feature has been slightly altered by weathering and is in fair condition.

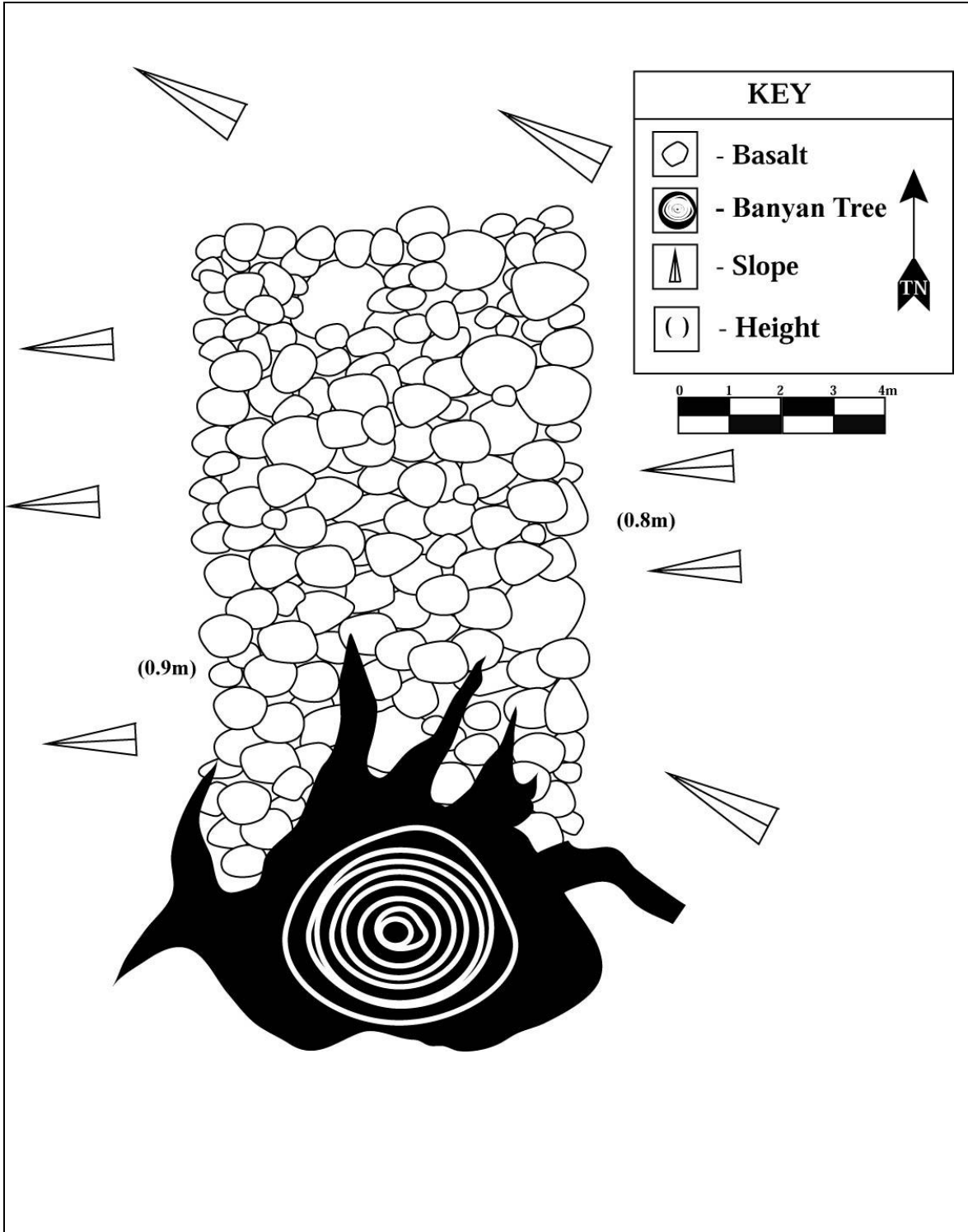


Figure 71: Site 29912 Plan View Map.



Figure 72: Photograph of Site 29912 Looking Southwest.

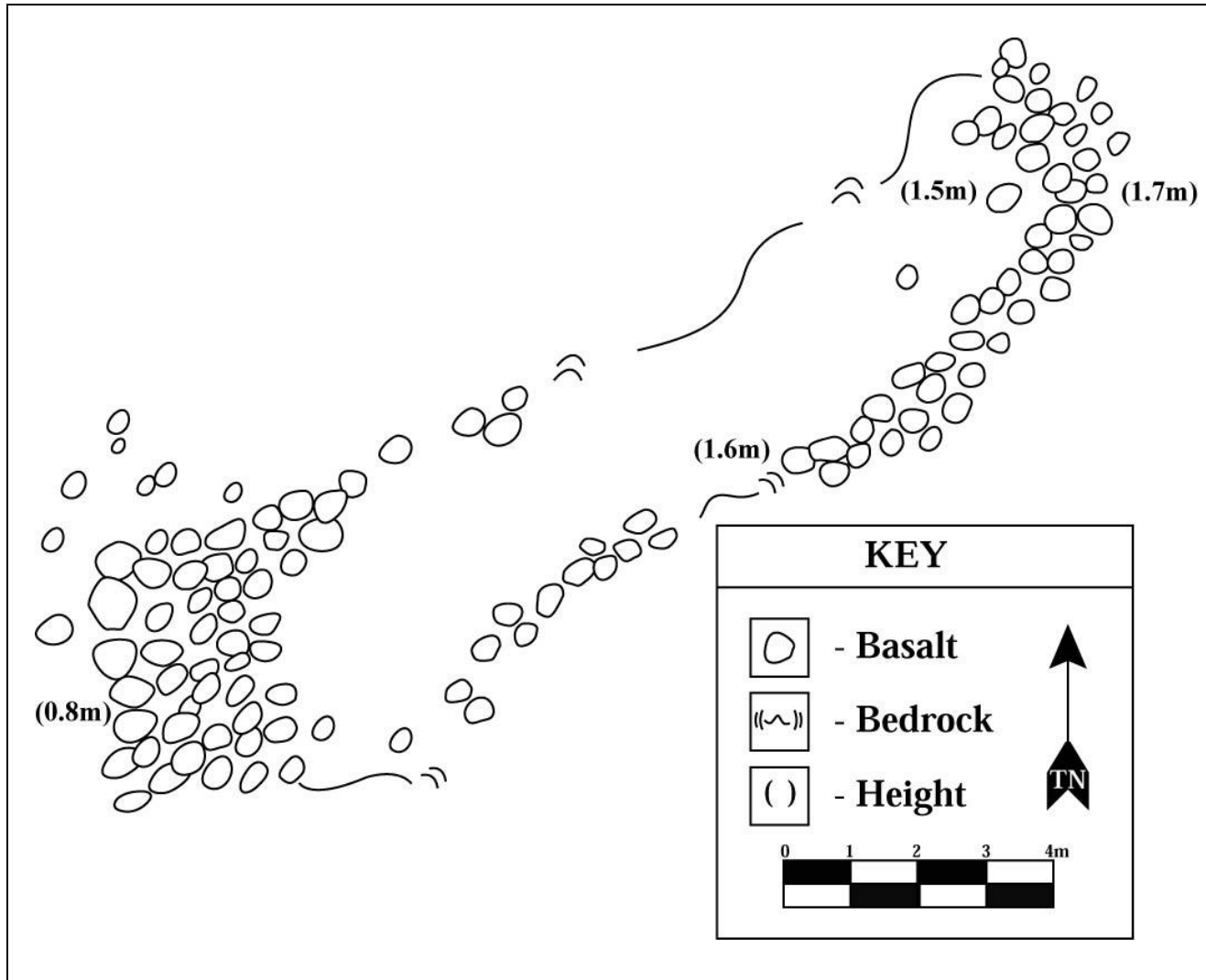


Figure 73: Site 29913 Plan View Map.



Figure 74: Photograph of Site 29913 Showing Stacking Looking West.

The modified outcrop at Site 29913 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

SITE 29914

Rock Mound

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 5.0 meters (N/S) by 5.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: ST-1
DESCRIPTION: Site 29914 is a circular rock mound located along the

western edge of the project area (see Figure 12). The feature is located on a slope in a stand of guava in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is approximately 5.0 meters in diameter and is 1.4 meters in maximum height (Figure 75). The feature is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 76). There is no stacking or facing evident in the feature construction. The feature has been slightly altered by weathering and is in good condition.

Stratigraphic Trench 1

ST-1 was a 1.3 meter long (N/S) by 1.0 m wide unit excavated in the southeast side of the rock mound. ST-1 contained an architectural layer and two natural stratigraphic layers, was excavated to a maximum depth of 67 cmbs, and terminated on bedrock (Figure 77).

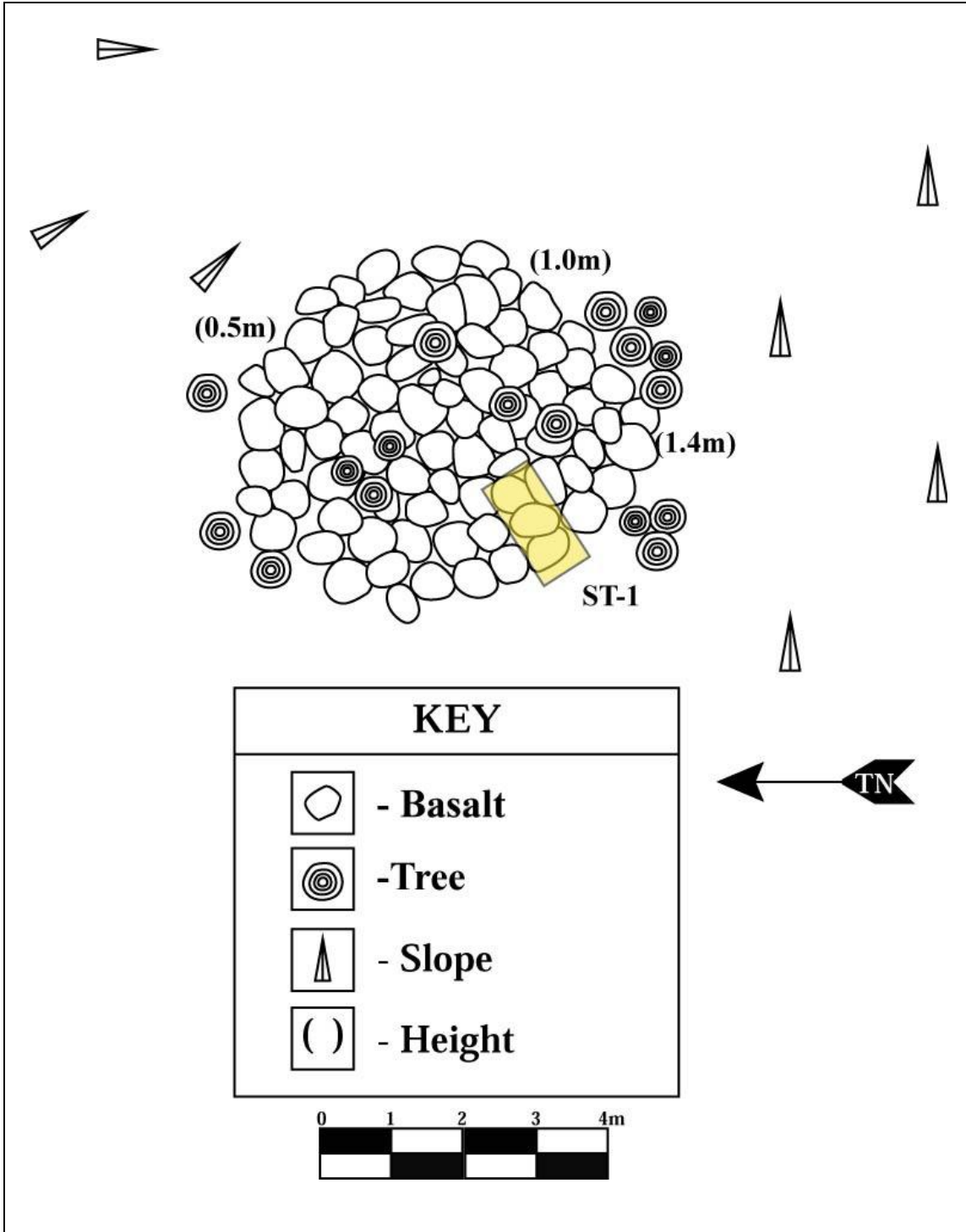


Figure 75: Site 29914 Plan View Map.



Figure 76: Photograph of Site 29914 Looking West.

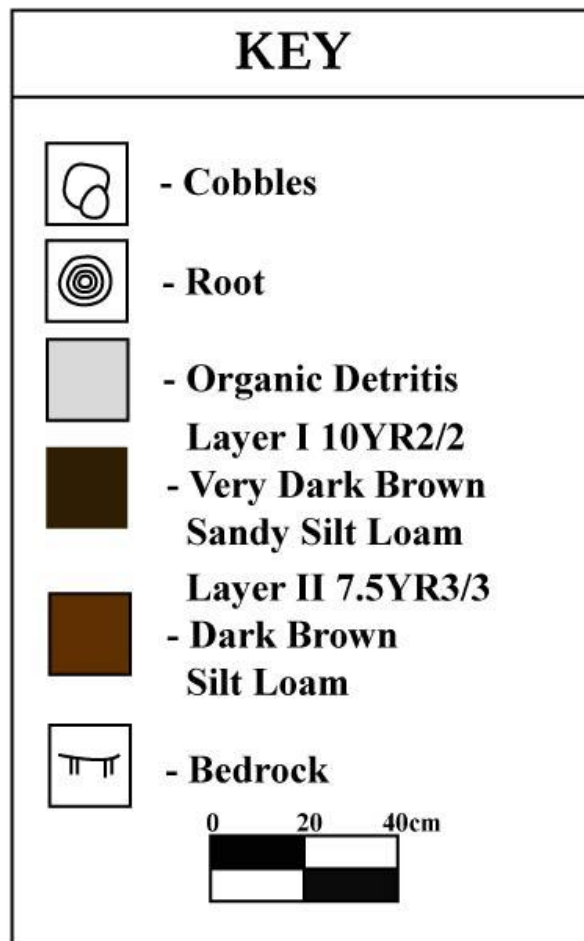
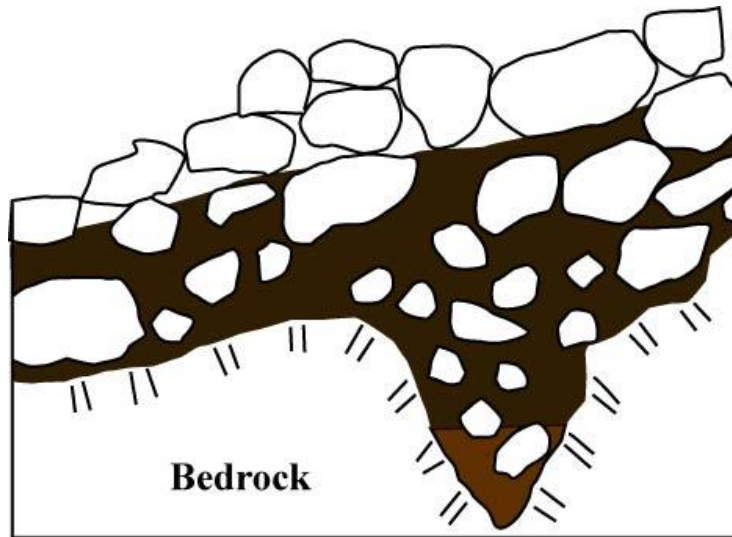


Figure 77: Site 29914 ST-1 North Profile.

The Architectural Layer (0-20 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 78). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated within the top surface of Layer I sediment.

Layer I (0-50 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 15% angular and subangular cobbles and pebbles, and 5% small roots (Figure 78). A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on Layer II sediment.

Layer II (50-67 cmbs) was soft dark brown (7.5YR3/3) sandy silt with 5% angular pebbles, and 5% small roots. Layer II did not contain cultural material. The base of Layer II was clear and wavy and terminated on bedrock (Figure 79).

The rock mound at Site 29914 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29915	Rock Mounds and Modified Outcrops
FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	50.0 meters (N/S) by 25.0 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None



Figure 78: Site 29914 ST-1 North Profile Showing Layer I Sediment.



Figure 79: Site 29914 ST-1 Base of Excavation Looking East.

DESCRIPTION: Site 29915 consists of six rock mounds (Features A, B, C, E, F, and J) and four modified outcrops (Features D, G, H, and I) recorded 100 meters northeast of Site 29914 (see Figure 12 and Figure 80). The features are located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular rock mound located at the north end of the site (Figure 81). The rock mound is 3.3 m long (NW/SE) by 1.9 m wide and is 0.6 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled and stacked up to two courses high on the ground surface (Figure 82). The feature is slightly mounded in shape. There is no facing evident in the feature construction. Feature A has been altered by guava trees and weathering and is in fair condition.

Feature B consists of a roughly rectangular rock mound located approximately nine meters southwest of Feature A. Feature B measures 3.0 m long (NE/SW) by 2.6 m wide and is 0.3 m in maximum height (Figure 83). The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled one to two courses high on the ground surface (Figure 84). No stacking or facing is evident on the ground surface. Feature B has been altered by guava trees and weathering and is in fair condition.

Feature C is a roughly circular rock mound located seventeen meters southeast of Feature B. The rock mound is 5.0 meters in diameter and is 0.5 m in maximum height (Figure 85). Feature C is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 86). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature C has been altered by guava trees and weathering and is in fair condition.

Feature D is a roughly rectangular modified outcrop located nineteen meters southwest of Feature C. The feature is 3.3 meters long (N/S) by 2.9 meters wide and is 0.8 m in maximum height (Figure 87). Feature D is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 88).

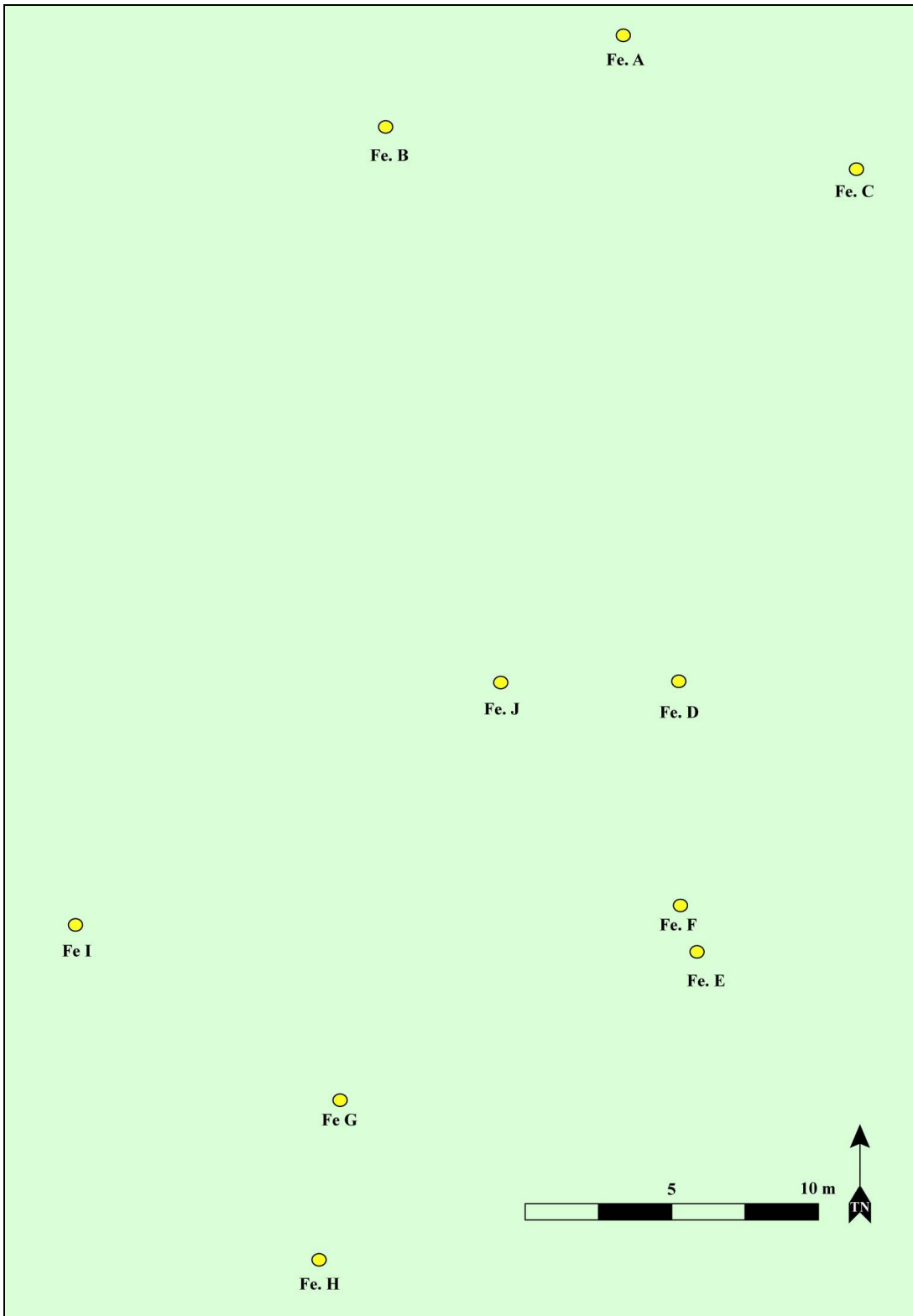


Figure 80: Site 29915 Plan View Map.

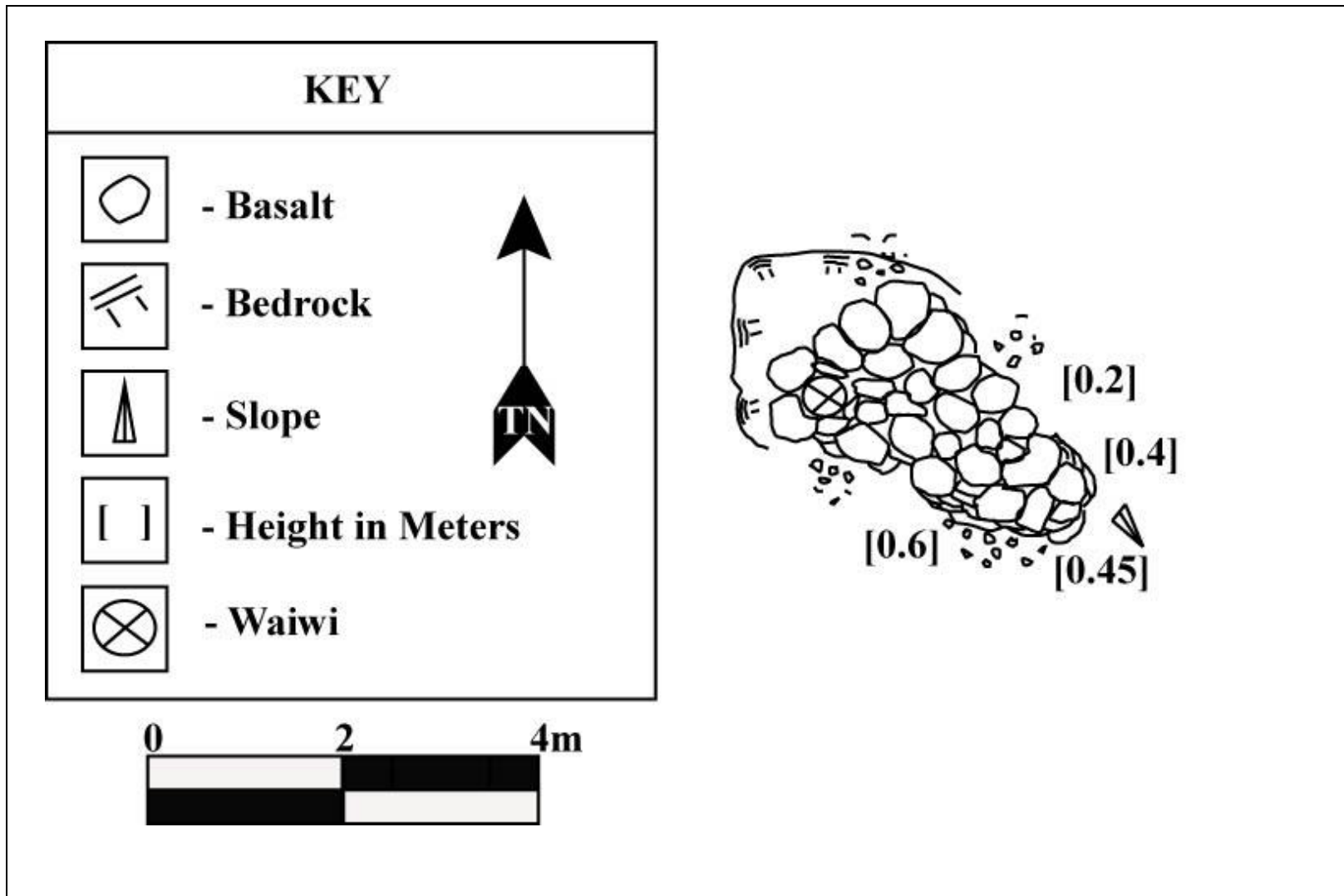


Figure 81: Site 29915 Feature A Plan View Map.



Figure 82: Photograph of Site 29915 feature A Looking South.

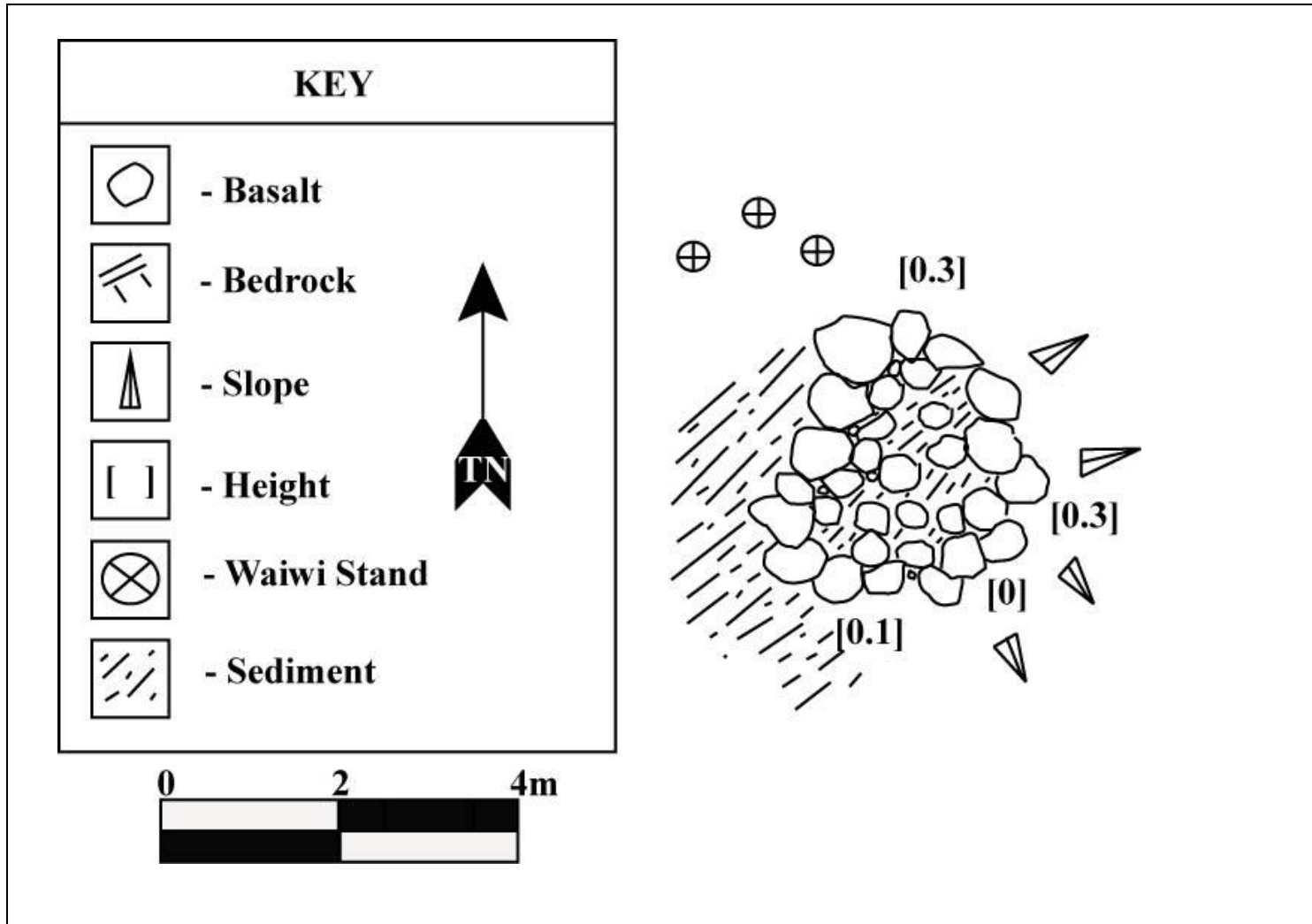


Figure 83: Site 29915 Feature B Plan View Map.



Figure 84: Photograph of Site 29915 Feature B Looking South.

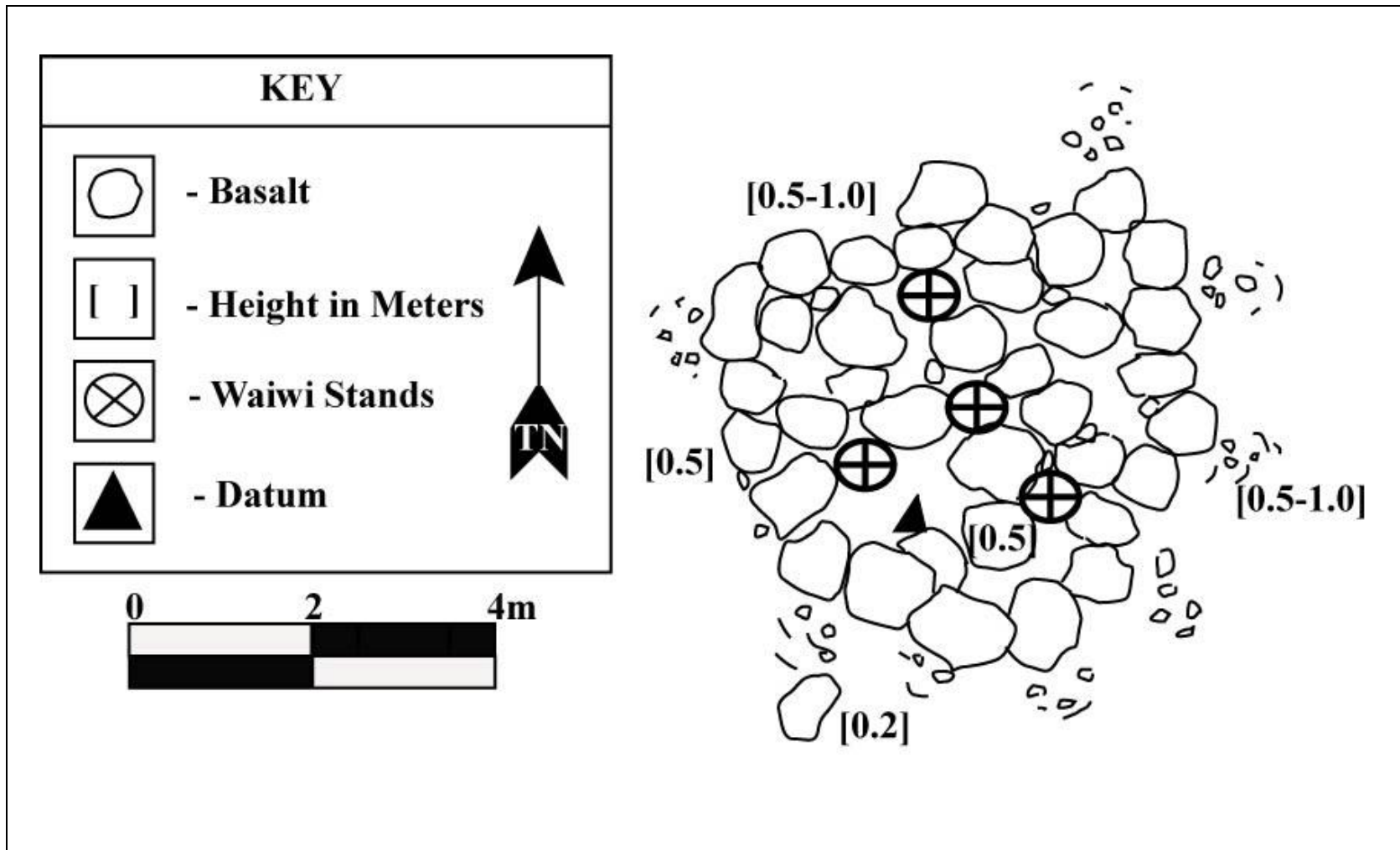


Figure 85: Site 29915 Feature C Plan View Map.



Figure 86: Photograph of Site 29915 Feature C Looking East.

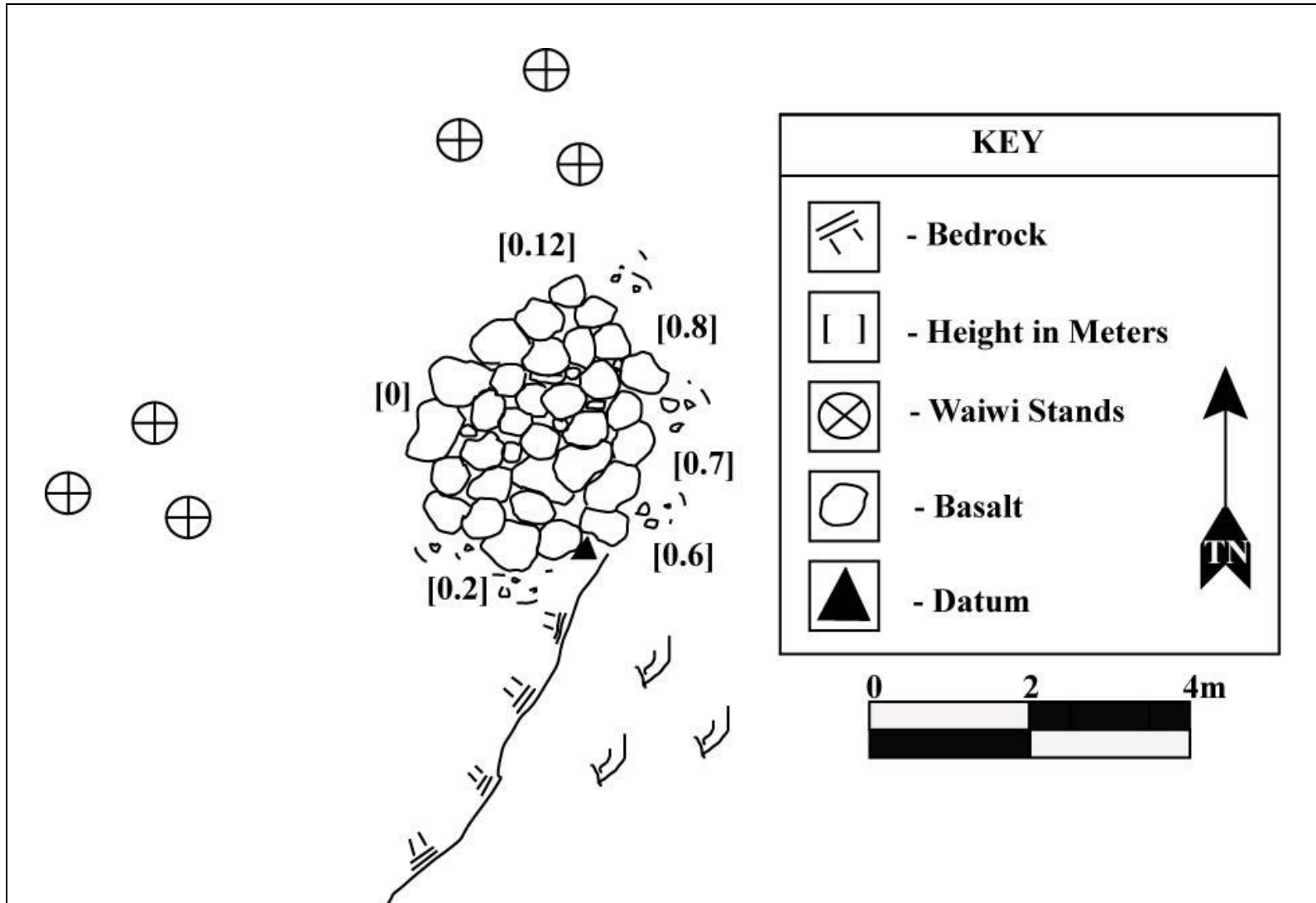


Figure 87: Site 29915 Feature D Plan View Map.



Figure 88: Photograph of Site 29915 Feature D Looking West.

The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature D has been altered by guava trees and weathering and is in fair condition.

Feature E is a roughly circular rock mound located ten meters south of Feature D. The rock mound is 4.4 meters Long (NW/SE) by 2.8 m wide and is 0.6 m in maximum height (Figure 89). Feature E is constructed of angular and subangular cobbles and small boulders piled on the ground surface. The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature E has been altered by guava trees and weathering and is in fair condition.

Feature F is a roughly rectangular rock mound located two meters north of Feature E. The rock mound is 5.4 meters long (NW/SE) by 3.8 meters wide and is 1.0 m in maximum height (Figure 90). Feature F is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 91). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature F has been altered by guava trees and weathering and is in fair condition.

Feature G is an oval modified outcrop located fifteen meters southwest of Feature F. The feature mound is 5.1 meters long (NW/SE) by 2.3 meters wide and is 0.6 m in maximum height (Figure 92). Feature G is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 93). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature G has been altered by guava trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 2.20 meter long (NE/SW) by 1.0 m wide unit excavated through the center of Feature G. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 20 cmbs, and terminated on bedrock (Figure 94).

The Architectural Layer (0-92 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 95). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

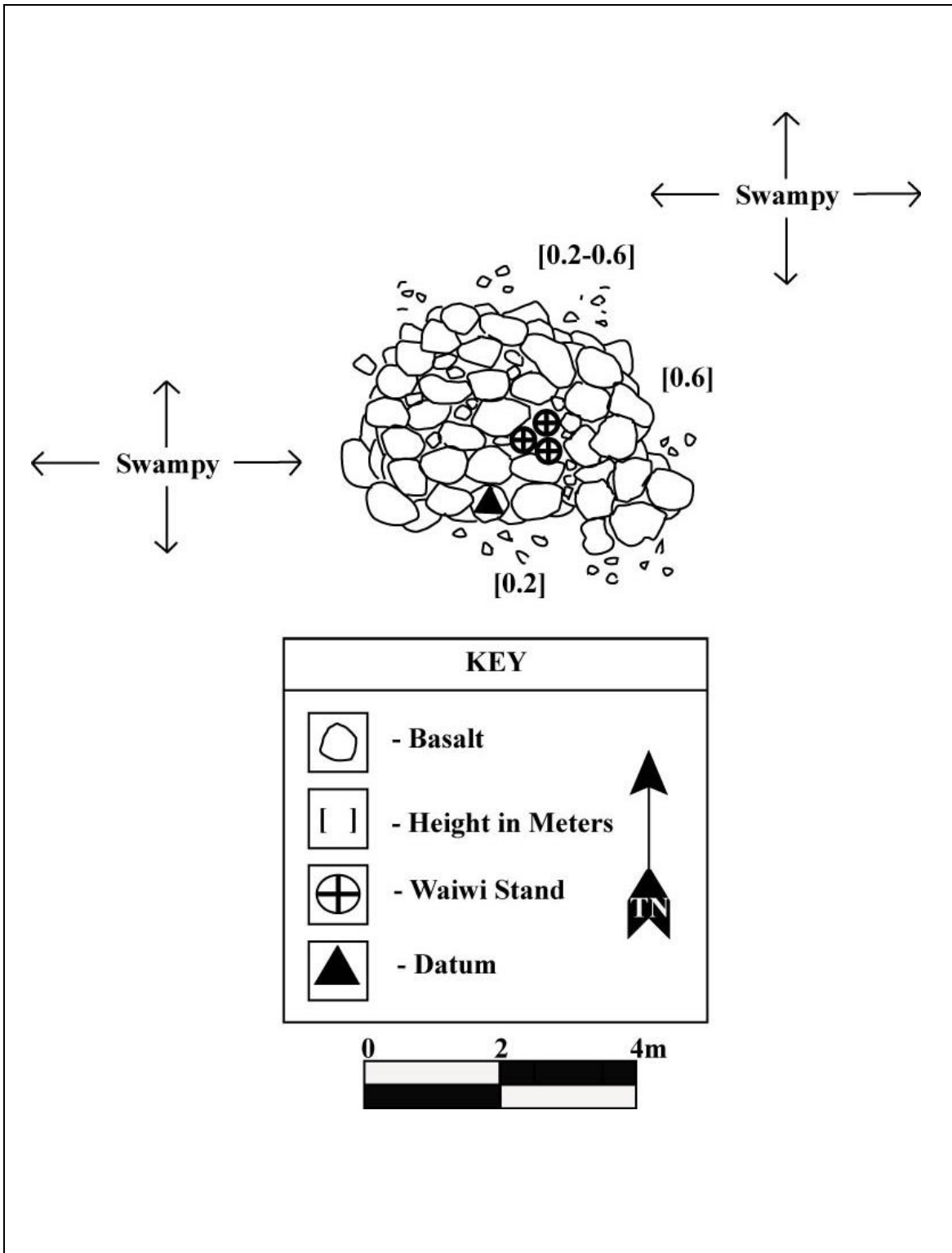


Figure 89: Site 29915 Feature E Plan View Map.

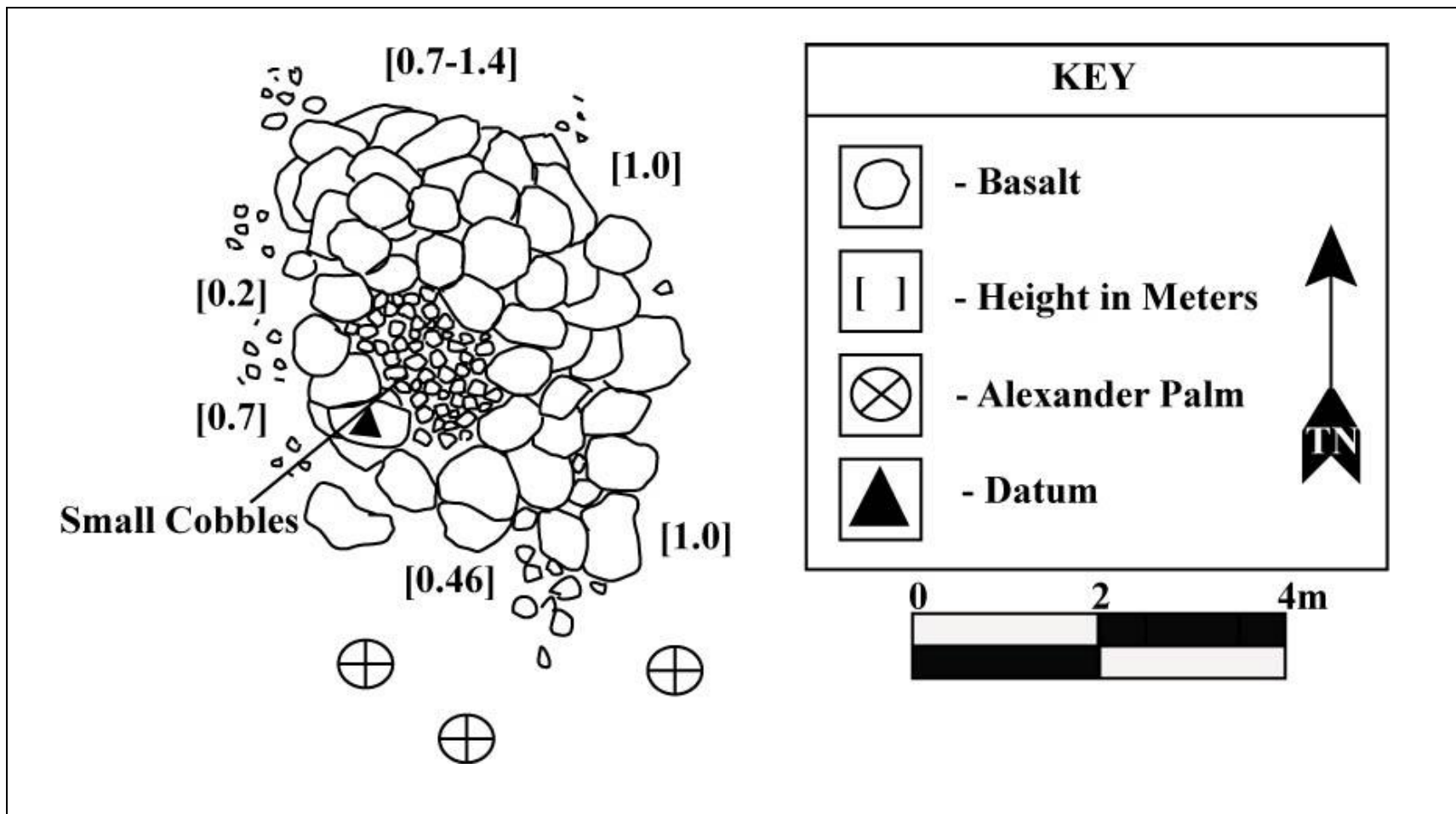


Figure 90: Site 29915 Feature F Plan View Map.



Figure 91: Photograph of Site 29915 Feature F Looking East.

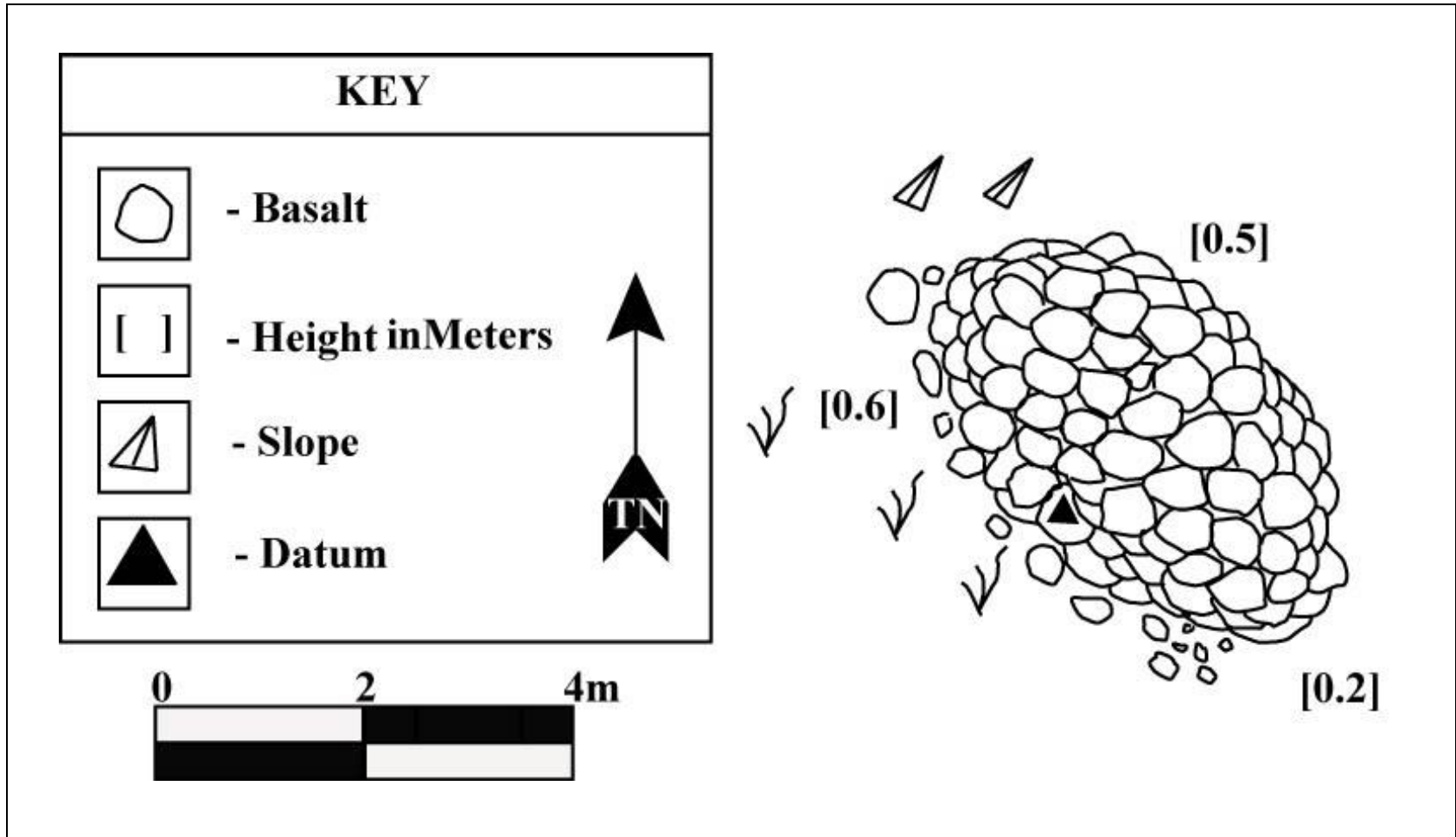


Figure 92: Site 29915 Feature G Plan View Map.



Figure 93: Photograph of Site 29915 Feature G Looking North.

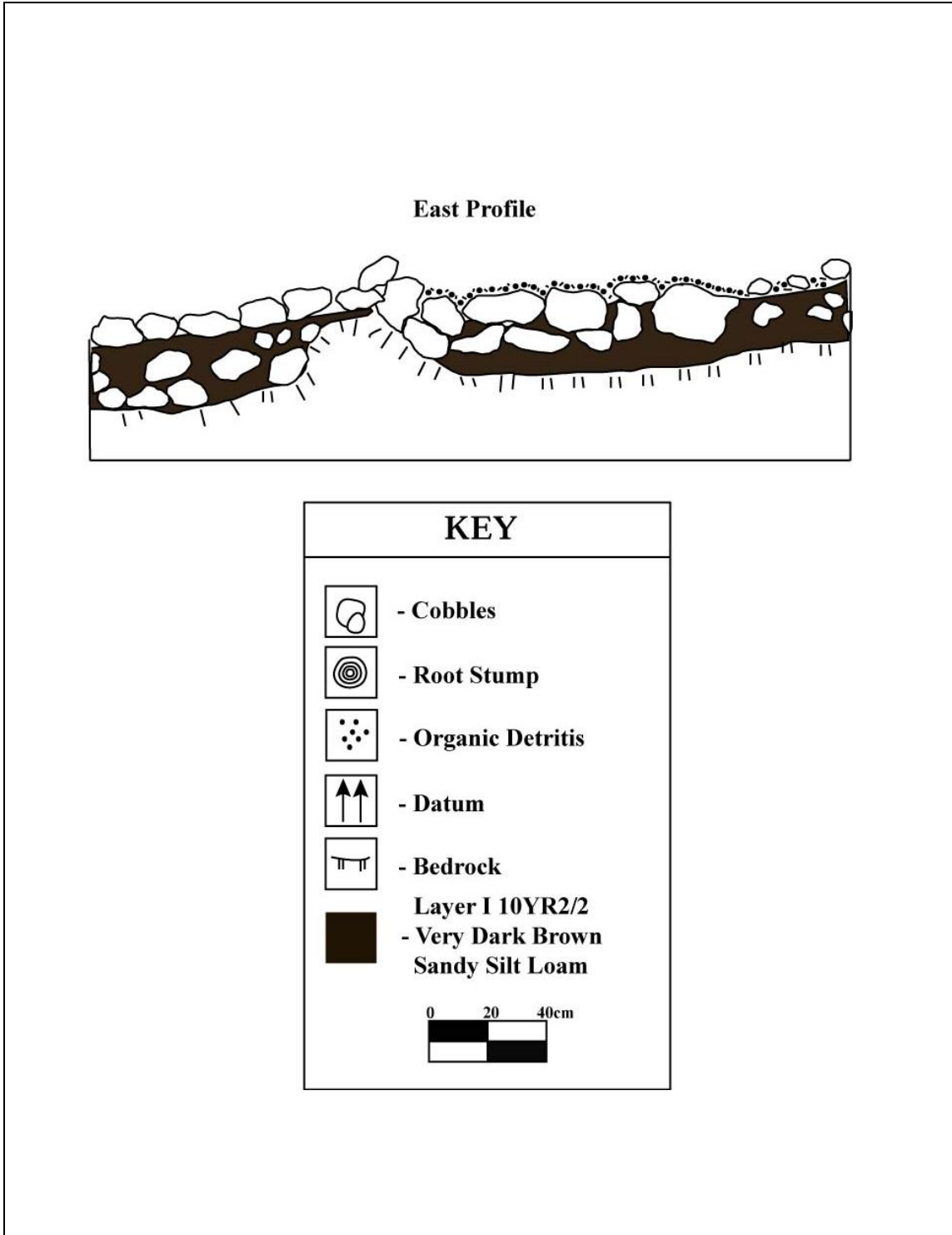


Figure 94: Site 29913 Feature G ST-1 East Profile.



Figure 95: Site 29913 Feature G ST-1 Architectural Layer Looking Northwest.

Layer I (0-12 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 20% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock (Figure 96).

Feature H is a roughly rectangular modified outcrop located six meters south of Feature G. The feature is 3.9 meters long (NW/SE) by 2.0 meters wide and is 0.5 m in maximum height (Figure 97). Feature H is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 98). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature H has been altered by guava trees and weathering and is in fair condition.

Feature I is an oval modified outcrop located twelve meters northwest of Feature G. The feature is 4.9 meters long (NW/SE) by 3.4 meters wide and is 0.7 m in maximum height (Figure 99). Feature I is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 100). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature I has been altered by guava trees and weathering and is in fair condition.

Feature J is a roughly rectangular modified outcrop located seven meters west of Feature D. The feature is 4.9 meters long (E/W) by 3.7 meters wide and is 1.5 m in maximum height (Figure 101). Feature J is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 102). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature H has been altered by guava trees and weathering and is in fair condition.

The rock mounds and modified outcrops at Site 29915 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.



