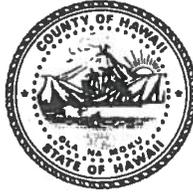


William P. Kenoi  
Mayor



FILE COPY

Clayton S. Honma  
Director

DEC 23 2015

Kenneth J. Van Bergen  
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 9, 2015

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Scott Glenn, Director  
Office of Environmental Quality Control  
235 South Beretania Street, Suite 702  
Honolulu HI 96813

Dear Mr. Glenn:

Subject: Final Environmental Assessment and FONSI for Hōnaunau Rodeo Arena Improvements, TMK (3<sup>rd</sup>.) 8-4-008:002, South Kona, Island of Hawai'i

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 Hōnaunau Rodeo Arena Improvements project for publication in the next available edition of the Environmental Notice. We have enclosed the following:

- One paper copy of the Final EA;
- A CD containing the .pdf file for the EA and a WORD file with the OEQC Environmental Notice Publication Form; and
- A hardcopy of the OEQC publication form

Please contact James Komata at 961-8311 if you have any questions.

Sincerely,

Clayton Honma, Director  
County of Hawai'i, Department of Parks and Recreation

Attach: As noted above

Cc: (w/o attach) Ron Terry, Ph.D, Project Environmental Consultant

OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

15 DEC 10 12:52

RECEIVED

**AGENCY ACTION  
SECTION 343-5(b), HRS  
PUBLICATION FORM**



DEC 23 2015

**Project Name** Hōnaunau Rodeo Arena Improvements  
**Island:** Hawai'i  
**District:** South Kona  
**TMK:** (3rd) 8-4-008:002  
**Permits:**

- National Pollutant Discharge Elimination System Permit and IWS Approval (State DOH)
- Grading and Grubbing Permits (County DPW)
- Building Permits and Plan Approval (County DPW and Planning)
- Chapter 6e, HRS, determination from State Historic Preservation Division on historic property effects
- Disability and Communication Access Board (DCAB) plan review and approval

**Proposing/Determination Agency:**

County of Hawai'i  
Department of Parks and Recreation  
101 Pauahi Street, Suite 6  
Hilo, Hawai'i 96720  
James Komata, 961-8311

**Consultant:**

Geometrician Associates  
PO Box 396  
Hilo HI 96721  
Ron Terry Ph. (808) 969-7090 rterry@hawaii.rr.com

OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

15 DEC 10 PM 2:53

RECEIVED

**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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto:oeqchawaii@doh.hawaii.gov)); no comment period ensues upon publication in the periodic bulletin.

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.

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.

Section 11-200-23  
Determination

Section 11-200-27  
Determination

Withdrawal (explain)

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

The project would improve and expand the facilities and range of services at the Hōnaunau Rodeo Arena by: rerouting and improving vehicular access and circulation to better accommodate and separate uses; improving water system; relocating the arena space and improving structures; expanding and rationalizing parking; replacing, expanding and improving spectator seating; building a new pavilion for community use; replacing the existing comfort station; and improving facilities to make them more accessible to individuals with disabilities. No impacts to any biological or water resources would occur. Archaeological sites consist solely of cattle walls that have been continuously modified through time and will be minimally impacted. Mitigation includes timing of clearing to avoid impacts to listed vertebrate species, NPDES and grading permits with BMPs during construction to avoid erosion and sedimentation, consultation of DOH concerning the need for a community noise control permit during construction, a dust control plan and precautionary conditions related to inadvertent finds of cultural materials. Traffic impacts are unlikely because there will be no substantial change to the traffic level of service on a daily basis.

# **Hōnaunau Rodeo Arena Improvements**

## **Final Environmental Assessment**

TMK (3rd) 8-4-008:002  
South Kona District, Hawai‘i Island, State of Hawai‘i

**January 2016**

Prepared for:  
Hawai‘i County  
Department of Parks and Recreation  
101 Pauahi Street, Suite 6  
Hilo, Hawai‘i 96720



# **Hōnaunau Rodeo Arena Improvements Final Environmental Assessment**

TMK (3rd) 8-4-008:002  
South Kona District, Hawai'i Island, State of Hawai'i

**PROPOSING/  
APPROVING AGENCY:**

County of Hawai'i  
Department of Parks and Recreation  
101 Pauahi Street, Suite 6  
Hilo, Hawai'i 96720

**CONSULTANT:**

Geometrician Associates LLC  
P.O. Box 396  
Hilo Hawai'i 96721

**CLASS OF ACTION:**

Use of State/County Land and County Funds

This document is prepared pursuant to:  
The Hawai'i Environmental Protection Act,  
Chapter 343, Hawai'i Revised Statutes (HRS), and  
Title 11, Chapter 200, Hawai'i Department of Health Administrative Rules (HAR).

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**SUMMARY OF THE PROPOSED ACTION,  
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

The County of Hawai‘i Department of Parks and Recreation (P&R) proposes to improve and expand the facilities and range of services at the Hōnaunau Rodeo Arena, which is located on Hōnaunau Road near Ke Ala O Keawe Road in South Kona. The project involves rerouting and improvement of vehicular access and circulation to better accommodate and separate uses; improvements to the water system; relocation of the arena space and improvement of structures; expansion and rationalization of parking; replacement, expansion and improvement of spectator seating; construction of a new pavilion for community use; replacement of the existing comfort station; and improvements to make the facilities more accessible to individuals with disabilities.

No impacts to any biological or water resources would occur. Archaeological sites consist only of cattle walls that have been continuously modified through time and will be minimally impacted. Mitigation includes timing of clearing to avoid impacts to listed vertebrate species, NPDES and grading permits with best management practices during construction to avoid erosion and sedimentation, consultation of DOH concerning the need for a community noise control permit during construction, a dust control plan and precautionary conditions related to inadvertent finds of cultural materials. Traffic impacts are unlikely because there will be no change to the traffic level of service on a daily basis. The size of rodeo events, which are infrequent, are not anticipated to increase, and existing road and highway facilities are adequate to handle these events.

## **PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS**

### **1.1 Project Location, Purpose and Need and Description**

The County of Hawai‘i Department of Parks and Recreation (P&R) proposes to improve and expand the facilities and range of services at the Hōnaunau Rodeo Arena, which is located on a 6.126-acre property on Hōnaunau Road near Ke Ala O Keawe Road in South Kona (Figures 1-5). The property is owned by the State of Hawai‘i, but through Executive Order No. 2468, approved on October 30, 1969, the State set aside the old Hōnaunau School Lot for recreational and allied uses under the control and management of the P&R.

The current arena hosts one large annual event sponsored by the Kona Roping Club, with a maximum of about 700 attendees and participants. Due to the high volume of both attendees and participants during such events, onsite traffic circulation and parking presents a challenge. Restrooms and concession areas are currently inadequate for efficiently serving large events. The arena is also used by small groups for practice sessions and by individual riders. The site also has a public water spigot located behind a gate that is usually locked, which makes it inconvenient for most users. Although the site is large enough to support other recreational uses, and there is a demand for public event space in the area, no such facilities are available on the site.

The project would improve the site to better serve the large event, which could possibly increase in frequency. Rodeo events are private (non-County sponsored) functions and would be determined by a user that would be required to rent the facility. The project would also create a pavilion that could be used by the public on a more frequent basis, a facility that the Ho‘okena to Hōnaunau area currently lacks and sorely needs. The project involves the following specific improvements, as shown in the Site Plan contained in Figure 4:

- **Rerouting and improvement of vehicular access and circulation to better accommodate and separate uses that exist or are planned for the site.** Currently there is one main entrance/exit for the site that both arena users and the general public utilize. The improvements will provide two new entrance locations on the *mauka* (east) side of the parcel. One will be dedicated to rodeo event participants and arena users to be used primarily in conjunction with rodeo functions, with the other used for general public access. With the proposed improvements, both participants and public will use the current access to enter and exit from the site. Vehicle gates will be added at various locations of the site to improve security and regulate access during events and after hours. This will also make the existing public water spigots more accessible to the public.
- **Improvements to the water system.** There will be a new storage tank for dedicated for domestic water, a pump station and associated building to provide consistent water pressure and capacity at the arena facilities, and new waterline infrastructure and water spigots to serve various facilities and locations within the site. There will also be a new water tank dedicated for fire protection of the buildings that will be sized in accordance with the State Fire Code and review and approval of the Hawai‘i Fire Department.
- **Relocation of the arena space and improvement of arena structures.** The arena will be shifted approximately 30 feet north of the current location. The arena and holding pens, chutes, judges’

stand, and other features will be reconfigured to better serve the users and accommodate the new building structures being placed on the site.

- **Expansion and rationalization of parking.** Approximately 41 new paved general parking spaces and 9 new paved ADA parking stalls will supplement the existing informal parking areas in order to provide adequate parking for the typical expected uses of the new pavilion facility and to ensure sufficient accessible parking for large rodeo events. Some large events may continue to require off-site.
- **Replacement, expansion and improvement of spectator seating.** The existing assemblage of multiple individual wood and aluminum bleacher units will be replaced with a new, comprehensive, eight-tier aluminum bleacher system with space for over 500 seats (per County Zoning Code), including 8 ADA wheel chair spaces and 8 companion spaces.
- **Construction of a new pavilion.** The approximately 2,260-square foot community pavilion will be available for public use, but during rodeo events it would be devoted exclusively to rodeo use. A concession stand would be built into the pavilion, which could also be used as a serving area for pavilion uses. Wastewater from the concession's sinks would be treated via a new underground grease trap and a new Individual Wastewater System (IWS) that would also serve the new comfort station. A concrete courtyard would front the pavilion and concession stand.
- **Replacement of existing comfort station and septic system and construction of new grease trap and leach field.** The new comfort station would be approximately 800 square feet, with an appropriately sized septic tank and leach field situated just *makai*.
- **Improvements to make the facilities more accessible to individuals with disabilities.** These would include replacement of the comfort station, accessible parking, walkways, and spectator seating.

## 1.2 Environmental Assessment Process

This Environmental Assessment (EA) is being conducted in accordance with Chapter 343 of the Hawai'i Revised Statutes. This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawai'i Administrative Rules, is the basis for the environmental impact process in the State of Hawai'i. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the anticipated finding that no significant impacts are expected to occur; Part 5 lists each criterion and presents the preliminary findings for each made by the Hawai'i County Department of Parks and Recreation, the proposing and approving agency. If, after considering comments to the Draft EA, the approving agency concludes that no significant impacts would be expected to occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to proceed to other appropriate approval and permit processes. If the agency concludes that significant impacts are expected to occur as a result of the Proposed Action, then an Environmental Impact Statement (EIS) will be prepared.

**Figure 1. Location Map**

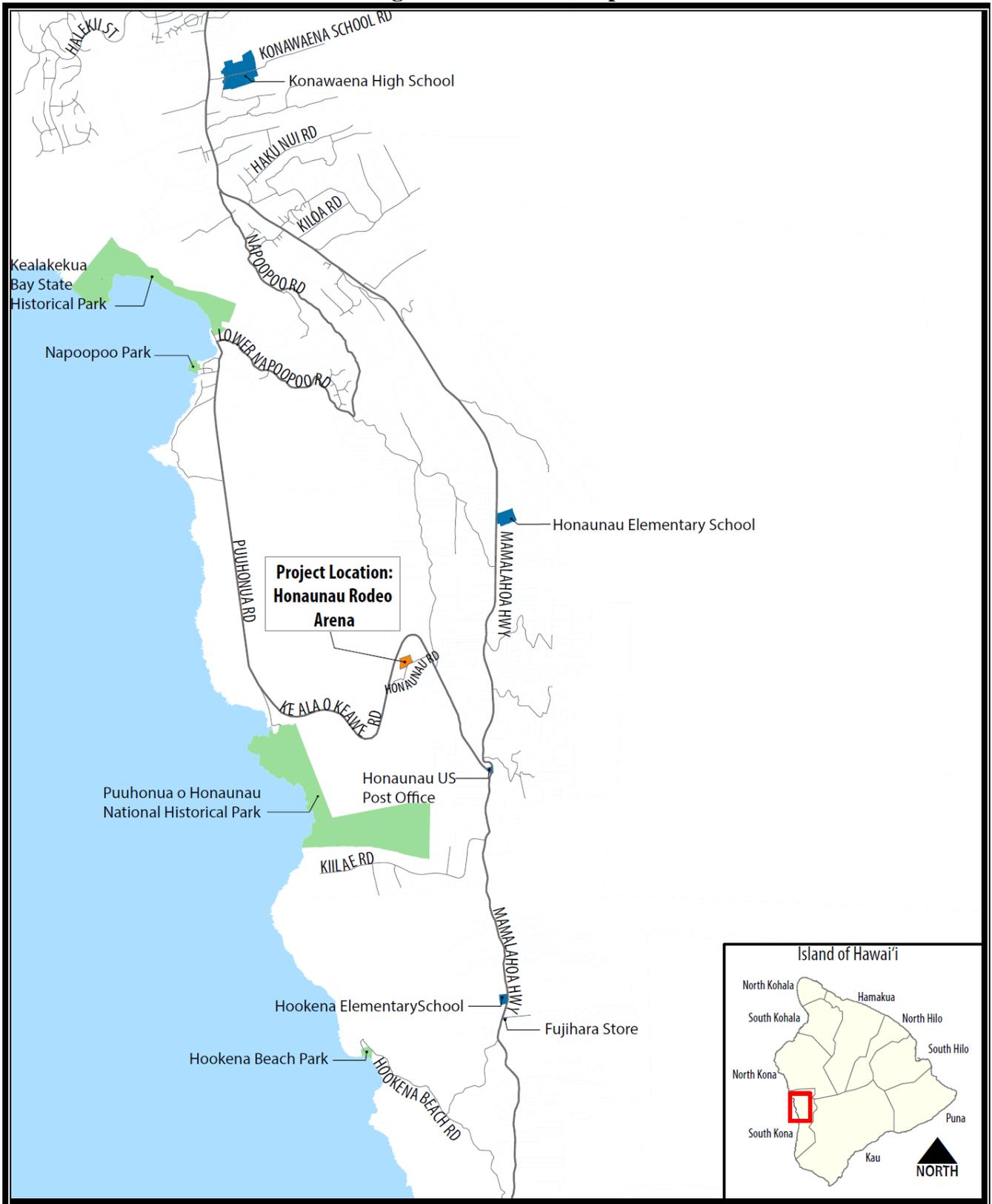


Figure 2. Aerial Image of Project Site





**Figure 4. Project Site Photos**



Main gate of Hōnaunau Rodeo Arena, view to the E ▲ ▼ Bleachers at the rodeo arena, view to the NE



**Figure 4. Project Site Photos**



Revetment below Hōnaunau Rd., view to the SW ▲ ▼ Pens at eastern end of rodeo arena, view to the NW

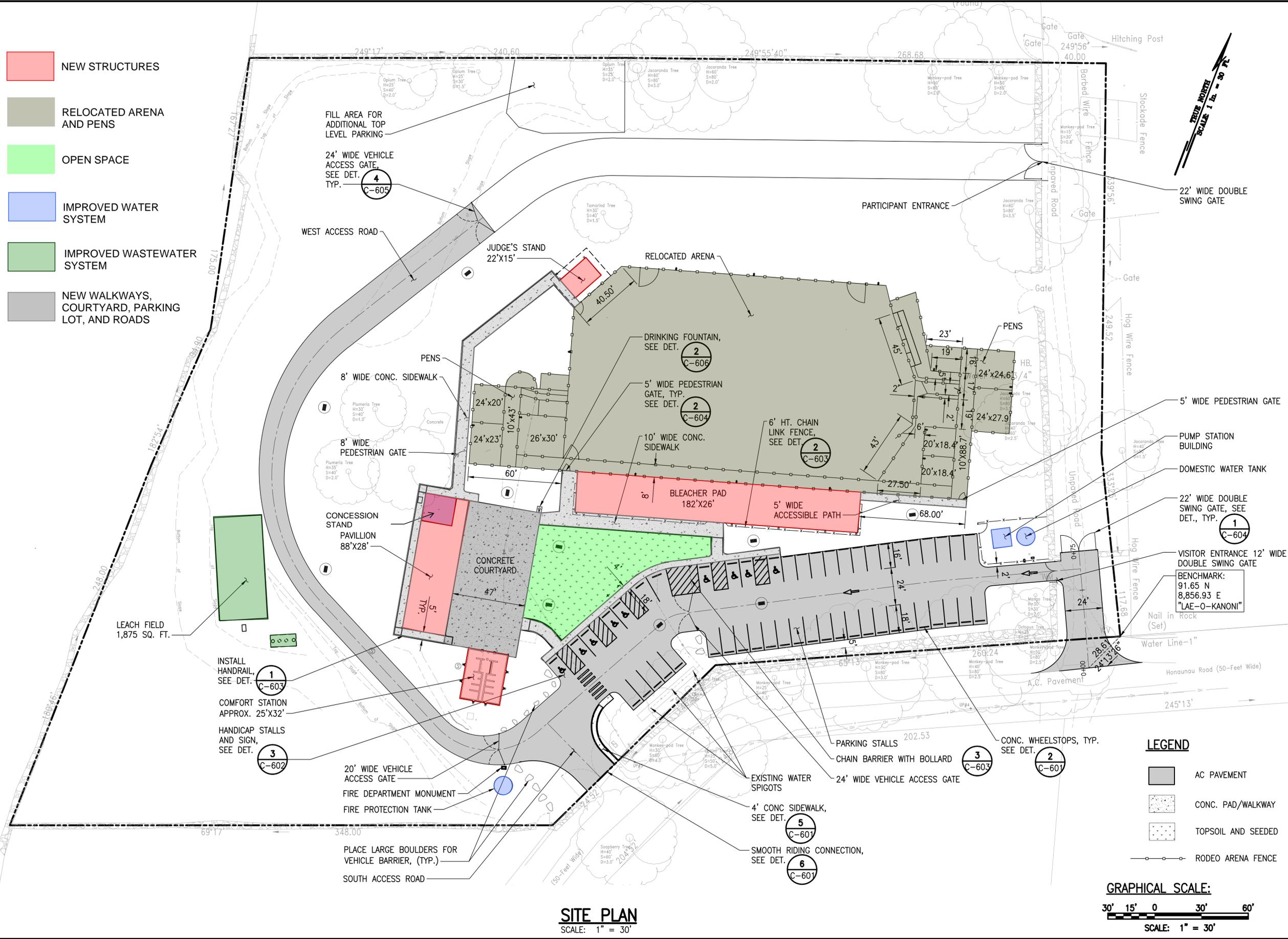


**Figure 4. Project Site Photos**



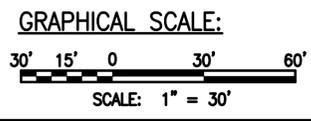
View from existing comfort station *makai* ▲ ▼ Access on *mauka* end of property





- NEW STRUCTURES
- RELOCATED ARENA AND PENS
- OPEN SPACE
- IMPROVED WATER SYSTEM
- IMPROVED WASTEWATER SYSTEM
- NEW WALKWAYS, COURTYARD, PARKING LOT, AND ROADS

- LEGEND**
- AC PAVEMENT
  - CONC. PAD/WALKWAY
  - TOPSOIL AND SEEDED
  - RODEO ARENA FENCE



**SITE PLAN**  
SCALE: 1" = 30'





MARK	DATE	DESCRIPTION	DATE

COUNTY OF HAWAII  
DEPARTMENT OF PARKS AND RECREATION  
AUPUNI CENTER, 101 PAUHAH STREET, SUITE 6, HILO, HAWAII

**HONAUNAU RODEO ARENA IMPROVEMENTS**

SOUTH KONA, HAWAII  
JOB NO.: PR-4335  
SHEETS: 8 OF 8  
DATE: \_\_\_\_\_

TMK: (3)8-4-008:002  
SHEET NO. **C-300**

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### 1.3 Public Involvement and Agency Coordination

The following agencies and organizations were consulted by letter during development of the Environmental Assessment.

Federal:

Pu‘uhonua o Hōnaunau National Historical Park

State:

Department of Health, Environmental Health Administration  
Department of Land and Natural Resources, Chairperson  
Department of Transportation, Highways Division                      Office of Hawaiian Affairs

County:

Civil Defense Agency  
County Councilmember Maile David  
Department of Environmental Management  
Department of Public Works  
Department of Research and Development  
Department of Water Supply  
Fire Department  
Mass Transit Agency  
Planning Department  
Police Department

Private:

Sierra Club  
Kamehameha Schools  
Neighboring Property Lessee

Responses received from early consultation are contained in Appendix 1a. Comments to the Draft EA and responses to these comments are contained in Appendix 1b. Various places in the EA have been modified to reflect input received in the comment letters; additional or modified non-procedural text is denoted by double underlines, as in this sentence.

### 1.4 Cost and Schedule

Shortly after the EA is complete and necessary permits are obtained, construction will begin. The improved facility is scheduled to be completed by late 2016. The cost of the improvements is currently estimated at \$3 to 5 million, a figure which will be refined as part of final design.

## **PART 2: ALTERNATIVES**

### **2.1 No Action Alternative**

Under the No Action Alternative, the County of Hawai‘i would not provide any improvements or new facilities at the rodeo arena. Parking and circulation would remain problematic during large events, and the community in the area would continue to lack a pavilion for events. The socioeconomic benefits that ensue from needed recreational facilities would fail to accrue. Conversely, there would be no disturbance of the existing ground surface or vegetation, and no impacts to traffic in the area. The No Action Alternative provides a basis for comparing the impacts of the proposed project.

### **2.2 Alternative Locations**

Rodeo arenas are a highly specialized use, and it is difficult to conceive of another site onto which it would be practical and economical to relocate the arena. In terms of the pavilion, as part of its mission to expand recreational opportunities, P&R periodically inventories available recreational areas and compares this against demand. The Hōnaunau to Ho‘okena area is serviced by very few County recreational facilities, and community and family groups from this area must travel to Captain Cook, Kailua or even Holualoa to find a facility. There is thus a clear need for such a venue. There are very few County-owned properties in the area, and no State-owned properties or facilities that might be dedicated to County recreational use. In summary, P&R is unaware of any other sites in the area that might be suitable for the proposed pavilion. The proposed site takes advantage of a site that is underutilized on most days and can accommodate pavilion uses at times when rodeo events are not occurring. Therefore, no alternative sites have been advanced in this Environmental Assessment.

## **PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES**

The location for the Proposed Action is referred to throughout this EA as the *project site* (see Figures 1-4). The term *project area* is used to describe the general environs of this part of South Kona.

### **3.1 Physical Environment**

#### **3.1.1 Climate, Geology, Soils and Geologic Hazards**

##### *Environmental Setting*

The climate in the area is warm and semi-arid, with an average annual rainfall of about 40 inches and a mean annual temperature of approximately 74 degrees Fahrenheit (Giambelluca et al 2013; UH Hilo-Geography 1998). The project site is located at about 600 feet above mean sea level. The underlying geology is a Mauna Loa lava flow dated between 3,000 and 5,000 years before the present (Wolfe and Morris 1996). The soil on the project site is classified by the U.S. Natural Resources Conservation Service (formerly Soil Conservation Service) as Kaimu extremely stony peat (rKED), which is characterized by permeable, well-drained soil on 7 to 25 percent slopes. In a representative profile, the surface layer is black peat up to three inches thick underlain by extremely cobbly material. Roughly eight percent of the surface area is covered with cobbles, stones or boulders, including numerous pahoehoe outcrops. The capability subclass is VIIs, which means that this soil has very severe limitations that make it unsuitable for cultivation and restrict its use to mainly pasture and woodland or wildlife (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey in this area of South Kona is 3 on a scale of ascending risk 9 to 1 (Heliker 1990:23). The hazard risk is based on the fact that Mauna Loa is an active volcano. Volcanic hazard zone 3 areas have had 1 to 5 percent of their land area covered by lava flows or ash since the year 1800, but are at lower risk than zone 2 areas because of their greater distances from recently active vents and/or because the local topography makes it less likely that flows would cover these areas.

The Island of Hawai'i experiences high seismic activity and is at risk from major earthquake damage (USGS 2000), especially to structures that are poorly designed or built, as the 6.7-magnitude quake of October 15, 2006 demonstrated. The portion of the project site proposed for improvement is graded and flat to low-sloping. There are appropriate setbacks to surrounding steeper slopes. There does not appear to be any risk to damage on the site from subsidence, landslides or other forms of mass wasting.

### *Impacts and Mitigation Measures*

Geologic conditions impose no constraints on the Proposed Action, and the continued utilization and improvement of the area for recreational purposes is not imprudent to undertake. Most of the surface of Hawai'i Island is subject to eventual lava inundation, and any recreational facilities in Kona face risk. Given the need for improved rodeo facilities and expanded recreational event space in the area, the County has determined that it is sensible to expand its facilities here. All facilities will be designed based on requirements of the 2006 International Building Code as adopted and amended by Chapter 5 (Building) of the Hawai'i County Code to ensure appropriate design. No mitigation measures related to geologic conditions are expected to be required.

#### **3.1.2 Drainage, Water Features and Water Quality**

##### *Existing Environment*

The project site is about 1.3 miles from the shoreline and is not located near any ponds, lakes, streams, wetlands or other water bodies. According to official flood maps, the project site is not mapped and is thus classified within in Flood Zone X, outside of the 100-year or 500-year floodplain.

##### *Impacts and Mitigation Measures*

Land clearing and construction activities, including parking, would occur in an area greater than one acre, and thus will require a National Pollutant Discharge Elimination System (NPDES) permit to ensure that erosion and sedimentation impacts to adjacent waters will be minimized. Plans submitted as part of the application for this permit and a County grading permit will specify practices to minimize the potential for sedimentation, erosion and pollution of coastal waters. The County will ensure that its contractor shall perform all earthwork and grading in conformance with:

- (a) "Storm Drainage Standards," County of Hawai'i, October, 1970, and as revised.
- (b) Applicable standards and regulations of Chapter 27, "Flood Control," and Chapter 10, "Erosion and Sedimentation Control," of the Hawai'i County Code.
- (c) Conditions of an NPDES permit.

Best Management Practices will include, but may not be limited to, the following practices:

- The contractor will install compost filter socks at certain areas of the construction site to restrict sediment movement.
- The contractor will construct and utilize a stabilized construction entrance to minimize tracking material offsite onto the adjacent road.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff.

### 3.1.3 Flora, Fauna and Ecosystems

#### *Existing Environment*

The property has been utilized for over a century for grazing, a school, and rodeo arena, and its terrain and vegetation have both been heavily modified. Most of the vegetation is either pasture grass, weedy waste areas that are periodically maintained, or planted trees including monkeypod (*Samanea saman*), mango (*Mangifera indica*), jacaranda (*Jacaranda mimosifolia*), tamarind (*Tamarindus indica*), and plumeria (*Plumeria* spp.). Where wild vegetation exists on the project site, it consists of weedy trees, shrubs, herbs and vines, including *koa haole* (*Leucaena leucocephala*), and/or guinea grass (*Megathyrsus maximus*), *opiuma* (*Pithecellobium dulce*), and *kaliko* (*Euphorbia heterophylla*). Only four native plants were observed, all of them very common. A full list of plants observed on the site is included as Table 1.

The project site is not valuable habitat for native fauna. Birds observed on the site are listed in Table 2. Those most abundant during observation were Common Myna (*Acridotheres tristis*), Japanese White-eye (*Zosterops japonicus*), and Saffron Finch (*Sicalis flaveola*). It is also expected that Spotted Dove (*Streptopelia chinensis*), Northern Cardinal (*Cardinalis cardinalis*) and House Finch (*Carpodacus mexicanus*) would be present. Only a few native birds are likely to be even occasionally present. These include the Pacific Golden-Plover or *kolea* (*Pluvialis fulva*), a migratory bird that resides in Hawai‘i from September to April and commonly forages or rests in grassy areas. Also known to be present in the area is the endangered Hawaiian Hawk (*Buteo solitarius*), which is found throughout wild, agricultural and urban landscapes on the Big Island as long as trees are present. The Hawaiian Owl or Pueo (*Asio flammeus sandwichensis*) may also make some use of the area. The endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell’s Shearwater (*Puffinus auricularis newelli*) may occasionally overfly the site at altitudes of about 100 feet as they pass between nesting areas on high mountains to foraging grounds in the ocean, but no suitable nesting habitat is present.

The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) likely forages in the area and could conceivably roost on some of the tall vegetation on the site. Apart from the Hawaiian hoary bat, all mammals in the project area are introduced species, including horses (*Equus caballus*) feral cats (*Felis catus*), small Indian mongooses (*Herpestes a. auropunctatus*) and various species of rats (*Rattus* spp.). None are of conservation concern and all are deleterious to native flora and fauna.

**Table 1 Plant Species Observed on Project Site**

Scientific Name	Family	Common Name	Life Form	Status
<i>Abutilon grandifolium</i>	Malvaceae	Hairy abutilon	Herb	A
<i>Ageratum conyzoides</i>	Asteraceae	Ageratum	Herb	A
<i>Allamanda cathartica</i>	Apocynaceae	Allamanda	Vine	A
<i>Amaranthus spinosus</i>	Amaranthaceae	Spiny amaranth	Shrub	A
<i>Asystasia gangetica</i>	Acanthaceae	Chinese violet	Herb	A
<i>Boerhavia coccinea</i>	Nyctaginaceae	Boerhavia	Herb	A
<i>Calyptocarpus vialis</i>	Asteraceae	Calyptocarpus	Herb	A
<i>Chamaecrista nictitans</i>	Fabaceae	Partridge pea	Herb	A
<i>Chamaesyce hirta</i>	Euphorbiaceae	Garden spurge	Herb	A
<i>Chloris barbata</i>	Poaceae	Swollen fingergrass	Grass	A
<i>Cleome gynandra</i>	Brassicaceae	Spider flower	Herb	A

Table 1, continued				
Scientific Name	Family	Common Name	Life Form	Status
<i>Clusia rosea</i>	Clusiaceae	Autograph tree	Tree	A
<i>Commelina benghalensis</i>	Commelinaceae	Hairy honohono	Herb	A
<i>Cordia subcordata</i> *	Boraginaceae	Kou	Tree	I
<i>Cynodon dactylon</i>	Poaceae	Bermuda grass	Grass	A
<i>Digitaria insularis</i>	Poaceae	Sourgrass	Herb	A
<i>Dysphania carinata</i>	Chenopodiaceae	Dysphania	Herb	A
<i>Eleusine indica</i>	Poaceae	Goose grass	Grass	A
<i>Eragrostis tenella</i>	Poaceae	Lovegrass	Herb	A
<i>Euphorbia heterophylla</i>	Euphorbiaceae	Kaliko	Shrub	A
<i>Falcataria moluccana</i>	Fabaceae	Albizia	Tree	A
<i>Hylocereus undatus</i>	Cactaceae	Night blooming cereus	Shrub	A
<i>Ipomoea indica</i>	Convolvulaceae	Koali 'awa	Vine	I
<i>Ipomoea triloba</i>	Convolvulaceae	Little bell	Vine	A
<i>Jacaranda mimosifolia</i>	Bignoniaceae	Jacaranda	Tree	A
<i>Jasminum sambac</i>	Oleaceae	Pikake	Shrub	A
<i>Kyllinga brevifolia</i>	Cyperaceae	Sedge	Herb	A
<i>Leonotis nepetifolia</i>	Lamiaceae	Lion's ear	Herb	A
<i>Leucaena leucocephala</i>	Fabaceae	Haole koa	Tree	A
<i>Malvastrum coromandelianum</i>	Malvaceae	Malvastrum	Herb	A
<i>Mangifera indica</i>	Anacardiaceae	Mango	Tree	A
<i>Manihot glaziovii</i>	Euphorbiaceae	Ceara rubber tree	Tree	A
<i>Mansoa hymenaea</i>	Bignoniaceae	Garlic vine	Vine	A
<i>Megathyrsus maximus</i>	Poaceae	Guinea grass	Grass	A
<i>Melia azedarach</i>	Meliaceae	Chinaberry	Tree	A
<i>Melinis repens</i>	Poaceae	Natal red top	Grass	A
<i>Momordica charantia</i>	Cucurbitaceae	Bitter gourd	Vine	A
<i>Paspalum conjugatum</i>	Poaceae	Hilo grass	Herb	A
<i>Plumeria sp.</i>	Apocynaceae	Plumeria	Shrub	A
<i>Plumbago auriculata</i>	Plumbaginaceae	Plumbago	Herb	A
<i>Pithecellobium dulce</i>	Fabaceae	Opiuma	Tree	A
<i>Pritchardia sp.</i>	Arecaceae	Loulu	Tree	A
<i>Ricinus communis</i>	Euphorbiaceae	Castor bean	Shrub	A
<i>Samanea saman</i>	Fabaceae	Monkeypod	Tree	A
<i>Sansevieria trifasciata</i>	Agavaceae	Mother-in-law's tongue	Shrub	A
<i>Schefflera actinophylla</i>	Araliaceae	Octopus tree	Tree	A
<i>Schinus terebinthifolius</i>	Anacardiaceae	Christmas berry	Shrub	A
<i>Sida rhombifolia</i>	Malvaceae	Broom weed	Herb	A
<i>Solanum americanum</i>	Solanaceae	Popolo	Shrub	I
<i>Tamarindus indica</i>	Fabaceae	Tamarind	Tree	A
<i>Waltheria indica</i>	Sterculiaceae	'Uhaloa	Herb	I

Key: A = alien, E = endemic, I = indigenous, Endan= listed endangered (\* indicates planted natives).

Note: *Pritchardia* species was a sterile juvenile with several offshoots in poor health; examination by three botanists concluded that it was most likely a Tahitian or Fijian palm, and not *Pritchardia maideniana*, which is endangered.

**Table 2. Bird Species Observed on Project Site**

<b>Scientific name</b>	<b>Common name</b>	<b>Status</b>
<i>Acroditheles tristis</i>	Common Myna	A
<i>Gallus gallus</i>	Chicken	A
<i>Geopelia striata</i>	Zebra Dove	A
<i>Lonchura malabarica</i>	Warbling Silverbill	A
<i>Paroaria capitata</i>	Yellow-billed Cardinal	A
<i>Zosterops japonicus</i>	Japanese White-eye	A

A= Alien

### *Impacts and Mitigation Measures*

Because of the lack of unusual native plants or intact native ecosystems on the project site, the Proposed Action would have no adverse impacts to native plants or vegetation habitat. Avoidance measures will be instituted in order to avoid impacts to Hawaiian Hawks, Hawaiian hoary bats, and listed seabirds:

- There will be no clearing of woody vegetation taller than 15 feet during the bat pupping season, which runs from June 1 through September 15 each year.
- If earthmoving or tree cutting is scheduled during the breeding season for Hawaiian Hawks (March through the end of September), the County will arrange for a hawk nest search to be conducted by a qualified biologist, and if hawk nests are present within 100 yards of any portion of the project site, all land clearing activity will cease until the expiration of the breeding season.
- All outdoor lighting it will be required to be shielded in conformance with the Hawai'i County Outdoor Lighting Ordinance to reduce the risk that seabirds may be attracted to and then disoriented by the lighting.
- No nighttime construction work will be allowed during the seabird-fledging season, which runs from September 15 through December 15 each year.

### **3.1.4 Air Quality, Noise, and Scenic Resources**

#### *Environmental Setting*

Air pollution in West Hawai'i is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that persistently blankets North and South Kona.

Noise on the project site is low to moderate and is derived principally from roadway noise, adjacent agricultural activities, and, occasionally, recreational activities on the project site.

The project site is on a small rural road in scenic South Kona, isolated for most other uses, The *makai* edge of the graded and useable portion of the site, where the comfort station and concession stand are, has views towards the shoreline, including Pu'uhonua O Hōnaunau, about 1.3 miles away (see photographs in Figure 4). The Hawai'i County General Plan identifies views "Hōnaunau Bay & Scenic View from Ke Ala O Keawe Road" as examples of natural beauty that require consideration. The project is not visible from Ke Ala O Keawe Road.

### *Impacts and Mitigation Measures*

During construction, there would be temporary and very minor effects to noise, air quality and visual quality. Because of the relatively remote location of the site, these activities would not markedly affect sensitive receptors. However, construction will likely include compressors, vehicles and equipment engine operations that are dependent upon means and methods utilized by the Contractor employed by the County. These activities can generate noise exceeding 95 decibels at times, impacting nearby sensitive noise receptors on the margins of the development. State law requires that whenever construction projects have noise that is expected to exceed the Department of Health's (DOH) "maximum permissible" property-line noise levels, contractors are required to consult with DOH per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH then reviews the proposed activity, location, equipment, project purpose and timetable in order to decide whether a permit is necessary and what conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers, will be necessary. The County will require the contractor to restrict construction to daylight hours, and also require the contractor will consult with DOH to determine any other appropriate restrictions.

Mitigation for dust generation will consist of several Best Management Practices, including a dust fence adjacent to Hōnaunau Road and periodic watering if necessary.

Operationally, the proposed improvements would not measurably affect air quality, noise levels or scenic sites recognized in the Hawai'i County General Plan. The slight increase in vehicular traffic associated with use of the pavilion would cause very slight increases in noise and exhaust emissions, but such increases are expected to be modest enough to not require mitigation. As discussed in Section 3.1.3, above, a number of trees including monkeypod, tamarind, *Schefflera* and *opiuma* are present on the property. The improvements have been designed to retain as many large trees as practical, with only one mango and one monkeypod tree requiring removal, along with several smaller trees. Due to the isolated location and modest scale of the proposed facilities, no aspect of the action would detract from scenic views of or from Hōnaunau Bay from any vantage point, including Ke Ala O Keawe Road. Views from the shoreline up the hill would remain scenic, as the proposed new facilities would simply replace other facilities that are themselves barely visible from the shoreline 1.3 miles away.

### **3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions**

#### *Environmental Setting, Impacts and Mitigation Measures*

The context of the project site, coupled with the absence of any known use of the site for other than a school during the early 20<sup>th</sup> century and recreational use since, suggests a low probability for hazardous materials. Additionally, visual surveys of the site and its surroundings during surveying, botanical and archaeological investigations did not reveal any hazardous materials nor structures, equipment, or storage containers that might be indicative of hazardous material use. Therefore, based upon known prior and present use of the project site, no hazardous substances, toxic wastes, or hazardous conditions are expected to be present. If evidence of suspicious materials or conditions appears during additional survey, design, or construction, P&R will undertake a systematic assessment of the property.

## 3.2 Socioeconomic and Cultural

### 3.2.1 Socioeconomic Characteristics

Hōnaunau Rodeo Arena is one of the few public recreational facilities within the Hōnaunau-Napo‘opo‘o census designated place (CDP). As of the 2010 census, this CDP contained 2,567 of South Kona’s 9,997 inhabitants, but had only one County park (the undeveloped Manini Beach Park) as well as the rodeo arena and Hōnaunau Boat Ramp. Non-County recreational areas include Pu‘uhonua O Hōnaunau National Historical Park and the Kealakekua Bay State Park, which do not have facilities suitable for general community use.

#### *Impacts*

The rodeo arena is surrounded by agricultural land, with several homes and farms within 300 feet and less than a dozen within 1,000 feet. This somewhat remote context, coupled with the long-established use, minimizes the potential for neighborhood impact that would result from minor expansion of the facility and broadening uses to include a recreational pavilion. As rodeo events tend to attract as many as 700-800 participants and spectators from around the island of Hawai‘i, the improvements to the rodeo arena itself, as well associated facilities such as water systems, restrooms, concessions, parking and circulation, would benefit residents of the entire island. Expanded pavilion uses would benefit primarily residents of South Kona.

### 3.2.2 Cultural Resources

This section utilizes a variety of previous studies concerning Kona. In addition, the archaeological inventory survey involved documentary research and interviews focused on this particular project site. The summary below does not include scholarly references except for quoted material; interested readers may consult Appendix 2.

#### *Cultural and Historical Background*

The project site is located in the modern district of South Kona and also on the lower, *kula* slopes of Kona, one of six traditional districts on Hawai‘i Island. Kona possesses a unique environment that played a large role in human actions from the time of Polynesian settlement to the modern day. After the first Polynesians in Hawai‘i arrived, they shaped and utilized the natural environment over generations to provide all they needed for sustenance and survival. In the process they created a uniquely Hawaiian culture that was wholly adapted to the environment. The brief generalized cultural sequence that follows below provides a time frame for the peopling of Hawai‘i, the development of Hawaiian culture, the expansion and intensification of the Hawaiian population, and the resulting stresses on it from the earliest Polynesian settlers to the time of European Contact.

The generalized cultural sequence that follows is based on Kirch’s (1985) model, and amended to include recent revisions offered by Kirch (2011). The initial settlement in Hawai‘i is believed to have occurred from the southern Marquesas Islands somewhere around 1000 AD. This was a period of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by

adapting their familiar patterns and traditional tools to their new environment. Their ancient and ingrained philosophy of life tied them to their environment and kept order. Order was further assured by the conical clan principle of genealogical seniority. The Hawaiians brought from their homeland certain universal Polynesian customs: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *‘aumakua* concept; and the concept of *mana*. Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and marine resources. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups. Soon, large areas of Hawai‘i were controlled by a few powerful chiefs.

The Development Period brought about a uniquely Hawaiian culture. The portable artifacts found in archaeological sites of this period reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (*ko‘i*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. A few areas in Hawai‘i, including the summit region of Mauna Kea, produced quality basalt for adze production. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are *‘ulu maika* stones and *lei niho palaoa*. The later was a status item worn by those of high rank, indicating a trend toward greater status differentiation.

The Expansion Period is characterized by the great social stratification, major socioeconomic changes, and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period. Subsistence patterns intensified as crop farming evolved into large irrigated field systems and expanded into the marginal dry land areas. The *loko* or fishpond aquaculture flourished during this period.

For generations following initial settlement, communities were clustered along the watered, windward (*ko‘olau*) shores of the Hawaiian Islands. Along the *ko‘olau* shores, streams flowed and rainfall was abundant, and agricultural production became established. The *ko‘olau* region also offered sheltered bays from which deep sea fisheries could be easily accessed. Nearshore fisheries, enriched by nutrients carried in the fresh water, could be maintained in fishponds and coastal waters. It was around these bays that clusters of family houses could be found. In these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence level agriculture and fishing.

During the first couple centuries of habitation, areas with the richest natural resources became populated and perhaps crowded, and archaeological evidence suggests that by A.D. 1200 the population began expanding to the *kona* (leeward) side and more remote regions of the island. In Kona, communities were initially established along sheltered bays with access to fresh water and rich marine resources. The primary “chiefly” centers were established at several locations—the Kailua (Kaiakeakua) vicinity, Kahalu‘u-Keauhou, Ka‘awaloa-Kealakekua, and Hōnaunau. The communities shared extended familial relations and there was an occupational focus on the collection of marine

resources. By the fourteenth century, inland elevations up as high as the 3,000-foot level were being turned into a complex and rich system of dryland agricultural fields (today referred to as the Kona Field System). By the fifteenth century, residency in the uplands was becoming permanent in at least some areas, and there was an increasing separation of the chiefly class from the common people. In the sixteenth century the population stabilized and the *ahupua'a* land management system was established as a socioeconomic unit.

In Kona, where there no regularly flowing streams flow to the coast, access to potable water (*wai*), was critical and played an important role in determining the areas of settlement. The waters of Kona were found in springs and caves (found from shore to the mountain lands), or procured from rain catchments and dewfall. Traditional and historic narratives abound with descriptions and names of water sources, and also record that the forests were more extensive and reached much further seaward than they do today. These forests not only attracted rains from the clouds and provided shelter for cultivated crops, but also in dry times drew the *kēhau* and *kēwai* (mists and dew) from the upper mountain slopes to the low lands.

In the 1920s-1930s, Handy et al. (1991) conducted extensive research and field interviews with elder native Hawaiians. In lands of North and South Kona, they recorded native traditions describing agricultural practices and rituals associated with rains and water collection. Primary in these rituals and practices was the lore of Lono—a god of agriculture, fertility, and the rituals for inducing rainfall. Handy et al., observed:

The sweet potato and gourd were suitable for cultivation in the drier areas of the islands. The cult of Lono was important in those areas, particularly in Kona on Hawai'i . . . there were temples dedicated to Lono. The sweet potato was particularly the food of the common people. The festival in honor of Lono, preceding and during the rainy season, was essentially a festival for the whole people, in contrast to the war rite in honor of Ku which was a ritual identified with Ku as god of battle. (Handy et al. 1991:14)

The worship of Lono was centered in Kona. Indeed, it was while Lono was dwelling at Keauhou that he is said to have introduced taro, sweet potatoes, yams, sugarcane, bananas, and *'awa* to Hawaiian farmers. The rituals of Lono (The father of waters) and the annual *Makahiki* festival honored Lono. These began before the coming of the *kona* (southerly) storms and lasted through the rainy season (the summer months), and were of great importance to the native residents of this region. The significance of rituals and ceremonial observances in cultivation and indeed in all aspects of life was of great importance to the well-being of the ancient Hawaiians, and cannot be overemphasized, or overlooked when viewing traditional sites of the cultural landscape.

Over the generations, the ancient Hawaiians developed a sophisticated system of land and resources management. By the time 'Umi-a-Līloa rose to rule the island of Hawai'i around 1525, the island (*moku-puni*) was divided into six districts or *moku-o-loko*. The district of Kona extends from the shore across the entire volcanic mountain of Hualālai, and continues to the summit of Mauna Loa, where Kona is joined by the districts of Ka'ū, Hilo, and Hāmākua. Kona, like other large districts on Hawai'i, was subdivided into *'okana* or *kalana* (regions of land smaller than the *moku-o-loko*, yet comprising a number of smaller units of land). The *moku-o-loko* and *'okana* or *kalana* were further divided into

manageable units of land, and were tended to by the *maka 'āinana* (people of the land). Of all the land divisions, perhaps the most significant management unit was the *ahupua'a*. *Ahupua'a* are subdivisions of land that were usually marked by an altar with an image or representation of a pig placed upon it. *Ahupua'a* may be compared to wedge-shaped pieces of land that radiate out from the center of the island, extending to the ocean fisheries fronting the land unit.