Figure 96: Site 29915 Feature G ST-1 Base of Excavation Looking North.

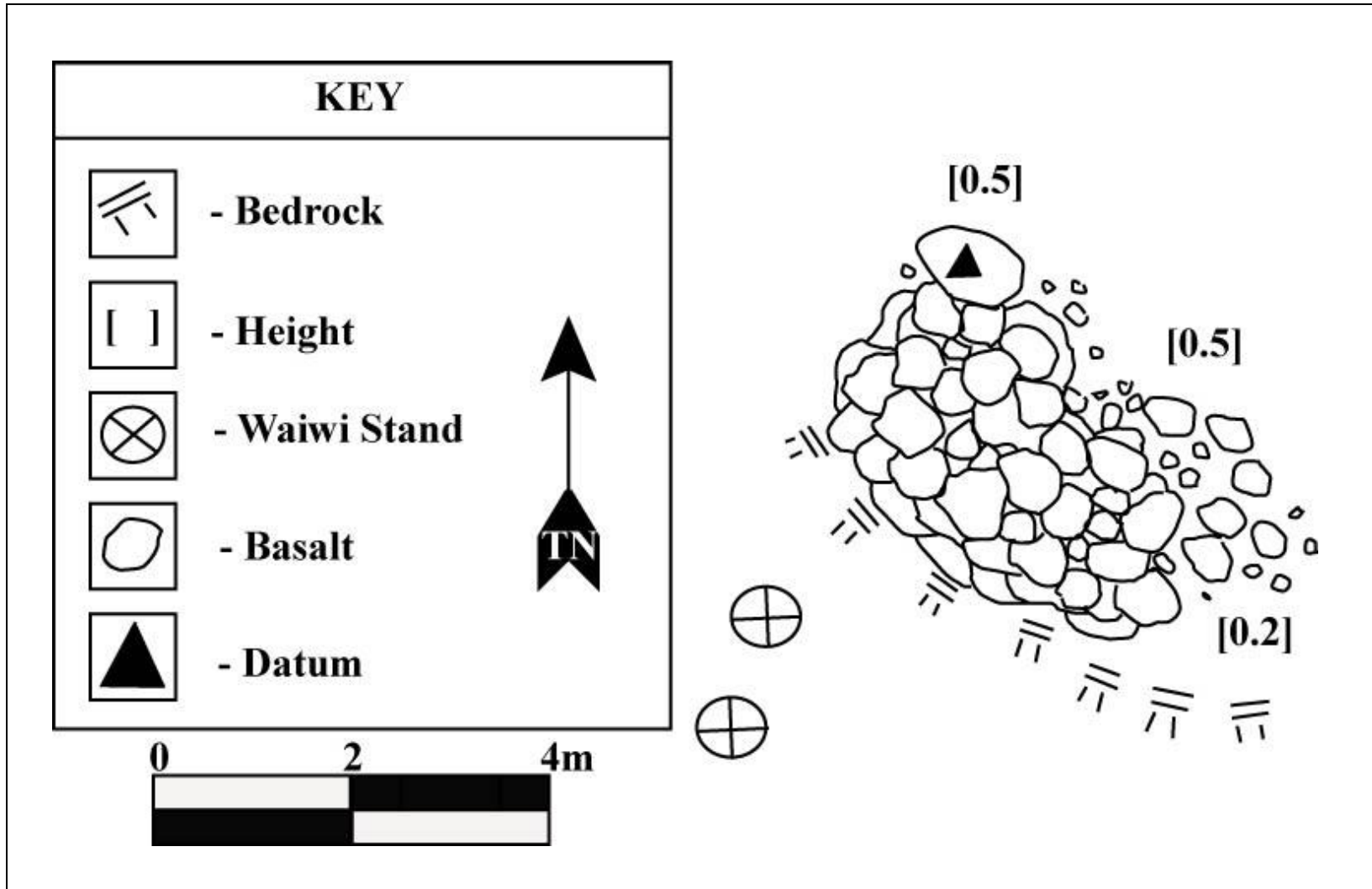


Figure 97: Site 29915 Feature H Plan View Map.



Figure 98: Photograph of Site 29915 Feature H Looking West.

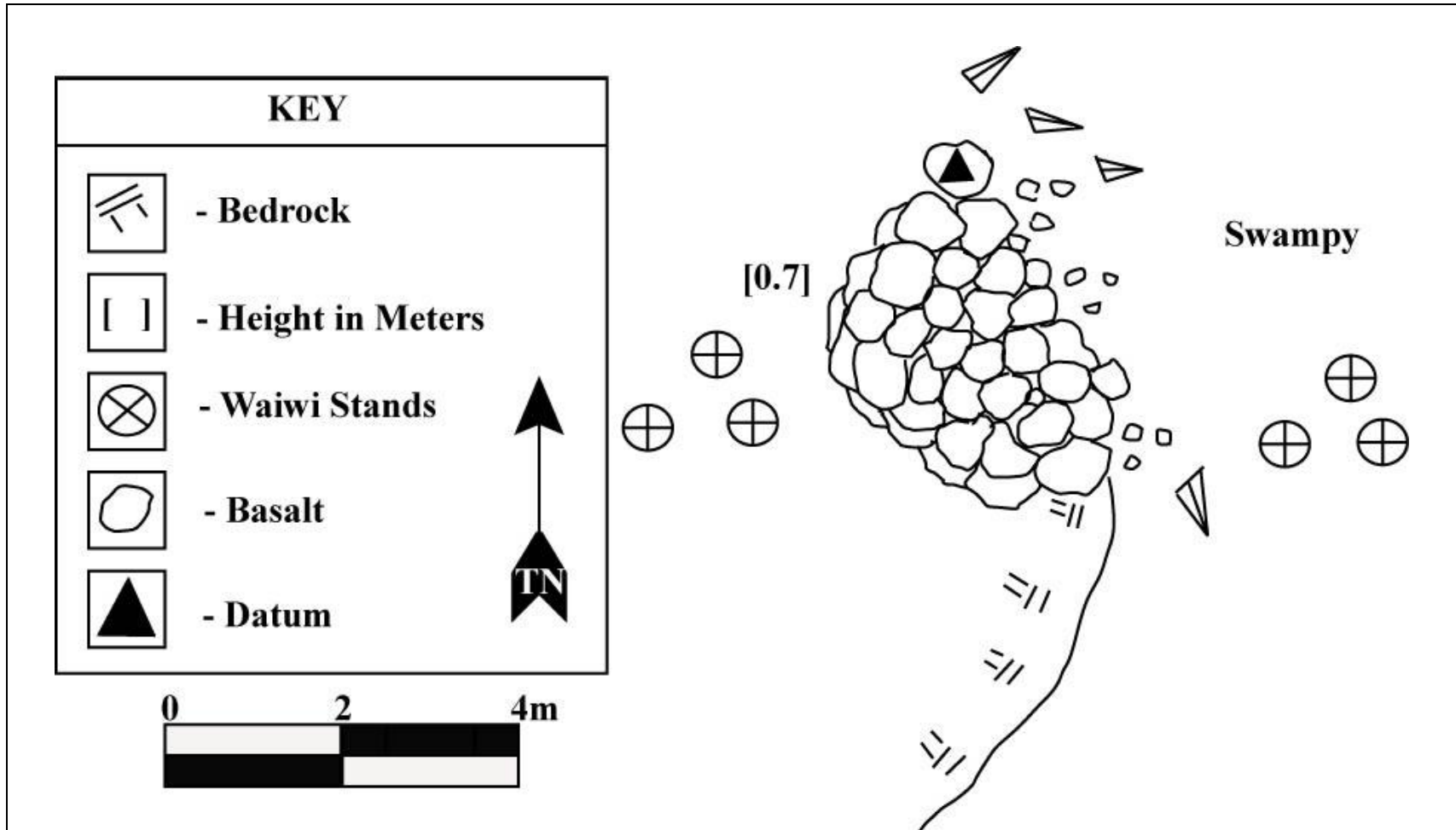


Figure 99: Site 29915 Feature I Plan View Map.



Figure 100: Photograph of Site 29915 Feature I Looking South.

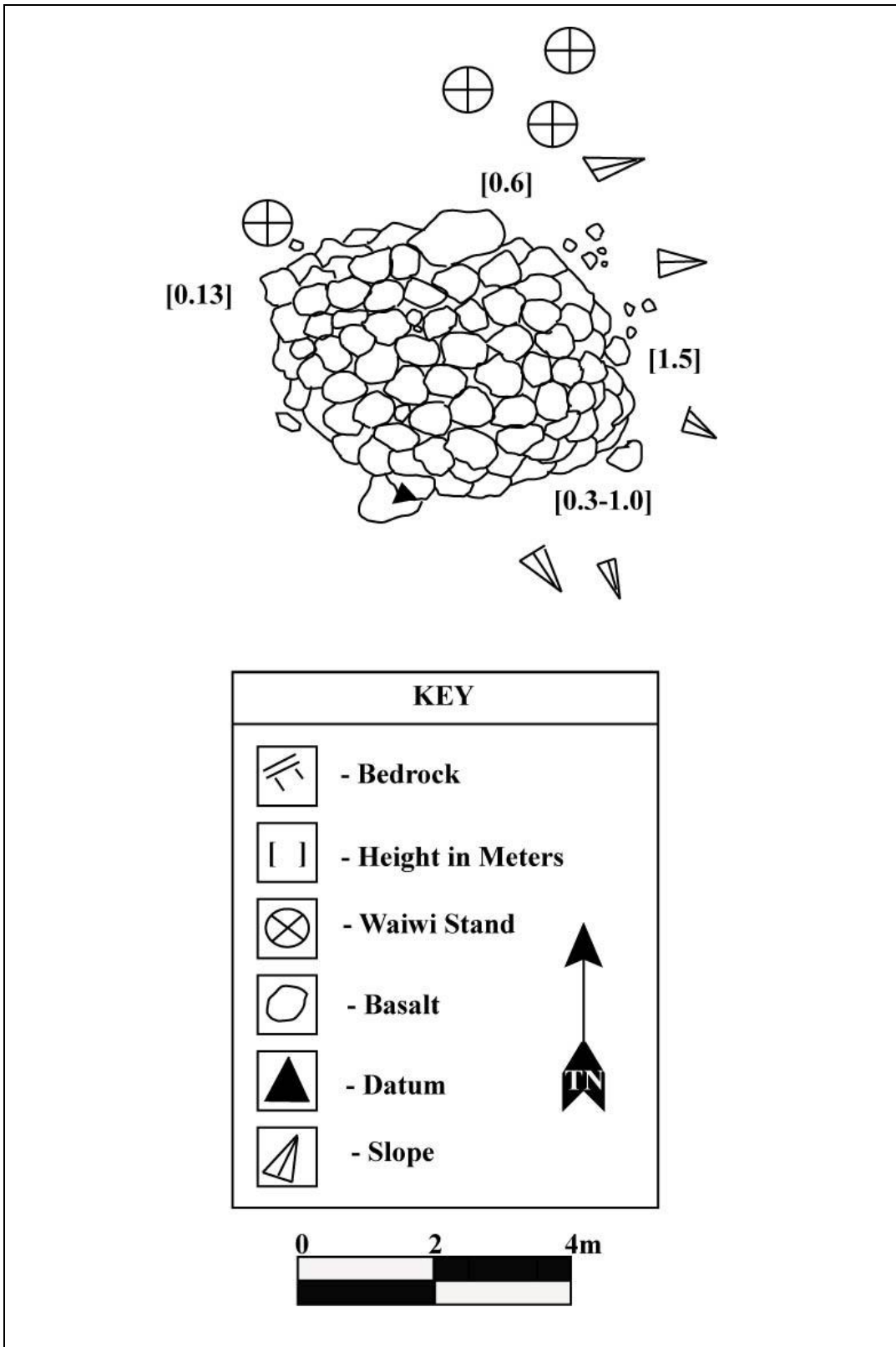


Figure 101: Site 29915 Feature J Plan View Map.



Figure 102: Photograph of Site 29915 Feature J Looking West.

SITE 29916**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 14.0 meters (N/S) by 0.9 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29916 consists of a linear rock mound located approximately 90 meters northwest of Site 29911 (see Figure 12). The feature is located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 14.0 m long (N/S) by 0.9 m wide and is 0.8 meters in maximum height (Figure 103). The feature is constructed of angular and subangular cobbles and small boulders piled two courses high and wide on the ground surface (Figure 104). There is no facing evident in the feature construction. The feature has been slightly altered by weathering and is in fair condition.

The rock mound at Site 29916 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29917**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 4.0 meters (NE/SW) by 3.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29917 consists of a rectangular rock mound located approximately twelve meters northwest of Site 29911 (see Figure 12). The feature is

located under a banyan tree in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 4.0 m long (NE/SW) by 3.0 m wide and is 2.0 meters in maximum height (Figure 105). The feature is constructed of angular and subangular cobbles and small boulders stacked up to thirteen courses high on the ground surface (Figure 106). The feature is conical in shape and is well faced. The feature has been slightly altered by weathering and is in good condition.

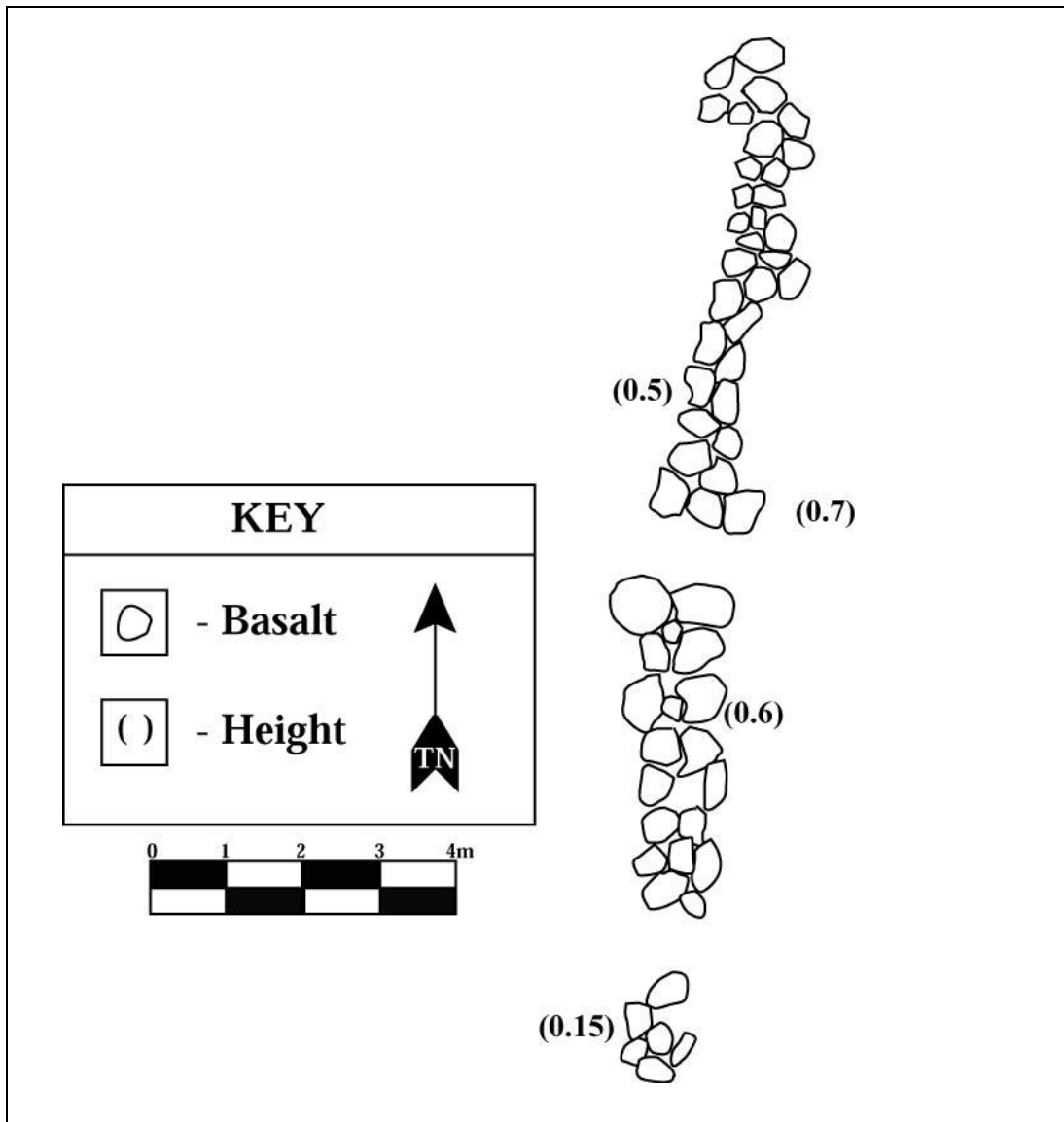


Figure 103: Site 29916 Plan View Map.



Figure 104: Photograph of Site 29916 Looking North.

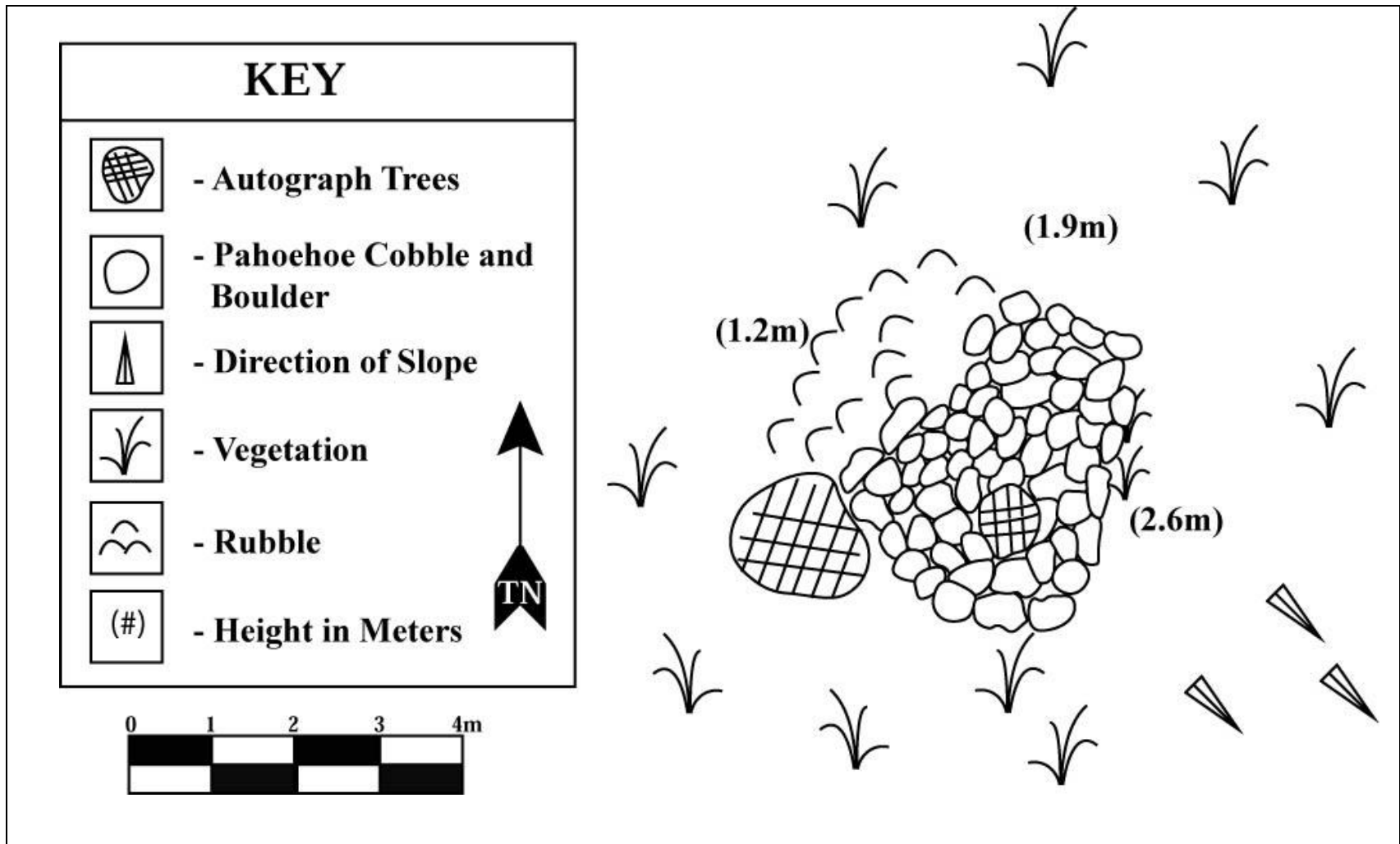


Figure 105: Site 29917 Plan View Map.



Figure 106: Photograph of Site 29917 Looking Southeast.

The rock mound at Site 29917 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29918

Rock Mounds and Modified Outcrops

FUNCTION: Agriculture

AGE: Historic

DIMENSIONS: 50.0 meters (N/S) by 25.0 meters

CONDITION: Fair

INTEGRITY: Altered by Weathering

SURFACE ARTIFACTS: None

EXCAVATION: ST-1

DESCRIPTION: Site 29918 consists of six rock mounds (Features A, C, D, E, H, and I) and four modified outcrops (Features B, F, G, and J) recorded 25 meters northwest of Site 29916 (see Figure 12). The features are located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular rock mound located at the center of the site (Figure 107). The rock mound is 2.0 m long (NW/SE) by 1.7 m wide and is 0.7 m in maximum height (Figure 108). Feature A is constructed of angular and subangular cobbles and small boulders piled up to two courses high on the ground surface (Figure 109). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature A has been altered by guava trees and weathering and is in fair condition.

Feature B consists of a linear modified outcrop located approximately thirteen meters south of Feature A. Feature B measures 3.7 m long (NE/SW) by 0.9 m wide and is 0.3 m in maximum height (see Figure 108). The feature is constructed of angular and subangular cobbles and small boulders piled and stacked one to two courses high on the ground surface (Figure 110). No facing is evident on the ground surface. Feature B has been altered by guava trees and weathering and is in fair condition.



Figure 107: Site 29918 Plan View Map.

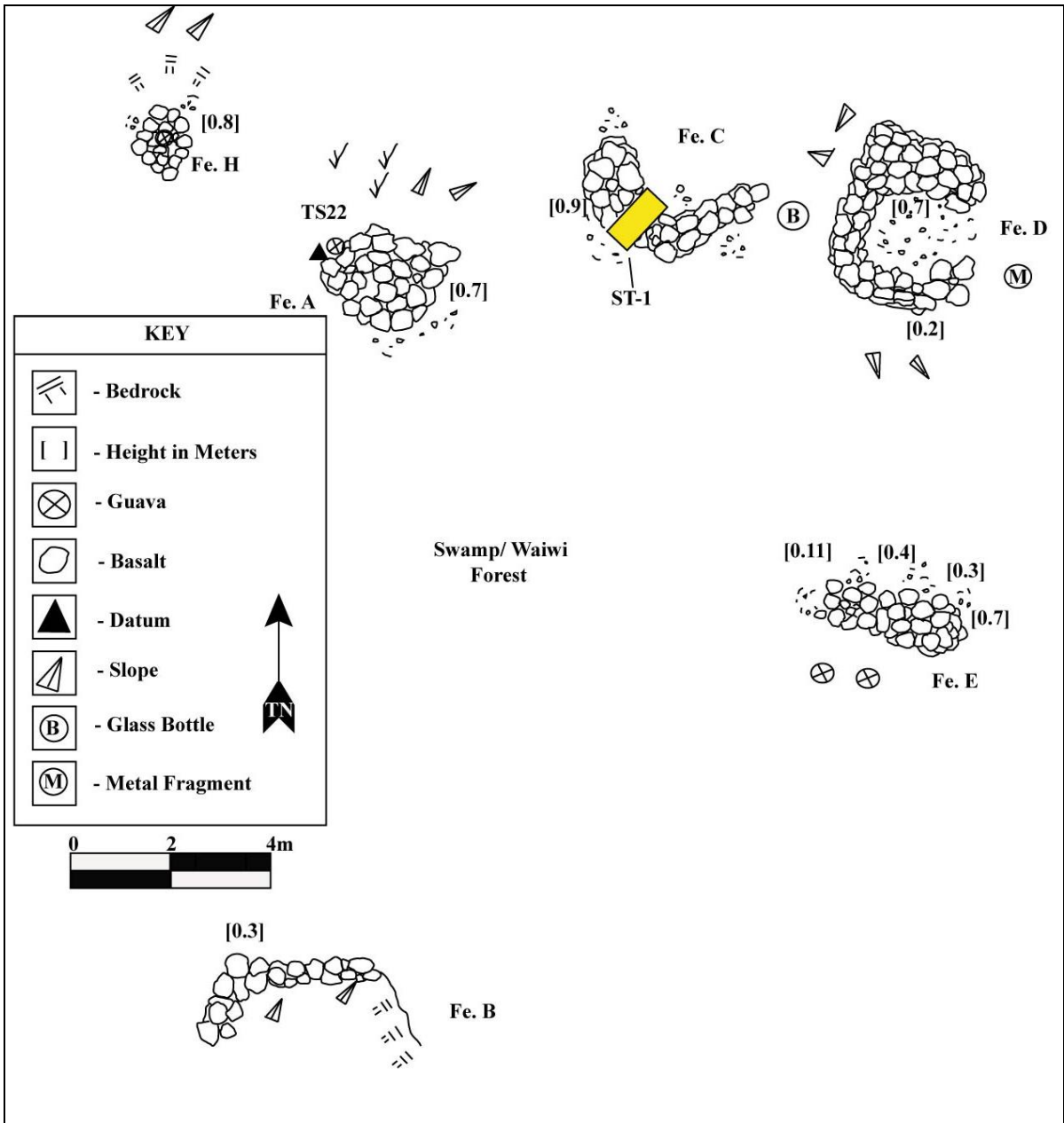


Figure 108: Site 29918 Feature A to E and H Plan View Map.



Figure 109: Photograph of Site 29918 feature A Looking North.



Figure 110: Photograph of Site 29918 Feature B Looking Southwest.

Feature C is a linear rock mound located three meters northeast of Feature A. The rock mound is 4.1 meters long (E.W) by 2.4 meters wide and is 0.9 m in maximum height (see Figure 108). Feature C is constructed of angular and subangular cobbles and small boulders stacked up to five courses high on the ground surface (Figure 111). Portions of the feature are well faced. Feature C has been altered by weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 1.8 meter long (NE/SW) by 1.0 m wide unit excavated through the center of Feature C. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 20 cmbs, and terminated on bedrock (Figure 112).

The Architectural Layer (0-80 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 113). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-20 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 20% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock.

Feature D is a roughly rectangular rock mound located two meters east of Feature C. The feature is 3.3 meters long (NE/SW) by 2.5 meters wide and is 0.7 m in maximum height (see Figure 108). Feature D is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 114). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature D has been altered by guava trees and weathering and is in fair condition.

Feature E is a roughly rectangular rock mound located five meters south of Feature D (see Figure 108). The rock mound is 2.8 meters Long (E/W) by 1.3 m wide and is 0.7 m in maximum height. Feature E is constructed of angular and subangular cobbles and small boulders piled and stacked one to three courses high on the ground



Figure 111: Photograph of Site 29918 Feature C Looking Northeast.

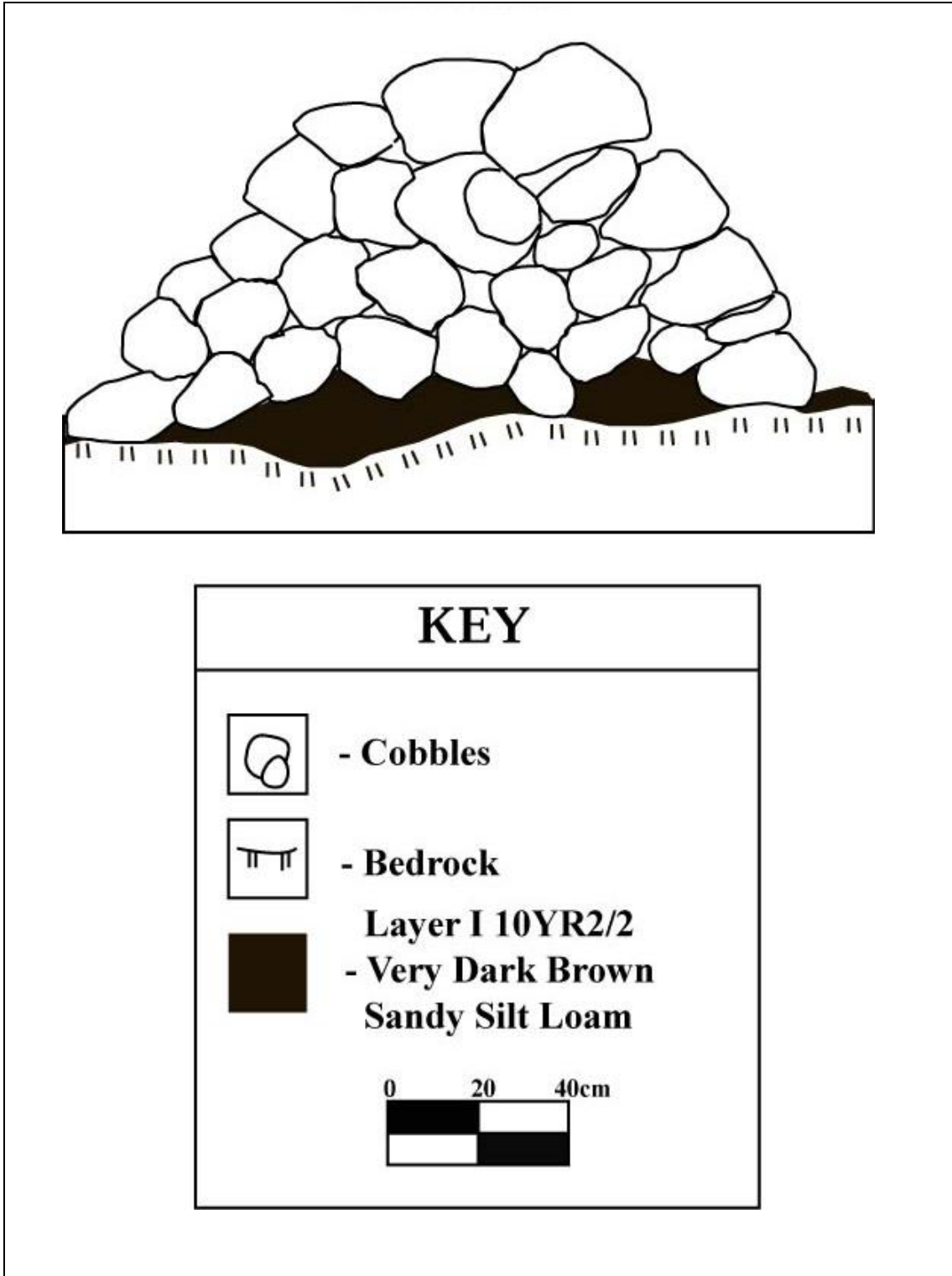


Figure 112: Site 29918 Feature C Southeast Profile.



Figure 113: Photograph of Site 29918 Feature C Southeast Profile.



Figure 114: Photograph of Site 29918 Feature D Looking North.

surface (Figure 115). No facing is evident in the feature construction. Feature E has been altered by guava trees and weathering and is in fair condition.

Feature F is a linear modified outcrop located four and a half meters southeast of Feature E. The feature is 3.0 meters long (E/W) by 0.6 meters wide and is 1.2 m in maximum height (Figure 116). Feature F is constructed of angular and subangular cobbles and small boulders stacked up to three courses high along the edge of an exposed bedrock outcrop (Figure 117). The north edge of the feature is well faced. Feature F has been altered by guava trees and weathering and is in fair condition.

Feature G is a roughly rectangular modified outcrop located twenty meters west of Feature F. The feature is 3.8 meters long (N/S) by 1.8 meters wide and is 0.2 m in maximum height (Figure 118). Feature G is constructed of angular and subangular cobbles and small boulders loosely piled one to two courses high on the ground surface (Figure 119). No stacking or facing is evident in the feature construction. Feature G has been altered by guava trees and weathering and is in fair condition.

Feature H is a circular rock mound located three meters northwest of Feature A. The rock mound is 0.8 meters in diameter and is 0.8 m in maximum height (see Figure 108). Feature H is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 120). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature H has been altered by guava trees and weathering and is in fair condition.

Feature I is an oval rock mound located twelve meters west of Feature H. The rock mound is 3.1 meters long (N/S) by 2.1 meters wide and is 0.4 m in maximum height (Figure 121). Feature I is constructed of angular and subangular cobbles and small boulders loosely piled one to two courses high on the ground surface (Figure 122). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature I has been altered by weathering and is in fair condition.



Figure 115: Photograph of Site 29918 Feature E Looking West.

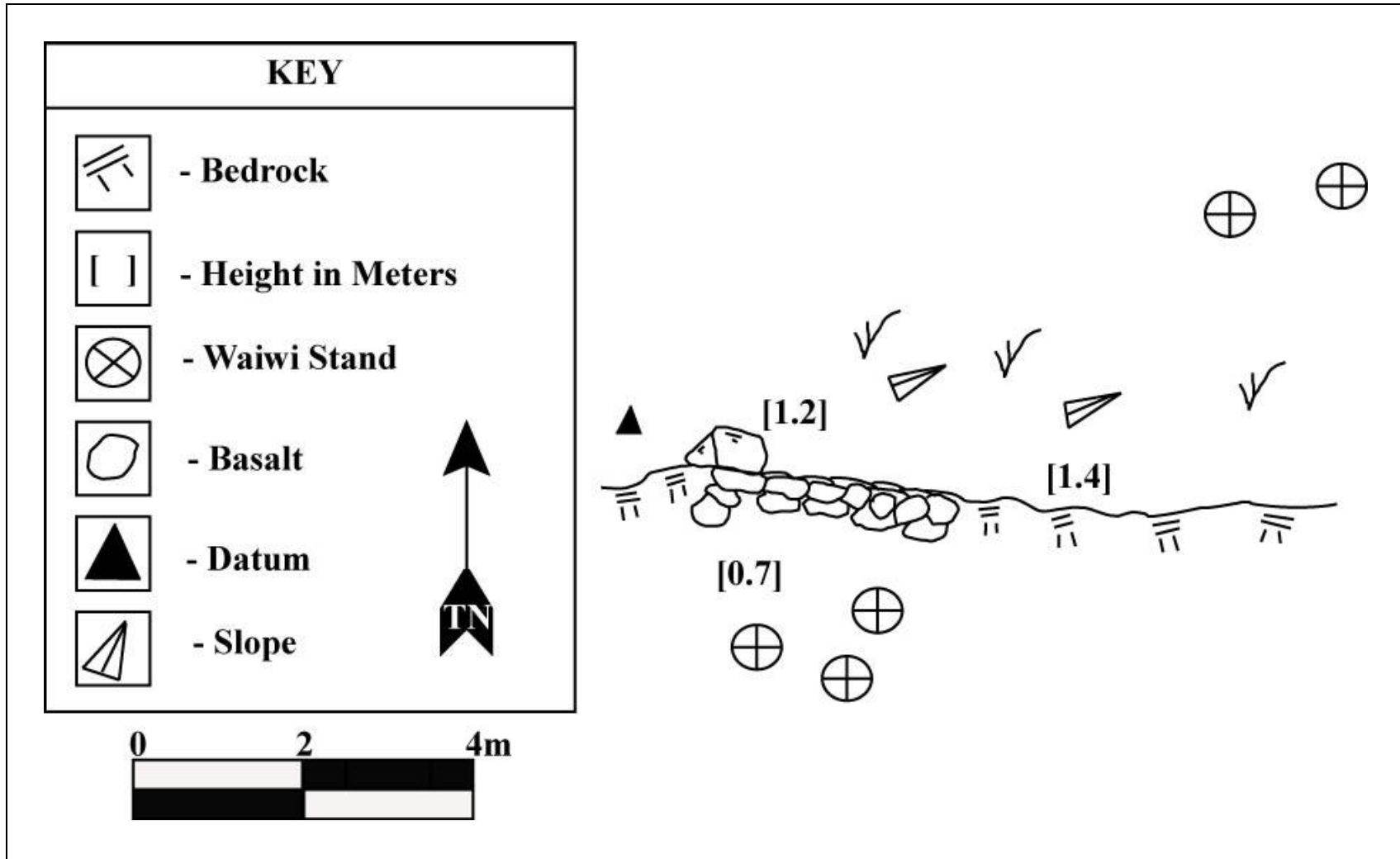


Figure 116: Site 29918 Feature F Plan View Map.



Figure 117: Photograph of Site 29918 Feature F Looking Southeast.

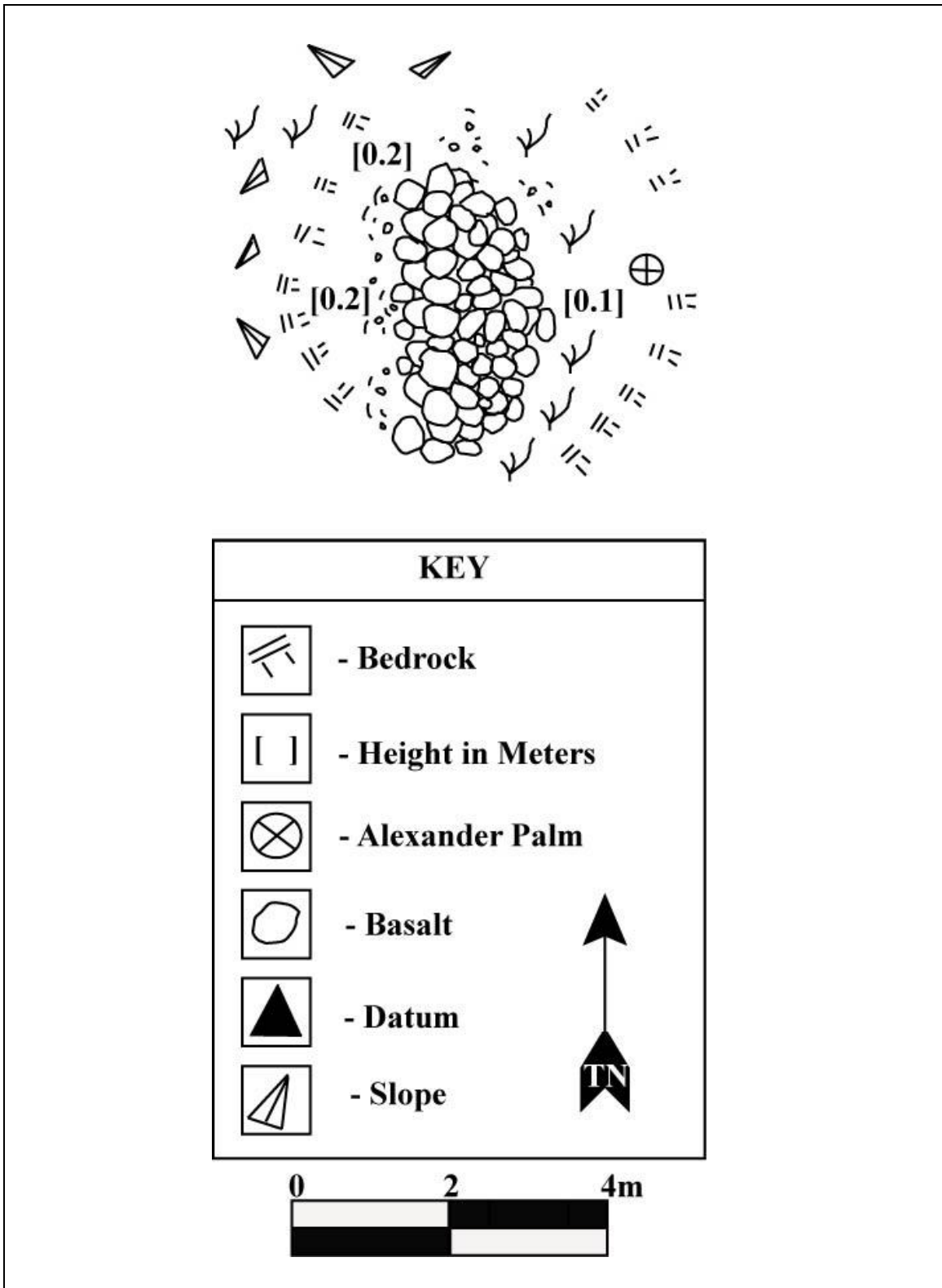


Figure 118: Site 29918 Feature G Plan View Map.



Figure 119: Photograph of Site 29918 Feature G Looking Northeast.



Figure 120: Photograph of Site 29918 Feature H Looking North.

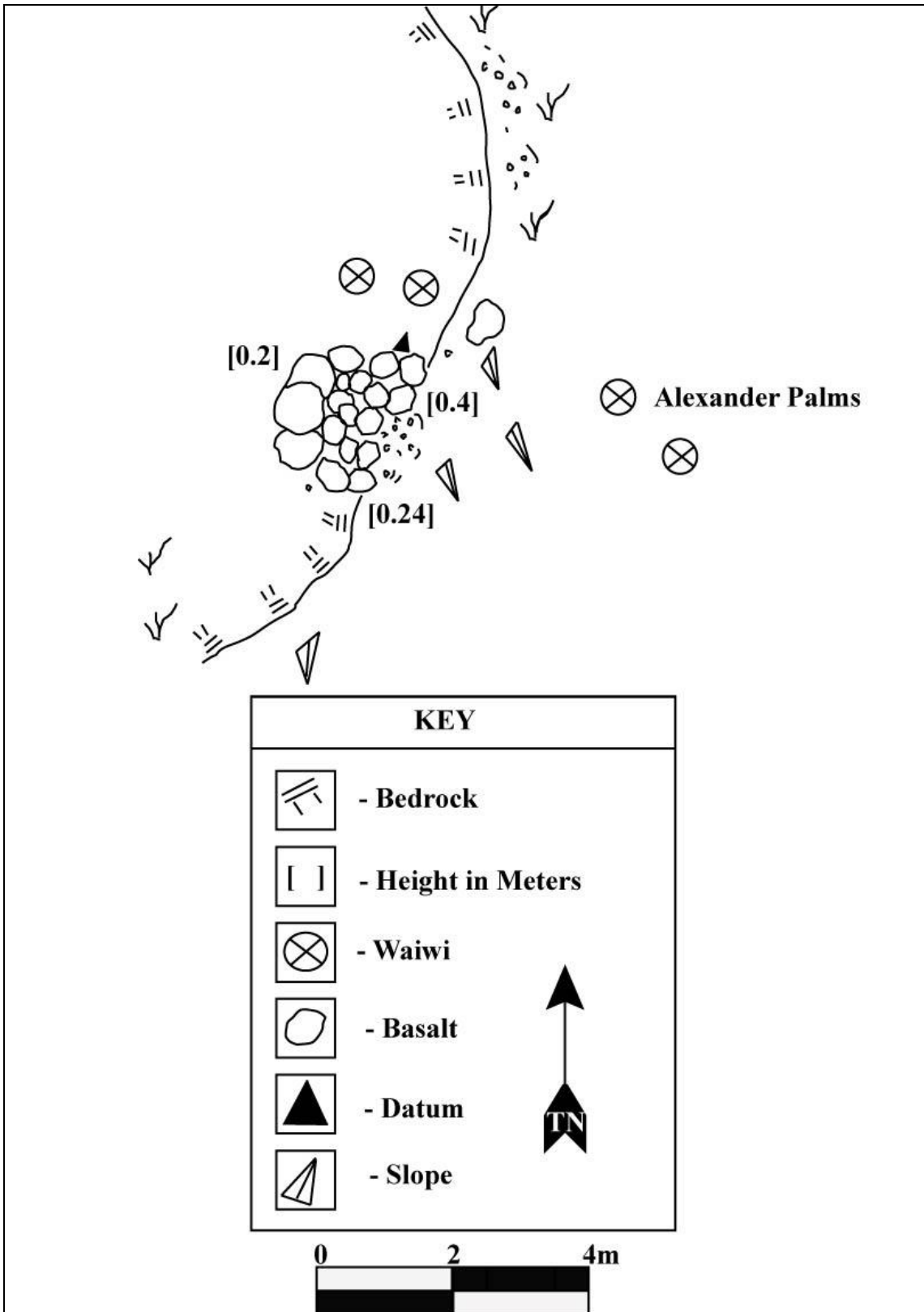


Figure 121: Site 29918 Feature I Plan View Map.



Figure 122: Photograph of Site 29918 Feature I Looking Northwest.

Feature J is an irregularly shaped modified outcrop located seven meters northwest of Feature H. The feature is 10.0 meters long (NW/SE) by 2.0 meters wide and is 0.7 m in maximum height (Figure 123). Feature H is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface. The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature H has been altered by guava trees and weathering and is in fair condition.

The rock mounds and modified outcrops at Site 29918 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

SITE 29919

Rock Mounds

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 20.0 meters (NW/SE) by 10.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29919 consists of four rock mounds (Features A through D) recorded 120 meters east of Site 29918 (see Figure 12). The features are located in a stand of banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a linear rock mound located at the center of the site (Figure 124). The rock mound is 2.9 m long (NE/SW) by 0.7 m wide and is 0.3 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled and stacked one to two courses high on the ground surface (Figure 125). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature A has been altered by banyan trees and weathering and is in fair condition.

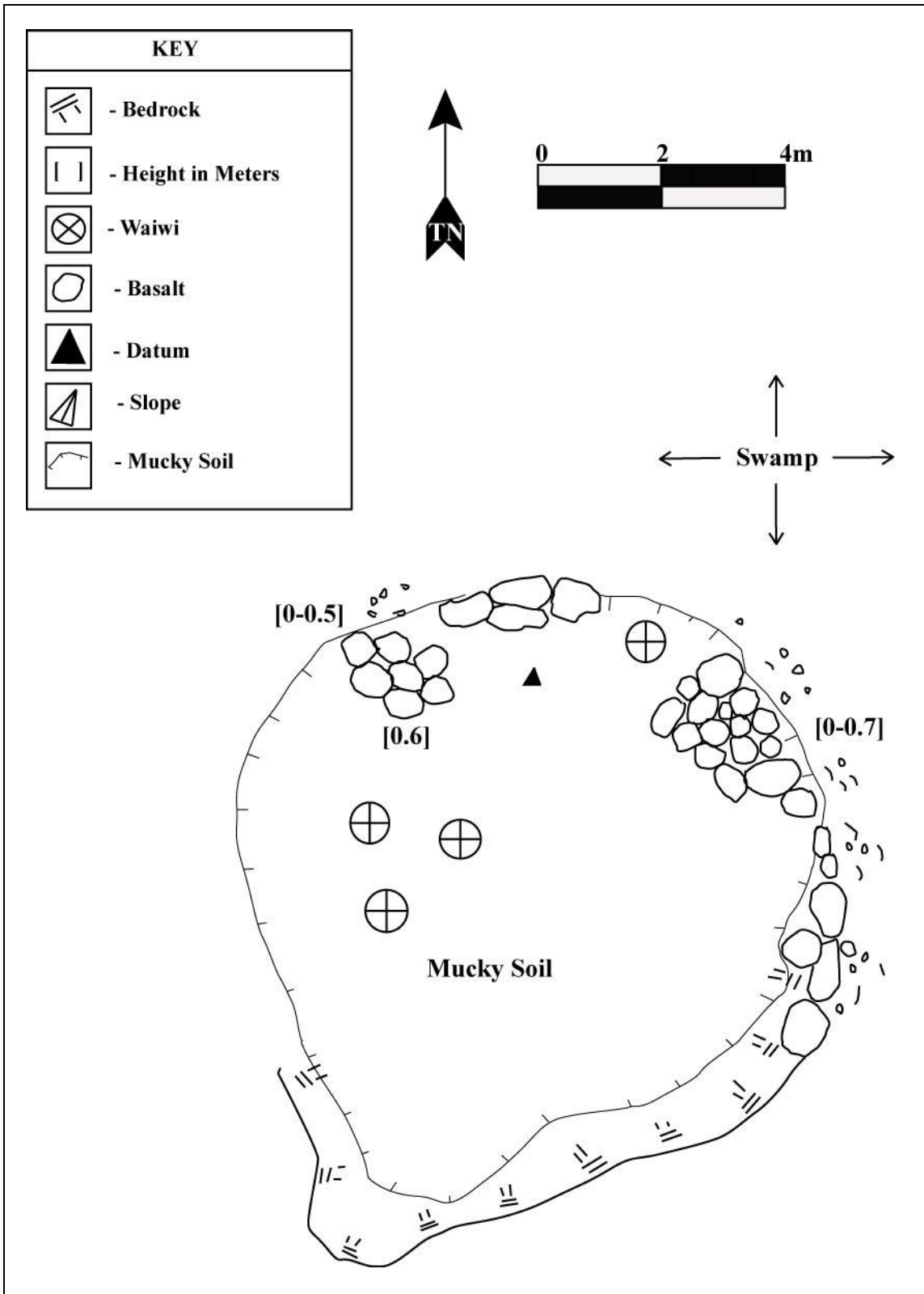


Figure 123: Site 29918 Feature J Plan View Map.

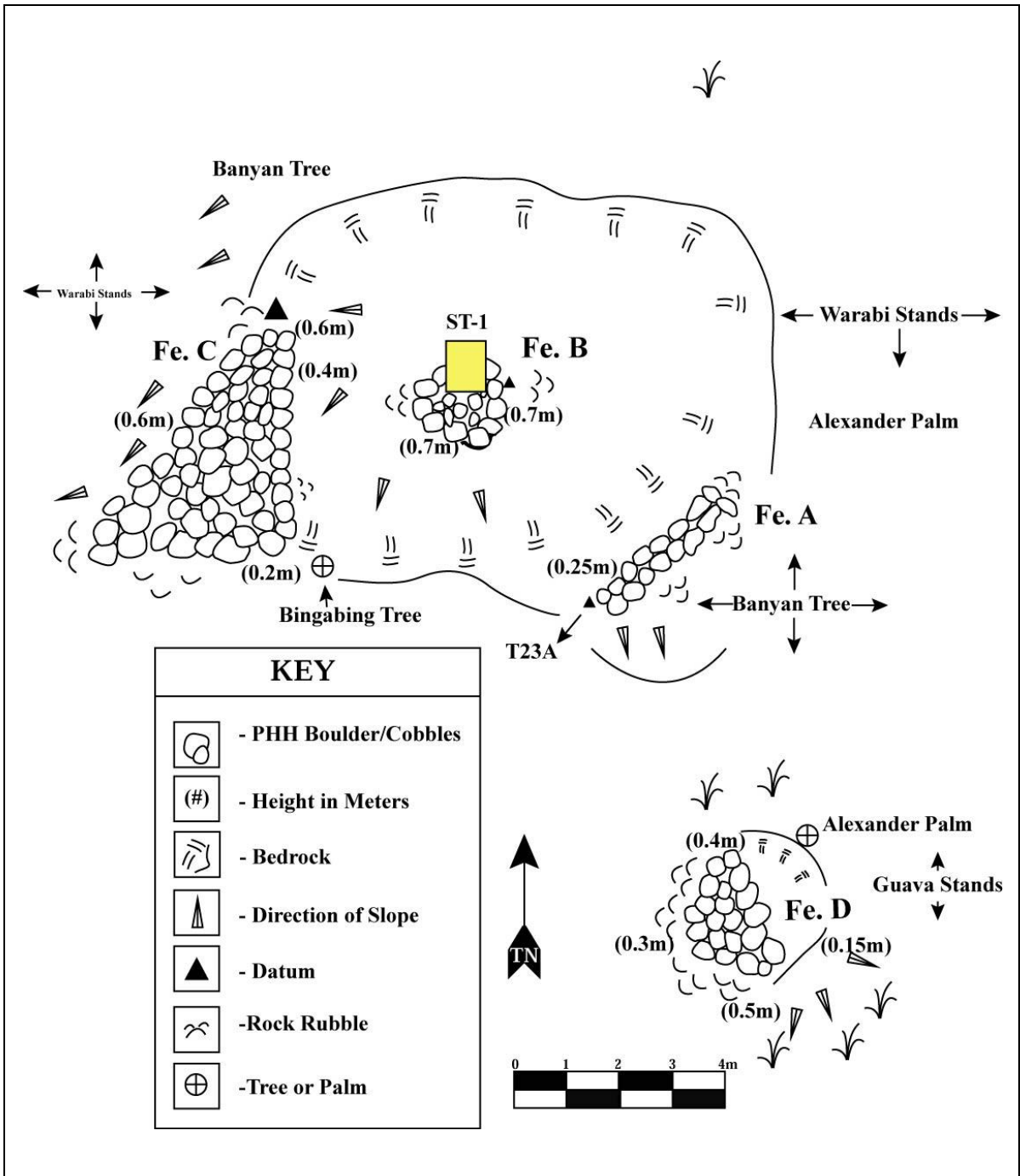


Figure 124: Site 29919 Plan View Map.



Figure 125: Photograph of Site 29919 Feature A Looking South.

Feature B consists of a circular rock mound located approximately three meters northwest of Feature A. Feature B measures 1.6 m in diameter and is 0.7 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled and stacked up to four courses high above the ground surface (Figure 126). No facing is evident in the feature construction. Feature B has been altered by banyan trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 1.0 meter long (N/S) by 0.8 m wide unit excavated into the north end of Feature B. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 15 cmbs, and terminated on bedrock (Figure 127).

The Architectural Layer (0-92 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 128). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-15 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 2% angular and subangular pebbles, and 30% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock.

Feature C is a roughly triangular rock mound located two meters west of Feature B. The rock mound is 5.5 m long (NE/SW) by 2.8 meters wide and is 0.6 m in maximum height. Feature C is constructed of angular and subangular cobbles and small boulders piled and loosely stacked on the ground surface (Figure 129). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature C has been altered by banyan trees and weathering and is in fair condition.



Figure 126: Photograph of Site 29919 Feature B Looking East.



Figure 128: Photograph of Site 29919 Feature B ST-1 Looking South.



Figure 129: Photograph of Site 29919 Feature C Looking Southwest.

Feature D is an oval rock mound located five meters south of Feature A. The rock mound is 2.0 m long (N/S) by 1.6 m wide and is 0.5 m in maximum height. Feature D is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 130). The feature is slightly mounded in shape. No stacking or facing is evident in the feature construction. Feature D has been altered by banyan trees and weathering and is in fair condition.

The rock mounds at Site 29919 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

SITE 29920	Rock Mound
FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	6.0 meters (NE/SW) by 2.3 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29920 consists of a rectangular rock mound located approximately 45 meters southwest of Site 29919 (see Figure 12). The feature is located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 6.0 m long (NE/SW) by 2.3 m wide and is 1.5 meters in maximum height (Figure 131). The feature is constructed of angular and subangular cobbles and small boulders piled one to four courses high on the ground surface (Figure 132). There is no stacking or facing evident in the feature construction. The feature has been slightly altered by weathering and is in good condition.



Figure 130: Photograph of Site 29919 Feature D Looking Southeast.

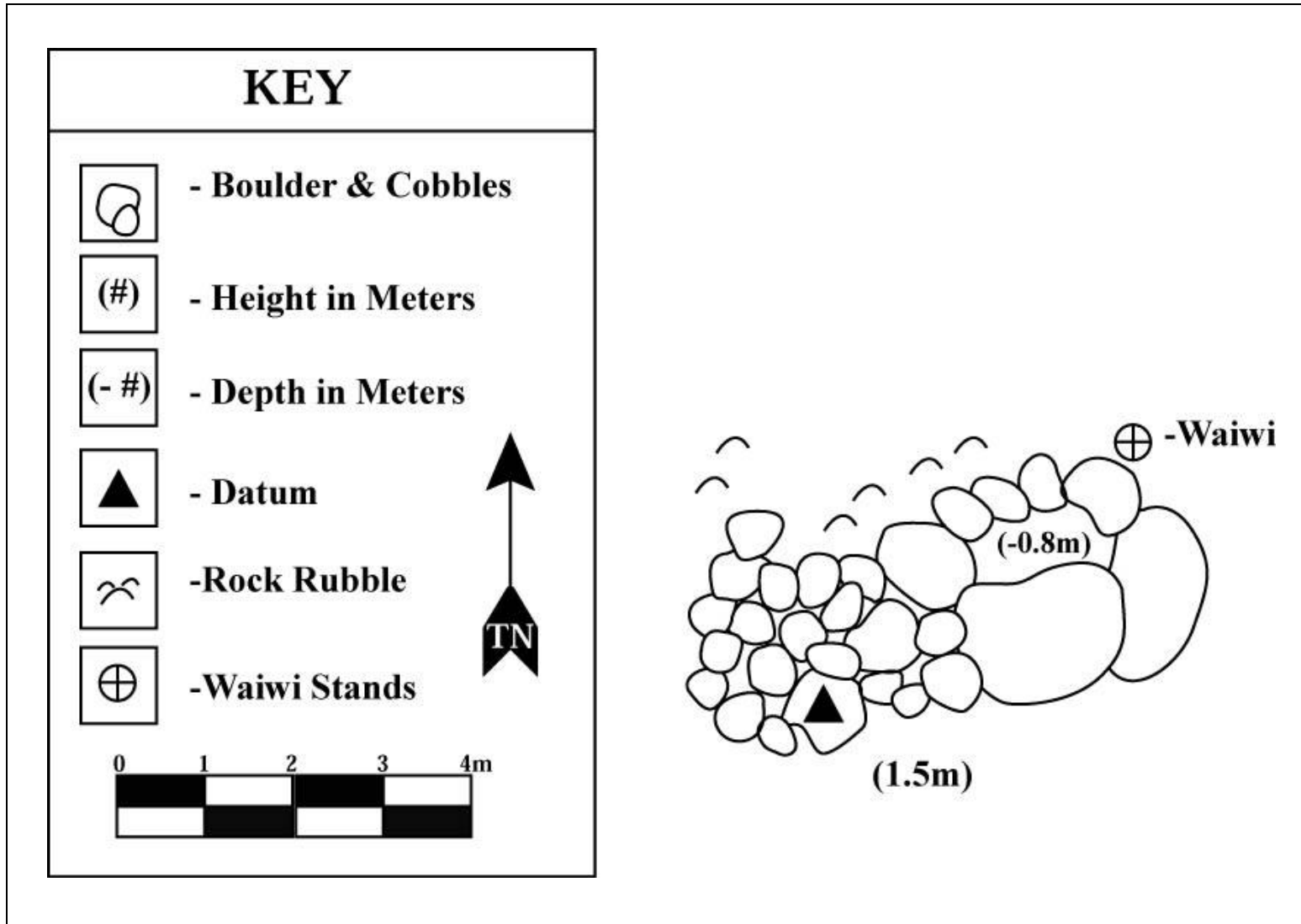


Figure 131: Site 29920 Plan View Map.



Figure 132: Photograph of Site 29920 Looking South.

The rock mound at Site 29920 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29921

Modified Outcrop

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

3.7.0 meters (N/S) by 2.1 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 29921 consists of a roughly square modified outcrop located approximately forty meters northwest of Site 29920 (see Figure 12). The feature is located in a thicket of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

The modified outcrop is 3.7 m long (NE/SW) by 2.1 m wide and is 0.8 meters in maximum height (Figure 133). The feature is constructed of angular and subangular cobbles and small boulders stacked three to four courses high along the southeast edge of a bedrock outcrop (Figure 134). The southeast edge of the feature is well faced. The feature has been slightly altered by weathering and is in fair condition.

The modified outcrop at Site 29921 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

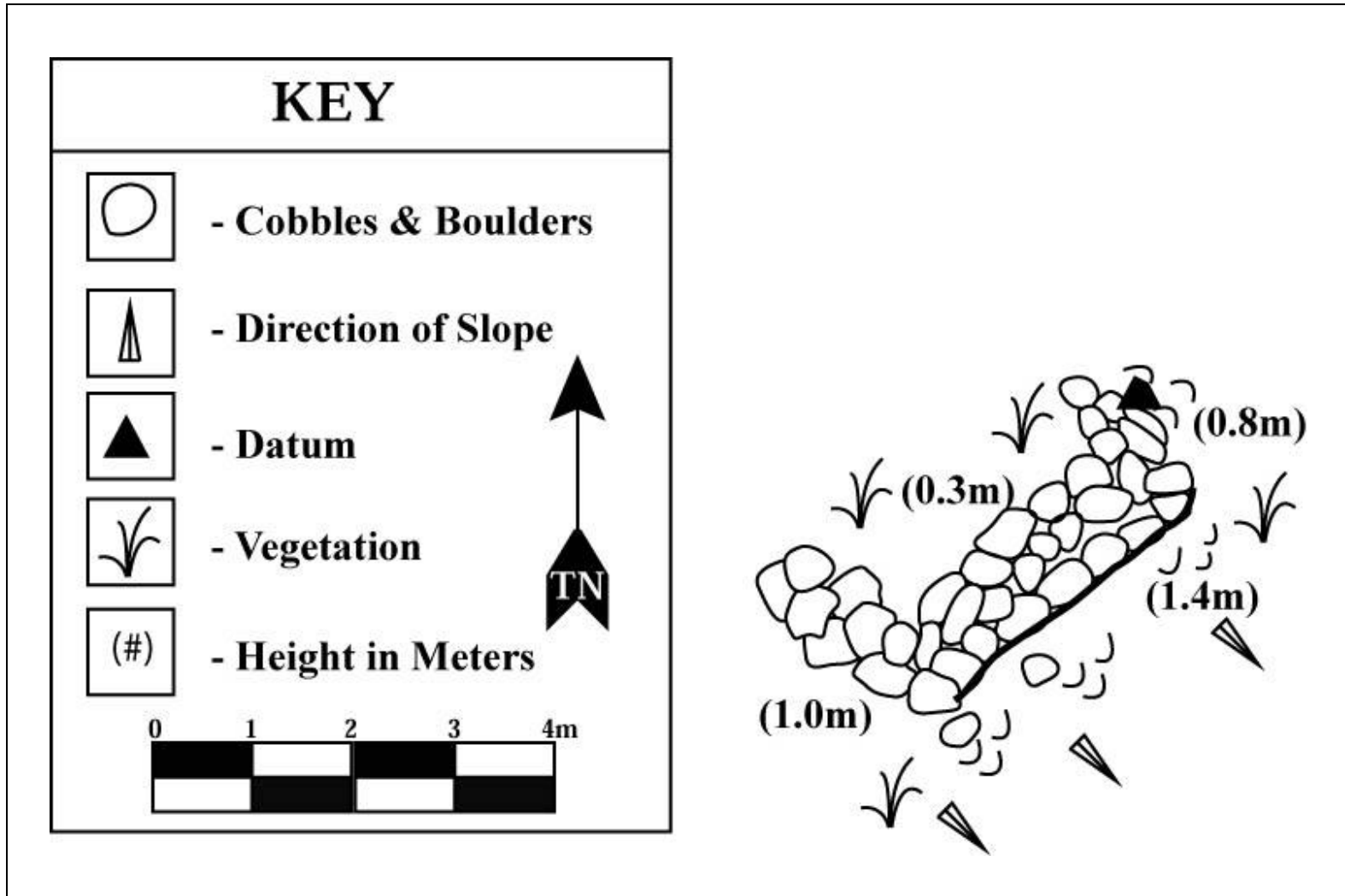


Figure 133: Site 29921 Plan View Map.



Figure 134: Photograph of Site 29921 Looking West.

SITE 29922**Rock Mounds**

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	20.0 meters (NE/SW) by 10.0 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29922 consists of two rock mounds (Feature A and Feature B) recorded 25 meters northeast of Site 29915 (see Figure 12). The features are located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular rock mound located at the northeast end of the site. The rock mound is 2.5 m long (N/S) by 1.8 m wide and is 1.5 m in maximum height (Figure 135). Feature A is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 136). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature A has been altered by guava trees and weathering and is in fair condition.

Feature B consists of a roughly oval rock mound located approximately sixteen meters southwest of Feature A. Feature B measures 7.7 m long (N/S) by 4.2 m wide and is 0.4 m in maximum height (Figure 137). The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface (Figure 138). No stacking or facing is evident in the feature construction. Feature B has been altered by banyan trees and weathering and is in fair condition.

The rock mounds at Site 29922 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

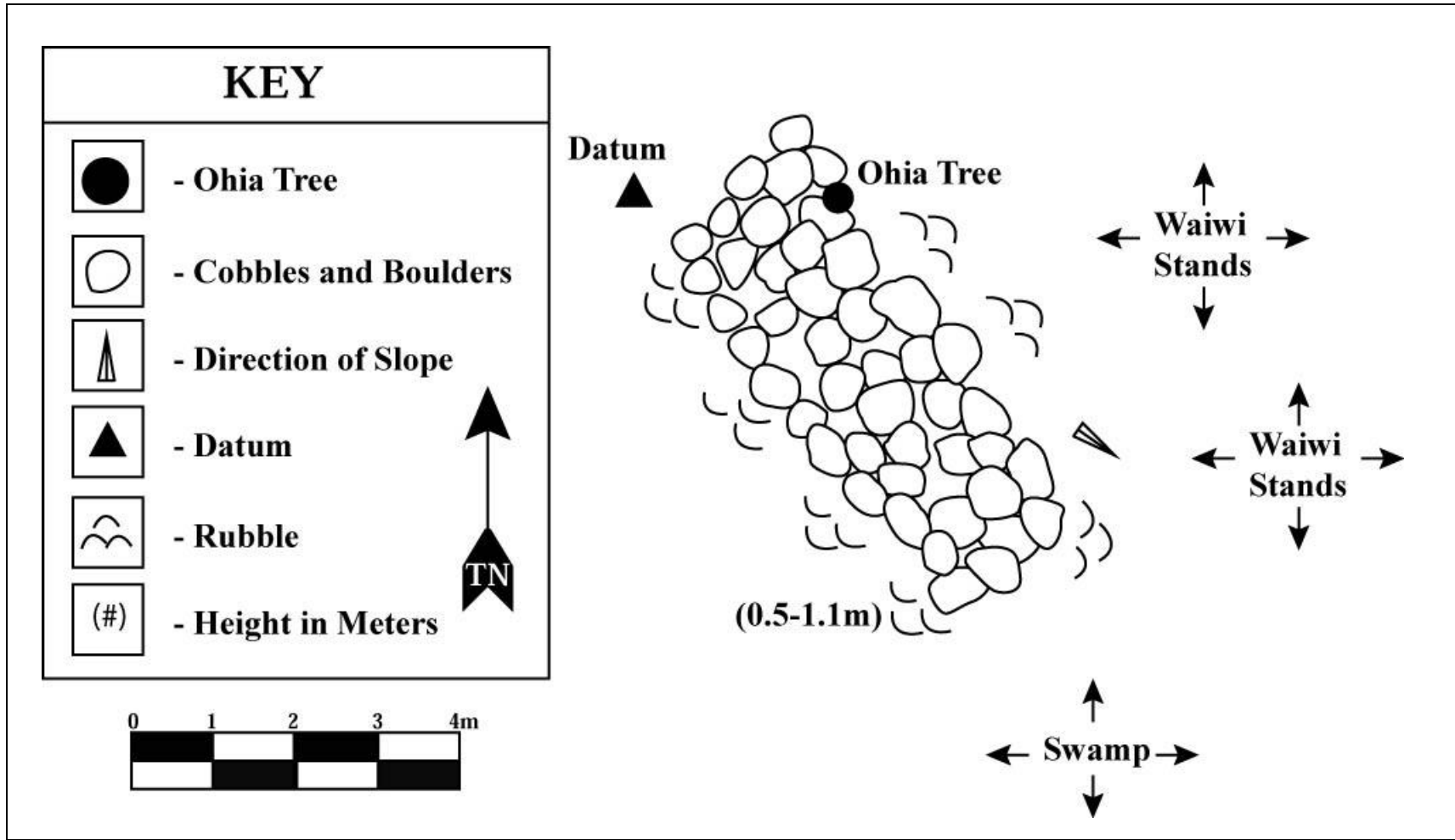


Figure 135: Site 29922 Feature A Plan View Map.



Figure 136: Photograph of Site 29922 Feature A Looking East.

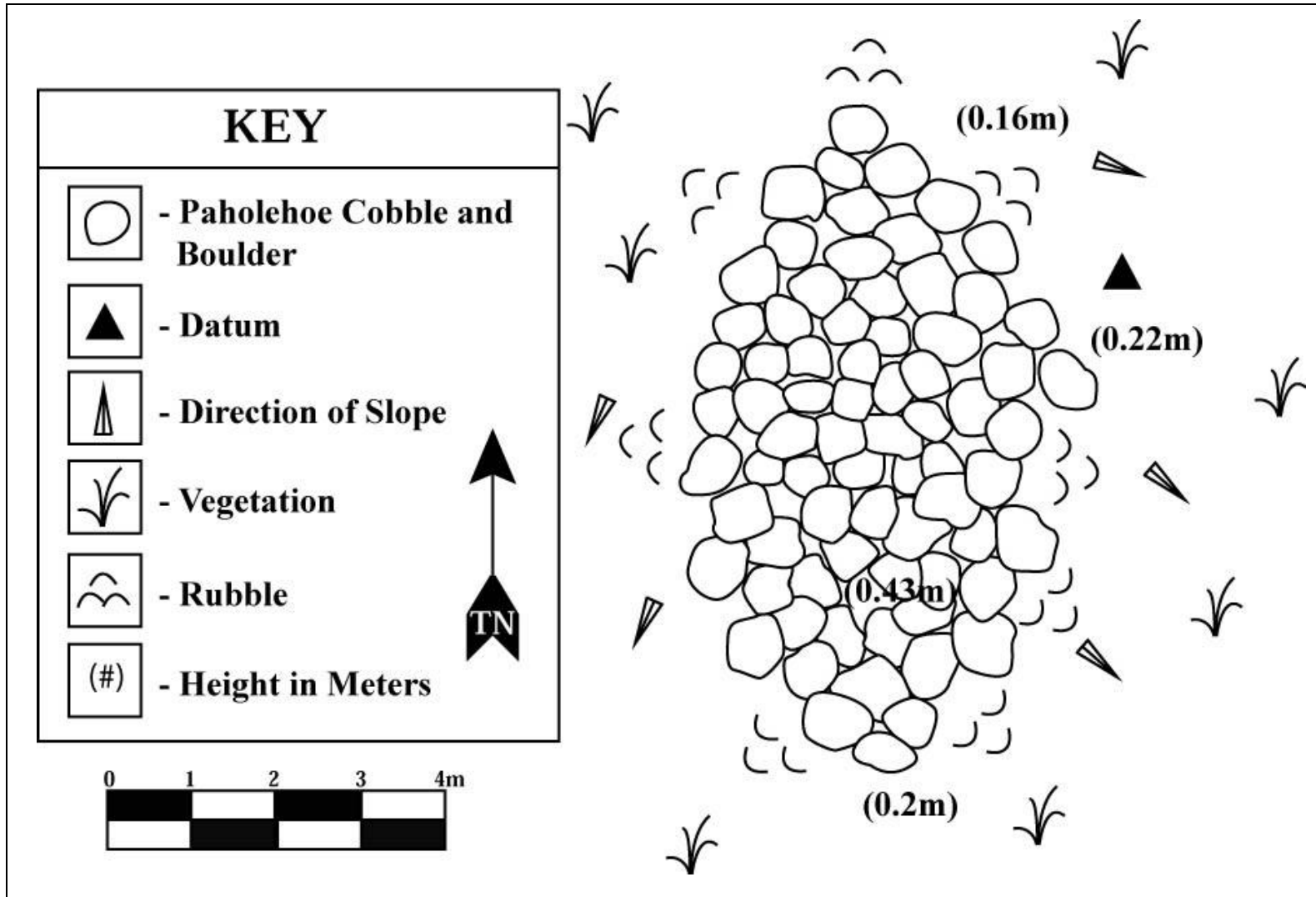


Figure 137: Site 29922 Feature B Plan View Map.



Figure 138: Photograph of Site 29922 Feature B Looking West.

SITE 29923**Modified Outcrop**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 2.0 meters (N/S) by 1.4 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29923 consists of a roughly triangular modified outcrop located approximately 25 meters northwest of Site 29921 (see Figure 12). The feature is located under a banyan tree in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The feature is 2.0 m long (E/W) by 1.4 m wide and is 0.6 meters in maximum height (Figure 139). The feature is constructed of angular and subangular cobbles and small boulders piled along the south corner of an exposed bedrock outcrop (Figure 140). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. The feature has been slightly altered by weathering and is in good condition.

The modified outcrop at Site 29923 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29924**Modified Outcrop**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 6.0 meters (N/S) by 2.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None

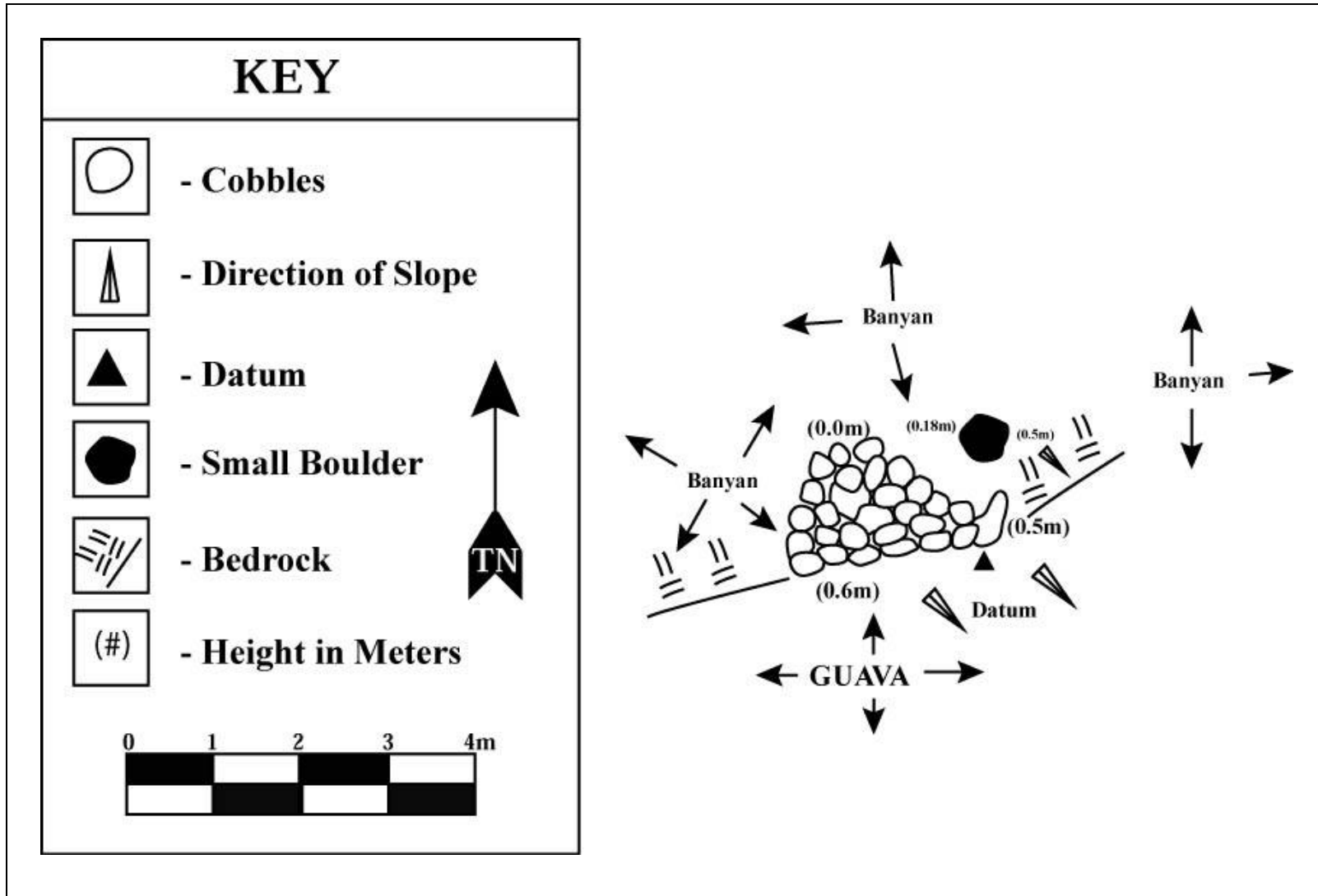


Figure 139: Site 29923 Plan View Map.



Figure 140: Photograph of Site 29923 Looking West.

DESCRIPTION: Site 29924 consists of a roughly triangular modified outcrop located approximately 100 meters northeast of Site 29922 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The feature is 6.0 m long (NE/SW) by 2.0 m wide and is 0.4 meters in maximum height (Figure 141). The feature is constructed of angular and subangular cobbles and small boulders piled along the southeast edge of an exposed bedrock outcrop (Figure 142). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. The feature has been slightly altered by weathering and is in good condition.

The modified outcrop at Site 29924 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29925

Rock Mound

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

4.2 meters (N/S) by 4.2 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

ST-1

DESCRIPTION:

Site 29925 consists of a square rock mound located approximately 25 meters east of Site 29915 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

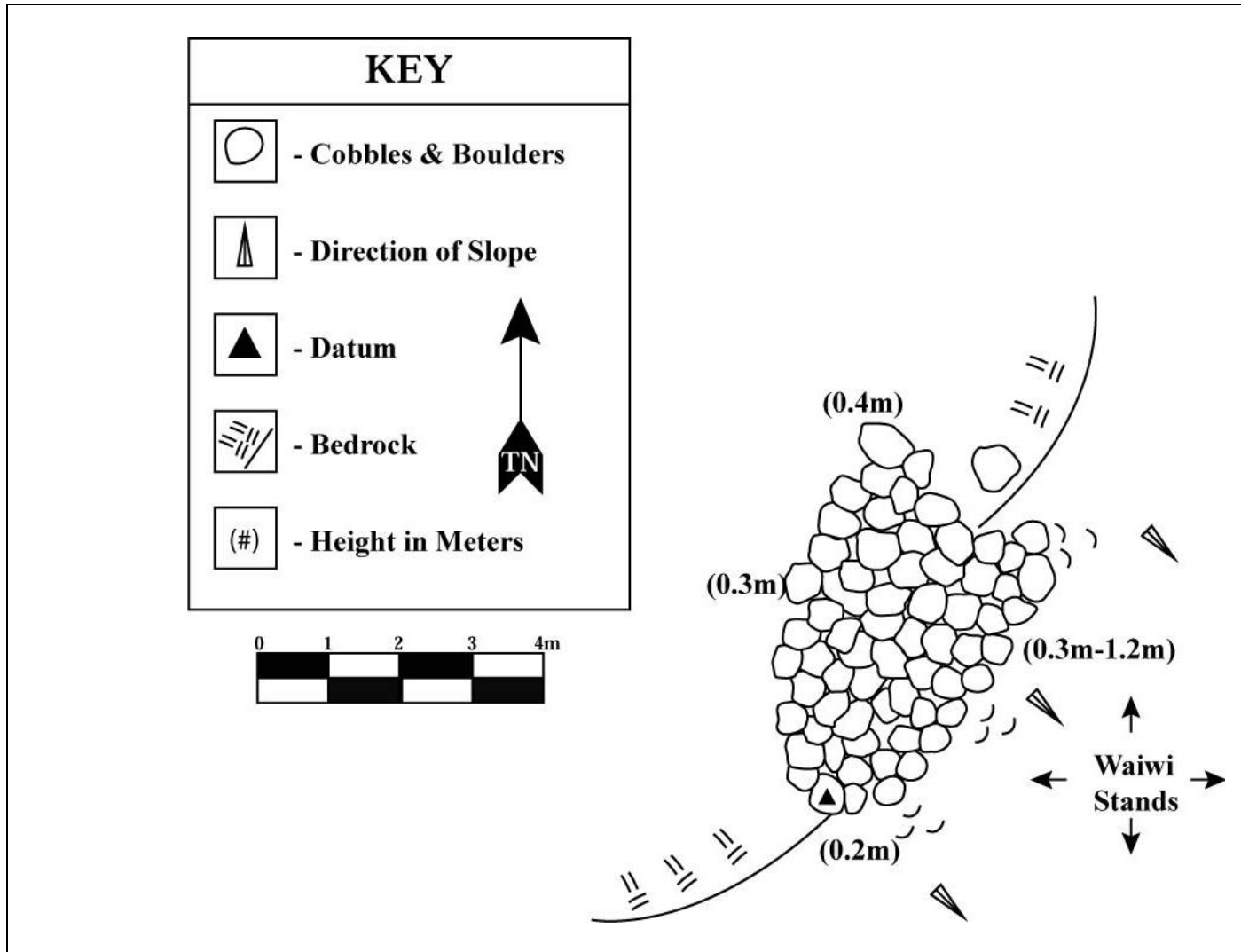


Figure 141: Site 29924 Plan View Map.



Figure 142: Photograph of Site 29924 Looking West.

The rock mound is 4.2 m long (N/S) by 4.2 m wide and is 1.6 meters in maximum height (Figure 143). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 144). The feature is slightly mound shaped. There is no stacking or facing evident in the feature construction. The feature has been slightly altered by guava trees and weathering and is in good condition.

Stratigraphic Trench 1

ST-1 was a 1.4 meter long (E/W) by 0.8 m wide unit excavated in the west side of the rock mound. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 25 cmbs, and terminated on bedrock (Figure 145).

The Architectural Layer (0-60 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 146). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-25 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 10% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock.

The rock mound at Site 29925 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29926	Rock Mound
FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	4.2 meters (N/S) by 4.2 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering

SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29926 consists of a rectangular rock mound located approximately 20 meters east of Site 29925 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 3.4 m long (NE/SW) by 3.0 m wide and is 1.1 meters in maximum height (Figure 147). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface. The feature is slightly mound shaped. There is no stacking or facing evident in the feature construction. The feature has been slightly altered by guava trees and weathering and is in good condition.

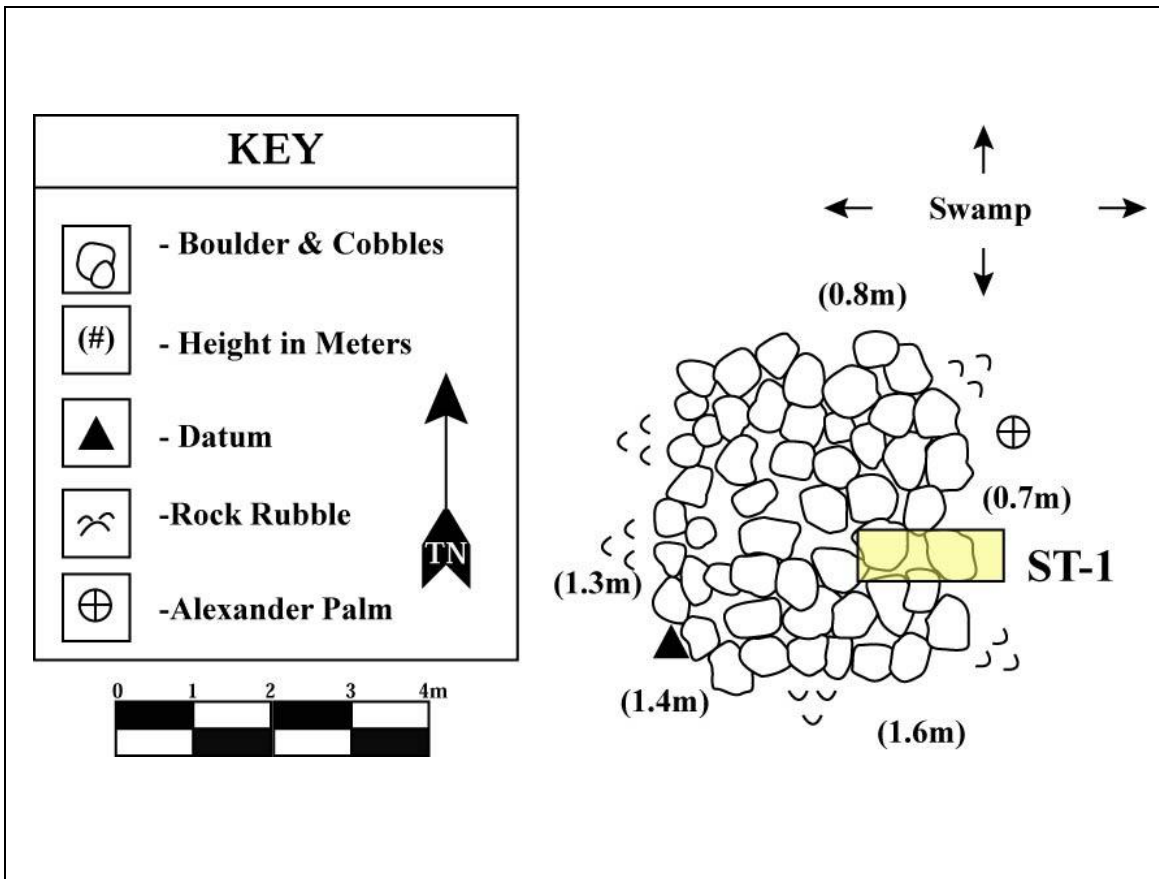


Figure 143: site 29925 Plan View Map.



Figure 144: Photograph of Site 29925 Looking Northeast.

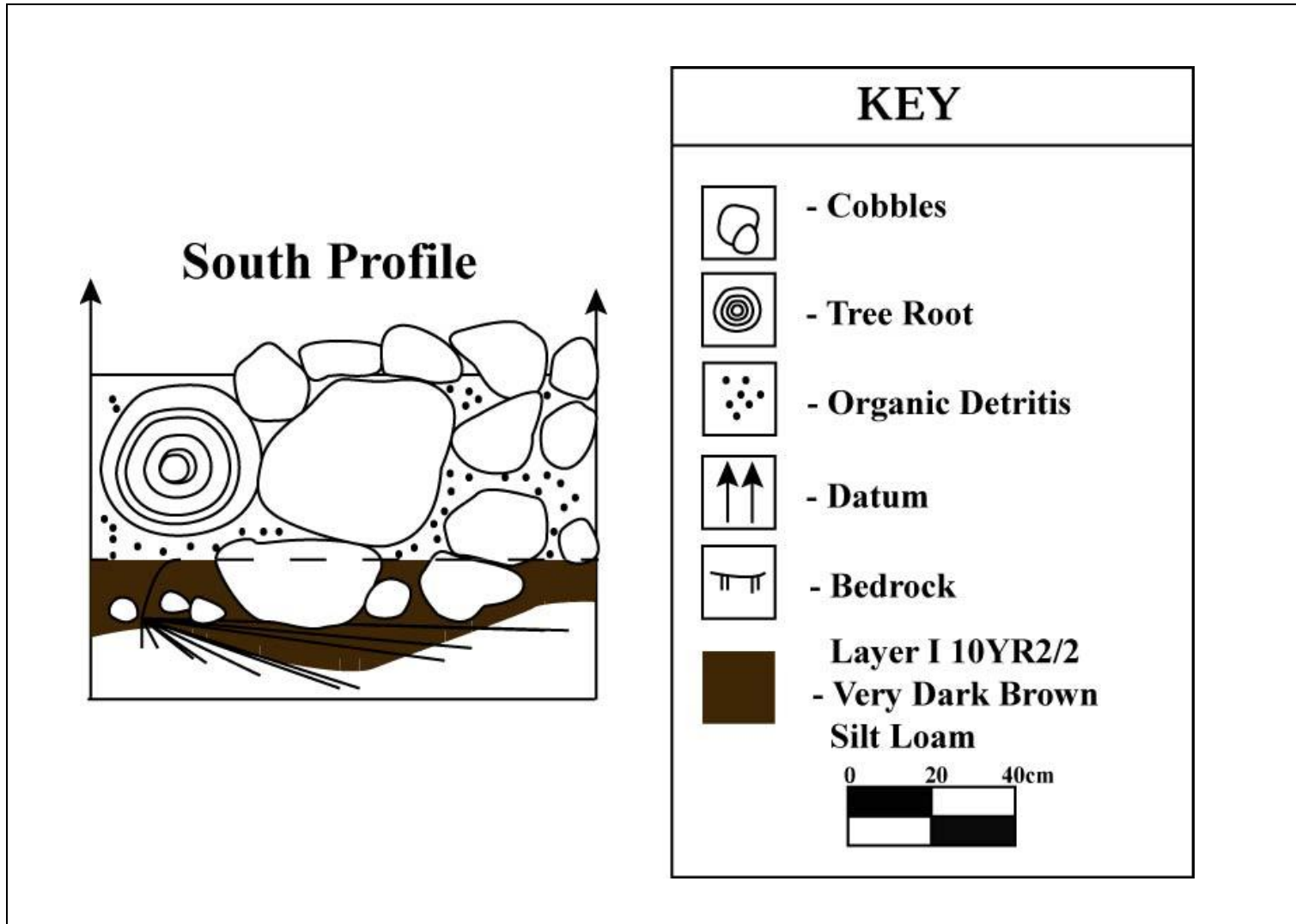


Figure 145: 29925 ST-1 South Profile.



Figure 146: Photograph of Site 29925 ST-1 Showing architectural Layer, Looking Southwest.

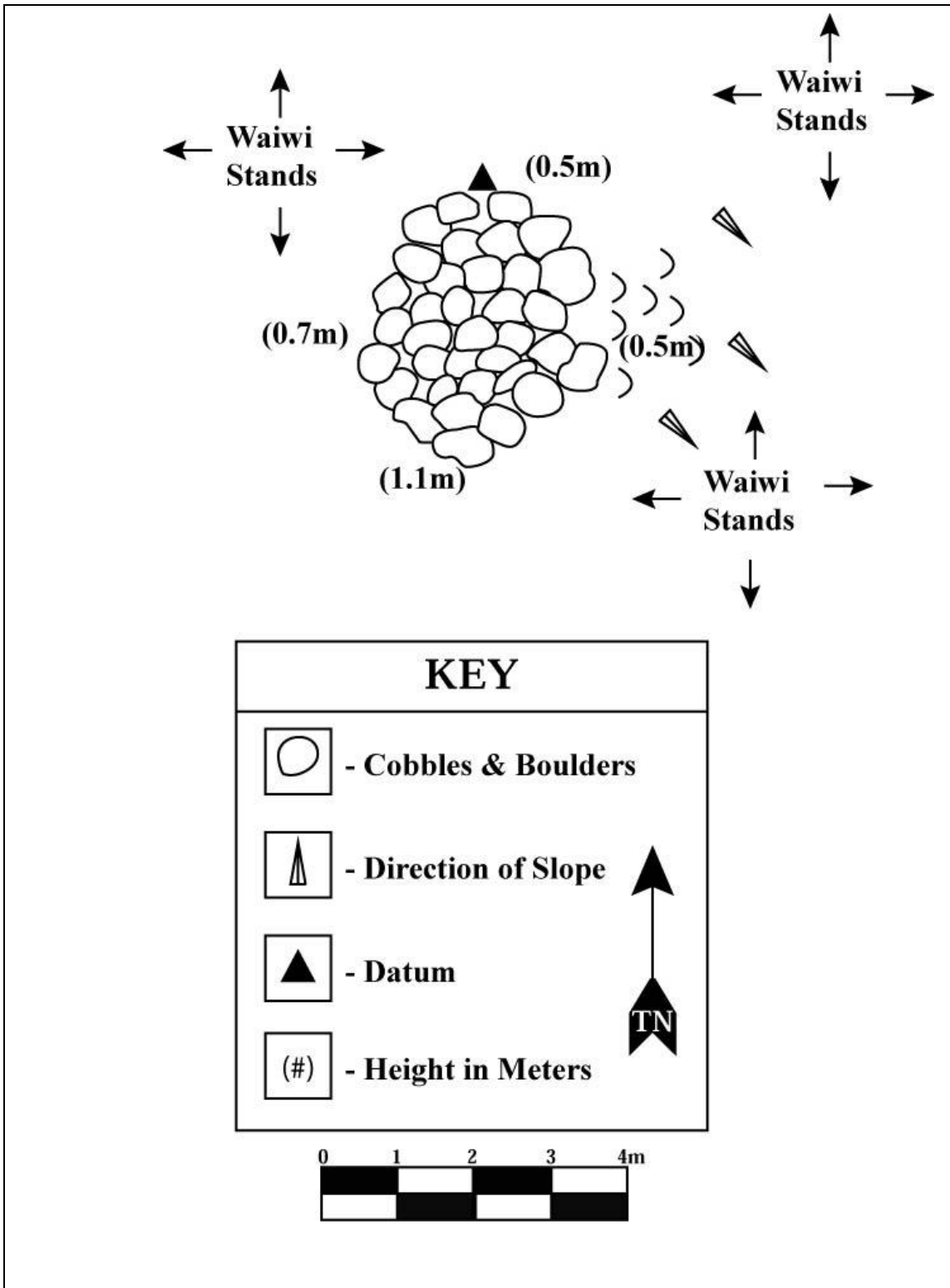


Figure 147: site 29926 Plan View Map.

The rock mound at Site 29926 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29927

Rock Mound

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

5.1 meters (N/S) by 4.5 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 29927 consists of a rectangular rock mound located approximately 15 meters southeast of Site 29926 (see Figure 12). The feature is located in a stand of guava and banyan trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 5.1 m long (N/S) by 4.5 m wide and is 0.9 meters in maximum height (Figure 148). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 149). The feature is mounded in shape. There is no stacking or facing evident in the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29927 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

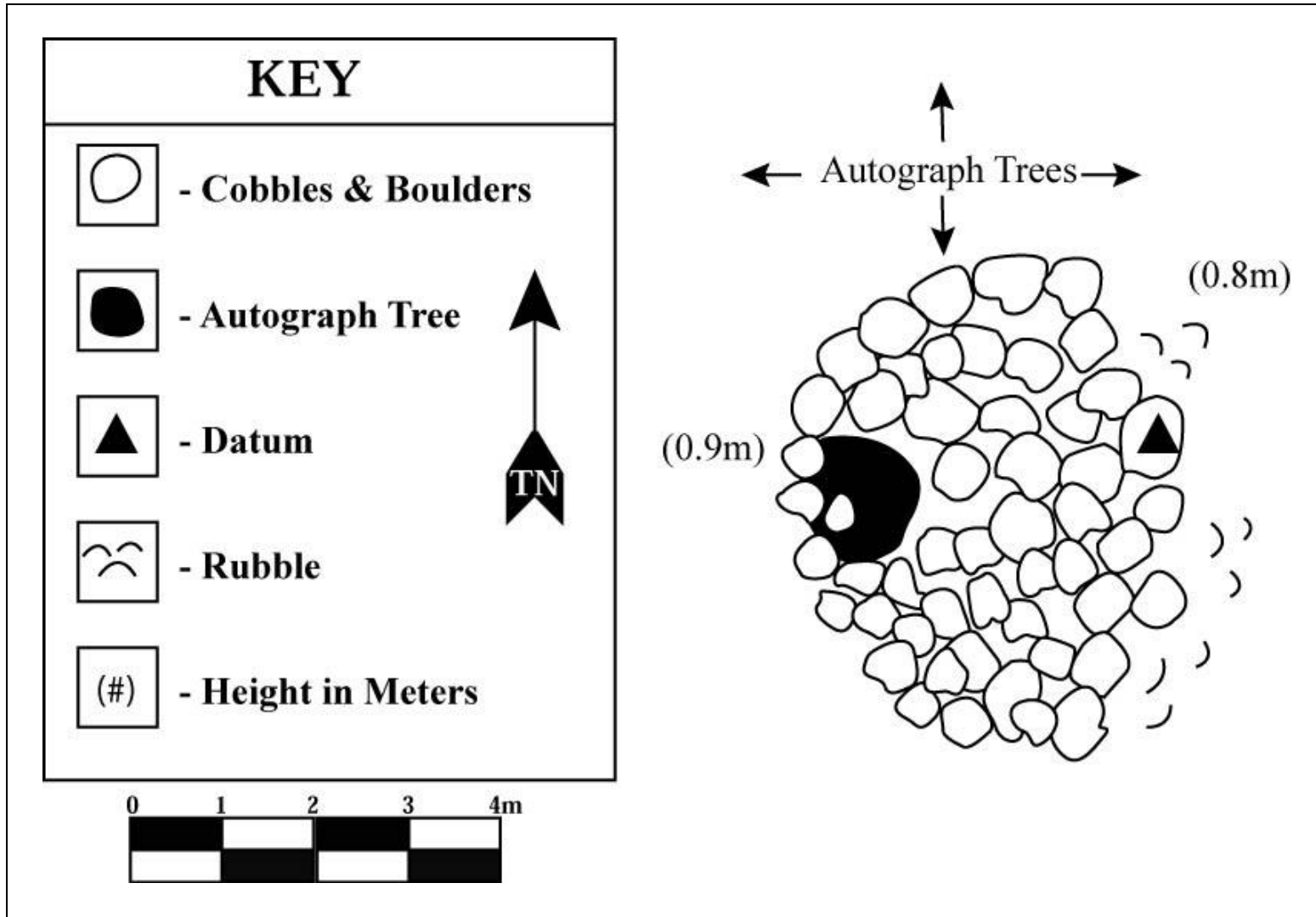


Figure 148: Site 29927 Plan View Map.



Figure 149: Photograph of Site 29927 Looking West.

SITE 29928**Rock Mound**

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	5.3 meters (N/S) by 1.3 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29928 consists of a square rock mound located approximately 10 meters northeast of Site 29927 (see Figure 12). The feature is located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 3.5 m long (NW/SE) by 3.5 m wide and is 1.2 meters in maximum height (Figure 150). The feature is constructed of angular and subangular cobbles and small boulders piled and stacked one to four courses high on the ground surface (Figure 151). The feature is slightly mound shaped. There is no facing evident in the feature construction. The feature has been slightly altered by weathering and is in good condition.

Stratigraphic Trench 1

ST-1 was a 1.0 meter long (NE/SW) by 0.8 m wide unit excavated in the southwest side of the rock mound. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 20 cmbs, and terminated on bedrock (Figure 152).

The Architectural Layer (0-40 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus (Figure 153). The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-20 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 10% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock.

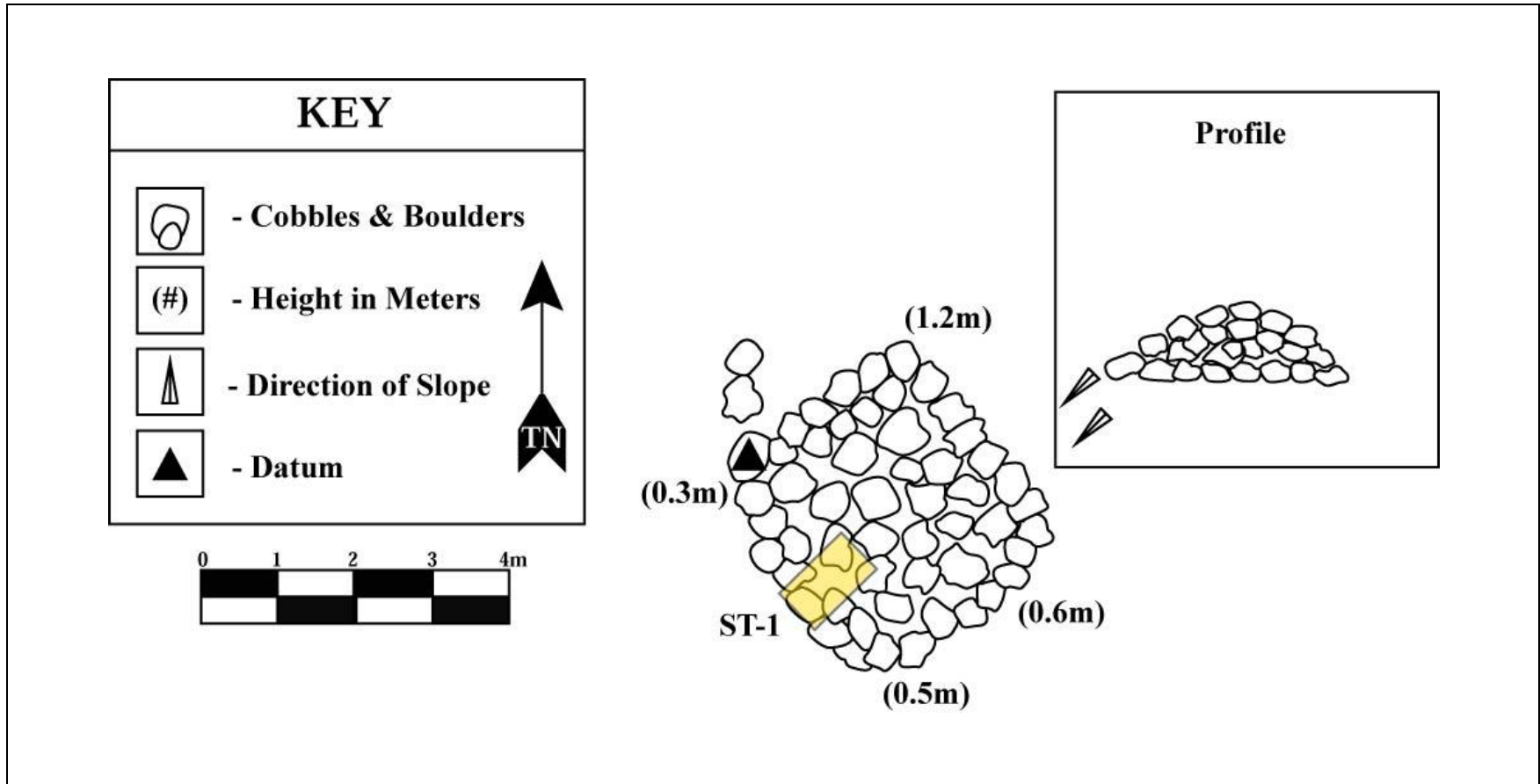


Figure 150: Site 29928 Plan View Map.



Figure 151: Photograph of Site 29928 Looking North.

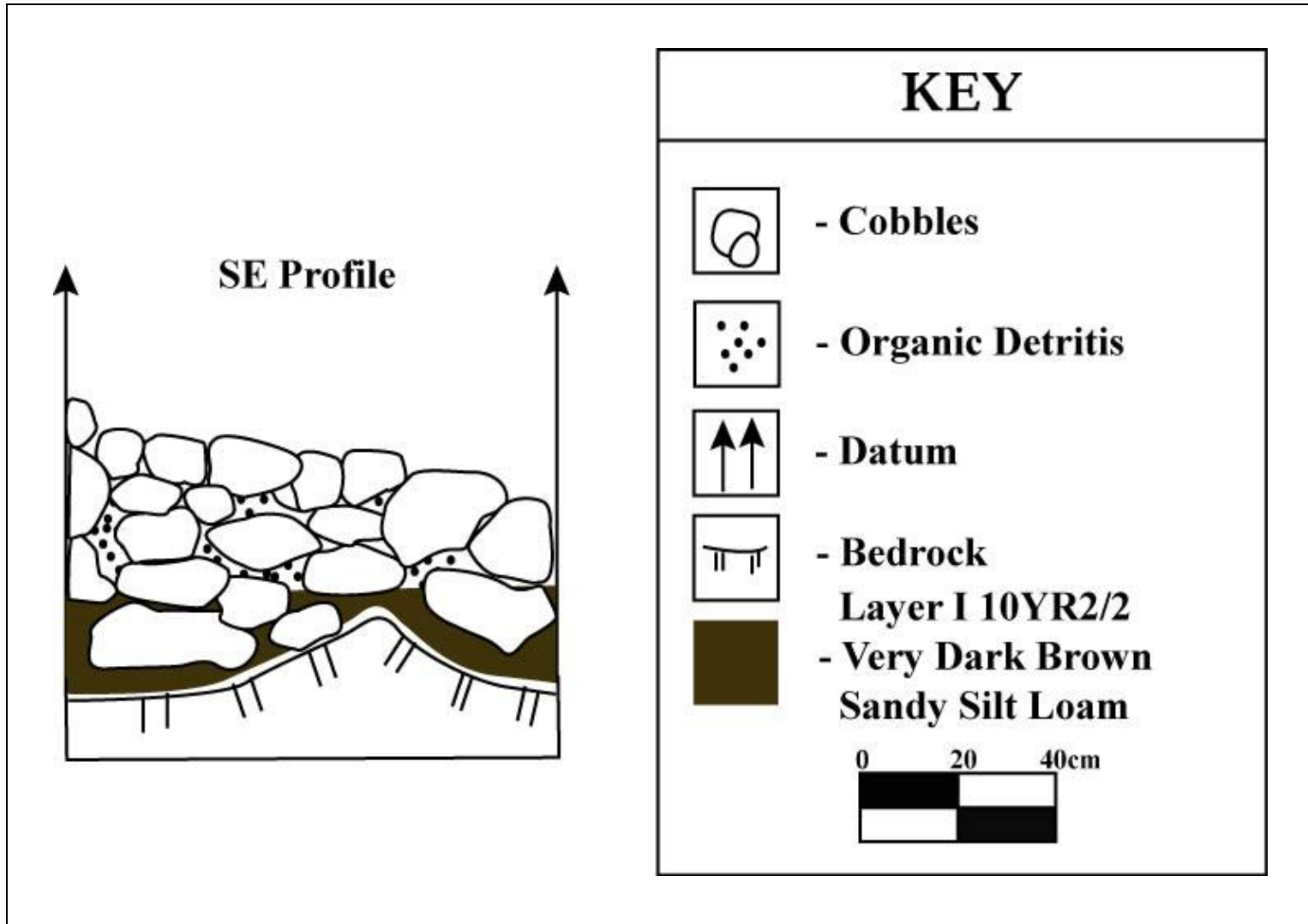


Figure 152: Site 29928 ST-1 Southeast Profile.



Figure 153: Photograph of Site 29928 ST-1 Architectural Layer Looking Northeast.

The rock mound at Site 29928 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29929

Rock Mounds

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	6.8 meters (E/W) by 5.0 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29929 consists of two rock mounds (Feature A and Feature B) recorded fifteen meters southeast of Site T-34 (see Figure 12). The features are located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

Feature A is a roughly rectangular rock mound located at the west edge of the site (Figure 154). The rock mound is 2.7 m long (N/S) by 1.8 m wide and is 0.5 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled one to three courses high on the ground surface (Figure 155). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature A has been altered by guava trees and weathering and is in fair condition.

Feature B consists of a roughly oval rock mound located approximately two meters east of Feature A. Feature B measures 2.6 m long (NW/SE) by 1.1 m wide and is 0.2 m in maximum height. The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface. No stacking or facing is evident on the ground surface. Feature B has been altered by banyan trees and weathering and is in fair condition.

The rock mounds at Site 29908 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

SITE 29930

Rock Mound

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

3.0 meters (E/W) by 2.7 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 29930 consists of a rectangular rock mound located approximately fifteen meters west of Site 29929 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 3.0 m long (E/W) by 2.7 m wide and is 0.5 meters in maximum height (Figure 156). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 157). The feature is slightly mounded in shape. There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29930 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

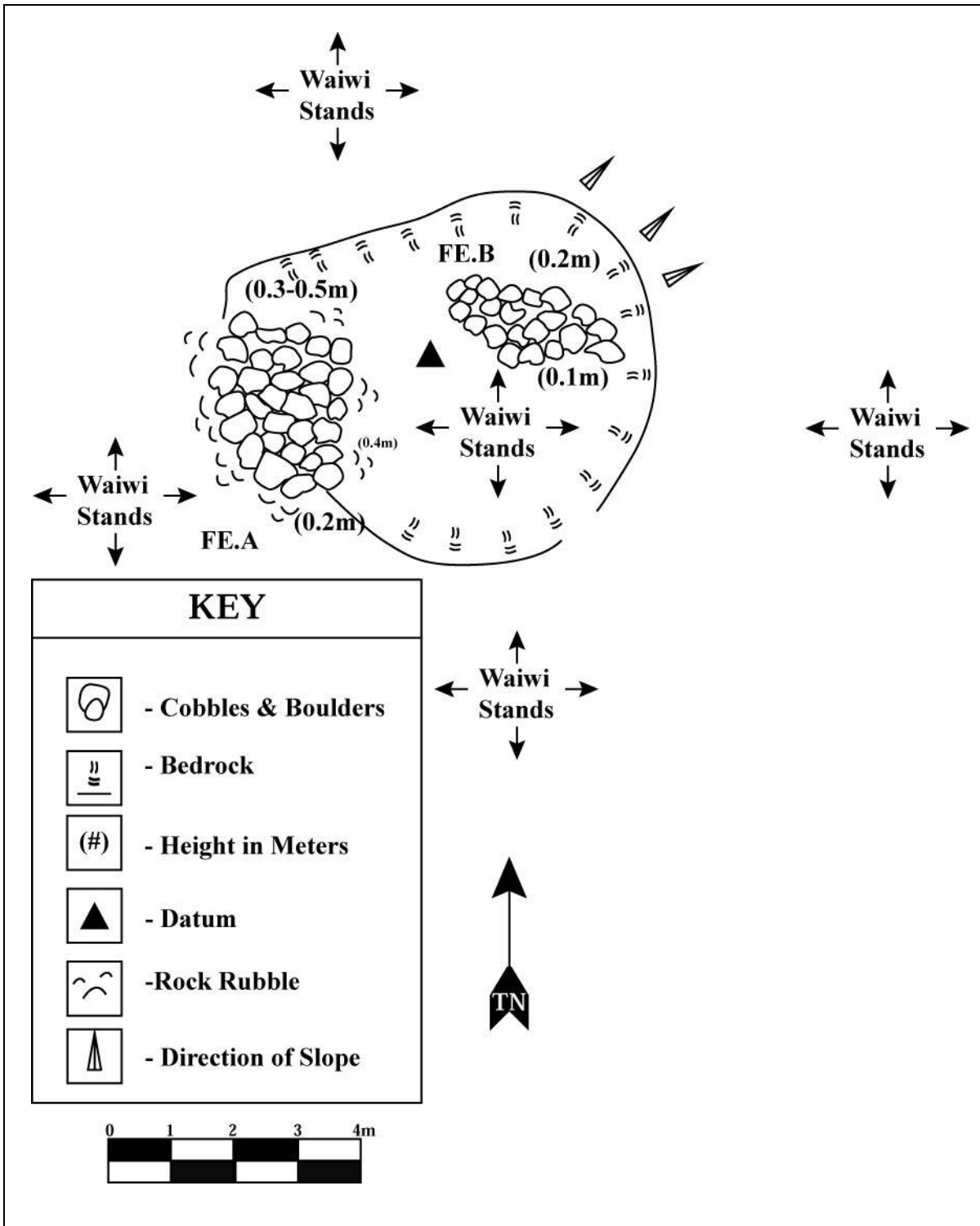


Figure 154: site 29929 Plan View Map.