The *ahupua'a* were also divided into smaller individual parcels of land (such as the *'ili, kō'ele, māla,* and *kīhāpai*, etc.), generally oriented in a *mauka-makai* direction, and often marked by stone alignments (*kuaiwi*). In these smaller land parcels the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people who lived in a given *ahupua'a* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *ali'i*. Entire *ahupua'a*, or portions of the land were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *ali'i-'ai-ahupua'a* (chief who controlled the *ahupua'a* resources). The *ali'i-'ai-ahupua'a* in turn answered to an *ali'i 'ai moku* (chief who claimed the abundance of the entire district). Thus, *ahupua'a* resources supported not only the *maka 'āinana* and *'ohana* who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resource management planning. In this system, the land provided fruits and vegetables and some meat in the diet, and the ocean provided a wealth of protein resources.

The Hōnaunau Rodeo Arena property is situated toward the southern end of a vast archaeological landscape that has been termed the Kona Field System. This landscape comprises about 50 square miles of dry-land agricultural fields that extend from Ho'okena Ahupua'a north to at least Kaū Ahupua'a, and east from the coastline all the way to the forested slopes of Hualālai, about 7,000 feet above sea level. A large portion of the field system is designated in the Hawai'i State Inventory of Historic Places (SIHP) as Site 50-10-37-6601 and has been determined eligible for inclusion in the National Register of Historic Places.

In communities with long-term royal residents, like Hōnaunau, specialist labor was the norm, with occupational activities on land and in procurement of marine resources. In the *ahupua'a* of Hōnaunau, perhaps based on specialist labor in combination with resource availability, there appear to have been two distinct settlement zones, a coastal village centered on the royal compound and *pu'uhonua*, and a more *mauka* agricultural settlement, with relatively marginal land in between the two areas.

Hōnaunau's ample marine and land resources made it attractive to the Hawaiians who settled on the *kona* coast of the island. The area's calm waters and sandy beaches provided easy access to abundant fish and other marine resources, and a dependable water source could be found in a number of brackish springs, actually tide pools in which rainwater and natural seepage accumulated on the surface of the salt water. The gentle, fertile upland slopes were conducive to growing taro, bananas, sweet potatoes, sugarcane, and breadfruit. Stands of hardwood trees

provided wood for constructing residences and religious structures and for manufacturing canoes. With these resources at hand, Hōnaunau became the traditional seat of the chiefdom of Kona. The ruling chief and his court occupied the area at the head of the bay and along the shore to the south, while lesser chiefs, commoners serving the court, and priests resided on the north shore of the bay, toward the mountains, and possibly at Kēōkea and Ki'ilae villages to the south.

Because of their great cultural and historical significance, the royal compound and Pu'uhonua o Hōnaunau have been the subject of numerous archaeological and ethnohistorical studies, which are cited in Appendix 2. The ancient village of Hōnaunau was the ancestral home of the Kamehameha dynasty, serving in ancient times as a major Hawaiian religious and cultural center. The few archaeological dates available for what became the royal compound indicate that the first *heiau*, 'Āle'ale'a I, was built in the A.D. 1000s-1300s. The *pu'uhonua*, or place of refuge, was reported by Kamakau (1870) to have been built by Keawe-ku-'i-ke-ka'ai during the reign of his father Keakealanikane about A.D. 1660-1680. The royal mausoleum (Hale-o-Keawe) appears to have been constructed after the death of King Keawe-'ikekahi-ali'i-o-ka-moku, Kamehameha's great-grandfather, about A.D. 1740. The remains of many as sixteen of Kamehameha's ancestors came to be housed there, and their *mana* endowed the area with extreme sacredness and the refuge with powerful guardian spirits.

The importance of Hōnaunau as a royal compound features in John Papa I'i's (1959) account of the death of King Kalani'ōpu'u around 1782, which set the stage for the battle of Moku'ōhai and Kamehameha's eventual conquest of Hawai'i Island. When Kalani'ōpu'u died at Ka'ū, his remains were taken to Kapalilua. Kiwala'ō (Kalani'ōpu'u's heir), and his cousin Kamehameha met at Hōnaunau, and disagreements over the division of lands arose. The events that unfolded led to a battle that brought Kamehameha to gain control over part of the island of Hawai'i. I'i described:

When the company from Kau reached Kapalilua in Kona with the corpse of Kalaniopuu, they heard that Kamehameha had arrived at Keei. That was probably the reason why the corpse was not taken to Kailua but to Hōnaunau, as they had originally agreed . . .

...After the Kau chiefs had been at Hōnaunau a while, Kamehameha and his canoe paddlers arrived in his single canoe, named *Noiku*. They landed back of Akahipapa, a lava flat extending into the sea. No sooner had his foot touched land than those on shore were ready to hurl spears of *hau* wood at him, a custom observed upon the landing of a high chief. This they did, and those on land watched with admiration as Kamehameha thrust them aside. A person remained near the chief with a container of water for his bath; and after the spear throwers had finished and had seated themselves, Kamehameha bathed and donned a dry *malo*. He went up to see his cousin Kiwalao, and when they met food was made ready. Thus they met graciously. As Kamehameha went there to see Kiwalao, so did his cousin visit him at Keei, spending the night time and again. It was said that Kamehameha served his cousin as steward during these visits. As Kiwalao was in no hurry to return to Hōnaunau, his uncle, Keawemauhili, came for him. He left at Keawemauhili's insistence, which caused Kiwalao to remark to Kamehameha that his uncle

seemed to be disturbed over their friendly association. “Because of this, trouble may brew between us,” he said. It happened so . . .

...That night, overseers sent a proclamation to all the men of the chiefs to go to the upland of Hōnaunau for some taro. That same night the great warrior taught Keoua all the things that he was to do on the morrow on the sands of Hauiki in Mokuohai. When day came, all the men had gone to the upland, having started while it was still dark because of the long distance they had to travel to and-fro. This gave Keoua and his companions a chance to do their work. After eating, they went to the beach to bathe or dive (*lele kawa*). They went along the shore diving until they reached Hauiki in Mokuohai. There coconut trees were hewn down, houses burned, and men killed. After this act of war, they turned about and went home. The work was then taken up by others, for the news had reached the chiefs of both sides. They prepared for war and the war canoes were made ready... (I'i 1959:13)

Another account by John Papa I'i states that Kamehameha's son Liholiho regularly visited the Hale-o-Keawe during his journeys to various *luakini* as his father's representative in those rituals necessary to replenish their *mana*. Liholiho would begin this series of prescribed visits in Kailua, proceed up the coast to Kawaihae, and then continue on around the island, finally stopping at Hale-o-Keawe.

As a *pu'uhonua*, the compound at Hōnaunau provided a haven for *kapu* violators and refugees displaced by warfare. The missionary William Ellis, who circled the island of Hawaii in 1823, (1964:126-128) provided a lengthy description of how the *pu'uhonua* functioned, as told to him by people who had seen it used:

This had several wide entrances, some on the side next the sea, the others facing the mountains. Hither the manslayer, the man who had broken a tabu, or failed in the observance of its rigid requirements, the thief, and even the murderer, fled from his incensed pursuers, and was secure.

To whomsoever he belonged; and from whatever part he came, he was equally certain of admittance, though liable to be pursued even to the gates of the enclosure. Happily for him, those gates were perpetually open; and as soon as the fugitive had entered, he repaired to the presence of the idol, and made a short ejaculatory address; expressive of his obligations to him in reaching the place with security. Whenever war was proclaimed, and during the period of actual hostilities, a white flag was unfurled on the top of a tall spear, at each end of the enclosure, and, until the conclusion of peace, waved the symbol of hope to those who, vanquished in fight, might flee thither for protection. It was fixed a short distance from the walls on the outside, and to the spot on which this banner was unfurled, the victorious warrior might chase his routed foes; but here, he must himself fall back; beyond it he must not advance one step, on pain of forfeiting his life.

The priests, and their adherents, would immediately put to death any one who should have the temerity to follow or molest those who were once within the pale of the pahu tabu; and, as they expressed it, under the shade or protection of the spirit of Keawe, the tutelar deity of the place.

In one part of the enclosure, houses were formerly erected for the priests, and others for the refugees, who, after a certain period, or at the cessation of war, were dismissed by the priests, and returned unmolested to their dwellings and families; no one venturing to injure those, who, when they fled to the gods, had been by them protected.

We could not learn the length of time it was necessary for them to remain in the puhonua; but it did not appear to be more than two or three days. After that, they either attached themselves to the service of the priests, or returned to their homes. The puhonua at Hōnaunau is capacious, capable of containing a vast multitude of people. In time of war, the females, children, and old people of the neighbouring districts, were generally left within it, while the men went to battle. Here they awaited in safety the issue of the conflict, and were secure against surprise and destruction, in the event of a defeat. (Ellis 1963:126-128)

Various traditional stories recounted in Appendix 2 confirm the antiquity of the *pu'uhonua* and its protocols.

Several factors contributed to the decline of Hōnaunau as a political center in the late eighteenth century. The small, shallow harbor could not accommodate European and American trading ships, and for that reason Kamehameha and other *ali'i* anxious to initiate social and economic interaction with foreigners moved to places that could, such as Kailua and Honolulu. The abolition of the *kapu* system in 1819 rendered the place of refuge unnecessary and ultimately led to the plunder of its sacred objects in 1825 by Lord Byron and the removal of the *iwi* of the *ali'i* housed in the Hale o Keawe by Ka'ahumanu in 1829. The regent had the deified bones placed in two large coffins, or wooden boxes, and secretly interred in Hoaiuku cave in the Ka'awaloa cliffs at Kealakekua Bay, where they remained for almost thirty years before being moved again, reportedly to the royal mausoleum in Nu'uau. The loss of Hōnaunau's political and religious importance to most Hawaiian inhabitants exacerbated the effects of disease and drought, and the seacoast village gradually lost inhabitants to the upland sections in the 1840s. By the late 1870s, the coastal village of Hōnaunau had diminished even further in size, and the *pu'uhonua* had begun to be touted as a tourist destination in guides.

Historical narratives of Hōnaunau from the late eighteenth to the early twentieth centuries provide details and insight into the changes that accompanied Hōnaunau's diminishing political and religious importance. The authors of these accounts were explorers, missionaries, and travelers, and their observations often include important descriptions of features that make up the cultural landscape (e.g., villages, *heiau*, trails, and agricultural fields), the nature of land use, and transitions in the Hawaiian community. Some of the writers also recorded traditions and their observations of traditional practices in their journals and letters.

The earliest of these accounts were recorded during Captain James Cook's fateful visit to Kealakekua Bay. Cook landed in the Hawaiian Islands on January 18, 1778, marking the end of the Precontact Period and the beginning of the Historic Period. The following January [1779], Cook and Kalani'ōpu'u met in Kealakekua Bay and exchanged gifts. In February, Cook set sail intending to leave the Hawaiian Islands; however, a severe storm off the Kohala coast damaged a mast and he was forced to return to Kealakekua. Cook's return occurred at an inopportune time, and this misfortune cost him his life. Commander Charles Clerke and Lieutenant James King, who accompanied and survived Cook, provided readers with the earliest recorded descriptions of life in the South Kona region. They described extensive plantations (some of which were more than 6 or 7 miles inland) in which taro, sweet potatoes, breadfruit, plantains (cooking bananas), and *wauke* (the "cloth" plant) were grown. The plantations as described by Clerke and King were formally laid out and in many instances bounded by walls. These formal fields were a part of what have been archaeologically described as the Kona Field System (see above), which also included less formal and opportunistic planting strategies in marginal environments with less soil and rain, like that found in the *kula* of Hōnaunau. Cook's crew also reported that most residences were situated near the shore, and that only few good houses were observed inland. While in the forests, various activities and features were observed as well—among them were canoe making, bird catching, and the occurrence of trails. They also noted that the Hawaiians demonstrated knowledge of upland resources and travel to the mountain lands.

After departing from Kealakekua, King took the opportunity to write up an account of excursions to the lands behind Kealakekua-Nāpo'opo'o (north of Hōnaunau), and of the trip begun on January 26, 1779 to the mountain lands from Kealakekua.

... As we have now left Karakooa [Kealakekua] bay, I shall before we go any farther, give a description of what was seen in the Country about it; (in the doing of which I am oblig'd to those who took the excursion up towards the Mountain) & leave any occurrences or Observations that may give an insight into their Arts & Manners, till we have bid a final Adieu to the Group of Islands; that also will be the best time to give in one View the dimensions of the different Island, &c. I was never myself above 3 miles into the body of the Country; for the first 2 ½ miles it is compos'd of burnt loose stones, & yet almost the whole surface beginning a little at the back of the town, is made to yield Sweet potatoes & the Cloth plant. One then comes to breadfruit trees which flourish amazingly. The ground was very uneven & although there was a tolerable Soil about the trees, yet there was constant breaks in the land & large bare, burnt rocks; in the bottoms that these made were planted the Sweet Potato roots with earth collected about them; my occupation at the Observatory hindered me always proceeding farther. If I had I should have come to the extensive cultivated spots that are visible at the Ships beyond the grove of bread fruit trees: I shall therefore relate the Journey of the party of seven & 4 guides who set out on the afternoon of the 26th.

They travelled 3 or 4 miles & found the Country as above represented, after which were the regular & very extensive plantations. The Plantain trees are mixed amongst the breadfruit

trees & did not compose any part of the plantation except some in the Walls: these walls separate their property & are made of the Stones got on clearing the Ground; but they are hid by the sugar cane being planted on each side, whose leaves or stalk make a beautiful looking edge. The Tarrow or Eddy root & the sweet Potato with a few cloth plants are what grow in these cultivated spots. The party stopt for the Night at the 2d hut they met on this ground, they then judged themselves 5 miles from our Village, or at the top of the first hill as seen at the Ship. The Prospect was delightful: they saw the Ships in the bay: to the NW a continuation of Villages by the Sea shore & to the left a thick wood, to the right cultivated ground as far as they could see, & a thick wood on their back. The Potatoes & Tarrow are planted 4 feet from each other, the former is cover'd except the tops with about a bushel of light Mould, the latter is left bare to the roots, & the mould surrounding made in the form of a basin, in order to preserve the rain as this root is fond of & requires much humidity, it should be noted that the Tarro of these Islands is the best we have ever tasted. They foresaw, from the few Cottages scattered about & the poverty of the one they took their residence in, that their trade would not be able to ensure them provisions ...

On the 27th in the Morning they set out & filld their Calabashes at an excellent well about ½ a mile from their hut & enter'd the wood by a foot path, made, as they understood, by those who fetch wild or horse Plantains, & who go to Catch birds; it was either Swampy or else Stoney, also narrow, & made still worse by large trunks of trees laying across it, there was no proceeding on either side of the path for underwood; as far as the Wild plantains grew, intermixt amongst the trees, were at Certain distances white flags secur'd to poles, which they took for divisions of Property ...

The 28th they march'd along the Skirt of the Wood for 6 or 7 miles, & then enterd again, by a path that went away to the Eastward. For the first 3 miles they passd thro a wood compos'd of high trees, interspers'd with Plantations of Plantains, for the next three miles were dwarfish trees, much underwood, & growing amongst broken burnt Stones. They then came again to a pleasant wood... In this wood they pass'd many Canoes, half finishd, & a hut also, but since their first entering of the different Woods could find no water, of which they began to feel the want, they proceeded on about 3 miles in this last Wood, when coming to two huts that was convenient for holding their whole party, they stopped; heartily fatigued with their day's Journey, having walkd as they thought 20 miles this day, but they were obligd to separate into parties in search of water, & at last found some rain water in the bottom of a Canoe, which although the Colour of red wine, was to them a very agreeable sight ...  
(Beaglehole 1967:520–523]

Clerke's notes of the Kealakekua region—describing agricultural development and native “towns,” and practices observed from near shore to the upper mountain slopes—concur with those of King and add some additional site and resource descriptions:

... this being the Lee side of the Isle the Natives have been at infinite pains to clear away the Cindars to make their plantations; the fertility of the Soil however when

they do come at it very well repays them for their trouble; for nothing in nature can be more abundantly prolific, being a fine rich Loom, tho' in many places they have been obliged to remove 4, 5, or 6 feet depth of Cinders, and the soil when they come to it probably does not exceed two or at most three feet, but what there is of it is excellent beyond comparison; two or three miles up the Country the soil becomes deeper and is luxurious to the last degree. All the Shores on the Southern and Western sides are formed by burnt Rocks, and in many places where they break off in Cliffs there are numberless Caverns blown in the sides.

The Towns of the Natives are built along the Sea side. At [Kealakekua] Bay there were three, one [Kealakekua-Nāpo'opo'o] on the SE-tern side of the Bay which was very large extending near two miles along the shore, another [Ka'awaloa] upon the NWtern side which was not so large, and a small Village [Palemano] in the cod or bottom of the Bay. At the back of the villages upon the Brow of the Hill are their plantations of Plantains, Potatoes, Tarrow, Sugar Canes &c, each mans particular property is fenced in with a stone wall; they have a method of making the Sugar Cane grow about the walls so that the stones are not conspicuous at any distance, but the whole has the appearance of fine green fences. These Plantations in many places they carry six or seven miles up the side of the hill, when the woods begin to take place which diffuse themselves from hence to the heights of the eminences and extend over a prodigious track of ground; in these woods are some paths of the Natives and here and there a temporary house or hut, the use of which is this; when a man wants a Canoe he repairs to the wood and looks about him till he has found a tree fit for his purpose and a convenient spot for his work; having succeeded thus far, he runs up a house for his present accommodation and goes to work upon his Canoe, which they in general compleatly finish before it's moved from the spot where its materials had birth. Our people who made excursions about the Country saw many of these Canoes in different states of forwardness, but what is somewhat singular, if one of their vessels want repairing she is immediately removed into the woods though at the distance of 5 or 6 miles. These woods abound with wild Plantains which though not equal to the cultivated, are far from being a bad fruit. The poorer sort of People here make a very general use of them. Upon the highest hills our people could ascend, the burnt rocks were in many places bare or only covered with a little moss with numberless Chasms blown in them by the violence of the volcano, though just by, there would be soil enough to hold large trees very firm... (Beaglehole 1967:591– 593)

All their Towns are built along the Sea shore, up the Country there is not a house to be seen except such temporary Huts as has been before described and here and there one by a large plantation where the peasants sometimes lodge who look after it . . . (Beaglehole 1967:599)

The village of Hōnaunau itself was visited fourteen years later, on February 28, 1793, when the Vancouver expedition's botanist, Archibald Menzies, arrived there at the tail end of an exploratory expedition into the uplands behind Kealakekua Bay. He and his companions:

. . . arrived in the afternoon at a village by the seaside called Hōnaunau, about two leagues to the southward of Kealakekua Bay. As we approached it, the natives came out in great crowds to meet us. The young women expressing their joy in singing and dancing, from every little eminence, to entertain us, while the men received us with a clamorous welcome and an officiousness to serve us that would have been troublesome and teasing had they not been kept in good order by John Smith and the natives who accompanied us, who exercised their authority by clearing an avenue before us wherever we went. They took us to a large house which was tabooed for the king, with a number of smaller houses contiguous to it for sleeping in and for his attendants when he comes to the village. We were told that he has a set of houses kept for him in the same way in every village he is likely the island, which, when he once occupies or eats in, cannot afterwards be used by any other. (Menzies 1920:87)

Menzies and his companions spent an uneventful night in the village. Little interested in ethnography, Menzies seemed unimpressed by the presence of the refuge or its meaning in Hawaiian culture. He mentions only that during the night, "in a large marae close to us we now and then heard the hollow sounding drums of the priests who were up in the dead hour of the night performing their religious rites" (Menzies 1920:87).

In April 1824, the year following Ellis' visit, the first South Kona Mission Station was established on the flats of Ka'awaloa by Reverend James Ely. Four years after his arrival, James Ely departed from Ka'awaloa (October 15, 1828), and was replaced by Samuel Ruggles (who transferred from the Kailua Station). On May 17, 1832, Cochran Forbes arrived in Hawai'i to take up residence at the Ka'awaloa (South Kona) Mission. Forbes sailed from Ka'awaloa on October 10, 1836, beginning a tour of the southern portion of his mission station. His journal offers readers a description of the villages he visited, the conditions of the schools, churches, and circumstances of the people, in Hōnaunau the region. While Forbes at times wrote with a prejudice, his first-hand accounts are of value in understanding the historic landscape of the period.

Forbes wrote that he first "arrived at Honaunau," the coastal village, where he "preached to a congregation in the school room" (Forbes 1836:2). His journal entry of October 13th, provides readers with a general overview of the villages between Hōnaunau and "Opihale" (or 'Ōpihihale):

I ought to say that all these villages are destitute of regular schools, tho I found in all of them a number who can read & in some cases almost the whole village could read. The teachers who had taught them that much, have deserted their posts and gone, many of them, after chiefs. They being the most capable men of their villages, in many cases, have been greedily courted by the chiefs, for headmen or for men to wait about their persons, and a prospect of earthly gain is as attractive to these poor heathens as any... nor indeed can I blame them. But we must now have better teachers to supply their place. I found the people in all of the villages remarkably

kind & docil & believe they would generally be glad to have schools if they had competent teachers. The above remarks apply to most every village from Hōnaunau, 10 miles south of us to Kau . . . (Forbes 1836:9-10)

Mark Ives also settled in the South Kona Station with Forbes, and in 1835, they established the Keālia-Kapalilua out-station of South Kona. Under Forbes' tenure, the Ka'awaloa Station relocated to the Kepulu vicinity of Nāpo'opo'o (location of the present-day Kāhikolu Church), in 1839, and became known as the Kealakekua Station. Forbes remained in Kona until 1845, and Ives remained until 1847. Ives' reports from the Mission Station includes descriptions of the devastating impacts of a drought, fires, and then heavy rains upon the native population and landscape of South Kona.

By the mid-nineteenth century, the ever-growing population of Westerners in Hawai'i forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. In 1848 the *Māhele 'Āina* became the vehicle for determining ownership of native lands. This change in land tenure was promoted primarily by the missionaries and Western businessmen in the island kingdom. Generally these individuals were hesitant to enter business deals on leasehold land. The *Māhele* (division) defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. The *Māhele* placed all lands in the Kingdom of Hawai'i in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) *Konohiki* Lands. The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission.

As a result of the *Māhele*, the *ahupua'a* of Hōnaunau was awarded as LCAw 11216, 'Āpana 34 to Mikahela Kekau'ōnohi. The land was later patented under Royal Patent 7874. Upon Kekau'ōnohi's death, the *ahupua'a* of Hōnaunau was inherited by her second husband, Levi Ha'alelea. After Ha'alea's death, the administrator of his estate sold the land at auction in 1866 to W.C. Jones, agent for Charles Kana'ina, the father of King Lunalilo. Jones never paid for the land, and so Charles R. Bishop bought it in 1867 as a present for his wife, Bernice Pauahi. Six years after her death, Bishop deeded Hōnaunau to the Trustees of the Bishop Estate. Many smaller *kuleana* claims were made within Hōnaunau. The Waihona 'Āina *Māhele* database lists 80 *kuleana* claims, of which 60 were awarded. Not surprisingly, the majority of these claims are located either near Māmalahoa Highway or near the coast, with only five of the awarded parcels (see Table 2 and Figure 18 in Appendix 2) located at least partially in the *kula* lands near the Hōnaunau Rodeo Arena property. No *kuleana* were awarded within 1,000 feet of arena. However, descriptions of the many upland *kuleana* claims attest to the substantial agricultural use of those lands, and it is perhaps telling that so few claims were made for *kula* lands, despite the evidence of the Kona Field System features at similar elevations in nearby *ahupua'a*.

Descriptions of Hōnaunau and adjoining lands written after the *Māhele* provide some details about transitions in the region's agricultural focus and population. Annual mission station reports by the Reverend John D. Paris, who relocated from Wai'ōhinu in Ka'ū, to the Kealakekua Station in 1852,

described living conditions among some of the native tenants as a result of the *Māhele* (Maly and Maly 2002). For the most part, settlements remained along the shores and cultivation of fruits, vegetables, and coffee occurred in the *mauka* lands. Goats became so prevalent that some of the *kula* lands of Hōnaunau became described in mission reports as “goat runs.” Goats continued to be raised here into the 1920s. William Paris, Sr., the grandson of the Reverend J. D. Paris, returned to Hōnaunau after a brief stint developing a cattle and sheep operation on Kaho‘olawe with Angus MacPhee and H. A. Baldwin. Paris leased *kula* lands in Hōnaunau and Ke‘ei from the Bishop Estate, raising angora goats and some cattle on the land. As his son Billy Paris recalls, however, his father at period of time, decided that they didn’t want goats raised on their lowlands anymore” (Paris 1981:1182). Ranching in Hōnaunau after that time focused on cattle. At about the time that the Paris family stopped leasing Hōnaunau *kula* lands, stone walls began to appear on maps of the area, evidence of this shift.

The Hōnaunau School opened on what is now the rodeo arena lot in 1897. It was preceded by a series of schools located in the coastal village. Originally established by the missionaries, population changes and other factors led to the closure and re-opening of schoolhouses in Hōnaunau between the 1830s and 1897. Interest in moving the school *mauka* began in the 1850s, but due to various reasons, a school was not built here until 1897. The original lot contained two buildings: the school building and a cottage occupied by the school master. Trails led eastward from the lot to the *mauka* Government Road. The school lot was surrounded by stone fences, but officials complained that these were not always successful in keeping errant livestock off the school property. The school lot was expanded during the 1920s as lands were purchased from the B.P. Bishop Estate. In 1921 an additional 1.74 acres adjoining the western boundary of the original school lot was purchased. Maps of the period that still survive today indicate the locations of buildings and boundaries, as reproduced in Appendix 2.

A magnitude 6.9 earthquake struck several miles offshore of Kealakekua Bay on August 21, 1951, and caused the Hōnaunau School buildings and water tank to collapse, among many other buildings and stone walls throughout Kona. Alfred Medeiros, Jr., who worked for McCandless Ranch between 1941 and 1989, recalled in an interview with Kepā Maly that he spent time fixing collapsed stone walls on the ranch after the earthquake:

No, we had the fence gang. When I started working just patched walls. That’s all we used to do. That big earthquake came when was...the trap, the walls all fall down so we just build ‘em up again. (Alfred Medeiros, Jr., quoted in Maly and Maly 2001b:A-200)

Due to the damage sustained during the quake, the school buildings were abandoned, and the Hōnaunau School was moved north to Ke‘ei. In 1954, the earthquake-damaged and abandoned main school building was still in place, but by 1961 it had been razed. The school buildings remained on the property into the 1960s, when the school lot was converted into the current rodeo grounds. From the Kona Historical Society’s website:

... In 1964, a group of South Kona residents with cowboy connections approached ranch manager Freddy Rice and his wife Sally for help in starting up a rodeo in Kona. The Rices had just returned from the world famous Calgary Stampede in Canada, so “Kona Stampede” was a natural choice for this upstart venture’s name. With Freddy’s help, August and Sonny Loando, Clarence and

Alfred Medeiros, and Frank Henriques asked the County for permission to acquire the old Hōnaunau School grounds for a roping arena. The devastating earthquake of August 21, 1951, had destroyed the original wooden school buildings and water tanks, leaving only grassy playing fields and a paved basketball court behind. (And, if ever an abandoned school was graced with a view, this one was it.)

With permission to move ahead, newly formed Kona Roping and Polo Club scoped out the layout of other arenas around the island and dug holes for posts. McCandless Ranch donated wooden poles and, once the arena was complete, produced wild cattle for roping practice! Wives and mothers jumped in to help, including Loke Medeiros, Mabel Medeiros and Sally Rice as pioneer secretaries. They did a great job and the kids of Kona had fun competing. (Melrose n.d.)

### *Existing Cultural Resources, Impacts and Mitigation Measures*

The project site is currently an actively used County recreational facility. Although it was formerly part of a traditional landscape that was heavily utilized for cultivation, it has been substantially transformed through goat and cattle ranching, use as a school lot for over half a century, and development as a rodeo arena. It does not contain natural features that might important in gathering or ritual, such as caves, springs, *pu'u*, native forest groves, etc. The vegetation is highly disturbed and does not contain the quality and quantity or resources that would be important for native gathering. The project site does not currently support any traditional resource uses, but rodeos are a symbol and reinforcement of the ranching and *paniolo* culture of Hawai'i, which has evolved to draw from and include a blend of ethnic groups.

It would not appear that the Proposed Action would have an adverse effect on the cultural/historical resources of the project site. Consultation with knowledgeable individuals in the area indicates a continuing interest in facilitating and improving rodeo features, which are integral to preservation of the *paniolo* culture. As discussed in the next section, ranching walls that have been converted to site use over the decades are present. Continuing the time-honored tradition of maintaining and modifying these walls to serve the needs of the rodeo arena is an appropriate way to preserve a practice that has come to be associated with ranching and related activities in Hawai'i.

The Office of Hawaiian Affairs, State Historic Preservation Division, and the Kona Roping Club were supplied a copy of the Draft EA, which will also be reviewed by agencies and the general public, in order to help finalize this determination. No party reviewing the Draft EA supplied any cultural information.

### **3.2.3 Archaeology and Historic Properties**

An archaeological inventory survey was conducted by ASM Affiliates, Inc. The report is attached as Appendix 2 and summarized below. The methods used for the project including review of documentary sources, fieldwork and consultation. Documentary sources included maps, local histories and ethnographic accounts, and records of lands use. Fieldwork for the current study was conducted on July 14, 2014 by Benjamin Barna, Ph. D. and J. David Nelson, B.A., and consisted of a pedestrian survey of the entire ground surface of the study parcel (i.e., 100% coverage). The ground surface within 10 meters of the perimeter walls and the walls themselves was closely examined by both field workers walking side-by-side. Ground visibility on the hillside near the western boundary of the parcel was fair due to heavy

vegetation. The remainder of the property, however, had excellent visibility and was therefore examined with 30-meter transects roughly oriented east-west. Rodeo arena structures were also examined. Because the property was graded subsequent to the abandonment of the Hōnaunau School, no subsurface testing was conducted. Field data was recorded using field notes, GPS, and digital photos. During the survey, the locations of archaeological features and other information were noted on a survey topographic map.

### *Existing Environment*

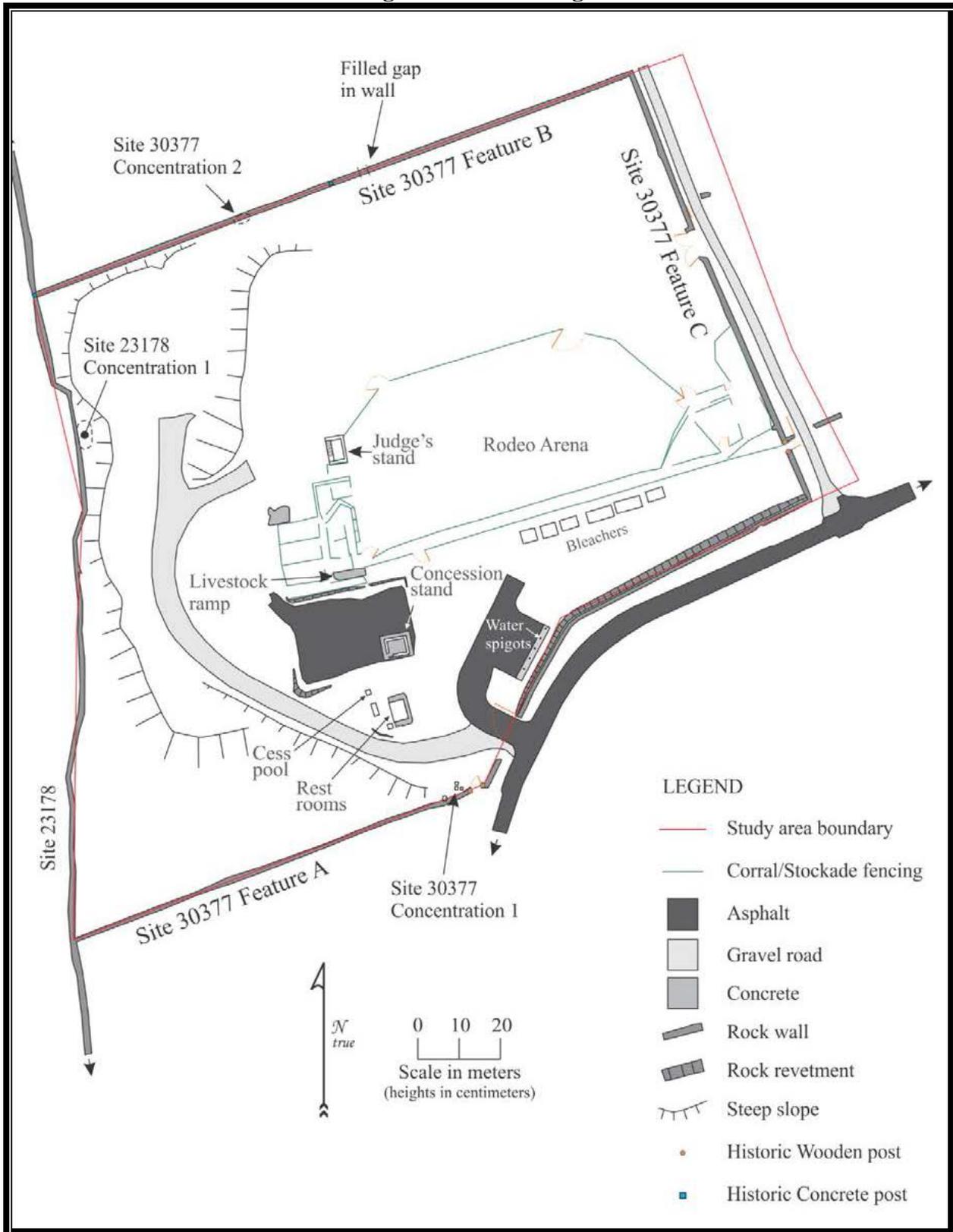
In terms of built features, the majority of the six-acre parcel is enclosed by stone walls of varying age, and the enclosed portion has been graded and improved to create the Hōnaunau Rodeo Arena (see Figure 6, Figure 4, and photos within Appendix 2). The arena is accessed through a main gate on Hōnaunau Road, which leads to an asphalt parking lot and a recently upgraded Hawai‘i County Wai Puna (water) station. To the east of the parking lot are four banks of arena bleachers on a leveled grassy area located about 10 feet below the Hōnaunau Road grade. A revetment below Hōnaunau Road is faced with stacked medium-to-large cobbles. The top of this revetment includes a low cobble and concrete wall capped with concrete that contains an inscription reading “KONA ROPING CLUB / 1-94”. At the eastern end of the arena are several pens constructed of galvanized pipe. The pens abut a stone wall that separates the rodeo grounds from a road right-of-way on the parcel’s eastern boundary. The arena proper is a graded, dirt-surfaced area surrounded by galvanized pipe fencing. At the western end of the arena are a judge’s stand, a ramp and livestock pens, a concession stand with a degraded asphalt area around it, and a comfort station. A degraded asphalt driveway curves around the western end of the arena to the northwestern corner of the developed portion of the parcel. As the driveway approaches the northwestern corner, it drops below the grade of the leveled arena area, and the northwestern end of the arena appears to be fill containing construction debris. To the west of the driveway, the ground surface has been graded, but abruptly drops off down a natural hillside a few meters east of the parcel boundary.

As a result of the fieldwork conducted for the project, one previously-identified site, State Inventory of Historic Places (SIHP) Site 23178) and one unrecorded site (SIHP Site 30377) were identified, both being heavily modified Historic Period livestock control walls surrounding the perimeter of the former Hōnaunau School Lot. Site 3178 is the wall on the *makai* side of the property that extends beyond the limits of the arena area, and Site 30377 is the wall complex that surrounds the north, south and *mauka* sides of the arena. These features are mapped in Figure 6.

### *Significance Evaluation, Recommended Treatment and Mitigation Measures*

These sites were evaluated as significant under criterion d of the significance criteria of the State Historic Preservation Division (SHPD), as they have yielded information important for research on prehistory or history. Much of the activity that has caused the loss of site integrity is a result of the refurbishment of the walls during the conversion of the property into the rodeo arena beginning in 1964, and subsequent maintenance of those walls. The transformation from the former school lot to the Hōnaunau Rodeo Arena marked the beginning of a new chapter in the parcel’s history that connects this place with the long history of ranching in South Kona. The information acquired during the archaeological study was considered sufficient to mitigate any alterations to the sites that may occur as a result of the proposed project, which would include the breaching of a roughly 20-foot wide segment of one wall to provide a

**Figure 6. Archaeological Sites**



new vehicular access as well as widening an existing opening in the same wall to improve an existing access. No further historic preservation work was recommended by the archaeologist for either site.

Although historic properties on the project site have been fully documented, and no additional finds are expected due to the long history of substantial disturbance, in the unlikely event that any unanticipated archaeological resources are unearthed during development activities, the County commits to halt work in the immediate vicinity of the finds and contact SHPD in compliance with HAR 13§13-280.

The AIS was officially transmitted to the State Historic Preservation Division (SHPD) for review, comment and concurrence on August 10, 2015. Per HAR 13-275-3(c), SHPD had until the end of September to provide a response. As of December 7, 2015, when this Final EA was finalized, SHPD had not provided a review letter. However, in a comment letter in response to the Draft EA (see Appendix 1b for letter and response), SHPD stated that the issuance of an NPDES permit is a federal undertaking triggering the National Historic Preservation Act (NHPA), Section 106 review and consultation process. They further requested that no permits be issued involving ground disturbance prior to SHPD review and acceptance of the AIS and any other necessary documents (e.g., archaeological monitoring plan). The County of Hawai‘i responded through its consultant, Geometrician Associates, that it did not concur with the statement regarding the federal undertaking, which it views as contrary to terms under which implementation of the NPDES permit system was delegated by the EPA to the individual states, as well as unprecedented with any other NPDES permit in Hawai‘i. Furthermore, the County stated that based on the erroneous assumption of federal involvement, as well as the amount of time that it has taken SHPD to provide a formal response with its review the AIS, the County may determine that it will need to proceed with ground-disturbing activities in order to retain the project schedule.

### **3.3 Infrastructure**

#### **3.3.1 Utilities**

##### *Existing Facilities and Services and Impacts*

Electrical power to the site is supplied by Hawai‘i Electric Light Company (HELCO), a privately owned utility company, via its island-wide distribution network, with poles and lines on Hōnaunau Road which feed an existing pole within the site. The pavilion and concession stand, as well as comfort station and judges’ stand will be supplied with electrical power, and the electric meter will be relocated, but at the current time, no substantial changes to the electrical infrastructure at the site appear necessary.

The project site is served by an existing 8-inch waterline at the intersection of Ke Ala O Keawe Road and Painted Church Road, which is about 1,600 feet east of the project site. According to the Hawai‘i County Department of Water Supply (DWS) (see letter of August 10, 2015 in Appendix 1a), the average daily usage through the existing 5/8-inch meter serving the subject parcel has been approximately 1,520 gallons per day over the last six billing cycles. This is four times the average daily capacity of a 5/8-inch meter. The DWS requested maximum daily water usage calculations and estimated peak-flow in gallons per minute. The DWS stated that based on these calculations, if water were available, P&R would be required to extend a waterline to front the property, install and appropriately sized service lateral, and cut/plug the 5/8-inch service. DWS facilities charges would apply.

P&R met with DWS to explore optimum water supply for the facility. The current distribution line to the arena has several sub-users, which has raised the average daily water consumption well beyond facility needs. It is expected that average daily use will be 400 to 800 gallons with the improvements. However, as peak use will be greater during rodeo events, P&R has determined that a 1-inch meter would be more appropriate for the future. P&R is exploring several alternate means for developing a new meter and distribution line that may involve construction

within the right-of-way of Honaunau Road and/or Ke Ala O Keawe Road, and/or easements through various properties owned by Kamehameha Schools (KS). Currently, engineering plans and negotiations with highway agencies and KS are not sufficiently advanced to determine the route. Therefore, the water facilities proposed as part of this project will address water needs on an interim basis until a new project improves the distribution line.

Currently, there is a comfort station using an individual wastewater system (IWS), involving a septic tank and leach field. The comfort station and IWS will be demolished and replaced with a more modern facility with a new, expanded IWS sized to meet the need of pavilion users. For rodeo events and other activities that exceed the normal capacity of the pavilion, the P&R will require renters of the facilities to bring in portable toilets to supplement the existing restroom accommodations based on anticipated head counts.

In summary, the proposed improvements would require some upgrades to utility infrastructure but would not have any substantial impact on existing utilities.

### **3.3.2 Roadways and Traffic**

A Traffic Assessment) for the Proposed Action was conducted by SSFM International, Inc. The report is attached as Appendix 3 and summarized below.

#### *Existing Facilities*

Hōnaunau Road is a narrow, 0.5-mile, two-way roadway that provides a *mauka-makai* connection between one switchback of Ke Ala O Keawe Road. Hōnaunau Road, also referred to as Rodeo Road, provides access to Hōnaunau Rodeo Arena and several agricultural properties. Currently, two separate and unconnected driveways exist for accessing the rodeo arena. The *makai* driveway is the primary access, with the *mauka* driveway an unpaved access only opened for participants during a rodeo event. There are gravel shoulders of varying widths on both sides of Hōnaunau Road. There are no posted speed limit signs along this roadway. During the annual rodeo event, traffic along Hōnaunau Road is converted to one-way flow in the *makai*-bound direction, controlled by police officers. The one-way traffic flow permits parking to occur along the shoulders of Hōnaunau Road.

Ke Ala O Keawe Road (State Route 160) is a 4-mile, two-lane, two-way roadway that travels through a rural area with the functional classification of major collector. This roadway is also referred to as City of Refuge Road. This roadway is located between Māmalahoa Highway (State Route 11) at the *mauka* terminus and the access to Pu‘uhonua O Hōnaunau National Park at the *makai* terminus. The posted speed limit is 45 mph.

In 2013, average daily traffic (ADT) along Ke Ala O Keawe Road *mauka* of the project area was 1,400 vehicles, with 110 vehicles during the PM peak hour, based on Hawai‘i Department of Transportation (HDOT) Historical Traffic Station Maps. ADT *makai* of the project area was 810 vehicles, with 85 vehicles during the PM peak hour and 105 in the AM peak hour. These figures indicate relatively light use for a major collector road.

Level of service (LOS) is a rating system used in traffic engineering to measure the effectiveness of roadway operating conditions. There are six LOS ranging from A to F. LOS A is defined as being the least interrupted flow conditions with little or no delays, whereas LOS F is defined as conditions where extreme delays exist. Ke Ala o Keawe Road is classified as a rural major collector roadway in a rolling area. Guidelines from *A Policy on Geometric Design of Highways and Streets* (AASHTO 2011) state that an appropriate LOS for a rural major collector in a rolling area is LOS C or better. Roadway LOS is a function of the volume to capacity (v/c) ratio for a roadway. As v/c increases, congestion increases and operations deteriorate. When v/c exceeds 1.0, the

capacity of the roadway has been exceeded, and high levels of congestion are associated with low speeds. Currently, the v/c ratio is low and the LOS is A on Ke Ala O Keawe Road.

### *Impacts and Mitigation Measures*

In terms of parking and circulation, the project would provide two functional, interconnected driveways for accessing the rodeo arena. During a rodeo, the *mauka* driveway would be used as an entrance for participants and attendees. Participants would continue north along an unpaved road to the participants' entrance. Attendees would make a left into the parking lot. The *makai* driveway would be an egress only during these large events. All other times the parking lot, unpaved path and road access for participants would be closed, and the *makai* driveway would be the sole entrance and exit access to the arena. The proposed improvements include the addition of 49 on-site formal paved parking stalls and improving available informal parking areas. Together, these parking and circulation improvements would benefit traffic conditions at all events, especially large ones.

The proposed project would not increase traffic in any appreciable way, as rodeo events already occur and usage of the pavilion would generate only very minor amounts of traffic. Nevertheless, to assess the impact to traffic conditions of continuing existing use, a Traffic Assessment was conducted.

The largest number of trips generated at the rodeo arena occurs during the annual rodeo event, which attracts a total of approximately 700-800 attendees including participants. With an assumed average vehicle occupancy rate of 2.5 persons per vehicle, it is estimated that the annual event generates a maximum of approximately 320 vehicles in and out. This event typically occurs during the weekend. Since weekend data are not available, the weekday peak hour volumes were used as the baseline to determine the traffic impact of an event, a conservative assumption. Another worst-case assumption was that that all incoming trips would occur within a one-hour period in the morning and outgoing trips would occur within a one-hour period in the afternoon, rather than being spread out throughout the day.

To assess future conditions, the analysis used a cumulative perspective, assessing all past, current and future foreseeable projects and their potential contribution to traffic. From research into the Statewide Transportation Improvements Program (STIP), it was determined that no roadway construction is expected to be completed by the year 2016. Research into the State of Hawai'i Office of Environmental Quality Control library, determined that no future developments are expected to be complete by the year 2016 that would affect the roadway geometrics or traffic volumes along Ke Ala O Keawe Road or Hōnaunau Road.

The details of the analysis of effects to volume to capacity and LOS are contained in Appendix 3. Even considering background growth and the worst-case assumptions listed above, the LOS would remain at A, the highest and best level.

A final traffic-related consideration is sight distance. A *Policy on Geometric Design of Highways and Streets*, 6th Edition (AASHTO 2011) states that proper sight distances should be provided to avoid conflicts and to maintain efficient traffic operations. The driver of a vehicle approaching an intersection should have an unobstructed view of the entire intersection. Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting roadway to

decide when to enter the intersecting roadway or to cross it. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.

The design speed along Ke Ala O Keawe Road is considered to be 50 mph, 5 mph greater than the posted speed limit of 45 mph. The required intersection sight distance for a left and right turn by a combination vehicle (truck with trailer) from Hōnaunau Road is 850 feet and 775 feet respectively. For a vehicle making a left turn from Ke Ala O Keawe Road to Hōnaunau Road, the required intersection sight distance is 555 feet. The design speed along Hōnaunau Road is 30 mph for a 25 mph speed limit. The required sight distance from the driveways of the arena for a combination vehicle making a left turn and a right turn is 510 feet and 465 feet respectively. Through field visits, it was observed that the intersection of Hōnaunau Road with Ke Ala o Keawe Road on the *mauka* and *makai* end meet the intersection sight distance requirements. There is limited sight distance from the arena driveways due to a curve in the roadway. It was observed to be approximately 250 feet from the *makai* driveway looking *mauka*. To ensure sufficient sight distances, intersection sight triangles should be maintained by ensuring vegetation along the north and south side of Hōnaunau Road are trimmed back to or below a height of three feet. It is also recommended to trim vegetation on both sides of Hōnaunau Road near the rodeo driveways.