Figure 155: Photograph of Site 29929 Looking East.

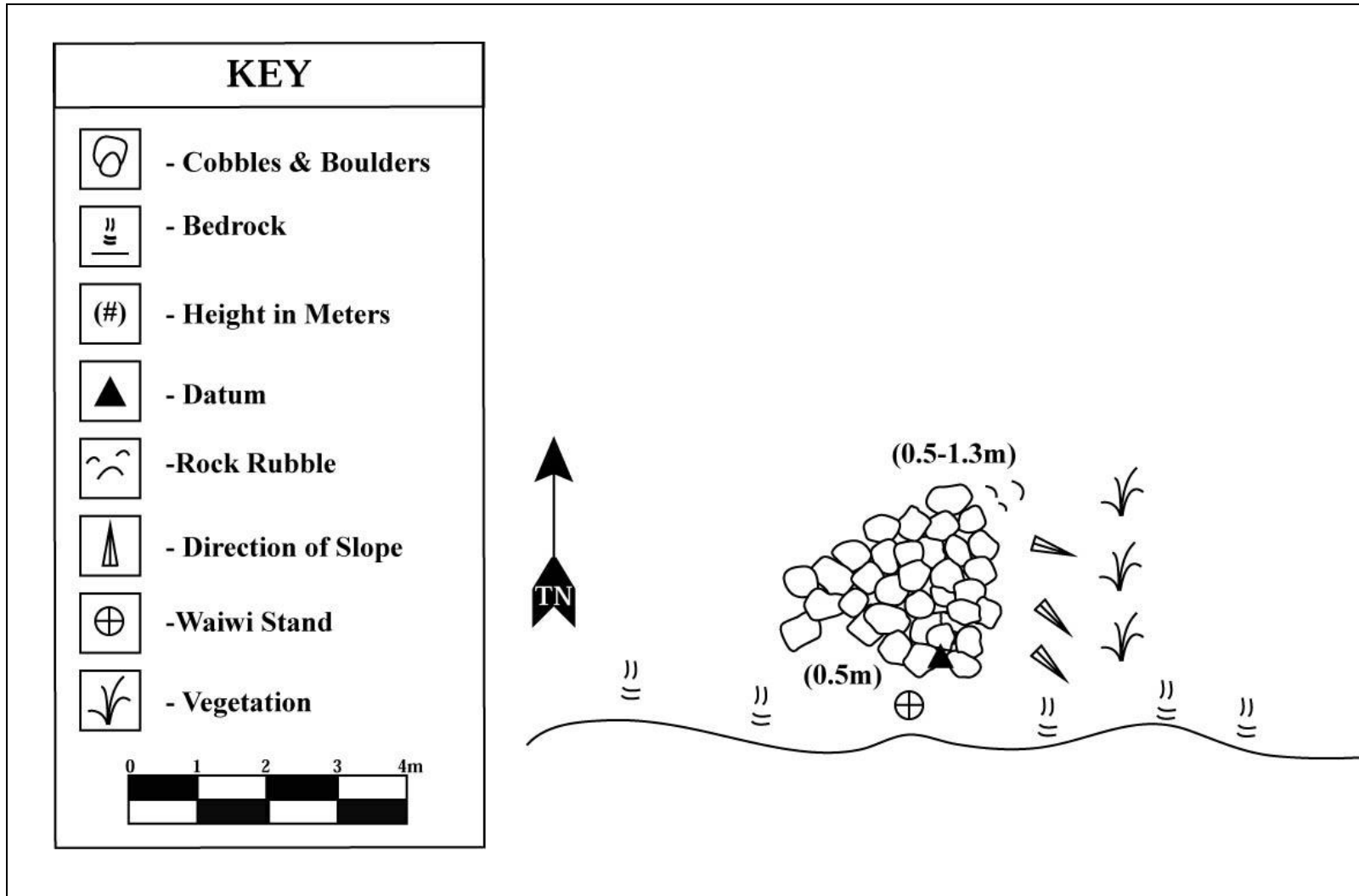


Figure 156: Site 29930 Plan view Map.



Figure 157: Photograph of Site 29930 Looking Southwest.

SITE 29931**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 3.6 meters (NW/SE) by 2.6 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29931 consists of a rectangular rock mound located approximately forty meters southeast of Site 29930 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 3.6 m long (NW/SE) by 2.6 m wide and is 0.4 meters in maximum height (Figure 158). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 159). The feature is slightly mounded in shape. There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29931 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29932**Modified Outcrop**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 3.4 meters (NW/SE) by 0.8 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None

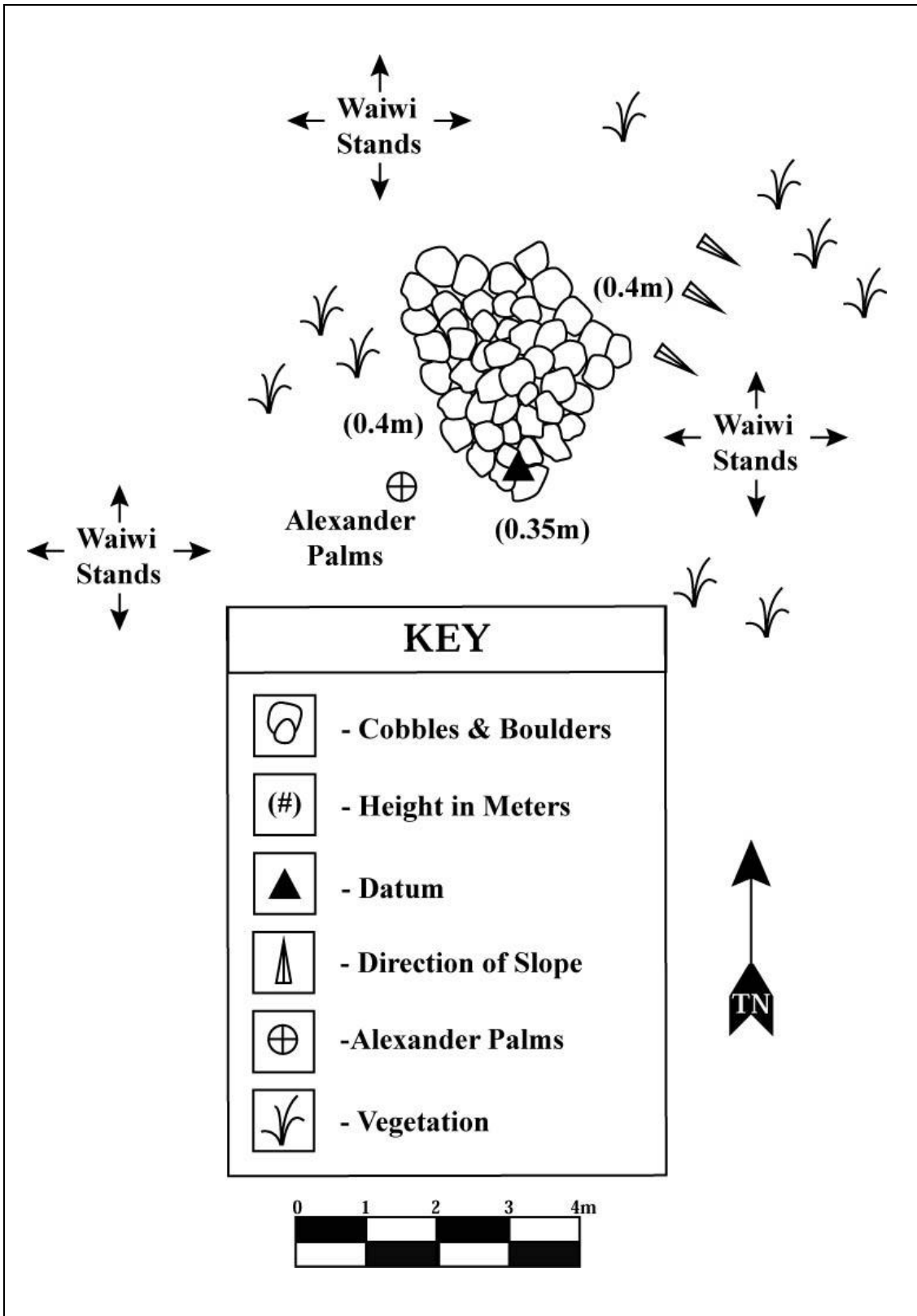


Figure 158: Site 29931 Plan View Map.



Figure 159: Photograph of Site 29931 Looking North.

DESCRIPTION: Site 29932 consists of a roughly rectangular modified outcrop located approximately 45 meters northeast of Site 29931 (see Figure 12). The feature is located in a stand of guava and trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

The modified outcrop is 3.4 m long (NW/SE) by 1.1 m wide and is 0.8 meters in maximum height (Figure 160). The feature is constructed of angular and subangular cobbles and small boulders stacked up to five courses high along the southwest edge of an exposed bedrock outcrop (Figure 161). The southwest side of the feature is well faced. The feature has been slightly altered by weathering and is in fair condition.

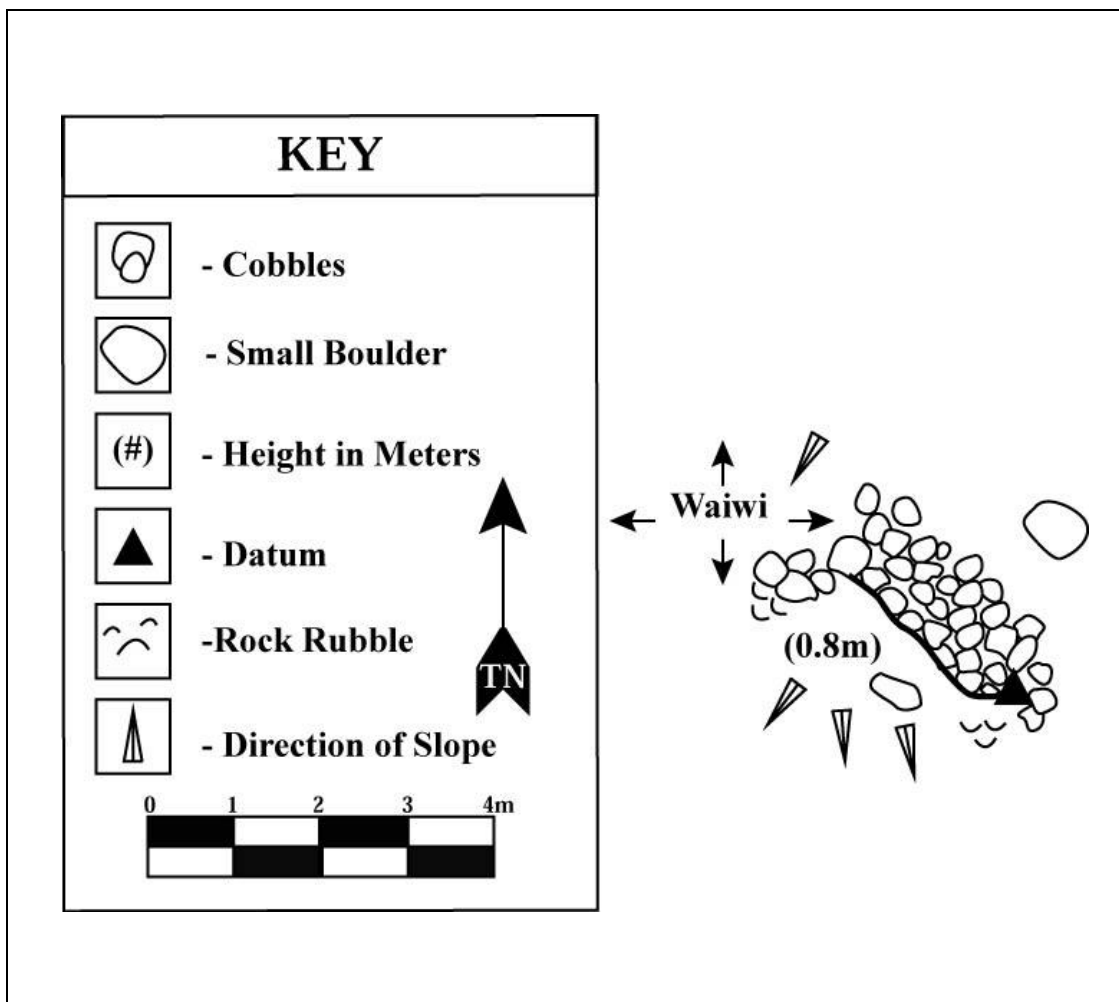


Figure 160: Site 29932 Plan View Map.



Figure 161: Photograph of Site 29932 Looking North.

The modified outcrop are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and are in fair condition. No further work is recommended at the site.

SITE 29933

Rock Mound

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

5.5 meters (E/W) by 2.6 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 29933 consists of an irregularly shaped rock mound located approximately six meters northeast of Site 29932 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 5.5 m long (E/W) by 2.6 m wide and is 0.5 meters in maximum height (Figure 162). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 163). The feature is slightly mounded in shape. There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29933 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

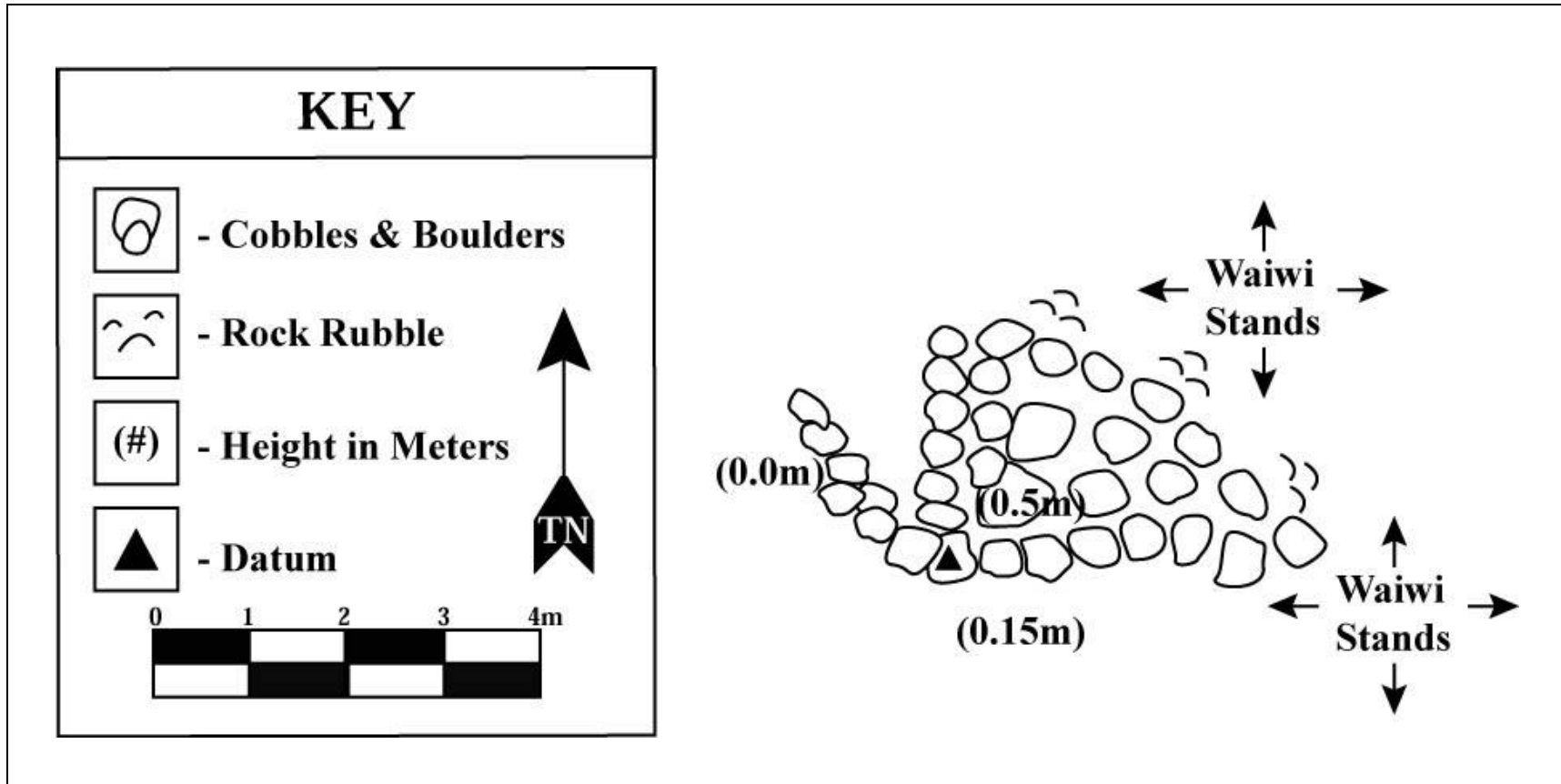


Figure 162: Site 29933 Plan view Map.



Figure 163: Photograph of site 29933 Looking Southeast.

SITE 29934**Rock Mound**

FUNCTION:	Agriculture
AGE:	Historic
DIMENSIONS:	2.0 meters (E/W) by 2.0 meters
CONDITION:	Fair
INTEGRITY:	Altered by Weathering
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 29934 consists of a square rock mound located approximately eighteen meters northwest of Site 29933 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 2.0 m long (N/S) by 2.0 m wide and is 0.7 meters in maximum height (Figure 164). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 165). The feature is slightly mounded in shape. There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

Stratigraphic Trench 1

ST-1 was a 2.1 meter long (N/S) by 0.8 m wide unit excavated through the center of the rock mound. ST-1 contained an architectural layer and one natural stratigraphic layer, was excavated to a maximum depth of 20 cmbs, and terminated on bedrock (Figure 166).

The Architectural Layer (0-65 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus. The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and wavy and terminated in Layer I sediment.

Layer I (0-20 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 10% small roots. A small amount of architectural rock was removed with Layer I. Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on bedrock (Figure 167).

The rock mound at Site 29934 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29935

Rock Mound

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

5.4 meters (E/W) by 2.5 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 29935 consists of a rectangular rock mound located approximately ninety meters northeast of Site 29934 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 5.4 m long (E/W) by 2.5 m wide and is 0.3 meters in maximum height (Figure 168). The feature is constructed of angular and subangular cobbles and small boulders piled one course high on the ground surface (Figure 169). There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29935 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

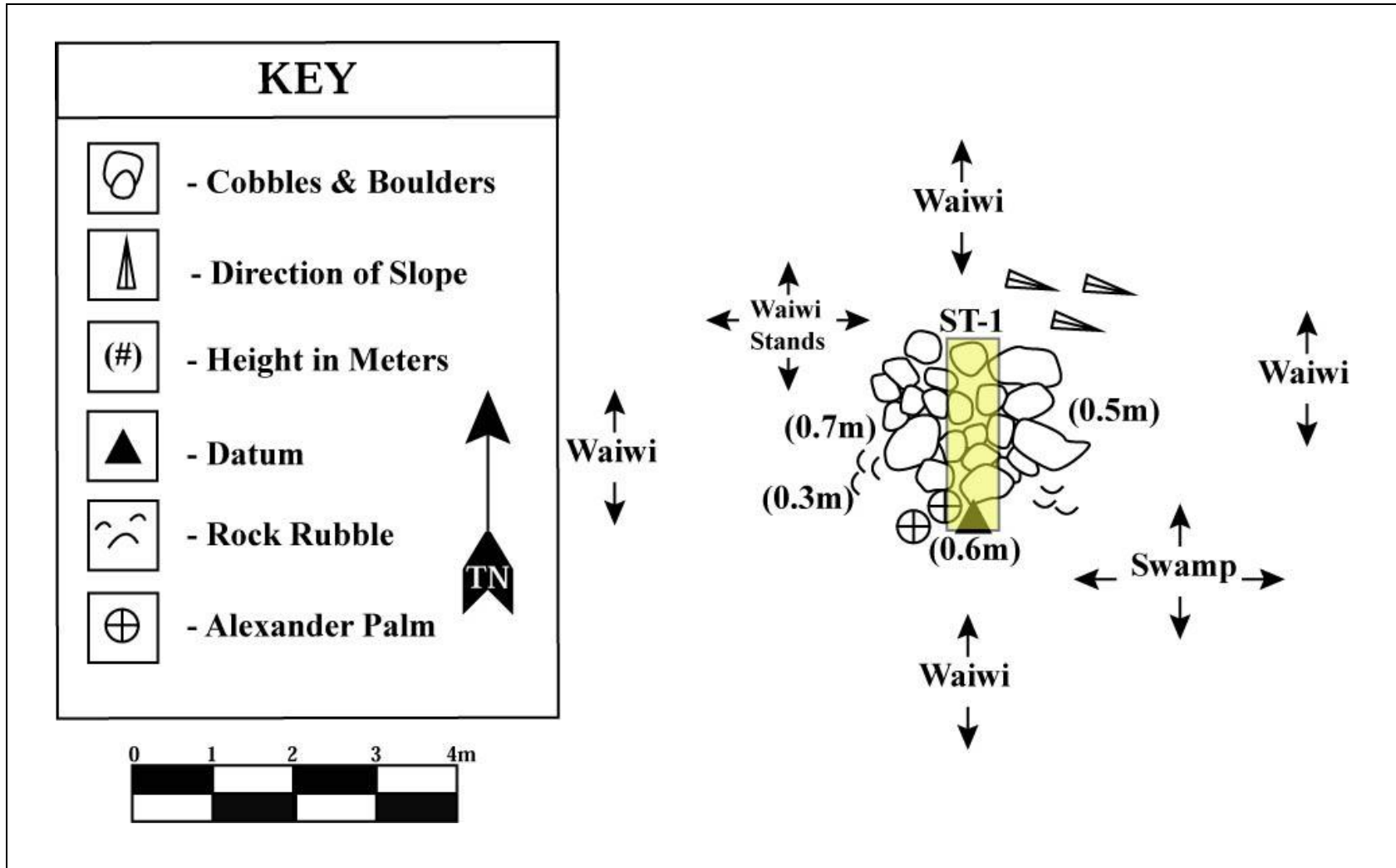


Figure 164: Site 29934 Plan View Map.



Figure 165: Photograph of Site 29934 Looking South.

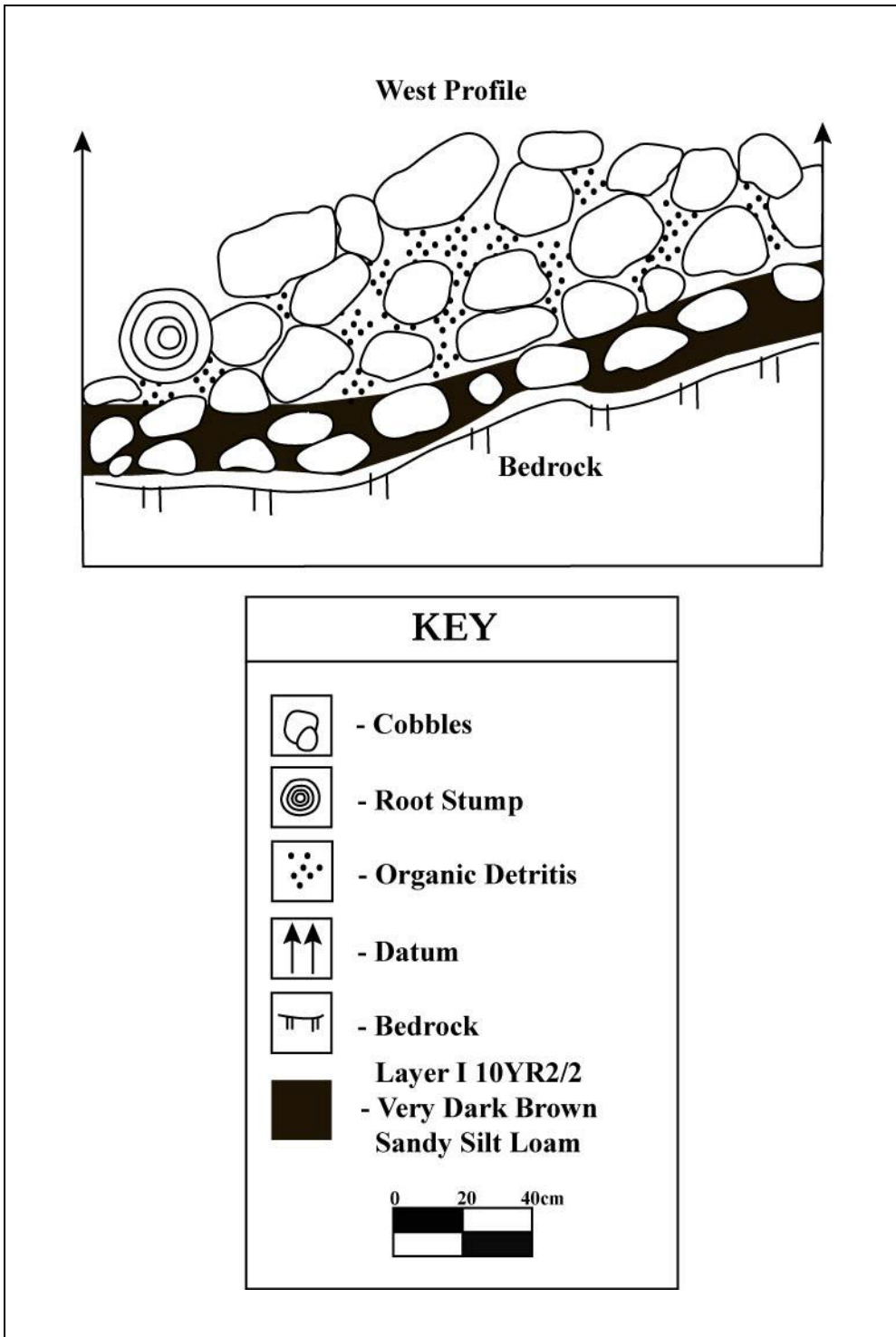


Figure 166: Site 29934 ST-1 West Profile.



Figure 167: Photograph of Site 29934 ST-1 Base of Excavation Looking South.

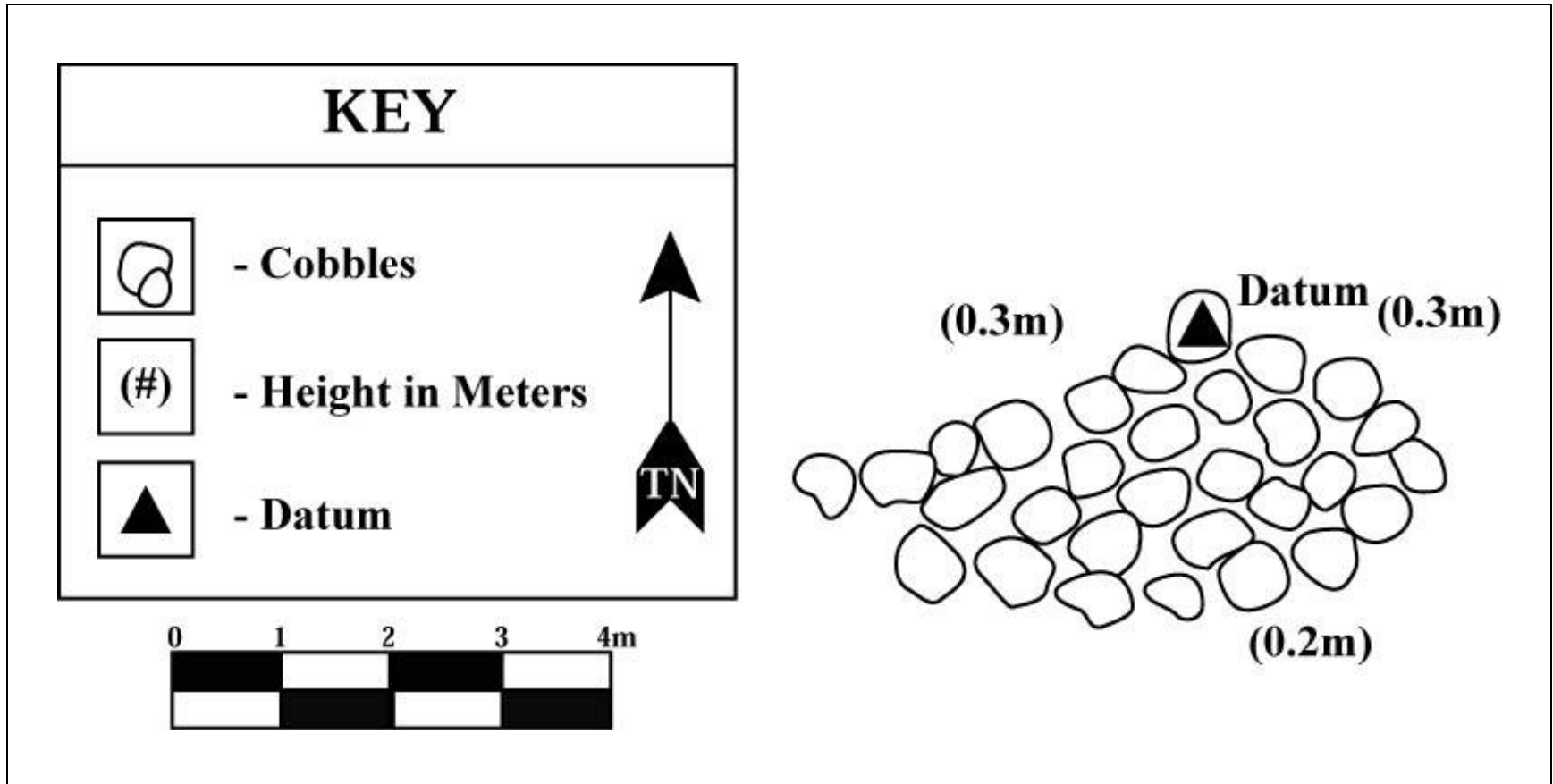


Figure 168: Site 29935 Plan View Map.



Figure 169: Photograph of Site 29935 Looking South.

SITE 29936**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 2.0 meters (E/W) by 2.0 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 29936 consists of a circular rock mound located approximately forty meters east of Site 29906 (see Figure 12). The feature is located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 1.7 m in diameter and is 0.4 meters in maximum height (Figure 170). The feature is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 171). The feature is slightly mounded in shape. There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29936 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29937**Rock Mound**

FUNCTION: Agriculture
AGE: Historic
DIMENSIONS: 3.0 meters (NW/SE) by 2.2 meters
CONDITION: Fair
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None

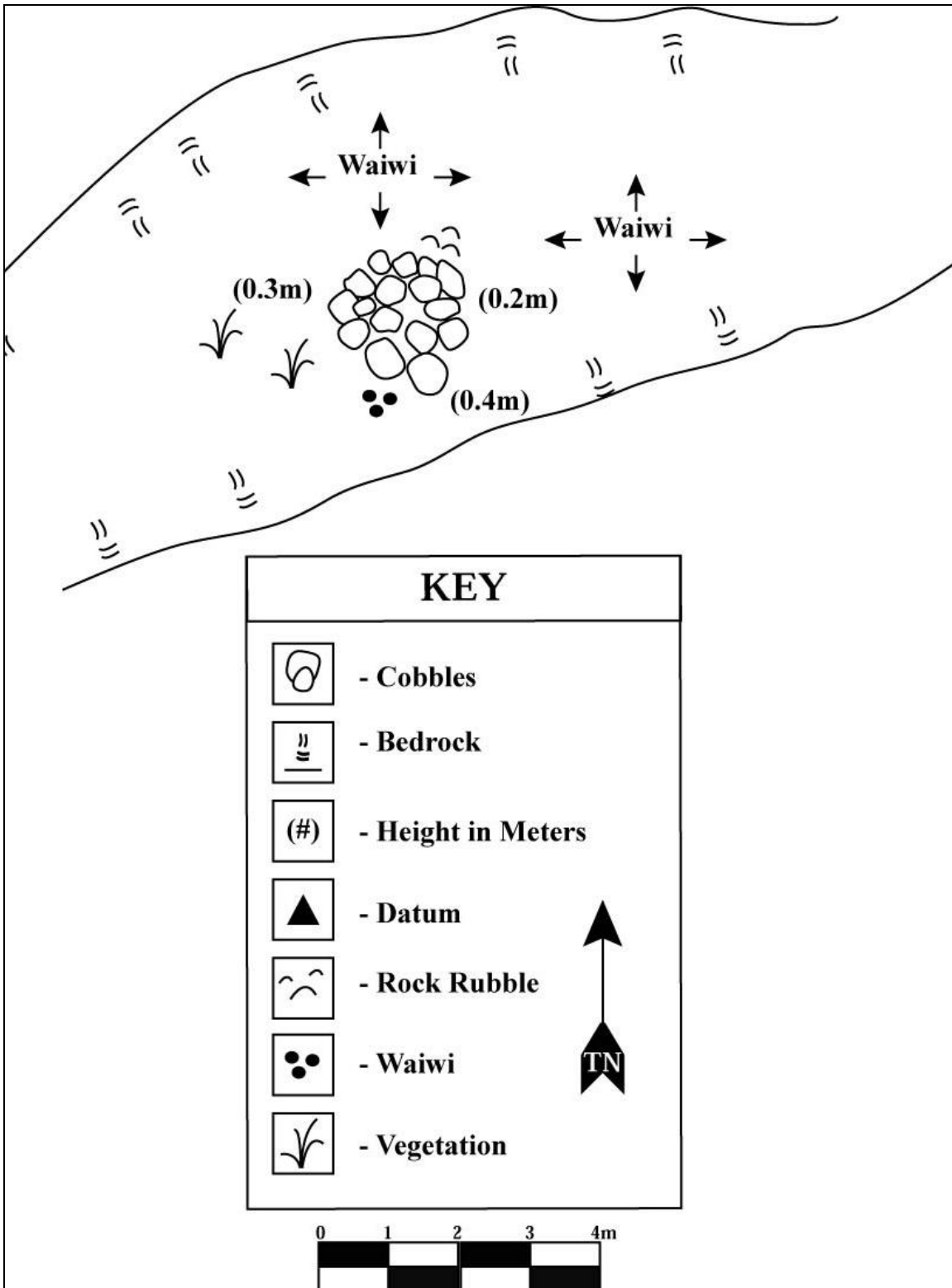


Figure 170: Site 29936 Plan View Map.



Figure 171: Photograph of Site 29936 Looking Southwest.

DESCRIPTION: Site 29937 consists of an irregularly shaped rock mound located approximately ten meters northeast of Site 29936 (see Figure 12). The feature is located in a guava thicket in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed for sugarcane fields.

The rock mound is 3.0 m long (NW/SE) by 2.2 m wide and is 0.3 meters in maximum height (Figure 172). The feature is constructed of angular and subangular cobbles and small boulders piled one course high on the ground surface (Figure 173). There is no stacking or facing evident on the feature construction. The feature has been slightly altered by weathering and is in good condition.

The rock mound at Site 29937 is the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The feature has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 29938

Rock Mounds

FUNCTION:

Agriculture

AGE:

Historic

DIMENSIONS:

8.0 meters (NW/SE) by 3.0 meters

CONDITION:

Fair

INTEGRITY:

Altered by Weathering

SURFACE ARTIFACTS:

None

EXCAVATION:

ST-1

DESCRIPTION:

Site 29938 consists two rock mounds located approximately 25.0 meters southwest of Site 29926 (see Figure 12). The features are located in a stand of guava trees in an area of exposed bedrock and thin soil. The surrounding terrain is level grassy fields that appear to have been bulldozed.

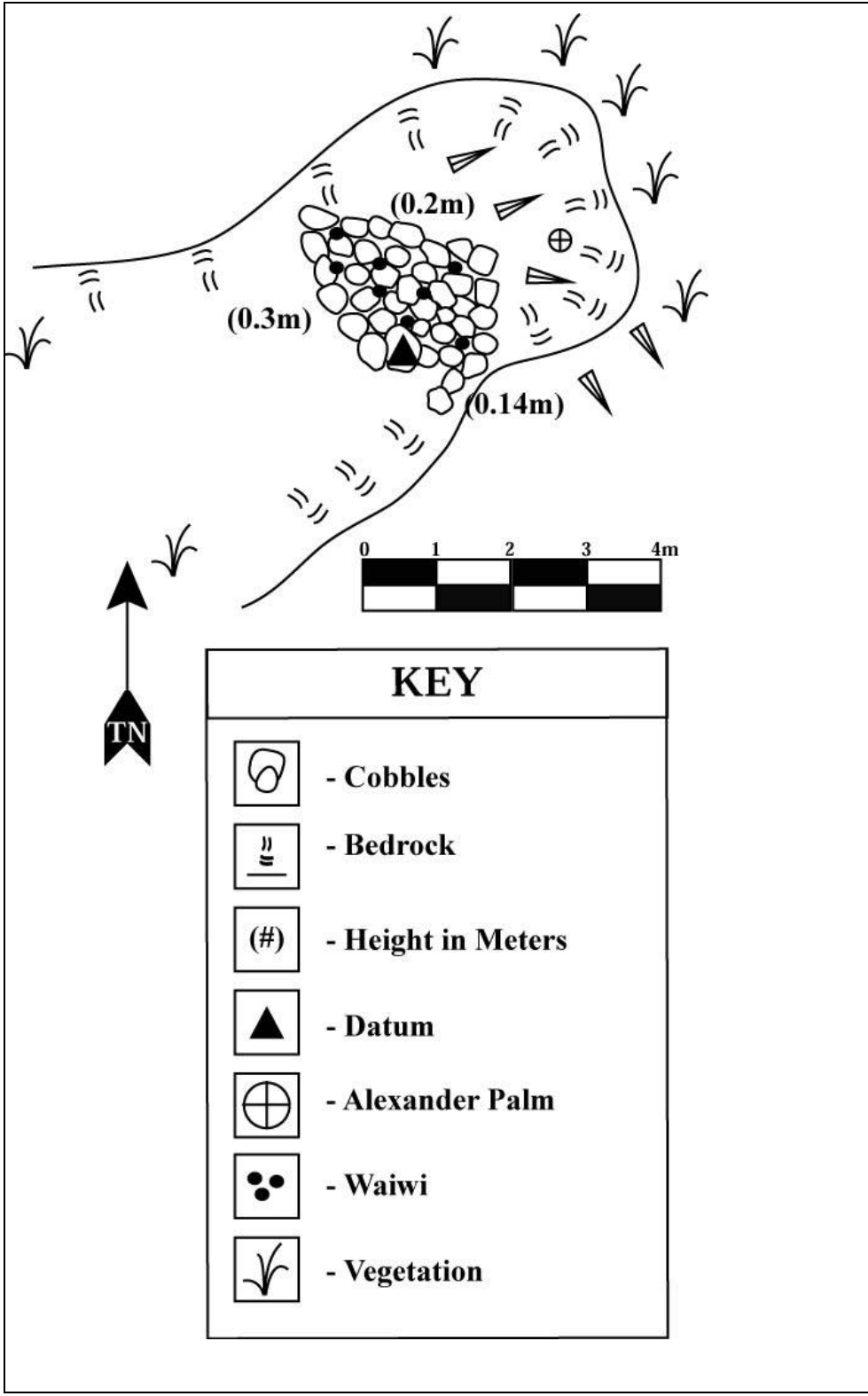


Figure 172: site 29937 Plan View Map.



Figure 173: Photograph of Site 29937 Looking West.

Feature A consists of a roughly square rock mound located at the north end of the site. Feature A measures 1.4 m long (N/S) by 1.4 m wide and is 0.25 m in maximum height (Figure 174). The rock mound is constructed of angular and subangular cobbles and small boulders loosely piled and stacked on the ground surface (Figure 175). No facing is evident in the feature construction. Feature A has been altered by banyan trees and weathering and is in fair condition.

Stratigraphic Trench 1

ST-1 was a 1.4 meter long (N/S) by 0.5 m wide unit excavated in the northwest side of the rock mound. ST-1 contained an architectural layer and two natural stratigraphic layers, was excavated to a maximum depth of 70 cmbs, and terminated on bedrock (Figure 176).

The Architectural Layer (0-20 cm in height) was angular and subangular large cobbles and small boulders with a small amount of "O" Horizon organic detritus. The Architectural Layer did not contain cultural material. The base of the Architectural Layer was clear and even and terminated within the top surface of Layer I sediment.

Layer I (0-40 cmbs) was loose to soft very dark brown (10YR2/2) sandy silt loam with strong blocky peds, 20% angular and subangular cobbles and pebbles, and 5% small roots (Figure 177). A small amount of architectural rock was removed with Layer I.

Layer I did not contain cultural material. The base of Layer I was clear and even, and terminated on Layer II sediment.

Layer II (40-70 cmbs) was soft dark brown (7.5YR3/3) sandy silt with 10% angular pebbles, and 5% small roots. Layer II did not contain cultural material. The base of Layer II was clear and wavy and terminated on bedrock (Figure 178).

Feature B is a roughly square rock mound located at the south end of the site. The rock mound is 2.0 m long (N/S) by 2.0 m wide and is 0.5 m in maximum height. Feature A is constructed of angular and subangular cobbles and small boulders piled on the ground surface (Figure 179). The feature is slightly mounded in shape. There is no stacking or facing evident in the feature construction. Feature A has been altered by guava trees and weathering and is in fair condition.

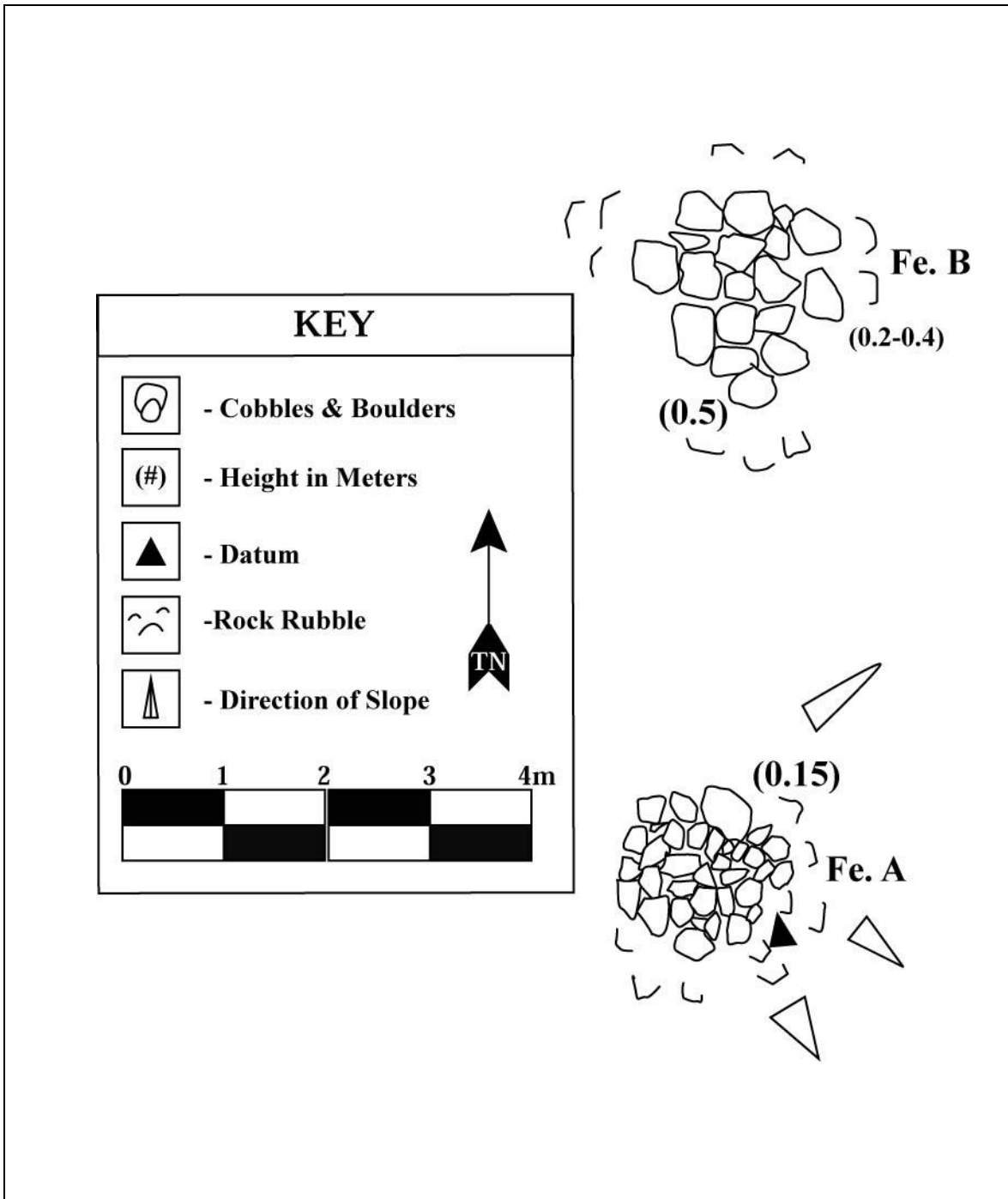


Figure 174: Site 29938 Plan View Map.



Figure 175: Photograph of Site 29938 Feature A Looking West.

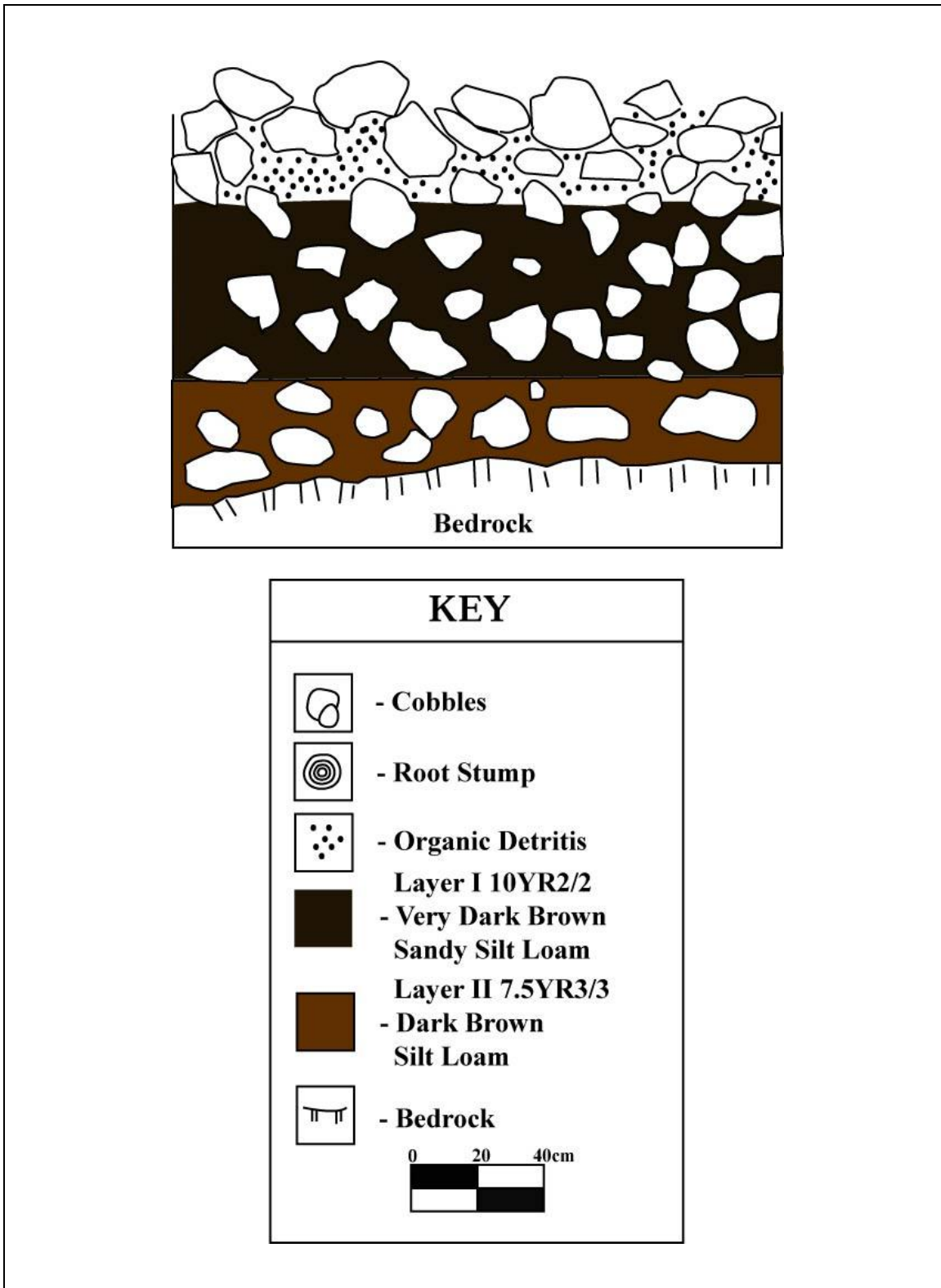


Figure 176: Site 29938 ST-1 South Profile.



Figure 177: Photograph of Site 29938 Feature A ST-1 South Profile.



Figure 178: Photograph of Site 29938 Feature A ST-1 East Profile.



Figure 179: Photograph of Site 29938 Feature B Looking Southwest.

The rock mounds at Site 29938 are the result of agricultural activities involving clearing land of loose rocks. The rocks were piled and stacked to make rock clearing mounds on areas of exposed bedrock and shallow soil at the edges of the sugarcane fields. This site is associated with the sugarcane agriculture of the late 1800s and 1900s. The features have been impacted by banyan trees and weathering and are in fair condition. No further work is recommended at the site.

CONCLUSION

Based on historic documentation and archaeological data collected in this AIS report, all of the archaeological sites are Historic era rock clearing mounds associated with sugarcane fields known to have existed here. There were no remnants of pre-Contact era sites recorded on the project area. No other archaeological sites or features were present on the subject property. Based on archival research, it is possible that there were no pre-Contact era sites on the property given its remote upland location. In addition, field clearing activities during the Historic-era would have eliminated any pre-Contact remains, if they existed.

SIGNIFICANCE ASSESSMENT & RECOMMENDATIONS

All of the archaeological sites identified during this project were assessed for significance as outlined in Hawai'i Administrative Rules §13-284-6. To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criteria [§13-284-6(b)]:

- (A) It must be associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property [§13-284-6(b)(1)].
- (B) It must be associated with the lives of persons significant in the past property [§13-284-6(b)(2)].
- (C) It must embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction property [§13-284-6(b)(3)].
- (D) It must have yielded or may be likely to yield, information important in prehistory or history property [§13-284-6(b)(4)].
- (E) Have an important value to native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events, oral accounts-- these associations being important to the group's history and cultural identity property [§13-284-6(b)(5)].

All of the sites are significant under criterion "D" as they are likely to yield information important to history. However, during the current AIS study, it was determined, based on feature type, construction method, and excavation that the rock mounds are field clearing mounds associated with Historic era sugarcane fields. Information recorded at the sites during the current study has adequately ascertained the timing and function of the features, and documentation contained in this report is sufficient to warrant no further work.

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Appendix **D**

CULTURAL IMPACT ASSESSMENT

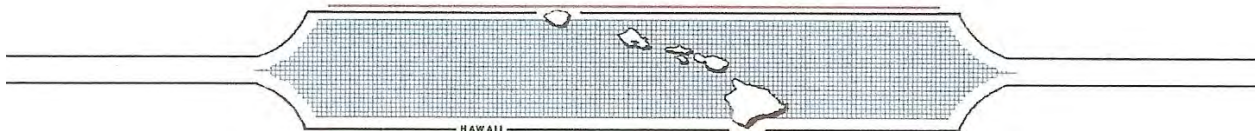
**A CULTURAL IMPACT ASSESSMENT OF LANDS AT
THE 71.121-ACRE PĀHOA PARK EXPANSION PARCEL IN
WAIAKAHIULA 2 AHUPUA‘A, PUNA DISTRICT,
HAWAI‘I ISLAND, HAWAI‘I
[TMK: (3) 1-5-002:020]**

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DRAFT Report
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INTRODUCTION

At the request of PBR Hawai‘i, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment of the proposed 71.121-acre parcel located in Pāhoa, Waiakahiula 2 Ahupua‘a, Puna District, Island of Hawai‘i [TMK: (3) 1-5-010:002] (Figures 1 through 3). The project area parcel is owned by the County of Hawai‘i and the existing Pāhoa Park is located in the northeast corner of the parcel. The undeveloped remainder of the parcel is being considered for the proposed Pāhoa Park Expansion project. The project area parcel is bounded to the north by Kea‘au-Pāhoa Road and residential property, is bounded to the east by businesses and residential property, and is surrounded on all other sides by undeveloped land. The undeveloped land within the project area and surrounding it were formerly used to cultivate sugarcane.

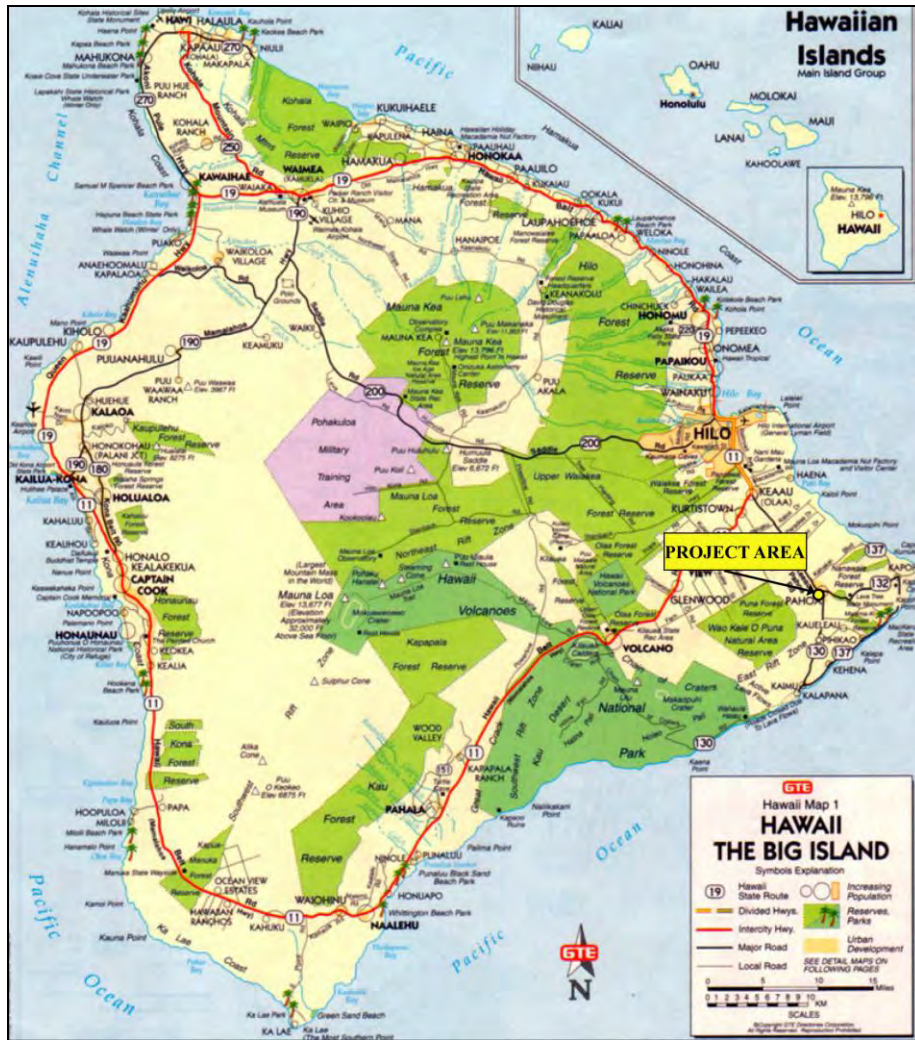


Figure 1: Hawai‘i Island Map Showing Project Area Location.

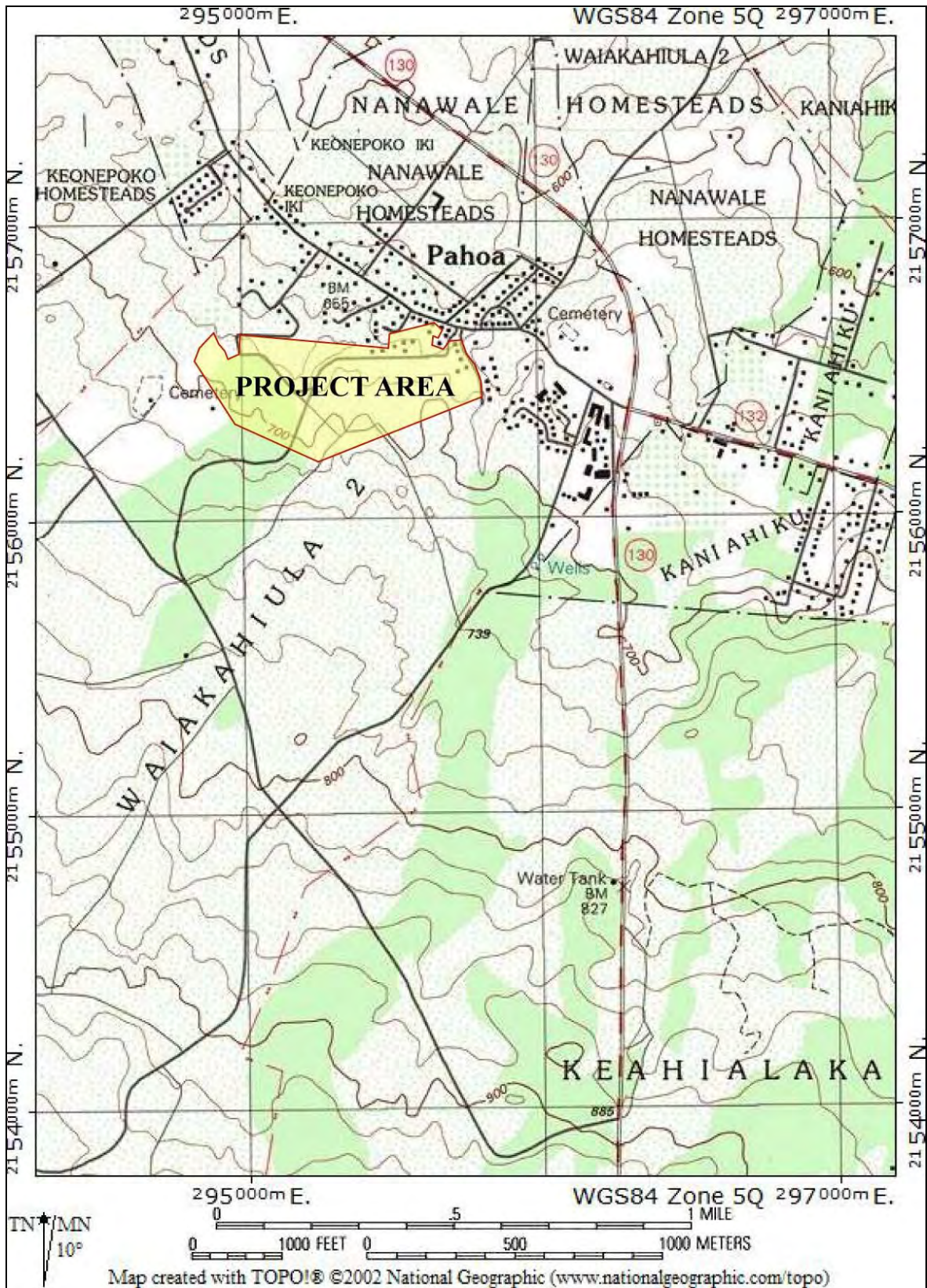


Figure 2: Project Area Location on USGS Map (Pāhoā South, 2005).

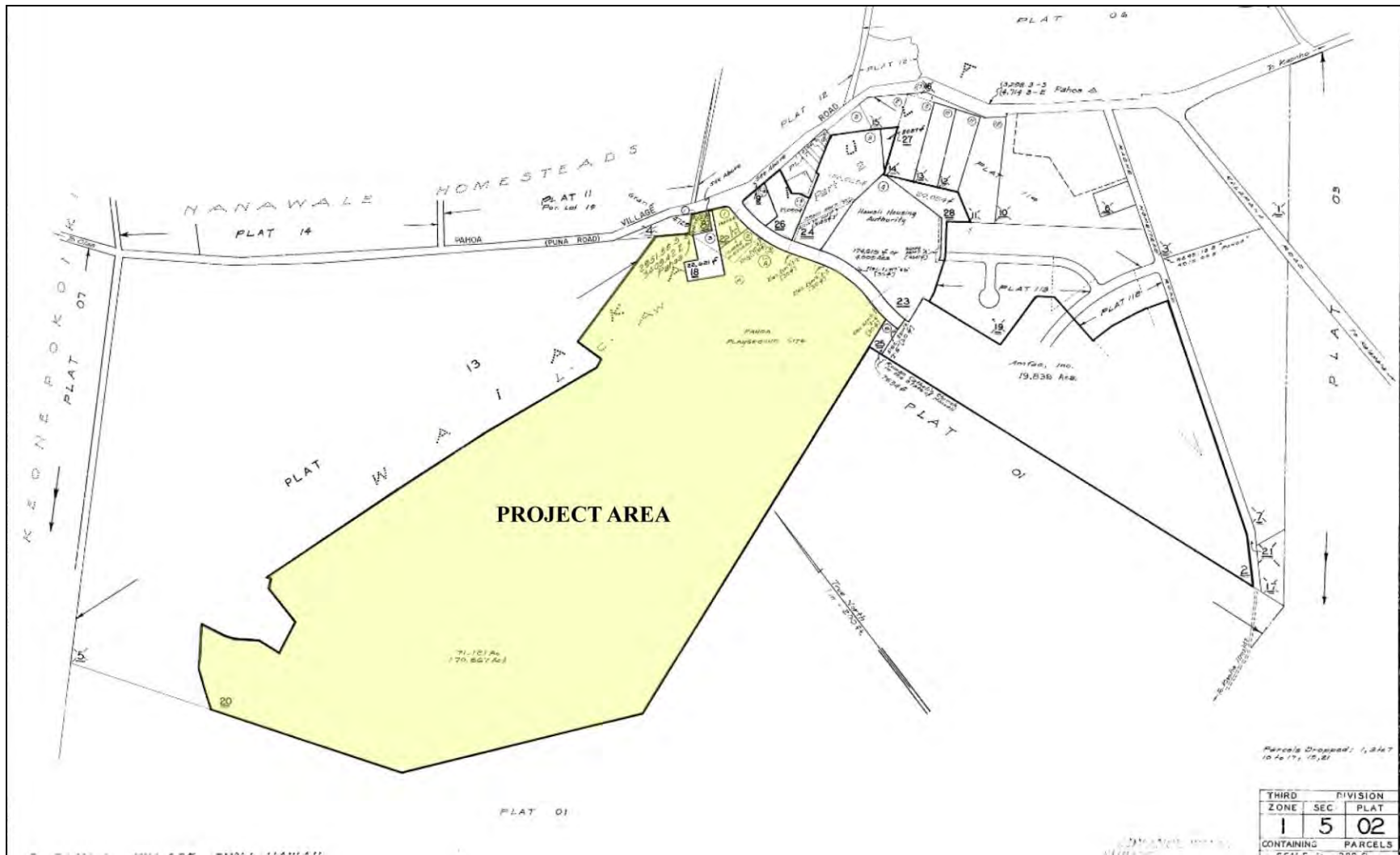


Figure 3: Project Area Location on Portion of TMK (3) 1-5-002 Map.

The Constitution of the State of Hawai`i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to “protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua`a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778” (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the peoples traditional right to subsistence. As a result in 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupua`a* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiian Revised Statutes (HRS) 7-1. In 1992, the State of Hawai`i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, “native Hawaiian rights...may extend beyond the *ahupua`a* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner” (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaii (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii’s culture, and traditional and customary rights... [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the “cultural practices of the community and State” as part of the HRS Chapter 343 environmental review process (2001).

Its purpose has broadened, “to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of ‘significant effect’ to be re-defined as “the sum of effects on the quality of the environment including actions that are...contrary to the State’s environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State” (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized

by using, as an example, “the broad geographical area, e.g. district or *ahupua‘a*” (OEQC 1997). It was decided that the process should identify ‘anthropological’ cultural practices, rather than ‘social’ cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997): The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity cultural values and rights within the project area and its vicinity (H.B. 2895, Act 50, 2000).

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the “Cultural Impact Assessment Methodology”, the OEQC state: ...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories... (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

- (1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained;
- (2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;
- (3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;
- (4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;
- (5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;
- (6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;
- (7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;
- (8) an explanation of confidential information that has been withheld from public disclosure in the assessment;
- (9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;
- (10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;
- (11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *ahupua* 'a, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

In this case, letters briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Kauanoë Hoomanawanui, SHPD Burial Sites Specialist; Rick Gmerkin, Ala Kahakai National Historic Trail, NPS Archaeologist; Mililani Trask; Hannah Reeves; and Uilani Kapu. If cultural resources are identified based on the information received from these organizations and/or additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed. Public Notices were placed in the Office of Hawaiian Affairs (OHA) Ka Wai Ola Newspaper, the Honolulu Star Advertiser, and the West Hawai‘i Today.

PROJECT AREA AND VICINITY

The current project area consists of a single parcel situated on level to gently sloping land between 650 and 720 feet (198-219 m) above mean sea level (amsl). The project area is on a Kīlauea lava flow dated between 400 and 750 years before present (ybp) (Wolfe and Morris 1996). Soil in the project area (Figure 4) is Keaukaha Series extremely rocky muck (rKFD) (Sato 1973:27) and ‘Ōla‘a Series extremely stony silty clay loam (OID) (*ibid*:42).

The ground surface is level shallow soil with undulating pāhoehoe bedrock outcrops. Drainage is from south to north with large puddles forming along the northern boundaries of the project area during rainy season. Rainfall in the project area is high, averaging 130 inches per year.

Vegetation in the project area is a suite of invasive disturbance species that have replaced the sugarcane fields once planted on the property. The primary tree species are guava (*Psidium* sp.), banyan (*Ficus* sp.), and autograph tree (*Clusia rosea*). Ground cover plants include Asian Melastoma (*Melastoma septemnerium*), ‘okupukupu fern (*Doodia kunthiana*), and several varieties of grass.

The project area parcel and surrounding lands were previously used for sugarcane agriculture. The majority of the project area parcel has been bulldozed level during the time it was cultivated for sugarcane.

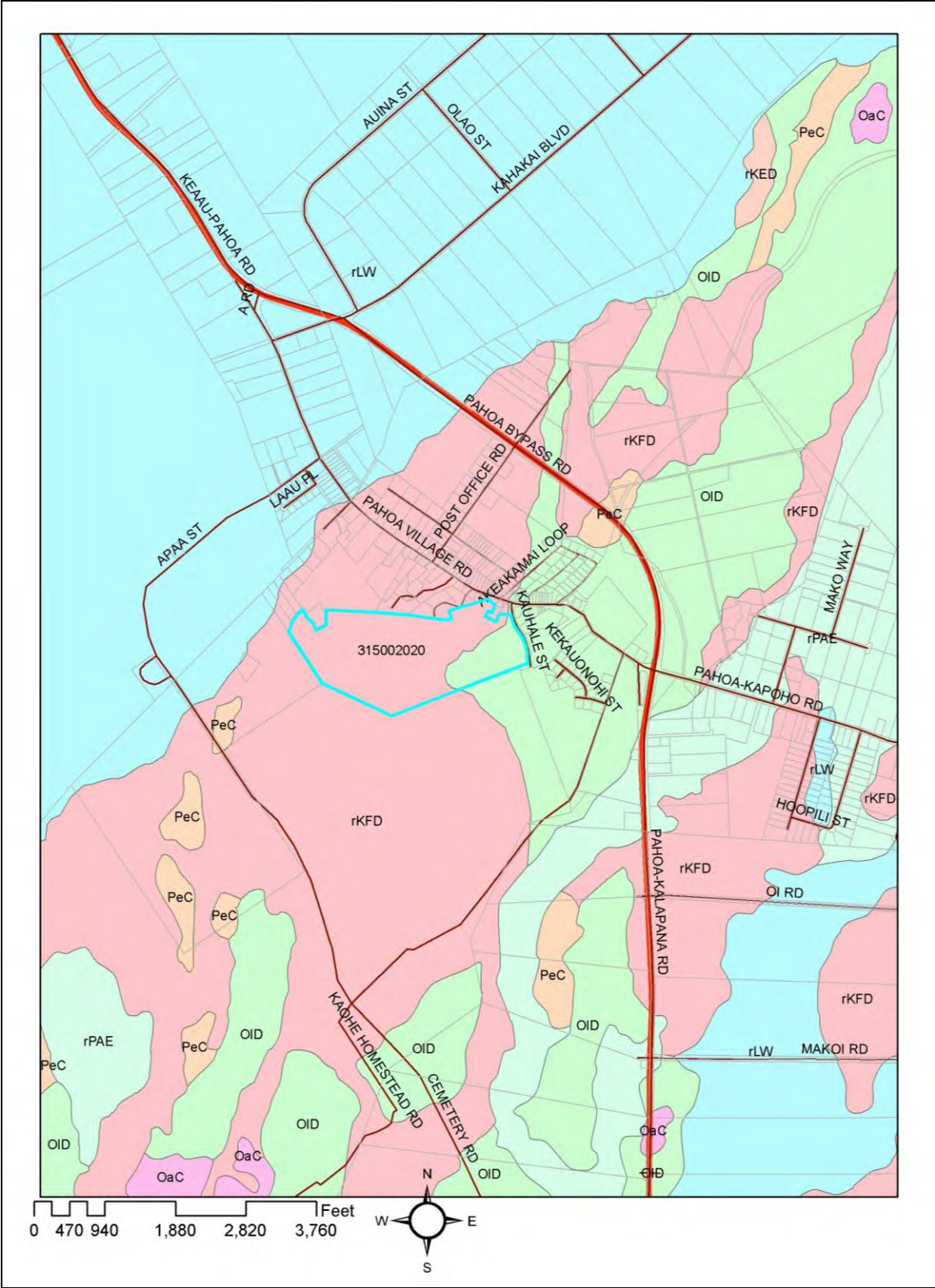


Figure 4: Map of Project Area Soil Series.

CULTURAL AND HISTORICAL BACKGROUND

EARLY SETTLEMENT AND EXPANSION

Initial settlement of the high Hawaiian Islands is believed to have occurred along the wetter and more fertile windward coasts where conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia. This exploitation involved inshore and pelagic fishing, gathering shellfish from the shore and strand, plant and animal husbandry, and the utilization of natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson *et al.* 1971; Kirch 1985). The pattern of this early settlement is thought to have consisted of widely spaced, permanent home bases that gradually expanded to form a nearly continuous zone of permanent settlement along the windward coasts as local populations grew.

TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE

Situated along the windward coast of Hawai'i Island, Puna is a verdant and abundant district with good rainfall and rich soils. However, it is also subject to volcanic eruptions and has been covered by new lava in many places over the last 1,000 years (Cordy 2000:17, and 22). Much of the district's coastal areas have thin soils and there are no good deep water harbors. The ocean along the Puna coast is often rough and wind-blown.

As a result of these two factors, settlement patterns in Puna tend to be dispersed and without major population centers. Villages in Puna tend to be spread out over larger areas and often are inland, and away from the coast, where the soil is better for agriculture (*ibid*: 45). The lack of population centers also had an effect on the development of a hierarchy of district rulers. Puna was often not strongly tied together by a tight web of allegiances between *ali'i* and *konohiki*. As a result, Puna was often conquered and ruled by stronger district leaders in Hilo or Ka'u (Kamakau 1992:17 and 77).

Puna was famous as a district for some of its valuable products, including "hogs, gray tapa cloth (*'eleuli*), tapas made of *mamaki* bark, fine mats made of young pandanus blossoms (*'ahuhinalo*), mats made of young pandanus leaves (*'ahuaao*), and feathers of the *'o'o* and *mamo* birds" (*ibid*:106).

Waiakahiula 1 and Waiakahiula 2 Ahupua‘a are located along the northeastern shore of Puna District (Figure 5). Waiakahiula 1 stretches from the coastline up to 400 feet in elevation, some four miles inland. Waiakahiula 2 is located just south of the modern Pāhoa Town center. It is situated between 600 and 1000 feet amsl, roughly six miles inland. Waiakahiula 1 and 2 cut off from each other by Keonepoko Iki and Kahuwai Ahupua‘a.

Historical accounts pertaining to Waiakahiula and the project area region are scarce but provide some information on traditional residence patterns, land-use, and subsistence horticulture in the Waiakahiula Ahupua‘a area. Waiakahiula is translated as Kahiula's water (Andrews and Parker 1922:672). William Ellis passed through Waiakahiula 1 Ahupua‘a in 1823 while travelling along the coast from Kilauea to Waiākea Ahupua‘a, Hilo. Ellis' journey took him along the coast of Kahuwai, Wa‘awa‘a, and Nānāwale Ahupua‘a just south of Waiakahiula 1 Ahupua‘a (see Figure 5). Ellis and his party then turned *mauka* and proceeded inland to a village in Honolulu Ahupua‘a (Ellis 1963:294). The village was small and set in the forest. The next morning Ellis traveled to the shore at Waiakahiula Ahupua‘a and rested in the shade of a canoe house there. His travelling companions walked inland about a half mile to preach to the people there (ibid: 295). The village would have been located at approximately 100 feet amsl, almost 5.5 miles northeast of the current project area.

The current project area is well outside of the narrow coastal band (0-150 feet amsl) where traditional Hawaiian habitation centers are known to have existed in the region. While there may have been pre-Contact Era travel through the region of the current project area, there were likely no homes or house gardens in the area. There are no early historic accounts pertaining to Waiakahiula 2 Ahupua‘a.

TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Māhele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). Waiakahiula 1 and 2 Ahupua‘a were awarded to Mikahela Kekauonohi and Aaron Keali‘iahonui as part of a large Land Commission Award (LCA 11216) that included parcels on several islands (waihona.com).

Mikahela Kekauonohi was the granddaughter of Kamehameha I, and wife of Liholiho, Kamehameha II. Aaron Keali‘iahonui was the son of the last ruling chief of Kaua‘i. A small portion of the 277.8-acre Land Grant 1533 awarded to Kekoa in also appears to be partially in Waiakahiula 1 Ahupua‘a (Figure 6). A second grant (LG 3331) was awarded to Keaneopala in Honolulu Ahupua‘a to the southeast.

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1865)

Between 1845 and 1865 traditional land-use and residential patterns underwent a change. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, the introduction of sugar cane cultivation, and a push to develop tourism all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al.* 1981).

Hilo became the center of population and settlements in outlying regions declined or disappeared. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements, respectively.

As commercial ranching, agricultural pursuits, logging, and tourism ventures were developed, there were concerted moves to develop new transportation infrastructure. New roads and railroad lines were developed to transport farm equipment to fields, agricultural products to harbors with waiting ships, and workers and travelers alike used the new transportation routes to reach their destinations. As new ventures and new routes prospered, the age old trails and travel routes, and even settlement patterns were abandoned.

The historic trail that leads from the modern day Lili‘uokalani Gardens area to Hā‘ena along the Puna coast was one such casualty. The trail is often called the old Puna Trail and/or Puna Road. There is an historic trail/cart road that is also called the Puna Trail (*Ala Hele* Puna) and/or the Old Government Road that continues from the south end of the Puna Trail through Waiakahiula 1 Ahupua‘a heading to points south. Lass also refers to the entire route from Hilo to Ka‘ū as the Puna-Ka‘ū trail.

Whatever name the trail/cart road alignment is called by, it likely incorporated segments of the traditional Hawaiian trail system often referred to as the *ala loa* or *ala hele* (Hudson 1932:247, Kuykendall 1966:23-25, Lass 1997:15, and Maly 1999:5). Lass suggests the full length of the Puna Trail, or Old Government Road, might have been constructed or improved just before 1840 (Lass 1997:15). The trail was called the Old Government Road, or *Ala Nui Aupuni* (Maly 1999:5). The alignment was mapped by the Wilkes Expedition of 1804-41 (Figure 7).

A general description of the area between the Old Government Road and the newer upper road (Kea'au - Pāhoa Road) from Hilo through Kea'au to Pāhoa was recorded in 1889 by the Surveyor General of the Hawaiian Government Survey. The description affords a glimpse into inland and coastal settlement patterns and land use.

The first settlement met with after leaving Hilo by the sea coast road, is at Keaau, a distant 10 miles where there are less than a dozen inhabitants; the next is at Makuu, distant 14 miles where there are a few more, after which there is occasionally a stray hut or two, until Halepuaa and Koaie are reached, 21 miles from Hilo, at which place there is quite a village; thence to Kaimu there are only a few scattered settlements here and there. A good many of those living along the lower road have their cultivating patches in the interior, along or within easy accessibility to the new road (Alexander 1891, cited in Maly 1999:107).

The 1889 description contrasts with Ellis' in which he documented a small village in Waiakahiula 1 just sixty-six years earlier. The 1889 description suggests a depopulation along the majority of the Puna near-coastal area. In both descriptions, the people in this area appear to have lived somewhat inland, between the coast and the inland gardens. In 1889 people were cultivating small patches of *kalo*, *awa*, and coffee as well as other food items in the inland gardens. The patches were placed in pockets of soil in holes amidst the lava flows. Additionally, sweet potatoes were grown on rock mounds. By 1889, it appears that very few people lived along the Old Government Road (Maly 1999:6).

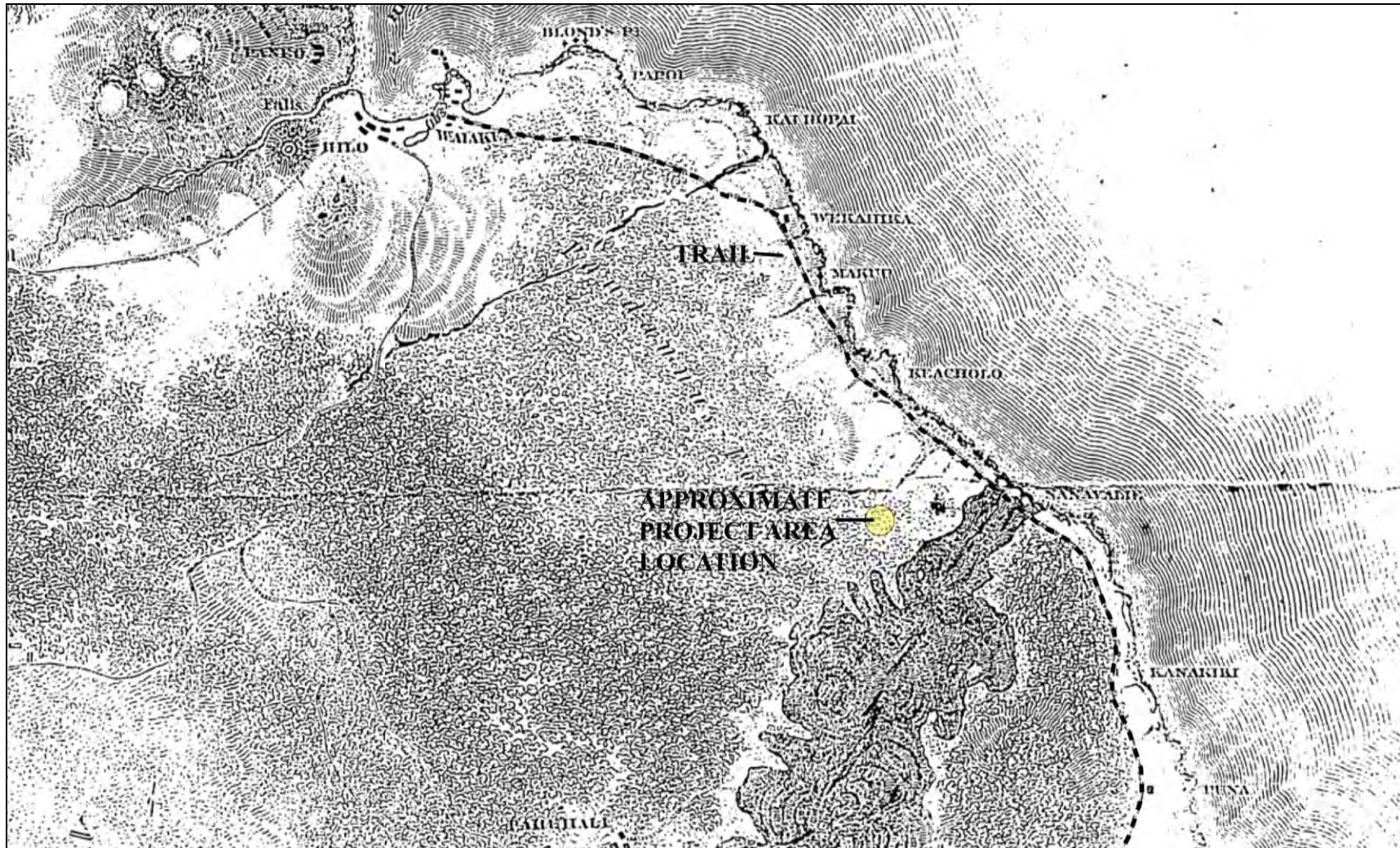


Figure 7: Location of Project Area and Old Government Road From Hilo Bay to Kapoho on Portion of Registered Map 424 By the Wilkes Expedition of 1840-1841.

The Surveyor General stated,

The old sea coast road cannot be kept in repair with the means now at its disposal and its condition each year is becoming more unsafe and ruinous, there is but little travel over it; it has been shown that there is little land capable of cultivation or development either side of it and whatever travel there is now over it would soon be entirely diverted to the upper road (Alexander 1891, cited in Maly 1999:107).

The new Kea'au - Pāhoa Road (Figure 8) being constructed from Hilo through Kea'au to Pāhoa was designed to allow access to the more arable inland areas. People who traditionally had lived along the Puna coast were moving toward Hilo and into the more fertile upland areas of Puna in order to find paid work and to produce cash crops for local markets and for export. In particular, people began to work in the inland areas to grow sugarcane. The new road, the Pāhoa branch of the railroad, sugarcane agriculture, and a logging venture all combined to create Pāhoa as a population in the region.

SUGARCANE, LOGGING, AND THE RAILROAD

By 1901 sugar dominated the island's industry, and Hilo was the epicenter of production and export. Railroads connected sugar mills and sugar plantations in Hilo, the Hāmākua and Puna. The railroad also connected the mills to the wharves at Hilo Bay. The railroad began operation in the Hilo area in 1899, and was abandoned in 1946 (Kelly *et al.* 1981). A main railroad line and several feeder lines were constructed in the early 1900s from Kea'au to locations in lower Puna District.

The major line ran from Hilo through Kea'au to the Kapoho area. A branch line ran from the 'Ōla'a Sugar Mill up past present day Glenwood. A second branch line ran to Pāhoa town. The junction of the Hilo to Kapoho line and the Pāhoa branch was located in Waiakahiula 1 Ahupua'a (see Figure 5). The trains provided transportation for sugarcane as well as for passengers traveling through Puna and on to other destinations such as Hilo and the Hāmākua coast.

Early on, one of the major export items transported by the railroad was timber. The Hawaiian Mahogany Company began cutting timber in Puna District in 1907. Trees were felled in areas to be cleared for sugarcane agriculture. The logs were brought to

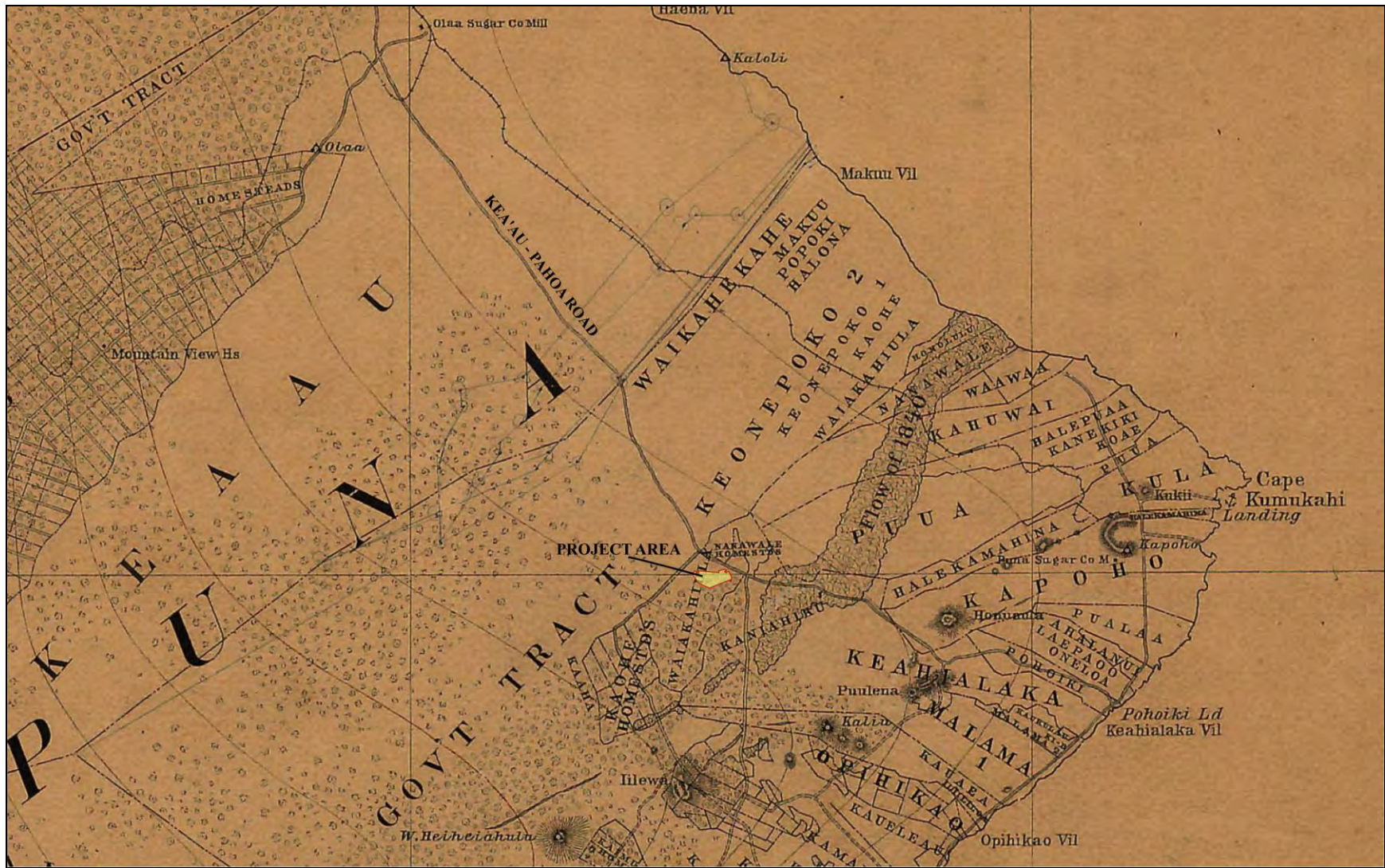


Figure 8: Project Area and Kea‘au - Pāhoa Highway Locations on Donn 1901 Map (Reg. Map 2060).

Pāhoā Town to be milled, sent to Hilo Harbor, and eventually shipped to the U.S. Mainland as railroad ties for the Santa Fe Railroad. The lumber mill facilities and the railroad line that served them were located just east of the current project area, where the present day Pāhoā Farmer's Market is held and where the Akebono Theater is located.

In 1909, the company was renamed Pāhoā Lumber Company. In 1913 the main mill facilities burned to the ground. That same year, the mill was rebuilt and the company was renamed the Hawaiian Hardwood Company. The company's main export was milled *‘ōhia* lumber. The company had several large clients in California and even sold lumber to the U.S. Navy. The company closed down in 1916 when the Santa Fe Railroad ended its contract to buy lumber. The defunct company then leased its mill facilities, buildings, and railroad tracks to the expanding ‘Ōla‘a Sugar Company.

The ‘Ōla‘a Sugar Company, established in 1899, soon became the largest sugarcane plantation and milling operation in Puna District. According to the Hawai‘i Sugar Planter's Association, Plantation Archives,

[The] Olaa Sugar Company was located on the Island of Hawaii just nine miles from Hilo on the road to Volcano and the National Park [Figure 9]. The plantation fields extended for ten miles along both sides of this highway as well as in the Pahoā and Kapoho areas of the Puna District. The elevation of the land ranged from sea level to 2,200 feet. The area was in the wet belt of Hawaii amid forests of fern trees and ohia with an average monthly rainfall of 18-30 inches. Finding varieties of cane that would thrive on forest soil in a cloudy district at various elevations was a major problem.

In 1899, B.F. Dillingham, Lorrin A. Thurston, Alfred W. Carter, Samuel M. Damon, and Wm. H. Shipman pooled their resources and started what they believed would become Hawaii's largest and most prosperous sugar plantation. Their original plan was that Olaa would be instrumental in bringing about the Americanization of Hawaii by fostering a home owning class of small farmers who would grow cane for the mill. The venture was planned as a demonstration of a plantation as small farming enterprise in which a large portion of the crop would be cared for

by laborers on shares. L.A. Thurston believed that Hawaii's future prosperity depended in the long run on the production of crops by small independent farmers who owned or leased the land they cultivated. The corporation would operate the mill and assure a market for produce. The promoters predicted that Oloa would become the banner plantation for all Hawaii. This was a radical departure from the ideas of the old plantation system, which opposed both independent cane growers and diversification.

On May 3, 1899, the Oloa Sugar Company was incorporated. With a \$5,000,000 investment, the promoters purchased 16,000 acres in fee simple land and nearly 7,000 acres in long leasehold from W.H. Shipman. They also purchased 90% of the stock in the adjacent Puna Plantation, adding another 11,000 acres to the holdings. Oloa Sugar Company began as one of Hawaii's largest sugar plantations with much of its acreage covered in trees.

The task of setting up the plantation was enormous. Before 1900, coffee was the chief agricultural crop in the area. Over 6,000 acres of coffee trees were owned by approximately 200 independent coffee planters and 6 incorporated companies. The coffee trees were uprooted to make way for cane. Ohia forests had to be cleared, field rock piled, land plowed by mules or dug up by hand with a pick, quarters for laborers and staff had to be built, the mill constructed, and the first cane planted.

On July 1, 1899, active operations began under the management of Frank B. McStocker. In his first report, he stated, "As soon as the planting of the main crop begins, which will be about the month of March [1900], arrangements will be made by which a large portion of the crop will be cared for by laborers on shares." From this early start of "share planting," the company branched out into the leasing of land to individuals to raise cane and to making contracts to purchase cane from persons who owned or leased their own land. In most cases, the company carried the financial burden for the planter until he was paid for his cane and then recovered the advances made. Other independent cane farmers lived in

their own homes, used their own work animals and tools, and supplied their own fertilizers.

In 1900, a twelve-roller, 2,000 ton mill was erected at Olaa. The mill was planned for a 60,000-ton crop and was of a size to accommodate future expansion. Everything was planned for a large-scale production, unlike most sugar companies, which expanded as the output increased.

The cane from the adjacent plantation, the Puna Plantation, was ground at the Olaa mill. Puna Plantation Company, established in the late 1890s, was taken over by Olaa Sugar Company in 1905.

A succession of experiments molded the history of Olaa Sugar Company. Because of heavy rains, numerous can varieties were tried out. Lahaina cane was abandoned early because of being particularly susceptible to root diseases due to moisture. New varieties were constantly being planted. The weather was also conducive to the growth of weeds. An experiment in paper mulching was started in 1916. The object of the paper mulch was to suppress the weed growth and keep the soil warm. But it also reduced labor costs for hoeing by 50% and provided an extra application of fertilizer.

In 1919, Olaa Sugar Company had the distinction of operating the first bagasse paper mill in the Territory and the only one of its kind in the United States at that time. The mill was erected alongside the sugar factory where bagasse was converted into mulching paper. C.F. Eckart, manager, originated the idea. The mill produced enough paper daily to cover 9 to 11 acres, with about 1,600 lbs. of paper per acre. The paper was used over the young ratoons, which pierced their way through to the light, while the weeds died. This asphalt-saturated paper used at Olaa became a forerunner of mulch paper developed for use in Hawaii's pineapple industry. Eventually the paper mill was dismantled, but mulching was still used for weed control.

The cane was transported to the mill by fluming and by railroad. Although Oloo Sugar Company had 72 miles of flumes, it had no dependable water source for their operation. The railroad was relied upon for delivery of 60% of the cane. In addition to its own standard gauge 35 miles of railway track, the company ran cars over the Consolidated Railway tracks to bring its cane in from more distant fields. The history of Oloo Sugar Company is closely connected with the southern branches of the Hawaii Consolidated Railway Co. because they were interdependent from the start. The cane fields were in four widely separated areas cut off from each other by stretches of barren lava. The railroad was therefore vital to the plantation, which in turn helped support the railroad. When a tidal wave on April 1, 1946 destroyed much of the Hawaii Consolidated Railway Company's tracks, it ceased operations. The plantation was then forced to convert to trucks in order to transport sugar and molasses to the Hilo wharf.

Fortunately, under the management of Wm. L.S. Williams, a major road-building program had been started in 1939 for the purpose of eliminating the portable track. He started the plantation on its way to modernization by laying a network of 500 miles of roads for hauling cane. Since 1948, all the cane hauling has been by truck.

By the end of 1947, Oloo Sugar Company owed its agents, American Factors, Ltd., \$2,000,000. Sugar prices, the tariff, rationing, epidemics of leafhoppers and armyworms, and volcanic eruptions had taken their toll on company profits. Manager C.E. Burns surmised that the only way for the plantation to stay alive was to mechanize harvesting operations. Because of the rocky and uneven condition of the land, Oloo was one of the last sugar companies to eliminate hand-cutting of cane. This conversion to mechanical harvesting was a turning point in cost reduction in the fields, but became a problem in the mill as a result of all the trash and rocks coming in with the cane. Cane cleaners were installed but the conventional cleaners could not remove the fine volcanic cinders. Oloo Sugar Company solved the grit problem with an ingenious flotation tank.

Another problem, which resulted when mechanical harvesting went into effect, was a need to layoff laborers. Manager Burns worked out an equitable schedule of layoffs. The first severance pay and repatriation formulas, which were later to serve as patters for the sugar and pineapple industries, were agreed to. In addition, both management and union members located new jobs in the Islands for most of those who were laid off. As a result, the transition from hand to mechanical harvesting was achieved without labor grievances.

Attention to employee welfare was demonstrated by Olaa Sugar Company in the housing program, free medical attention, and recreational facilities. Manager A.J. Watt modernized the housing by building new family units and relocating outlying houses scattered about the plantation into nine main villages. They became miniature towns with running water, electric lights, schools, churches, stores, clubhouses, theaters, parks and ball fields. The plantation roads radiated from these nine camps to cover the cane areas where the men worked. The 1930 plantation census noted a total of 5,999 men, women and children residing in 1,098 houses at Olaa.

In spite of Olaa Sugar Company's efforts to reduce operating costs, the plantation was still in debt. In 1953, a minority stockholders' suit was brought against American Factors, Ltd. The suit alleged that the plantation company paid "excessive" commissions to AMFAC and insufficient dividends to stockholders. By this time Olaa Sugar Co. was over \$4.1 million in debt to the agency and possible liquidation of the company was being considered. After six years of litigation, the suit was finally dismissed by the court in 1959. In the wake of statehood, it was decided that the company would take advantage of the land boom and sell some of its fee simple land. By this time, the plantation had accumulated 35,700 acres of which 22,000 were used by Olaa and the remainder by independent planters. They also offered employees the opportunity to purchase their houses.

On March 28, 1960, a name change from Olaa Sugar Company, Ltd. to Puna Sugar Company, Ltd. was voted on at a stockholders meeting.

Apparently, the directors felt "Olaa" was jinxed and that a name change might erase the failures of the past. With a new name and the monies accrued from land sales, the company did make a comeback and by 1963 had the best year ever with a 36% profit gain. In 1966, Puna Sugar Company was free of debt for the first time in its history. The reduction in the cost of operations and the improvements in the field and mill were regarded throughout the industry as a major accomplishment. American Factors offered to buy out the minority shareholders and by 1969 Puna Sugar Company was a wholly owned AMFAC subsidiary.

AMFAC launched an expansion program by converting to the diffusion method of cane processing and by installing a modern steam generating facility. A \$4.5 million power plant was built at Puna, which used bagasse and trash fuel to generate 15,000 kilowatts of electricity. Hilo Electrical Light Co. contracted to purchase 12,500 kilowatts.

The 1980's brought bleak prospects to the company once again. The sugar industry could no longer depend on government subsidies or tax breaks. High fructose corn syrup, a low cost substitute, and artificial sweeteners were hurting the sugar market. On January 7, 1982, AMFAC announced that it would be shutting down Puna Sugar Company.

The chore of closing down was phased out over a two-year period. It involved negotiating leases and contracts, disposing of equipment, and the most difficult of all, working out employee layoffs. Once again in an unprecedented move, AMFAC included in the severance package a gift of five acres of land for each employee. They also donated \$2 million towards improvement costs of the land and offered to help locate other agricultural related jobs for the employees, if they desired. The last worker was gone by December 1, 1984. The entire sugar mill was sold to Fiji Sugar Corporation, Ltd. in 1988 and Hawaiian Electric Light Company took over the power plant (Campbell and Ogburn 2004).

The growth of the 'Ōla'a Sugar Company impacted the development of regional land-use, tenure, and the transportation network. Homestead lots and agricultural plots

were surveyed and cleared from the surrounding forests. Sugar camps, housing and facilities for workers, were constructed. Over time, many of the smaller agricultural lots initially purchased by private owners to grow sugarcane were bought up by the large sugar plantation.

The project area parcel is a portion of a larger area of ‘Ōla‘a Sugar Company sugarcane fields in the Pāhoa area. This particular region of sugarcane fields is recorded on a 1906 Hawai‘i Territory Survey Map (Figure 9). The sugarcane fields are also clearly visible on a USDA aerial photo taken in February of 1965 (Figure 10). There are no records of house lots or other types of land use, other than sugarcane agricultural lots, on the project area parcel.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

There are twenty previous archaeological studies conducted in Pāhoa Town (Table 1 and Figure 11). An archaeological inventory survey (AIS) study was conducted on the project area parcel as part of the proposed Pāhoa Park Expansion project.

Table 1: Previous Archaeological Studies in the Broader Pāhoa Region.

AUTHOR	STUDY	LOCATION	FINDINGS
Bordner 1977	Archaeological Reconnaissance Survey	TMK: (3) 1-5-010:017	A single rock mound marker recorded
Kam 1982	Field Inspection	Pāhoa Cave TMK: (3) 1-5-009:009	Description of cave inspection
Yent 1983	Archaeological Survey	Lava tube in Waikahiula Ahupua‘a TMK: (3) 1-5-008:001	Documented lava tube Site 50-10-45-14900.
Komori 1987	Cultural and Biological Resources Survey	Puna Electrical Power Line Corridor	Eleven archaeological sites and three historical sites, including agricultural features (ditches, terraces, modified outcrops) and habitation platforms, burial caves, and petroglyphs

AUTHOR	STUDY	LOCATION	FINDINGS
Rosendahl 1986	Archaeological Reconnaissance Survey	Pāhoa Post Office TMK: (3) 1-5-007: 008	No sites documented
Rosendahl 1988	Archaeological Reconnaissance Survey	Keonepoko Iki and Keonepoko Nui Ahupua‘a TMK: (3) 1-5-008:001, 006; 1-5-009: 009; and 1-5-010: 003	No sites documented
Bonk 1989A	Archaeological Reconnaissance Survey	TMK: (3) 1-2-010: 001	No Sites documented
Bonk 1989B	Archaeological Monitoring and Survey	TMK: (3) 1-2-010: 003	No sites documented
Stone & Tashima 1989	Field Survey	Pāhoa Cave TMK: (3) 1-5-010: 003; 1-5-116: 030, 031, 049-057	Eight sites documented within cave
Bonk 1990	Archaeological Reconnaissance Survey	TMK: (3) 1-2-010: 003	No sites documented
Kennedy 1991	Archaeological Inventory Survey	TMK: (3) 1-2-010: 001	No sites documented
McEldowney & Stone 1991	Lava Tube Survey	TMK: (3) 1-2-010: 002, 003	Four sites recorded
Conte et al. 1994	Archaeological Inventory Survey	TMK: (3) 1-5-008: 003; 1-5-010: 004	No sites documented
Clark et al. 2001	Archaeological Inventory Survey	TMK: (3) 1-5-002: 024	Two Pāhoa Lumber Co. sites
Rechtman 2003	Archaeological and Cultural Assessment	TMK: (3) 1-5-008: 001	No sites documented
Rechtman 2004	No Effect Letter	TMK: (3) 1-5-07: 017	No sites documented
Rechtman & Desilets 2004	Archaeological Inventory Survey	TMK: (3) 1-5-008: 003	Two sites, an enclosure complex and a terrace recorded
Runyon et al. 2008	Archaeological Monitoring	TMK: (3) 1-5-114: 002, 025	No sites documented
Wilkinson et al. 2010	Archaeological Inventory Survey	Kea‘au - Pāhoa Highway (Route 130)	Two Historic Era sites documented
Escott 2013 Draft	Archaeological Inventory Survey	Pāhoa Park Parcel TMK: (3) 1-5-002:020	38 sites, sugarcane rock clearing mounds

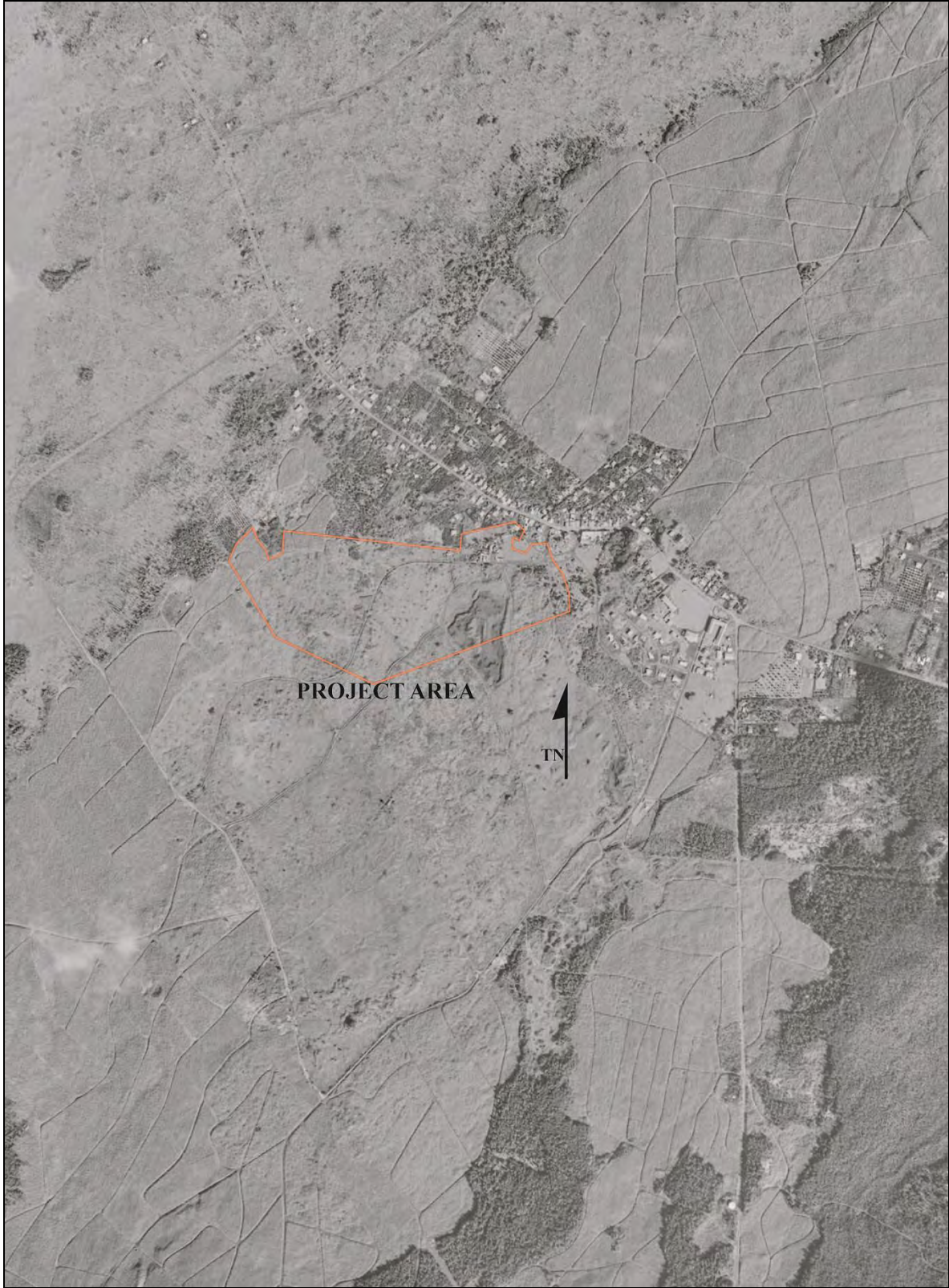


Figure 10: Aerial Photo Showing Project Area (Red Boundary) and Sugarcane Fields (USDA 1965).