In conclusion, the Traffic Assessment determined that the Hōnaunau Rodeo Arena improvements are anticipated to have minimal impact to traffic along Hōnaunau Road and Ke Ala O Keawe Road. By letter of July 22, 2015 (see Appendix 1a), the Police Department also stated that it did not foresee any significant impact to traffic and/or public safety concerns with the proposed improvements.

### **3.4 Secondary and Cumulative Impacts**

The Proposed Action will not involve any substantial secondary or cumulative impacts, such as population changes or effects on public facilities. Traffic can be considered a secondary impact of facility improvement, and it has been fully evaluated through the Traffic Assessment.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. Consultation of EA/EIS files in the *OEQC Environmental Notice* and records of Special Permits, Use Permits and Special Management Area Permits did not reveal any projects of a scale substantial enough to potentially interact with the proposed rodeo arena improvements. In any case, the Proposed Action will have very limited and temporary construction period impacts, such as noise, traffic, dust and sedimentation, which would be unlikely to accumulate with similar impacts from nearby projects if any are proposed in the future. Operationally, future traffic impacts were explicitly assessed in the Traffic Assessment from a cumulative perspective that considered other traffic in the area, and found to be non-significant.

### **3.5 Required Permits and Approvals**

The following permits and approvals would be required:

- National Pollutant Discharge Elimination System Permit (State DOH)
- Individual Wastewater System Permit (IWS) (State DOH)
- Grading, Grubbing and Driveway Permits (County DPW)
- Building Permits and Plan Approval (County DPW and Planning)
- Chapter 6e, HRS, determination from State Historic Preservation Division on historic property effects
- Disability and Communication Access Board (DCAB) plan review and approval

### **3.6 Consistency with Government Plans and Policies**

#### **3.6.1 Hawai‘i State Plan**

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The Proposed Action would promote these goals by improving recreational facilities and expanding recreational opportunities for the project area, thereby enhancing quality-of-life and community and social well-being.

#### **3.6.2 Hawai‘i State Land Use Law**

*Hawai‘i State Land Use District.* All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The property is in the State Land Use Agricultural District. The Proposed Action for use of the project site as a rodeo arena and park is consistent with intended uses for this Land Use District.

#### **3.6.3 Hawai‘i County Zoning**

The project site is zoned Agricultural, minimum lot size 5 acres (A-5a), which allows for the existing use and proposed improvements, provided they receive plan approval from the Planning Director, per Hawai‘i County Code Section 25-4-11(c).

#### **3.6.4 Hawai‘i County General Plan**

The *General Plan* for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005 (Hawai‘i County Planning Department). The *General Plan* itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i.

Most relevant to the proposed project are the following Goal and Policies, and Courses of Action of particular chapters of the General Plan:

## **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.
- (c) Recreational facilities shall reflect the natural, historic, and cultural character of the area.
- (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.
- (h) Provide facilities and a broad recreational program for all age groups, with special considerations for the handicapped, the elderly, and young children.
- (i) Coordinate recreational programs and facilities with governmental and private agencies and organizations. Innovative ideas for improving recreational facilities and opportunities shall be considered.

### **12.4 STANDARDS**

and

#### **12.5.8.2 COURSES OF ACTION FOR SOUTH KONA**

- (a) Expand and /or develop recreational facilities in existing communities.

Discussion: The General Plan does not list rodeo arenas among facilities that are classified by scale and provided with standards, and instead considers them “miscellaneous” facilities, along with boat ramps, scenic lookouts, drag strips, etc. The Proposed Action is an appropriately scaled recreational project that satisfies recreational goals, policies, standards and courses of action with minimal impact.

## **HISTORIC SITES**

### **6.2 GOALS**

- (a) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawai‘i.
- (b) Appropriate access to significant historic sites, buildings, and objects of public interest should be made available.

Discussion: The Proposed Action has involved appropriate inventory survey to determine the presence and significance of historic sites and to ensure that there no adverse effects. Therefore the action satisfies

relevant goals, policies, and courses of action for historic sites in Hawai‘i County. The survey is currently under review by the State Historic Preservation Division.

## **NATURAL BEAUTY**

### **7.2 GOALS**

- (a) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
- (b) Protect scenic vistas and view planes from becoming obstructed.
- (c) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

### **7.3 POLICIES**

- (h) Protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.
- (i) Do not allow incompatible construction in areas of natural beauty.

Discussion: The Proposed Action does not involve scenic areas or vantages and would not be inconsistent with the natural beauty of the South Kona area. Therefore the action is consistent with relevant goals, policies, and courses of action of the Natural Beauty section of the Hawai‘i County General Plan.

## **NATURAL RESOURCES**

### **8.2 GOALS**

- (a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
- (b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
- (c) Protect and promote the prudent use of Hawaii’s unique, fragile, and significant environmental and natural resources.
- (e) Protect and effectively manage Hawaii’s open space, watersheds, shoreline, and natural areas.

### **8.3 POLICIES**

- (b) Encourage a program of collection and dissemination of basic data concerning natural resources.
- (h) Encourage public and private agencies to manage the natural resources in a manner that avoids or minimizes adverse effects on the environment and depletion of energy and natural resources to the fullest extent.
- (i) Encourage an overall conservation ethic in the use of Hawaii’s resources by protecting, preserving, and conserving the critical and significant natural resources of the County of Hawaii.
- (u) Ensure that activities authorized or funded by the County do not damage important natural resources.

Discussion: The Proposed Action does not involve destruction of natural resources and is consistent with the goals, standards and policies of the Natural Resources chapter of the Hawai‘i County General Plan.

The *Hawai‘i County General Plan Land Use Pattern Allocation Guide (LUPAG)*. The LUPAG map component of the *General Plan* is a graphic representation of the Plan’s goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The project site is classified as Important Agricultural Land in the LUPAG.

Improvement of the project site's already existing recreational facilities on a property dedicated by Executive Order for recreational use is not inconsistent with this designation.

### **3.6.5 Kona Community Development Plan**

The Kona Community Development Plan (CDP) encompasses the judicial districts of North and South Kona, and was developed under the framework of the February 2005 County of Hawai'i General Plan. Community Development Plans are intended to translate broad General Plan Goals, Policies, and Standards into implementation actions as they apply to specific geographical regions around the County. CDPs are also intended to serve as a forum for community input into land-use, delivery of government services and any other matters relating to the planning area.

The General Plan now requires that a Community Development Plan shall be adopted by the County Council as an "ordinance," giving the CDP the force of law. This is in contrast to plans created over past years, which were adopted by "resolution" and served only as guidelines or reference documents to decision-makers. The Kona CDP was adopted in September 2008 by the County Council. The CDP is available at: [http://www.hcrc.info/community-planning/north-and-south-kona-cdp/cdp-final-drafts/Final%20KCDP\\_Sept%202008\\_text.pdf](http://www.hcrc.info/community-planning/north-and-south-kona-cdp/cdp-final-drafts/Final%20KCDP_Sept%202008_text.pdf)

The Plan among notes Kona's "Unique or Valued Characteristics" the fact that:

Kona is blessed with open space and natural areas that have the potential for active and passive recreational opportunities, as well as to preserve and conserve sensitive natural systems (native forests, anchialine ponds, floodways, beaches, etc.).

In the section of the Plan entitled, Visualizing Kona Tomorrow, one guiding principle is that

Future growth should provide a diversity of recreational opportunities that are well-maintained, attractive, and easily accessible to the entire community.

The Plan has many elements and wide-ranging implications, with goals, objectives, policies and actions that embody the guiding principles related to the economy, energy, environmental quality, flooding and other natural hazards, historic sites, natural beauty, natural resources and shoreline, housing, public facilities, public utilities, recreation, transportation and land use

The project is consistent with all aspects of the Plan, and in particular, with Objective PUB-6, Quality of Life, which calls for the fostering of a sense of community and health through the public realm such as gathering places, parks, pedestrian networks, and open spaces, as well as Policy PUB-6.2, which dictates that a range of recreational opportunities shall be provided to encourage physical activity and interaction among residents and visitors to Kona.

## **PART 4: DETERMINATION**

Based on the findings above, and in consideration of comments received, the County of Hawai‘i, Department of Parks and Recreation has determined that the proposed project will not have any significant effect in the context of Chapter 343, Hawai‘i Revised Statutes and section 11-200-12 of the State Administrative Rules, and has issued a Finding of No Significant Impact (FONSI).

## **PART 5: FINDINGS AND REASONS**

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resources would be committed or lost by the Proposed Action, which would not adversely affect significant historic sites or native species or habitat. The Proposed Action has involved appropriate inventory survey to determine the presence and significance of historic sites, and to ensure that there no adverse effects. The survey is currently under review by the State Historic Preservation Division.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The Proposed Action expands and in no way curtails beneficial uses of the environment, and through the improvements, expands beneficial recreational uses.
3. *The proposed project will not conflict with the State's long-term environmental policies.* The State’s long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The Proposed Action is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment by improving and expanding recreational opportunities. It is thus consistent with all elements of the State’s long-term environmental policies.
4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The Proposed Action will benefit the social welfare of the community and State by expanding and improving recreational use of public property for public benefit.
5. *The proposed project does not substantially affect public health in any detrimental way.* The Proposed Action will promote public health through provision of recreational opportunities.
6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities.* No secondary effects are expected to result from the Proposed Action, which would not induce in-migration or unduly affect roads or other public facilities.
7. *The proposed project will not involve a substantial degradation of environmental quality.* The Proposed Action is minor and environmentally benign, and would thus not contribute to environmental degradation with adherence to Best Management Practices.
8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The project site supports overwhelmingly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna will not occur, with planned restrictions of the timing of vegetation removal and a hawk survey if necessitated by the construction schedule.
9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* Effects to resources and conditions, including traffic flow, have been considered from a cumulative

perspective. The Proposed Action is not related to other activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.

10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* Slight increases in noise and effects to air quality will occur, but below levels that would require mitigation.
11. *The project does not affect nor would it likely to be damaged as a result of being located in an environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* Although the project site is in an area with volcanic and seismic risk, the entire Island of Hawai‘i shares this risk, and the Proposed Action is not imprudent to undertake.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* The Proposed Action would not adversely impact any scenic sites or viewplanes.
13. *The project will not require substantial energy consumption.* The Proposed Action involves only minor use of energy for construction and operation.

For the reasons above, the Proposed Action would not have any significant effect in the context of Chapter 343, Hawai‘i Revised Statutes and section 11-200-12 of the State Administrative Rules.

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# **Hōnaunau Rodeo Arena Improvements**

## **Environmental Assessment**

TMK (3rd) 8-4-008:002  
South Kona District, Hawai‘i Island, State of Hawai‘i

### **APPENDIX 1a**

#### **Comments in Response to Early Consultation**

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-----Original Message-----

From: Jeri Hall [mailto:[jehall@ksbe.edu](mailto:jehall@ksbe.edu)]

Sent: Monday, July 20, 2015 12:09 PM

To: 'rterry@hawaii.rr.com'

Cc: Kainoa Keawe; Perry Kealoha

Subject: EA for Honaunau Rodeo Arena Improvements

Mr. Terry:

Thank you for your letter dated July 17, 2015 regarding Early Consultation for Environmental Assessment for Honaunau Rodeo Arena Improvements. As you're probably aware, Kamehameha Schools owns parcels surrounding TMK No. (3) 8-4-008-002. I've contacted Austen Drake at SSFM International to let him know that I'm available for a meeting if that would be helpful.

By this e-mail, Kamehameha Schools requests a copy of the EA/notification of EA availability when it is completed.

Jeri

Mahalo,

Jerilynn Ono Hall, Land Asset Manager  
Asset Management - Hawaii Island, Kamehameha Schools  
78-6831 Alii Drive, #429  
Kailua-Kona, HI 96740  
Telephone: (808) 322-5324  
E-Mail: [jehall@ksbe.edu](mailto:jehall@ksbe.edu)

**From:** Henry, Sharron [mailto:Sharron.Henry@hawaiicounty.gov]  
**Sent:** Tuesday, July 21, 2015 9:10 AM  
**To:** RON TERRY PH. D (rterry@hawaii.rr.com)  
**Subject:** EA for Honaunau Rodeo Arena Improvements TMK;8-4-008:002

Co. of Hawai'i Department of Environmental Management has no comments to offer on this project.

Thank you for allowing us to provide our comments on the subject project.

Sharron Henry  
Private Secretary to the Director  
County of Hawai'i  
Department of Environmental Management  
345 Kekūanāo'a Street, Suite 41  
Hilo, HI 96720  
Phone: 808.961.8083  
Fax: 808.961.8086  
Email: [Sharron.Henry@hawaiicounty.gov](mailto:Sharron.Henry@hawaiicounty.gov)  
[cohdem@hawaiicounty.gov](mailto:cohdem@hawaiicounty.gov)

<http://www.hawaiicounty.gov/environmental-management>

*Hawai'i County is an equal opportunity provider and employer*

**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 22, 2015

Ron Terry  
Principal, Geometrician Associates  
P. O. Box 396  
Hilo, HI 96721

Dear Mr. Terry:

Upon reviewing the provided documents, we do not anticipate any significant impact to traffic and/or public safety concerns with the proposed improvements for the Honaunau Rodeo Arena.

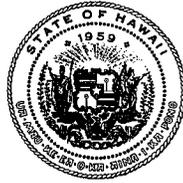
Thank you for allowing us the opportunity to comment.

We would like to receive a notification of Environmental Assessment availability when it is completed. Please notify our Kona District Commander Captain Randal Ishii at 808-326-4646 ext 299 or via email: [Randal.Ishii@hawaiicounty.gov](mailto:Randal.Ishii@hawaiicounty.gov)

Sincerely,

  
HARRY S. KUBOJIRI  
POLICE CHIEF

DAVID Y. IGE  
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.  
DIRECTOR OF HEALTH

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

In reply, please refer to:  
File:

EPO 15-186

July 27, 2015

Mr. Ron Terry, Principal  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, Hawaii 96721  
Via email: rterry@hawaii.rr.com

Dear Mr. Terry:

**SUBJECT: Early Consultation (EC) for Environmental Assessment for Honaunau Rodeo Arena Improvements, South Kona, Hawaii**  
**TMK: (3) 8-4-008:002**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your EC to our office on July 20, 2015. Thank you for allowing us to review and comment on the proposed project. They will provide specific comments to you if necessary. EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: <http://health.hawaii.gov/epo/home/landuse-planning-review-program>. Projects are required to adhere to all applicable standard comments.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: <https://eha-cloud.doh.hawaii.gov>

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

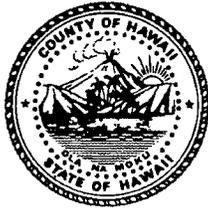
Mahalo nui loa,

A handwritten signature in black ink, appearing to read "Laura Phillips", written over a white background.

Laura Leialoha Phillips McIntyre, AICP  
Program Manager, Environmental Planning Office

William P. Kenoi  
Mayor

Walter K. M. Lau  
Managing Director



Warren H. W. Lee  
Director

Brandon A. K. Gonzalez  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224  
(808) 961-8321 · Fax (808) 961-8630  
www.co.hawaii.hi.us

July 28, 2015

Geometrician Associates  
Attn: Ron Terry  
P.O. Box 396  
Hilo, HI. 96721

SUBJECT: Early Consultation for Environmental Assessment  
Honaunau Rodeo Arena Improvements  
Location: Honaunau, South Kona, Hawaii  
TMK No. 8-4-008:002

We reviewed the subject and our comments are as follows:

FLOODPLAIN MANAGEMENT

We have determined that the subject property is located within Flood Zone "X" according to the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA).

DRAINAGE

1. All development generated runoff shall be disposed of on-site and shall not be directed toward any adjacent properties. A drainage study shall be prepared, and the recommended drainage system shall be constructed meeting with the approval of DPW.
2. The applicant shall be informed that if they include drywells in the subject development, an Underground Injection Control (UIC) permit may be required from the Department of Health, State of Hawaii.

EARTHWORK

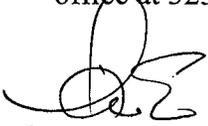
1. All earthwork and grading shall conform to Chapter 10, Erosion and Sediment Control, of the Hawaii County Code.
2. The applicant shall comply with Chapter 11-55, Water Pollution Control, Hawaii Administrative Rules, Department of Health, which requires an NPDES permit for certain construction activity.

DPW Comments --Early Consultation

July 29, 2015

p. 2 of 2

We would appreciate a notification of EA availability upon completion. Should there be any questions concerning this matter, please contact Kiran Emler of our Kona Engineering Division office at 323-4851.



BEN ISHII, Division Chief  
Engineering Division

KE

Copy: ENG-Hilo/Kona

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  
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

August 6, 2015

Mr. Ron Terry  
Geometrician Associates  
P.O. Box 396  
Hilo, HI 96721

Dear Mr. Terry:

**SUBJECT: Pre-Consultation on Draft Environmental Assessment**  
**Applicant: State of Hawai'i, EO'd to County of Hawai'i -**  
**Department of Parks and Recreation**  
**Project: Hōnaunau Rodeo Arena Improvements and Expansion**  
**Tax Map Key: (3) 8-4-008:002, South Kona, Hawai'i**

---

This is to acknowledge receipt of your July 17, 2015 letter requesting comments from this office regarding the preparation of a Draft Environmental Assessment (DEA) for the subject project.

The County is proposing improvements and expansion of the facilities and range of services at the Hōnaunau Rodeo Arena. It will include improvements to vehicular access to better accommodate and separate uses that are planned for the site; improvements to the water system; expansion and rationalization of parking; replacement, expansion and improvement of spectator seating, concession facility, judges' stand, and comfort station; construction of a new community pavilion; and improvements and expansion of accessibility.

The subject 5.78 acre parcel is zoned Agricultural (A-5a) by the County and designated Agricultural by the State Land Use Commission. In addition, the Hawai'i County General Plan Land Use Allocation Guide (LUPAG) Map designates the parcel as Important Agricultural Lands (IAL). It is not located within the Special Management Area.

Executive Order No. 2468, approved on October 30, 1969, set aside the old Hōnaunau School Lot for recreational and allied uses to be under the control and management of the Department of Parks and Recreation, County of Hawai'i.

Hawai'i County Code Section 25-4-11(c) states that "*Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use.*" Therefore, the proposed project will require a Plan Approval issued by this office.

Mr. Ron Terry  
Geometrician Associates  
August 6, 2015  
Page 2

In the DEA, describe how the proposed use is consistent with the policies, standards, and courses of action of the County of Hawai'i General Plan, as amended in 2005. We note 12.5.8.2(a) Recreation, South Kona, Section Courses of Action - *Expand and/or develop recreational facilities in existing communities*. Further, the project site is located in the Kona Community Development Plan (CDP) planning area. Please review and include discussion of the proposed project's consistency with its overall goals, objectives, policies and actions. In particular, we note the following,

2.1 Unique or Valued Characteristics

*Open Space and Natural Areas. Kona is blessed with open space and natural areas that have the potential for active and passive recreational opportunities, as well as to preserve and conserve sensitive natural systems (native forest, anchialine ponds, floodways, beaches, etc.)*

3.2.4 Visualizing Kona Tomorrow, Guiding Principles

*Provide recreation opportunities. Future growth should provide a diversity of recreational opportunities that are well maintained, attractive, and easily accessible to the entire community.*

Thank you for the opportunity to provide preliminary comments on the proposed project. Please provide our department with a copy of the DEA for our review and comment.

If you have questions, please feel free to contact Esther Imamura of our office at (808) 961-8139.

Sincerely,

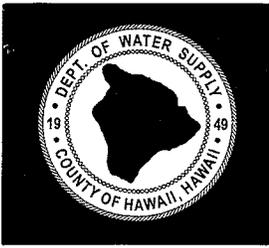


 DUANE KANUHA  
Planning Director

ETI:cs

P:\Wpwin60\ET\Eadraftpre-Consul\Terry Hoonanau Rodeo Arena.Rtf

cc: Planning Department - Kona



**DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I**  
345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720  
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

August 10, 2015

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

**PRE-ENVIRONMENTAL ASSESSMENT  
HŌNAUNAU RODEO ARENA IMPROVEMENTS  
TAX MAP KEY 8-4-008:002**

This is in response to your Pre-Environmental Assessment letter dated July 17, 2015.

Please be informed that there is an existing 8-inch waterline at the intersection of Ke Ala O Keawe Road and Painted Church Road, approximately 1,600 feet from the subject parcel. The subject parcel is currently serviced through a 5/8-inch meter.

Please note that the average daily usage through the existing 5/8-inch meter serving the subject parcel has averaged approximately 1,520 gallons per day (GPD) over the past six billing cycles (August 2014 to June 2015). This equates to approximately four (4) units of water at 400 GPD per unit, which is four (4) times the average daily usage capacity of the 5/8-inch meter of one (1) unit of water (400 GPD).

As the current water usage is already exceeding the capacity of the existing meter and due to the additional water demand that may be generated by subject project, the applicant must comply with the following conditions:

1. Submit estimated maximum daily water usage calculations, prepared by a professional engineer licensed in the State of Hawai'i, for the additional water demand. The water demand calculations should include the estimated maximum daily usage, including all irrigation/landscaping use, in gallons per day and the estimated peak-flow in gallons per minute.
2. Based on the calculations provided per Item No. 1 above, and *if* additional water is available, the applicant will be required to extend a waterline to front the property from the existing waterline; install the appropriately-sized service lateral; and cut/plug the existing 5/8-inch service.

The applicable facilities charge will be determined by the Department upon approval of the water usage calculations provided per Item No. 1 above.

3. A backflow prevention assembly will be required. The installation of the backflow prevention assembly(s) must be inspected and approved by the Department.

*... Water, Our Most Precious Resource ... Ka Wai A Kāne ...*

The Department of Water Supply is an Equal Opportunity provider and employer.

Mr. Ron Terry  
Page 2  
August 10, 2015

4. Please be informed that the existing 8-inch waterline within Ke Ala O Keawe Road and Painted Church Road is inadequate to provide 2,000 gallons per minute of fire-flow required per the Department's Water System Standards. The applicant should contact the Fire Department to determine fire protection requirements.

Should there be any questions, please contact Mr. Ryan Quitariano of our Water Resources and Planning Branch at 961-8070, extension 256.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'k. okamoto', written in a cursive style.

Keith K. Okamoto, P.E.  
Manager-Chief Engineer

RQ:dfg

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

August 20, 2015

Geometrician Associates  
Attention: Mr. Ron Terry  
P.O. Box 396  
Hilo, Hawaii 96721

via email: [rterry@hawaii.rr.com](mailto:rterry@hawaii.rr.com)

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Honaunau Rodeo Arena Improvements, Geometrician Associates, LLC for the County of Hawaii Department of Parks and Recreation, Applicant, South Kona, Hawaii, TMKs: (3) 8-4-008:002

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) Division of State Parks, and (iii) Hawaii District Land Office on the subject matter. Should you have any questions, please feel free to call Kevin Moore at (808) 587-0426.

Sincerely,

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

Russell Y. Tsuji  
Land Administrator

Enclosure(s)

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 30, 2015

MEMORANDUM

TO: *FR*

**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: *FR*

FROM: *FR* Russell Y. Tsuji, Land Administrator *van*

SUBJECT: Early Consultation for Environmental Assessment for Honaunau Rodeo Arena Improvements

LOCATION: South Kona, Hawaii, TMKs: (3) 8-4-008:002

APPLICANT: Geometrician Associates, LLC for the County of Hawaii Department of Parks and Recreation

15 JUL 30 PM 10:45 ENGINEERING

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by August 19, 2015.

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: Carty S. Chang, Chief Engineer

Date: 8/18/15

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

LD/ Russell Y. Tsuji  
Ref.: Early Consultation for EA for Honaunau Rodeo Arena Improvements  
Hawaii.044

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 Zone X. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X.**
- ( ) 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 site 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.

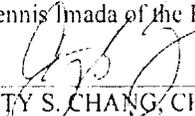
Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable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

- ( ) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
  - ( ) Mr. Carter Romero (Acting) at (808) 961-8943 of the County of Hawaii, Department of Public Works.
  - ( ) Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
  - ( ) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.
- ( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
  - ( ) 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: \_\_\_\_\_

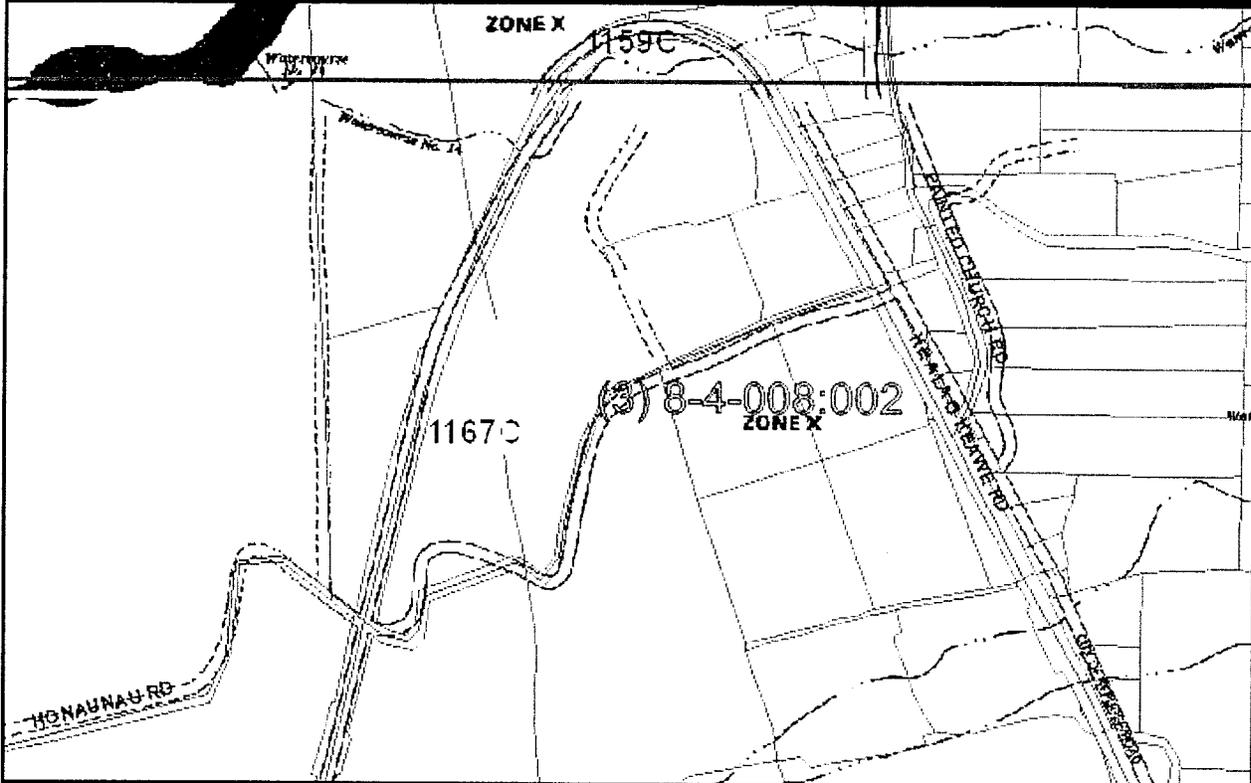
Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed:   
CARY S. CHANG, CHIEF ENGINEER

Date: 2/12/15



# FLOOD HAZARD ASSESSMENT REPORT



### FLOOD ZONE DEFINITIONS

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD** – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- Zone A: No BFE determined.
- Zone AE: BFE determined.
- Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
- Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
- Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

**NON-SPECIAL FLOOD HAZARD AREA** – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

### OTHER FLOOD AREAS

- Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

### PROPERTY INFORMATION

COUNTY: HAWAII  
 TMK NO: (3) 8-4-008-002  
 PARCEL ADDRESS: 84-5134 HONAUANAU ROAD  
 CAPTAIN COOK, HI 96704  
 FIRM INDEX DATE: APRIL 02, 2004  
 LETTER OF MAP CHANGE(S): 13-09-2129P  
 FEMA FIRM PANEL(S): 1551661167C  
 PANEL EFFECTIVE DATE: SEPTEMBER 16 1988

PARCEL DATA FROM: JUNE 2013  
 IMAGERY DATA FROM: MAY 2005

### IMPORTANT PHONE NUMBERS

County NFIP Coordinator  
 County of Hawaii  
 Carter Romero, P.E., CFM (808) 961-8943  
State NFIP Coordinator  
 Carol Tyau-Beam, P.E., CFM (808) 587-0267

*Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.*

*If this map has been identified as 'PRELIMINARY' please note that it is being provided for informational purposes and shall not be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.*

56712

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



RECEIVED  
STATE DEPT

15 JUL 31 12:41 STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 30, 2015

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:

*fr* Russell Y. Tsuji, Land Administrator *VT*

SUBJECT:

Early Consultation for Environmental Assessment for Honaunau Rodeo Arena Improvements

LOCATION:

South Kona, Hawaii, TMKs: (3) 8-4-008:002

APPLICANT:

Geometrician Associates, LLC for the County of Hawaii Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by August 19, 2015.

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: *Daniel Quinn*

Print name: Daniel Quinn  
Date: \_\_\_\_\_

cc: Central Files

2015 JUL -5 11:10:49  
OFFICE OF THE ATTORNEY GENERAL  
STATE OF HAWAII

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

2015 JUL 31 A 9:50

RECEIVED  
LAND DIVISION  
JUL 31 2015

July 30, 2015

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:

*fr* Russell Y. Tsuji, Land Administrator *RS*

SUBJECT:

Early Consultation for Environmental Assessment for Honaunau Rodeo Arena Improvements

LOCATION:

South Kona, Hawaii, TMKs: (3) 8-4-008:002

APPLICANT:

Geometrician Associates, LLC for the County of Hawaii Department of Parks and Recreation

2015 AUG - 7 11:16:42  
RECEIVED  
LAND DIVISION

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by August 19, 2015.

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:

*Gordon C. Heit*

Print name:

*GORDON C. HEIT*

Date:

*8/5/15*

cc: Central Files

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

75 Aupuni Street, Room 204  
Hilo, Hawaii 96720  
PHONE: (808) 961-9590  
FAX: (808) 961-9599

August 5, 2015

MEMORANDUM

TO: Russell Y. Tsuji, Administrator

FROM: Gordon C. Heit, Hawaii District Land Agent 

SUBJECT: Early Consultation for Environmental Assessment for the County of Hawaii  
Department of Parks and Recreation, Honaunau Rodeo Arena Improvements

LOCATION: Honaunau, South Kona, Island of Hawaii. TMK: (3) 8-4-008:002

APPLICANT: Geometrician, LLC on behalf of the County of Hawaii, Department of Parks and Recreation

Pursuant to your request for comments on the above matter, we offer the following:

The property identified above is encumbered under E.O. 2468 to the County of Hawaii, Department of Parks and Recreation (P&R). The Land Division will provide further comments when the draft environmental assessment is available for review.

Please contact me should you have any questions.

**[This page intentionally left blank]**

# **Hōnaunau Rodeo Arena Improvements**

## **Environmental Assessment**

TMK (3rd) 8-4-008:002  
South Kona District, Hawai‘i Island, State of Hawai‘i

### **APPENDIX 1b**

#### **Comments to Draft EA and Responses**

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DAVID Y. IGE  
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.  
DIRECTOR OF HEALTH

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

In reply, please refer to:  
EMD/CWB

10034PJF.15

October 20, 2015

Mr. James Komata  
Department of Parks and Recreation  
County of Hawaii  
101 Pauahi Street, Suite 6  
Hilo, Hawaii 96720

Dear Mr. Komata:

**SUBJECT: Draft Environmental Assessment (DEA) for  
Hoanau Rodeo Arena Improvements  
TMK: (3) 8-4-008:002  
South Kona, Island of Hawaii, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated October 12, 2015, 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/2013/05/Clean-Water-Branch-Std-Comments.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 National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. 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 applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee (\$1,000 for an individual NPDES permit or \$500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: <https://eha-cloud.doh.hawaii.gov/epermit/>. You will be 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 appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) 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 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.
5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:
  - a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects

natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

- b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.
- c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.
- d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.
- e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

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

JF:ay

c: DOH-EPO [via e-mail only]  
Mr. Ron Terry, Geometrician Associates [via e-mail [rterry@hawaii.rr.com](mailto:rterry@hawaii.rr.com) only]

# geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Alec Wong, P.E., Chief  
Clean Water Branch  
Hawai'i State Department of Health  
PO Box 3378  
Honolulu HI 96801-3378

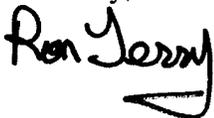
**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

Dear Mr. Wong:

Thank you for your comment letter dated October 20, 2015, on the Draft EA in which you provided references to DOH's standard comments, noted requirements in Chapters 11-54 and 11-55, HAR, related to water quality criteria and NPDES, recommended contact with the U.S. Army Corps of Engineers (USACE), and discussed green building practices. The County of Hawai'i affirms the need to comply with the water quality regulations. No water bodies including streams, bays, ponds or wetlands are included in the project area and it therefore does not appear that permits related to Section 404 of the Clean Water Act are required. As stated in the EA, the project is expected to disturb more than an acre of surface and thus requires a National Pollutant Discharge Elimination System (NPDES) permit from the State Department of Health before it commences. The NPDES permit was obtained on November 20, 2015. The project involves mainly upgrades of existing facilities and related improvements, and all drainage will be contained onsite and will be allowed to percolate to recharge groundwater in the basal lens.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal  
Geometrician Associates

Cc: James Komata, P&R; Austen Drake, SSFM Int'l

DAVID Y. IGE  
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.  
DIRECTOR OF HEALTH

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

In reply, please refer to:  
File:

EPO 15-248

October 19, 2015

Mr. Ron Terry  
Geometrician Associates  
P.O. Box 396  
Hilo, Hawaii 96721  
Email: rterry@hawaii.rr.com

Dear Mr. Terry:

**SUBJECT: Draft Environmental Assessment (DEA) for Honaunau Rodeo Arena Improvements  
South Kona, Hawaii  
TMK: (3<sup>rd</sup>) 8-4-008:002**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:  
[http://oeqc.doh.hawaii.gov/Shared%20Documents/EA\\_and\\_EIS\\_Online\\_Library/Hawaii/2010s/2015-10-08-HA-5B-DEA-Honaunau-Rodeo-Arena-Improvements.pdf](http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Hawaii/2010s/2015-10-08-HA-5B-DEA-Honaunau-Rodeo-Arena-Improvements.pdf)

EPO strongly recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: <http://health.hawaii.gov/epo/landuse>. Projects are required to adhere to all applicable standard comments.

We suggest you review the requirements for the National Pollutant Discharge Elimination System (NPDES) permit. We recommend contacting the Clean Water Branch at (808) 586-4309 or [cleanwaterbranch@doh.hawaii.gov](mailto:cleanwaterbranch@doh.hawaii.gov) after relevant information is reviewed at:

1. <http://health.hawaii.gov/cwb>
2. <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/standard-npdes-permit-conditions>
3. <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/forms>

Please note that all wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems". We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: <http://health.hawaii.gov/wastewater> and contact the Planning and Design Section of the Wastewater Branch at 586-4294.

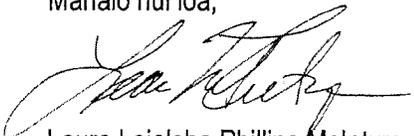
Mr. Ron Terry  
Page 2  
October 19, 2015

EPO encourages you to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: <https://eha-cloud.doh.hawaii.gov>

In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: <http://www2.epa.gov/ejscreen>

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa,



Laura Leialoha Phillips-McIntyre, AICP  
Program Manager, Environmental Planning Office

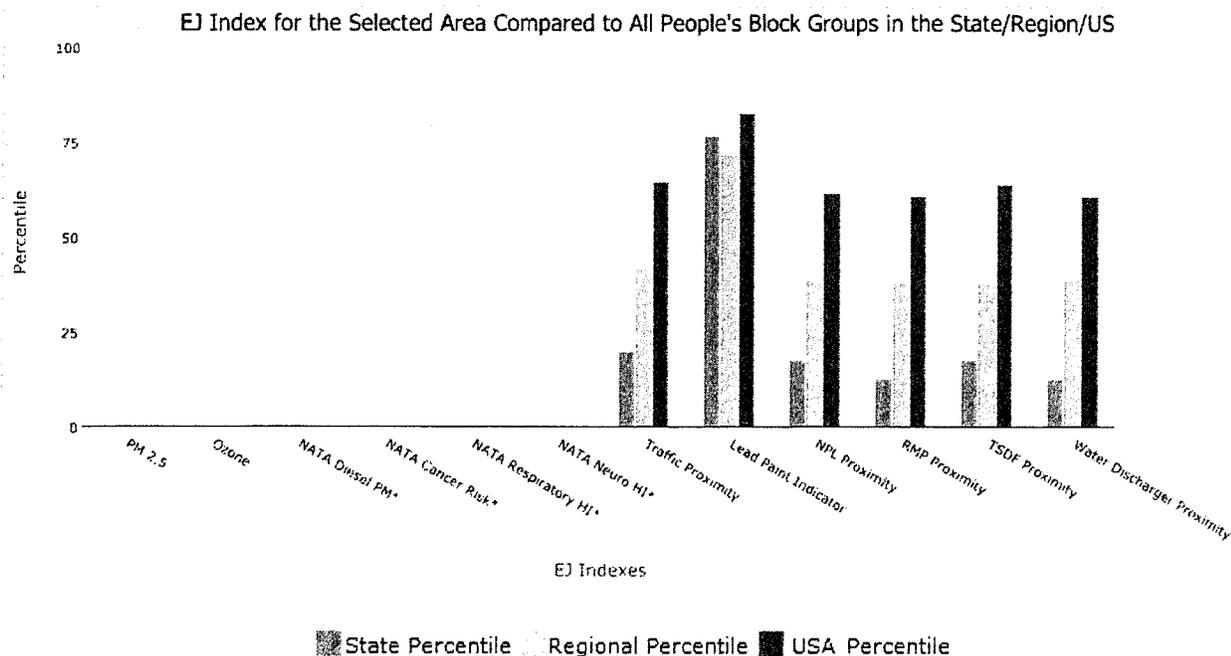
Attachment: U.S. EPA EJSCREEN 3 page report

c: James Komata, County of Hawaii, Department of Parks and Recreation  
DOH: DHO Hawaii, CWB (via email only)

for 1 mile Ring Centered at 19.431857,-155.892313, HAWAII, EPA Region 9

Approximate Population: 466

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
<b>EJ Indexes</b>			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA Diesel PM*	N/A	N/A	N/A
EJ Index for NATA Cancer Risk*	N/A	N/A	N/A
EJ Index for NATA Respiratory Hazard Index*	N/A	N/A	N/A
EJ Index for NATA Neuro HI*	N/A	N/A	N/A
EJ Index for Traffic Proximity and Volume	20	42	65
EJ Index for Lead Paint Indicator	77	72	83
EJ Index for Proximity to NPL sites	18	39	62
EJ Index for Proximity to RMP sites	13	38	61
EJ Index for Proximity to TSDFs	18	38	64
EJ Index for Proximity to Major Direct Dischargers	13	39	61

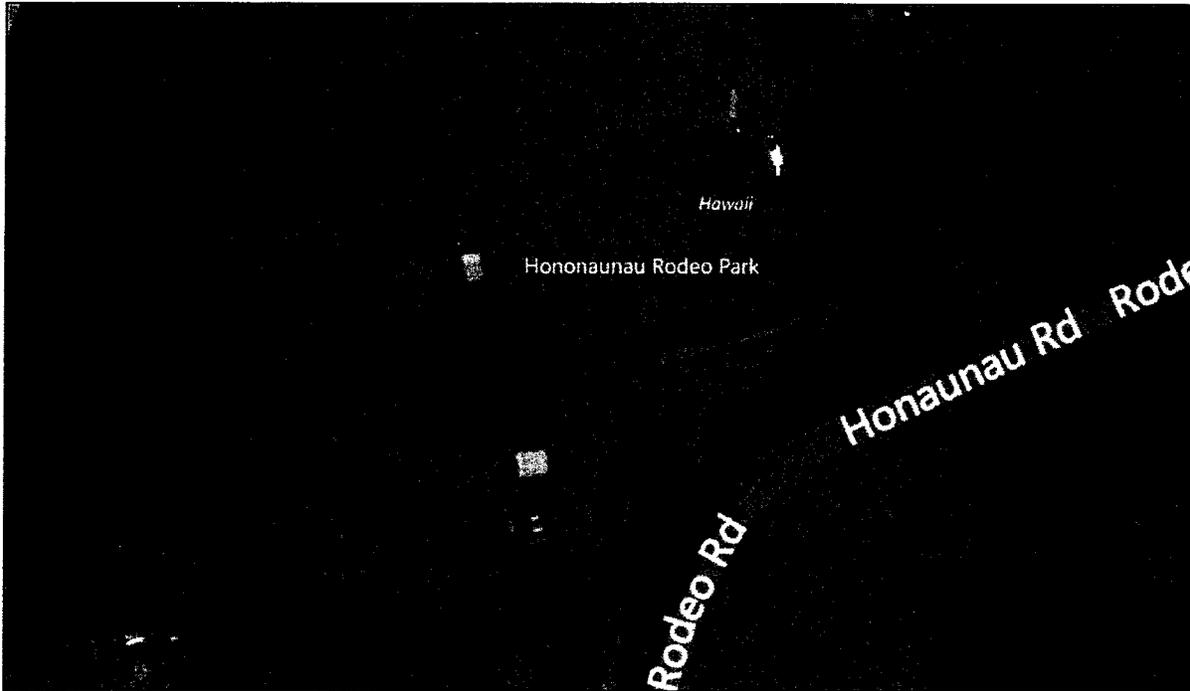


This report shows environmental, demographic, and EJ indicator values. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.



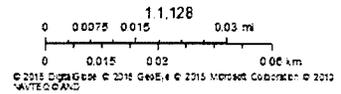
for 1 mile Ring Centered at 19.431857,-155.892313, HAWAII, EPA Region 9

Approximate Population: 466



October 19, 2015

+ Digitized Point



## EJSCREEN Report



for 1 mile Ring Centered at 19.431857,-155.892313, HAWAII, EPA Region 9

Approximate Population: 466

Selected Variables	Raw Data	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
<b>Environmental Indicators</b>							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$ )	N/A	N/A	N/A	9.95	N/A	9.78	N/A
Ozone (ppb)	N/A	N/A	N/A	49.7	N/A	46.1	N/A
NATA Diesel PM (ppb)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Lead (ppb)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Mercury (ppb)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Nitrogen Dioxide (ppb)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Traffic Proximity and Volume (daily traffic count/distance to road)	7.2	280	9	190	8	110	17
Lead Paint Indicator (% Pre-1960 Housing)	0.35	0.17	79	0.25	67	0.3	64
NPL Proximity (site count/km distance)	0.003	0.092	7	0.11	0	0.096	0
RMP Proximity (facility count/km distance)	0.011	0.18	0	0.41	0	0.31	0
TSD Proximity (facility count/km distance)	0.0031	0.092	7	0.12	0	0.054	3
Water Discharger Proximity (facility count/km distance)	0.011	0.33	4	0.19	0	0.25	0
<b>Demographic Indicators</b>							
Demographic Index	48%	51%	41	46%	55	35%	73
Minority Population	62%	77%	20	57%	54	36%	76
Low Income Population	34%	25%	74	35%	54	34%	56
Linguistically Isolated Population	4%	6%	54	9%	39	5%	67
Population With Less Than High School Education	7%	10%	46	18%	31	14%	34
Population Under 5 years of age	11%	6%	87	7%	84	7%	86
Population over 64 years of age	11%	14%	33	12%	54	13%	44

\* The National-scale Air Toxics Assessment (NATA) environmental indicators and EJ indexes, which include cancer risk, respiratory hazard, neurodevelopment hazard, and diesel particulate matter will be added into EJSCREEN during the first full public update after the soon-to-be-released 2011 dataset is made available. The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <http://www.epa.gov/ttn/atw/natamain/index.html>.

For additional information, see: [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice)

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

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integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Laura Leialoha McIntyre, Program Manager  
Hawai'i State Department of Health EPO  
[epo@doh.hawaii.gov](mailto:epo@doh.hawaii.gov)

**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

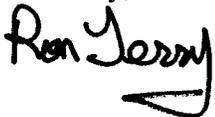
Dear Ms. McIntyre:

Thank you for your comment letter dated October 19, 2015, on the Draft EA. In answer to your specific comments:

1. *EPO standard comments, Environmental Health Portal and Water Quality Standards.* Thank you for referencing these websites. The design team is developing the project with water quality standards in mind, and P&R believes the action is a socially and environmentally sustainable use of a site that has served the rural community for many decades in the same capacity.
2. *Need for NPDES permit.* As discussed in Section 3.1.2 of the Draft EA, an NPDES permit is be required for the project and was obtained on November 20, 2015.
3. *Wastewater.* All wastewater plans will conform to applicable provisions of the DOH's Administrative Rules, Chapter 11-62, "Wastewater Systems", and we understand DOH's the right to review the detailed wastewater plans for conformance to applicable rules.
4. *EPA EJSCREEN.* Thank you for the reference to the EPA site and the information you provided.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

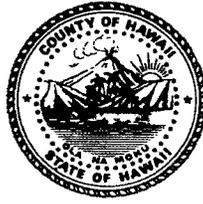
Sincerely,



Ron Terry, Principal  
Geometrician Associates

Cc: James Komata, P&R; Austen Drake, SSFM Int'l

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  
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

October 22, 2015

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

Dear Mr. Terry:

**SUBJECT: Draft Environmental Assessment**  
**Applicant: State of Hawai'i, EO'd to County of Hawai'i,**  
**Department of Parks and Recreation**  
**Project: Hōnaunau Rodeo Arena Improvements**  
**TMK: (3) 8-4-008:002, South Kona, Hawai'i**

This is in response to your letter received on October 8, 2015, requesting our comments on the above-referenced project.