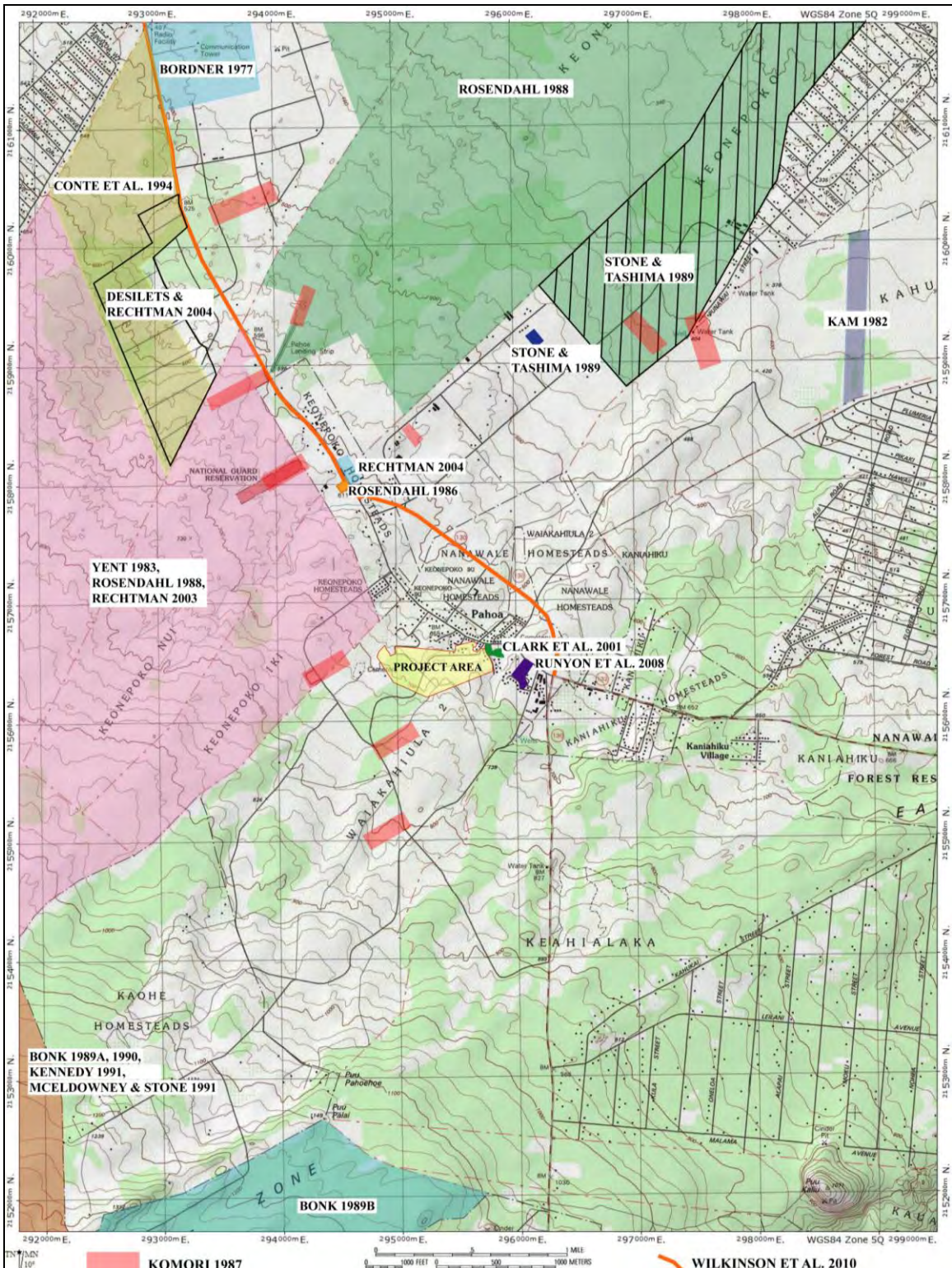


Figure 11: Previous Archaeological Studies on USGS Map (Pahoa South Quad, 2005).

Half (n=10) of the previous archaeological studies did not document any archaeological sites. These findings are consistent with settlement pattern data gleaned from historical literature sources. The upland elevations of this part of Puna District was not known to be settled or used for gardens during the pre-Contact era.

Nine of the other ten studies documented lava tubes with archaeological sites and features (Kam 1982, Yent 1983, Stone & Tashima 1989, and McEldowney & Stone 1991), or they documented a limited number of surface archaeological features (Bordner 1977, Komori 1987, and Rechtman & Desilets 2004). Surface archaeological features included agricultural features such as rock mounds, ditches, terraces, and modified outcrops as well as other feature types including habitation platforms and petroglyphs. None of the lava tube sites or surface archaeological sites are located near the current project area.

There are four previous archaeological studies in Waiakahiula 2 Ahupua‘a, and in the immediate vicinity of the current project area (see Figure 11). One of the studies, an archaeological monitoring project at the Pāhoa Elementary School, did not document archaeological sites (Runyon et al. 2008). Two of the studies documented historic era sites associated with Pāhoa Town. The first study, just west of the current project area, documented the remains of a railroad turntable (SIHP 50-10-55-22966) and a railroad bed (SIHP 50-10-55-22967) associated with the Pāhoa Lumber Company property (Clark et al. 2001:14-19) (Figure 12). The second study mentions the presence of the Pāhoa Historic and Commercial District (SIHP 50-10-55-7388) that fronts both sides of the Kea‘au - Pāhoa Road through the center of Pāhoa Town (Wilkinson et al. 2010). The current project area is well south of the Kea‘au - Pāhoa Road and the Historic District.

Thirty-eight sites comprising 78 features were recorded during the course of the Pāhoa Park Expansion Project Archaeological Inventory Survey (AIS). All of the features at all of the sites consisted of rock mounds and modified outcrops. Thirteen stratigraphic trenches and one test-unit were excavated at thirteen of the sites to determine the function and approximate age of the features. All of the archaeological features at all of the sites are associated with historic era sugarcane cultivation. The rock mounds and modified outcrops are the results of clearing rocks from the sugarcane fields that once covered the entire project area parcel. None of the sites were interpreted as pre-Contact. Based on historic documentation and archaeological data collected in the AIS report, all of the archaeological sites were Historic era rock clearing mounds associated with the ‘Ōla‘a sugarcane fields known to have existed here. There were no remnants of pre-Contact era sites recorded on the project area.

CULTURAL INFORMANT INTERVIEWS

SCS, Inc contacted six individuals who either work for the Office of Hawaiian Affairs, are Hawai‘i Island Burial Council Members (HIBC), or have a long-standing ‘ohana connection to Pāhoā, or are familiar with the project area lands through cultural and historical work they conduct on the Island of Hawai‘i (Table 3). None of the individuals responded with information concerning cultural activities conducted on the subject parcels.

Table 2: Individuals Responding to CIA.

Name	Affiliation	Responded	Has Knowledge	Cultural Practices
Kai Markell	Office of Hawaiian Affairs	No	-	-
Kauanoë Hoomanawanui	SHPD Burial Sites Program	No	-	-
Rick Gmerkin	Ala Kahakai NHT, NPS	Yes	Yes	No
Mililani Trask	Has Kuleana in Ahupua‘a	Yes	Yes	No
Hannah Reeves	Cultural Practitioner	Yes	Some	No
Uilani Kapu	Cultural Practitioner	Yes	Some	No

SUMMARY

The “level of effort undertaken” to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a “good faith effort”. However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Ruby McDonald, Coordinator of the Hawai‘i branch of the Office of Hawaiian Affairs; Bucky Leslie, Kailua-Kona representative of the Hawai‘i Island Burial Council; and Keōpū ‘ohana members.

Public notices were published in the Office of Hawaiian Affairs Ka Wai Ola Newspaper, and were published in the Honolulu Star Advertiser and the West Hawai'i Today.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I'i, Kamakau, Chinen, Kame'elehiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku'i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai'i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona 'Aina 2007 Data Base.

CIA INQUIRY RESPONSE

As suggested in the "Guidelines for Accessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

As stated above, consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; Kauanoë Hoomanawanui, SHPD Burial Sites Specialist; Rick Gmerkin, Ala Kahakai National Historic Trail, NPS Archaeologist; Mililani Trask; Hannah Reeves; and Uilani Kapu. None of the organizations or individuals that responded were aware of ongoing or past cultural resources or practices associated with lands of the project area. Those individuals who had knowledge of the project area lands responded that they were not aware of any cultural resources or ongoing cultural practices or beliefs associated with those lands.

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). To our knowledge, the project area has not been used for traditional cultural purposes within recent times. Based on historical research and the responses from the above listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs. There will

be no visual impact of the project from surrounding vantage points, e.g. the highway, mountains, and coast.

CULTURAL ASSESSMENT

Based on the results of a pedestrian survey of the project area, the results of previous archaeological studies at the school campus, as well as organizational response, individual cultural informant responses, and archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. No cultural activities were identified within the project area, and the proposed undertaking will not produce adverse effects to any Native Hawaiian cultural practices.

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TRANSPORATION IMPACT ANALYSIS REPORT

Pahoa Park Master Plan

Transportation Impact Analysis Report

Prepared for:

PBR Hawaii

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FEHR  PEERS

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EXECUTIVE SUMMARY

This report presents the results of the transportation impact analysis report (TIAR) for the proposed Pahoa Park Expansion Master Plan in Pahoa, HI, on the island of Hawaii. The proposed project includes the expansion of the facilities, sports fields, amenities, and infrastructure to better serve the Pahoa community and greater Puna area as a District/Regional Park. The site is located just west of Kauhale Street, and south of Pahoa Village Road. Vehicle access, both existing and proposed, is located on Kauhale Street. The Master Plan is proposed to include the development of an on-site circulator roadway.

The impacts of the proposed project to the surrounding transportation system were evaluated following best practices in transportation planning and engineering and input from the County of Hawaii and State of Hawaii Department of Transportation staff. The operations of three (3) key intersections were evaluated with level of service calculations during the weekday afternoon (PM) and Saturday peak periods for Existing, Near Term (2014), and Near Term (2014) plus Project Conditions.

The Pahoa Park expansion is proposed in two phases. The first phase is expected to complete build out in 2014 and was analyzed for its anticipated "typical use." The second phase of the Park's expansion is estimated for full build out after 10 years and was analyzed at a conceptual level. The proposed project is anticipated to generate approximately 280 trips at its "typical use." The project will not result in any significant impacts at any of the study intersections at its "typical use."

The Park's typical use would increase delays at Kauhale Street and results in a project-specific impact at the Pahoa Village Road / Kauhale Street intersection during the weekday PM peak hour. Furthermore, the maximum use and full build out of the proposed project's Phase 2 facilities is expected to result in significant impacts at the Pahoa Village Road / Kauhale Street intersection in both the weekday PM and Saturday peak hours. Mitigation at this intersection would be required in each of these four scenarios and depending on the frequency with which activities at the Park are expected to occur, options for mitigation could include the installation of a signal or temporary traffic control specific to the event.

Generally, the proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing or planned facilities. The installation of as many as four (4) bicycle racks is recommended to provide secure bicycle storage within sight of employees and customers. Improvements at the Pahoa bus stop are also recommended to provide amenities such as benches and/or covered shelters and encourage people to access the Park via public transit.

1. INTRODUCTION

This report presents the results of the transportation impact analysis report (TIAR) conducted for the proposed expansion of Pahoa Park located near the Pahoa Village Road / Kauhale Street intersection in Pahoa, Hawaii. The proposed project will include expansions of the facilities including new sports fields, amenities, and infrastructure to better serve the Pahoa community and greater Puna area as a District/Regional Park. The site is located just west of Kauhale Street and south of Pahoa Village Road. Vehicle access, both existing and proposed, is located on Kauhale Street. The Master Plan includes the development of an on-site circulation roadway and new parking areas. This report presents the results of the transportation analysis, including the study of the potential circulation and mobility impacts resulting from the proposed project. This TIAR is certified as having been conducted in accordance with best practices of the engineering profession and the requirements of the affected government agencies.

PROJECT STUDY AREA

The purpose of this analysis is to identify impacts of the proposed project on the surrounding transportation system. Figure 1 illustrates the existing study area, and Figure 2 shows the proposed site plan. The project includes two development phases: Phase 1 and build out of the remainder of the site. Due to the uncertainty of the timing of construction of uses beyond Phase 1, build out of the entire site was addressed qualitatively.

STUDY INTERSECTIONS

The transportation analysis evaluated the operations of the following three (3) study intersections, as well as the estimated project trip generation, distribution, and assignment assumptions:

- 1) Pahoa Bypass Road / Pahoa Village Road
- 2) Pahoa Village Road / Kauhale Street
- 3) Pahoa Bypass Road / Pahoa Village Road – Kapoho Road

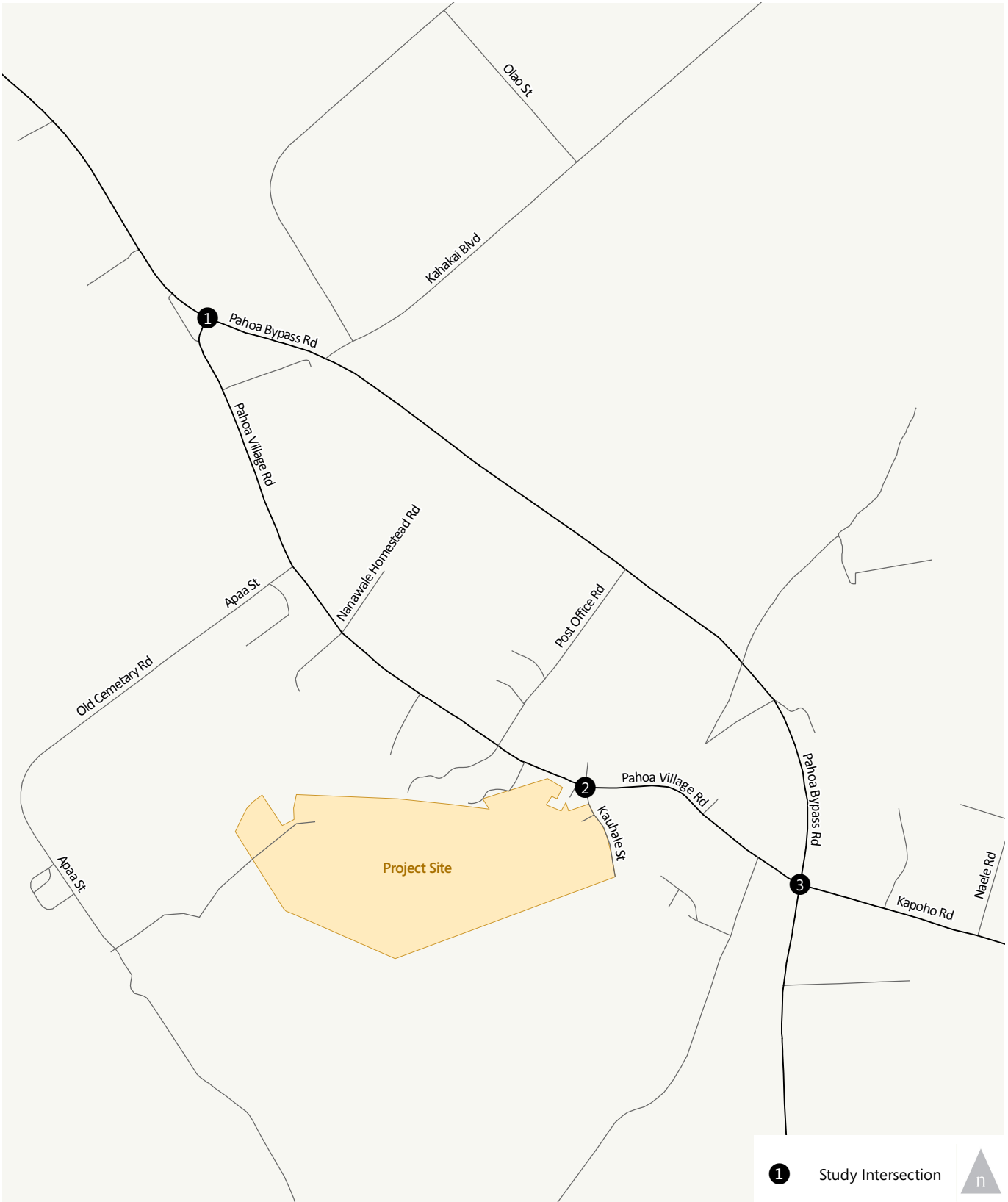


Figure 1.
Study Area



Figure 2.
Proposed Site Plan

INTERSECTION ANALYSIS SCENARIOS

The operations of the study intersections were evaluated during the weekday afternoon (3:00 pm to 4:00 pm) and Saturday (11:00 am to 12:00 pm) peak hours for the following scenarios:

- **Scenario 1: Existing Conditions** – Existing volumes obtained from new counts.
- **Scenario 2: Near Term (2014) Conditions** – Existing volumes increased using historic counts to calculate an annual growth factor and estimate volumes in the anticipated year of the opening of Phase 1 facilities.
- **Scenario 3: Near Term (2014) Plus Project Conditions** – Traffic volumes from Scenario 2 plus traffic estimated and anticipated from the project's Phase 1 uses.

TRAFFIC ANALYSIS METHODS

The analysis of roadway operations performed for this study is based upon procedures presented in the *Highway Capacity Manual* (HCM), published by the Transportation Research Board in 2000. Although the 2010 HCM was available at the time this report was published; not many jurisdictions have yet adopted the 2010 HCM, as many level of service (LOS) analysis software programs are still fine tuning versions incorporating updated 2010 methods. Differences in analysis results for peak hour intersection evaluation have been found to be negligible between the 2000 and 2010 HCM and are not expected to change the conclusions of this report.

The operations of roadway facilities are described with the term level of service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, with the least congested operating conditions, to LOS F, with the most congested operating conditions. LOS E represents "at-capacity" operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions. The methodology for signalized and un-signalized intersections, as well as roundabouts, is described below.

SIGNALIZED INTERSECTIONS

The method described in Chapter 16 of the 2000 *Highway Capacity Manual* (HCM) (Special Report 2009, Transportation Research Board) was used to prepare the LOS calculations for signalized intersections. This LOS method analyzes a signalized intersection's operation based on average control delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final

acceleration delay. The average control delay for signalized intersections is calculated using Synchro analysis software and is correlated to a LOS designation as shown in Table 1.

TABLE 1 SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

UNSIGNALIZED INTERSECTIONS

The operations of the un-signalized intersections were evaluated using the method contained in Chapter 17 of the *Highway Capacity Manual* (HCM, 2000). LOS ratings for stop-sign-controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side-street-controlled intersections, the average control delay is calculated for each stopped movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. For approaches with multiple lanes, the control delay is computed for each movement; the movement with the worst (i.e., longest) delay is presented. The average control delay for un-signalized intersections is calculated using Synchro analysis software and is correlated to a LOS designation as shown in Table 2.

TABLE 2 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delay.	10.1 to 15.0
C	Average traffic delays.	15.1 to 25.0
D	Long traffic delays.	25.1 to 35.0
E	Very long traffic delays.	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

ROUNDBOUT INTERSECTIONS

State DOT (HDOT) plans to improve the Pahoa Bypass Road / Pahoa Village Road intersection with the installation of a roundabout, and therefore the intersection was analyzed with this control-type under Near Term (2014) Conditions. The operations of the roundabout intersection were evaluated using the method contained in Chapter 21 of the *Highway Capacity Manual* (HCM, 2000). LOS ratings for roundabout controlled intersections are based on the average control delay expressed in seconds per vehicle. LOS F is assigned if the volume to capacity ratio of a lane exceeds 1.0 regardless of the control delay. The average control delay for roundabout intersections is calculated using Synchro analysis software and is correlated to a LOS designation as shown in Table 3.

TABLE 3 ROUNDABOUT INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delay.	10.1 to 15.0
C	Average traffic delays.	15.1 to 25.0
D	Long traffic delays.	25.1 to 35.0
E	Very long traffic delays.	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

SIGNIFICANT IMPACT CRITERIA

The analysis of future conditions compares baseline scenarios with the project opening year to determine whether the project traffic is expected to result in a significant impact on the surrounding roadways. Based on previous studies conducted for the County of Hawaii and the State of Hawaii Department of Transportation (DOT) Highways Division, the minimum acceptable operating standard for a signalized intersection and roundabout is LOS D. If the addition of project traffic is expected to degrade acceptable service levels (LOS D or better) to unacceptable service levels (LOS E or F) then the project is considered to have a project-specific impact. If the LOS for any roadway is LOS E or F without the project and the project adds traffic to this location, then this would be characterized as a cumulative impact. When evaluating intersection approach LOS at any location, other factors should be considered in the analysis, such as traffic volumes, volume-to-capacity (V/C) ratios (should ideally be less than 1.00), and secondary impacts to pedestrian, bicycle, and transit travel. If the proposed project is expected to conflict with existing or planned improvements for pedestrian, bicycle facilities, or if the project is expected to generate a substantial demand which could warrant additional transit service, then the project is expected to have a project-specific impact.

For un-signalized intersections, the project is determined to have a significant cumulative impact when it adds traffic to a study location that: 1) includes a controlled approach that operates at an unacceptable level (i.e., LOS E or F), and 2) satisfies the peak hour signal warrant criteria published in the 2009 edition of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD). If the addition of project traffic causes an un-signalized intersection to degrade from LOS D or better to LOS E or F and causes the peak hour warrant to be met, then the impact is considered project-specific.

The County of Hawaii and State DOT do not publish impact criteria for pedestrian, bicycle, and transit impacts. However, these impacts are generally evaluated based on whether a proposed project would: 1) conflict with existing or planned pedestrian, bicycle, or transit facilities, or 2) create walking, bicycling, or transit use demand without providing adequate and appropriate facilities for non-motorized mobility. The existing amenities for pedestrians, bicycles, and transit users were inventoried to evaluate the quality of the facilities in place today. The assessment of planned facilities outlined in planning documents, including the Puna Regional Circulation Plan (2005), were used to evaluate future conditions for non-automobile modes.

REPORT ORGANIZATION

The remainder of this report is divided into six chapters. The existing transportation system serving the project site and the current operating conditions of the key intersections are described in **Chapter 2** Existing Conditions. **Chapter 3** summarizes the methodologies used to forecast Near Term (2014) traffic volumes and intersection operations without the proposed project. **Chapter 4** presents the analysis and results for Near Term (2014) plus Project Conditions. **Chapter 5** discusses the project's site access, circulation, and parking, and **Chapter 6** summarizes the project-specific and cumulative impacts to the study area and discusses potential mitigation measures.

2. EXISTING CONDITIONS

This chapter describes the existing roadway network and includes a discussion of the existing bicycle, pedestrian, and transit facilities and services located in the project study area. This chapter also includes a discussion of the existing intersection LOS results.

EXISTING TRANSPORTATION FACILITIES

This section describes the key roadway facilities within the study area, as well as other travel modes including active transportation and transit.

EXISTING STREET SYSTEM

Local access to the project site is provided by Kauhale Street, and the key roadways providing access to the site are described below. Figure 1 illustrates the Pahoa Park location and the surrounding roadway system.

Pahoa Village Road is a two-lane roadway providing direct access to Pahoa town from Pahoa Bypass Road (State Highway Route 130). Pahoa Village Road re-connects with State Highway Route 130 at its southern terminus, east of which it becomes Kapoho Road. This facility serves two-way traffic along its entire length. Pahoa Village Road is lined with utility poles, and does not include any separate bicycle facilities. While there are few defined sidewalks along the roadway, except for portions through Pahoa town, mid-block crossings are provided periodically for pedestrians. On-street parking is permitted on the street through Pahoa town. The posted speed limit is 25 MPH.

Kauhale Street is a two-lane road dead-end road and provides direct access to the park site. Formal sidewalks line both sides of the roadway for pedestrians, but no separate existing bicycle facilities are provided. There is on-street parking on both sides of the street. There is no posted speed limit along the roadway.

Pahoa Bypass Road is also known as State Highway Route 130 and is primarily a two-lane roadway. No sidewalks or separate bicycle facilities are provided on this facility, and the posted speed limit is 45 MPH.

Kaohe Homestead Road is a two-lane roadway (near the school) linked to Kauhale Street by Pahoa Village Road. While, there are no separate pedestrian or bicycle facilities, the roadway does feature mid-block crosswalks near Pahoa Elementary School. On-street parking is generally permitted at portions. The posted speed limit is 15 MPH (Fehr & Peers 2013).

EXISTING TRANSIT SERVICES

The Hawaii County Mass Transit Agency provides public transportation around the island via the Hele-On bus. The fare to ride the bus is \$1.00 for all island-wide scheduled routes. Figure 3 illustrates the transit services within the study area. The one fixed-route bus line that serves the study area is:

Pohoiki/Pahoa/Hilo—this route extends along Pahoa Bypass Road (Highway 130) between Hilo, to the north, and Pohoiki, to the south, and while there is no official bus stop along Pahoa Bypass Road, riders tend to congregate to get picked up. This service operates Monday through Friday, and while service is limited to and from Pohoiki, it operates regularly within Pahoa in both the northbound and southbound directions. This route operates at 45 minute headways during the PM peak hour. On Saturdays, this route operates during the AM and PM peak hours in both directions, and as late as 9pm in the southbound direction. This route does not operate on holidays.

EXISTING BICYCLE FACILITIES

Bicycle facilities generally consist of three types of facilities, which are outlined below:

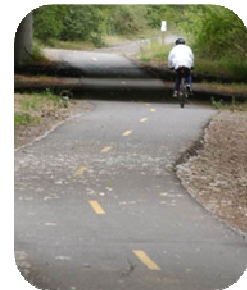
- *Bike or Shared Use Paths* provide a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized. Generally, the recommended pavement width for a two-directional shared use path is ten (10) feet.



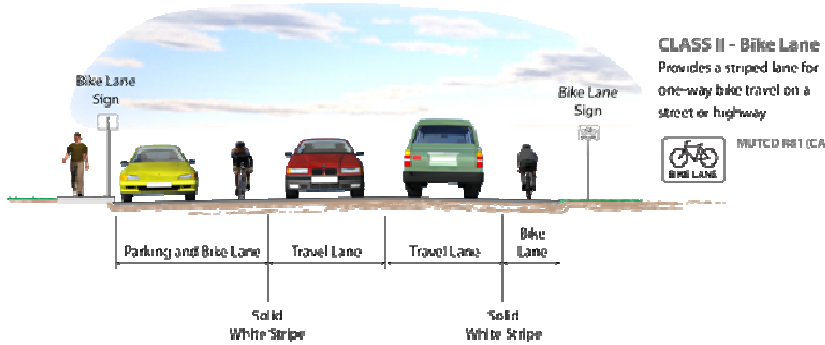
CLASS I - Multi-Use Path
Provides a completely separate right-of-way for exclusive use of bicycles and pedestrians with cross-flow minimized



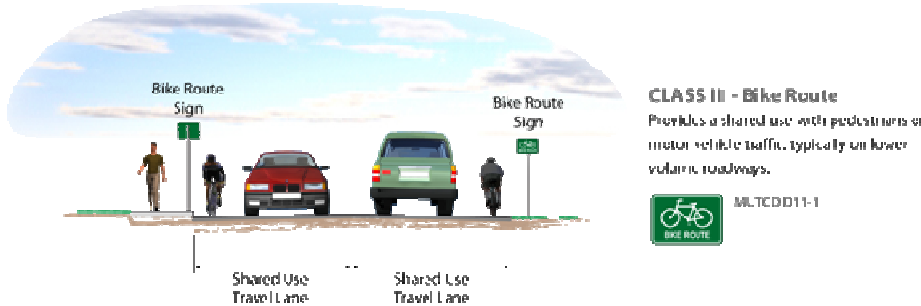
MUTCD 8A.1.1.1.1



- Bike Lanes provide a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five (5) feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.



- Bike Route or Signed Shared Roadways provide for a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles.



While there are no existing bicycle facilities within the study area, plans do exist at the state and regional level to improve bicycle infrastructure on the island of Hawaii. The State's *Bike Plan Hawaii* (2003) prioritizes bicycle infrastructure projects to be implemented in a three-tier system, and identifies some Priority II (to be implemented within the next 20 years) projects within the study area. These projects include shared bicycle routes on:

- Kahakai Boulevard, between Railroad Avenue and the Pahoa School Complex
- Pahoa Village Road, between Volcano Highway and the Pahoa Coast
- Pahoa-Kalapana Highway, between Kapoho-Kalapana Beach Road and Kea'ae-Pahoa Road.

At the regional level, the *Puna Regional Circulation Plan (2005)* identifies goals to implement these projects with a high priority on bicycle facilities on Pahoa Village Road. Furthermore, the plan seeks to build an environment for enhanced walking and biking with the implementation of a "Safe Routes to School" program, as well as the installation of key multi-use paths both north and south of the study area.

EXISTING PEDESTRIAN FACILITIES

The study area features existing pedestrian facilities such as crosswalks, both at mid-block and at intersections, as well as formal and informal sidewalks. The Pahoa Bypass Road / Pahoa Village Road intersection lacks crosswalks on all three legs.

Pahoa Village Road lacks formal sidewalks south of the intersection with Pahoa Bypass Road, and pedestrians are forced to walk in the narrow shoulder or in the grassy right-of-way. A mid-block crossing east of the Pahoa Village Road / Kauhale Street intersection is identified with a high visible crosswalk (i.e., "ladder" striping). Continuing south on Pahoa Village Road, another mid-block high visibility crosswalk is provided approximately 500 feet west of the Pahoa Village Road / Kauhale Street intersection.

The Pahoa Village Road / Kauhale Street intersection features more extensive pedestrian infrastructure. Sidewalks at the southwest corner of the Pahoa Village Road / Kauhale Street intersection are not physically separated or specifically defined, and vertical delineators are used to increase pedestrian visibility for vehicles and provide a visual separation. At this intersection, the west leg of Pahoa Village Road provides sidewalks on the south side, while the east leg of the intersection provides sidewalks on both sides of Pahoa Village Road which serve the commercial uses. These sidewalks continue on both sides of Kauhale Street leading to the proposed project site.

High visibility crosswalks exist across the west and south legs of the Pahoa Village Road / Kauhale Street intersection, and a painted median refuge (which is not raised or separated from the roadway) exists for pedestrians crossing the south leg of the intersection. Opportunities for enhancement at this intersection include an AC (asphalt-concrete) berm or raised median refuge to provide a separation between pedestrians and vehicles, as well as the installation of crosswalks across all three legs of the intersection.

The Pahoa Bypass Road / Pahoa Village Road-Kapoho Road intersection also has existing crosswalks across all four legs of the intersection; however some portions are fading and should be re-striped.

EXISTING PARKING FACILITIES

Parking counts were conducted in July 2013 to obtain the hourly occupancy data at the three existing parking lots serving the existing swimming pool, community center, and the skate park within Pahoa Park. These counts were conducted on a mid-week day between 9:00 AM and 3:00 PM. As the table below shows, each of the three lots experience low occupancy throughout a typical mid-week day. However, it should be noted that these counts were conducted with the local schools were not in session which could affect the park usage and parking occupancy. Input from the County of Hawaii's Parks & Recreation Department indicates that the parking lots are, on average, at 75% of their capacity at least once when school is in session. However, both of these data sources still point to the fact that there is an existing parking surplus on site.

TABLE 4 EXISTING PARKING OCCUPANCY

	Lot 1 (Pool)			Lot 2 (Community Center)			Lot 3 (Skate Park)		
	ADA	Stalls	Occupancy	ADA	Stalls	Occupancy	ADA	Stalls	Occupancy
Stalls Provided	6	86	-	4	80	100%	2	22	-
Time of Day									
9:00 AM	0	9	10%	1	17	21%	0	2	8%
10:00 AM	0	12	13%	1	17	21%	0	2	8%
11:00 AM	0	13	14%	0	18	21%	0	3	13%
12:00 PM	0	10	11%	0	10	12%	0	3	13%
1:00 PM	0	11	12%	0	15	18%	0	1	4%
2:00 PM	0	10	11%	0	13	15%	0	1	4%
3:00 PM	0	10	11%	0	11	13%	0	1	4%

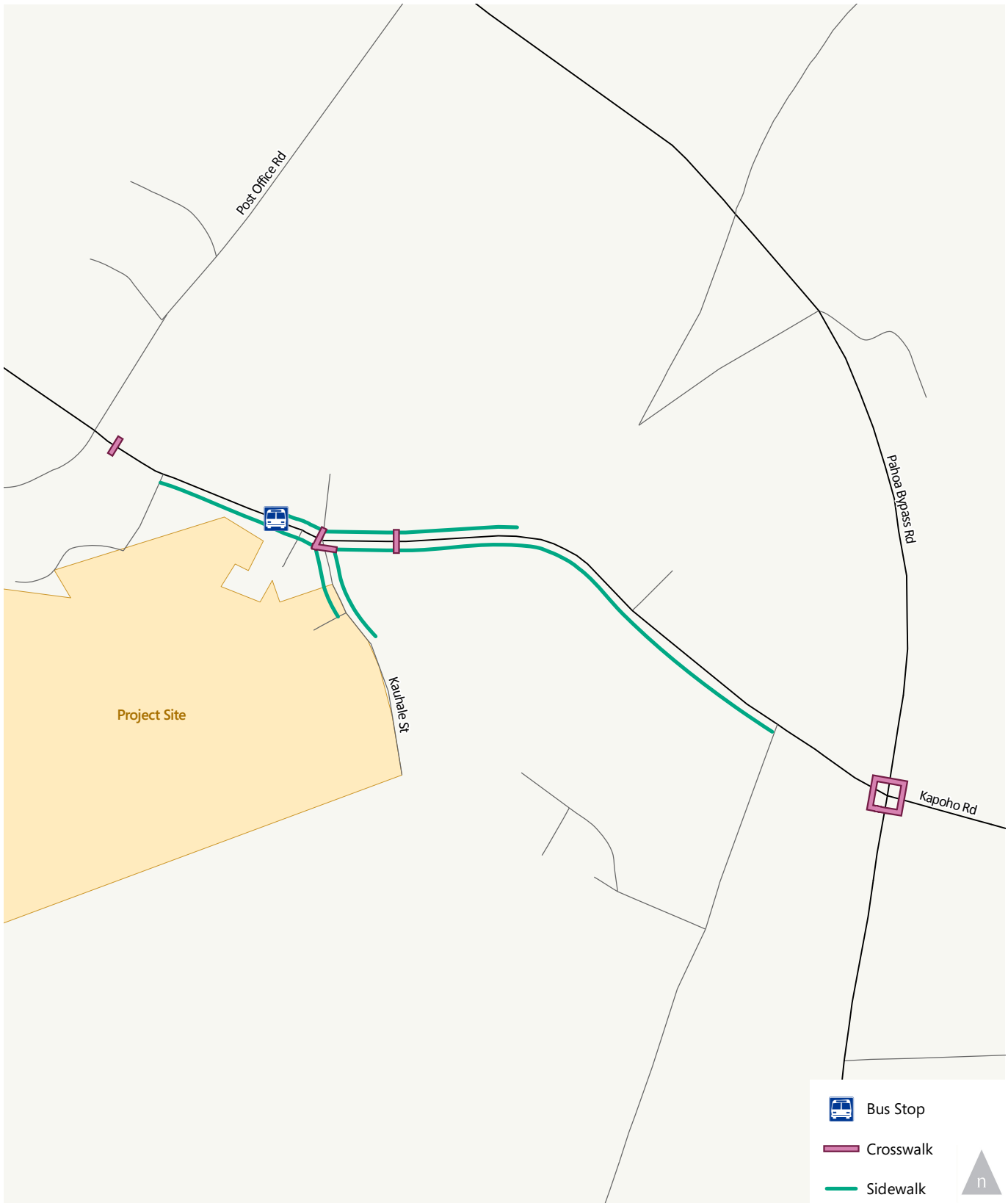


Figure 3.
Existing Transportation Facilities

EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

The operations of the three (3) study intersections were evaluated during the weekday afternoon (2:00 pm to 5:00 pm) and Saturday (10:00 am to 1:00 pm) peak-period conditions. AM peak hour conditions were not analyzed because the project is expected to generate a negligible amount of traffic during that period. To maintain the previous project schedule, traffic counts were conducted during the weekday and Saturday peak periods at the study intersections in July 2013, when school was not in session. However, the intersection counts were adjusted to account for the additional traffic expected from nearby schools based on a daily traffic count that was obtained in August 2012, while schools were in session. Figure 4 presents the existing weekday PM and Saturday peak-hour turning movement volumes, corresponding lane configurations and traffic control devices. The raw traffic counts are contained in Appendix A.

EXISTING INTERSECTION LEVELS OF SERVICE

Existing peak-hour volumes and lane configurations were used to calculate levels of service for each of the study intersections. The results of the existing LOS analysis are presented in Table 5 and the corresponding LOS calculation sheets are included in Appendix B. The results of the LOS calculations indicate that two of the study intersections operate at acceptable service levels (LOS D or better), but the Pahoa Bypass Road / Pahoa Village Road operates at LOS F during both peak periods.

The eastbound approach on Pahoa Village Road experiences high levels of delay during the Weekday PM and Saturday peak hours as vehicles at this approach are stopped and must wait a substantial amount of time for an adequate gap in traffic on Pahoa Bypass Road, which is not stop controlled.

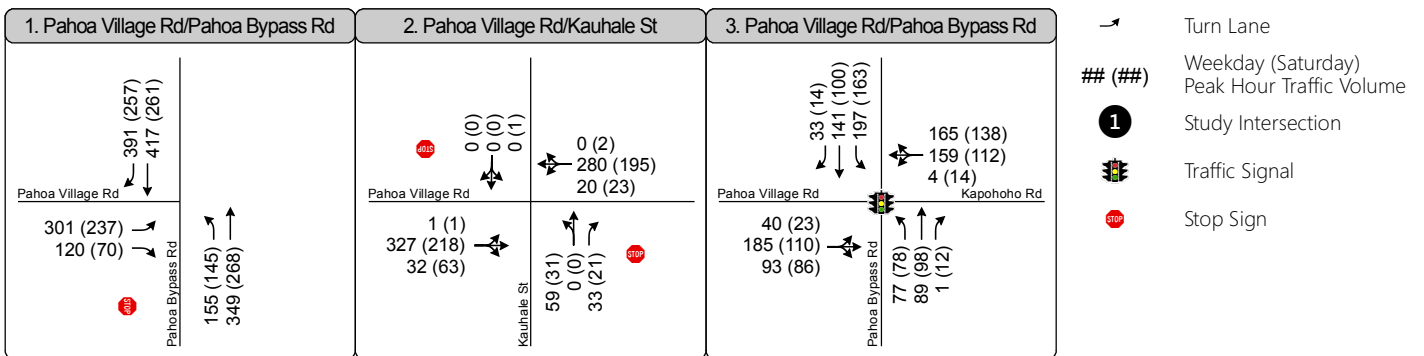


Figure 4.
Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

TABLE 5 EXISTING INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control	Peak Hour	Count Date	Delay (sec/veh) ¹	LOS ²
1. Pahoa Bypass Road / Pahoa Village Road	Side Street Stop	Wkdy PM Saturday	7/18/2013 7/20/2013	>200.0 61.9	F F
2. Pahoa Village Road / Kauhale Street	Side Street Stop	Wkdy PM Saturday	7/18/2013 7/20/2013	15.0 13.4	C B
3. Pahoa Bypass Road / Pahoa Village Road – Kapoho Road	Signalized	Wkdy PM Saturday	7/18/2013 7/20/2013	25.5 28.7	C C

Source: Fehr & Peers, 2013.

Note:

1. Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. The worst movement is presented for unsignalized intersections.
2. LOS calculations performed using the *2000 Highway Capacity Manual (HCM)* method.
3. Unacceptable LOS highlighted in **bold**.

As noted above, the worst approach on Pahoa Bypass Road / Pahoa Village Road operates unacceptably during the weekday and Saturday peak hours. HDOT is working to develop a design at this intersection for a planned roundabout, which is intended to mitigate the poor peak period traffic operations at this location. Roundabouts also provide a safety benefit by usually reducing the number and severity of collisions.

3. NEAR TERM (2014) CONDITIONS

This chapter presents the results of transportation analysis under Near Term (2014) Conditions without the project. Near Term Conditions are defined as conditions expected to occur at the anticipated year (2014) of project's Phase 1 construction and occupancy. Traffic volumes for Near Term (2014) Conditions comprise existing volumes plus the ambient growth in traffic volumes calculated based on an annual growth factor.

NEAR TERM (2014) TRAFFIC ESTIMATES

The following section summarizes the growth assumptions used to estimate the amount of traffic that will be added to existing intersection volumes to by 2014.

NEAR TERM ROADWAY NETWORK

The existing roadway network configuration was assumed under Near Term (2014) Conditions except for improvements assumed to be in place at the Pahoa Bypass Road / Pahoa Village Road intersection. As noted under Existing Conditions, HDOT is planning to design and construct a roundabout in place of the side-street stop control at this intersection. As such, this improvement was assumed in the roadway network for Near Term (2014) Conditions. These plans involve the roundabout initially constructed with a single lane circulation lane and a single approach at each leg. However, a preliminary analysis showed the intersection will continue to operate unacceptably during the weekday PM peak hour with a single lane design, and therefore a two-lane roundabout is required for the intersection to operate acceptably regardless of project implementation.

REGIONAL GROWTH ASSUMPTIONS

A growth factor was applied to all intersections equally to account for future regional growth. Historic HDOT data was obtained at the roadway segments within the study area for the years 2007 and 2010. A comparison between the 2007 and 2010 ADT counts showed generally similar traffic volumes between the two sets of data. Furthermore, the comparison of these counts to the segment counts collected in August 2012 indicated minimal growth in the area over the past few years. As a result, an annual growth factor of one percent was applied to the three study intersections, to account for the ambient growth in the immediate area and region. This growth rate was applied for just one year (i.e., 12 months) to September 2014 when the Phase Phase 1 facilities are expected to be built and occupied. The traffic volumes for Near Term (2014) Conditions are shown on Figure 5.

In addition to overall growth, traffic from one approved project located in the Puna District was included in the Near Term (2014) conditions analysis. The B.T. Kuwahara Private Commercial Development is located at the intersection of Kahakai Boulevard and Old Pahoa Village Road, north of the proposed project site. The commercial development would most likely include a super market, garden center, family medical clinic, some specialty retail stores, and a full service restaurant. The TIAR for B.T. Kuwahara Private Commercial Development was completed in June 2013, and ITE trip generation rates were used to estimate the net increase in traffic volumes resulting from the project. The TIAR analyzed the development for the AM and PM weekday peak hours. For the purpose of this analysis, weekend peak hour volumes were calculated based on an adjustment factor applied to the PM weekday project traffic. This adjustment factor was calculated based on a comparison between the weekday PM and weekend peak ITE trip generation rates. Volumes from this cumulative project were added to the growth factored existing volumes described above and the total represents the Near Term (2014) traffic volumes without the proposed project.

NEAR TERM (2014) LEVELS OF SERVICE

Levels of service calculations were conducted to evaluate the operating levels of the study intersections under Near Term (2014) Conditions using the network and volume assumptions described above. The results of the LOS analysis for the study intersections are presented in Table 6. The corresponding LOS calculation sheets are included in Appendix B.

TABLE 6 NEAR TERM (2014) INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control	Peak Hour	Near Term (2014)	
			Delay (sec/veh) ¹	LOS ²
1. Pahoa Bypass Road / Pahoa Village Road	Roundabout	Wkdy PM	10.8	B
		Saturday	6.7	A
2. Pahoa Village Road / Kauhale Street	Side Street Stop	Wkdy PM	17.5	C
		Saturday	16.4	C
3. Pahoa Bypass Road / Pahoa Village Road – Kapoho Road	Signalized	Wkdy PM	28.3	C
		Saturday	19.8	B

Source: Fehr & Peers, 2013

Note:

1. Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. Worst-case approach delay for two-way stop controlled intersections.

2. LOS calculations performed using the 2000 Highway Capacity Manual (HCM) method.

3. Unacceptable LOS highlighted in **bold**.

N/A = Not applicable.

With the installation of a two-lane roundabout the Pahoa Bypass Road / Pahoa Village Road intersection is projected to operate acceptably during both peak hours in 2014 without the proposed project. Furthermore, the Pahoa Village Road / Kauhale Street and Pahoa Bypass Road / Pahoa Village Road – Kapoho Road intersections will operate acceptably assuming a one percent growth in traffic over existing conditions.

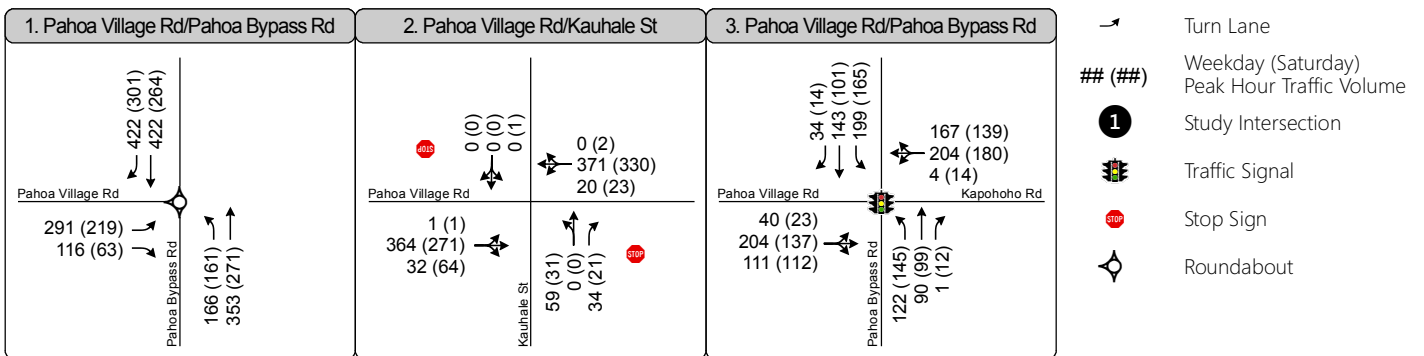


Figure 5.
Peak Hour Traffic Volumes and Lane Configurations -
Near Term Conditions

4. NEAR TERM (2014) PLUS PROJECT CONDITIONS

This chapter summarizes the project's travel demand characteristics and presents the results of the level of service calculations under Near Term (2014) plus Project Conditions with the project. Near Term plus Project Conditions include existing traffic, added traffic from regional growth, added traffic from the approved B.T Kuwahara Private Commercial Development, plus new traffic generated by the proposed project. There is a possibility that Post Office Road could be extended to the proposed project site to provide a safer and more direct alternative access to the park. At present, Post Office Road is one of three main means of access and egress between Pahoa Village Road and the Pahoa Bypass Road. Since this improvement is still in the midst of the CIP process, it was not included in the assumptions for the proposed project.

PROJECT TRIP ESTIMATES

The amount of traffic added to the roadway system by proposed development is estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. The first step estimates the amount of traffic added to the roadway network. The second step estimates the direction of travel to and from the project site. The new trips are assigned to specific street segments and intersection turning movements during the third step. The results of the process for the proposed project are described in the following sections.

TRIP GENERATION ESTIMATES

Preparing a vehicle trip generation estimate for a project such as a community park with a variety of facilities requires development of a series of assumptions regarding the attendance level and turnover expected for each facility component. In addition, the average vehicle occupancy for uses will vary, as well as the days of the week when activities occur. In many cases, the typical operating level for the park as a whole will be well below its maximum capacity for a majority of the time.

The trip generation estimate for the peak one hour when Phase 1 uses could be generating traffic was prepared for two scenarios:

1. Typical use of the park – this assumes one multi-use field, the youth baseball field, the high school baseball field, and one covered play court (volleyball or basketball) are simultaneously in use and they all turn over within the same hour (i.e., one game ends and another game begins).

2. Maximum use of all facilities – this assumes that every Phase 1 facility is simultaneously in use and that the facilities turn over once in the same hour. This represents a worst-case condition that would occur with a major tournament at each facility. Note: This scenario is addressed qualitatively.

Based on input from the County of Hawaii's Parks and Recreation Department and information in the project description, the typical use was assumed to be the same for the weekday PM peak hour and the Saturday peak hour. Each facility was assessed based on the number of vehicles, and the corresponding one-way trips it would generate per game. This analysis accounts for players, coaches, parents, spectators, officials, and in some cases, field operators. For the purpose of this analysis, spectators were assumed to be family members, friends, or acquaintances who might attend the game but do not arrive early with the player for warm-up, etc. The assumptions for each facility component are summarized below and the resulting trip generation is presented in Table 6.

- Multi-use Field (soccer) – Each team is made up of 47 people, including coaches, players, parents, and spectators. Three officials are assumed per game. This equates to 97 people per game. It was assumed that during the given peak hour, one game would end and another would begin, meaning two teams would arrive and two teams would depart during this time.
- Youth Baseball Field – Each team is made up of 41 people, including coaches, players, parents, and fans. One umpire is assumed per game. This equates to 83 people per game. It was assumed that during the given peak hour one game would end and another would begin, meaning two teams would arrive and two teams would depart during this time.
- High School Baseball Field – Each team is made up of 40 people, including coaches, players, parents, and fans. Two umpires are assumed per game, as well as two field operators to keep score, etc. This equates to 84 people per game. It was assumed that during the given peak hour, one game would begin and another would begin, meaning two teams would arrive and two teams would depart during this time.
- Covered Play Court (Volleyball, Basketball, etc) – Each team is made up of 24 people, including coaches, players, parents, and fans. One referee and two court operators are assumed per game. This equates to 51 people per game. It was assumed that during the given peak hour, one game would end and another would begin.

The number of trips estimated for the proposed project is based on the maximum use and the typical use of the park facilities. The reality of actual operations will likely be less than described here. For example: 1) youth baseball may only occur on certain afternoons during the week, 2) the High School baseball field

will not be used every weekday afternoon the attendance may be lower than the 84 people/game assumed in the analysis, and 3) fields may only be used for a single game per day or could have a more staggered schedule. In general, the trip generation estimates are considered conservative for each scenario in that these levels are not expected to occur every afternoon or Saturday.

Each field or facility was assumed to experience the conclusion of one game and the start of another during the peak hour as a worst case scenario. Table 7 shows an example schedule at a given field.

TABLE 7 EXAMPLE FIELD SCHEDULE

Time	Description
0:00 PM	All are present for Game 1 (Coaches, Players, Parents, Fans, Officials)
0:15 PM	Coaches, Players, and Parents arrive for Game 2
0:30 PM	Game 1 ends
0:45 PM	All for Game 1 depart, Officials stay for Game 2
0:00 PM	Fans for Game 2 arrive

In order to assess the parking needs of the proposed project, each facility would need to potentially accommodate up to four teams at once, since both teams for Game 2 are at the field to warm-up while two teams are still playing Game 1. To provide a conservative estimate, the assumption was made that the parking required would equate to the total inbound and outbound trips generated in a single peak hour. Table 7 above shows the correlation between the number of trips generated and the parking required.

As shown in Table 8, typical weekday PM and Saturday use would generate a total of 280 peak hour vehicle trips (140 in/140 out). Maximum use of the park, where all facilities are in use simultaneously, could generate as many as 456 trips (228 in/228 out).

TABLE 8 TYPICAL USE PROJECT TRIP GENERATION AND PARKING ESTIMATES

Facility	Multi-use Field (9)	Multi-use Field (12)	Youth Baseball Field (17)	High School Baseball Field (20)	Covered Play Court 1	Covered Play Court 2	Covered Play Court 3	Total
Active Uses		x	x	x			x	
Number of Trips		88	76	72			44	280
Inbound Trips		44	38	36			22	140
Outbound Trips		44	38	36			22	140
Parking Stalls		88	76	72			44	280

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution is defined as the directions of approach and departure that vehicles would use to arrive at and depart from the site. Trip distribution percentages were developed based on:

- Locations of complementary land uses
- Distribution of population and number of households based on a GIS analysis of a 7-mile radius of the surrounding Pahoa Park site.

Distribution patterns are expected to be similar for the weekday PM and Saturday peak periods. Project-generated trips were assigned to the surrounding transportation network based on the general directions of approach and departure. Figure 6 illustrates the project trip distribution. Approximately 70% of traffic is expected to travel to and from the north on Pahoa Village Road and Pahoa Bypass Road, 20% of traffic is expected to travel to and from the east on Pahoa Village Road-Kapoho Road, and 10% is expected to travel to and from the south on Pahoa Bypass Road.

The project trips were assigned to the roadway network based on the trip distribution pattern discussed above. Figure 6 shows the AM and PM peak-hour project trips assigned to each turning movement at the study intersections.

NEAR TERM (2014) PLUS PROJECT TRAFFIC VOLUMES

Project trips associated with the Park's estimated "typical use" of Phase 1 facilities were added to Near Term (2014) traffic volumes to analyze the Near Term (2014) plus Project Conditions. The resulting volumes are shown on Figure 7.

NEAR TERM (2014) PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Intersection levels of service calculations were conducted to evaluate the operating levels of the study intersections under Near Term (2014) plus Project Conditions. Table 9 presents the level of service calculations for the study intersections under Near Term (2014) and Near Term (2014) plus Project Conditions. Appendix B contains the corresponding calculation sheets.



Figure 6.

**Proposed Project Trip Distribution and Assignment
 Typical Use**

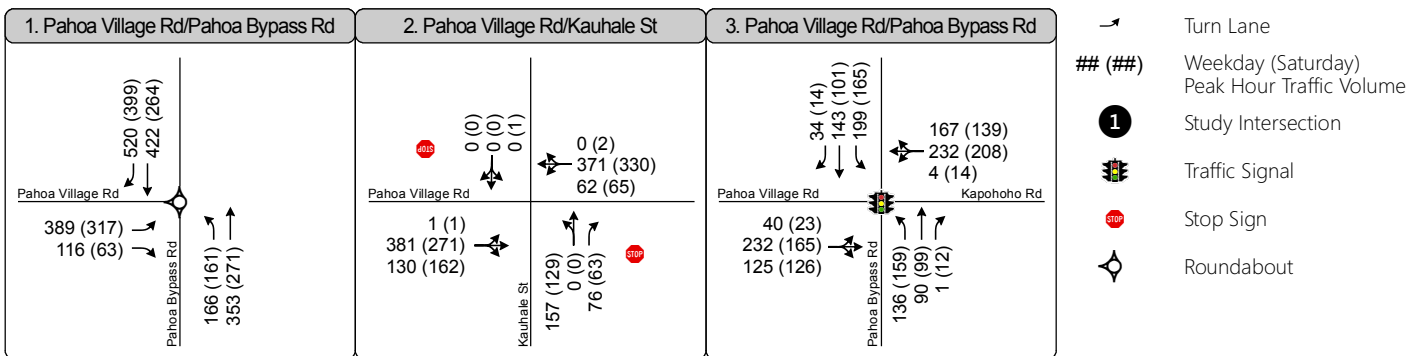


Figure 7.

Peak Hour Traffic Volumes and Lane Configurations -
Near Term Plus Project Conditions



TABLE 9 NEAR TERM (2014) PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control	Peak Hour	Near Term (2014) No Project		Near Term (2014) Plus Project	
			Delay (sec/veh) ¹	LOS ²	Delay (sec/veh) ¹	LOS ²
1. Pahoa Bypass Road / Pahoa Village Road	Roundabout	Wkdy PM	10.8	B	17.5	C
		Saturday	6.7	A	8.4	A
2. Pahoa Village Road / Kauhale Street	Side Street Stop	Wkdy PM	17.5	C	46.4	E
		Saturday	16.4	C	25.3	D
3. Pahoa Bypass Road – / Pahoa Village Road – Kapoho Road	Signalized	Wkdy PM	28.3	C	27.9	C
		Saturday	19.8	B	21.0	C

Source: Fehr & Peers, 2013

Note:

1. Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. Worst-case approach delay for two-way stop controlled intersections.