We provided preliminary comments by letter dated August 6, 2015 for the proposed project and have no additional comments on the Draft Environmental Assessment.

If you have questions, please feel free to contact Esther Imamura of this office at 961-8139.

Sincerely,

*for* DUANE KANUHA  
Planning Director

ETI

P:\Wpwin60\ETI\Eadraftpre-Consul\Terry Honaunau Rodeo Arena DEA.Rtf

cc: Mr. James Komata  
Hawai'i County Department of Parks & Recreation

Planning Department - Kona

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A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Duane Kanuha, Director  
Hawaii County Planning Department  
101 Pauahi Street, Suite 3  
Hilo HI 96720

**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

Dear Mr. Kanuha:

Thank you for the comment letter dated October 8, 2015, in which you stated that your office had provided preliminary comments by letter dated August 6, 2015 for the proposed project and had no additional comments.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal  
Geometrician Associates

Cc: James Komata, P&R; Austen Drake, SSFM Int'l



National Park Service  
U.S. Department of the Interior

Pu`uhonua o Hōnaunau  
National Historical Park

P.O. Box 129  
Hōnaunau, Hawai'i  
96726

(808)328-2326 phone  
(808)328-9485 fax

---

## Pu`uhonua o Hōnaunau

IN REPLY REFER TO:

L7621 (2015-14)

November 6, 2015

Mr. Ron Terry  
Geometrician Associates  
PO Box 396  
Hilo, HI 96721

Re: Hōnaunau Rodeo Arena Improvements, South Kona, Hawai'i Island (TMK (3rd) 8-4-008:002)

Dear Mr. Terry:

I, on behalf of the National Park Service (NPS), thank you for the opportunity to provide comments on the proposed Hōnaunau Rodeo Arena Improvements, South Kona, Hawai'i Island (TMK (3rd) 8-4-008:002). The NPS shares the commitment you and the Hawai'i County Department of Parks and Recreation have to protect the unique and fragile natural and cultural resources of Hawai'i County. We look forward to working together to ensure current and proposed future developments or improvements do not impact the important natural and cultural resources the NPS is congressionally mandated to protect. We are pleased this project has minimized impacts to the natural and cultural resources that the citizens of Hawaii County, the State of Hawaii, and the Nation value. We ask that you please continue to keep us informed of future proposed developments or improvements in the areas of Pu`uhonua o Hōnaunau NHP and Kaloko-Honokōhau NHP.

The City of Refuge National Historical Park (NHP) was authorized by Congress on July 26, 1955 (Public law 95-625). These lands were transferred to the NPS in 1961. In 1978, the park name was changed to Pu`uhonua o Hōnaunau NHP. The park is 420 acres in size and was established for the "benefit and inspiration of the people" due to its historical and cultural significance. The park preserves a complex of archaeological sites, including temple platforms, royal fishponds, sledding tracks (*hōlua*), and coastal village sites. Natural resources include anchialine pools, endemic species, native plant garden and seed source, threatened and endangered species and culturally significant native plant species. The west boundary of the park is the near shore marine coastal ecosystems where threatened and endangered Hawaiian Monk Seals and Hawaiian sea turtles frequently feed and forage, these culturally significant species haul out and rest on the parks shoreline. The park purpose is to protect, restore, and maintain resources associated with the cultural values, traditions, and Native Hawaiian story of these sites

---

EXPERIENCE YOUR AMERICA

The National Park Service cares for special places saved by the American people so that all may experience our heritage.

[REDACTED]

and to also protect the flora and fauna. Because of the significant resources on NPS lands as well as lands adjacent, the NPS strives to maintain visual resources (lightscares, viewsheds and cultural landscapes), auditory resources (soundscapes), and air quality and water quality. The park welcomes over 400,000 people a year including local residents and visitors from around the world who come to enjoy these resources. In 2014, visitor spending generated \$22,534, 600 in spending for the local economy. Clearly there is also economic benefit to preserving these resources.

Of great importance to the NPS is maintaining the park's water quality. Managers have identified the anchialine pools and nearshore marine waters of the park as unique or pristine resources worthy of special attention. Inland surface waters of the park are designated "Class 2" by the Hawai'i Department of Health; protecting their use for recreational purposes, agricultural and industrial water supplies, and the support and propagation of aquatic life. Marine waters in the nearshore areas adjacent to the park are designated "AA". Waters designated "AA" are to 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. To the extent practicable, the wilderness character of these areas shall be protected. As of 2012, there are no water bodies within Pu'uhoonua o Hōnaunau NHP that are listed as impaired by the State of Hawaii although, four miles to the north, Kealakekua Bay has been listed as impaired by high levels of phosphorous. Increasing upslope development, the use of cesspools by local homeowners, and increasing use of Honaunau Bay for recreation pose threats to water quality. In closing, we are pleased this project has minimized impacts to the visual or auditory resources of Pu'uhoonua o Hōnaunau NHP and has minimized impacts to air and water quality within the park and the surrounding area.

I thank you again for providing us the opportunity to comment and look forward to working together to preserve and protect that natural and cultural resources of NPS and adjacent lands and waters. If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer of my staff (808-329-6881 ex 1500 or [jeff\\_zimpfer@nps.gov](mailto:jeff_zimpfer@nps.gov)).

Sincerely,



Tammy Ann Duchesne  
Superintendent

# geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Tammy Ann Duchesne, Superintendent  
Pu'uhonua o Honaunau NHP  
P.O. Box 129  
Honaunau, HI 96726

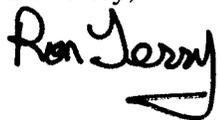
**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

Dear Superintendent Duchesne:

Thank you for the comment letter dated November 6, 2015, stating that your agency looks forward to working together to ensure that current and proposed future developments or improvements do not impact the park's resources, that you are pleased this project has minimized impacts to the natural and cultural resources, and that you would like to be kept apprised of any future P&R developments or improvements in the areas of Pu'uhonua o Honaunau NHP and Kaloko-Honokohau NHP. We appreciate the additional information on the park resources and the environmental challenges within its context. On behalf of the Department of Parks and Recreation, I wish to provide assurances that the County of Hawai'i is similarly concerned about protecting environmental quality. P&R will continue to keep your agency informed about activities in this area.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

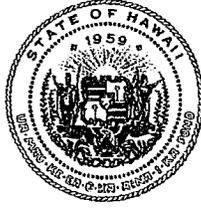
Sincerely,



Ron Terry, Principal  
Geometrician Associates

Cc: James Komata, P&R; Austen Drake, SSFM Int'l

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE  
MANAGEMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

November 9, 2015

Geometrician Associates, LLC  
Attention: Mr. Ron Terry  
P.O. Box 396  
Hilo, Hawaii 96721

via email: [rterry@hawaii.rr.com](mailto:rterry@hawaii.rr.com)

County of Hawaii  
Department of Parks and Recreation  
Attention: Mr. James Komata  
101 Pauahi Street, Suite 6  
Hilo, Hawaii 96720

via email: [jkomata@co.hawaii.hi.us](mailto:jkomata@co.hawaii.hi.us)

Dear Messrs. Terry and Komata:

SUBJECT: Draft Environmental Assessment (DEA) for Honaunau Rodeo Arena Improvements

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 (a) Engineering Division and (b) Land Division – Hawaii District on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

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

Russell Y. Tsuji  
Land Administrator

Enclosure(s)  
cc: Central Files

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
**LAND DIVISION**

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

October 12, 2015

**MEMORANDUM**

15 OCT 12 AM 10:35 ENGINEERING

TO: *PA*

**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: *TO: AR*

*AR* Russell Y. Tsuji, Land Administrator *✓*

SUBJECT: Draft Environmental Assessment (DEA) for Honaunau Rodeo Arena Improvements

LOCATION: South Kona, Hawaii, TMKs: (3) 8-4-008:002

APPLICANT: Geometrician Associates, LLC for the County of Hawaii Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced project. The DEA may be accessed on-line at the Office of Environmental Quality Control's website at <http://health.hawaii.gov/oeqc/> in the October 8, 2015 issue of The Environmental Notice. One hard copy of the DEA is also available in the Land Division office in Honolulu. We would appreciate your comments on this project. Please submit any comments by November 6, 2015.

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: *Carty S. Chang*

Print name: Carty S. Chang, Chief Engineer

Date: 11/7/15

cc: Central Files

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

October 12, 2015

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:

*AR* Russell Y. Tsuji, Land Administrator *RS*

SUBJECT:

Draft Environmental Assessment (DEA) for Honaunau Rodeo Arena Improvements

LOCATION:

South Kona, Hawaii, TMKs: (3) 8-4-008:002

APPLICANT:

Geometrician Associates, LLC for the County of Hawaii Department of Parks and Recreation

Transmitted for your review and comment is information on the above-referenced project. The DEA may be accessed on-line at the Office of Environmental Quality Control's website at <http://health.hawaii.gov/oeqc/> in the October 8, 2015 issue of The Environmental Notice. One hard copy of the DEA is also available in the Land Division office in Honolulu. We would appreciate your comments on this project. Please submit any comments by November 6, 2015.

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: *Gordon C. Heit*

Print name: GORDON C. HEIT

Date: 10/20/15

cc: Central Files

# geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Russell Y. Tsuji, Administrator  
Hawai'i State DLNR Land Division  
P.O. Box 621  
Honolulu HI 96809

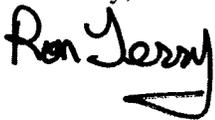
**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

Dear Mr. Tsuji:

Thank you for your comment letter dated November 9, 2015, on the Draft EA. We wish to acknowledge the no-comment/no objection memo by the Hawai'i District Land Office and the statement of no additional comments by the Engineering Division, which had previously provided information on the flood zone status of the property, which was contained in the Draft EA. We have responded to the SHPD letter separately, and have provided a cc: to your agency.

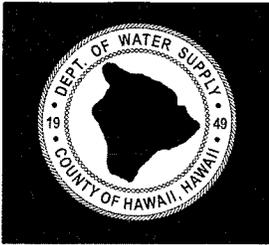
We very much appreciate your review of the document, including circulation to various DLNR agencies. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal  
Geometrician Associates

Cc: James Komata, P&R; Austen Drake, SSFM Int'l



**DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII**

345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAII 96720

TELEPHONE (808) 961-8050 • FAX (808) 961-8657

November 5, 2015

Mr. Ron Terry  
Geometrician Associates, LLC  
P.O. Box 396  
Hilo, HI 96721

Dear Mr. Terry:

**Subject: Draft Environmental Assessment  
Honaunau Rodeo Arena Improvements  
Tax Map Key 8-4-008:002**

We have reviewed the subject Draft Environmental Assessment and have the following comments.

We will continue to work with the Department of Parks and Recreation to determine how the requirements to obtain/retain water service to this facility will be addressed.

Should there be any questions, please contact Mr. Ryan Quitariano of our Water Resources and Planning Branch at 961-8070, extension 256.

Sincerely yours,

Keith K. Okamoto, P.E.  
Manager-Chief Engineer

RQ:dfg

# geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Keith Okamoto, P.E., Manager-Chief Engineer  
Hawai'i County DWS  
345 Kekuanaoa Street, Suite 20  
Hilo HI 96720

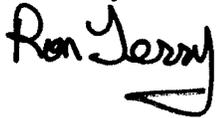
**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

Dear Mr. Okamoto:

Thank you for the comment letter dated November 5, 2015, stating that your agency will continue to work with the Department of Parks and Recreation to determine how the requirements to obtain/retain water service to this facility will be addressed.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is written in a cursive style with a large, sweeping flourish at the end.

Ron Terry, Principal  
Geometrician Associates

Cc: James Komata, P&R; Austen Drake, SSFM Int'l

DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE  
MANAGEMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

November 16, 2015

Geometrician Associates, LLC  
Attention: Mr. Ron Terry  
P.O. Box 396  
Hilo, Hawaii 96721

via email: [rterry@hawaii.rr.com](mailto:rterry@hawaii.rr.com)

County of Hawaii  
Department of Parks and Recreation  
Attention: Mr. James Komata  
101 Pauahi Street, Suite 6  
Hilo, Hawaii 96720

via email: [jkomata@co.hawaii.hi.us](mailto:jkomata@co.hawaii.hi.us)

Dear Messrs. Terry and Komata:

SUBJECT: Draft Environmental Assessment (DEA) for Honaunau Rodeo Arena  
Improvements

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent you on November 9, 2015, enclosed are comments from the State Historic Preservation Division on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

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

Russell Y. Tseji  
Land Administrator

Enclosure  
cc: Central Files

DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA  
FIRST DEPUTY

JEFFREY T. PEARSON  
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 3, 2015

Russell Y. Tsuji, Administrator  
Land Division  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

LOG NO: 2015.03728  
DOC NO: 1511GCO1  
Archaeology, Architecture

Dear Mr. Tsuji:

**SUBJECT: Chapter 6E-8 Historic Preservation Review –  
Draft Environmental Assessment (DEA) – Honaunau Rodeo Arena Improvements  
Honaunau Ahupua'a, Kona District, Island of Hawai'i  
TMK: (3) 8-4-008:002**

Thank you for the opportunity to review and comment the County of Hawai'i, Department of Parks and Recreation's Draft Environmental Assessment (DEA) (Geometrician Associates, LLC 2015) for the Honaunau Rodeo Arena Improvements. The 6.126-acre old Honaunau School Lot property was conveyed to the Department of Parks and Recreation by Executive Order No. 2468, approved on October 30, 1969, for recreational and allied uses. We received this submittal on October 12, 2015. The project involves (1) rerouting and improving vehicular access and circulation; (2) water systems improvements; (3) relocation of arena; (3) improvement of structures and expansion of parking; (4) construction of a new pavilion; (5) replacement of existing comfort station; and (6) improvements to facilities for accessibility to individuals with disabilities.

The DEA indicates that the Department of Parks and Recreation will pursue acquiring various permits, including Environmental Protection Act (EPA), Clean Water Act, National Pollutant Discharge Elimination System (NPDES) permit. The issuance of an NPDES permit is a federal undertaking triggering the National Historic Preservation Act (NHPA), Section 106 review and consultation process.

Our records indicate the proposed project area is located within the geographic boundaries of the Kona Field System (SIHP 50-10-37-06601), and potential exists for architectural and/or archaeological historic properties to be present within the project area. In addition, SHPD's records indicate that a recent draft archaeological inventory survey (AIS) report (Barna and Rechtman 2015) was submitted to SHPD (Log No. 2015.03111) for the Honaunau Rodeo Arena Improvements and is still under review.

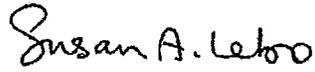
Based on the information provided, **SHPD requests no permits be issued involving ground disturbance prior to SHPD review and acceptance of the AIS and any other necessary documents (e.g., archaeological monitoring plan). We will notify your office when the necessary documents have been accepted.**

In addition, SHPD looks forward to the lead federal agency or its delegated authority initiating the NHPA Section 106 consultation and review process with our agency.

Please contact Anna Broverman at (808) 692-8028 or at [Anna.E.Broverman@hawaii.gov](mailto:Anna.E.Broverman@hawaii.gov) if you have any questions regarding architectural resources (e.g. basalt curbing, bridges). Please contact me at [Susan.A.Lebo@hawaii.gov](mailto:Susan.A.Lebo@hawaii.gov) or at (808) 692-8019 if you have any questions regarding archaeological resources or this letter.

Russell Y. Tsuji  
November 3, 2015  
Page 2

Aloha,

A handwritten signature in cursive script that reads "Susan A. Lebo".

Susan A. Lebo, PhD  
Archaeology Branch Chief

cc: Kevin Moore, Land Division ([Kevin.E.Moore@hawaii.gov](mailto:Kevin.E.Moore@hawaii.gov))

# geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

December 11, 2015

Susan Lebo, Archaeology Branch Chief,  
State Historic Preservation Division  
601 Kamokila Blvd., Rm. 555  
Kapolei HI 96707

**Subject: Comment to Draft Environmental Assessment on Hōnaunau Rodeo Arena Improvements**

Dear Ms. Lebo:

Thank you for the comment letter dated November 3, 2015, to Russell Tsuji, Land Division Administrator of DLNR, who circulated the EA to your agency and solicited your comment. On behalf of the County of Hawai‘i, I offer the following responses to your specific comments.

1. *“The issuance of an NPDES permit is a federal undertaking triggering the National Historic Preservation Act (NHPA), Section 106 review and consultation process.”* The County of Hawai‘i does not concur with this analysis, which is contrary to terms under which implementation of the NPDES permit system was delegated by the EPA to the individual states. As such, Section 106 is not triggered.
2. *“A draft archaeological inventory survey (AIS) report (Barna and Rechtman 2015) was submitted to SHPD (Log No. 2015.03111) for the Honaunau Rodeo Arena Improvements and is still under review.”* We note that the survey was submitted to your office on August 10 and logged in on August 14, 2015. Per HAR 13-275-3(c), we understand that your office has 45 days to review the survey and determine whether it is adequate.
3. *“Based on the information provided, SHPD requests no permits be issued involving ground disturbance prior to SHPD review and acceptance of the AIS and any other necessary documents (e.g., archaeological monitoring plan).”* The County looks forward to receiving your review letter and determining appropriate action after that. However, based on the erroneous assumption of federal involvement that is partly behind this request, as well as the amount of time that it has taken your agency to provide a formal response of your review the AIS, the County may determine that it will need to proceed with ground-disturbing activities in order to retain the project schedule.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090. For questions about the project, please contact James Komata at 961-311.

Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is written in a cursive style with a large, sweeping "R" and a distinct "T".

Ron Terry, Principal  
Geometrician Associates

Cc: Russell Y. Tsuji, Administrator, DLNR Land Division  
James Komata, P&R; Austen Drake, SSFM Int'l

**Hōnaunau Rodeo Arena Improvements**  
**Environmental Assessment**

TMK (3rd) 8-4-008:002  
South Kona District, Hawai‘i Island, State of Hawai‘i

**APPENDIX 2**  
**Archaeological Report**

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# Archaeological Inventory Survey for Proposed Improvements to the Hōnaunau Rodeo Arena

TMK: (3) 8-4-008:002

Hōnaunau Ahupua‘a  
South Kona District  
Island of Hawai‘i

DRAFT VERSION



*Prepared By:*

Benjamin Barna, Ph.D.,  
and  
Robert B. Rechtman, Ph.D.

*Prepared For:*

Austen Drake, P.E.  
SSFM International, Inc.  
99 Aupuni Street  
Hilo, HI 96720

August 2015

ASM Project Number 24810.00



Archaeology • History • Ethnography • Architectural History

Office: (808) 969-6066 • Fax: (808) 443-0065



# **Archaeological Inventory Survey for Proposed Improvements to the Hōnaunau Rodeo Arena**

TMK: (3) 8-4-008:002

Hōnaunau Ahupua‘a  
South Kona District  
Island of Hawai‘i





## EXECUTIVE SUMMARY

At the request of Austen Drake, P.E., of SSFM International, Inc., on behalf of the County of Hawai'i Department of Parks and Recreation (DPR), ASM Affiliates (ASM) conducted an Archaeological Inventory Survey (AIS) of a roughly six-acre property (TMK: (3) 8-4-008:002) in Hōnaunau, South Kona, Hawai'i Island (Figures 1 and 2). DPR has proposed improvements to an existing rodeo arena complex that occupies the parcel, to include enhancing the water system at the site, providing a covered bleacher structure with new bleachers, replacing the comfort station, replacing the judge's stand, replacing the concession facility, providing a new pavilion, improving available parking, providing an ADA accessible system of walkways and amenities, and appurtenant work. This project triggers compliance with HRS 343 and thus the production of an Environmental Assessment (EA); the present study is being prepared to support the EA, and was performed in compliance with Hawai'i Administrative Rules (HAR) 13§13-275 and in accordance with the *Rules Governing Standards for Archaeological Inventory Surveys and Reports* as contained in HAR 13§13-276. Fieldwork for the current study was conducted on July 14, 2014 by Benjamin Barna, Ph. D. and J. David Nelson, B.A., and consisted of a pedestrian survey of the entire ground surface of the study parcel. As a result of the current fieldwork, one previously-identified site (SIHP Site 23178) and one unrecorded site (SIHP Site 30377) were identified, both being heavily modified Historic Period livestock control walls surrounding the perimeter of the former Hōnaunau School Lot. No further historic preservation work is the recommended treatment for both sites.

The information acquired during the current study is sufficient to mitigate any alterations to the sites that may occur as a result of the proposed project. Much of the activity that has caused the loss of site integrity is a result of the refurbishment of the walls during the conversion of the property into the rodeo arena beginning in 1964, and subsequent maintenance of those walls. The transformation from the former school lot to the Hōnaunau Rodeo Arena marked the beginning of a new chapter in the parcel's history that connects this place with the long history of ranching in South Kona. Continuing the time-honored tradition of maintaining and modifying these walls to serve the needs of the rodeo arena would be an appropriate way to unofficially "preserve" them through the persistence of a practice that has come to be associated with ranching and related activities in Hawai'i.



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# 1. INTRODUCTION

At the request of Austen Drake, P.E., of SSFM International, Inc., on behalf of the County of Hawai'i Department of Parks and Recreation (DPR), ASM Affiliates (ASM) conducted an Archaeological Inventory Survey (AIS) of a roughly six-acre property (TMK: (3) 8-4-008:002) in Hōnaunau, South Kona, Hawai'i Island (Figures 1 and 2). DPR has proposed improvements to an existing rodeo arena complex that occupies the parcel, to include enhancing the water system at the site, providing a covered bleacher structure with new bleachers, replacing the comfort station, replacing the judge's stand, replacing the concession facility, providing a new pavilion, improving available parking, providing an ADA accessible system of walkways and amenities, and appurtenant work. This project triggers compliance with HRS 343 and thus the production of an Environmental Assessment (EA); the present study is being prepared to support the EA.

The current study was performed in compliance with Hawai'i Administrative Rules (HAR) 13§13–275 and in accordance with the *Rules Governing Standards for Archaeological Inventory Surveys and Reports* as contained in HAR 13§13–276. The project was undertaken in compliance with both the historic preservation review process requirements of the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) and the County of Hawai'i. This report contains background information outlining the study area's physical and cultural contexts, a presentation of previous archaeological work in the immediate vicinity of the property, and current survey expectations based on that previous work. Also presented is an explanation of the survey methods, descriptions of the resources encountered, interpretation and evaluation of those resources, and treatment recommendations for the documented sites.

## STUDY PARCEL DESCRIPTION

The roughly six-acre study parcel is located between 550 and 610 feet elevation, and is surrounded by agricultural lands owned by Kamehameha Schools (Bishop Estate). The majority of the parcel is enclosed by stone walls of varying age, and the enclosed portion has been graded and improved to create the Hōnaunau Rodeo Arena. The arena is accessed through a main gate (Figure 4) on Hōnaunau Road, which leads to an asphalt parking lot and a recently (2011) upgraded Hawai'i County Wai Puna (water) station (Figure 5). To the east of the parking lot are four banks of arena bleachers (Figure 6) on a leveled grassy area located about three meters below the Hōnaunau Road grade. A revetment (Figure 7) below Hōnaunau Road is faced with stacked medium-to-large cobbles. The top of this revetment includes a low (70 centimeter tall) cobble and concrete wall capped with concrete that contains an inscription reading "KONA ROPING CLUB / 1-94" (Figure 8). At the eastern end of the arena are several pens (Figure 9) constructed of galvanized pipe. The pens abut a stone wall that separates the rodeo grounds from a road right-of-way on the parcel's eastern boundary (Figure 10). The arena proper (Figure 11) is a graded, dirt-surfaced area surrounded by galvanized pipe fencing. At the western end of the arena are a judge's stand (Figure 12), a ramp and livestock pens (Figure 13), a concession stand (Figure 14) with a degraded asphalt area around it, and a comfort station (see Figure 14). A degraded asphalt driveway (Figure 15) curves around the western end of the arena to the northwestern corner of the developed portion of the parcel. As the driveway approaches the northwestern corner, it drops below the grade of the leveled arena area, and the northwestern end of the arena appears to be fill containing construction debris (Figure 16). To the west of the driveway, the ground surface has been graded (Figure 17), but abruptly drops off down a natural hillside a few meters east of the parcel boundary.

The soils within the study parcel are mapped as Kainaliu-Waiaha complex of ash fields on 'a'ā flows, 10 to 20 percent slopes, consisting of well-drained, cobbly silty clay loam (Kainaliu) and cobbly medial silt loam (Waiaha) (Soil Survey Staff 2015). These soils cover Mauna Loa (Qk1y) 'a'ā flows dating between 3,000 and 5,000 years B.P. The majority of the study parcel, however, has been graded to an elevation between 580 and 593 feet above sea level, and a portion of the parcel has been filled to attain this relatively flat surface. This graded area around the rodeo arena is covered with manicured grass and ornamental trees including: 'opiuma (*Pithecellobium dulce*), jacaranda (*Jacaranda mimosifolia*), plumeria (*Plumeria sp.*), tamarind (*Tamarindus indica*), monkey pod (*Pithecellobium saman*), Octopus-tree (*Schefflera actinophylla*), and mango (*Mangifera indica*). The natural hillside on the western end of the property, by contrast, is overgrown with guinea grass (*Panicum maximum*), 'ēkoa (*Leucaena sp.*), night-blooming cereus (*Hylocereus undatus*), a few autograph trees (*Clusia major*), and several vines. Annual rainfall averages about 42 inches (Giambelluca et al. 2013).

# I. Introduction



Figure 1. Location of the study area.

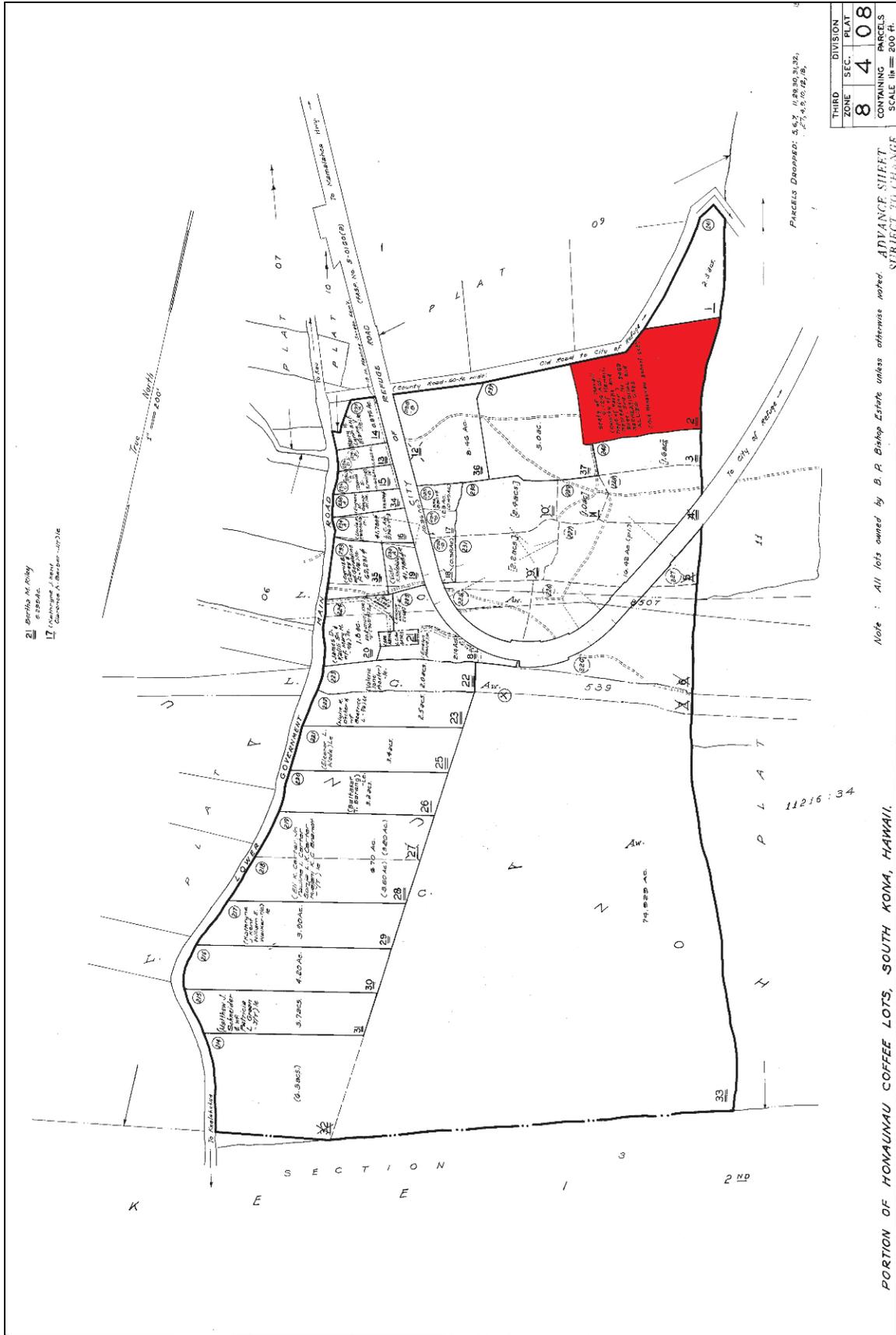


Figure 2. Tax Map Key (TMK) (3) 8-4-008 with the study parcel (002) shaded red..



Figure 3. Google Earth™ satellite imagery with the current study parcel outlined in red.



Figure 4. Main gate of Hōnaunau Rodeo Arena, view to the east.



Figure 5. Wai Puna station and asphalt parking lot, view to the southwest.



Figure 6. Bleachers at the rodeo arena, view to the northeast.



Figure 7. Revetment below Hōnaunau Street, view to the west-southwest.



Figure 8. Inscription in concrete capping Hōnaunau Street revetment.



Figure 9. Pens at eastern end of rodeo arena, view to the northwest.



Figure 10. Road right-of-way on eastern boundary of the study parcel, view to the north.



Figure 11. Rodeo arena, view to the west.



Figure 12. Judges stand, view to the west-northwest.



Figure 13. Ramp and livestock pens, view to the west-northwest.



Figure 14. Concession stand (center) with comfort station (left) and asphalt pad (right), view to the west.



Figure 15. Degraded asphalt driveway behind the judge's stand, view to the southwest.



Figure 16. Debris used to level northwest corner of arena grounds, view to the north.



Figure 17. Graded area west of the arena grounds and edge of natural hillside, view to the northwest.

## 2. BACKGROUND

This section of the report describes and synthesizes prior archaeological, cultural, and historical research relevant to the current study area. This information is provided in order to generate a set of expectations regarding the nature of cultural resources that might be encountered within the study area and to establish a foundation for assessing the significance of any such resources.

### CULTURE-HISTORICAL CONTEXT

In an effort to provide a comprehensive and holistic understanding of the current study area and in order to generate a set of expectations for the subject parcel, archival and historical data relevant to Hōnaunau Ahupua‘a and South Kona, along with the settlement patterns for the general region are presented.

#### An Overview of Hawaiian Settlement

The conventional wisdom has been that first inhabitants of Hawai‘i Island probably arrived by at least A.D. 300, and focused habitation and subsistence activity on the windward side of the island (Burtchard 1995; Kirch 1985; Hommon 1986). However, there is no archaeological evidence for occupation of Hawai‘i Island (or perhaps anywhere in Hawai‘i) during this initial settlement, or colonization stage of island occupation (A.D. 300 to 600). More recently, Kirch (2011) has convincingly argued that Polynesians may not have arrived to the Hawaiian Islands until at least A.D. 1000, but expanded rapidly thereafter. It has been generally reported that the sources of the early Hawaiian population—the Hawaiian Kahiki—were the Marquesas and Society Islands (Cordy 2000; Emory in Tatar 1982:16-18).

For generations following initial settlement, communities were clustered along the watered, windward (*ko‘olau*) shores of the Hawaiian Islands. Along the *ko‘olau* shores, streams flowed and rainfall was abundant, and agricultural production became established. The *ko‘olau* region also offered sheltered bays from which deep sea fisheries could be easily accessed, and near shore fisheries, enriched by nutrients carried in the fresh water, could be maintained in fishponds and coastal waters. It was around these bays that clusters of houses where families lived could be found (McEldowney 1979:15). In these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991:287).

During the first couple centuries of habitation, areas with the richest natural resources became populated and perhaps crowded, and archaeological evidence suggests that by A.D. 1200 the population began expanding to the *kona* (leeward) side and more remote regions of the island (Cordy 2000:130). In Kona, communities were initially established along sheltered bays with access to fresh water and rich marine resources. The primary “chiefly” centers were established at several locations—the Kailua (Kaiakeakua) vicinity, Kahalu‘u-Keauhou, Ka‘awaloa-Kealakekua, and Hōnaunau. The communities shared extended familial relations, and there was an occupational focus on the collection of marine resources. By the fourteenth century, inland elevations to around the 3,000-foot level were being turned into a complex and rich system of dryland agricultural fields (today referred to as the Kona Field System). By the fifteenth century, residency in the uplands was becoming permanent, and there was an increasing separation of the chiefly class from the common people. In the sixteenth century the population stabilized and the *ahupua‘a* land management system was established as a socioeconomic unit (see Ellis 1963; Handy et al. 1991; Kamakau 1961; Kelly 1983; and Tomonari-Tuggle 1985).

In Kona, where there were no regularly flowing streams to the coast, access to potable water (*wai*), was of great importance and played a role in determining the areas of settlement. The waters of Kona were found in springs and caves (found from shore to the mountain lands), or procured from rain catchments and dewfall. Traditional and historic narratives abound with descriptions and names of water sources, and also record that the forests were more extensive and extended much further seaward than they do today. These forests not only attracted rains from the clouds and provided shelter for cultivated crops, but also in dry times drew the *kēhau* and *kēwai* (mists and dew) from the upper mountain slopes to the low lands (see Rechtman et al. 2001).

In the 1920s-1930s, Handy et al. (1991) conducted extensive research and field interviews with elder native Hawaiians. In lands of North and South Kona, they recorded native traditions describing agricultural practices and rituals associated with rains and water collection. Primary in these rituals and practices was the lore of Lono—a god of agriculture, fertility, and the rituals for inducing rainfall. Handy et al., observed:

The sweet potato and gourd were suitable for cultivation in the drier areas of the islands. The cult of Lono was important in those areas, particularly in Kona on Hawai‘i . . . there were temples dedicated to Lono. The sweet potato was particularly the food of the common people. The festival

in honor of Lono, preceding and during the rainy season, was essentially a festival for the whole people, in contrast to the war rite in honor of Ku which was a ritual identified with Ku as god of battle. (Handy et al. 1991:14)

Handy et al. (1991) noted that the worship of Lono was centered in Kona. Indeed, it was while Lono was dwelling at Keauhou, that he is said to have introduced taro, sweet potatoes, yams, sugarcane, bananas, and 'awa to Hawaiian farmers (Handy et al. 1991:14). The rituals of Lono "The father of waters" and the annual *Makahiki* festival, which honored Lono and which began before the coming of the *kona* (southerly) storms and lasted through the rainy season (the summer months), were of great importance to the native residents of this region (Handy et al. 1991: 523). The significance of rituals and ceremonial observances in cultivation and indeed in all aspects of life was of great importance to the wellbeing of the ancient Hawaiians, and cannot be overemphasized, or overlooked when viewing traditional sites of the cultural landscape.

## Hawaiian Land Use and Resource Management Practices

Over the generations, the ancient Hawaiians developed a sophisticated system of land and resources management. By the time 'Umi-a-Liloa rose to rule the island of Hawai'i in ca. 1525, the island (*moku-puni*) was divided into six districts or *moku-o-loko* (cf. Fornander 1973–Vol. II:100-102). On Hawai'i, the district of Kona is one of six major *moku-o-loko* within the island. The district of Kona itself, extends from the shore across the entire volcanic mountain of Hualālai, and continues to the summit of Mauna Loa, where Kona is joined by the districts of Ka'ū, Hilo, and Hāmākua. One traditional reference to the northern and southern-most coastal boundaries of Kona tells us of the district's extent:

*Mai Ke-ahu-a-Lono i ke 'ā o Kani-kū, a hō 'ea i ka 'ūlei kolo o Manukā i Kaulanamauna epili aku i Ka'ū!*—From Keahualono [the Kona-Kohala boundary] on the rocky flats of Kanikū, to Kaulanamauna next to the crawling (tangled growth of) 'ūlei bushes at Manukā, where Kona clings to Ka'ū! (*Ka'ao Ho'oniua Pu'uwai no Ka-Miki in Ka Hōkū o Hawai'i*, September 13, 1917; Translated by K. Maly)

Kona, like other large districts on Hawai'i, was subdivided into 'okana or *kalana* (regions of land smaller than the *moku-o-loko*, yet comprising a number of smaller units of land). The *moku-o-loko* and 'okana or *kalana* were further divided into manageable units of land, and were tended to by the *maka'āinana* (people of the land) (cf. Malo 1951:63-67). Of all the land divisions, perhaps the most significant management unit was the *ahupua'a*. *Ahupua'a* are subdivisions of land that were usually marked by an altar with an image or representation of a pig placed upon it (thus the name *ahu-pua'a* or pig altar). In their configuration, the *ahupua'a* may be compared to wedge-shaped pieces of land that radiate out from the center of the island, extending to the ocean fisheries fronting the land unit. When describing *ahupua'a* boundaries during the Boundary Commission hearings during the 1870s, witnesses generally defined them according to topography and geological features such as *pu'u* (hills), ridges, gullies, valleys, craters, or areas of a particular vegetation growth.

The *ahupua'a* were also divided into smaller individual parcels of land (such as the *'ili*, *kō'ele*, *māla*, and *kīhāpai*, etc.), generally oriented in a *mauka-makai* direction, and often marked by stone alignments (*kuaiwi*). In these smaller land parcels the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people, who lived in a given *ahupua'a* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *ali'i* (see Kamakau 1961:372-377 and Malo 1951:63-67). Entire *ahupua'a*, or portions of the land were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *ali'i-'ai-ahupua'a* (chief who controlled the *ahupua'a* resources). The *ali'i-'ai-ahupua'a* in turn answered to an *ali'i'ai moku* (chief who claimed the abundance of the entire district). Thus, *ahupua'a* resources supported not only the *maka'āinana* and 'ohana who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning. In this system, the land provided fruits and vegetables and some meat in the diet, and the ocean provided a wealth of protein resources.

The current study parcel is situated toward the southern end of a vast archaeological landscape that has been termed the Kona Field System (Cordy 1995; Newman 1970; Schilt 1984). This landscape (about 140 km<sup>2</sup>) of dry-land agricultural fields extends north from Ho'okena Ahupua'a to at least Kaū Ahupua'a and east from the coastline all the way to the forested slopes of Hualālai, about 2500 meters above sea level (Cordy 1995). A large portion of the field

system is designated in the Hawai'i State Inventory of Historic Places (SIHP) as Site 50-10-37-6601 (Newman 1974) and has been determined eligible for inclusion in the National Register of Historic Places. The basic characteristics of this agricultural/residential system as presented in Newman (1970) have been confirmed and elaborated on by ethnohistorical investigations (Kelly 1983) and summarized by Cordy (1995). Recent work (Lincoln and Ladefoged 2015; Lincoln et al. 2014) has further refined models of the extent and configuration of the system. The construct is based on the Hawaiian terms for the major vegetation zone (Table 1) that roughly parallel the coast and mark changes in elevation and rainfall, which are used to define and segregate space within the region's *ahupua'a*. In the Kona Field System model, the current study area is located near the transition from the *kula* zone to the *kalu'ulu* zone, however, it should be noted that Rechtman et al. (2001) reported that the term "*kula*" was used by *Māhele* claimants for land in South Kona to refer to the entire area below the upper Government Road at an elevation of roughly 1000 feet. Additionally, for the South Kona region, Horrocks and Rechtman (2009) have suggested that localized environmental conditions had the effect of pushing the *kula* planting zone up to about 1000 feet elevation.

**Table 1. Traditional Hawaiian vegetation zone classification (after Newman 1970 and Kelly 1983).**

<i>Zone</i>	<i>Approx. Elevation Limits (ft.)*</i>	<i>Agricultural uses</i>
<i>kula</i>	Sea level – 500	Sweet potato, paper mulberry, gourds
<i>kalu'ulu</i>	500-1000	Breadfruit, sweet potato, paper mulberry
<i>'āpa'a</i>	1000-2500	Taro, sweet potato, sugar cane, ti
<i>'ama'u</i>	2500-4000	Banana, plantain

\*above sealevel.

In communities with long-term royal residents, like Hōnaunau, specialist labor was the norm, with occupational activities on land and in procurement of marine resources. In the *ahupua'a* of Hōnaunau, perhaps based on specialist labor in combination with resource availability, there appears to have been two distinct settlement zones, a coastal village centered on the royal compound and *pu'uhonua*, and a more *mauka* agricultural settlement, with relatively marginal land between the two areas.

### The Royal Compound and Pu'uhonua o Hōnaunau

Because of their great cultural and historical significance, the royal compound and Pu'uhonua o Hōnaunau have been the subject of numerous archaeological and ethnohistorical studies (Apple 1966; Bryan et al. 1957; Bryan and Emory 1986; Emory 1970; Greene 1993, Jackson 1966; Kekahuna and Kelsey 1956; Ladd 1969, 1986; Pearson 1969; Soehren and Tuohy 1987; Somers 1986). A brief summary of the *pu'uhonua* and the royal compound is provided, drawing largely on work presented by Barrère (1986) and augmented with more recent studies (e.g., Cordy 2000).

Hōnaunau's ample marine and land resources made it attractive to the Hawaiians who settled on the kona coast of the island. The area's calm waters and sandy beaches provided easy access to abundant fish and other marine resources, and a dependable water source could be found in a number of brackish springs, actually tide pools in which rainwater and natural seepage accumulated on the surface of the salt water. The gentle, fertile upland slopes were conducive to growing taro, bananas, sweet potatoes, sugarcane, and breadfruit. Stands of hardwood trees provided wood for constructing residences and religious structures and for manufacturing canoes. With these resources at hand, Hōnaunau became the traditional seat of the chiefdom of Kona. The ruling chief and his court occupied the area at the head of the bay and along the shore to the south, while lesser chiefs, commoners serving the court, and priests resided on the north shore of the bay, toward the mountains, and possibly at Kēōkea and Ki'ilae villages to the south.

The ancient village of Hōnaunau was the ancestral home of the Kamehameha dynasty, serving in ancient times as a major Hawaiian religious and cultural center. The few archaeological dates available for what became the royal compound indicate that the first *heiau*, 'Āle'ale'a I, was built in the A.D. 1000s-1300s (Cordy 2000). The *pu'uhonua*, or place of refuge, was reported by Kamakau (1870) to be built by Keawe-ku-'i-ke-ka'ai during the reign of his father Keakealanikane ca. A.D. 1660-1680. The royal mausoleum (Hale-o-Keawe) appears to have been constructed after the death of King Keawe 'ikekahi-ali-'i-o-ka-moku, Kamehameha's great-grandfather, about A.D. 1740. The remains of many as sixteen of Kamehameha's ancestors came to be housed there (Barrère 1986), and their *mana* endowed the area with extreme sacredness and the refuge with powerful guardian spirits. Barrère (1986) reported that as late as 1919, a few descendants of Hōnaunau people could remember their grandparents saying that until the overthrow of the *kapu* system by Liholiho, commoners had to pass along the shore in the morning, and around the bank of the village in the afternoon, lest their shadows fall upon the sacred ground of the chiefs, a profanity punishable by death.

The importance of Hōnaunau as a royal compound features in John Papa I'i's (1959) account of the death of King Kalani'ōpu'u in ca. 1782, which set the stage for the battle of Moku'ōhai and Kamehameha's eventual conquest of Hawai'i Island. When Kalani'ōpu'u died at Ka'ū, his remains were taken to Kapalilua. Kiwala'ō (Kalani'ōpu'u's heir)

and his cousin Kamehameha met at Hōnaunau, and disagreements over the division of lands arose. The events that unfolded led to a battle that brought Kamehameha to gain control over part of the island of Hawai‘i. I‘i described:

When the company from Kau reached Kapalilua in Kona with the corpse of Kalaniopuu, they heard that Kamehameha had arrived at Keei. That was probably the reason why the corpse was not taken to Kailua but to Honaunau, as they had originally agreed . . .

After the Kau chiefs had been at Honaunau a while, Kamehameha and his canoe paddlers arrived in his single canoe, named *Noiku*. They landed back of Akahipapa, a lava flat extending into the sea. No sooner had his foot touched land than those on shore were ready to hurl spears of *hau* wood at him, a custom observed upon the landing of a high chief. This they did, and those on land watched with admiration as Kamehameha thrust them aside. A person remained near the chief with a container of water for his bath; and after the spear throwers had finished and had seated themselves, Kamehameha bathed and donned a dry *malo*. He went up to see his cousin Kiwalao, and when they met food was made ready. Thus they met graciously. As Kamehameha went there to see Kiwalao, so did his cousin visit him at Keei, spending the night time and again. It was said that Kamehameha served his cousin as steward during these visits. As Kiwalao was in no hurry to return to Honaunau, his uncle, Keawemauhili, came for him. He left at Keawemauhili’s insistence, which caused Kiwalao to remark to Kamehameha that his uncle seemed to be disturbed over their friendly association. “Because of this, trouble may brew between us,” he said. It happened so . . .