2. LOS calculations performed using the *2000 Highway Capacity Manual (HCM)* method.

3. Unacceptable LOS highlighted in **bold**.

N/A = Not applicable.

Table 9 above shows that all study intersections operate acceptably under Near Term (2014) plus Project Conditions, with the exception of the Pahoa Village Road/Kauhale Street intersection which operates at LOS E during the Weekday PM peak hour. Therefore, the project is not expected to result in any significant traffic impacts and no roadway improvements are necessary at its typical use. It should be noted that the intersection was also analyzed without the approved B.T Kuwahara Private Commercial Development and without this additional traffic the Pahoa Village Road/Kauhale Street intersection operates acceptably.

Because the intersection is projected to operate at a level below the LOS D standard, the need for a traffic signal was evaluated at the study intersection. According to the peak hour signal warrant analysis identified in the 2009 edition of the *Manual of Uniform Traffic Control Devices* (MUTCD, Federal Highway Administration), the Near Term (2014) traffic volumes with the proposed project satisfy the warrant during the weekday PM peak hour. This represents a project-specific impact to the Pahoa Village Road/Kauhale Street intersection. Appendix B includes the worksheets for the peak hour warrant analysis.

The signal warrant analysis is intended to examine the general correlation between future traffic conditions and the need to install a new traffic signal. Existing plus Project Condition peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the *Manual of Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration 2009. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The County of Hawaii should undertake regular monitoring of actual traffic conditions and collision data and conduct a timely re-evaluation of the full set of warrants to prioritize and program the intersection for signalization.

Maximum Occupancy of Phase 1

As noted previously, maximum and simultaneous occupancy of all uses at the Pahoa Park site is expected to be a rare occurrence. With all courts and fields occupied and turning over during the same hour, the Pahoa Village Road / Kauhale Street intersection would operate unacceptably and mitigation would be required. Depending on the frequency of this scenario, potential mitigation could include the installation of a traffic signal or the use of manual traffic control to allow traffic to turn to and from Kauhale Street. Table 10 below shows the estimated parking and trip generation associated with the Park's maximum use.

TABLE 10 PROJECT TRIP GENERATION AND PARKING ESTIMATES

Facility	Multi-use Field (9)	Multi-use Field (12)	Youth Baseball Field (17)	High School Baseball Field (20)	Covered Play Court 1	Covered Play Court 2	Covered Play Court 3	Total
Scenario 1 – Maximum Use								
Active Uses	x	x	x	x	x	x	x	
Number of Trips	88	88	76	72	44	44	44	456
Inbound Trips	44	44	38	36	22	22	22	228
Outbound Trips	44	44	38	36	22	22	22	228
Parking Stalls	88	88	76	72	44	44	44	456

As shown above the proposed project is estimated to generate 456 peak hour trips when the park is at its maximum use.

Other Generators

The proposed Pahoa Park expansion includes a second development phase anticipated for full build out in approximately 10 years. Potential traffic generators anticipated with this phase include a full-size track and multi-use field suitable for football, an amphitheater, and an archery range. Without specific descriptions of each use and detailed sizes of spectator seating, it is not possible to accurately estimate vehicle trip generation for project build out, and maximum use of the Park was assumed to generate double the project trips estimated in typical use of Phase 1. Under these maximum use conditions, the peak hour signal warrant would be met and a significant impact would occur at the Pahoa Village Road / Kauhale Road intersection during both the weekday PM and Saturday peak hours. Depending on the frequency at which the full Park expansion is expected to operate at close to its maximum use, mitigation would include the installation of a traffic signal or manual traffic control.

Pedestrian, Bicycle, and Transit Impacts

The proposed project is not expected to conflict with any planned bicycle or pedestrian projects identified in HDOT's *Bike Plan Hawaii* (2003) or projects identified in the County of Hawaii's *Puna Regional Circulation Plan* (2005) discussed earlier in this report. County of Hawaii staff did not identify any upcoming bicycle or pedestrian projects in the vicinity of the proposed park expansion.

Due to the lack of bicycle infrastructure, bicyclists are forced to share the roadway with vehicular traffic. Without the infrastructure in place, the recommendation is to add specific amenities to the proposed site plan and the surrounding area to encourage users of the park to bike to the site. The same recommendation is made to enhance the use of transit to access the park by adding amenities to the bus stop located on Pahoa Village Road.

5. SITE ACCESS/CIRCULATION/PARKING

This section provides a summary of the site access, circulation, and parking at the proposed Pahoa Park expansion site. All vehicles will access the site via Kauhale Street and an internal road will allow for circulation within the site. The latest site plan, dated April 2013, shows that one new driveway will provide vehicle access to the site. The existing driveway at the community center will remain as an access point to the site.

Once entering the Park from Kauhale Street, an internal road continues around the edge of the Park allowing vehicles to circulate to the various facilities and parking lots. This internal road continues between the two multi-use fields on the eastern half of the Park which will enable vehicles to cut through to the existing community pool, existing community center, and existing driveway without driving all the way around the Park. This configuration limits the dead-end aisles within the Park and provides improved circulation. There is a possibility that Post Office Road could be extended to the proposed project site to provide a safer and more direct alternative access to the park. At present, Post Office Road is one of three main means of access and egress between Pahoa Village Road and the Pahoa Bypass Road. This could improve circulation by better distributing the vehicles within the site.

The internal roadway provides a long stretch of roadway and speeding is a potential concern. The installation of speed humps or speed tables is recommended at key locations along the roadway to encourage vehicles to slow down as they circulate through the site. Speed humps are generally constructed 14 feet across the roadway with a three and a half foot hump and are strictly meant to slow the driver. Speed tables are similar to raised crosswalks and are constructed with a six foot inclined approach on either side of a 10 foot flat middle section. Similar to speed humps, speed tables are traditionally three and half feet in height. Figure 8 displays the recommended locations for both speed humps and speed tables throughout the proposed site plan.

The proposed site plan parking summary provides a total of 783 parking stalls, 413 formal stalls and 370 informal stalls comprised of overflow areas and the provision of roadside parking. The supply is based on County code for spectator seating for each facility, as well as assumed seating within the covered court area. The analyzed "typical use" of the proposed Park expansion (Phase 1) would require 280 parking stalls, in which case the proposed site plan offers sufficient formal parking. At its maximum occupancy with all Phase 1 uses in operation and turning over during same hour, the proposed Park expansion would require approximately 456 parking stalls, which would require use of the overflow parking areas.

In the case of a major event such as a school graduation, the proposed expansion is still expected to provide sufficient parking given the availability of the roadside parking, as well as the existing parking surplus discussed under Existing Conditions of this report. Given the existing and proposed parking supply, all of the vehicles under this scenario could not be accommodated at the site and other arrangements for transporting patrons to the site would have to be made. This event would likely include remote/off-site parking and frequent shuttle service, plus manual traffic control at intersections to control peak arriving and departing traffic. A more detailed transportation demand management (TDM) plan will have to be completed to address parking and circulation for a major event or multiple tournaments that would generate near-capacity attendance of the entire facility.



Figure 8.
 Site Plan Recommendations

6. MITIGATION MEASURES

This chapter discusses potential measures to minimize the impact of the project on the surrounding transportation system including roadways, and facilities and services associated with transit, walking and bicycling.

As noted above, a project-specific impact is anticipated at the Pahoa Village Road/Kauhale Street intersection during the Weekday PM peak hour with the “typical use” of the proposed Park expansion through Phase 1. This impact could be mitigated with manual traffic control or the installation of a traffic signal. The type of mitigation will depend on the frequency of activities expected at the Park. It is possible that traffic control such as the use of crossing guards and/or police officers directing traffic could be relied upon to manage the intersection’s operations. With increased activity, a traffic signal would create gaps in traffic on Pahoa Village Road and thus allow the side street traffic on Kauhale Street to travel east or west. The County of Hawaii should undertake regular monitoring of actual traffic conditions and collision data and conduct a timely re-evaluation of the full set of traffic signal warrants to prioritize and program intersections for signalization.

The maximum use of the proposed Park expansion after Phase I does require mitigation during the weekday PM peak hour at the Pahoa Village Road/Kauhale Street intersection. If this maximum use is expected only for special events, manual traffic control could be relied upon. The full build out of the proposed Phase II will also warrant a signal at the Pahoa Village Road / Kauhale Street intersection and the installation of a signal would be required as mitigation for both the weekday PM and Saturday peak hours.

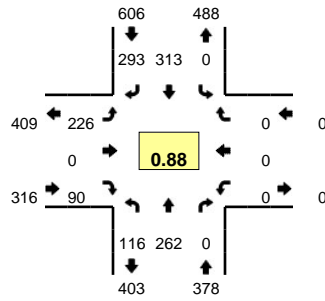
Due to the relatively low vehicular volumes and speeds on Pahoa Village Road it is reasonable that bicyclists share the roadway. It is recommended that “Share the Road” signs be displayed within a half-mile radius of the proposed project in order to increase driver awareness of bicyclists. Enhanced pedestrian and bicycle infrastructure is anticipated at the Pahoa Bypass Road / Pahoa Village Road intersection associated with the installation of the roundabout. These facilities will provide connections to HDOT’s planned shared bicycle route on Pahoa Bypass Road north of the future roundabout. It is recommended that bicycle racks and other bicycle storage facilities be provided at different locations throughout the proposed Park expansion in order to continue to encourage bicycling to and from the park.

It is recommended to enhance the amenities at the Pahoa bus stop with a bench or covered structure in order to encourage Park users to access the site via transit.

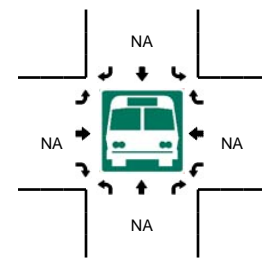
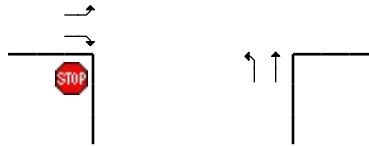
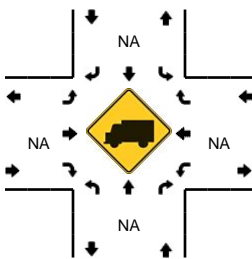
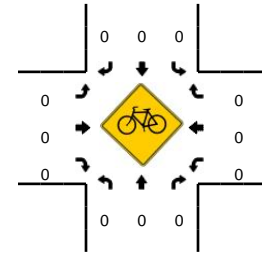
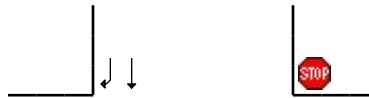
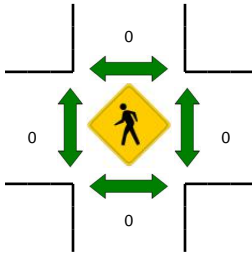
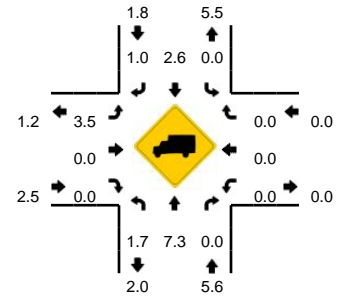
APPENDIX A: TRAFFIC COUNTS

LOCATION: State Rte 130 -- Pahoa Rd
CITY/STATE: Pahoa, HI

QC JOB #: 11088205
DATE: Thu, Jul 18 2013



Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:45 PM -- 4:00 PM



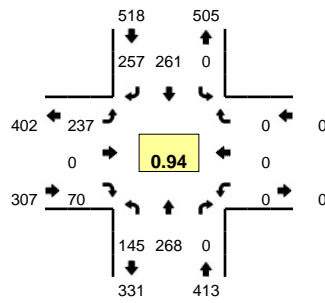
15-Min Count Period Beginning At	State Rte 130 (Northbound)				State Rte 130 (Southbound)				Pahoa Rd (Eastbound)				Pahoa Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	27	60	0	0	0	66	63	0	49	0	16	0	0	0	0	0	281	
2:15 PM	23	79	0	0	0	81	71	0	50	0	17	0	0	0	0	0	321	
2:30 PM	22	69	0	0	0	66	72	0	66	0	16	0	0	0	0	0	311	
2:45 PM	28	63	0	0	0	63	52	0	53	0	21	0	0	0	0	0	280	1193
3:00 PM	34	58	0	0	0	77	69	0	47	0	21	0	0	0	0	0	306	1218
3:15 PM	25	61	0	0	0	71	71	0	70	0	24	0	0	0	0	0	322	1219
3:30 PM	22	69	0	0	0	71	75	0	47	0	17	0	0	0	0	0	301	1209
3:45 PM	35	74	0	0	0	94	78	0	62	0	28	0	0	0	0	0	371	1300

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	140	296	0	0	0	376	312	0	248	0	112	0	0	0	0	0	1484
Heavy Trucks	0	24	0	0	0	8	8	0	4	0	0	0	0	0	0	0	44
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

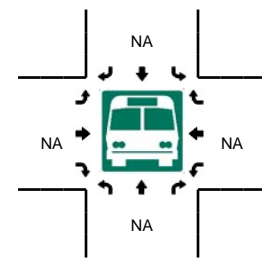
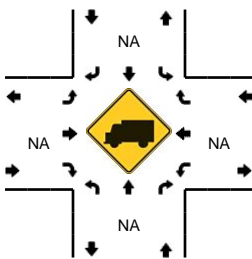
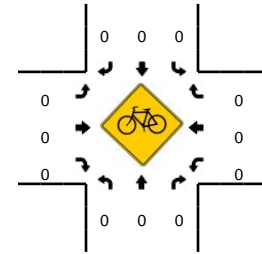
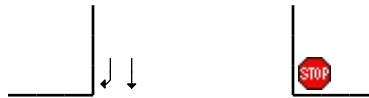
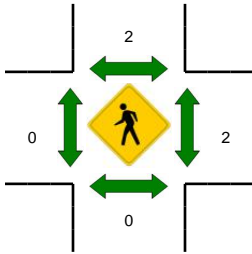
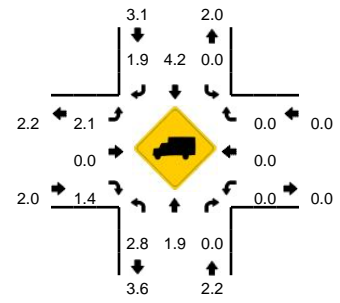
Comments:

LOCATION: State Rte 130 -- Pahoa Rd
CITY/STATE: Pahoa, HI

QC JOB #: 11088206
DATE: Sat, Jul 20 2013



Peak-Hour: 10:45 AM -- 11:45 AM
Peak 15-Min: 11:30 AM -- 11:45 AM

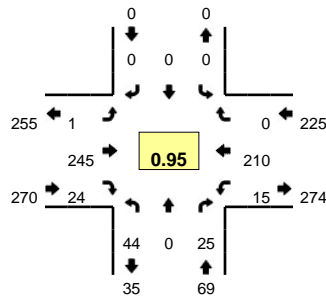


15-Min Count Period Beginning At	State Rte 130 (Northbound)				State Rte 130 (Southbound)				Pahoa Rd (Eastbound)				Pahoa Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
10:00 AM	30	69	0	0	0	46	44	0	58	0	23	0	0	0	0	0	270	
10:15 AM	25	70	0	0	0	50	59	0	47	0	12	0	0	0	0	0	263	
10:30 AM	40	56	0	0	0	72	63	0	48	0	17	0	0	0	0	0	296	
10:45 AM	38	71	0	0	0	59	65	0	71	0	16	0	0	0	0	0	320	1149
11:00 AM	29	57	0	0	0	57	66	0	55	0	22	0	0	0	0	0	286	1165
11:15 AM	40	60	0	0	0	64	64	0	58	0	16	0	0	0	0	0	302	1204
11:30 AM	38	80	0	0	0	81	62	0	53	0	16	0	0	0	0	0	330	1238
11:45 AM	26	76	0	0	0	63	61	0	46	0	16	0	0	0	0	0	288	1206
12:00 PM	26	64	0	0	0	71	65	0	46	0	20	0	0	0	0	0	292	1212
12:15 PM	33	57	0	0	0	67	63	0	51	0	18	0	0	0	0	0	289	1199
12:30 PM	38	55	0	0	0	77	49	0	59	0	18	0	0	0	0	0	296	1165
12:45 PM	30	62	0	0	0	72	61	0	45	0	26	0	0	0	0	0	296	1173
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	152	320	0	0	0	324	248	0	212	0	64	0	0	0	0	0	1320	
Heavy Trucks	8	8	0	0	0	12	4	0	8	0	0	0	0	0	0	0	40	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

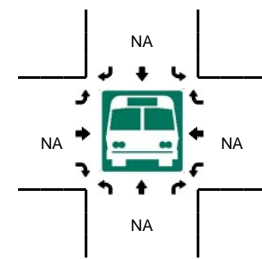
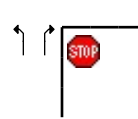
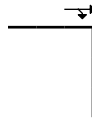
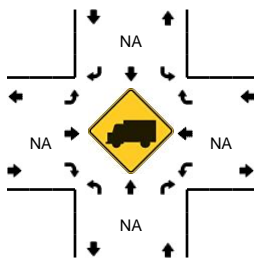
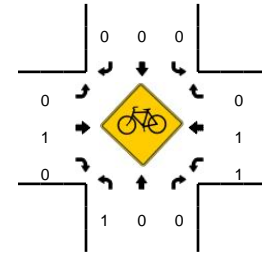
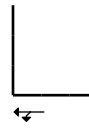
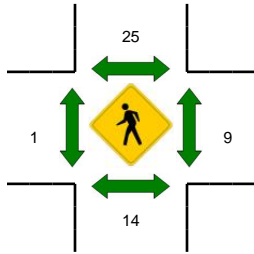
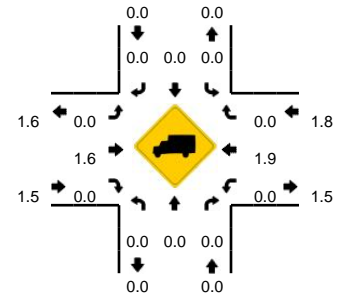
Comments:

LOCATION: Kauhale Rd -- Pahoia Village Rd
CITY/STATE: Pahoia, HI

QC JOB #: 11088203
DATE: Thu, Jul 18 2013



Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:15 PM -- 3:30 PM

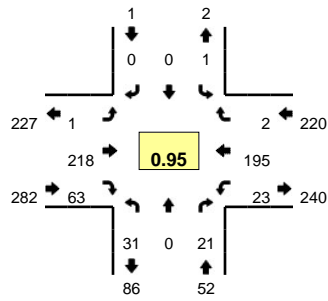


15-Min Count Period Beginning At	Kauhale Rd (Northbound)				Kauhale Rd (Southbound)				Pahoia Village Rd (Eastbound)				Pahoia Village Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	9	0	5	0	0	0	0	0	0	42	2	0	3	36	0	0	97	
2:15 PM	11	0	3	0	0	0	0	0	0	59	7	0	2	64	0	0	146	
2:30 PM	10	0	3	0	0	0	0	0	0	58	10	0	3	46	0	0	130	
2:45 PM	8	0	2	0	0	0	0	0	0	51	3	0	4	59	0	0	127	500
3:00 PM	6	0	7	0	0	0	0	0	0	62	7	0	1	54	0	1	138	541
3:15 PM	14	0	5	0	0	0	0	0	0	67	6	1	4	50	0	1	148	543
3:30 PM	15	0	8	0	0	0	0	0	0	51	8	0	2	56	0	1	141	554
3:45 PM	9	0	5	0	0	0	0	0	0	65	3	0	4	50	0	1	137	564
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	56	0	20	0	0	0	0	0	0	268	24	4	16	200	0	4	592	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
Pedestrians		24				20				4				8			56	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

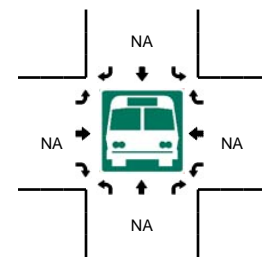
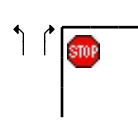
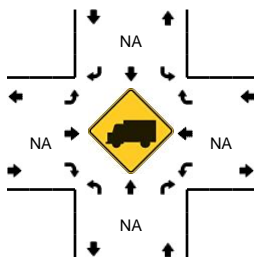
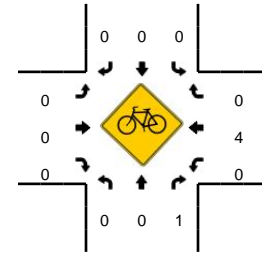
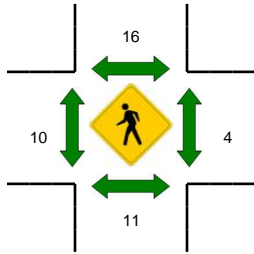
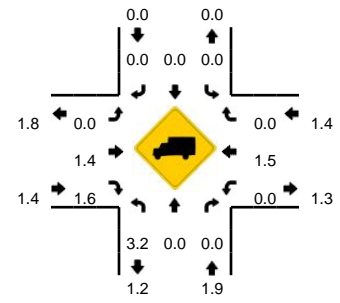
Comments:

LOCATION: Kauhale Rd -- Pahoia Village Rd
CITY/STATE: Pahoia, HI

QC JOB #: 11088204
DATE: Sat, Jul 20 2013



Peak-Hour: 11:00 AM -- 12:00 PM
Peak 15-Min: 11:00 AM -- 11:15 AM

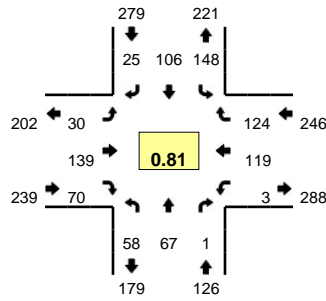


15-Min Count Period Beginning At	Kauhale Rd (Northbound)				Kauhale Rd (Southbound)				Pahoia Village Rd (Eastbound)				Pahoia Village Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
10:00 AM	5	0	4	0	0	0	0	0	1	35	4	0	3	46	0	0	98	
10:15 AM	10	0	4	0	0	0	0	0	0	41	9	0	4	43	0	0	111	
10:30 AM	9	0	6	0	0	0	0	0	0	40	13	0	1	56	0	0	125	
10:45 AM	5	0	5	0	0	0	0	0	0	50	5	0	4	44	0	0	113	447
11:00 AM	13	0	6	0	0	0	0	0	0	53	15	0	7	51	1	0	146	495
11:15 AM	9	0	4	0	1	0	0	0	0	57	14	0	9	46	1	0	141	525
11:30 AM	4	0	4	0	0	0	0	0	0	61	17	0	4	48	0	0	138	538
11:45 AM	5	0	7	0	0	0	0	0	0	47	17	1	3	50	0	0	130	555
12:00 PM	3	0	5	0	0	0	0	0	0	57	12	0	7	49	0	0	133	542
12:15 PM	7	0	6	0	0	0	0	0	0	48	10	0	3	56	0	0	130	531
12:30 PM	7	0	2	0	0	0	0	0	0	52	7	0	3	51	0	0	122	515
12:45 PM	7	0	3	0	0	0	0	0	0	59	11	0	2	49	0	0	131	516
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	52	0	24	0	0	0	0	0	0	212	60	0	28	204	4	0	584	
Heavy Trucks	4	0	0		0	0	0		0	8	0		0	0	0		12	
Pedestrians		12				20				4				0			36	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																	0	
Stopped Buses																		

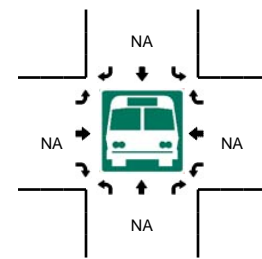
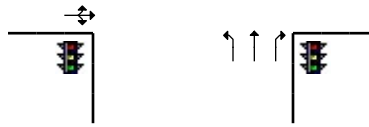
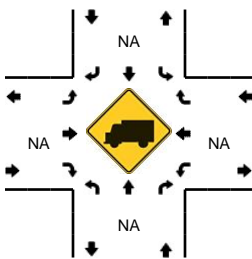
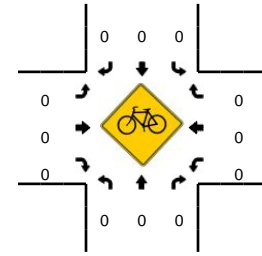
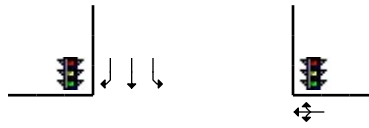
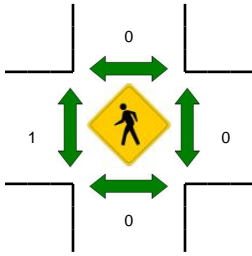
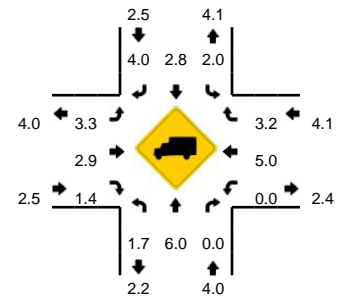
Comments:

LOCATION: State Rte 130 -- Hwy 132
CITY/STATE: Pahoia, HI

QC JOB #: 11088201
DATE: Thu, Jul 18 2013



Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:45 PM -- 4:00 PM



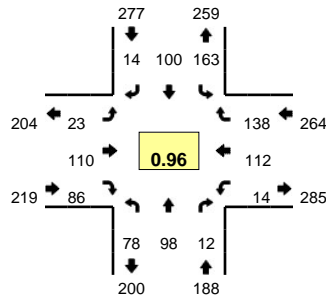
15-Min Count Period Beginning At	State Rte 130 (Northbound)				State Rte 130 (Southbound)				Hwy 132 (Eastbound)				Hwy 132 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	14	23	2	0	40	22	3	0	7	27	20	0	1	24	33	0	216	
2:15 PM	24	30	2	0	34	18	4	0	8	29	12	0	6	26	30	0	223	
2:30 PM	14	21	2	0	42	27	6	0	12	23	18	0	0	21	29	0	215	
2:45 PM	13	12	2	0	24	20	6	0	7	32	11	0	4	32	25	0	188	842
3:00 PM	14	22	0	0	42	24	8	0	6	36	10	0	0	25	19	0	206	832
3:15 PM	19	12	0	0	28	28	6	0	7	35	18	0	1	31	23	0	208	817
3:30 PM	14	10	0	0	38	18	5	0	7	30	20	0	1	27	32	0	202	804
3:45 PM	11	23	1	0	40	36	6	0	10	38	22	0	1	36	50	0	274	890

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	92	4	0	160	144	24	0	40	152	88	0	4	144	200	0	1096
Heavy Trucks	0	12	0	0	0	4	0	0	4	0	0	0	0	4	12	0	36
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

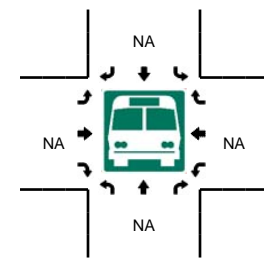
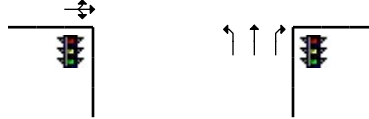
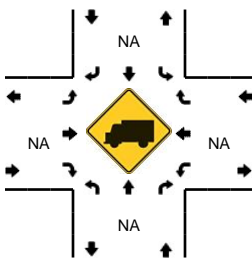
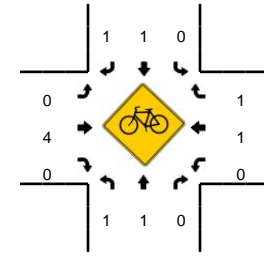
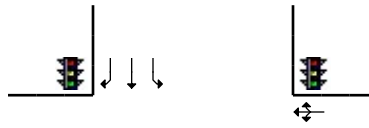
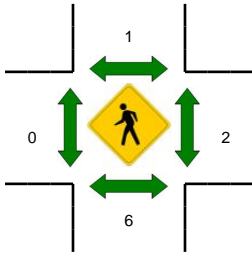
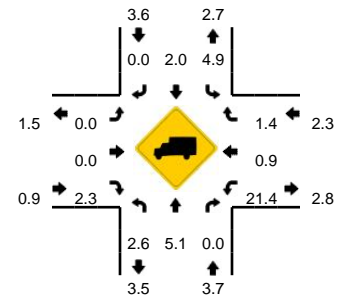
Comments:

LOCATION: State Rte 130 -- Hwy 132
CITY/STATE: Pahoia, HI

QC JOB #: 11088202
DATE: Sat, Jul 20 2013



Peak-Hour: 11:15 AM -- 12:15 PM
Peak 15-Min: 12:00 PM -- 12:15 PM



15-Min Count Period Beginning At	State Rte 130 (Northbound)				State Rte 130 (Southbound)				Hwy 132 (Eastbound)				Hwy 132 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
10:00 AM	14	21	3	0	37	22	5	0	5	21	19	0	1	28	34	0	210	
10:15 AM	26	32	3	0	40	17	4	0	4	29	14	0	2	28	31	0	230	
10:30 AM	20	20	4	0	38	18	2	0	6	19	16	0	3	28	27	0	201	
10:45 AM	19	28	0	0	40	23	3	0	10	27	19	0	3	30	25	0	227	868
11:00 AM	14	22	1	0	43	13	3	0	6	27	16	0	2	33	32	0	212	870
11:15 AM	22	21	2	0	44	24	1	0	7	32	17	0	2	27	24	0	223	863
11:30 AM	18	25	3	0	28	32	3	0	5	26	26	0	6	26	43	0	241	903
11:45 AM	18	35	4	0	34	19	4	0	4	24	25	0	4	29	37	0	237	913
12:00 PM	20	17	3	0	57	25	6	0	7	28	18	0	2	30	34	0	247	948
12:15 PM	10	21	6	0	38	19	2	0	7	32	21	0	5	25	27	0	213	938
12:30 PM	17	22	1	0	43	18	3	0	4	28	18	0	4	46	38	0	242	939
12:45 PM	21	24	3	0	31	26	2	0	3	27	16	0	3	34	41	0	231	933
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	80	68	12	0	228	100	24	0	28	112	72	0	8	120	136	0	988	
Heavy Trucks	0	0	0	0	16	0	0	0	0	0	4	0	0	0	4	0	24	
Pedestrians		8				0				0				0			8	
Bicycles	1	1	0		0	1	1		0	2	0		0	0	0		6	
Railroad																		
Stopped Buses																		

Comments:

APPENDIX B: INTERSECTION LEVEL OF SERVICE CALCULATIONS



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Right Turn Channelized						
Volume (veh/h)	291	116	166	353	422	422
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	331	132	189	401	480	480
Approach Volume (veh/h)	463			590	959	
Crossing Volume (veh/h)	480			331	189	
High Capacity (veh/h)	949			1068	1195	
High v/c (veh/h)	0.49			0.55	0.80	
Low Capacity (veh/h)	768			875	989	
Low v/c (veh/h)	0.60			0.67	0.97	
Intersection Summary						
Maximum v/c High			0.80			
Maximum v/c Low			0.97			
Intersection Capacity Utilization			109.0%		ICU Level of Service	G

2: Kauhale Road & Pahoia Village Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↗		↕	
Volume (veh/h)	1	327	32	20	280	0	59	0	33	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	344	34	21	295	0	62	0	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	295			378			700	700	361	735	717	295
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	295			378			700	700	361	735	717	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			82	100	95	100	100	100
cM capacity (veh/h)	1267			1181			349	357	684	314	349	745

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	379	316	62	35	0
Volume Left	1	21	62	0	0
Volume Right	34	0	0	35	0
cSH	1267	1181	349	684	1700
Volume to Capacity	0.00	0.02	0.18	0.05	0.00
Queue Length 95th (ft)	0	1	16	4	0
Control Delay (s)	0.0	0.7	17.5	10.5	0.0
Lane LOS	A	A	C	B	A
Approach Delay (s)	0.0	0.7	15.0		0.0
Approach LOS			C		A

Intersection Summary

Average Delay		2.1			
Intersection Capacity Utilization		40.0%		ICU Level of Service	A
Analysis Period (min)		15			

3: Pahoia Bypass Road & Pahoia Village Road/Pahoia Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖	↗	↗	↖	↖
Volume (vph)	40	185	93	4	159	165	77	89	1	197	141	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1778			1735		1770	1863	1583	1770	1863	1583
Flt Permitted		0.83			0.99		0.65	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)		1480			1725		1206	1863	1583	1278	1863	1583
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	49	228	115	5	196	204	95	110	1	243	174	41
RTOR Reduction (vph)	0	21	0	0	50	0	0	0	1	0	0	23
Lane Group Flow (vph)	0	371	0	0	355	0	95	110	0	243	174	18
Turn Type	Perm	NA		Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6		2	2		6
Actuated Green, G (s)		21.0			21.0		36.3	30.6	30.6	36.3	33.2	33.2
Effective Green, g (s)		21.0			21.0		36.3	30.6	30.6	36.3	33.2	33.2
Actuated g/C Ratio		0.28			0.28		0.49	0.41	0.41	0.49	0.45	0.45
Clearance Time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)		2.8			2.8		0.5	1.5	1.5	0.5	1.5	1.5
Lane Grp Cap (vph)		420			490		615	770	655	665	836	710
v/s Ratio Prot							0.01	0.06		c0.03	c0.09	
v/s Ratio Perm		c0.25			0.21		0.07		0.00	c0.15		0.01
v/c Ratio		0.88			0.72		0.15	0.14	0.00	0.37	0.21	0.03
Uniform Delay, d1		25.3			23.9		10.1	13.5	12.7	11.1	12.4	11.4
Progression Factor		1.01			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		19.2			5.1		0.0	0.4	0.0	0.1	0.6	0.1
Delay (s)		44.9			29.0		10.2	13.9	12.7	11.3	13.0	11.4
Level of Service		D			C		B	B	B	B	B	B
Approach Delay (s)		44.9			29.0			12.2			11.9	
Approach LOS		D			C			B			B	

Intersection Summary

HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	237	70	145	268	261	257
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	252	74	154	285	278	273
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	871	278	551			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	871	278	551			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	8	90	85			
cM capacity (veh/h)	273	761	1019			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	252	74	154	285	278	273
Volume Left	252	0	154	0	0	0
Volume Right	0	74	0	0	0	273
cSH	273	761	1019	1700	1700	1700
Volume to Capacity	0.92	0.10	0.15	0.17	0.16	0.16
Queue Length 95th (ft)	213	8	13	0	0	0
Control Delay (s)	77.2	10.2	9.2	0.0	0.0	0.0
Lane LOS	F	B	A			
Approach Delay (s)	61.9		3.2	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			16.4			
Intersection Capacity Utilization			44.9%	ICU Level of Service	A	
Analysis Period (min)			15			

2: Kauhale Road & Pahoia Village Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕		↕	
Volume (veh/h)	1	218	63	23	195	2	31	0	21	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	229	66	24	205	2	33	0	22	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	207			296			519	521	263	542	553	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207			296			519	521	263	542	553	206
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			93	100	97	100	100	100
cM capacity (veh/h)	1364			1266			460	451	776	432	432	834

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	297	232	33	22	1
Volume Left	1	24	33	0	1
Volume Right	66	2	0	22	0
cSH	1364	1266	460	776	432
Volume to Capacity	0.00	0.02	0.07	0.03	0.00
Queue Length 95th (ft)	0	1	6	2	0
Control Delay (s)	0.0	1.0	13.4	9.8	13.4
Lane LOS	A	A	B	A	B
Approach Delay (s)	0.0	1.0	11.9		13.4
Approach LOS			B		B

Intersection Summary

Average Delay		1.5			
Intersection Capacity Utilization		38.0%		ICU Level of Service	A
Analysis Period (min)		15			

3: Pahoia Bypass Road & Pahoia Village Road/Pahoia Road

8/21/2013



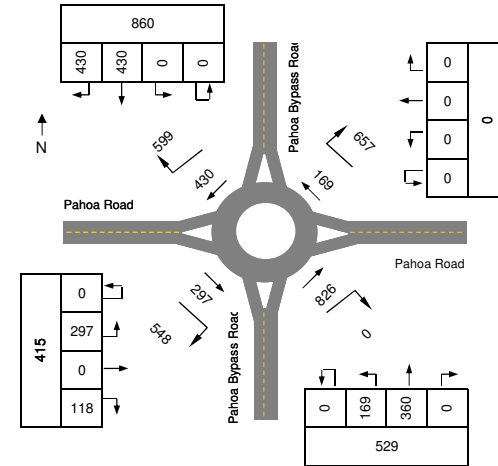
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖	↗	↗	↖	↖
Volume (vph)	23	110	86	14	112	138	78	98	12	163	100	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2			6.2		6.5	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1755			1727		1770	1863	1583	1770	1863	1583
Flt Permitted		0.86			0.97		0.69	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)		1517			1675		1285	1863	1583	1287	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	24	115	90	15	117	144	81	102	12	170	104	15
RTOR Reduction (vph)	0	24	0	0	41	0	0	0	5	0	0	10
Lane Group Flow (vph)	0	205	0	0	235	0	81	102	7	170	104	5
Turn Type	Perm	NA		Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6		2	2		6
Actuated Green, G (s)		18.0			18.0		58.2	55.7	55.7	60.7	30.1	30.1
Effective Green, g (s)		18.0			18.0		58.2	55.7	55.7	60.7	30.1	30.1
Actuated g/C Ratio		0.19			0.19		0.61	0.58	0.58	0.64	0.32	0.32
Clearance Time (s)		6.2			6.2		6.5	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)		2.8			2.8		1.5	1.5	1.5	3.0	1.5	1.5
Lane Grp Cap (vph)		286			316		927	1088	924	844	588	499
v/s Ratio Prot							0.03	0.05		c0.01	0.06	
v/s Ratio Perm		0.13			c0.14		0.03		0.00	c0.12		0.00
v/c Ratio		0.72			0.74		0.09	0.09	0.01	0.20	0.18	0.01
Uniform Delay, d1		36.3			36.5		7.6	8.7	8.3	7.0	23.7	22.4
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		8.0			8.9		0.2	0.2	0.0	0.1	0.7	0.0
Delay (s)		44.5			45.4		7.8	8.9	8.3	7.1	24.3	22.5
Level of Service		D			D		A	A	A	A	C	C
Approach Delay (s)		44.5			45.4			8.4			14.1	
Approach LOS		D			D			A			B	

Intersection Summary		
HCM Average Control Delay	28.7	HCM Level of Service C
HCM Volume to Capacity ratio	0.32	
Actuated Cycle Length (s)	95.4	Sum of lost time (s) 14.2
Intersection Capacity Utilization	45.7%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

ROUNDBABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	1	Project	Pahoa Park Master Plan				E-W Street	Pahoa Road						
PHF	0.88	Scenario	NT Weekday PM				N-S Street	Pahoa Bypass Road						
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	2	1 (Left)	LT	100%	50%	0%	349	297	1	840	0.47	8.6	A	66
	Bypass?	2 (Right)	TR	0%	50%	100%	180	297	1	840	0.24	5.9	A	24
	No													
	Total				100%	100%	100%	529				7.7	A	
South	2	1 (Left)	LT	100%	50%	0%	215	169	1	954	0.26	5.3	A	26
	Bypass?	2 (Right)	TR	0%	50%	100%	645	169	1	954	0.77	16.7	C	229
	No													
	Total				100%	100%	100%	860				13.8	B	
East	2	1 (Left)	LT	100%	50%	0%	297	430	1	735	0.46	9.5	A	63
	Bypass?	2 (Right)	TR	0%	50%	100%	118	430	1	735	0.18	6.2	A	17
	No													
	Total				100%	100%	100%	415				8.6	A	
West	0													
	Bypass?													
	No													
	Total													
All							1,804				10.8	B		

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	166	353	0	0	0	422	422	0	291	0	116	0	0	0	0
Trucks	0	3	7	0	0	0	8	8	0	6	0	2	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	163	346	0	0	0	414	414	0	285	0	114	0	0	0	0
f _{HV}	1.00	0.98	0.98	1.00	1.00	1.00	0.98	0.98	1.00	0.98	1.00	0.98	1.00	1.00	1.00	1.00
Total (pcph)	0	169	360	0	0	0	430	430	0	297	0	118	0	0	0	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

2: Kauhale Road & Pahoia Village Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	364	32	20	371	0	59	0	34	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92
Hourly flow rate (vph)	1	383	34	21	391	0	62	0	36	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	391			417			835	835	400	871	852	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			417			835	835	400	871	852	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			78	100	94	100	100	100
cM capacity (veh/h)	1168			1142			283	298	650	253	291	658
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	418	412	62	36	0							
Volume Left	1	21	62	0	0							
Volume Right	34	0	0	36	0							
cSH	1168	1142	283	650	1700							
Volume to Capacity	0.00	0.02	0.22	0.06	0.00							
Queue Length 95th (ft)	0	1	20	4	0							
Control Delay (s)	0.0	0.6	21.3	10.9	0.0							
Lane LOS	A	A	C	B	A							
Approach Delay (s)	0.0	0.6	17.5		0.0							
Approach LOS			C		A							
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			44.8%	ICU Level of Service	A							
Analysis Period (min)			15									

3: Pahoia Bypass Road & Pahoia Village Road/Pahoia Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖	↗	↖	↖	↗
Volume (vph)	40	204	111	4	204	167	122	90	1	199	143	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1774			1750		1770	1863	1583	1770	1863	1583
Flt Permitted		0.83			0.99		0.65	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)		1482			1741		1203	1863	1583	1277	1863	1583
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	49	252	137	5	252	206	151	111	1	246	177	42
RTOR Reduction (vph)	0	22	0	0	38	0	0	0	1	0	0	24
Lane Group Flow (vph)	0	416	0	0	425	0	151	111	0	246	177	18
Turn Type	Perm	NA		Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6		2	2		6
Actuated Green, G (s)		23.0			23.0		35.6	29.9	29.9	35.6	31.7	31.7
Effective Green, g (s)		23.0			23.0		35.6	29.9	29.9	35.6	31.7	31.7
Actuated g/C Ratio		0.31			0.31		0.47	0.40	0.40	0.47	0.42	0.42
Clearance Time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)		2.8			2.8		0.5	1.5	1.5	0.5	1.5	1.5
Lane Grp Cap (vph)		452			531		598	739	628	641	784	666
v/s Ratio Prot							0.01	0.06		c0.03	0.10	
v/s Ratio Perm		c0.28			0.24		0.11		0.00	c0.15		0.01
v/c Ratio		0.92			0.80		0.25	0.15	0.00	0.38	0.23	0.03
Uniform Delay, d1		25.3			24.0		11.4	14.6	13.7	12.2	13.9	12.8
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		24.2			8.2		0.1	0.4	0.0	0.1	0.7	0.1
Delay (s)		49.5			32.2		11.5	15.0	13.7	12.3	14.6	12.8
Level of Service		D			C		B	B	B	B	B	B
Approach Delay (s)		49.5			32.2			13.0			13.2	
Approach LOS		D			C			B			B	

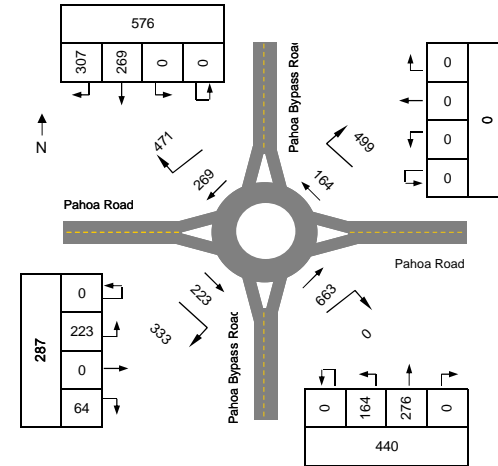
Intersection Summary

HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	16.7
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ROUNDBABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	1	Project	Pahoa Park Master Plan						E-W Street	Pahoa Road					
PHF	0.88	Scenario	NT Saturday						N-S Street	Pahoa Bypass Road					
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)	
Direction	Lanes			L	T	R		Flow	Lanes						
North	2	1 (Left)	LT	100%	50%	0%	302	223	1	904	0.38	6.8	A	46	
	Bypass?	2 (Right)	TR	0%	50%	100%	138	223	1	904	0.17	5.0	A	16	
	No														
	Total				100%	100%	100%	440				6.2	A		
South	2	1 (Left)	LT	100%	50%	0%	135	164	1	959	0.16	4.6	A	14	
	Bypass?	2 (Right)	TR	0%	50%	100%	442	164	1	959	0.52	8.4	A	81	
	No														
	Total				100%	100%	100%	576				7.5	A		
East	2	1 (Left)	LT	100%	50%	0%	223	269	1	863	0.29	6.2	A	31	
	Bypass?	2 (Right)	TR	0%	50%	100%	64	269	1	863	0.08	4.6	A	7	
	No														
	Total				100%	100%	100%	287				5.8	A		
West	0														
	Bypass?														
	No														
	Total														
All											6.7	A			

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	161	271	0	0	0	264	301	0	219	0	63	0	0	0	0
Trucks	0	3	5	0	0	0	5	6	0	4	0	1	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	158	266	0	0	0	259	295	0	215	0	62	0	0	0	0
f _{HV}	1.00	0.98	0.98	1.00	1.00	1.00	0.98	0.98	1.00	0.98	1.00	0.98	1.00	1.00	1.00	1.00
Total (pcph)	0	164	276	0	0	0	269	307	0	223	0	64	0	0	0	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Trucks (vph)																

2: Kauhale Road & Pahoia Village Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕		↕	
Volume (veh/h)	1	271	64	23	330	2	31	0	21	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	285	67	24	347	2	33	0	22	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	349			353			718	719	319	740	752	348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			353			718	719	319	740	752	348
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	97	100	100	100
cM capacity (veh/h)	1209			1206			339	347	722	317	332	695

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	354	374	33	22	1
Volume Left	1	24	33	0	1
Volume Right	67	2	0	22	0
cSH	1209	1206	339	722	317
Volume to Capacity	0.00	0.02	0.10	0.03	0.00
Queue Length 95th (ft)	0	2	8	2	0
Control Delay (s)	0.0	0.7	16.8	10.1	16.4
Lane LOS	A	A	C	B	C
Approach Delay (s)	0.0	0.7	14.1		16.4
Approach LOS			B		C

Intersection Summary

Average Delay		1.4			
Intersection Capacity Utilization		44.9%		ICU Level of Service	A
Analysis Period (min)		15			

3: Pahoia Bypass Road & Pahoia Village Road/Pahoia Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖	↗	↗	↖	↖
Volume (vph)	23	137	112	14	180	139	145	99	12	165	101	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.94			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1752			1754		1770	1863	1583	1770	1863	1583
Flt Permitted		0.93			0.98		0.69	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)		1631			1723		1284	1863	1583	1286	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	24	143	117	15	188	145	151	103	12	172	105	15
RTOR Reduction (vph)	0	36	0	0	37	0	0	0	7	0	0	8
Lane Group Flow (vph)	0	248	0	0	311	0	151	103	5	172	105	7
Turn Type	Perm	NA		Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6		2	2		6
Actuated Green, G (s)		17.6			17.6		36.4	31.2	31.2	36.4	32.5	32.5
Effective Green, g (s)		17.6			17.6		36.4	31.2	31.2	36.4	32.5	32.5
Actuated g/C Ratio		0.25			0.25		0.51	0.44	0.44	0.51	0.46	0.46
Clearance Time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)		2.8			2.8		0.5	1.5	1.5	0.5	1.5	1.5
Lane Grp Cap (vph)		406			428		687	822	698	697	856	727
v/s Ratio Prot							0.01	0.06		c0.02	0.06	
v/s Ratio Perm		0.15			c0.18		0.10		0.00	c0.11		0.00
v/c Ratio		0.61			0.73		0.22	0.13	0.01	0.25	0.12	0.01
Uniform Delay, d1		23.5			24.3		9.1	11.7	11.1	9.2	10.9	10.4
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.6			5.9		0.1	0.3	0.0	0.1	0.3	0.0
Delay (s)		26.1			30.3		9.2	12.0	11.1	9.3	11.2	10.4
Level of Service		C			C		A	B	B	A	B	B
Approach Delay (s)		26.1			30.3			10.3			10.0	
Approach LOS		C			C			B			B	

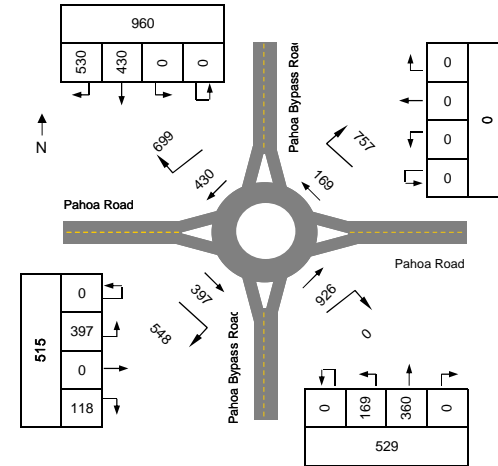
Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	16.7
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ROUNDBABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	1	Project	Pahoa Park Master Plan				E-W Street	Pahoa Road						
PHF	0.88	Scenario	NT Weekday PM Plus Project				N-S Street	Pahoa Bypass Road						
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	2	1 (Left)	LT	100%	50%	0%	349	397	1	760	0.52	10.4	B	80
	Bypass?	2 (Right)	TR	0%	50%	100%	180	397	1	760	0.27	6.8	A	28
	No													
	Total				100%	100%	100%	529				9.2	A	
South	2	1 (Left)	LT	100%	50%	0%	215	169	1	954	0.26	5.3	A	26
	Bypass?	2 (Right)	TR	0%	50%	100%	745	169	1	954	0.89	30.9	D	443
	No													
	Total				100%	100%	100%	960				25.2	D	
East	2	1 (Left)	LT	100%	50%	0%	397	430	1	735	0.61	13.2	B	115
	Bypass?	2 (Right)	TR	0%	50%	100%	118	430	1	735	0.18	6.2	A	17
	No													
	Total				100%	100%	100%	515				11.6	B	
West	0													
	Bypass?													
	No													
	Total													
All											17.5	C		

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	166	353	0	0	0	422	520	0	389	0	116	0	0	0	0
Trucks	0	3	7	0	0	0	8	10	0	8	0	2	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	163	346	0	0	0	414	510	0	381	0	114	0	0	0	0
f _{HV}	1.00	0.98	0.98	1.00	1.00	1.00	0.98	0.98	1.00	0.98	1.00	0.98	1.00	1.00	1.00	1.00
Total (pcph)	0	169	360	0	0	0	430	530	0	397	0	118	0	0	0	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

2: Kauhale Road & Pahoia Village Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↗		↕	
Volume (veh/h)	1	381	130	62	371	0	157	0	76	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	401	137	65	391	0	165	0	80	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	391			538			993	993	469	1073	1061	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			538			993	993	469	1073	1061	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			23	100	87	100	100	100
cM capacity (veh/h)	1168			1030			213	230	594	163	209	658

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	539	456	165	80	0
Volume Left	1	65	165	0	0
Volume Right	137	0	0	80	0
cSH	1168	1030	213	594	1700
Volume to Capacity	0.00	0.06	0.77	0.13	0.00
Queue Length 95th (ft)	0	5	135	12	0
Control Delay (s)	0.0	1.9	63.0	12.0	0.0
Lane LOS	A	A	F	B	A
Approach Delay (s)	0.0	1.9	46.4		0.0
Approach LOS			E		A

Intersection Summary		
Average Delay		9.9
Intersection Capacity Utilization	69.7%	ICU Level of Service C
Analysis Period (min)		15

3: Pahoia Bypass Road & Pahoia Village Road/Pahoia Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖	↗	↖	↖	↗
Volume (vph)	40	232	125	4	232	167	136	90	1	199	143	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1775			1758		1770	1863	1583	1770	1863	1583
Flt Permitted		0.86			0.99		0.65	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)		1531			1749		1203	1863	1583	1277	1863	1583
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	49	286	154	5	286	206	168	111	1	246	177	42
RTOR Reduction (vph)	0	22	0	0	33	0	0	0	1	0	0	25
Lane Group Flow (vph)	0	467	0	0	464	0	168	111	0	246	177	17
Turn Type	Perm	NA		Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6		2	2		6
Actuated Green, G (s)		25.6			25.6		34.4	28.6	28.6	34.4	30.4	30.4
Effective Green, g (s)		25.6			25.6		34.4	28.6	28.6	34.4	30.4	30.4
Actuated g/C Ratio		0.33			0.33		0.45	0.37	0.37	0.45	0.40	0.40
Clearance Time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)		2.8			2.8		0.5	1.5	1.5	0.5	1.5	1.5
Lane Grp Cap (vph)		510			583		569	694	590	610	738	627
v/s Ratio Prot							0.02	0.06		c0.03	0.10	
v/s Ratio Perm		c0.31			0.27		0.12		0.00	c0.15		0.01
v/c Ratio		0.92			0.80		0.30	0.16	0.00	0.40	0.24	0.03
Uniform Delay, d1		24.5			23.2		12.9	16.0	15.1	13.6	15.4	14.1
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		21.1			7.3		0.1	0.5	0.0	0.2	0.8	0.1
Delay (s)		45.6			30.5		13.0	16.5	15.1	13.7	16.2	14.2
Level of Service		D			C		B	B	B	B	B	B
Approach Delay (s)		45.6			30.5			14.4			14.7	
Approach LOS		D			C			B			B	

Intersection Summary

HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	76.7	Sum of lost time (s)	16.7
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

2: Kauhale Road & Pahoia Village Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕		↕	
Volume (veh/h)	1	271	162	65	330	2	129	0	63	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	285	171	68	347	2	136	0	66	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	349			456			858	859	371	924	943	348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			456			858	859	371	924	943	348
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			49	100	90	100	100	100
cM capacity (veh/h)	1209			1105			264	276	675	214	246	695

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	457	418	136	66	1
Volume Left	1	68	136	0	1
Volume Right	171	2	0	66	0
cSH	1209	1105	264	675	214
Volume to Capacity	0.00	0.06	0.51	0.10	0.00
Queue Length 95th (ft)	0	5	68	8	0
Control Delay (s)	0.0	1.9	32.3	10.9	21.9
Lane LOS	A	A	D	B	C
Approach Delay (s)	0.0	1.9	25.3		21.9
Approach LOS			D		C

Intersection Summary		
Average Delay		5.5
Intersection Capacity Utilization	62.0%	ICU Level of Service
Analysis Period (min)		15
		B