...That night, overseers sent a proclamation to all the men of the chiefs to go to the upland of Honaunau for some taro. That same night the great warrior taught Keoua all the things that he was to do on the morrow on the sands of Hauiki in Mokuohai. When day came, all the men had gone to the upland, having started while it was still dark because of the long distance they had to travel to and-fro. This gave Keoua and his companions a chance to do their work. After eating, they went to the beach to bathe or dive (*lele kawa*). They went along the shore diving until they reached Hauiki in Mokuohai. There coconut trees were hewn down, houses burned, and men killed. After this act of war, they turned about and went home. The work was then taken up by others, for the news had reached the chiefs of both sides. They prepared for war and the war canoes were made ready... (I‘i 1959:13)

Another account by John Papa I‘i states that Kamehameha’s son Liholiho regularly visited the Hale-o-Keawe during his journeys to various *luakini* as his father’s representative in those rituals necessary to replenish their *mana*. Liholiho would begin this series of prescribed visits in Kailua, proceed up the coast to Kawaihae, and then continue on around the island, finally stopping at Hale-o-Keawe. I‘i, who travelled as a companion of Liholiho, published the only eye-witness account of an official state visit to the Hale-o-Keawe and of the accompanying rituals, as performed in 1817:

The person whose writing this is [I‘i] often went about them [places of refuge on the various islands]. He has seen the Hale o Keawe, where the bones were deposited, standing majestically on the left side of Akahipapa lava flat. The house stood by the entrance of a wooden enclosure, its door facing inland toward the farming lands of South Kona. The house was good-looking inside and out. Its posts and rafters were of *kauila* wood, which, it is said, was found in the upland of Napuu. It was well built, with crossed stems of dried ti leaves for thatching. The compact bundles of deified bones were in a row inside the house, beginning with Keawe’s bones, near the right side of the door by which one went in and out, and extending to the spot opposite the door.

At the right front corner of the house, heaped up like firewood, were the unwrapped bones of those who had died in war. In that heap were the bones of Nahiolea, father of Mataio Kekuanaoa. Ii saw his own father remove his tapa shoulder covering and place it on a bundle among the other bundles of bones. He must have done this after asking the caretaker about all of them. When Ii saw his father’s action he asked, “Have we a near kinsman in this house?” His father assented. There are still some people who have relatives in this house of “life”...

After Liholiho had finished his visit to the house, a pig was cooked and the gathering sat to worship the deified persons there. Then the chief and those who went into the house with him ate together. After the eating was finished, the kapu was removed... (I‘i 1950:137-139).

As a *pu‘uhonua*, the compound at Hōnaunau provided a haven for *kapu* violators and refugees displaced by warfare. Barrère (1986) speculates on the evolution of the *pu‘uhonua* as the compound’s different *heiau* and other

## 2. Background

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features were built over several centuries. Ellis (1964:126-128) provides a lengthy description of how the *pu'uhonua* functioned, as told to him by people who had seen it used. His description is quoted at length:

This had several wide entrances, some on the side next the sea, the others facing the mountains. Hither the manslayer, the man who had broken a tabu, or failed in the observance of its rigid requirements, the thief, and even the murderer, fled from his incensed pursuers, and was secure.

To whomsoever he belonged; and from whatever part he came, he was equally certain of admittance, though liable to be pursued even to the gates of the enclosure.

Happily for him, those gates were perpetually open; and as soon as the fugitive had entered, he repaired to the presence of the idol, and made a short ejaculatory address; expressive of his obligations to him in reaching the place with security.

Whenever war was proclaimed, and during the period of actual hostilities, a white flag was unfurled on the top of a tall spear, at each end of the enclosure, and, until the conclusion of peace, waved the symbol of hope to those who, vanquished in fight, might flee thither for protection. It was fixed a short distance from the walls on the outside, and to the spot on which this banner was unfurled, the victorious warrior might chase his routed foes; but here, he must himself fall back; beyond it he must not advance one step, on pain of forfeiting his life.

The priests, and their adherents, would immediately put to death any one who should have the temerity to follow or molest those who were once within the pale of the pahu tabu; and, as they expressed it, under the shade or protection of the spirit of Keawe, the tutelar deity of the place.

In one part of the enclosure, houses were formerly erected for the priests, and others for the refugees, who, after a certain period, or at the cessation of war, were dismissed by the priests, and returned unmolested to their dwellings and families; no one venturing to injure those, who, when they fled to the gods, had been by them protected.

We could not learn the length of time it was necessary for them to remain in the puhonua; but it did not appear to be more than two or three days. After that, they either attached themselves to the service of the priests, or returned to their homes.

The puhonua at Honaunau is capacious, capable of containing a vast multitude of people. In time of war, the females, children, and old people of the neighbouring districts, were generally left within it, while the men went to battle. Here they awaited in safety the issue of the conflict, and were secure against surprise and destruction, in the event of a defeat. (Ellis 1963:126-128)

An early twentieth-century account, “*Ka’ao Ho’oniua Pu’uwai no Ka-Miki*” (The Heart Stirring Story of Ka-Miki), includes a detailed passage relating the use of the *pu’uhonua* by the story’s protagonists. The Ka-Miki story is a long and complex account that was published over a period of four years (1914-1917) in the weekly Hawaiian language newspaper *Ka Hōkū o Hawai’i*. The narratives were primarily recorded for the paper by Hawaiian historians John Wise (born ca. 1865) and J.W.H.I. Kihe (born 1953) with contributions from others of their peers. The passage summarized below was used by Barrère (1986) as evidence of the antiquity of the *pu’uhonua* and its protocols. While “Ka-Miki” as published in the 1910s is not an ancient account, its authors used a mixture of local traditions, tales, and family histories in association with place names to tie together fragments of site-specific history that had been handed down over the generations. Also, while the personification of individuals and their associated place names may not be entirely “ancient,” such place name-person accounts are common throughout Hawaiian traditions. The English translations below (translated by Kepā Maly in Rechtman et al. 2001) are a synopsis of the Hawaiian texts, with emphasis upon the main events and areas being discussed. Diacritical marks, hyphenation were added to selected names to help readers with pronunciation and identify locational references.

This *mo’olelo* is set in the 1300s (by association with the chief Pili-a-Ka’aiaea), and is an account of two supernatural brothers, Ka-Miki (The quick, or adept, one) and Maka’iole (Rat [squinting] eyes). The narratives describe the birth of the brothers, their upbringing, and their journey around the island of Hawai’i along the ancient *alaloa* and *alalele* (trails and paths) that encircled the island. During their journey, the brothers competed alongside the trails they traveled, and in famed *kahua* (contest fields) and royal courts, against *’ōlohe* (experts skilled in fighting or in other competitions, such as running, fishing, debating, or solving riddles, that were practiced by the ancient Hawaiians). They also challenged priests whose dishonorable conduct offended the gods of ancient Hawai’i. Ka-Miki and Maka’iole were empowered by their ancestress Ka-uluhe-nui-hihi-kolo-i-uka (The great entangled growth of *uluhe* fern which spreads across the uplands), who was one of the myriad of

body forms of the goddess Haumea, the earth-mother, creative force of nature who was also called Papa or Hina. Among her many nature-form attributes were manifestations that caused her to be called upon as a goddess of priests and competitors.

. . . Ka-Miki and Maka-'iole departed from Nā'ulu-o-Weli and 'Ālanapō at Ke'ei, and arrived at an area with a large *hālau*, which had no equal; it was the *hālau* of the chief Hōnaunau-ihikapu-maka-o-ka-lani. The high priest of Hōnaunau was Nō-hale-o-Keawe, and at the time that Ka-Miki and Maka-'iole arrived, the *kapu* period of *Akua* (the full moon) had been called for the 'Aha'ula (chief's council). At that time, the temple drums were also heard ringing throughout the area. Seeing Ka-Miki and Maka-'iole approaching, the guardians of the *heiau* commanded that they prostrate themselves. Ka-Miki told the guardians that if they prostrated themselves, that he and Maka-'iole would do the same.

One of the *kia'i* (guardians) leapt to attack Ka-Miki with a *lā'au pālau* (war club), and was beaten, and the others who tried to attack were beaten as well. Word of the events were carried to the chief Hōnaunau, his priest and companion chiefs. Hōnaunau commanded that Ka-Miki *mā* be brought before him. Uia, an *ilāmuku* (chief officer and war leader) and others attempted to capture Ka-Miki and Maka-'iole, but they leapt into the *heiau*, at the place where the priest was offering his prayers. The brothers lay before the priest claiming the *pu'uhonua* (sanctuary) status.

The warrior-guardians of Hōnaunau demanded that Ka-Miki and Maka-'iole be turned over to them, but Nōhaleokeawe told them, "*He pu'uhonua kēia, a ua kapu ho'i no nā po'e wale no e imi 'ana i pakele ko lākou ola*" (This is a sanctuary sacred for those who seek to save their lives. Any who attempted to kill them would suffer reprisal from the gods). Nāhaleokeawe offered the ceremonies of releasing, calling upon the male and female deities of the *pu'uhonua* in a *mele pule* (prayer chant)—

*Kāne-hekili, Kāne-wāwāhi-lani,*

*Kāne-i-ka-pualena,  
Kāne-i-ka-mālamalama,  
Kāne-i-kolihana-a-ka-lā,  
Kāne-i-ka-mōlehulehu,  
Kāne-i-ka-wana'ao,  
Kāne-i-ka-pule,  
Kāne-i-ka-mākaukau...*

*O Kanaloa, o Kū,  
O Lono-honua-mea,  
O Pele ka wahine 'ai lā'au,  
O Hi'iaka-i-ka-poli-o-Pele,  
O Meheanu, o Wahine-lua-nu'u,*

*Ka-wahine-i-ka'e-o-kapuahi,  
O Wa-'ula-ke-ahi,  
O Luahinekaikapū,  
O Kahina-a-ola . . .  
Ua kapu i ka lani,  
Ua kapu i ka papa ka honua,  
Ua wela ua moe ka pāpāi-a-oa,  
Kapu o! Ua moe!  
Moe i ke kapu!  
A lele wale ke kapu  
'Āmama - noa!*

Kāne the thunderer, Kāne who breaks  
the heavens,  
Kāne in the glowing dawn light,  
Kāne in the light,  
Kāne who works in the heat of the sun,  
Kāne in the dusk,  
Kāne in the dawn,  
Kāne in the prayers,  
Kāne in readiness...  
O Kanaloa, O Kū,  
O Lono of the sacred earth,  
O Pele the woman who devours the forest,  
O Hi'iaka in the bosom of Pele,  
O goddess Meheanu, O goddess  
Wahine-lua-nu'u,  
The woman at the edge of the fire pit,  
O Wa-'ula-ke-ahi- goddess of flames,  
O goddess Luahinekaikapū,  
O goddess Ka-hina-a-ola . . .  
Sacred are the heavens,  
Sacred are the strata of the earth,  
Fire sacredness, prostrate sacredness,  
Everlasting sacredness! Prostrate!  
Prostrate before the sacredness!  
The sacredness flies away,  
It is finished, it is freed!

Uia, went to his chief and asked if he could be permitted to kill Ka-Miki and Maka-'iole when they came before him, but Hōnaunau-ihikapu-maka-o-ka-lani urged Uia to be patient.

That evening, Hōnaunau-ihikapu-maka-o-ka-lani, his retainers, and priests gathered at the royal compound. After discussing the events with his counselors, the chief agreed that it would not be wise to tempt the wrath of the gods, by allowing Uia to fight with the brothers once they departed

from the *pu'uhonua*. Uia was upset at this and determined to go to his grandaunt, Ala-haka-lewa-i-ke-kai (Alahaka) who was a skilled *'ōlohe*. Together they devised a plan by which he might kill Ka-Miki and Maka-'iole.

In the early morning when the *kapu* period of the *pu'uhonua* was completed, Ka-Miki and Maka-'iole arose and gave their thanks to the gods and Nā-hale-o-Keawe and then departed from Hōnaunau. The brothers then walked the trail towards Alahaka, at Kēōkea. (*Ka Hoku o Hawai'i* October 1- November 1, 1914)

### **Hōnaunau in Historical Journals and Letters**

Several factors contributed to the decline of Hōnaunau as a political center in the late eighteenth century. The small, shallow harbor could not accommodate European and American trading ships, and for that reason Kamehameha and other *ali'i* anxious to initiate social and economic interaction with foreigners moved to places that could, such as Kailua and Honolulu. The abolition of the *kapu* system in 1819 rendered the place of refuge unnecessary and ultimately led to the plunder of its sacred objects in 1825 by Lord Byron (Macrae 1922) and the removal of the *iwi* of the *ali'i* housed in the Hale o Keawe by Ka'ahumanu in 1829 (Bingham 1969). The regent had the deified bones placed in two large coffins, or wooden boxes, and secretly interred in Hoaiuku cave in the Ka'awaloa cliffs at Kealakekua Bay, where they remained for almost thirty years before being moved again, reportedly to the royal mausoleum in Nu'uaniu (Alexander 1890; Barrère 1986). The loss of Hōnaunau's political and religious importance to most Hawaiian inhabitants exacerbated the effects of disease and drought, and the seacoast village gradually lost inhabitants to the upland sections in the 1840s. By the late 1870s, the coastal village of Hōnaunau had diminished even further in size, and the *pu'uhonua* had begun to be touted as a tourist destination in guides (Bowser 1880; Kinney 1913).

Historical narratives of Hōnaunau from the late eighteenth to the early twentieth centuries provide details and insight into the changes that accompanied Hōnaunau's diminishing political and religious importance. The authors of these accounts were explorers, missionaries, and travelers, and their observations often include important descriptions of features that make up the cultural landscape (e.g., villages, *heiau*, trails, and agricultural fields), the nature of land use, and transitions in the Hawaiian community. Some of the writers also recorded traditions and their observations of traditional practices in their journals and letters.

The earliest of these accounts were recorded during Captain James Cook's fateful visit to Kealakekua Bay. Cook landed in the Hawaiian Islands on January 18, 1778, marking the end of the Precontact Period and the beginning of the Historic Period. The following January [1779], Cook and Kalani'ōpu'u met in Kealakekua Bay and exchanged gifts. In February, Cook set sail intending to leave the Hawaiian Islands; however, a severe storm off the Kohala coast damaged a mast and he was forced to return to Kealakekua. Cook's return occurred at an inopportune time, and this misfortune cost him his life (Kuykendall and Day 1976). Commander Charles Clerke and Lieutenant James King (Beaglehole 1967), who accompanied and survived Cook, provide readers with the earliest recorded descriptions of life in the South Kona region. They described extensive plantations (some of which were more than 6 or 7 miles inland) in which taro, sweet potatoes, breadfruit, plantains (cooking bananas), and *wauke* (the "cloth" plant) were grown. The plantations as described by Clerke and King were formally laid out and in many instances bounded by walls. These formal fields were a part of what have been archaeologically described as the Kona Field System (see above), which also included less formal and opportunistic planting strategies in marginal environments with less soil and rain, like that found in the *kula* of Hōnaunau. Cook's crew also reported that most residences were situated near the shores, and that only few good houses were observed inland. While in the forests, various activities and features were observed as well—among them were canoe making, bird catching, and the occurrence of trails. They also noted that the Hawaiians demonstrated knowledge of upland resources and travel to the mountain lands.

After departing from Kealakekua, King took the opportunity to write up an account of excursions to the lands behind Kealakekua-Nāpo'opo'o (north of Hōnaunau), and of the trip begun on January 26, 1779 to the mountain lands from Kealakekua.

... As we have now left Karakooa [Kealakekua] bay, I shall before we go any farther, give a description of what was seen in the Country about it; (in the doing of which I am oblig'd to those who took the excursion up towards the Mountain) & leave any occurrences or Observations that may give an insight into their Arts & Manners, till we have bid a final Adieu to the Group of Islands; that also will be the best time to give in one View the dimensions of the different Island, &c.

I was never myself above 3 miles into the body of the Country; for the first 2 ½ miles it is compos'd of burnt loose stones, & yet almost the whole surface beginning a little at the back of the town, is made to yield Sweet potatoes & the Cloth plant. One then comes to breadfruit trees which flourish

amazingly. The ground was very uneven & although there was a tolerable Soil about the trees, yet there was constant breaks in the land & large bare, burnt rocks; in the bottoms that these made were planted the Sweet Potato roots with earth collected about them; my occupation at the Observatory hindered me always proceeding farther. If I had I should have come to the extensive cultivated spots that are visible at the Ships beyond the grove of bread fruit trees: I shall therefore relate the Journey of the party of seven & 4 guides who set out on the afternoon of the 26<sup>th</sup>.

They travelled 3 or 4 miles & found the Country as above represented, after which were the regular & very extensive plantations. The Plantain trees are mixed amongst the breadfruit trees & did not compose any part of the plantation except some in the Walls: these walls separate their property & are made of the Stones got on clearing the Ground; but they are hid by the sugar cane being planted on each side, whose leaves or stalk make a beautiful looking edge. The Tarrow or Eddy root & the sweet Potato with a few cloth plants are what grow in these cultivated spots. The party stopt for the Night at the 2d hut they met on this ground, they then judged themselves 5 miles from our Village, or at the top of the first hill as seen at the Ship. The Prospect was delightful: they saw the Ships in the bay: to the NW a continuation of Villages by the Sea shore & to the left a thick wood, to the right cultivated ground as far as they could see, & a thick wood on their back. The Potatoes & Tarrow are planted 4 feet from each other, the former is cover'd except the tops with about a bushel of light Mould, the latter is left bare to the roots, & the mould surrounding made in the form of a basin, in order to preserve the rain as this root is fond of & requires much humidity, it should be noted that the Tarro of these Islands is the best we have ever tasted. They foresaw, from the few Cottages scattered about & the poverty of the one they took their residence in, that their trade would not be able to ensure them provisions ...

On the 27<sup>th</sup> in the Morning they set out & filld their Calabashes at an excellent well about ½ a mile from their hut & enter'd the wood by a foot path, made, as they understood, by those who fetch wild or horse Plantains, & who go to Catch birds; it was either Swampy or else Stoney, also narrow, & made still worse by large trunks of trees laying across it, there was no proceeding on either side of the path for underwood; as far as the Wild plantains grew, intermixt amongst the trees, were at Certain distances white flags secur'd to poles, which they took for divisions of Property ...

The 28<sup>th</sup> they march'd along the Skirt of the Wood for 6 or 7 miles, & then entered again, by a path that went away to the Eastward. For the first 3 miles they passd thro a wood compos'd of high trees, interspers'd with Plantations of Plantains, for the next three miles were dwarfish trees, much underwood, & growing amongst broken burnt Stones. They then came again to a pleasant wood... In this wood they pass'd many Canoes, half finishd, & a hut also, but since their first entering of the different Woods could find no water, of which they began to feel the want, they proceeded on about 3 miles in this last Wood, when coming to two huts that was convenient for holding their whole party, they stopped; heartily fatigued with their day's Journey, having walkd as they thought 20 miles this day, but they were obligd to separate into parties in search of water, & at last found some rain water in the bottom of a Canoe, which although the Colour of red wine, was to them a very agreeable sight ... (Beaglehole 1967:520–523)

Clerke's notes of the Kealakekua region—describing agricultural development and native “towns,” and practices observed from near shore to the upper mountain slopes—concur with those of King and add some additional site and resource descriptions:

... this being the Lee side of the Isle the Natives have been at infinite pains to clear away the Cindars to make their plantations; the fertility of the Soil however when they do come at it very well repays them for their trouble; for nothing in nature can be more abundantly prolific, being a fine rich Loom, tho' in many places they have been obliged to remove 4, 5, or 6 feet depth of Cindars, and the soil when they come to it probably does not exceed two or at most three feet, but what there is of it is excellent beyond comparison; two or three miles up the Country the soil becomes deeper and is luxurious to the last degree. All the Shores on the Southern and Western sides are formed by burnt Rocks, and in many places where they break off in Cliffs there are numberless Caverns blown in the sides.

The Towns of the Natives are built along the Sea side. At Cari'ca'coo'ah [Kealakekua] Bay there were three, one [Kealakekua-Napoopoo] on the SE-tern side of the Bay which was very large extending near two miles along the shore, another [Kaawaloa] upon the NWtern side which was not

so large, and a small Village [Palemano] in the cod or bottom of the Bay. At the back of the villages upon the Brow of the Hill are their plantations of Plantains, Potatoes, Tarrow, Sugar Canes &c, each mans particular property is fenced in with a stone wall; they have a method of making the Sugar Cane grow about the walls so that the stones are not conspicuous at any distance, but the whole has the appearance of fine green fences. These Plantations in many places they carry six or seven miles up the side of the hill, when the woods begin to take place which diffuse themselves from hence to the heights of the eminences and extend over a prodigious track of ground; in these woods are some paths of the Natives and here and there a temporary house or hut, the use of which is this; when a man wants a Canoe he repairs to the wood and looks about him till he has found a tree fit for his purpose and a convenient spot for his work; having succeeded thus far, he runs up a house for his present accommodation and goes to work upon his Canoe, which they in general compleatly finish before it's moved from the spot where its materials had birth. Our people who made excursions about the Country saw many of these Canoes in different states of forwardness, but what is somewhat singular, if one of their vessels want repairing she is immediately removed into the woods though at the distance of 5 or 6 miles. These woods abound with wild Plantains which though not equal to the cultivated, are far from being a bad fruit. The poorer sort of People here make a very general use of them. Upon the highest hills our people could ascend, the burnt rocks were in many places bare or only covered with a little moss with numberless Chasms blown in them by the violence of the volcano, though just by, there would be soil enough to hold large trees very firm... (Beaglehole 1967:591–593)

All their Towns are built along the Sea shore, up the Country there is not a house to be seen except such temporary Huts as has been before described and here and there one by a large plantation where the peasants sometimes lodge who look after it . . . (Beaglehole 1967:599)

Clerke added additional notes to King's previous descriptions of the Kealakekua region, and described the area as "highly cultivated & populous" (Beaglehole 1967:607):

... We now come to the West side, where are the districts of A-kona & Ko-harra. The part of A-kona joining to Koa partakes of its nature. Its N part is highly cultivated & very populous... Before they enter'd the first Wood, they also observ'd Arms or branches, stretch towards the Sea side, in a direction at right Angles to the Main wood, & that these reach within a Mile or two of the beach, these Arms seperated the great Plantations which has been observ'd to be 4 or 5 miles broad, & which are again divided into Small fields by stone hedges. The Soil was good, the Space that seperated these Plantations from the entire Lava, or burnt Cindery surface, which extends two or three miles inland from the beach, is Planted with Breadfruit trees & Plantains; Wild or horse Plantains grow some distance into the first Wood. The prevailing productions of the above Plantations is Tarro (Eddy) & which in all other Islands is only plant'd in very wet ground, & where a great part is always coverd with water. These can only be water'd from the heavens, the Earth about them is so contriv'd as to retain about their roots whatever moisture falls; they are the best tasted tarrow we have seen. The Sweet Potatoe grows any where, a great part of the ground about the Villages yield them... (Beaglehole 1967:607–608)

The village of Hōnaunau itself was visited fourteen years later, on February 28, 1793, when the Vancouver expedition's botanist, Archibald Menzies, arrived there at the tail end of an exploratory expedition into the uplands behind Kealekekua Bay. He and his companions:

... arrived in the afternoon at a village by the seaside called Honaunau, about two leagues to the southward of Kealakekua Bay. As we approached it, the natives came out in great crowds to meet us. The young women expressing their joy in singing and dancing, from every little eminence, to entertain us, while the men received us with a clamorous welcome and an officiousness to serve us that would have been troublesome and teasing had they not been kept in good order by John Smith and the natives who accompanied us, who exercised their authority by clearing an avenue before us wherever we went. They took us to a large house which was tabooed for the king, with a number of smaller houses contiguous to it for sleeping in and for his attendants when he comes to the village. We were told that he has a set of houses kept for him in the same way in every village he is likely to stop at round the island, which, when he once occupies or eats in, cannot afterwards be used by any other. (Menzies 1920:87)

Menzies and his companions spent an uneventful night in the village. Little interested in ethnography, Menzies seemed unimpressed by the presence of the refuge or its meaning in Hawaiian culture. He mentions only that during the night, “in a large marae close to us we now and then heard the hollow sounding drums of the priests who were up in the dead hour of the night performing their religious rites” (Menzies 1920 :87).

Following the death of Kamehameha I in 1819, the Hawaiian religious and political systems began undergoing radical changes that would have profound effects on the Pu‘uhonua o Hōnaunau. Just moments after his death, Ka‘ahumanu proclaimed herself “*Kuhina nui*” (Prime Minister), and approximately six months later, the ancient *kapu* system was overthrown in chiefly centers. Less than a year after Kamehameha’s death, Protestant missionaries arrived from America (see I‘i 1959, Kamakau 1961, and Fornander 1973). Hiram Bingham was a member of the first party of missionaries sent to the “Sandwich Islands” (Hawai‘i), by the American Board of Commissioners for Foreign Missions (ABCFM), and arrived in April 1820. Bingham worked earnestly in his capacity as a missionary, but also took the time to speak with surviving *ali‘i*, and people of the land who had been eye-witnesses to many of the events that followed the arrival of foreigners in the islands. Bingham’s texts were regularly referenced by authors and historians throughout the nineteenth century, and his descriptions of Hawaiian history provide readers with important details. Among his writings, Bingham includes an account of the removal of *ilina* (burials) from Hōnaunau by Ka‘ahumanu in 1829, an act that profoundly affected the fate of the Hale-o-Keawe and *pu‘uhonua*:

Burials of Ali‘i Revered—Relocation of Remains from Hōnaunau to the Pali of Ka‘awaloa and Kealakekua (1829)

A species of superstition once existed at the islands analogous to the *grave-worship* of the Chinese, and the worship of relics in other countries. This was supposed to have nearly ceased before the attempt to introduce Romanism. It was, however obvious that the tendency still existed in the nation to revive that superstition. The zeal of Kaahumanu led her as early as 1829 to visit the *Hale o Keawe* at Honaunau, a cemetery associated with dark superstitions, and surrounded with horrid wooden images of former generations. The regent visited the place not to mingle her adorations with her early contemporaries and predecessors to the relics of departed mortals, but for the purpose of removing the bones of twenty-four deified kings and princes of the Hawaiian race, and consigning them to oblivion. But at that time she thought Naihe was wavering in respect to their removal, and Kekauluohi, whose father’s bones were there, she thought still cherished an undue veneration for them; and Boki she feared would treat her with abuse and violence if she should disturb the house or remove its mass of relics. But when she saw it *ought* to be done, she determined it *should* be done: and in company with Mr. Ruggles and Kapiolani, she went to the sacred deposit, and caused the bones to be placed in large coffins and entombed in a cave in the precipice at the head of Kealakekua Bay. In doing this she found an expensive article of foreign manufacture, comparatively new, placed near the bones of the father of Kekauluohi, and which appeared to have been presented as an offering since the date of the prohibition of the worship of idols . . . (Bingham 1969:426)

In 1823, British missionary William Ellis and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawai‘i seeking out communities in which to further work of the growing Calvinist mission. Ellis’ (1963) journal, written in 1825, generally contain the earliest detailed descriptions of settlements around the island of Hawai‘i, and offer readers important glimpses into the nature of native residency and history at the time. During the visit, Ellis and his traveling companions visited Hōnaunau and lands south. Ellis’ journal includes detailed descriptions of Hale o Keawe and the larger area of the Pu‘uhonua o Hōnaunau. Those descriptions, cited in several historical publications (e.g., Stokes and Dye 1991, and Bryan and Emory et al., 1986), are not repeated here as they exceed the scope of the present study. In general, Ellis (1963) and his companions found the entire grounds to be neglected, but despite this apparent disuse they were not allowed to enter the Hale-o-Keawe by its resident *kahuna*.

Ellis also provides one of very few descriptions of Hōnaunau’s landscape extending from sea to the upland field systems and areas of residence. At the time of his visit, the coastal “town” of Hōnaunau contained “147 houses” (Ellis 1963:109), but its inhabitants could (or chose) only to provide Ellis with an open-sided canoe house for sleeping. While Ellis recuperated from walking to Hōnaunau, his companions Asa Thurston and Joseph Goodrich made an excursion to the uplands, where they found that:

. . . after proceeding about two miles from the sea, that the ground was generally cultivated.

They passed through considerable groves of breadfruit trees, saw many cocoa-nuts, and number of the prickly pear (*cactus ficus inidicus*), growing very large, and loaded with fruit. They also found many people residing at the distance of from two to four miles from the beach, in the midst of the

plantations, who seemed to enjoy an abundance of provisions, seldom possessed by those of the sea shore...(Ellis 1963:109)

In April 1824, the year following Ellis' visit, the first South Kona Mission Station was established on the flats of Ka'awaloa by Reverend James Ely. Four years after his arrival, James Ely departed from Ka'awaloa (October 15, 1828), and was replaced by Samuel Ruggles (who transferred from the Kailua Station). On May 17, 1832, Cochran Forbes arrived in Hawai'i to take up residence at the Ka'awaloa (South Kona) Mission. Forbes sailed from Ka'awaloa on October 10, 1836, beginning a tour of the southern portion of his mission station. His journal offers readers a description of the villages he visited, the conditions of the schools, churches, and circumstances of the people, in Hōnaunau the region. While Forbes at times wrote with a prejudice, his first-hand accounts are of value in understanding the historic landscape of the period.

Forbes wrote that he first "arrived at Honaunau," the coastal village, where he "preached to a congregation in the school room" (Forbes 1836:2). His journal entry of October 13<sup>th</sup>, provides readers with a general overview of the villages between Hōnaunau and "Opihale" (or 'Ōpihihale):

I ought to say that all these villages are destitute of regular schools, tho I found in all of them a number who can read & in some cases almost the whole village could read. The teachers who had taught them that much, have deserted their posts and gone, many of them, after chiefs. They being the most capable men of their villages, in many cases, have been greedily courted by the chiefs, for headmen or for men to wait about their persons, and a prospect of earthly gain is as attractive to these poor heathens as any... nor indeed can I blame them. But we must now have better teachers to supply their place. I found the people in all of the villages remarkably kind & docil & believe they would generally be glad to have schools if they had competent teachers. The above remarks apply to most every village from Honaunau, 10 miles south of us to Kau . . . (Forbes 1836:9-10)

Mark Ives also settled in the South Kona Station with Forbes, and in 1835, they established the Keālia-Kapalilu a out-station of South Kona. Under Forbes' tenure, the Ka'awaloa Station relocated to the Kepulu vicinity of Nāpo'opo'o (location of the present-day Kāhikolu Church), in 1839, and became known as the Kealakekua Station. Forbes remained in Kona until 1845, and Ives remained until 1847. Ives' report from the Mission Station at Kealakekua for 1845-1846 includes descriptions the devastating impacts of a drought, fires, and then heavy rains upon the native population and landscape of South Kona. In the period between February 15<sup>th</sup> to December 18<sup>th</sup>, 1845, there was no rainfall, then on December 18<sup>th</sup> there was "a terrific conflagration" to the north of Hōnaunau.

The drought aforementioned was followed by the epidemic common to all the island & by a scarcity of provisions scarcely before known even at Kealakekua. The consequence was that numbers flocked to Kau & other places where they found sustenance.

It is now impossible for many of the natives to get taro & potatoe tops to start their plantations; such has been the devastation. A spark of fire dropped into the leaves would immediately kindle & the consequence was that the country from Onouli to Kapua & onwards a distance of 30 miles including all our arable land except here and there a small patch where the owner with uncommon vigor defended it, was burnt over & the food thoroughly baked. Often the man after watching his plantation a whole night would leave it supposing it past danger when some sudden turn of the wind would change the direction of the fire, & before he could again reach it, his whole plantation be consumed.

There has been a decrease of children in our field the last 5 years, upwards of 250... The population in our field is diminishing. There is no place probably among us where it is on the increase. Kaawaloa which in 1835 numbered 460 inhabitants has now only 160 either on the land or considered as belonging to it... The famines too are thinning off our inhabitants.

There are two or three vessels constantly plying between our place & Oahu & every vessel that left for several weeks was loaded down with passengers so as scarcely to afford a foot room for the captain. But a part of these will ever get back.

They are trusted for their fare to Oahu & when they return they are required to pay the fare for both ways. Their lands in the mean time, lying uncultivated, they will have nothing to eat should the return... (Ives 1846:2-5)

In 1846, Chester S. Lyman, "a sometime professor" at Yale University visited the island of Hawai'i. His narratives provide readers with important documentation pertaining to the native villages in Kona; decline of the native population in the region; and offers specific descriptions of roads and trails (both along the coast and in the uplands)

between Kealakekua and Keauhou. On December 2<sup>nd</sup> 1846, Lyman and Ives traveled to Hōnaunau, where they visited the *pu'uhonua* (Lyman, Book V; October 10-December 21, 1846), and Lyman recorded a detailed account of the visit and features seen.

### The *Māhele* of 1848

It was around this time that drastic changes in land tenure throughout the Hawaiian Islands were initiated. By the mid-nineteenth century, the ever-growing population of Westerners had forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. This change in land tenure was promoted primarily by the missionaries and Western businessmen in the island kingdom. Generally these individuals were hesitant to enter business deals on leasehold land. In 1848 the *Māhele 'Āina* became the vehicle for determining ownership of native lands. The *Māhele* (division) defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. During the *Māhele*, all lands in the Kingdom of Hawai'i were placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) *Konohiki* Lands (Chinen 1958:vii and Chinen 1961:13). The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission. All three types of land were subject to the rights of the native tenants therein; those individuals who lived on the land and worked it for their subsistence and the welfare of the chiefs (Sinoto and Kelly 1970). Native tenants could claim, and acquire title to, *kuleana* parcels that they actively lived on or farmed at the time of the *Māhele*. The Kuleana Act of December 21, 1849 provided the framework by which native tenants could apply for and receive fee-simple interest in their *kuleana* lands from the Land Commission. The Board of Commissioners over saw the program and administered the lands as Land Commission Awards (LCAw.). Not all lands that were claimed were awarded. The A.B.C.F.M., which had been granted the use of a number of lands throughout all of the Hawaiian Islands by various chiefs beginning as early as 1820, was also able to claim ownership of these lands under the Kuleana Act. Many of the lands were awarded.

As a result of the *Māhele*, the *ahupua'a* of Hōnaunau was awarded as LCAw 11216, 'Āpana 34 to Mikahela Kekau'ōnohi. The land was later patented under Royal Patent 7874. Upon Kekau'ōnohi's death, the *ahupua'a* of Hōnaunau was inherited by her second husband, Levi Ha'alelea. After Ha'alelea's death, the administrator of his estate sold the land at auction in 1866 to W. C. Jones, agent for Charles Kana'ina, the father of King Lunalilo. Jones never paid for the land, and so Charles R. Bishop bought it in 1867 as a present for his wife, Bernice Pauahi. Six years after her death, Bishop deeded Honaunau to the Trustees of the Bishop Estate. Many smaller *kuleana* claims were made within Hōnaunau. The Waihona 'Āina *Māhele* database lists 80 *kuleana* claims, of which 60 were awarded. Not surprisingly, the majority of these claims are located either near Māmalahoa Highway or near the coast, with only five of the awarded parcels (Table 2, Figure 18) located at least partially in the *kula* lands near the current study parcel. Descriptions of the many upland *kuleana* claims attest to the substantial agricultural use of those lands, and it is perhaps telling that so few claims were made for *kula* lands, despite the evidence of Kona Field System features at similar elevations in nearby *ahupua'a* (Rechtman et al. 2001)

**Table 2. *Kuleana* awarded in the vicinity of the current study parcel.**

<i>LCAw.</i>	<i>Claimant</i>	<i>'Āpana</i>	<i>Acreage Awarded</i>	<i>Land Use</i>
539	Charles Thornton	'Ili of Kukuihaa	27.9	
7284	Kaholoaa, Levi	Kakai, Kukuiki, Ohiki	1.23	<i>Pahale, kihapai</i>
8507	Anton Fernandes	'Ili of Honiuli	22.5	“cultivated a part of it”
9474	Kapiioho	Keamoalii	0.259	<i>Kihapai alani</i>
9769F	Naai	Haleape	2.7	<i>Pahale</i>

2. Background

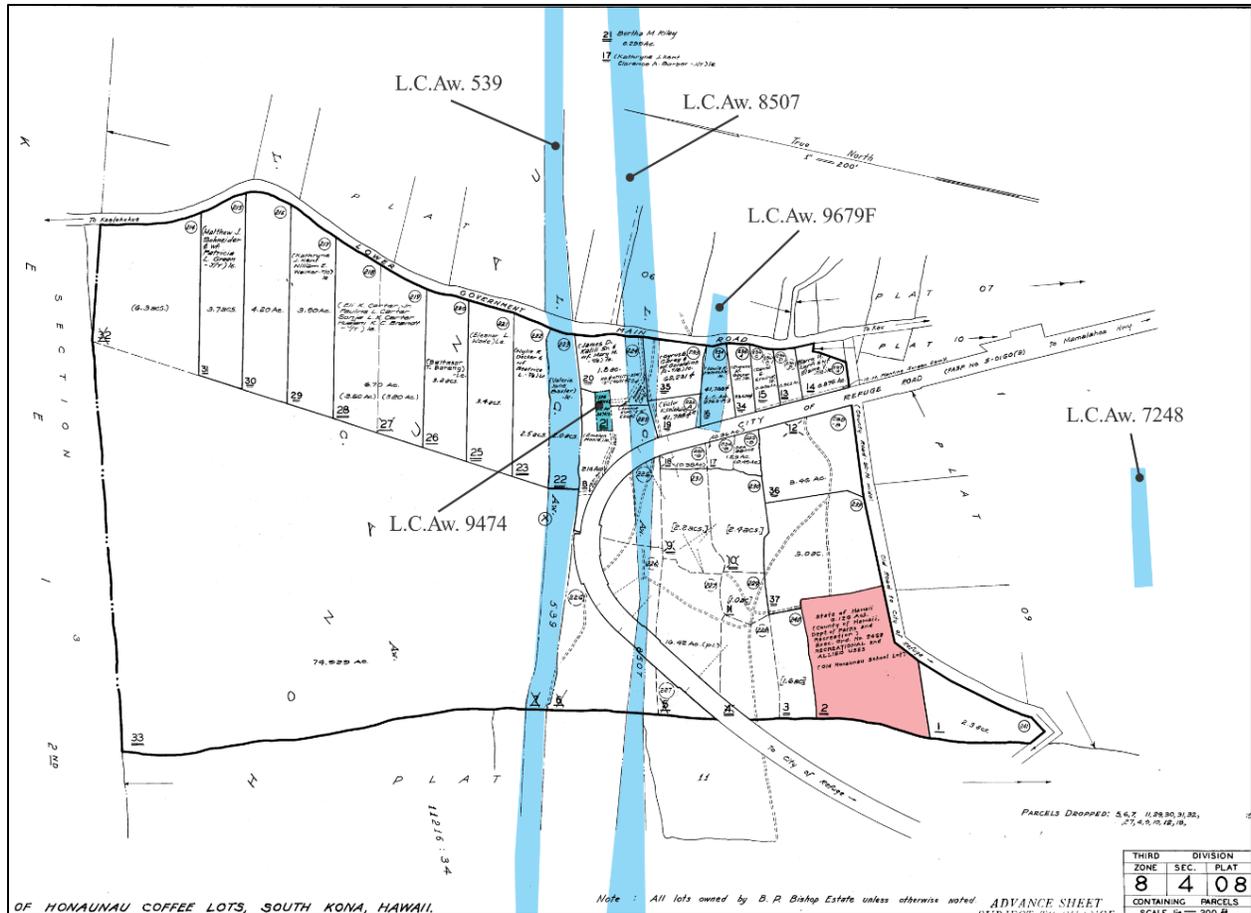


Figure 18. Kuleana awards (blue) near the current study parcel (red).

Descriptions of Hōnaunau and adjoining lands written after the *Māhele* provide some details about transitions in the region’s agricultural focus and population. Annual mission station reports by the Reverend John D. Paris, who relocated from Wai’ōhinu, Ka’ū, to the Kealakekua Station in 1852, describe living conditions among some of the native tenants as a result of the *Māhele* (Maly and Maly 2002). For the most part, settlements remained along the shores and cultivation of fruits, vegetables, and coffee occurred in the *mauka* lands. In the Station Report for 1852, Paris reported:

South Kona embraces a large extent of the richest, most fertile land, with the best climate on Hawaii. A little back from the sea shore, vegetables of all kinds, & fruit in great variety, can be produced with as little labor & in as great perfection as in any portion of the Hawaiian Islands...there are signs of improvement & progress among our people. A number are purchasing farms & fencing them, & seem to be inspired with new life in putting in order & cultivating them. Orange & other fruit trees are being planted extensively & are beginning to adorn the hills & vallies. A little better class of houses, with enclosed yards ornamented with flowers, a variety of fruit & shade trees begin to appear. . . (Paris 1852:7-8)

In his 1855 station report, Paris described the reorganization of the South Kona Mission Station, giving the boundaries of each out-station, and the population. Paris reported:

Since our last Annual Report our Church in S. Kona has reorganized and divided into six branches . . . The 3d [branch] is the Hoonau Church. This church embraces 169 members . . .  
 . . . The health of the native population & foreign residents in South Kona has been during the past year unusually good. . . Our hills & valleys have been watered abundantly with the showers of heaven. The Earth has yielded its increase & the ocean abounded with fish. . . More patches have been cultivated—more fields fenced—more trees planted—more houses built & repaired, & more roads & paths made than in years past. In some of our villages there is a very marked improvement about the houses & yards everything wearing a more cheerful aspect.

We have no field waving with golden harvests (as on some other islands) but our people are multiplying their Coffee patches & the number of Orange trees loaded with golden fruit, are rapidly increasing.

Some of the “thousand hills” are dotted over with cattle & horses; and vast fields of barren lava, fertilized with streams of living goats ... (Paris 1855:7-8)

Some of the “streams of living goats” described by Paris would have been found on the *kula* of Hōnaunau, and the practice of raising goats there continued into the late nineteenth century. Registered Map 1457 (Figure 19), from ca. 1870, specifically labels the land *makai* of the upper government road as a “Goat Run.” Registered Map 1445 (Figure 20) prepared ca. 1888, does not mention goats, but does describe the *kula* lands of Hōnaunau as “Scant Pasturage.”

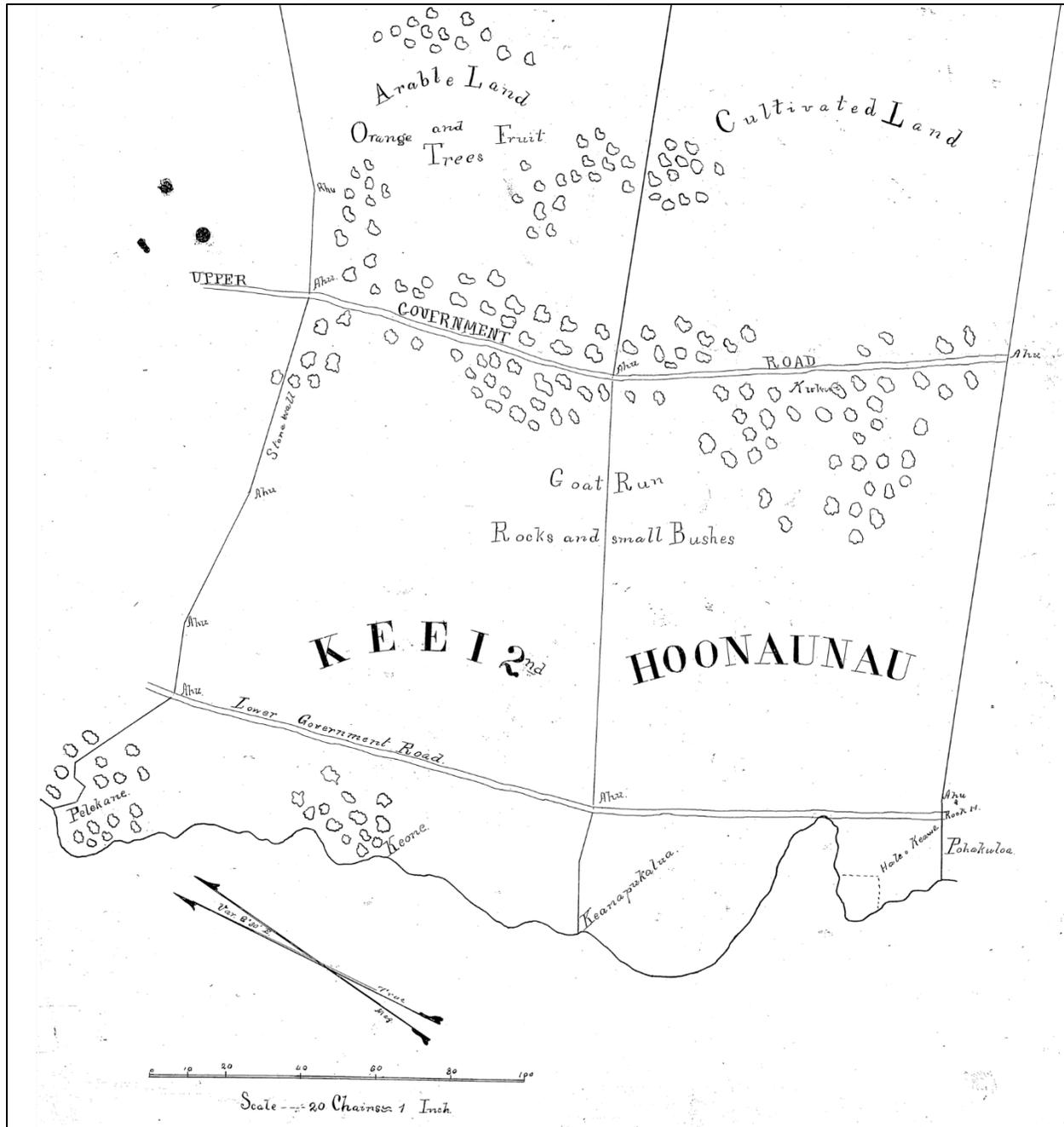


Figure 19. Detail of Registered Map 1457.

2. Background

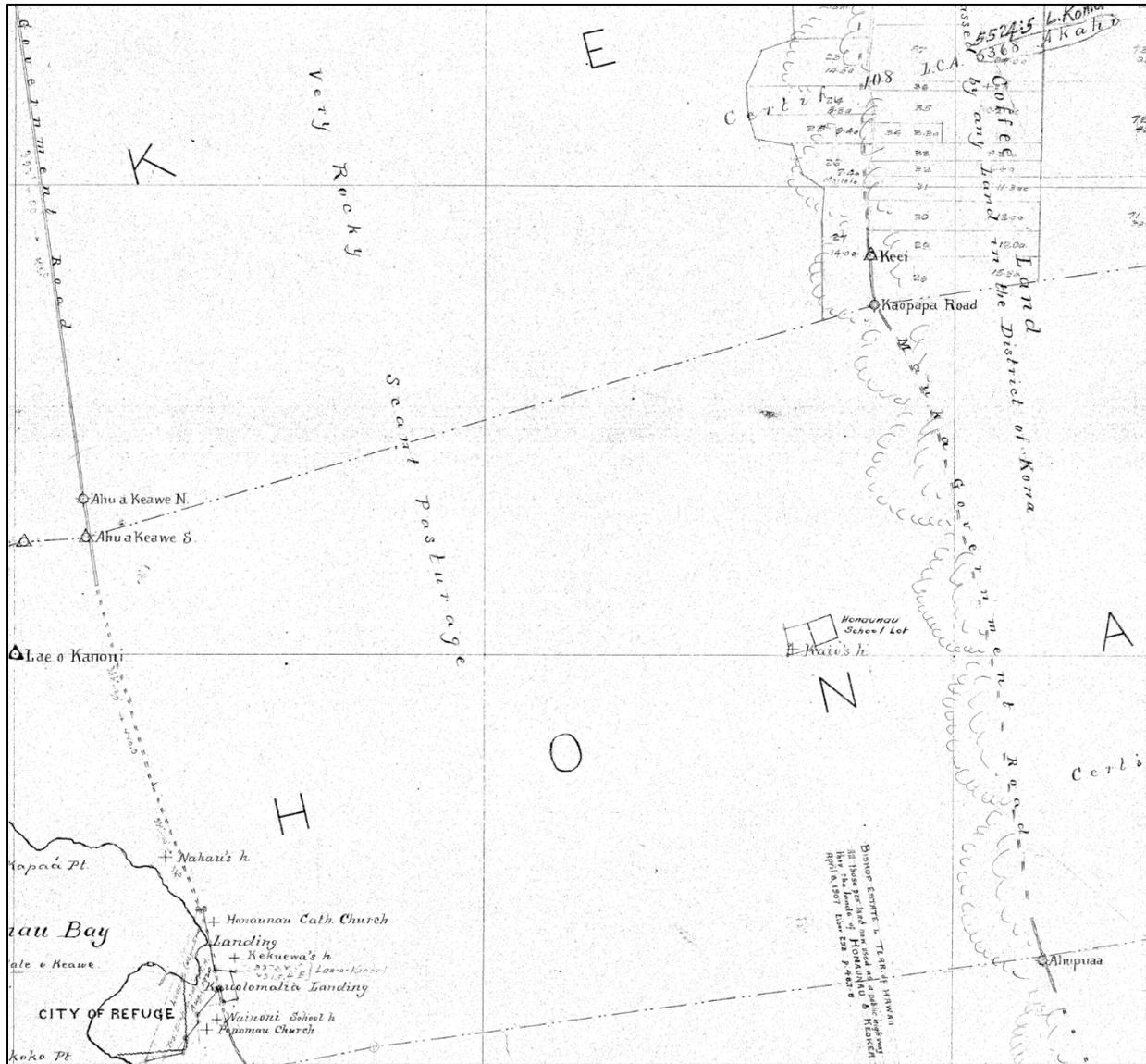


Figure 20. Detail of and annotated copy of Registered Map 1447.

Goats continued to be raised on the *kula* of Hōnaunau into the 1920s. William Paris, Sr., the grandson of the Reverend J. D. Paris, returned to Hōnaunau after a brief stint developing a cattle and sheep operation on Kaho‘olawe with Angus MacPhee and H. A. Baldwin. Paris leased *kula* lands in Hōnaunau and Ke‘ei from the Bishop Estate (Paris 1980, 1991), raising angora goats and some cattle on the land. As his son Billy Paris recalls, however, his father gave up the lease around 1926 when the “Bishop Estate, in that period of time, decided that they didn’t want goats raised on their lowlands anymore” (Paris 1981:1182). Ranching in Hōnaunau after that time focused on cattle.

At about the time that the Paris family stopped leasing Hōnaunau *kula* lands, a stone wall began to appear on maps of the area. The 1924 USGS Honaunau Quadrangle (Figure 21) shows a stone wall extending between *ahupua‘a* boundary walls at the northern border of Hōnaunau and the southern boundary of Kauleoli 1<sup>st</sup>. A map of B.P. Bishop Estates lands in South Kona (Figure 22) created in 1924 also depicts the wall. The wall is longer on this map than on the USGS Quadrangle, beginning in the north just *makai* of a parallelogram-shaped lot (“Lot 15”) in the Ke‘ei 1<sup>st</sup> Subdivision, and from there extending to the southern border of Keālia 1<sup>st</sup> Ahupua‘a. Neither of these maps provide a name for the wall, but a third map (Figure 23) made for the transfer of road rights-of-way from the B.P. Bishop Estate to the Territory in 1925 labels the wall, “Great Wall or Paaina.” The earliest depiction of the wall found during the current research indicates that the wall likely has its origins in the early 1920s.

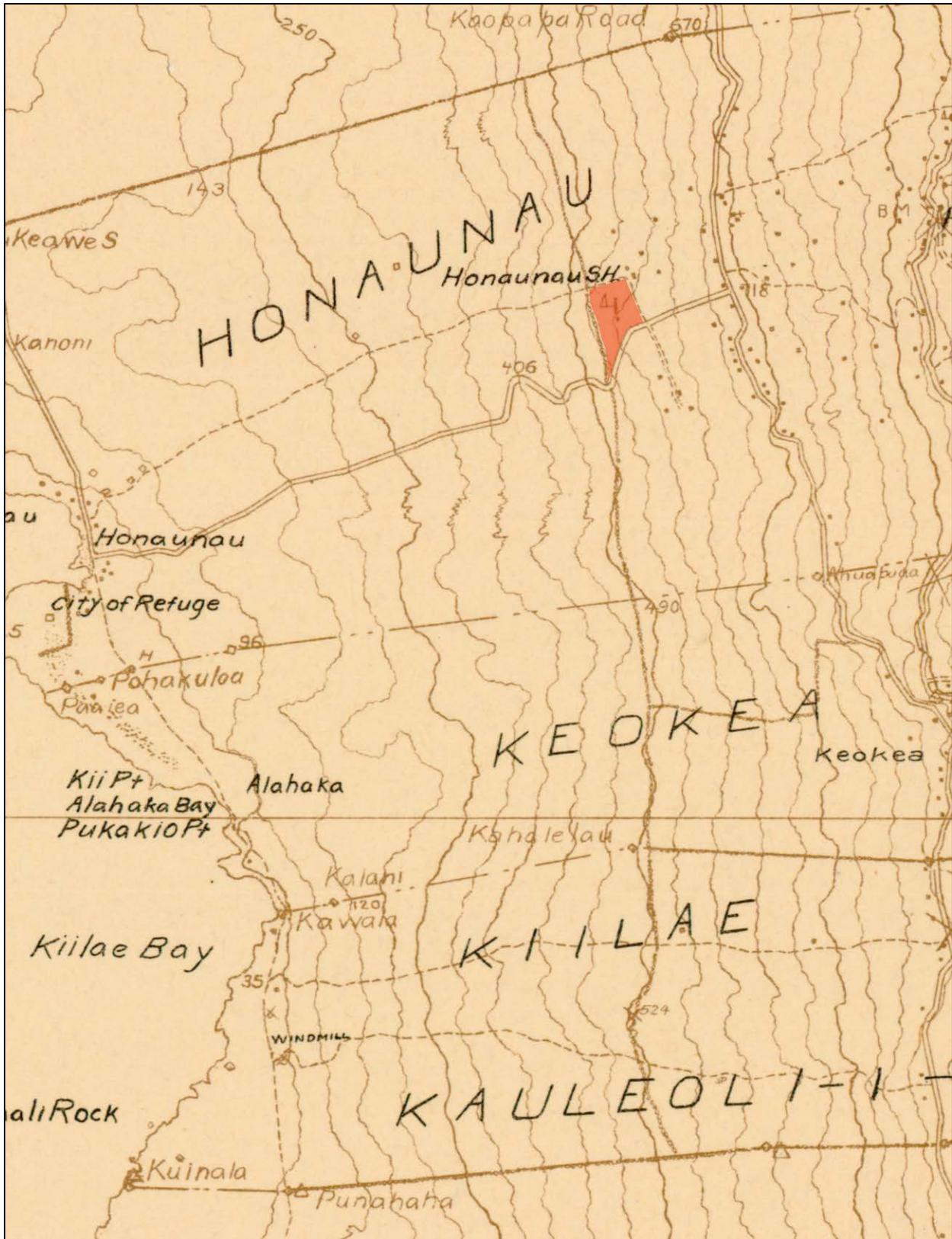


Figure 21. Portion of 1924 USGS Honaunau Quadrangle with a large stone wall depicted on the western border of the current study parcel (shaded red).

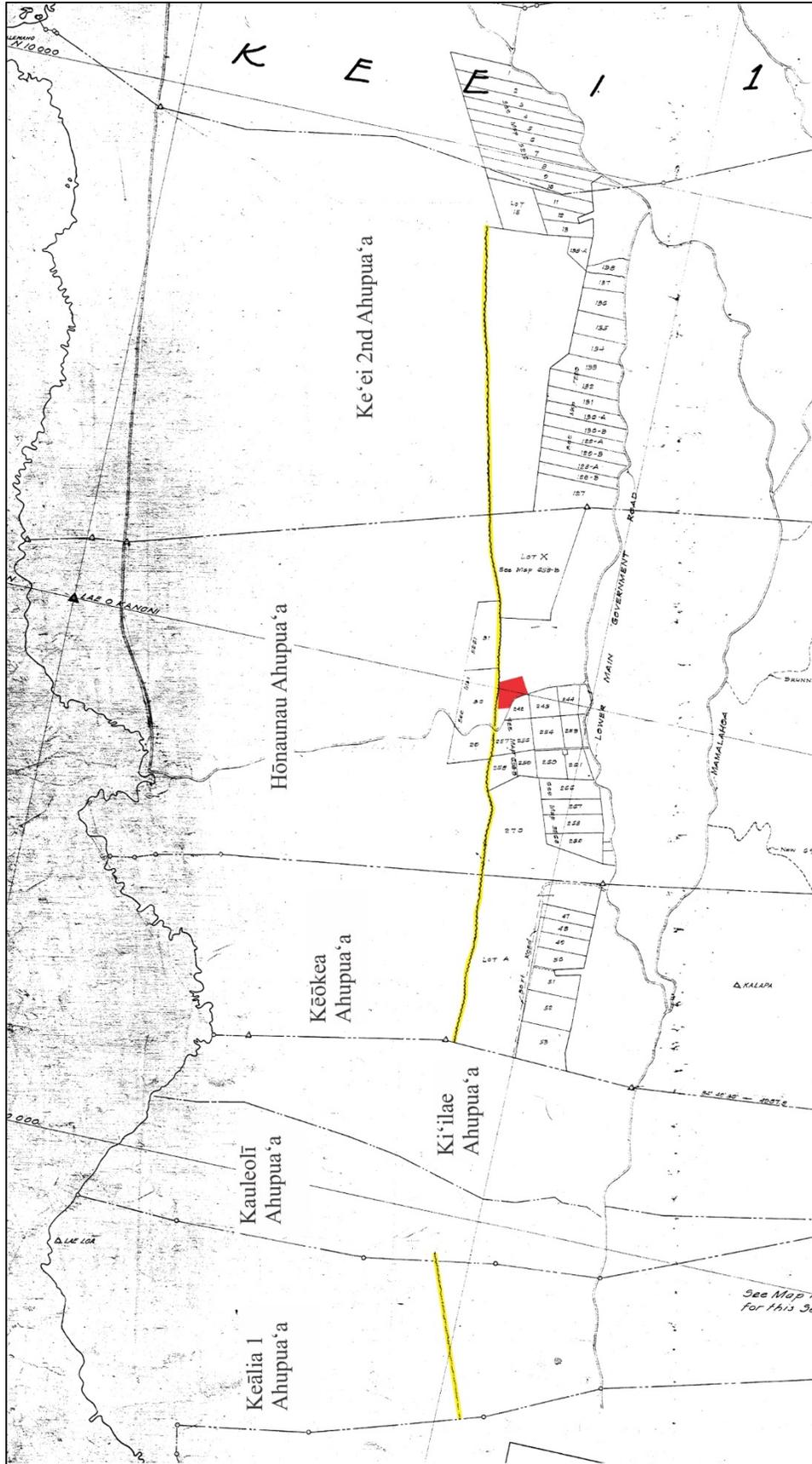


Figure 22. Detail of B. P. Bishop Estate Map 1027 depicting the large livestock wall (yellow) and the study parcel (red).

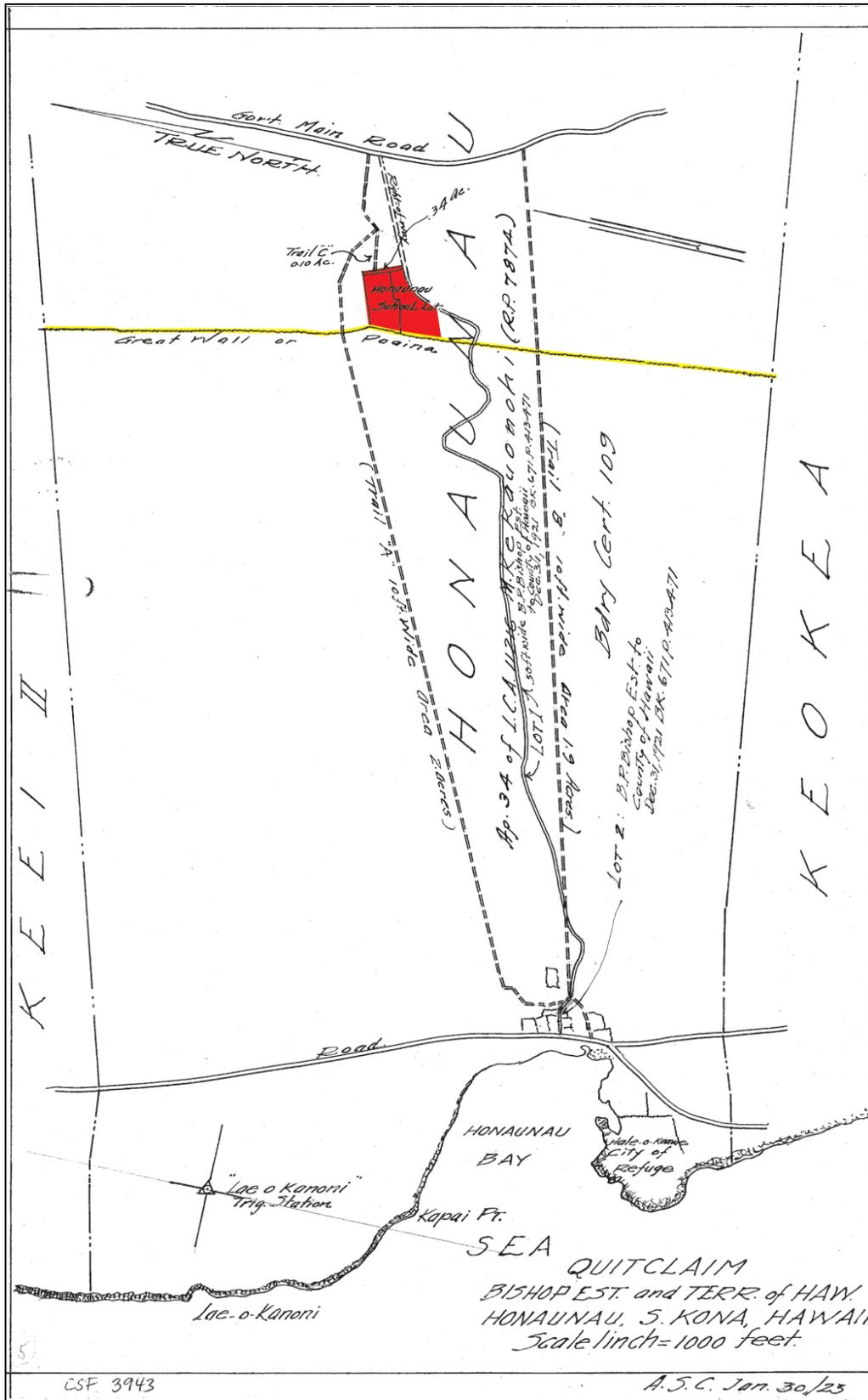


Figure 23. Map accompanying C.S.F. 3493 and 3494 depicting the "Great Wall or Paaina" on the western boundary of the Honaunau School Lot .

## Hōnaunau School Lot

The Hōnaunau School opened on the study parcel in 1897. It was preceded by a series of schools located in the coastal village. Originally established by A.B.C.F.M. missionaries, population changes and other factors led to the closure and re-opening of schoolhouses in Hōnaunau between the 1830s and 1897 (Rechtman et al. 2001). Interest in moving the school *mauka* began in the 1850s, but poor relations with Levi Haalea, *konohiki* of Hōnaunau prevented the acquisition of a *mauka* site for the schoolhouse. Letters written to public education officials during this time repeatedly ask for the establishment, and reestablishment, of school—requests that were repeatedly denied (Rechtman et al. 2001). After several years of petitioning the territorial legislature, a school was finally built on the study parcel in 1897. The original lot (Figure 23) contained two buildings: the school building and a cottage occupied by the school master. Trails led eastward from the lot to the *mauka* Government Road. The school lot was surrounded by stone fences, but these were not always successful in keeping errant livestock off the school property. Several letters (Figure 24) published in the *Honolulu Star-Bulletin* on March 17, 1917, provide some details about the walls around the school lot. One letter, by the school's Principal P. M. Banknight, noted that a horse and cow pasture had been established that January “on two sides of the school premises” and that the five-foot high stone fences were inadequate to keep the animals out of the schoolchildren’s garden. A second letter, by a student named Hidetane Yamano, notes that the stone wall had been built higher and were keeping the cows out.

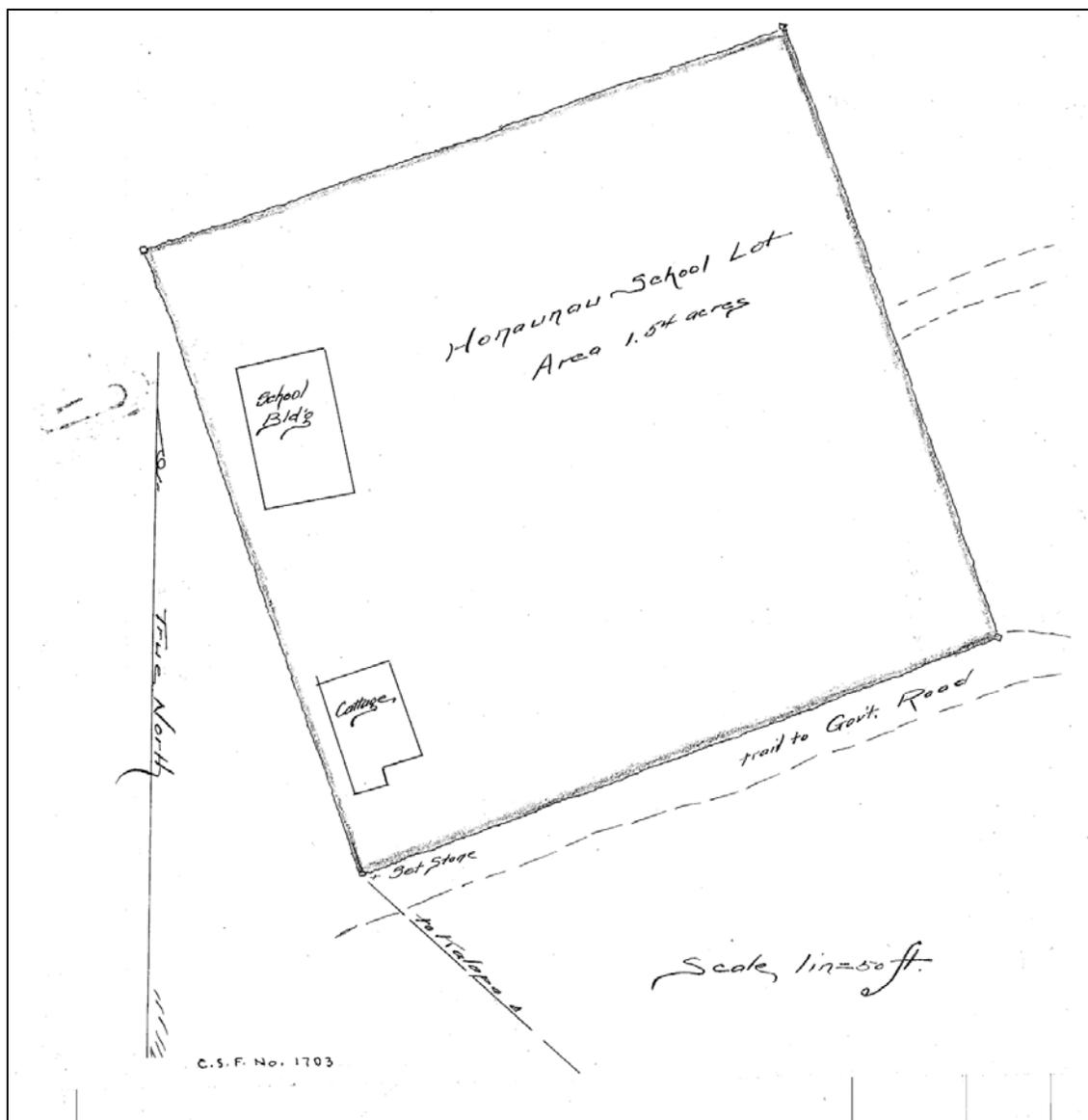


Figure 24. C.S.F. 1703 documenting the Hōnaunau School Lot and two school-related buildings in 1906.

17. per acre. The area in turnips was 170 square feet. The actual sales amounted to \$1.80. This is at the rate of \$461.25 per acre.

before they became famous with scout philosophy.  
Respectfully yours,  
E. A. BROWN.

## HONAUNAU GARDENERS HAVE MANY REVERSES BUT ARE STICKING TO IT

Honaunau School,  
Napooopo P. O., South Kona, Hawaii,  
March 7, 1917.  
Editor Honolulu Star-Bulletin.

Dear Sir: I send this communication on behalf of the Honaunau school boys who are planting contest gardens. They have had a particularly strenuous time their first venture, but they feel it has been worth while and enjoyed it. The reverses are as follows:

First, a long drought at the start with no irrigation facilities but tanks—none too full—and kerosene tins.

Second, a kona storm blowing things right and left.

Third, a readjustment of the children by the supervising principal whereby the older boys with the best gardens are transferred to another school four miles distant.

Fourth and worst, A horse and cow pasture has been recently established (since January) on two sides of the school premises. The stock brought in included several expert steeple chasers among both horses and cows. The only fences provided are a stone wall about five feet high. No other fence is available at present. The boys' gardens are very tempting to the stock. The almost nightly raids have led the boys to eat their best produce. I dare say we must abandon the contest. The matter has been referred to supervisors and school authorities.

Very respectfully yours,  
P. M. BANKNIGHT,  
Principal.

## STONE WALL TO PROTECT GARDEN

Honaunau School,  
South Kona, Hawaii, Feb. 28, 1917.  
Editor Honolulu Star-Bulletin.

Dear Sir: We built the stone wall higher and the cows that jumped into our garden are not seen near our garden. Now we get something good and some of my watermelons died. From tomorrow we must go to Napooopo school and on every Friday afternoon I must come back to Honaunau school and make the garden good.

Very respectfully yours,  
HIDETANE YAMANO.

Dear Sir: My plants are growing very well. My cabbage is about five inches tall and my beans have seed, and my watermelons came up and the peanuts are about two inches tall. My corn is about three inches high.

Very respectfully yours,  
CHARLEY KELHIKIPI.

## PUUNENE THIRD GRADERS WRITE

Here are some letters from the third grade, Puunene, Maui, school. They are accompanied by sketches of vegetables:

Puunene, Maui, March 13, 1917.  
Editor Honolulu Star-Bulletin.

Dear Sirs: I have two gardens. One garden is growing and another is ready to be planted. I wanted to plant seed today. Today I am going to irrigate my gardens. I want to see the gardens this morning. They look very nice.

Yours truly,  
MASUTO YAMAHTA.

Sir: My plants are all growing. The seeds that I planted are: turnips, lettuce and diakon. They are all tall. We are going to irrigate the garden today. My garden is very dry. Somebody's destroyed a garden and some one's horse stepped on my garden.

Yours truly,  
MARGERY KEMPLY.

Figure 25. Letters from Hōnaunau School relating the arrival of livestock to pastures surrounding the school grounds (*Honolulu Star-Bulletin*, March 17, 1917).

The school lot was expanded during the 1920s as lands were purchased from the B.P. Bishop Estate. In 1921 an additional 1.74 acres adjoining the western boundary of the original school lot was purchased. The survey map (Figure 26) produced for the acquisition depicts the same two buildings (schematically) shown in the 1906 map. In 1923, the Bishop Estate transferred a forty-foot wide corridor right-of-way (Figure 27, see Figure 23) to the Territory along the eastern boundary of the school lot. In addition to the right-of-way, the Territory also acquired three trails connecting the school lot with the coast. The study parcel took its current form in 1929 (Figure 28), when an additional 2.5 acres were added to the south and west of the school property. This addition brought the school parcel all the way down to Hōnaunau Road.

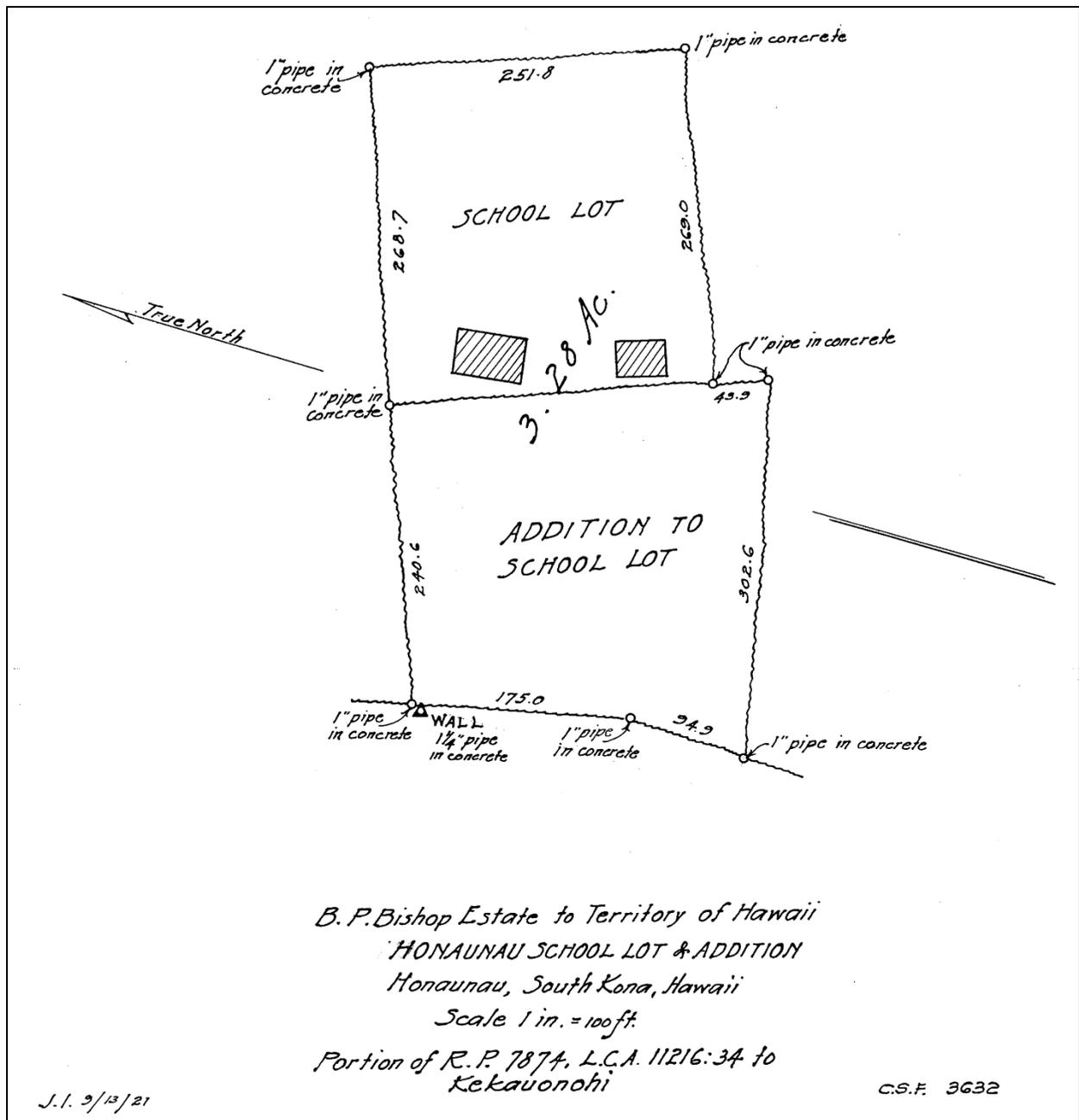


Figure 26. C.S.F. 3632 map documenting addition to Hōnaunau School Parcel.

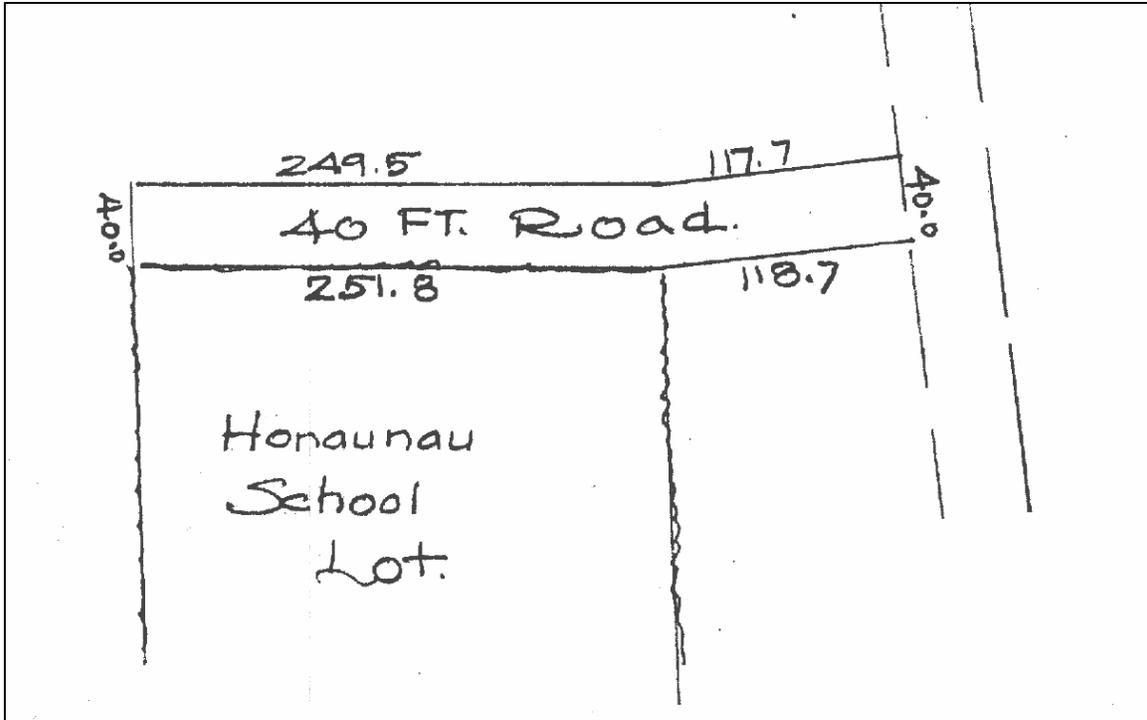


Figure 27. Detail of a map accompanying C.S.F. 3493 depicting the right-of-way added to the Hōnaunau School Lot.

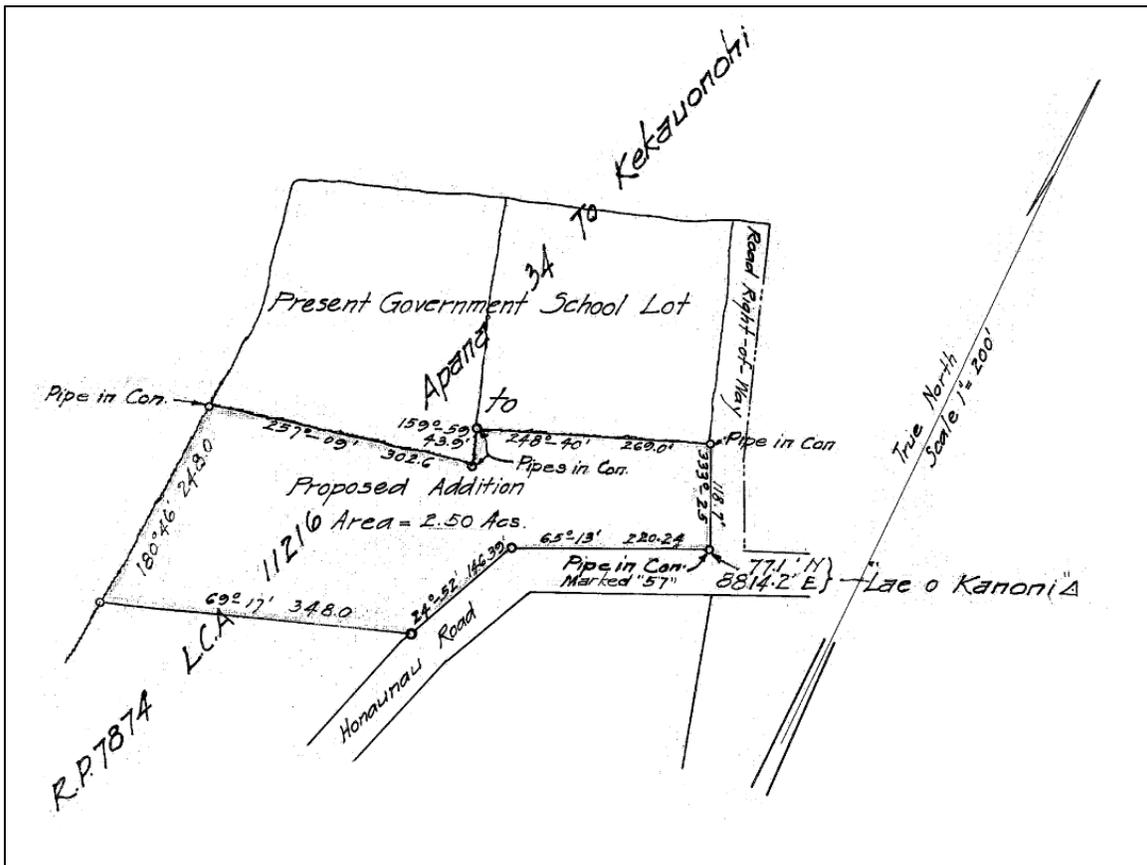


Figure 28. Detail of C.S.F 5112 documenting the 1929 addition to the study parcel.

## 2. Background

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A magnitude 6.9 earthquake struck several miles offshore of Kealakekua Bay on August 21, 1951, and caused the Hōnaunau School buildings and water tank (Figure 29) to collapse (MacDonald and Wentworth 1955). Figure 29, taken from the MacDonald and Wentworth's report, shows the damaged school building in 1951 along with the collapsed water catchment tank. Damage during the earthquake was not limited to just the school buildings, but was widespread and dramatic. MacDonald and Wentworth reported that on the South Kona ranching lands, many stone walls were damaged:

The earthquake of August 21 caused extensive shaking down of the walls. The commonest type of damage was a slumping of the upper part of the downslope face of the wall, the fragments rolling down and out a short distance from the base of the wall. Such damage was especially common on the north-south trending walls and at high places on the walls. In a few instances, walls on nearly level ground were dislodged almost equally in both directions, but the failure was preponderantly on the west side of the walls, and the material from the walls was displaced westward. (MacDonald and Wentworth 1952:279)

Alfred Medeiros, Jr., who worked for McCandless Ranch between 1941 and 1989, recalled in an interview with Kepā Maly that he spent time fixing collapsed stone walls on the ranch after the earthquake:

No, we had the fence gang. When I started working just patched walls. That's all we used to do. That big earthquake came when was...the trap, the walls all fall down so we just build 'em up again. (Alfred Medeiros, Jr., quoted in Maly and Maly 2001b:A-200)



Figure 29. Damage to the Honaunau School building (background) and water tank (foreground) sustained during the Kona earthquake of 1951 (MacDonald and Wentworth 1952:278).

Due to the damage sustained during the quake, the school buildings were abandoned, and the Hōnaunau School was moved north to Ke'e'i. A comparison of historical aerial photographs (Figure 30) indicates that few other changes occurred to the study parcel in the years immediately following the earthquake. In 1954 (see Figure 30, top), the earthquake-damaged main school building (indicated by the arrow), was still in place, but by 1961 (see Figure 30, bottom) it had been razed. The other buildings, however, were still standing within three years of the parcel's conversion to its current use as a rodeo arena.

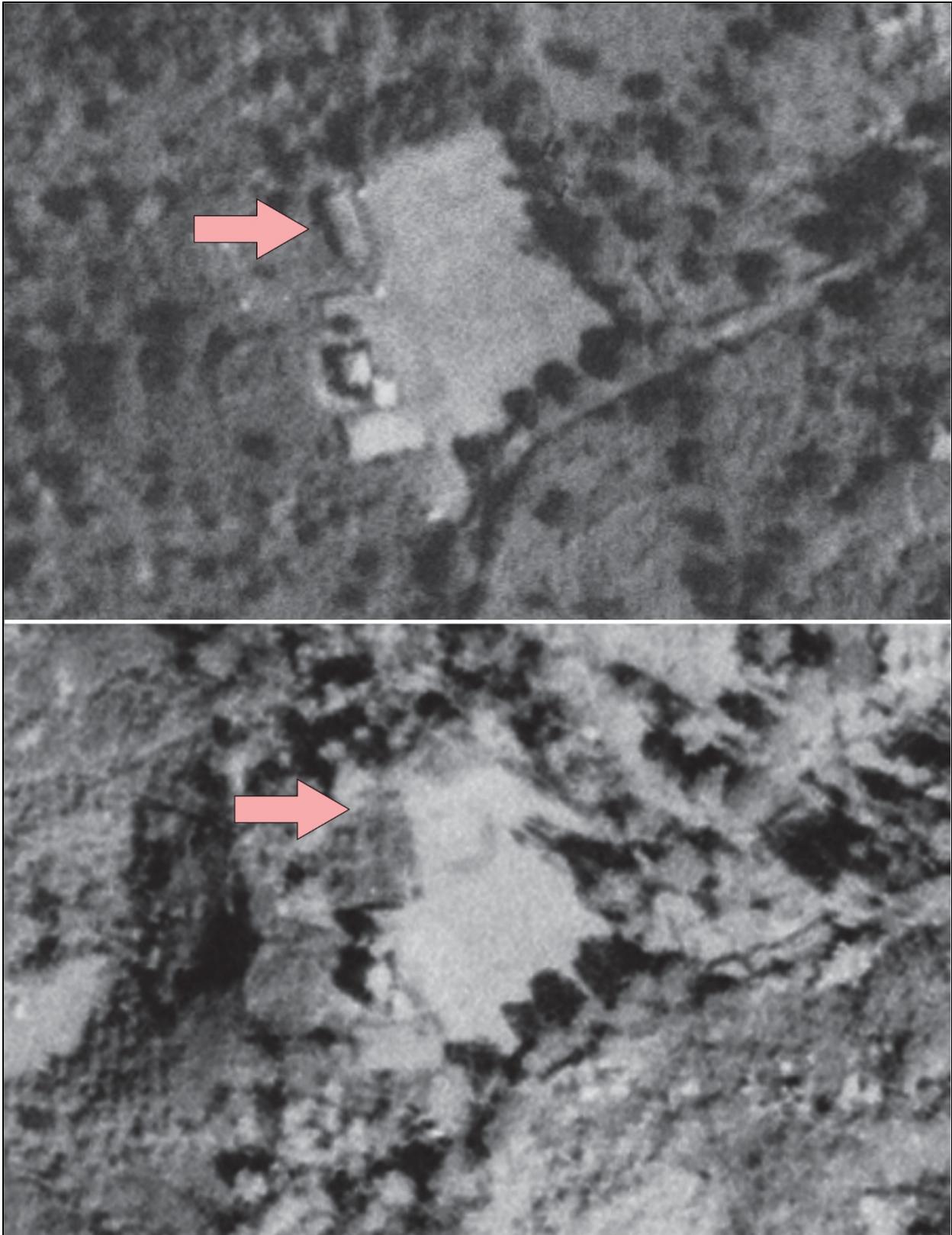


Figure 30. Details of aerial photographs showing the location of the main Hōnaunau school building in 1954 (top) and 1961 (bottom) (USGS images 1HAI000050006 and 1VJXI00007017).

## Hōnaunau Rodeo Arena

The school buildings remained on the property into the 1960s, when the school lot was converted into the current rodeo grounds. From the Kona Historical Society's website:

... In 1964, a group of South Kona residents with cowboy connections approached ranch manager Freddy Rice and his wife Sally for help in starting up a rodeo in Kona. The Rices had just returned from world famous Calgary Stampede in Canada, so "Kona Stampede" was a natural choice for this upstart venture's name. With Freddy's help, August and Sonny Loando, Clarence and Alfred Medeiros, and Frank Henriques asked the County for permission to acquire the old Honaunau School grounds for a roping arena. The devastating earthquake of August 21, 1951, had destroyed the original wooden school buildings and water tanks, leaving only grassy playing fields and a paved basketball court behind. (And, if ever an abandoned school was graced with a view, this one was it.)

With permission to move ahead, newly formed Kona Roping and Polo Club scoped out the layout of other arenas around the island and dug holes for posts. McCandless Ranch donated wooden poles and, once the arena was complete, produced wild cattle for roping practice! Wives and mothers jumped in to help, including Loke Medeiros, Mabel Medeiros and Sally Rice as pioneer secretaries. They did a great job and the kids of Kona had fun competing. (Melrose n.d.)

## PREVIOUS RESEARCH

Most archaeological studies conducted in Hōnaunau Ahupua'a have focused on sites in and near Pu'uhonua o Hōnaunau National Historic Park near the coast. In the early twentieth century, Thrum (1908) and Stokes (Stokes and Dye 1991), conducted literature and field research to identify and record *heiau* (ceremonial sites) and associated features on Hawai'i Island. Because of the great cultural and historical significance of the Pu'uhonua o Hōnaunau, numerous archaeological and ethnographic studies have been conducted within the National Historical Park (Apple 1966; Bryan et al. 1957; Bryan and Emory 1986; Emory 1970; Greene 1993; Jackson 1966; Kekahuna and Kelsey 1956; Ladd 1969, 1986; Pearson 1969; Soehren and Tuohy 1987; Somers 1986). As the scope of the National Historical Park was being developed, it was determined to also acquire the *makai* lands of Kēōkea and a portion of the coastal village at Ki'ilae. As a result, some detailed field studies and ethnographic research has been compiled for the *makai* lands (with Jackson's 1966 study also covering upland residency and land use practices). The comprehensive report prepared by Greene (1993) provides a detailed presentation of the studies conducted between 1919 and 1990 in the greater Pu'uhonua o Hōnaunau area.

The *kula* lands of Hōnaunau, on the other hand, remain almost unexamined by archaeologists. Mary Anne Maigret (personal communication) of Pu'uhonua O Hōnaunau National Park was unaware of surveys conducted in Hōnaunau between the park boundary and Māmalahoa Highway. One exception to this is Ching's (1971) surface survey of a corridor for the Nāpo'opo'o to Hōnaunau Road Alignment (Alternative 2), which included a portion of Hōnaunau *ahupua'a* north of the 1966 Hōnaunau Road below about 300 feet elevation. Ching's study identified sixteen archaeological features in that corridor, including three agricultural complexes and five temporary shelters. Ching interpreted the distribution of sites to indicate a narrow "dead zone" between the coastal settlement and the upland agricultural lands, but recognized that his sample size was quite small compared to the rest of the *kula* zone.

Other studies in South Kona demonstrate the variability of Kona Field System development with respect to environmental factors as well as historical and political ones. In neighboring Kēōkea Ahupua'a, Keffer's (1989) study of the 3.9-acre Hawaiian Historic area at Keokea Gardens documented field system, habitation, ceremonial, and petroglyph features at about 900 feet elevation. These features included an agricultural *heiau*, a Precontact *kapa* workshop that was later occupied into the 1930s, an area with typical Kohala Field System *kuaiwi*, and elaborate habitation enclosures interpreted as a chiefly residential complex.

Further south, numerous Precontact and Historic sites have been recorded in the *kula* lands of Ki'ilae and Kauleoli *ahupua'a*. Wolforth (2000) conducted a reconnaissance survey of approximately 720 acres *makai* of the Māmalahoa Highway in Ki'ilae and Kauleoli *ahupua'a*. His reconnaissance identified 606 sites, the majority of which were mounds and walls related to agricultural activities. Wolforth (2000:1, 4) observed that the agricultural mounds below 600 feet elevation are smaller and less formal than those above 600 feet elevation. One of the walls (Wolforth's site 238) corresponds with SIHP Site 23178, the "Great Wall" depicted on the 1920s historic maps (see Figure 21 and 22). Enclosures were another abundant feature type, which according to Wolforth (2000:6) "were created during prehistory around habitation agricultural, and ceremonial areas." He also recorded sixteen platforms, five of which he suggested as possible burials. Five lava tube openings were identified, one of which contained human skeletal remains.