3: Pahoia Bypass Road & Pahoia Village Road/Pahoia Road

12/20/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↖	↗	↖	↖	↗
Volume (vph)	23	165	126	14	208	139	159	99	12	165	101	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.95			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1756			1763		1770	1863	1583	1770	1863	1583
Flt Permitted		0.94			0.98		0.69	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)		1649			1731		1284	1863	1583	1286	1863	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	24	172	131	15	217	145	166	103	12	172	105	15
RTOR Reduction (vph)	0	34	0	0	32	0	0	0	7	0	0	8
Lane Group Flow (vph)	0	293	0	0	345	0	166	103	5	172	105	7
Turn Type	Perm	NA		Perm	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			6		2	2		6
Actuated Green, G (s)		18.8			18.8		35.7	30.4	30.4	35.7	31.8	31.8
Effective Green, g (s)		18.8			18.8		35.7	30.4	30.4	35.7	31.8	31.8
Actuated g/C Ratio		0.26			0.26		0.50	0.43	0.43	0.50	0.45	0.45
Clearance Time (s)		6.2			6.2		4.0	6.5	6.5	4.0	6.5	6.5
Vehicle Extension (s)		2.8			2.8		0.5	1.5	1.5	0.5	1.5	1.5
Lane Grp Cap (vph)		435			457		670	795	675	680	832	707
v/s Ratio Prot							0.01	0.06		c0.02	0.06	
v/s Ratio Perm		0.18			c0.20		c0.11		0.00	0.11		0.00
v/c Ratio		0.67			0.76		0.25	0.13	0.01	0.25	0.13	0.01
Uniform Delay, d1		23.5			24.1		9.8	12.4	11.7	9.8	11.6	10.9
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.9			6.9		0.1	0.3	0.0	0.1	0.3	0.0
Delay (s)		27.4			30.9		9.8	12.7	11.7	9.9	11.9	11.0
Level of Service		C			C		A	B	B	A	B	B
Approach Delay (s)		27.4			30.9			11.0			10.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	71.2	Sum of lost time (s)	16.7
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

2: Kauhale Road & Pahoa Village Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕		↕	
Volume (veh/h)	1	330	192	88	283	0	219	0	102	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	347	202	93	298	0	231	0	107	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	298			549			934	934	448	1041	1035	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	298			549			934	934	448	1041	1035	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			0	100	82	100	100	100
cM capacity (veh/h)	1263			1020			229	242	610	159	211	742

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	551	391	231	107	0
Volume Left	1	93	231	0	0
Volume Right	202	0	0	107	0
cSH	1263	1020	229	610	1700
Volume to Capacity	0.00	0.09	1.01	0.18	0.00
Queue Length 95th (ft)	0	7	235	16	0
Control Delay (s)	0.0	2.9	106.8	12.2	0.0
Lane LOS	A	A	F	B	A
Approach Delay (s)	0.0	2.9	76.7		0.0
Approach LOS			F		A

Intersection Summary				
Average Delay			21.1	
Intersection Capacity Utilization		71.0%	ICU Level of Service	C
Analysis Period (min)		15		

2: Kauhale Road & Pahoia Village Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕		↕	
Volume (veh/h)	1	220	224	91	197	2	191	0	89	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	232	236	96	207	2	201	0	94	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	209			467			752	753	349	845	869	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			467			752	753	349	845	869	208
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			34	100	86	100	100	100
cM capacity (veh/h)	1361			1094			305	309	694	228	264	832

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	468	305	201	94	1
Volume Left	1	96	201	0	1
Volume Right	236	2	0	94	0
cSH	1361	1094	305	694	228
Volume to Capacity	0.00	0.09	0.66	0.14	0.00
Queue Length 95th (ft)	0	7	109	12	0
Control Delay (s)	0.0	3.3	37.1	11.0	20.9
Lane LOS	A	A	E	B	C
Approach Delay (s)	0.0	3.3	28.8		20.9
Approach LOS			D		C

Intersection Summary		
Average Delay		8.9
Intersection Capacity Utilization	60.8%	ICU Level of Service
Analysis Period (min)		15
		B

2: Kauhale Road & Pahoia Village Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↑	↗		↔	
Volume (veh/h)	1	330	320	156	283	0	379	0	170	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	347	337	164	298	0	399	0	179	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	298			684			1144	1144	516	1323	1313	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	298			684			1144	1144	516	1323	1313	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			82			0	100	68	100	100	100
cM capacity (veh/h)	1263			909			152	164	559	78	130	742

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	685	462	399	179	0
Volume Left	1	164	399	0	0
Volume Right	337	0	0	179	0
cSH	1263	909	152	559	1700
Volume to Capacity	0.00	0.18	2.62	0.32	0.00
Queue Length 95th (ft)	0	16	878	34	0
Control Delay (s)	0.0	4.9	794.6	14.4	0.0
Lane LOS	A	A	F	B	A
Approach Delay (s)	0.0	4.9	553.0		0.0
Approach LOS			F		A

Intersection Summary

Average Delay		186.5			
Intersection Capacity Utilization		91.5%		ICU Level of Service	F
Analysis Period (min)		15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Right Turn Channelized						
Volume (veh/h)	337	71	146	271	264	358
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	359	76	155	288	281	381
Approach Volume (veh/h)	434			444	662	
Crossing Volume (veh/h)	281			359	155	
High Capacity (veh/h)	1111			1045	1226	
High v/c (veh/h)	0.39			0.42	0.54	
Low Capacity (veh/h)	913			854	1017	
Low v/c (veh/h)	0.48			0.52	0.65	
Intersection Summary						
Maximum v/c High			0.54			
Maximum v/c Low			0.65			
Intersection Capacity Utilization			50.7%		ICU Level of Service	A

2: Kauhale Road & Pahoia Village Road

8/21/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕		↕	
Volume (veh/h)	1	220	384	159	197	2	351	0	157	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	232	404	167	207	2	369	0	165	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	209			636			979	980	434	1144	1181	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			636			979	980	434	1144	1181	208
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			82			0	100	73	99	100	100
cM capacity (veh/h)	1361			948			198	205	622	112	156	832

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	637	377	369	165	1
Volume Left	1	167	369	0	1
Volume Right	404	2	0	165	0
cSH	1361	948	198	622	112
Volume to Capacity	0.00	0.18	1.87	0.27	0.01
Queue Length 95th (ft)	0	16	666	27	1
Control Delay (s)	0.0	5.3	448.4	12.9	37.4
Lane LOS	A	A	F	B	E
Approach Delay (s)	0.0	5.3	313.8		37.4
Approach LOS			F		E

Intersection Summary

Average Delay		109.6			
Intersection Capacity Utilization		82.7%		ICU Level of Service	E
Analysis Period (min)		15			

APPENDIX C: SIGNAL WARRANT ANALYSIS

Major Street **Pahoa Village Road**
 Minor Street **Kauhale Road**

Project **Pahoa Park Master Plan**
 Scenario **Near Term**
 Peak Hour **Weekday PM Plus Project**

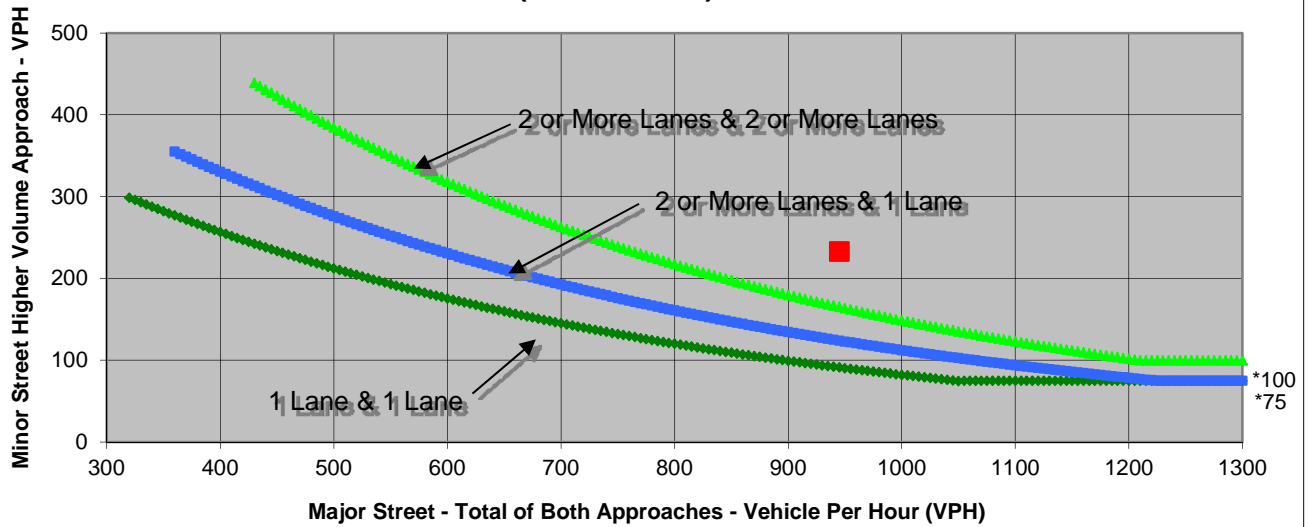
Turn Movement Volumes

	NB	SB	EB	WB
Left	157	0	1	62
Through	0	0	381	371
Right	76	0	130	0
Total	233	0	512	433

Major Street Direction

	North/South
x	East/West

**Figure 4C-4
 Warrant 3, Peak Hour (70% Factor)
 (Rural Areas)**



* Note: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
 Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2006

	Major Street	Minor Street	<u>Warrant Met</u>
	Pahoa Village Road	Kauhale Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	945	233	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Pahoa Village Road**
 Minor Street **Kauhale Road**

Project **Pahoa Park Master Plan**
 Scenario **Near Term**
 Peak Hour **Saturday Plus Project**

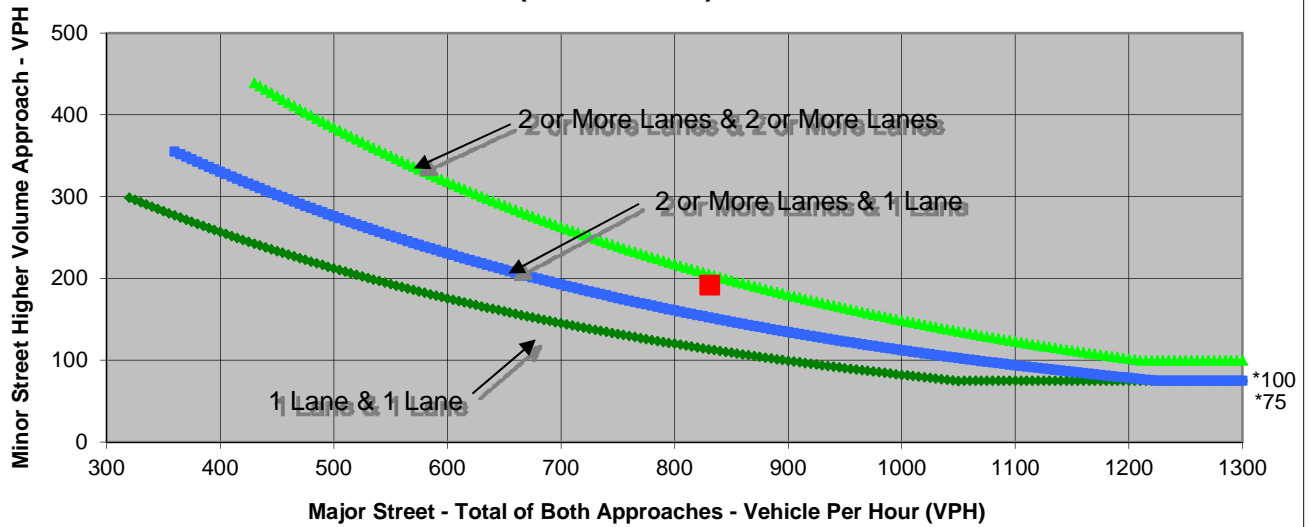
Turn Movement Volumes

	NB	SB	EB	WB
Left	129	1	1	65
Through	0	0	271	330
Right	63	0	162	2
Total	192	1	434	397

Major Street Direction

	North/South
x	East/West

**Figure 4C-4
 Warrant 3, Peak Hour (70% Factor)
 (Rural Areas)**



* Note: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
 Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2006

	Major Street	Minor Street	<u>Warrant Met</u>
	Pahoa Village Road	Kauhale Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	831	192	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Sheet No 1 of 8

Major Street Pahoa Village Road
 Minor Street Kauhale Road

Project Pahoa Park Master Plan
 Scenario NT Phase 1 Max
 Peak Hour Weekday

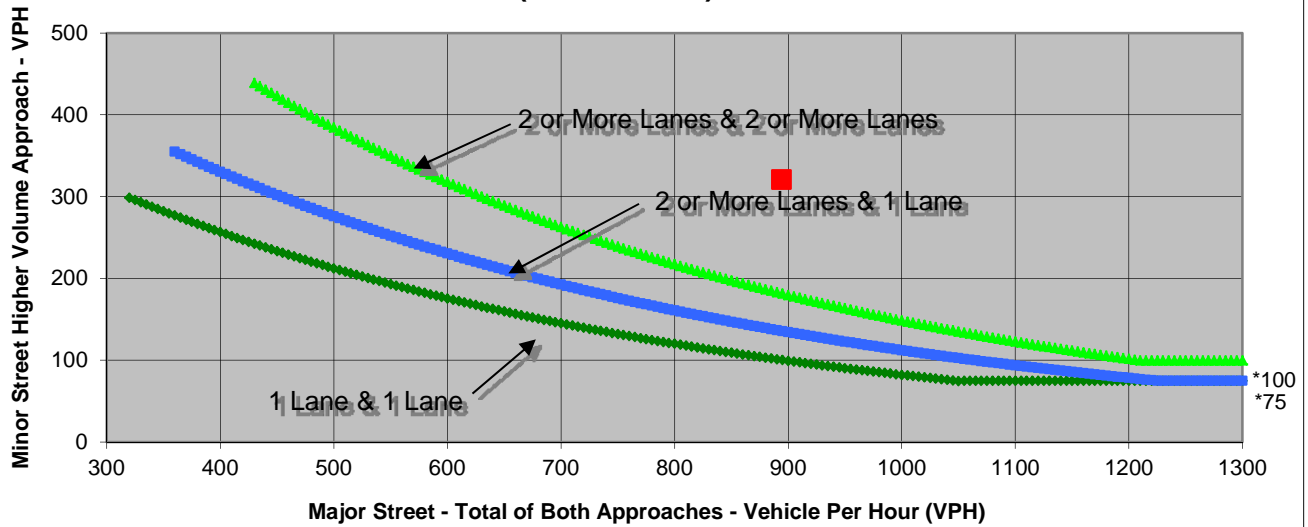
Turn Movement Volumes

	NB	SB	EB	WB
Left	219	0	1	88
Through	0	0	330	283
Right	102	0	192	0
Total	321	0	523	371

Major Street Direction

	North/South
x	East/West

**Figure 4C-4
 Warrant 3, Peak Hour (70% Factor)
 (Rural Areas)**



* Note: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
 Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2006

	Major Street	Minor Street	<u>Warrant Met</u>
	Pahoa Village Road	Kauhale Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	894	321	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Pahoa Village Road
 Minor Street Kauhale Road

Project Pahoa Park Master Plan
 Scenario NT Phase 1 Max
 Peak Hour Saturday

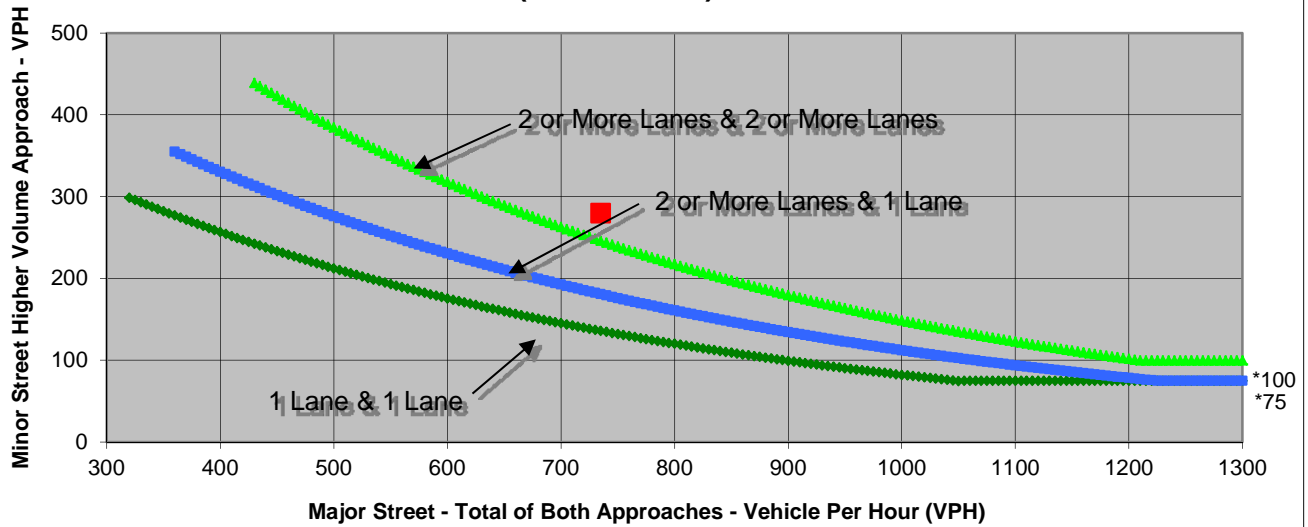
Turn Movement Volumes

	NB	SB	EB	WB
Left	191	1	1	91
Through	0	0	220	197
Right	89	0	224	2
Total	280	1	445	290

Major Street Direction

	North/South
x	East/West

**Figure 4C-4
 Warrant 3, Peak Hour (70% Factor)
 (Rural Areas)**



* Note: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
 Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2006

	Major Street	Minor Street	<u>Warrant Met</u>
	Pahoa Village Road	Kauhale Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	735	280	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Pahoa Village Road
 Minor Street Kauhale Road

Project Pahoa Park Master Plan
 Scenario NT Phase 1 Max
 Peak Hour Weekday

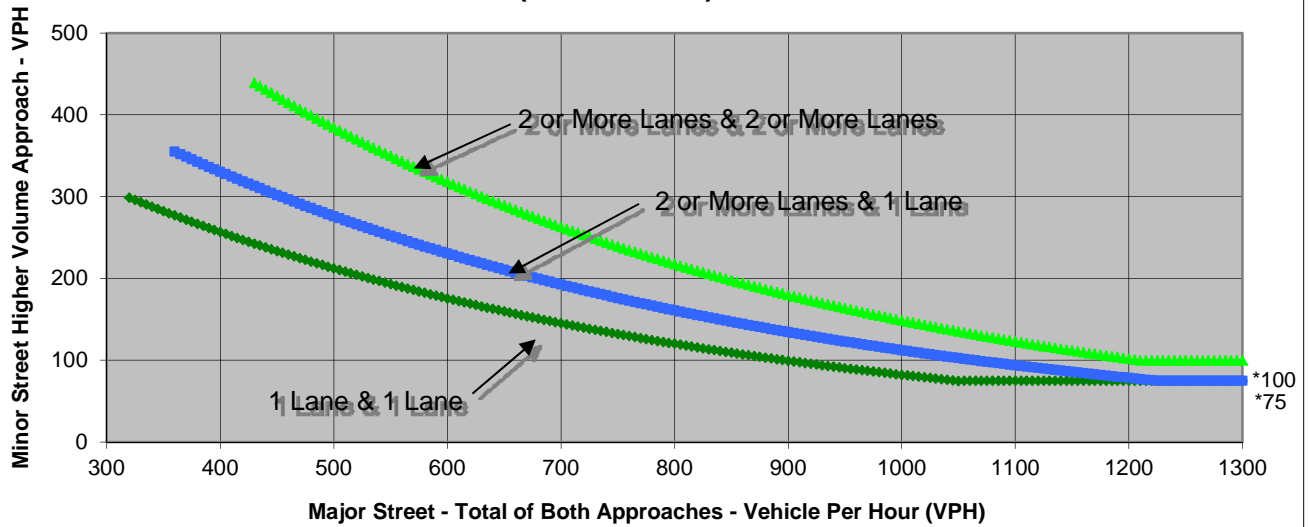
Turn Movement Volumes

	NB	SB	EB	WB
Left	379	0	1	156
Through	0	0	330	283
Right	170	0	352	0
Total	549	0	683	439

Major Street Direction

	North/South
x	East/West

**Figure 4C-4
 Warrant 3, Peak Hour (70% Factor)
 (Rural Areas)**



* Note: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
 Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2006

	Major Street	Minor Street	<u>Warrant Met</u>
	Pahoa Village Road	Kauhale Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,122	549	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Pahoa Village Road**
 Minor Street **Kauhale Road**

Project **Pahoa Park Master Plan**
 Scenario **NT Built Out**
 Peak Hour **Saturday**

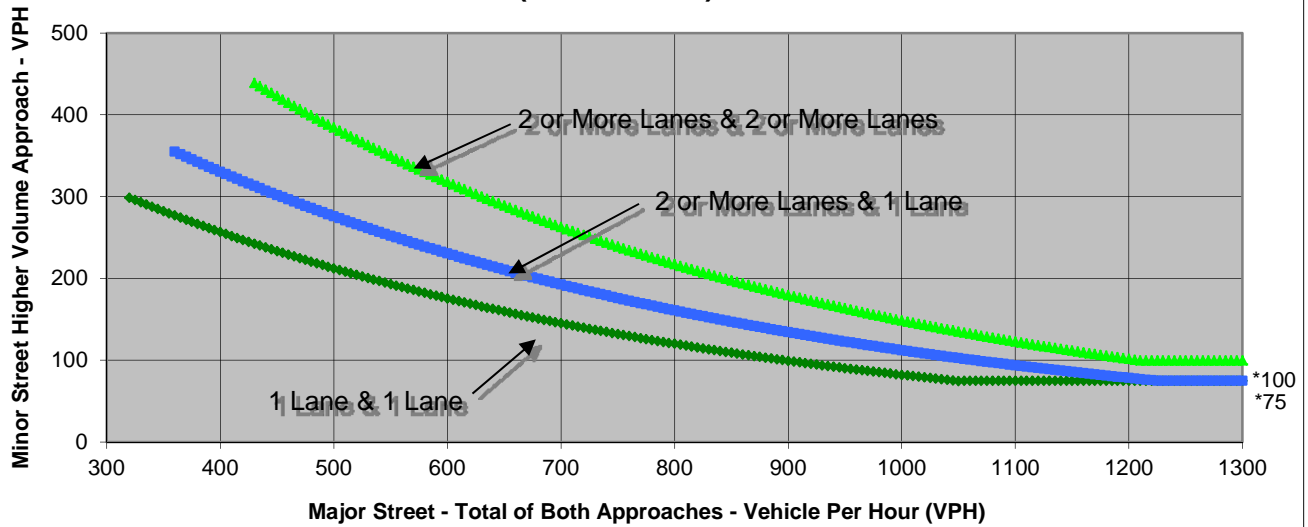
Turn Movement Volumes

	NB	SB	EB	WB
Left	351	1	1	159
Through	0	0	220	197
Right	157	0	384	2
Total	508	1	605	358

Major Street Direction

	North/South
x	East/West

**Figure 4C-4
 Warrant 3, Peak Hour (70% Factor)
 (Rural Areas)**



* Note: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
 Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2006

	Major Street	Minor Street	<u>Warrant Met</u>
	Pahoa Village Road	Kauhale Road	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	963	508	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Appendix **F**

PRELIMINARY ENGINEERING REPORT



Engineering Partners, Inc.

Progressive Solutions

4066-12-001

August 6, 2013

WCIT ARCHITECTURE
725 Kapiolani Blvd, Suite C400
Honolulu, HI 96813

Subject: Preliminary Engineering Study for the Pahoa Park Expansion – Pahoa,
TMK: (3) 1-5-002: 020

At your request Engineering Partners, Inc. has reviewed the background information and completed a Due Diligence report for the subject project. Engineering Partners conducted research with the County approving agencies. The listed improvements, though they have been researched and proposed to the agencies that would impose the requirements, are approximate and may change at the time the design is presented to those agencies.

I. Background Information

- A. The proposed site is at TMK: (3) 1-5-002 : 020. The property is zoned A-1a and is located within a Residential District. Access to the property will be from the County road, Kauhale Place. The proposed built-out Pahoa Park Expansion will include three (3) baseball fields, a covered play court facility, two (2) multi-use fields, comfort stations, covered bleachers, pavilion, a track & field, community center building, maintenance yard/ facility, a potential archery site, & an outdoor covered amphitheater. Proposed infrastructure improvements to support the facilities, will include septic system, roadway, ADA accessible walkways, parking lots, drainage detention basins, electrical distribution, water service distribution, and fire protection.

II. Offsite Improvements

- A. The subject property is fronting Kauhale Place. Entrance to the facility will also be from Kauhale Place. The Kauhale Place is under the jurisdiction of the County of Hawai'i. The proposed offsite improvements are based on discussions with the County of Hawai'i – Department of Water Supply, & Hawai'i District Office and the County of Hawai'i, Department of Public Works, Engineering and Traffic Division.

1. Roadway Improvements

- a) Existing concrete sidewalk with curb and gutter fronts the project parcel, along the Length of Kauhale Place.

- i) A paved driveway will be constructed thru existing sidewalk, and curb and gutter, to provide a new south entrance driveway. Driveway will be constructed per County of Hawai'i, Department of Works standard details
 - b) There are two existing street lights within the vicinity of the proposed new driveway location.
 - i) Replacing existing LPS street lights with new LED street lights, may be required if County of Hawai'i Traffic division hasn't replaced the existing street lights, by the time of the driveway construction.
 - ii) Per Traffic division estimation, all existing LPS street lights will be replaced with LED street lights, by the end of 2016.
2. Internet Services
- a) Internet service is available at street frontage through Hawaiian Telcom.
3. Electrical Services
- a) Electrical power service is available at street frontage through HELCO.
4. Telephone Services
- a) Telephone service is available at highway frontage through Hawaiian Telcom. Additional charges may be assessed if overhead service extends beyond 300' from the highway.
5. Water Distribution System Capacity
- a) The existing water main located in Kauhale Place, is an 8" ductile iron water main. This water main is supplied by a one-way fed from an 8" cast iron water main, on Old Pahoa Village Road, that is being fed by the 0.3 MG "Pahoa" Tank. Per Department of Water Supply (DWS) standards, 1,500 gpm (gallons per minute) fire flow can be provided from the one-way feed 8" ductile iron water main on Kauhale Place, without exceeding the maximum allowable velocity of 10 feet per second.
 - i) Per e-mail correspondence with the Fire Department (exhibit 1), the existing fire flow capacity of 1,500 gpm from the 8" ductile iron water main on Kauhale Place is acceptable for fire protection of the project site.

III. Onsite Improvements

- A. Onsite improvements for this project are regulated by various government agencies. Domestic water requirements are regulated by the County of Hawai'i, Department of Water Supply. Fire protection water requirements are regulated by the County of Hawai'i, Fire Prevention Bureau.

Septic requirements are regulated by the State of Hawai'i, Department of Health. Drainage and grading requirements are regulated by the County of Hawai'i, Department of Public Works.

1. Domestic Water

- a) The proposed improvements are based on discussions with the County of Hawai'i, Department of Water Supply, Engineering Division and County of Hawai'i Parks & Rec.
- b) Water availability for the project has been agreed upon between County of Hawai'i Department of Water Supply and County of Hawai'i Parks & Rec.
- c) Per County of Hawai'i Parks & Recreations decision, the anticipated domestic maximum water usage for the project is 22,000 per month. The highest usage of water is anticipated to be during the weekends, where an estimate of 2,750 gpd will be used. The minimum water usage for the project is equivalent to 7 water units (1 water unit = 400 gpd). The minimum required water meter is a 1-inch water meter, with a minimum one (1) 1-1/2" backflow preventer, and one (1) 1-1/2" service lateral will be required for this project.
 - i) Water usage is based on the comparison of the water usage at Kohala Kamehameha Park, which is a comparable size park. 11,000 gallons/month of water is used at the Kohala Kamehameha Park. Due to the higher population of the Pahoehoe area, water usage for project is based on doubling the water usage of Kohala Kamehameha Park.

2. Fire Protection

- a) The proposed improvements are based on discussions with the County of Hawai'i, Fire Prevention Bureau and the Department of Water Supply.
- b) To provide fire protection, a fire hydrant having the ability to supply adequate flow must be located within around building as shown on attached exhibit 2.
- c) Due to the size of the proposed project, eight (8) onsite fire hydrants, one (1) 8" DC meter, one (1) 8" DC backflow preventer, and an 8" onsite waterline system will have to be installed with this project. The Department of Water Supply has acknowledged that there should be 1500 gpm flow for fire protection, being provided from the existing 8" water main. Per e-mail correspondence with the County of Hawai'i, Fire Prevention Bureau the 1500 gpm fire flow is acceptable for fire protection for this project.

3. Septic System

- a) The septic system will receive food wastes from the concession stands. A grease interceptor will be required to be installed before this waste reaches the septic system.
- b) The anticipated maximum waste flow rate is 2,750 gallons per day; however due the high fluctuation on the amount people that will visit the parks, or attendees to gaming events,

the actual waste flow may be less than what is anticipated. It is also anticipated that the highest wastewater generation will be generated during the weekends (see exhibit 3).

- i) Waste flow will be handled by three (3) septic systems, as the individual wastewater system (IWS). Each septic system will consist of an 2,000 gallon septic tank or a set of smaller tanks totaling that volume may be installed for this project. Each IWS will also consist of an absorption bed, totaling 595 square feet in area.
 - c) For septic system components installed in areas not subject to traffic loading, non-traffic rated components may be used. For septic system components installed in areas subject to traffic loading, those system components will have to be rated to accept that traffic load.
4. Onsite Drainage
- a) The proposed drainage requirements are based on the County of Hawai'i, Department of Public Works, Drainage Standards.
 - b) Any additional stormwater runoff caused by the new construction must be collected and infiltrated onsite. The subject project proposes about 20.31 acres of new impervious surface to the existing lot. It is proposed that two (2) infiltration detention basins, shallow drywells, and various piping to connect the drywells and building downspouts will need to be constructed to collect and infiltrate the anticipated storm water runoff.
5. Offsite Drainage
- a) Kauhale Place already has an existing drainage system that consists of grated inlets, curb inlets, and storm drain pipes. No off-site drainage improvements are required for the project development.
 - b) The park's perimeter roadway will have a 4' interceptor swale line, to intercept off-site storm water. Swale line will direct off-site storm water around the park and will be discharged at the current discharge point of the property.

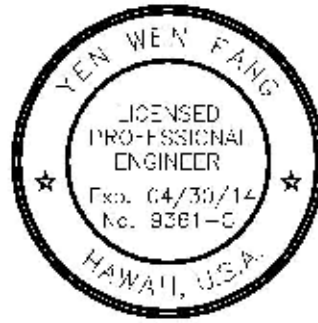
IV. Miscellaneous Requirements

A. NPDES Permit

1. Construction of this project will cause a ground disturbance of greater than one acre. As such, coverage under an NPDES permit will be required. These permits are regulated locally through the State of Hawai'i, Department of Health, Environmental Management Division, Clean Water Branch.

Engineering Partners, Inc.

Yen Wen Fang, P.E.
Principal



DRAFT

Mark Grant

From: Robert Perreira [rperreira@co.hawaii.hi.us]
Sent: Tuesday, June 18, 2013 7:46 AM
To: Mark Grant
Cc: Yen Wen Fang; 'Jason Antonio'
Subject: RE: Pahoia Park Expansion

Mark,

Looks good.

Thank you,

Captain Bobby Perreira
Fire Prevention Bureau East Hawaii
Work (808) 932-2913
Fax (808) 932-2927

From: Mark Grant [mailto:mark@epintegrated.com]
Sent: Monday, June 17, 2013 5:10 PM
To: Robert Perreira
Cc: Yen Wen Fang; 'Jason Antonio'
Subject: RE: Pahoia Park Expansion

Aloha Fire Captain Perreira,

As discussed on our phone conversation on Friday evening, here is a revised site plan which shows the adjustment of the FH located on the back side of the covered play court. The site plan also shows a FH being provided for both the community center building and the amphitheater.

Also, this is to confirm that the theoretical fire flow of 1500 gpm, being provided from the existing water system is suffice for your fire protection purposes.

Please respond back with your concurrence or if I may have misunderstood anything.

Please contact me if you have any questions or if more information is needed. Thank you again for your time and assistants.

Mahalo,

Mark Grant



Engineering Partners, Inc.
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From: Robert Perreira [<mailto:rperreira@co.hawaii.hi.us>]
Sent: Tuesday, June 04, 2013 9:44 AM
To: Mark Grant
Cc: Yen Wen Fang; 'Jason Antonio'
Subject: RE: Pahoia Park Expansion

Mark,

I had a chance to review the proposed layout and I have a few concerns. The fire hydrant placement could be adjusted to better cover the area.

1. Phase 1: There is one hydrant at the back side of the covered play court that appears would not be accessible to our fire vehicles.
2. Phase 2: The hydrant between the Community center and the Amphitheater should be placed for better access to the community center as I believe this will pose a greater hazard.
3. Phase 2: The hydrant between the Maintenance Building and the Booth should also be placed for better access to the Maintenance Building as it also poses the greater hazard.

Let me know what you think.

Thank you,

Captain Bobby Perreira
Fire Prevention Bureau East Hawaii
Work (808) 932-2913
Fax (808) 932-2927

From: Mark Grant [<mailto:mark@epintegrated.com>]
Sent: Tuesday, May 21, 2013 3:34 PM
To: Perreira, Robert
Cc: Yen Wen Fang; Jason Antonio
Subject: Pahoia Park Expansion

Aloha Captain Perreira,

I wanted to get a dialogue started with you on a the Pahoia Park Expansion Project. The project will be the development of a 71.121 acre parcel, where the Pahoia community pool , skate park, and community center facility buildings, are located at. The overall development will include (3) baseball fields, Covered Play Court Facility, (2) multi-use fields, comfort stations, covered bleachers, pavilion, a track & field, Community Center Building, Maintenance Yard/ Facility, a potential archery site, & a outdoor covered amphitheater. The overall development has been broken up into two phases. We are currently concentrating on the first phase.

Please see attached site plan, which shows the overall development and the phasing line between the two phases. The site also shows preliminary location of proposed fire hydrants, with a 150' long hose being pulled from the fire hydrant. I am also providing you with preliminary floor plans and building sections of the scorer's booth, covered play court, pavilion, and comfort station. Please note that the plans are preliminary, so type of construction materials that will be used is still to be determine. Please note that in Phase 2 area, the layout is conceptual and may be subject to change, but I wanted to show a general layout of the fire hydrants in the phase 2 area, so that we can determine the best location for future connection stub-outs from phase 1.

Lastly, the water main that is fronting the project (Kauhale Place), is a one-way feed 8" D.I. water line. This means that we will only be able to provide 1500 gpm to the fire hydrants. To provide the 2000 gpm flow, we will need to do extensive off-site waterline improvements, to the existing water system. I am not sure if we will be fire sprinkling any of the buildings, but I will be verifying on if any of the buildings will be FS.

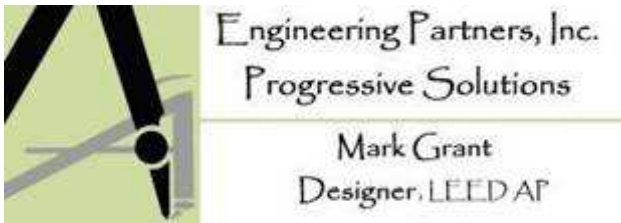
With this information provided, could you please provide your thoughts on the following:

- Are proposed fire hydrant locations in phase 1 area acceptable?
- Are the general location of the fire hydrants in phase 2 area seem reasonable, should the layout remain as is once the phase 2 work has commence?
- Will the will existing 1500 gpm fire flow be acceptable for fire protection?

Please contact me if you have any questions or if more information is needed. I will relay more information on the type of construction materials, and if any of the buildings will be FS, once I am obtain this information.

Mahalo,

Mark Grant



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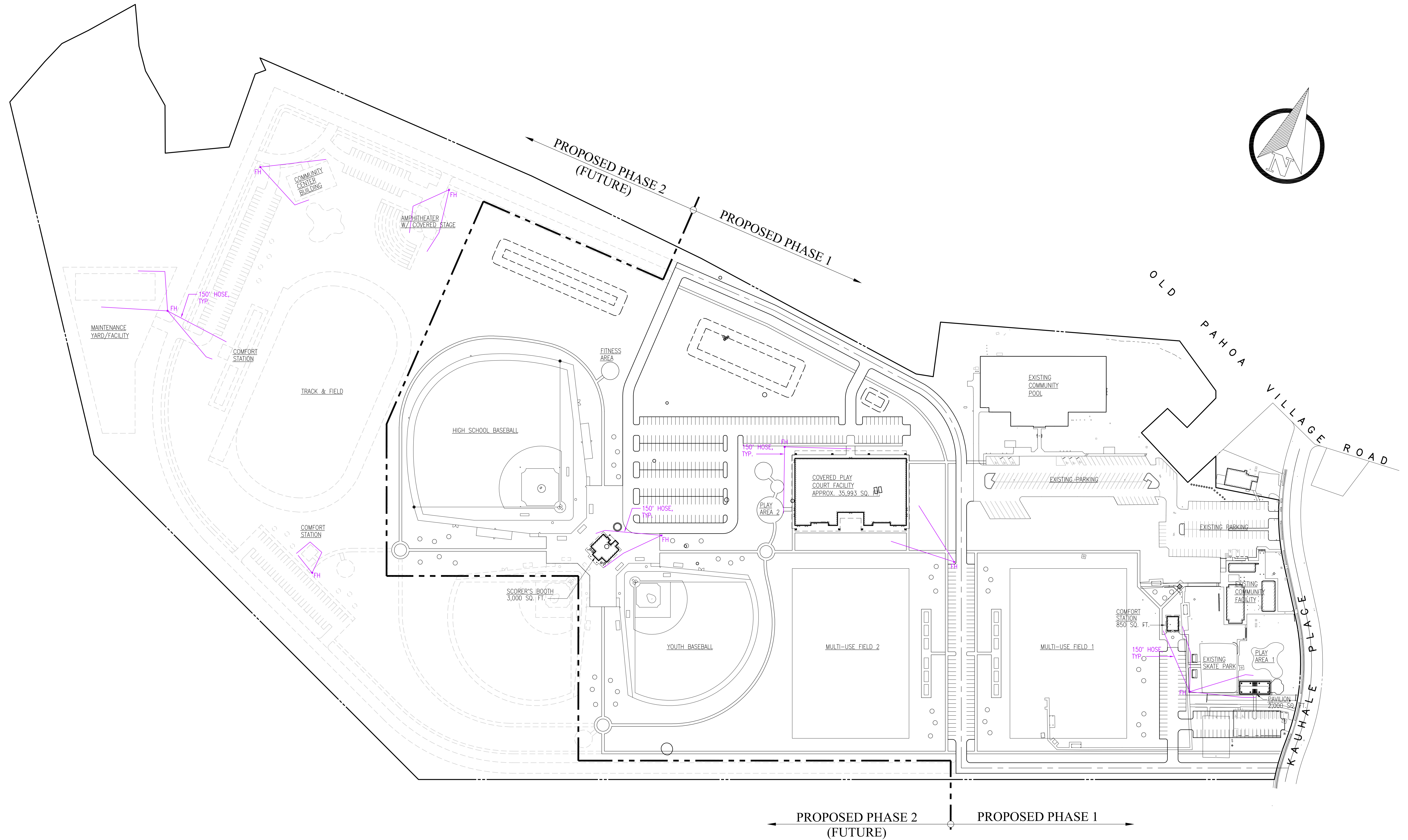
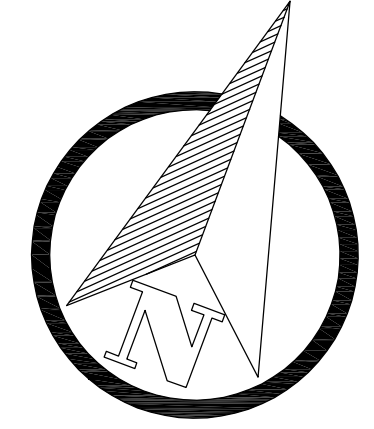
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EXHIBIT 2



A OVERALL SITE PLAN

SCALE: 1" = 100'



**PAHOA PARK EXPANSION
PUNA, HAWAII
TMK: (3) 1-5-002 : 020**

Area calculations/Maximum allowed wastewater load:

Total Property Area: 71.12 acres = 3,097,988 sf.

Total usable area = land area - building footprints

3,097,988 - 41,850 = 3,056,138 sf.

Maximum allowed wastewater load = 3,056,138 sf x (1,000gal/10,000sf) = 305,614 gpd

Maximum allowed wastewater load for a IWS system = 15,000 gpd

Water Usage of Project

Water Usage for Project = 22,000 gallons per month

*Water usage is based on the comparasion of the water usage at Kohala Kamehameha Park, which is a comparable size park. 11,000 gallons/month of water is used at the Kohala Kamehameha Park. Due to the higher popluation of the Pahoia area, water usage for project is based on doubling the water usage of Kohala Kamehameha Park.

Estimated Wastewater Generated

22,000 gallons per month = 22,000 gallons / 8 days (4 weekends) = 2,750 gpd

Number of Systems to Control Wastewater Generated

(3) I.W.S. system will be constructed to handle wastewater Generated.

Each system will be designed to handle 1/3 of Wastewater Generated.

2,750 gpd Wastewater Generated = (2,750 gallons / 3 systems) X 1.5 = 1,375 gallons/system

Septic Tank Selection:

For 800 gal. or more use (1,000+ (Q-800)1.25 = gal.)

(1,000 + (1,375-800)1.25 = 1,718.75 gal.)

1,718.75 gpd. < 2,000 gpd.

Use one (1) 2,000-gallon septic tank

Absorption Field Design:

Percolation Rate = 2 min./inch

Equivalent Bedrooms (1 rm. = 200gpd) = 1,375 / 200 = 6.87 Rooms ~ Say: 7 rooms

7 rooms x 85 sf/room = 595 sq.ft. required

Use (1) 18'x36' Absorption Bed = 648 sf bed

with 3' of suitable soil replacement



Appendix **G**

COMMUNITY MEETINGS

PĀHOA PARK EXPANSION MASTER PLAN
Information Sheet
September 2012

Project Description

The County acquired 56 acres in 2002 to enable an expansion of the Pāhoia Park. The combined land area with the existing Pāhoia Park facilities totals approximately 72 acres. The existing facilities include a neighborhood center, senior center, swimming pool, skateboard park, basketball court, and ballfields. Pāhoia's relatively rainy climate causes the basketball court to be underutilized and the fields to be soggy. There is a need in Puna for recreational facilities that support youth activities, such as well-designed ballfields and covered outdoor facilities. Other needs identified in the Puna Community Development Plan for the Pāhoia Park include art and performance center, sheltered picnic areas, children's museum and playground, and walking paths that link to the Pāhoia Village center.

With input from the community and stakeholders, the objective of the master plan is to layout the existing and desired facilities on the 72 acres taking into consideration the topography, relationships among the various uses, orientation to the sun, facility sizing requirements, and other factors. Community input and cost estimates will determine priorities. The master plan is an important first step to seek funding, ensure orderly development, and for the community to rally support behind a shared vision to make it happen.

Planning Process

The County Department of Parks & Recreation has initiated the following process to plan and improve Pāhoia Park (see schedule on the back of this page):

1. **Community Input.** Gather community input to verify and update the community's desires for the park (January 2012);
2. **Survey.** Survey the property to precisely locate features and understand the topography (approximately 3 months);
3. **Master Plan.** Develop a preliminary master plan; hold a community meeting to provide feedback to the preliminary master plan; finalize the master plan (approximately 4 months);
4. **Environmental Assessment (EA).** Conduct archaeological, biological, and traffic field studies. Describe and assess the potential impacts of the master plan. Distribute the Draft EA for public comments. Revise the Master Plan as applicable depending on the comments received and finalize the EA (approximately 8 months);
5. **Phase I, Increment 1.** Start the design of Increment 1 of the Master Plan (approximately 9 months). Bid the project (approximately 3 months). Start construction.

Contact for More Information

For more information on the project, contact Jason Armstrong at the Department of Parks & Recreation at (808) 961-8311 or jarmstrong@co.hawaii.hi.us.

Agenda for September 10, 2012 Community Meeting

5:30-6:15 Welcome and Introductions; Master Plan Presentation
6:15-7:15 Group breakout session to provide comments to the Master Plan
7:15-7:30 Summary and Closing

Pahoia Park Expansion Master Plan
Notes from Community Meeting

Date of Meeting: September 10, 2012
Place: Pahoia Neighborhood Facility
Time: 5:30-7:30pm

Group Notes

Group #1

1. Comments that supported the master plan:
 - a. Like the plan as is. Everything is there and fits. The children are taken care of.
 - b. A person involved with the original playfield and basketball courts said that the proposed covered courts and playfields should solve the current problems and would see much increased usage.
 - c. Puna is missing baseball facilities for several levels where players must go to Hilo to play. All the proposed baseball fields in the master plan are needed for the variety and demand of various league play.
 - d. Especially liked the amphitheater. Puna has no venue for hula, high school, or other performances.
2. Comments that proposed alternative ideas:
 - a. There should be less emphasis on organized sports and more natural areas.
 - b. Include a separate facility for the community library. Include a children's garden. Liked the performance arts center.
 - c. Limit the cars to the developed areas; vehicles should not intrude into the natural areas.
 - d. The entire site should not be graded. Leave the natural topography in the natural areas (e.g., hills and varied terrain add interest).
 - e. Include more open areas for families.
 - f. Include space for community gardens.
 - g. Include alternative access, possibly to/from Cemetery Road, especially to handle peak traffic from various events.
 - h. Add BBQ to picnic areas.
3. Comments on the planning and design process:
 - a. Inventory specimen trees and other special understory plants (e.g., native ferns). Try to incorporate these plants in place since transplanting may be costly and difficult.
 - b. Allow the community or various botanical clubs (e.g., palms, rhododendrons, taro) to provide input on the landscape plan. Allow the community groups to adopt certain areas to design and maintain.

Group #2

1. Desired features
 - a. Community gardens
 - b. Community library
 - c. Camping grounds
 - d. Golf driving range
 - e. Dog park/training
 - f. Classrooms
 - g. Open passive park area
 - h. Underground electrical utilities

- i. Solar-powered buildings
 - j. Recycled rainwater
 - k. Shower facilities?
 - l. Compost toilets?
2. Concerns
- a. Retain existing significant trees
 - b. Identify historic/cultural features
 - c. Adequate parking
 - d. Security/drinking/drugs
 - e. DWS water commitments?
 - f. Blue rock?

Group #3

1. Priorities
- a. Covered multi-court facility
 - b. Perimeter road with multi-use path
 - c. Football/soccer fields
 - d. Lights (solar-powered) all over
2. Desired features
- a. Cover the skatepark
 - b. Showers/lockers near fields
 - c. Roller derby striping in covered court
 - d. Gardens
 - e. Track and field facilities (e.g., shotput, discus, javelin)
 - f. Library
 - g. Dog park
 - h. Driving range
 - i. Shaded parking (align on north-south axis so trees can shade cars)
 - j. Sustainable water reuse
3. Concerns
- a. Security
 - b. Access out
 - c. Remove all albizia and strawberry guava; plant with native only

Group #4

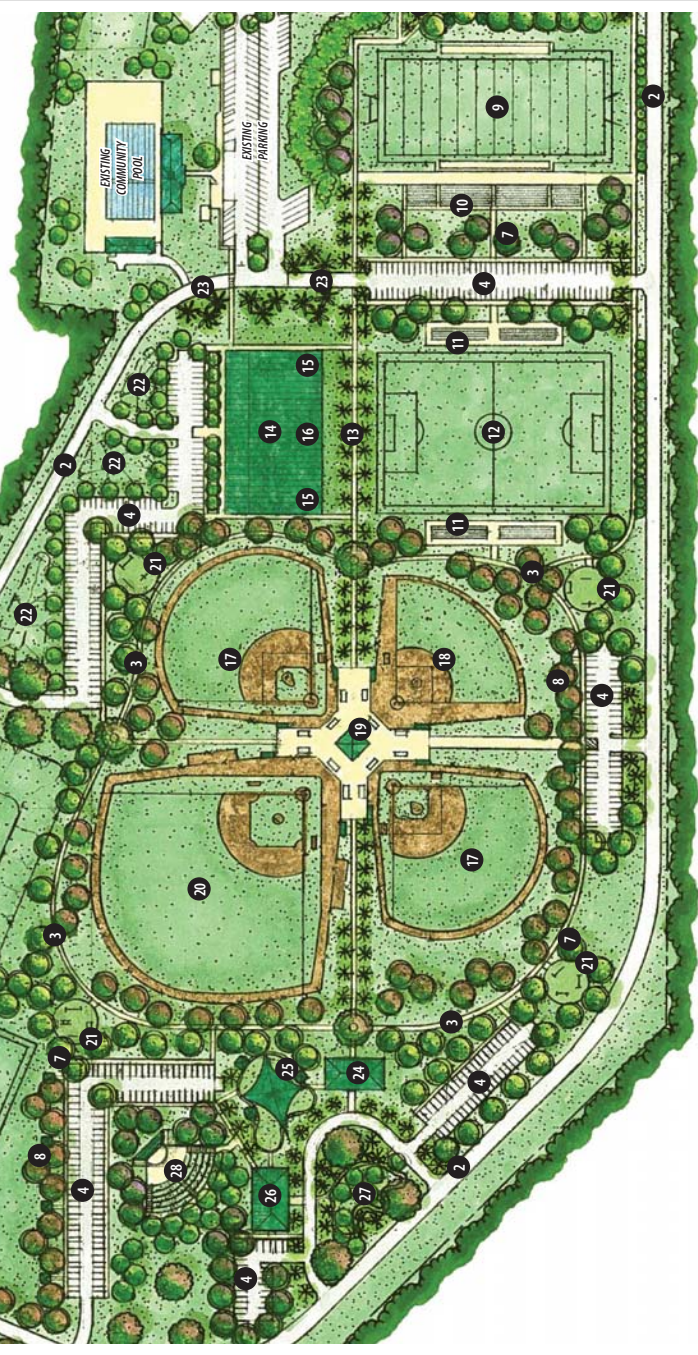
1. Desired features
- a. Most comments focused on the community library and performing arts area. Capacity of the performing arts center ranged from 200 to 500+.
 - b. Cultural park?
 - c. Underground electrical
 - d. Multiple access points
 - e. Parking and road connection to support Pahoia Village?
 - f. Disc golf
 - g. Farmer's market
 - h. Quiet area
 - i. Community gardens
 - j. Keiki playgrounds
 - k. Conference center?

- l. Sustainable/green showcase
2. Concerns
- a. Security
 - b. Team sports don't deserve half the budget; move playfields to the back
 - c. Tie-in to transit
3. Priorities
- a. Amphitheater/Performing Arts (4)
 - b. Library, Parking (3)
 - c. Community garden (2)
 - d. Keiki playground, Infrastructure, bike paths, quiet area
 - e. Organized team sports

Written Comments/Questions Submitted at the Meeting

1. Great job on presentation and plan. Priority—library, security, *well lit* amphitheatre, bike paths, walking paths, attractive landscaping for picnicking, etc. Mahalo for your time!
2. Please build the library and performance space first! Too many ball fields.
3. Can the performance area have covered seating and covered stage? Performing area needs plenty of electricity and lighting.
4. Are there plans for a children's (and/or community) garden and performing arts center?
5. Library size and plans?
6. Leash-free dog park with fence, please! (possibly locate in areas numbered on the drawing as 29/30 or 12/22?)
7. Please support roller derby. It is the fastest growing sport in the world. Kona has two teams. Hilo has three. Waimea even has a team. It's time for Pahoia to create this opportunity for our girls. All it needs is a flat track and covered space. Could be painted on any tennis/basketball court (like at Malama Park but covered).
8. Please consult with PahoiaPlan@gmail.com. (email response to: baileysdad@hawaiiantel.net)
9. Add a miniature golf course, bus stop, street hockey, green house. Art—include Hawaiian myths and story plates.
10. Concern: \$5M insufficient for grand plan. Can we count on more? *Zero* fence. Access: we cannot block traffic through Pahoia—access from Kaohe Homestead Road? Staffing and maintenance concern.

- 3 Pedestrian Path*
- 4 Parking
- 5 Covered Bleachers for Skate Park
- 6 Expanded Playground
- 7 Restroom Facility
- 8 Covered Picnic Areas
- 9 Football Field*
- 10 Grandstands
- 11 Bleachers
- 12 Multi-Use Field (Soccer, Rugby, Disc golf, etc.)*
- 13 Main Pedestrian Spine**
- 14 Multi-Purpose Facility:
- Three Covered Playcourts (basketball, volleyball, etc.)
- Storage
- 17 Youth Soft
- 18 Soft
- 19 Conc
- 20 High
- 21 Ffite
- 22 Drail
- 23 Comr
- 24 Child
- 25 Cove
- 26 ArtC
- 27 Art/S
- 28 Amp
- 29 Main
- 30 Poter



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ara Lively			
e Siracusa	POB 1520 Pahoia	965-2000	
es, Doreen, Ariel, & zen Brown	15-2718 Opae St. Pahoia, HI 96778	238-0350	Residents
ara Awarez	P.O. Box 1067 Pahoia, HI 96778	965-9470	Resident/ Puna Panthers Football
o Like	P.O. Box 1556 Pahoia	345-8428	Puna Panther Football
ak Hildegard	P.O. Box 2196 Pahoia	965-1989	
1 Nagasawa	RR4 Box 2294 Pahoia	965-8804	AILH
1 Higashi	533 Ihe St. Hon. HI 96817	382-9999	Landscape Architect/Design Team
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e Wright	P.O.Box 1391 Pahoia	pahoapal@gmail.com	
1 Stump	Box1079 Pahoia	stumpv001@hawaii.rr.com	Pahoia Plan Transit Committee
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en Lee	16-1066 Maho Rd.	443-6586	PUNA Panter Football
id Zeisster	Hawaiian Shores		
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	PO Box 1326 Pahoia HI 96778	430-1459	Resident Life
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ty	15-121 Kuna St.	965-6339	
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