Rechtman et al. (2001) conducted a more detailed archaeological inventory survey of portions Wolforth's (2000) study area. The inventory recorded 140 sites consisting of 4,773 features, of which 95% were agriculture-related and probably represent the persistence of traditional Hawaiian agricultural land use into the 19th century. The agricultural sites were overwhelmingly located above the 600-foot elevation contour, with only 228 agricultural features recorded below that level. Centralized temporary habitation features were also found associated with these agricultural features. The lower-elevation agricultural sites appeared to be opportunistic, taking advantage of localized soil accumulations, and may represent either an expansion of farming into marginal areas or early attempts to farm near the coastal residential areas. They found that Historic Period residential sites clustered near Māmalahoa Highway, and recorded seventy-one core-filled livestock control walls throughout the lower elevations of their study area. A portion of the wall recorded by Wolforth as Site 238—the large stone wall in Figures 21 and 22—was assigned SIHP Site number 23178 as a result of the Rechtman et al. (2001) study.

There are key differences between the current study area and the areas covered by Keffer (1989), Wolforth (2000), and Rechtman et al (2001). Keffer's site was located 400 feet higher in elevation, well above the *kula* and in the rainier *kalu'ulu* zone. While the studies in Ki'ilae and Kauleolī included the 500 foot elevation, traditional agricultural practices are known to have persisted in those *ahupua'a* into the 1930s. These three study areas probably represent more intensive agricultural development than would have been possible in the *kula* of Hōnaunau, which is generally drier and has less abundant soil than the *ahupua'a* to the south.

### 3. STUDY AREA EXPECTATIONS

With the exception of stone walls on the parcel boundaries, the likelihood of encountering archaeological features in the study parcel is limited. Satellite imagery suggests that Kona Field system remnants in southwest corner are possible, and may take the form of *kuaiwi* or planting mounds. Archaeological material related to the Hōnaunau School are unlikely to be found *in situ*. Figure 31 depicts the approximate locations of the school buildings superimposed on a recent satellite image of the study parcel. Grading of the property to clear the damaged school buildings and to create the rodeo arena space very likely removed most, if not all, traces of the school buildings. The hillside on the western edge of the parcel, behind the degraded asphalt driveway, may contain material related to the school such as artifacts or architectural debris that were pushed down the hill during clearing of the property for the rodeo arena.

Some of the walls surrounding the property are Historic in age, and some or all of the eastern and northern walls were in place at least as early as 1917. These include the “Great Wall or Pa aina” depicted on maps from the 1920s. Given the known damage to the school property during the 1951 earthquake and subsequent conversion to the Hōnaunau Rodeo Arena, however, it is likely that the stone walls are in their original locations, but have been extensively repaired and maintained in the intervening years.



Figure 31. Current satellite imagery of the study parcel with potential locations of archaeological features.

## 4. FIELDWORK

Fieldwork for the current study was conducted on July 14, 2014 by Benjamin Barna, Ph. D. and J. David Nelson, B.A., and consisted of a pedestrian survey of the entire ground surface of the study parcel (i.e., 100% coverage). The ground surface within 10 meters of the perimeter walls and the walls themselves were closely examined by both field workers walking side-by-side. Ground visibility on the hillside near the western boundary of the parcel was fair due to heavy vegetation. The remainder of the parcel, however, had excellent visibility and was therefore examined with 30-meter transects roughly oriented east-west. Rodeo arena structures were also examined. Because the parcel has been graded subsequent to the abandonment of the Hōnaunau School, no subsurface testing was conducted. Field data was recorded using field notes, GPS, and digital photographs. During the survey, the locations of archaeological features and other information were noted on a copy of a topographic map (Figure 32) prepared by Imata & Associates for the current project.

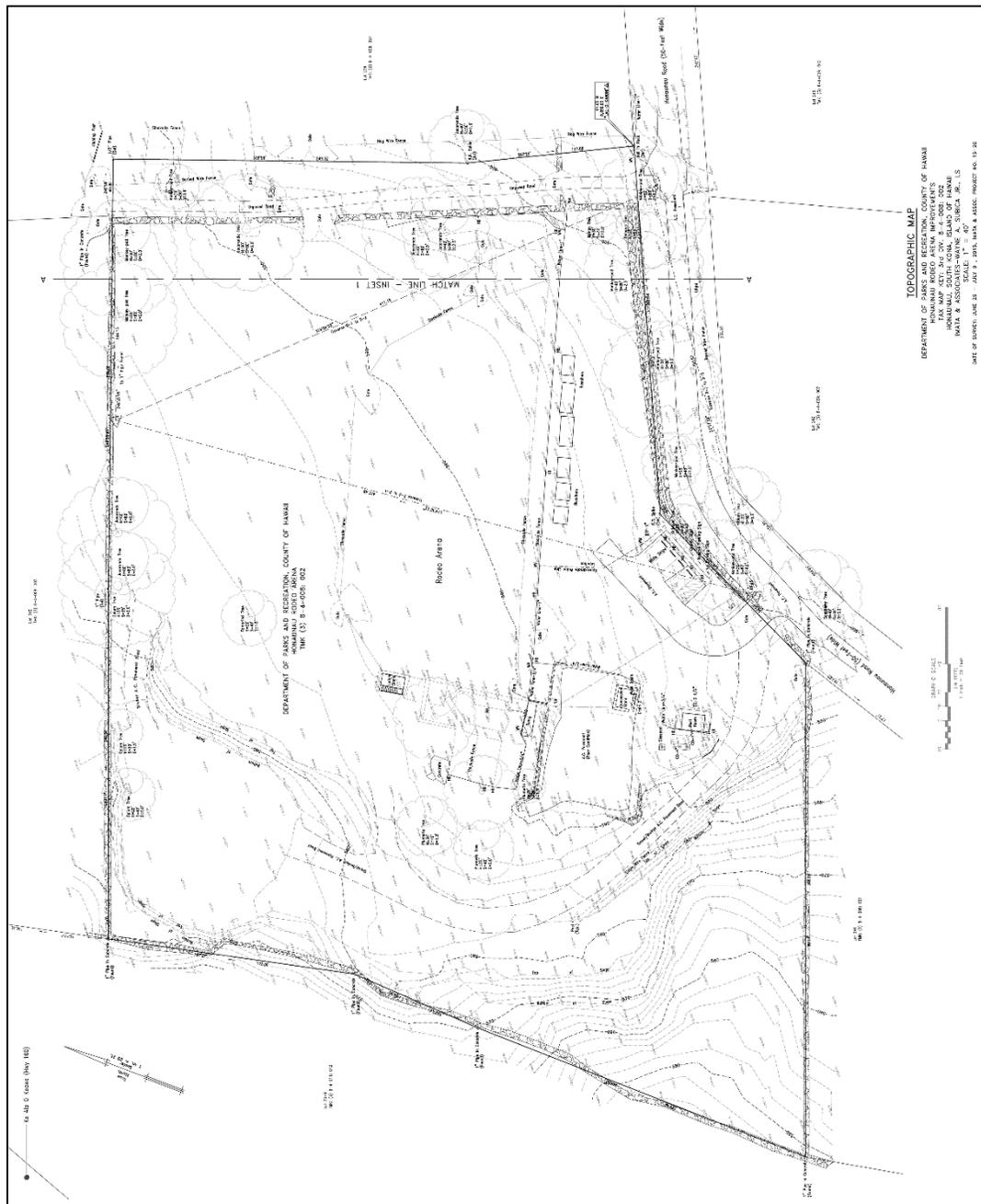


Figure 32. Detail of topographic map prepared by Imata & Associates for the current project.

## FINDINGS

As a result of the current fieldwork, one previously-identified site (SIHP Site 23178) and one unrecorded site (SIHP Site 30377) were identified in the study parcel (Table 3; Figure 33).

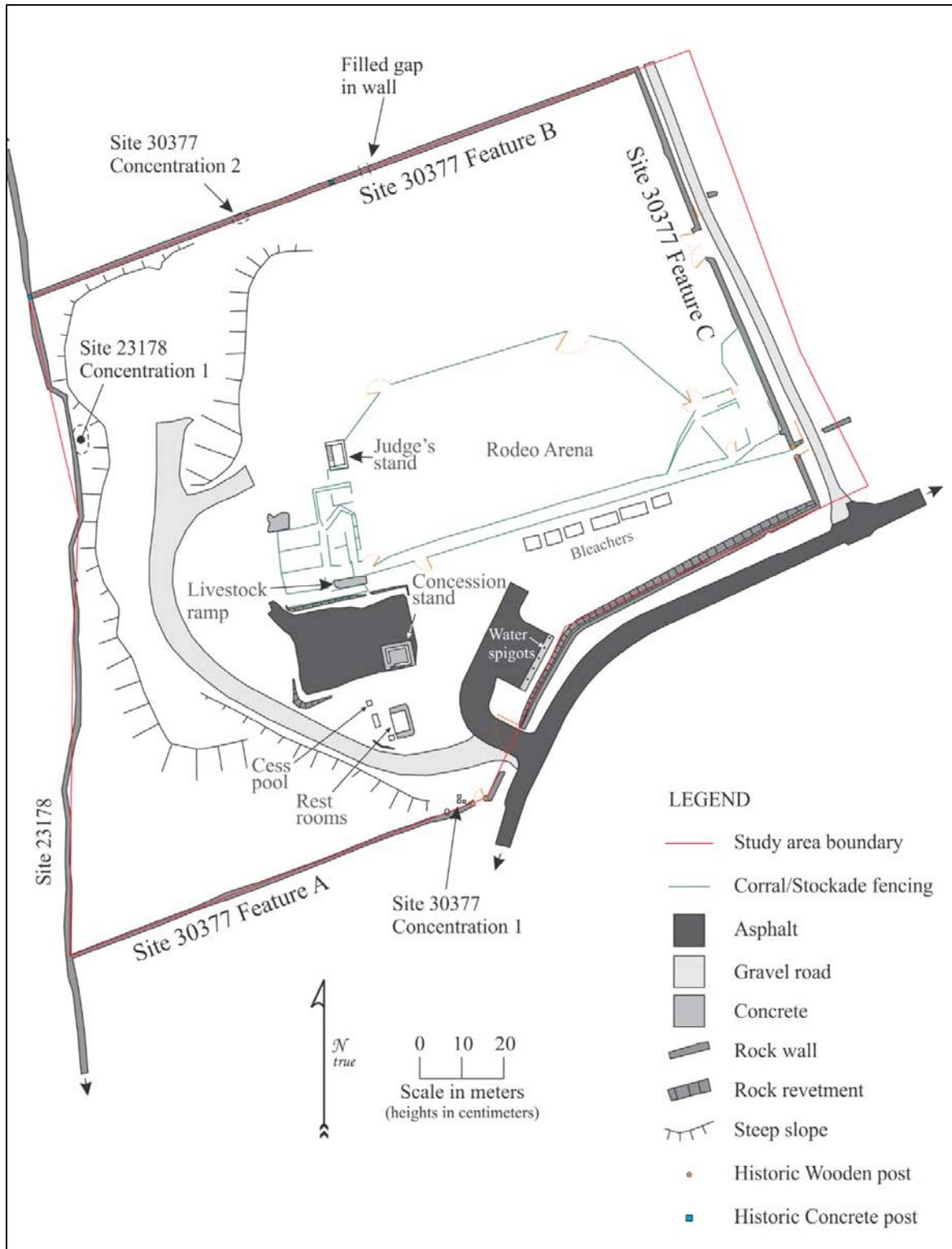


Figure 33. Site location map.

**Table 3. Sites recorded during the current study.**

<i>SIHP Site #</i>	<i>Formal Type</i>	<i>Functional Type</i>	<i>Age</i>
23178	Wall	Boundary	Historic
30377	Wall Complex	Boundary	Historic

\*SIHP site number is preceded by state, island, and U.S.G.S. quad prefix 50-10-47.

### SIHP Site 23178

Site 23178 is a core-filled stone wall built of medium-to-large cobbles (*pāhoehoe* and *'a'ā*) with a few small boulders. The wall is located along the western (*makai*) boundary of the current study parcel (see Figure 33). The wall extends beyond the current study parcel to the north and south. In the study parcel, it stands up to 1.2 meters tall, but averages 90 centimeters tall and 65 centimeters wide. It is built parallel to a steep *mauka-makai* slope and has collapsed in several areas. It is generally overgrown with vines along its entire length within the study parcel (Figure 34). At the intersections of Site 23178 with the northern and southern boundary walls of the study parcel (SIHP Site 30377 Features A and B), a 23-centimeter (8-inch) square concrete post has been installed inside Site 23178. The post stands about one meter above the top of the wall. Two strands of wire have been strung along the top of the wall between these two concrete posts. One strand is 5-gauge hog wire and the other is a double-twisted strand of barbed wire.

A small surface artifact concentration (Concentration 1) is located 20 meters south of the northwest corner of the parcel on the hillside next to Site 23178 (see Figure 33). The concentration contains seven cast-iron school desks leg- and side pieces (Figure 35). The cast iron pieces are embossed on their inner faces with “4-L [or 4-R] / ECONOMIS. / No. 763” with “L” and “R” corresponding to the left or right side of the desk, respectively. The concentration also includes a metal barrel painted for rodeo use, lumber, and three colorless glass jars. Two jars have round bases with screw-top mouths. One of the round jars has an Owens-Illinois manufacturer’s mark with a date code of “7” indicating a 1937 manufacture; the remainder of the base mark is illegible. The other round jar has an Owens-Illinois manufacturer’s mark and “Duraglas” markings, with a date code of “4” indicating 1947 and a plant code of “20” (Oakland, California, based on the manufacturing date). A third jar has a decorative, “art-deco” body design, and a threaded mouth, but its base mark is mostly illegible. A design patent number of D-86565 on the base indicates it was made by the Owens-Illinois company and was made some time after 1932, the date of the design patent (Fuerst 1932).



Figure 34. Typical segment of 23178 in the current study area.



Figure 35. Site 23178 Concentration 1 cast iron school desk parts located on the natural hill near the western boundary of the study parcel.

### SIHP Site 30377

Site 30377 is a complex of Historic stone walls located around the perimeter of the current Hōnaunau Rodeo Arena. The complex contains three stone walls (Features A, B, and C) of varying age and condition.

#### *Feature A*

Feature A is a core-filled stone wall segment built of medium-to-large cobbles (*pāhoehoe* and *'a'ā*) with a few small boulders. It is located along the southwestern boundary of the study parcel (see Figure 33), extending for 107.5 meters between the yellow main rodeo gate and Site 23178. A 2-meter long segment of wall (Figure 36) has been rebuilt and reinforced with cement to support the main rodeo gate, but the remainder of the wall is of dry-stack construction. Seven meters from the main gate, the wall is breached by an older gate (Figure 37) made of galvanized pipe and attached to a wooden post with large hinges and heavy gauge wire. The wall measures 105 meters long from the gate to Site 23178, which Feature A abuts in the study parcel's southwestern corner. Feature A's width varies from 60 to 70 centimeters, and its height averages 90 centimeters above the ground surface. In general, the wall is in good condition with very little collapse observed. As the wall descends the natural hillside (Figure 38) toward the southwest corner of the parcel, it is covered by a thick matting of vines. Associated with Feature A is a small concentration of artifacts (Concentration 1) that were deposited near the edge of the graded portion of the parcel. The concentration (Figure 39) includes three concrete pier blocks, a modern garden hose, and a wooden fence post.



Figure 36. Site 30377 Feature A, with the modern cemented segment at left and the Historic segment extending to the right, view to the south.



Figure 37. Site 30377 Feature A wooden gate post and galvanize pipe gate, view to the south.



Figure 38. Site 30377 Feature A Historic wall descending hillside behind rodeo arena, view to the southwest.



Figure 39. Site 30377 Feature A Concentration 1.

*Feature B*

Feature B is a core-filled stone wall segment composed of medium-to-large cobbles (*pāhoehoe* and *'a'ā*) with a few small boulders. It is located on the northern boundary of the study parcel (see Figure 33). Its western end abuts Site 23178 in the northwest corner of the study parcel. The wall is constructed of medium to large cobbles with some small boulders. The wall stands an average of 1 meter tall and 1.4 meters wide, and is in excellent condition, and it shows evidence of recent modifications and repairs. At its intersection with Site 23178, a 6-inch square concrete post has been installed inside Site 23178, standing about 1 meter above the top of the wall. Three strands of 5-gauge (~ 5 millimeter diameter) hog-wire (Figure 40) run along the top of the wall for 74.3 meters to another 6-inch concrete post (Figure 41), which is installed into the wall and is anchored into the wall with 5-gauge hog wire. This second post stands approximately 1.2 meters above the top of the wall, and is located at what was the original northwest corner of the Hōnaunau School Lot. Immediately south of the concrete post is a large jacaranda tree, to which a wooden gate post (Figure 42) has been attached with 5-gauge wire. The gate post is located near the end of a degraded asphalt driveway that passes behind the judge's stand to the open grass area north of the rodeo arena (see Figure 33). At a point about five meters from the northwest end of the feature, a gap (Figure 43) in the wall measuring 1.2 meters at its base and 1.4 meters at the top has been filled with stones. This filled gap can be discerned by the difference in color and lichen accumulation on the stones, and the angled wall ends that once formed the gap can still be seen. The eastern half of the wall (Figure 44) includes fragments of poured concrete, and some stones used in the wall have concrete adhering to them (but the wall is not mortared). The eastern end of the wall (Figure 46) abuts Site 30377 Feature C in the northeastern corner of the study parcel.



Figure 40. Site 30377 Feature B in the western half of the study parcel, view to the northeast.



Figure 41. Site 30377 Feature B filled gap and evidence of repairs to the top thirty centimeters of stacking, view to the north.



Figure 42. Site 30377 Feature B concrete post with hog wire built near center of the wall segment, view to the northwest.



Figure 43. Site 30377 Feature B wooden gate post wired to jacaranda tree center of the wall segment, view to the north.



Figure 44. Site 30377 Feature B in eastern half of the study parcel, view to the northwest.



Figure 45. Site 30377 Feature B at intersection with Site 30377 Feature C, view to the north.

Associated with Feature B is a small concentration of artifacts (Concentration 3) deposited on top of and next to the wall (see Figure 33). The concentration (Figure 46) includes ten soda bottles (Table 4) dating between 1942 and 1947. Five are Sunbrite brand bottles missing their applied color labels and with partially legible base marks. Four are T. Kuramoto Soda Works bottles dating to 1943. One is a Maui Soda Works bottle dating to 1947. All of the bottles are missing their finishes and part of their necks. Other objects in this concentration include two large (>6 inch diameter) jar bases without base marks, two pieces of galvanized sheet metal, and a fragment of a school desk (Figure 46). This desk fragment differs in design from those in Concentration 2, and the embossing reads “6-R / DE LUXE / No. 664” indicating that it is made by the same manufacturer as the other desks. The variety of the materials in this concentration and the concentration’s location on and next to the boundary wall suggests that Concentration 3 was created during the clearing of the parcel after the 1951 earthquake. The presence of the bottles on top of the wall does not necessarily indicate a *terminus post quem* of 1947 for the wall’s construction, as it is possible that the bottles were deposited there after earthquake damage was repaired in the 1950s, or possibly during rodeo-related activities any time after 1964. The fact that the bottles lack finishes and are clustered together on top of the wall strongly suggests that it is a pile of bottles rejected by an erstwhile bottle collector.

**Table 4. Soda bottles recorded in Concentration 3.**

<i>Count</i>	<i>Color</i>	<i>Base</i>	<i>Heel</i>	<i>Shoulder</i>
5	Colorless	... [I in O in Diamond] 47	[Sunbrite heel molding]	[Sunbrite shoulder molding]
4	Colorless	TK / 20 [I in O in Diamond] 43	NET CONTENTS 7 FL. OZS	T. KURAMOTO SODA WORKS
1	Colorless	2212G/M/20 [I in O in Diamond] 2[dot]	NET CONTENTS 6 1/2 FLUID OUNCES	M...SODA & ICE WORKS LTD



Figure 46. Site 30377 Concentration 2 consisting of late 1940s-vintage soda bottles and corrugated sheet metal on top of Feature B.

#### *Feature C*

Feature C is a core-filled wall segment built with medium to large cobbles and the occasional small boulder of *'a'ā* and *pāhoehoe*. It is located on the eastern end of the study parcel, along the western boundary of the road right-of-way (Figure 47, see Figure 33). This location corresponds with the original Hōnaunau School Lot eastern boundary. North of the study parcel, a low alignment of cobbles (see Figure 45) appears to be a continuation of this wall. In the study parcel, the wall averages one meter in width and stands an average of one meter tall. The wall has two collapsed portions (Figure 48) along its width and shows signs of repair in other places. There is a twenty-foot wide gap (Figure 49) in the wall where two gates have been installed to allow vehicle access. The wall has been modified to support the gate posts, and the stones in the modified portions have been set with concrete. South of this gate, pens (Figure 50) made of galvanized pipe run along the west side of the wall for approximately 21 meters. A smaller pedestrian gate (Figure 51) has been installed in the wall just south of the pens. While the gate is currently hung from metal pipe, older wooden gate posts remain in place. From this gate to the intersection with the revetment below Hōnaunau Street, the wall stands 1.5 meters tall (Figure 52).



Figure 47. Site 30377 Feature C as seen from the road right-of-way, view to the southwest.



Figure 48. Site 30377 Feature C with collapsed sections at center, view to the south.



Figure 49. Site 30377 Feature C modern gate, view to the southeast.



Figure 50. Site 30377 Feature C and livestock pens, view to the southeast.



Figure 51. Site 30377 Feature C modern gate with remnant wooden gateposts, view to the east.



Figure 52. Site 30377 Feature C between the pedestrian gate and the revetment below Hōnaunau Street, view to the south-southeast.

## SUMMARY AND DISCUSSION

The archaeological features identified during the current study are heavily modified Historic Period livestock control walls surrounding the perimeter of the former Hōnaunau School Lot (with the exception of the road right-of-way on the eastern edge of the parcel). If Kona Field System features had once existed on the property, as might be expected by the results of archaeological studies of nearby *kula* lands (Ching 1971; Wolforth 2000; Rechtman et al. 2001), the extensive grading for the Hōnaunau School and the Hōnaunau Rodeo Arena removed them long ago. The stone walls around the current study parcel's perimeter primarily reflect the long-term use of the parcel, including the repair of the walls following catastrophic events such as the August 21, 1951 earthquake and in the course of regular maintenance. The current appearance of the walls, however, is largely due to improvements that have occurred during last fifty years, since the property was converted to the rodeo arena in 1964. The Kona Stampede Rodeo recently celebrated its 50th anniversary, and with it the 50th anniversary of the conversion of the study parcel into the Hōnaunau Rodeo Arena. While the practice of rodeo on the parcel has become “historic”, very little of the built environment is that old.

### Site 23178

Site 23178 recorded in the study area is only a small portion of this much larger ranching wall. Recent satellite imagery and historical maps show the wall beginning at the northern border of Ke‘ei 2<sup>nd</sup> Ahupua‘a and ending at another *mauka-makai* wall at the southern boundary of Kēōkea Ahupua‘a. The 1924 USGS Honaunau Quadrangle (see Figure 8) shows the wall can be seen crossing Hōnanuanu, Kēōkea, Ki‘ilae, and Kauleoli *ahpuua‘a*, where it terminates at *ahupua‘a* boundaries on each end. The B. P. Bishop Estate’s map of its South Kona lands (see Figure 9) shows the wall beginning farther north, just *makai* of “Lot 15” in the Ke‘ei 1<sup>st</sup> Subdivision, and ending in Keālia 1<sup>st</sup> Ahupua‘a. The apparent break in the wall on that map is a symptom of the piecemeal surveying caused by the discontinuous land holdings of the Bishop Estate. Modern archaeological recording of the wall is similarly limited by the boundaries of the study areas required for each particular project. The current study has positively correlated this segment of the wall with the “Great Wall” on the 1920s maps. Artifact Concentration 1 recorded near this wall is composed of debris created during the clearing of the parcel after the 1951 earthquake, but also contains more recent items and associated with this wall only through its physical proximity.

### Site 30377

While the school buildings and other infrastructure have been removed from the study parcel, the walls comprising Site 30377 remain as tangible reminders of the school’s presence. The two artifact accumulations associated with the walls contain items associated with the school, but are in secondary contexts that were created when the parcel was cleared after the 1951 earthquake for use as the rodeo arena and cannot provide any contextual data regarding the Hōnaunau School beyond establishing the presence of these objects on the school lot. With this lack of meaningful contextual data in mind, no formal subsurface testing was conducted in any of these artifact concentrations. The walls (Features A, B, and C of Site 30377) surrounding the study parcel, on the other hand, can be associated with the history of the Hōnaunau School, in particular the establishment of the school in 1897, the expansion of the lot during the 1920s, and the damage it received during the 1951 earthquake. Feature C is located on the eastern boundary of the original school lot (see Figure 24), and very likely dates to around 1897 when the school was established. The current study, however, has identified two breaches in the wall and collapsed sections. Feature B has also been modified extensively from its original construction, including the addition of concrete posts and hog wire, the filling of a gap, and apparent repairs to its upper portion. Feature A appears to document the last expansion of the lot in 1929, and it has also been modified for rodeo use through the addition of gates and, probably, the wholesale replacement of its eastern portion by the modern revetment along Hōnaunau Road. In summary, the locations and constituent stones of each of these wall segments date to the Hōnaunau School period, but the condition of the walls themselves reflect many alterations changes, the most significant of which are not related to the school.

## 5. SIGNIFICANCE EVALUATION AND TREATMENT RECOMMENDATIONS

The recorded archaeological sites are assessed for their significance based on criteria established and promoted by the DLNR-SHPD and contained in the Hawai'i Administrative Rules 13§13-284-6. This significance evaluation should be considered preliminary until DLNR-SHPD provides concurrence. For a resource to be considered significant it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- a** Be associated with events that have made an important contribution to the broad patterns of our history;
- b** Be associated with the lives of persons important in our past;
- c** Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- d** Have yielded, or is likely to yield, information important for research on prehistory or history;
- e** Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

The significance and recommended treatments for the two sites that were documented as part of the current study are presented in Table 3 and discussed below.

**Table 3. Site significance and treatment recommendations.**

<i>SIHP Site #*</i>	<i>Site Type</i>	<i>Temporal Affiliation</i>	<i>Significance</i>	<i>Recommended Treatment</i>
23178	Wall	Historic	d	No further work
30377	Wall Complex	Historic	d	No further work

\*SIHP Site number is preceded by the state, island, and U.S.G.S prefix 50-10-47

### SITE 23178

A portion of Site 23178 in Kauleo'i Ahupua'a was determined significant under Criterion d by Rechtman et al. (2001) with an approved treatment of "No Further Work." The recordation of the segment of this wall during the current study partially adds more data about the twentieth-century use and modification of the *kula* lands of South Kona, exhausting the data potential of the wall only within the study parcel (but not elsewhere along its length). Therefore, the site is still considered eligible under Criterion d for both the information it has yielded and for the information it is likely to yield. Because the wall shows evidence of modification, probably after the establishment of the rodeo arena in the 1960s, and plans for the renovations at the Hōnaunau Rodeo Arena will not impact the wall, the recommended treatment for this segment of the wall is "No further work."

### SITE 30377

Walls document the expansion of the school lot as the needs of the school grew, beginning with Feature C and the eastern half of Feature B, which are on the original school lot boundary. The 1921 expansion of the lot is documented by the western half of Feature B, which brought the school property down to Site 23178. Finally, Feature A documents the 1929 expansion of the school lot, which extended the boundary to its current location on Hōnaunau Road. Despite their ability to document these changes, the condition of these walls, especially the rodeo-related breaches, gates, and additions, and the fact that they were repaired after suffering damage during the 1951 earthquake, reflects a loss of integrity of materials, workmanship, and design that renders them substantially different from the original school walls. Much of this loss of integrity involves the addition of concrete and other materials (Features A, B, and C), the breaching of walls (Features A and C), the filling of openings (Feature B), and the wholesale replacement of wall sections (the revetment along Hōnaunau Road). Furthermore, the removal of all of the school-related buildings and structures, and their replacement with the current rodeo arena, has eliminated the setting and feeling of the Hōnaunau

School, and also the integrity of association with the school. The net result of this loss of integrity severs the association of Site 30377 with the Hōnaunau School.

Despite the lack of association with the school, the walls of Site 30377 have contributed to a more thorough understanding of the evolution of the Hōnaunau School Lot through the physical manifestations of those changes on the walls themselves. The information they have provided includes the modifications made to convert the lot into the Hōnaunau Rodeo Arena, an institution that has only very recently celebrated its 50th anniversary. By recording the modifications to the walls, the current study has exhausted the information potential of the site. Therefore, Site 30377 is recommended significant under Criterion d, with a recommended treatment of “No further work.”

The information acquired during the current study is sufficient to mitigate any alterations to the sites that may occur as a result of the proposed project. Much of the activity that has caused the loss of site integrity is a result of the refurbishment of the walls during the conversion of the property into the rodeo arena beginning in 1964, and subsequent maintenance of those walls. The transformation from the former school lot to the Hōnaunau Rodeo Arena marked the beginning of a new chapter in the parcel’s history that connects this place with the long history of ranching in South Kona. Continuing the time-honored tradition of maintaining and modifying these walls to serve the needs of the rodeo arena would be an appropriate way to unofficially “preserve” them through the persistence of a practice that has come to be associated with ranching and related activities in Hawai‘i.

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# **Hōnaunau Rodeo Arena Improvements**

## **Environmental Assessment**

TMK (3rd) 8-4-008:002  
South Kona District, Hawai‘i Island, State of Hawai‘i

### **APPENDIX 3**

#### **Traffic Assessment**

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**DRAFT**

**Honaunau Rodeo Arena Improvements**

**Traffic Assessment**

**South Kona, Island of Hawai'i**

**August 27, 2015**

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Prepared for  
County of Hawai'i,  
Department of Parks & Recreation

Prepared by

**SSFM**  
INTERNATIONAL

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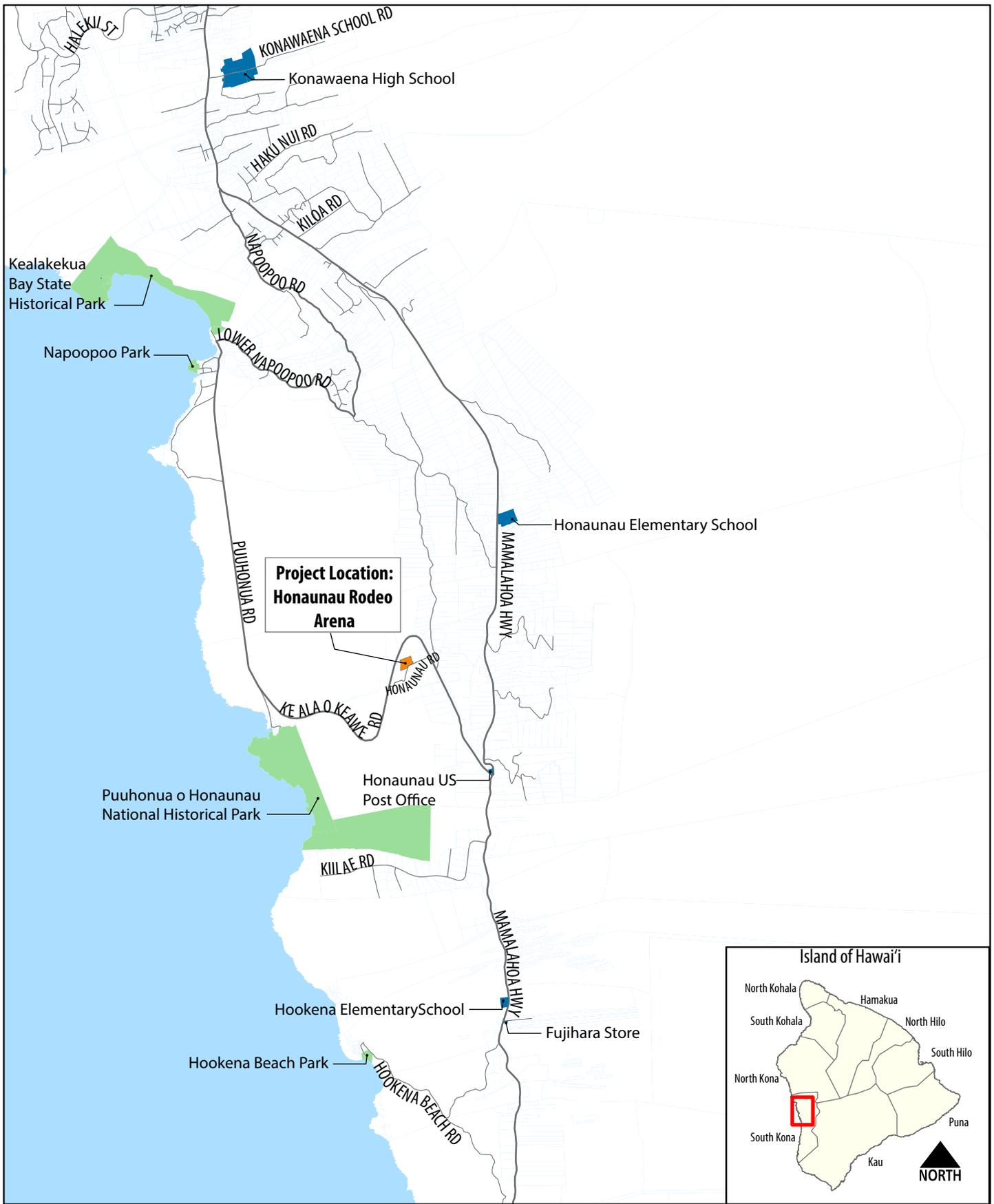
Appendix A – 24-Hour HDOT Traffic Count Data

## **I. PROJECT DESCRIPTION**

The County of Hawai'i, Department of Parks and Recreation, is proposing to improve Honaunau Rodeo Arena (HRA) which is located at Tax Map Key: (3) 8-4-008: 002 in South Kona on the Island of Hawai'i. A location map is provided in Figure 1. Access to HRA is through a paved driveway off of Honaunau Road. There is also a gated driveway immediately mauka (mountain side) of the property that leads to an unpaved roadway which provides access for rodeo participants. There are currently four paved parking stalls near the makai (ocean side) driveway. HRA currently holds an annual rodeo event which attracts approximately 800 attendees including participants. Attendees can park on-site and along Honaunau Road.

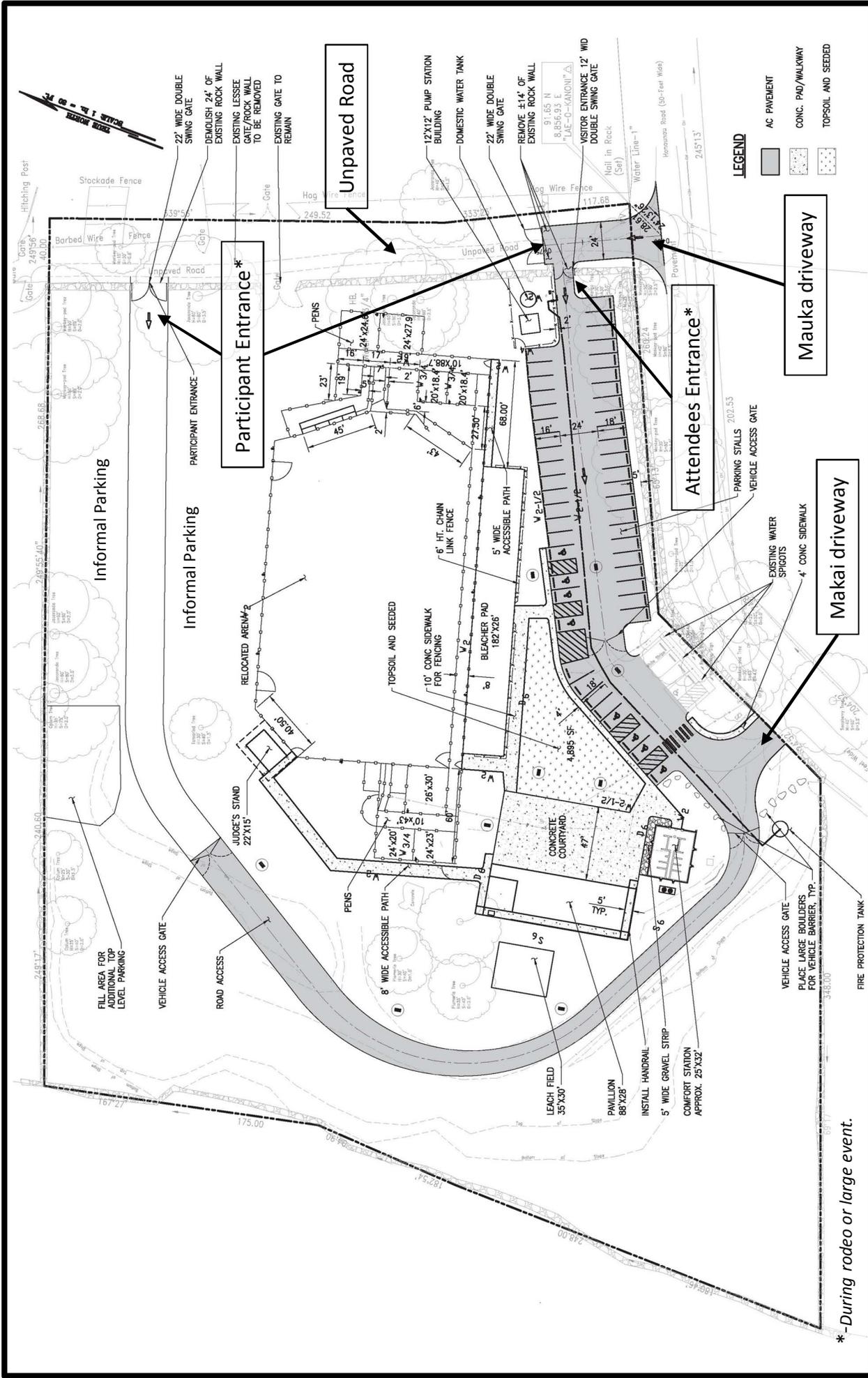
Proposed improvements at Honaunau Rodeo Arena include enhancing the water system at the site, providing a covered bleacher structure with new bleachers, replacing the comfort station, replacing the judges' stand, providing a new pavilion, and providing an accessible system of walkways and amenities. The proposed improvements also include improving available parking areas (formal/informal) and the addition of 49 on-site paved parking stalls. The proposed site plan is provided in Figure 2.

This traffic assessment (TA) will evaluate existing conditions and assess traffic impacts on the surrounding area as a result of the improvements at Honaunau Rodeo Arena. The TA was prepared in support of an Environmental Assessment.



**Figure 1: Project Location Map**

Honaunau Rodeo Arena Improvements - South Kona, Island of Hawai'i



\* -During rodeo or large event.

**Figure 2: Site Plan**

Honaunau Rodeo Arena Improvements – South Kona, Island of Hawaii



## II. EXISTING CONDITIONS

### A. Geometric Configuration

Honaunau Road is a narrow, 0.5-mile, two-way roadway that provides a mauka-makai connection between one switchback of Ke Ala o Keawe Road. Honaunau Road, also referred to as Rodeo Road, provides access to Honaunau Rodeo Arena and several agricultural properties. Two driveways exist for accessing HRA. The makai driveway is the primary access to HRA. The mauka driveway is an unpaved access only opened for participants during a rodeo event. There are gravel shoulders of varying widths on both sides of Honaunau Road. There are no posted speed limit signs along this roadway. During the annual HRA rodeo event, traffic along Honaunau Road is converted to one-way flow in the makai-bound direction, and controlled by police officers. The one-way traffic flow permits parking to occur along the shoulders of Honaunau Road.

Ke Ala o Keawe Road (State Route 160) is a 4-mile, two-lane, two-way roadway that travels through a rural area with the functional classification of major collector. This roadway is also referred to as City of Refuge Road. This roadway is located between Māmalahoa Highway (State Route 11) at the mauka terminus and the access to Pu’uhonua O Honaunau National Park at the makai terminus. The posted speed limit is 45 mph.

### B. Volumes

#### 1. 24-Hour Roadway Volumes

In 2013, average daily traffic (ADT) along Ke Ala O Keawe Road mauka of the project area was 1,400 vehicles, based on Hawai’i Department of Transportation (HDOT) *Historical Traffic Station Maps*. ADT makai of the project area was 810 vehicles. Table 1 provides the roadway ADT and average peak hour volumes along Ke Ala o Keawe Road. Appendix A includes the detailed 24-hour HDOT traffic count data. There are no volume data for Honaunau Road.

**Table 1: Roadway Traffic Volumes**

Roadway	Location	2013 ADT (veh/day)	Average Peak Hour Volumes (veh/hr)	
			AM	PM
Ke Ala o Keawe Road	Between Mamalahoa Highway and Honaunau Road	1,400	105	110
	Between Honaunau Road and access to Pu’uhonua O Honaunau National Park	810	70	85

Source: *Historical Traffic Station Maps* (HDOT)

#### 2. Peak Hour Roadway Volumes

Along Ke Ala o Keawe Road, between Mamalahoa Highway and Honaunau Road, the AM peak hour was from 7:45-8:45 AM. Of the approximate 105 vehicles traveling during the AM peak hour about 65 vehicles were traveling in the mauka-bound direction and 40 vehicles in the makai-bound direction. The PM peak hour was between 4:00-5:00 PM. Of the approximate 110 vehicles traveling during the PM peak hour

about 60 vehicles were traveling in the mauka-bound direction and 50 vehicles in the makai-bound direction.

Along Ke Ala o Keawe Road, between Honaunau Road and access to Pu’uhonua O Honaunau National Park, the AM peak hour was from 7:45-8:45 AM. Of the approximate 75 vehicles traveling during the AM peak hour, about 50 vehicles were traveling in the mauka-bound direction and 25 vehicles in the makai-bound direction. The PM peak hour was between 4:00-5:00 PM. Of the approximate 85 vehicles traveling during the PM peak hour, vehicle distribution was evenly split between the two directions. Figures 3 and 4 shows graphs demonstrating directional hourly distribution along the roadway segments at the HDOT counting stations.

**3. Rodeo Event Volumes**

The largest amount of trips generated by HRA is from the annual rodeo event which attracts a total of approximately 800 attendees including participants.

**a) Trip Generation**

With an assumed average vehicle occupancy rate of 2.5 persons per vehicle, it can be estimated that approximately 320 vehicles are generated by the annual HRA event. This event typically occurs during the weekend. Since weekend data is not available, the weekday peak hour volumes will be used as the baseline to determine the worst case traffic impact of an HRA event. It is assumed that all trips will come within a one-hour period in the morning and leave within a one-hour period in the afternoon. The project related trips generated by the annual rodeo are shown in Table 2.

**Table 2: Trips Generated from Rodeo Event**

Attendees (Persons)	Trip Generation (Vehicles)		
	Daily	AM	PM
800	640	320	320

**b) Trip Distribution/Assignment**

Trip distribution matches trip maker’s origins and destinations to determine the number of trips along each route. Trips were assumed to primarily come from Māmalahoa Highway which is mauka of HRA. Trips generated by the rodeo event were added to existing volumes to determine estimated total roadway volumes during an event.

**Table 3: Existing Roadway Volumes with Trips Generated from Rodeo Event**

Roadway Segment	Daily	AM	PM
Ke Ala o Keawe Road between Mamalahoa Highway and Honaunau Road	2,040	425	430

**4. Transit Bus Volumes**

There are no bus routes that travel along Ke Ala o Keawe Road. The closest bus route is along Māmalahoa Highway which has a stop on the mauka side of the intersection with Ke Ala o Keawe Road for buses travelling in the northbound direction. The nearest bus stop location for buses traveling in the southbound direction is at Honaunau Elementary School which is 2.4 miles north of the intersection with Māmalahoa Highway and Ke Ala o Keawe Road.

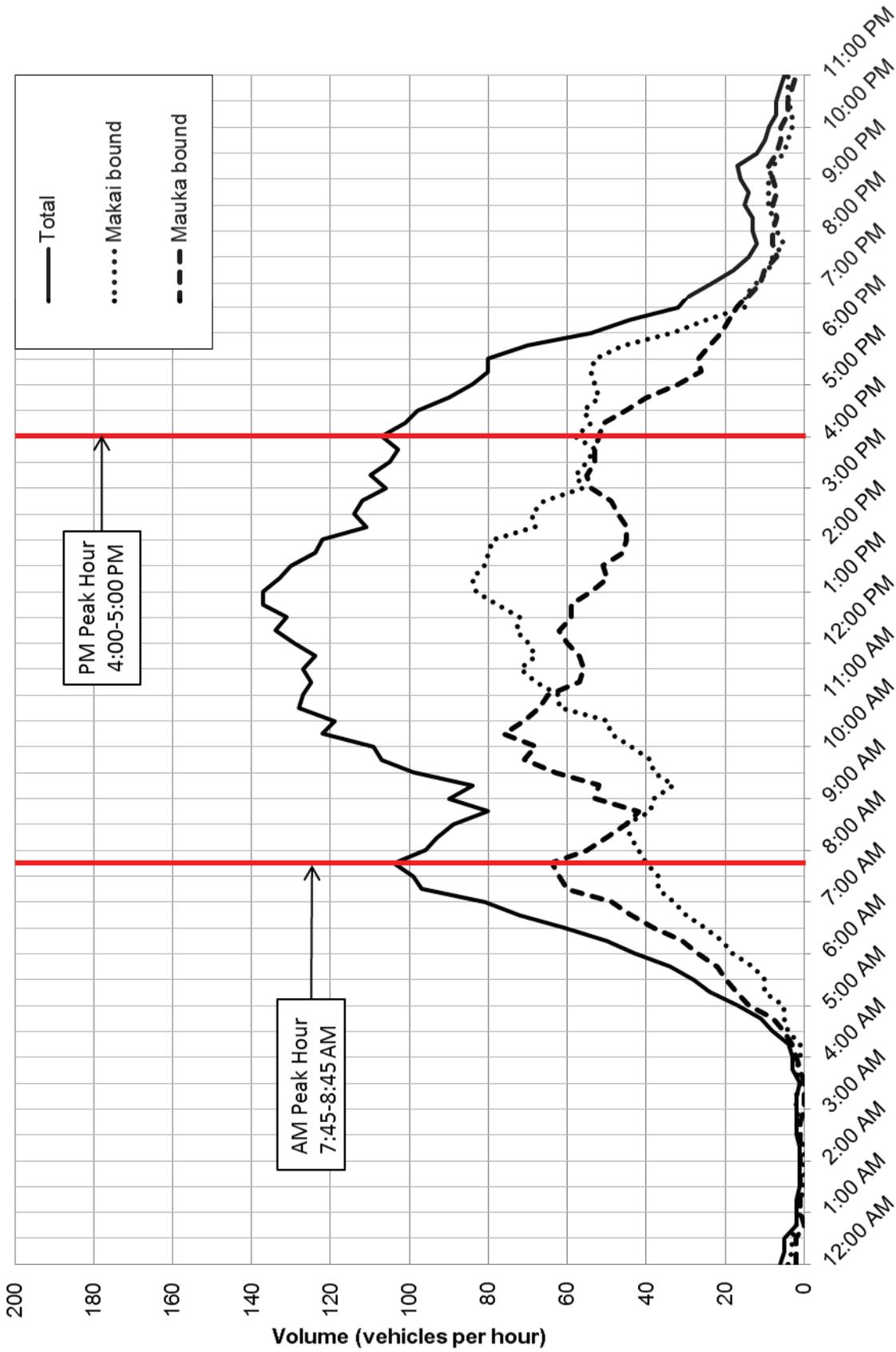


Figure 3: Ke Ala O Keawe Road between Mamalahoa Highway and Honaunau Road, 24-Hour Volume Distribution

Honaunau Rodeo Arena Improvements – South Kona, Island of Hawaii



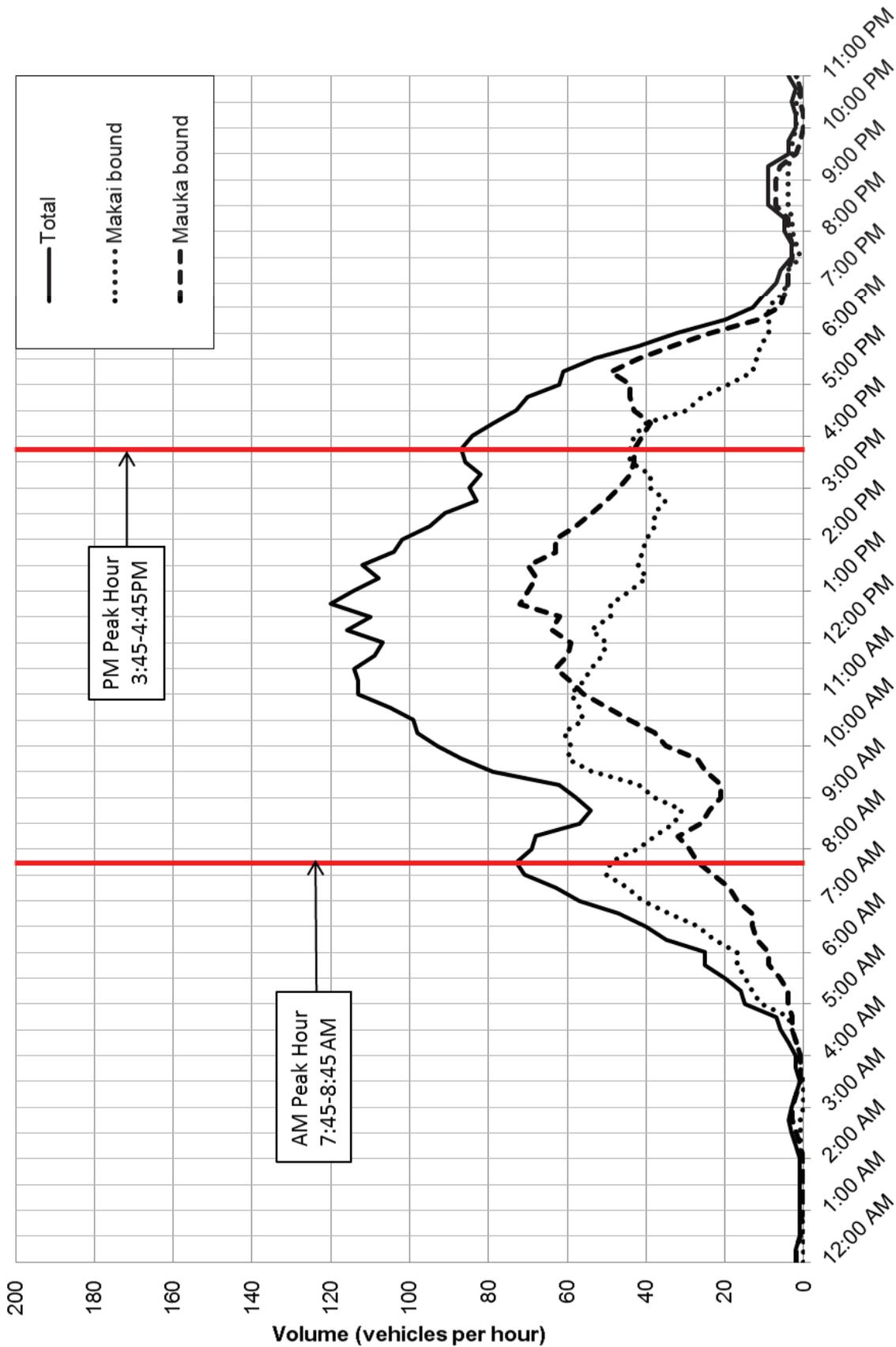


Figure 4: Ke Ala O Keawe Road between Honaunau Road and access to Pu'u'honua O Honaunau National Park, 24-Hour Volume Distribution



## 5. Pedestrians and Bicycle Volumes

There was no existing data on pedestrian or bicycle volumes in the area. There are no dedicated pedestrian or bicycle facilities near the project site. The shoulders along Honaunau Road are not paved and are primarily unimproved and gravel. During larger rodeo events, pedestrians do walk along the road after parking off-site.

### C. Level of Service

#### 1. Methodology

Level of service (LOS) is a rating system used in traffic engineering to measure the effectiveness of roadway operating conditions. There are six LOS ranging from A to F. LOS A is defined as being the least interrupted flow conditions with little or no delays, whereas LOS F is defined as conditions where extreme delays exist. Ke Ala o Keawe Road is classified as a rural major collector roadway in a rolling area. Guidelines from *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011) state that an appropriate LOS for a rural major collector in a rolling area is LOS C or better.

Roadway LOS is a function of the volume to capacity (v/c) ratio for a roadway. As v/c increases, congestion increases and operations deteriorate. When v/c exceeds 1.0, the capacity of the roadway has been exceeded, and high levels of congestion are associated with low speeds. This is described in greater detail in Table 4.

**Table 4: Relationship of Levels of Service (LOS) and v/c**

Level of Service (LOS)	Description	v/c
A	Free flows operation, vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	0.00 to 0.60
B	Reasonably free flow, vehicles' maneuverability within the traffic stream is only slightly restricted.	0.61 to 0.70
C	Freedom to maneuver within the traffic stream is noticeably restricted.	0.71 to 0.80
D	Freedom to maneuver within the traffic stream is more noticeably limited and the driver experiences reduced physical and psychological comfort level.	0.81 to 0.90
E	Vehicles are closely spaced, leaving little room to maneuver within the traffic stream at speeds that still exceed 49 miles per hour.	0.91 to 1.00
F	Breakdowns in vehicular flow.	Greater Than 1.00

Source: *Highway Capacity Manual* (TRB, 2010)

**2. Roadway LOS on Ke Ala o Keawe Road**

The roadway vehicle capacity for Ke Ala o Keawe Road is 1,020 vehicles per hour per lane (vphpl) during the PM peak hour (considered the peak one-hour of the day) and 10,200 vehicles per lane per day (vplpd), as noted in the County of Hawai'i Long Range Land Transportation Plan (LRLTP) 2007 base travel demand forecast model (CH2M Hill, 2013). The roadway segmental v/c and LOS was calculated to be LOS A using the 2013 traffic volumes from HDOT's *Historical Traffic Station Maps*. Roadway segment volumes, capacity, and LOS are provided in Table 5.

**Table 5: Existing (2013) Roadway Segmental Level of Service**

Roadway Segment	Location	Time of Day	Capacity (vehicles /lane)	2013 Volume (vehicles)	v/c Ratio	Level of Service
Ke Ala O Keawe Road	Between Mamalahoa Highway and Honaunau Road	PM Peak Hour	1,020	110	0.11	A
		Daily	10,200	1,400	0.14	A

**3. Roadway LOS on Ke Ala o Keawe Road with Rodeo Event**

The v/c ratio increased with the addition of the rodeo-related trips; however, the LOS remained at LOS A. Table 6 provides the v/c ratio and LOS with the increase of traffic due to the rodeo along Ke Ala O Keawe Road.

**Table 6: Existing (2013) with Rodeo Event Roadway Segmental Level of Service**

Roadway Segment	Location	Time of Day	Capacity (vehicles /lane)	2013 Volume (vehicles)	v/c Ratio	Level of Service
Ke Ala O Keawe Road	Between Mamalahoa Highway and Honaunau Road	PM Peak Hour	1,020	440	0.43	A
		Daily	10,200	2,040	0.20	A

### III. FUTURE (2016) WITHOUT CONDITIONS

The proposed improvements at Honaunau Rodeo Arena are anticipated to be completed by the end of 2016. Therefore, future analysis was completed for 2016.

#### A. Surrounding Area Conditions

##### 1. Roadway Construction

From research into the Statewide Transportation Improvements Program (STIP), no roadway improvements are expected to be completed along Ke Ala o Keawe Road or Honaunau Road by the year 2016.

##### 2. Surrounding Developments

From research into the State of Hawai'i Office of Environmental Quality Control library, no future developments are expected to be completed by 2016 that would affect the roadway geometrics or traffic volumes along Ke Ala o Keawe Road or Honaunau Road.

#### B. Geometric Conditions

Geometric configurations along Ke Ala o Keawe Road and Honaunau Road are expected to remain similar to existing conditions by the end of the year 2016.

#### C. Volumes

##### 1. Background Growth

Comparisons to counts taken from HDOT *Historical Traffic Maps* showed a growth in traffic volumes over the past seven years from 2006 to 2013 (see Table 4). However, the traffic volumes for 2012 and 2013 remain relatively similar with a growth rate of 0.7%.

**Table 4: Yearly ADT Comparison along Ke Ala o Keawe Road**

Year	ADT	Compounded Annual Growth
2006	1,033	-
2008	1,058	1.2%
2010	1,547	20.9%
2012	1,350	-6.6%
2013	1,360	0.7%

##### 2. Surrounding Area Development

No surrounding area developments were identified for completion within the project future time frame to consider applying for growth in traffic volumes.

##### 3. Future (2016) Without Project Volumes

Future (2016) Without Project volumes are projected to remain similar to the 2013 HDOT traffic volumes for the AM peak hour, PM peak hour, and daily volumes.

#### D. Level of Service

With no change in geometry or volume, Future (2016) Without Project conditions are anticipated to have similar level of service results as existing conditions.

## **IV. FUTURE (2016) WITH PROJECT CONDITIONS**

### **A. Geometric Conditions**

There are two driveways proposed for accessing HRA at the same location as the existing driveways. The mauka driveway will be an entrance only for participants and attendees during a rodeo or a large event in the pavilion. Participants will continue north along an unpaved road to the participants' entrance. Attendees will make a left into the parking lot. The makai driveway will be an egress only during these large events. All other times the parking lot, unpaved path and road access for participants will be closed and the makai driveway will be the only entrance and exit access to HRA. The proposed improvements include the addition of 49 on-site formal paved parking stalls and improving available informal parking areas.

### **B. Volumes**

Annual rodeo events have the greatest number of trips generated by HRA. Additional parking stalls are being designated on-site; however, improvements being proposed by the project are not expected to significantly increase trips generated. Therefore, Future (2016) With Project volumes will be similar to Future (2016) Without Project and Existing volumes.

### **C. Level of Service**

With no change in geometry or volume, Future (2016) With Project conditions are anticipated to have similar level of service results as Future (2016) Without Project conditions.

The number of vehicle trips generated by HRA that would result in an unacceptable LOS D along Ke Ala o Keawe Road is approximately 700 peak hour vehicle trips or 6,800 daily vehicle trips.

### **D. Sight Distance**

#### **1. Methodology**

*A Policy on Geometric Design of Highways and Streets, 6<sup>th</sup> Edition* (AASHTO, 2011) states that proper sight distances should be provided to avoid conflicts and to maintain efficient traffic operations. The driver of a vehicle approaching an intersection should have an unobstructed view of the entire intersection. Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting roadway to decide when to enter the intersecting roadway or to cross it. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.

#### **2. Analysis**

The design speed along Ke Ala o Keawe Road is considered to be 50 mph, 5 mph greater than the posted speed limit of 45 mph. The required intersection sight distance for a left and right turn by a combination vehicle (truck with trailer) from Honaunau Road is 850 feet and 775 feet respectively. For a vehicle making a left turn from Ke Ala o Keawe Road to Honaunau Road, the required intersection sight distance is 555 feet. The design speed along Honaunau Road is 30 mph for a 25 mph speed limit. The required sight distance from the driveways of HRA for a combination vehicle making a left turn and a right turn is 510 feet and 465 feet respectively.

Through field visits, it was observed that the intersection of Honaunau Road with Ke Ala o Keawe Road on the mauka and makai end meet the intersection sight distance requirements. There is limited sight distance from the HRA driveways due to a curve in the roadway. It was observed to be approximately 250 feet from the makai driveway looking mauka.

To ensure sufficient sight distances, intersection sight triangles should be maintained by ensuring vegetation along the north and south side of Honaunau Road are trimmed back to or below a height of three feet. It is also recommended to trim vegetation on both sides of Honaunau Road near HRA driveways.

## **V. SUMMARY AND RECOMMENDATIONS**

The County of Hawai'i, Department of Parks and Recreation, is proposing to improve Honaunau Rodeo Arena (HRA) by enhancing the water system at the site, providing a covered bleacher structure with new bleachers, replacing the comfort station, replacing the judges' stand, providing a new pavilion, providing an accessible system of walkways and amenities and improving available parking areas (formal/informal) and the addition of 49 on-site paved parking stalls. These improvements at the Honaunau Rodeo Arena will have an insignificant impact on traffic.

Access to the arena will typically be through the makai driveway off of Honaunau Road. During rodeo or large events, access to the arena will be through two driveways off of Honaunau Road. Parking will be accommodated on-site and is also permitted along Honaunau Road during events when the road operates as one-way.

The existing roadway operations along Ke Ala o Keawe Road are acceptable resulting in LOS A. The rodeo generates a large number of trips to the project site once a year during the primary event. The existing roadway operations along Ke Ala o Keawe Road will continue to operate at LOS A with the additional trips for the rodeo. No other surrounding area development, roadway construction, or change in traffic volumes are expected by 2016. Roadway conditions are expected to continue to operate at an appropriate LOS after the improvements at Honaunau Rodeo Arena.

It is recommended that sufficient sight distances are ensured for both driveway accesses. This may require the regular trimming of vegetation along Ke Ala o Keawe Road and Honaunau Road.

In conclusion, the Honaunau Rodeo Arena improvements are anticipated to have an insignificant impact to traffic along Honaunau Road and Ke Ala o Keawe Road.

## VI. REFERENCES

American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Highways and Streets*, 2011.

CH2M Hill. *State of Hawai'i Department of Transportation Hawai'i Long Range Land Transportation Plan*, TransCAD model, 2013.

Office of Environmental Quality Control (OEQC). *EA and EIS Online Library*, Accessed August 18, 2015, <<http://oeqc.doh.hawaii.gov/default.aspx>>.

State of Hawaii, Department of Transportation. *Historical Traffic Station Maps*.

State of Hawaii, Department of Transportation. *Statewide Transportation Improvements Program*, Revised October 27, 2014, <<http://hawaii.gov/dot/highways/STIP>>.

Transportation Research Board, National Research Council. *Highway Capacity Manual*, Washington, D.C., 2010 Edition.

# **Appendix A**

## **24-Hour HDOT Traffic Count Data**

**Traffic Data Service**  
Traffic Station Sketch



Section ID/Station #: B71016000000

Island: Hawaii

Area: City of Refuge

Mamalahoa Hwy

D2



D1



Ke Ala O Keawe Rd

1

Painted Church Rd

<u>Meter #</u>	<u>File Name</u>	<u>GPS</u>
1. v120	D1024015_B71016000000	19.42909, -155.88737
2.	D1024016_B71016000000	

**Station Description:**

Ke Ala O Keawe Rd: Mamalahoa Hwy to Painted Church Rd

Survey Beginning Date/Time:  
10/24/13 @ 0000

Survey Ending Date/Time:  
10/25/13 @ 2400

Survey Method:	Road Tube	Data Type:	Class
Survey Crew:	LM		C1B
Sketch Updated:		By:	SR

Remarks: 950

FACILITY NAME	JURI	FUNC CLASS	AREA TYPE	NO.	ROUTE MILE
Ke Ala O Keawe Rd		7		0160	

D1= Direction to End  
D2= Direction to Begin

D1: Painted Church Rd / END STATE HWY SIGN  
D2: Mamalahoa Hwy / MAMALAHOA HIGHWAY

Run Date: 2014/05/30

**Hawaii Department of Transportation**  
**Highways Division** **Highways Planning Survey Section**

**2013 Program Count - Summary**

Site ID: B71016000000

Town: Hawaii  
 Count Type: CLASS

DIR 1: +MP    DIR 2: -MP    Final AADT: 1300  
 Counter Type: Tube    Route No: 160

Location: Ke Ala O Keawe Rd - Mamalahoa Hwy to Painted Church Rd

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL									
<b>DATE : 10/24/2013</b>																								
12:00-12:15	1	0	1	06:00-06:15	4	2	6	12:00-12:15	14	15	29	06:00-06:15	16	5	21									
12:15-12:30	0	0	0	06:15-06:30	3	5	8	12:15-12:30	13	16	29	06:15-06:30	18	6	24									
12:30-12:45	1	1	2	06:30-06:45	5	4	9	12:30-12:45	23	15	38	06:30-06:45	5	2	7									
12:45-01:00	1	0	1	06:45-07:00	3	13	16	12:45-01:00	17	14	31	06:45-07:00	3	4	7									
01:00-01:15	0	0	0	07:00-07:15	7	6	13	01:00-01:15	23	14	37	07:00-07:15	3	2	5									
01:15-01:30	0	0	0	07:15-07:30	7	11	18	01:15-01:30	15	8	23	07:15-07:30	3	3	6									
01:30-01:45	0	0	0	07:30-07:45	5	9	14	01:30-01:45	20	13	33	07:30-07:45	5	1	6									
01:45-02:00	0	0	0	07:45-08:00	9	21	30	01:45-02:00	23	14	37	07:45-08:00	0	0	0									
02:00-02:15	0	0	0	08:00-08:15	8	21	29	02:00-02:15	25	6	31	08:00-08:15	0	1	1									
02:15-02:30	0	0	0	08:15-08:30	8	12	20	02:15-02:30	15	11	26	08:15-08:30	2	0	2									
02:30-02:45	0	0	0	08:30-08:45	15	14	29	02:30-02:45	17	12	29	08:30-08:45	2	0	2									
02:45-03:00	0	1	1	08:45-09:00	10	6	16	02:45-03:00	20	10	30	08:45-09:00	1	0	1									
03:00-03:15	0	0	0	09:00-09:15	10	12	22	03:00-03:15	13	10	23	09:00-09:15	2	0	2									
03:15-03:30	0	0	0	09:15-09:30	4	9	13	03:15-03:30	7	14	21	09:15-09:30	1	2	3									
03:30-03:45	0	0	0	09:30-09:45	6	10	16	03:30-03:45	14	9	23	09:30-09:45	0	1	1									
03:45-04:00	1	0	1	09:45-10:00	11	18	29	03:45-04:00	14	18	32	09:45-10:00	0	1	1									
04:00-04:15	0	0	0	10:00-10:15	8	11	19	04:00-04:15	14	11	25	10:00-10:15	1	0	1									
04:15-04:30	0	0	0	10:15-10:30	12	19	31	04:15-04:30	13	14	27	10:15-10:30	0	1	1									
04:30-04:45	1	1	2	10:30-10:45	10	19	29	04:30-04:45	15	13	28	10:30-10:45	0	0	0									
04:45-05:00	0	0	0	10:45-11:00	15	13	28	04:45-05:00	12	13	25	10:45-11:00	0	2	2									
05:00-05:15	0	1	1	11:00-11:15	14	19	33	05:00-05:15	9	12	21	11:00-11:15	0	0	0									
05:15-05:30	2	3	5	11:15-11:30	13	14	27	05:15-05:30	18	5	23	11:15-11:30	1	1	2									
05:30-05:45	1	4	5	11:30-11:45	19	17	36	05:30-05:45	10	10	20	11:30-11:45	1	0	1									
05:45-06:00	0	6	6	11:45-12:00	16	16	32	05:45-06:00	11	8	19	11:45-12:00	0	2	2									
AM COMMUTER PERIOD (05:00-09:00)			DIR 1	DIR 2			PM COMMUTER PERIOD (15:00-19:00)			DIR 1	DIR 2													
TWO DIRECTIONAL PEAK																								
AM - PEAK HR TIME				07:45 AM to 08:45 AM				PM - PEAK HR TIME				03:45 PM to 04:45 PM												
AM - PEAK HR VOLUME			40	68			108			56			56			112								
AM - K FACTOR (%)						8.27						8.58												
AM - D (%)			37.04	62.96			100.00			50.00			50.00			100.00								
DIRECTIONAL PEAK																								
AM - PEAK HR TIME				08:00 AM to 09:00 AM				07:45 AM to 08:45 AM				03:45 PM to 04:45 PM				03:45 PM to 04:45 PM								
AM - PEAK HR VOLUME			41	68			56			56			56			56								
AM PERIOD (00:00-12:00)																								
TWO DIRECTIONAL PEAK																								
AM - PEAK HR TIME				11:00 AM to 12:00 PM				PM - PEAK HR TIME				12:15 PM to 01:15 PM												
AM - PEAK HR VOLUME			62	66			128			76			59			135								
AM - K FACTOR (%)						9.80						10.34												
AM - D (%)			48.44	51.56			100.00			56.30			43.70			100.00								
NON-COMMUTER PERIOD (09:00-15:00)																								
TWO DIRECTIONAL PEAK																								
PEAK HR TIME				12:15 PM to 01:15 PM				AM 6-HR PERIOD (06:00-12:00)				222				301				523				
PEAK HR VOLUME			76	59			135			AM 12-HR PERIOD (00:00-12:00)			230			318			548					
DIRECTIONAL PEAK																								
PEAK HR TIME				01:15 PM to 02:15 PM				10:15 AM to 11:15 AM				PM 6-HR PERIOD (12:00-18:00)				375				285				660
PEAK HR VOLUME			83	70			51.23			48.77			100.00			669			637			1,306		
D (%)																								

Run Date: 2014/05/30

**Hawaii Department of Transportation**  
**Highways Division** **Highways Planning Survey Section**

**2013 Program Count - Summary**

Site ID: B71016000000

Town: Hawaii  
 Count Type: CLASS

DIR 1: +MP    DIR 2: -MP    Final AADT: 1300  
 Counter Type: Tube    Route No: 160

Location: Ke Ala O Keawe Rd - Mamalahoa Hwy to Painted Church Rd

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL									
<b>DATE : 10/25/2013</b>																								
12:00-12:15	0	0	0	06:00-06:15	5	5	10	12:00-12:15	26	10	36	06:00-06:15	8	5	13									
12:15-12:30	1	0	1	06:15-06:30	2	5	7	12:15-12:30	22	11	33	06:15-06:30	8	8	16									
12:30-12:45	1	2	3	06:30-06:45	4	8	12	12:30-12:45	9	17	26	06:30-06:45	5	7	12									
12:45-01:00	0	0	0	06:45-07:00	6	10	16	12:45-01:00	15	20	35	06:45-07:00	3	3	6									
01:00-01:15	0	0	0	07:00-07:15	8	9	17	01:00-01:15	23	15	38	07:00-07:15	5	3	8									
01:15-01:30	1	0	1	07:15-07:30	6	13	19	01:15-01:30	19	14	33	07:15-07:30	3	6	9									
01:30-01:45	0	0	0	07:30-07:45	14	15	29	01:30-01:45	23	19	42	07:30-07:45	5	3	8									
01:45-02:00	0	1	1	07:45-08:00	7	12	19	01:45-02:00	18	10	28	07:45-08:00	0	2	2									
02:00-02:15	0	0	0	08:00-08:15	16	17	33	02:00-02:15	22	15	37	08:00-08:15	1	2	3									
02:15-02:30	0	0	0	08:15-08:30	5	16	21	02:15-02:30	12	12	24	08:15-08:30	2	4	6									
02:30-02:45	0	0	0	08:30-08:45	10	14	24	02:30-02:45	24	10	34	08:30-08:45	1	6	7									
02:45-03:00	0	0	0	08:45-09:00	9	9	18	02:45-03:00	20	12	32	08:45-09:00	2	1	3									
03:00-03:15	0	0	0	09:00-09:15	17	16	33	03:00-03:15	12	11	23	09:00-09:15	1	1	2									
03:15-03:30	1	0	1	09:15-09:30	12	8	20	03:15-03:30	22	13	35	09:15-09:30	5	4	9									
03:30-03:45	0	0	0	09:30-09:45	8	12	20	03:30-03:45	21	16	37	09:30-09:45	4	2	6									
03:45-04:00	0	0	0	09:45-10:00	6	19	25	03:45-04:00	5	13	18	09:45-10:00	3	3	6									
04:00-04:15	0	0	0	10:00-10:15	9	15	24	04:00-04:15	16	12	28	10:00-10:15	1	3	4									
04:15-04:30	0	0	0	10:15-10:30	13	20	33	04:15-04:30	10	9	19	10:15-10:30	0	1	1									
04:30-04:45	1	1	2	10:30-10:45	5	18	23	04:30-04:45	16	12	28	10:30-10:45	1	2	3									
04:45-05:00	0	1	1	10:45-11:00	12	18	30	04:45-05:00	17	16	33	10:45-11:00	1	2	3									
05:00-05:15	0	1	1	11:00-11:15	14	22	36	05:00-05:15	12	9	21	11:00-11:15	1	0	1									
05:15-05:30	3	0	3	11:15-11:30	15	15	30	05:15-05:30	10	6	16	11:15-11:30	0	0	0									
05:30-05:45	2	3	5	11:30-11:45	21	12	33	05:30-05:45	14	5	19	11:30-11:45	1	0	1									
05:45-06:00	0	7	7	11:45-12:00	12	12	24	05:45-06:00	20	6	26	11:45-12:00	1	0	1									
AM COMMUTER PERIOD (05:00-09:00)			DIR 1	DIR 2			PM COMMUTER PERIOD (15:00-19:00)			DIR 1	DIR 2													
TWO DIRECTIONAL PEAK																								
AM - PEAK HR TIME				07:30 AM to 08:30 AM				PM - PEAK HR TIME				03:15 PM to 04:15 PM												
AM - PEAK HR VOLUME			42	60			102			64			54			118								
AM - K FACTOR (%)							7.22						8.35											
AM - D (%)			41.18	58.82			100.00			54.24			45.76			100.00								
DIRECTIONAL PEAK																								
AM - PEAK HR TIME				07:15 AM to 08:15 AM				07:30 AM to 08:30 AM				03:15 PM to 04:15 PM				03:15 PM to 04:15 PM								
AM - PEAK HR VOLUME			43	60			64			64			54											
AM PERIOD (00:00-12:00)																								
TWO DIRECTIONAL PEAK																								
AM - PEAK HR TIME				10:45 AM to 11:45 AM				PM - PEAK HR TIME				12:45 PM to 01:45 PM												
AM - PEAK HR VOLUME			62	67			129			80			68			148								
AM - K FACTOR (%)							9.13						10.47											
AM - D (%)			48.06	51.94			100.00			54.05			45.95			100.00								
NON-COMMUTER PERIOD (09:00-15:00)																								
TWO DIRECTIONAL PEAK																								
PEAK HR TIME				12:45 PM to 01:45 PM				AM 6-HR PERIOD (06:00-12:00)				DIR 1				DIR 2				Total				
PEAK HR VOLUME			80	68			148			236			320			556								
DIRECTIONAL PEAK																								
PEAK HR TIME				01:00 PM to 02:00 PM				10:15 AM to 11:15 AM				AM 12-HR PERIOD (00:00-12:00)				246				336				582
PEAK HR VOLUME			83	78			50.67			49.33			716			697			1,413					
D (%)																								

Run Date: 2014/05/29

Hawaii Department of Transportation  
Highways Division  
Highways Planning Survey Section

Vehicle Classification Data Summary  
2013

Site ID: B71016000000

Route No: 160

Date From: 2013/10/24 0:00

Town: Hawaii

Direction: +MP

Date To: 2013/10/25 23:45

Location: Ke Ala O Keawe Rd - Mamalahoa Hwy to Painted Church Rd

Functional Classification: 7 RURAL:MAJOR COLLECTOR  
REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	53	1.95%	106
PC	2041	75.06%	4082
2A-4T	574	21.11%	1148
-----			
<b>LIGHT VEHICLE TOTALS</b>	<b>2668</b>	<b>98.13%</b>	<b>5336</b>
<b>HEAVY VEHICLES</b>			
Bus	20	0.74%	50
<b>SINGLE UNIT TRUCK</b>			
2A-6T	9	0.33%	18
3A-SU	2	0.07%	6
4A-SU	0	0.00%	0
<b>SINGLE-TRAILER TRUCKS</b>			
4A-ST	16	0.59%	64
5A-ST	2	0.07%	10
6A-ST	2	0.07%	12
<b>MULTI-TRAILER TRUCKS</b>			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	0	0.00%	0
-----			
<b>HEAVY VEHICLE TOTALS</b>	<b>51</b>	<b>1.88%</b>	<b>160</b>

**CLASSIFIED VEHICLES TOTALS** 2719 (A) 100.00% 5496 (B)  
**UNCLASSIFIED VEHICLES TOTALS** -0 -0.00%

AXLE  
CORRECTION  
FACTOR (A/C) = 0.989

ROADTUBE  
EQUIVALENT(B/2) = 2748 (C)

PEAK HOUR VOLUME : 141 2013/10/25 13:00	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
SINGLE UNIT TRUCKS (TYPE 4-7)	0	(65A-1) 0.00%	15	1300	(65A-2) 1.15%	10.85%
COMBINATION (TYPE 8-13)	1	(65B-1) 0.71%	10		(65B-2) 0.77%	10.85%

**Traffic Data Service**  
Traffic Station Sketch

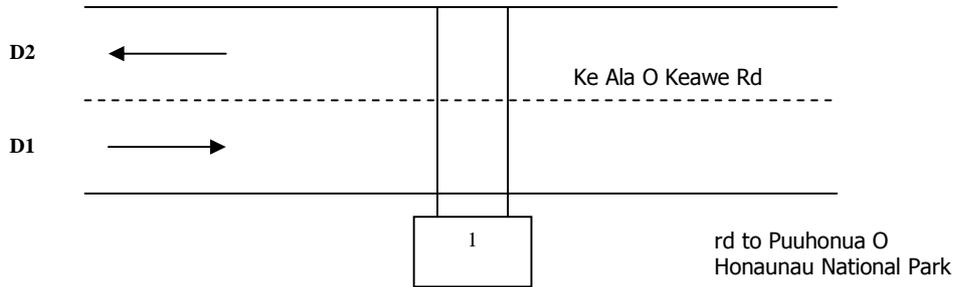


Section ID/Station #: B71016000278

Island: Hawaii

Area: Honaunau

lookout rd



<u>Meter #</u>	<u>File Name</u>	<u>GPS</u>
1. v120	D1024013_B71016000278	19.42511, -155.9031
2.	D1024014_B71016000278	

<b>Station Description:</b> Ke Ala O Keawe Rd: lookout rd to rd to Puuhonua O Honaunau National Park					
Survey Beginning Date/Time: 10/24/13 @ 0000			Survey Ending Date/Time: 10/25/13 @ 2400		
Survey Method:	Road Tube		Data Type:	Class	
Survey Crew:	LM		C1B		
Sketch Updated:			By:	SR	
Remarks:	1286				
FACILITY NAME	JURI	FUNC CLASS	AREA TYPE	ROUTE NO.	ROUTE MILE
Ke Ala O Keawe Rd		7		0160	
D1= Direction to End D2= Direction to Begin		D1: rd to Puuhonua O Honaunau National Park / END STATE HWY SIGN D2: lookout rd / MAMALAHOA HIGHWAY			

Run Date: 2014/05/30

**Hawaii Department of Transportation**  
**Highways Division** **Highways Planning Survey Section**

**2013 Program Count - Summary**

Site ID: B71016000278

Town: Hawaii  
 Count Type: CLASS

DIR 1: +MP    DIR 2: -MP    Final AADT: 970  
 Counter Type: Tube    Route No: 160

Location: Ke Ala O Keawe Rd - lookout rd to rd to Puuhonua O Honaunau Nat'l Pk

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL				
<b>DATE : 10/24/2013</b>																			
12:00-12:15	0	0	0	06:00-06:15	1	1	2	12:00-12:15	15	10	25	06:00-06:15	1	17	18				
12:15-12:30	0	0	0	06:15-06:30	3	2	5	12:15-12:30	13	21	34	06:15-06:30	2	14	16				
12:30-12:45	0	0	0	06:30-06:45	1	2	3	12:30-12:45	12	11	23	06:30-06:45	1	2	3				
12:45-01:00	0	1	1	06:45-07:00	6	2	8	12:45-01:00	11	16	27	06:45-07:00	3	1	4				
01:00-01:15	0	0	0	07:00-07:15	7	2	9	01:00-01:15	15	19	34	07:00-07:15	0	2	2				
01:15-01:30	0	0	0	07:15-07:30	8	3	11	01:15-01:30	5	14	19	07:15-07:30	2	3	5				
01:30-01:45	0	0	0	07:30-07:45	10	2	12	01:30-01:45	8	23	31	07:30-07:45	0	2	2				
01:45-02:00	0	0	0	07:45-08:00	17	2	19	01:45-02:00	6	16	22	07:45-08:00	0	0	0				
02:00-02:15	0	0	0	08:00-08:15	13	4	17	02:00-02:15	8	24	32	08:00-08:15	0	1	1				
02:15-02:30	0	0	0	08:15-08:30	11	7	18	02:15-02:30	6	9	15	08:15-08:30	0	0	0				
02:30-02:45	0	0	0	08:30-08:45	11	9	20	02:30-02:45	11	13	24	08:30-08:45	0	1	1				
02:45-03:00	1	0	1	08:45-09:00	5	5	10	02:45-03:00	8	20	28	08:45-09:00	0	1	1				
03:00-03:15	0	1	1	09:00-09:15	6	10	16	03:00-03:15	8	8	16	09:00-09:15	0	1	1				
03:15-03:30	0	0	0	09:15-09:30	6	1	7	03:15-03:30	8	6	14	09:15-09:30	1	1	2				
03:30-03:45	0	1	1	09:30-09:45	8	5	13	03:30-03:45	8	10	18	09:30-09:45	1	0	1				
03:45-04:00	0	0	0	09:45-10:00	12	2	14	03:45-04:00	15	12	27	09:45-10:00	0	1	1				
04:00-04:15	0	0	0	10:00-10:15	11	8	19	04:00-04:15	13	9	22	10:00-10:15	0	0	0				
04:15-04:30	0	0	0	10:15-10:30	18	5	23	04:15-04:30	14	8	22	10:15-10:30	0	0	0				
04:30-04:45	1	1	2	10:30-10:45	12	6	18	04:30-04:45	8	11	19	10:30-10:45	1	0	1				
04:45-05:00	0	0	0	10:45-11:00	14	11	25	04:45-05:00	9	10	19	10:45-11:00	0	0	0				
05:00-05:15	0	0	0	11:00-11:15	11	10	21	05:00-05:15	9	7	16	11:00-11:15	1	0	1				
05:15-05:30	2	1	3	11:15-11:30	13	11	24	05:15-05:30	3	16	19	11:15-11:30	0	2	2				
05:30-05:45	3	1	4	11:30-11:45	18	13	31	05:30-05:45	6	9	15	11:30-11:45	0	0	0				
05:45-06:00	7	1	8	11:45-12:00	16	15	31	05:45-06:00	3	11	14	11:45-12:00	2	0	2				
AM COMMUTER PERIOD (05:00-09:00)			DIR 1	DIR 2			PM COMMUTER PERIOD (15:00-19:00)			DIR 1	DIR 2								
TWO DIRECTIONAL PEAK																			
AM - PEAK HR TIME				07:45 AM to 08:45 AM				PM - PEAK HR TIME				03:45 PM to 04:45 PM							
AM - PEAK HR VOLUME			52	22			74			50			40						
AM - K FACTOR (%)						7.43						9.04							
AM - D (%)			70.27	29.73			100.00			55.56			44.44						
DIRECTIONAL PEAK																			
AM - PEAK HR TIME				07:45 AM to 08:45 AM				08:00 AM to 09:00 AM				03:30 PM to 04:30 PM				05:15 PM to 06:15 PM			
AM - PEAK HR VOLUME			52	25						50			53						
AM PERIOD (00:00-12:00)																			
TWO DIRECTIONAL PEAK																			
AM - PEAK HR TIME				11:00 AM to 12:00 PM				PM - PEAK HR TIME				12:15 PM to 01:15 PM							
AM - PEAK HR VOLUME			58	49			107			51			67						
AM - K FACTOR (%)						10.74						11.85							
AM - D (%)			54.21	45.79			100.00			43.22			56.78						
NON-COMMUTER PERIOD (09:00-15:00)																			
TWO DIRECTIONAL PEAK																			
PEAK HR TIME				11:30 AM to 12:30 PM				AM 6-HR PERIOD (06:00-12:00)				238							
PEAK HR VOLUME			62	59			121			AM 12-HR PERIOD (00:00-12:00)			252						
DIRECTIONAL PEAK																			
PEAK HR TIME				11:15 AM to 12:15 PM				01:15 PM to 02:15 PM				PM 6-HR PERIOD (12:00-18:00)				222			
PEAK HR VOLUME			62	77						PM 12-HR PERIOD (12:00-24:00)			237						
6-HR, 12-HR, 24-HR PERIODS																			
D (%)			49.10			50.90			24 HOUR PERIOD			489							
			100.00									507							
												996							

Run Date: 2014/05/30

**Hawaii Department of Transportation**  
**Highways Division** **Highways Planning Survey Section**

**2013 Program Count - Summary**

Site ID: B71016000278

Town: Hawaii  
 Count Type: CLASS

DIR 1: +MP    DIR 2: -MP    Final AADT: 970  
 Counter Type: Tube    Route No: 160

Location: Ke Ala O Keawe Rd - lookout rd to rd to Puuhonua O Honaunau Nat'l Pk

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL						
<b>DATE : 10/25/2013</b>																					
12:00-12:15	0	0	0	06:00-06:15	4	1	5	12:00-12:15	8	20	28	06:00-06:15	1	8	9						
12:15-12:30	0	1	1	06:15-06:30	3	0	3	12:15-12:30	10	20	30	06:15-06:30	4	8	12						
12:30-12:45	0	0	0	06:30-06:45	6	3	9	12:30-12:45	12	10	22	06:30-06:45	4	2	6						
12:45-01:00	0	0	0	06:45-07:00	7	6	13	12:45-01:00	16	11	27	06:45-07:00	1	1	2						
01:00-01:15	0	0	0	07:00-07:15	11	0	11	01:00-01:15	17	17	34	07:00-07:15	1	1	2						
01:15-01:30	0	0	0	07:15-07:30	6	6	12	01:15-01:30	9	20	29	07:15-07:30	3	0	3						
01:30-01:45	0	0	0	07:30-07:45	11	5	16	01:30-01:45	16	14	30	07:30-07:45	0	0	0						
01:45-02:00	1	0	1	07:45-08:00	10	6	16	01:45-02:00	11	18	29	07:45-08:00	0	0	0						
02:00-02:15	0	0	0	08:00-08:15	13	7	20	02:00-02:15	16	14	30	08:00-08:15	1	0	1						
02:15-02:30	0	0	0	08:15-08:30	12	8	20	02:15-02:30	11	12	23	08:15-08:30	0	0	0						
02:30-02:45	0	0	0	08:30-08:45	8	8	16	02:30-02:45	10	23	33	08:30-08:45	1	1	2						
02:45-03:00	0	0	0	08:45-09:00	9	6	15	02:45-03:00	7	15	22	08:45-09:00	2	0	2						
03:00-03:15	0	0	0	09:00-09:15	12	8	20	03:00-03:15	12	9	21	09:00-09:15	1	1	2						
03:15-03:30	0	1	1	09:15-09:30	7	8	15	03:15-03:30	10	18	28	09:15-09:30	1	0	1						
03:30-03:45	0	0	0	09:30-09:45	8	2	10	03:30-03:45	7	17	24	09:30-09:45	0	6	6						
03:45-04:00	0	0	0	09:45-10:00	16	7	23	03:45-04:00	8	9	17	09:45-10:00	1	1	2						
04:00-04:15	0	0	0	10:00-10:15	15	6	21	04:00-04:15	7	12	19	10:00-10:15	1	1	2						
04:15-04:30	0	0	0	10:15-10:30	20	9	29	04:15-04:30	13	11	24	10:15-10:30	0	0	0						
04:30-04:45	1	0	1	10:30-10:45	16	6	22	04:30-04:45	7	14	21	10:30-10:45	0	0	0						
04:45-05:00	0	0	0	10:45-11:00	11	10	21	04:45-05:00	13	9	22	10:45-11:00	0	0	0						
05:00-05:15	2	0	2	11:00-11:15	19	12	31	05:00-05:15	5	9	14	11:00-11:15	1	0	1						
05:15-05:30	0	1	1	11:15-11:30	15	13	28	05:15-05:30	5	8	13	11:15-11:30	0	0	0						
05:30-05:45	1	1	2	11:30-11:45	11	12	23	05:30-05:45	1	13	14	11:30-11:45	0	0	0						
05:45-06:00	7	1	8	11:45-12:00	13	14	27	05:45-06:00	4	13	17	11:45-12:00	0	1	1						
AM COMMUTER PERIOD (05:00-09:00)			DIR 1	DIR 2			PM COMMUTER PERIOD (15:00-19:00)			DIR 1	DIR 2										
TWO DIRECTIONAL PEAK																					
AM - PEAK HR TIME				07:30 AM to 08:30 AM				PM - PEAK HR TIME				03:00 PM to 04:00 PM									
AM - PEAK HR VOLUME			46	26			72			37			53			90					
AM - K FACTOR (%)						6.74						8.43									
AM - D (%)			63.89	36.11			100.00			41.11			58.89			100.00					
DIRECTIONAL PEAK																					
AM - PEAK HR TIME				07:30 AM to 08:30 AM				07:45 AM to 08:45 AM				04:00 PM to 05:00 PM				03:15 PM to 04:15 PM					
AM - PEAK HR VOLUME			46	29						40			56								
AM PERIOD (00:00-12:00)																					
TWO DIRECTIONAL PEAK																					
AM - PEAK HR TIME				11:00 AM to 12:00 PM				PM - PEAK HR TIME				01:00 PM to 02:00 PM									
AM - PEAK HR VOLUME			58	51			109			53			69			122					
AM - K FACTOR (%)						10.21						11.42									
AM - D (%)			53.21	46.79			100.00			43.44			56.56			100.00					
NON-COMMUTER PERIOD (09:00-15:00)																					
TWO DIRECTIONAL PEAK																					
PEAK HR TIME				01:00 PM to 02:00 PM				AM 6-HR PERIOD (06:00-12:00)				DIR 1				DIR 2				Total	
PEAK HR VOLUME			53	69			122			263			163			426					
DIRECTIONAL PEAK																					
PEAK HR TIME				09:45 AM to 10:45 AM				01:00 PM to 02:00 PM				AM 12-HR PERIOD (00:00-12:00)				275				168	443
PEAK HR VOLUME			67	69						235			336			571					
PM 6-HR PERIOD (12:00-18:00)																					
PM 12-HR PERIOD (12:00-24:00)																					
24 HOUR PERIOD																					
D (%)																					
									49.91			50.09			100.00						

Run Date: 2014/05/29

Hawaii Department of Transportation  
Highways Division  
Highways Planning Survey Section

Vehicle Classification Data Summary  
2013

Site ID: B71016000278

Route No: 160

Date From: 2013/10/24 0:00

Town: Hawaii

Direction: +MP

Date To: 2013/10/25 23:45

Location: Ke Ala O Keawe Rd - lookout rd to rd to Puuhonua O Honaunau Nat

Functional Classification: 7 RURAL:MAJOR COLLECTOR  
REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	27	1.31%	54
PC	1664	80.62%	3328
2A-4T	339	16.42%	678
-----			
<b>LIGHT VEHICLE TOTALS</b>	2030	98.35%	4060
<b>HEAVY VEHICLES</b>			
Bus	9	0.44%	22
<b>SINGLE UNIT TRUCK</b>			
2A-6T	6	0.29%	12
3A-SU	0	0.00%	0
4A-SU	0	0.00%	0
<b>SINGLE-TRAILER TRUCKS</b>			
4A-ST	17	0.82%	68
5A-ST	2	0.10%	10
6A-ST	0	0.00%	0
<b>MULTI-TRAILER TRUCKS</b>			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	0	0.00%	0
-----			
<b>HEAVY VEHICLE TOTALS</b>	34	1.65%	112

CLASSIFIED VEHICLES TOTALS 2064 (A) 100.00% 4173 (B)  
UNCLASSIFIED VEHICLES TOTALS -0 -0.00%

AXLE CORRECTION FACTOR (A/C) = 0.989

ROADTUBE EQUIVALENT(B/2) = 2086 (C)

PEAK HOUR VOLUME : 122 2013/10/25 13:00	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
SINGLE UNIT TRUCKS (TYPE 4-7)	0	(65A-1) 0.00%	7	970	(65A-2) 0.72%	12.58%
COMBINATION (TYPE 8-13)	1	(65B-1) 0.82%	9		(65B-2) 0.93%	12.58%