SCS Project Number 1871-1

## ARCHAEOLOGICAL INVENTORY SURVEY REPORT FOR 5.0 ACRES LOCATED IN HŌLUALOA 1<sup>ST</sup> AHUPUA'A, NORTH KONA DISTRICT, HAWAI'I ISLAND, HAWAI'I [TMK: (3) 7-6-021:017 POR.]

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## AUGUST 2016 DRAFT

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## **ABSTRACT**

At the request of Kona Three, LLC, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey (AIS) of a 5.0-acre portion of land TMK: (3)-7-6-021:017 located in Hōlualoa 1<sup>st</sup> Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i. The property is owned by Kona Three, LLC. The owner's contact mailing address is 181 Kalanianaole Street Hilo, HI 96720-4703.

Prior to fieldwork, a search of geological maps, aerial photos, historical maps, historical documents, and archaeological reports was conducted. A pedestrian survey and site recording were conducted in March and April 2016 by Joe Farrugia, B.A., Suzan Escott, B.A., Tomasi Patolo, B.A., and Glenn Escott, M.A. A series of north/south transects spaced 2.0 to 4.0 meters apart were walked across the entire project area. Ground cover consisted of tall California and Guinea grass, koa haole, kiawe, and a few kukui trees. Ground visibility was fair to poor.

The project area lands were used for cattle ranching and commercial agriculture from the early 1900s until the present. The majority of the project area has been bulldozed. Evidence of bulldozing is visible in aerial photographs as alternating bands of cleared bulldozer tracks and bands of push pile. Pedestrian survey confirmed the linear bands in the aerial photographs are bulldozer-cleared paths and linear piles of bulldozed rock along the cleared bulldozer paths.

Twenty two newly identified archaeological sites were recorded during the course of the archaeological inventory survey study. The sites are primarily agricultural terraces associated with pre-Contact era to Historic era agriculture. Several rock walls and enclosures are associated with Historic era agriculture and ranching. A pre-Contact era to later post-Contact era single lava tube burial was recorded. A portion of the old railroad berm was also recorded along the eastern edge of the project area.

All of the sites were assessed as significant under criterion "d" as they are likely to yield information important to history. The burial is also significant criterion "e" as it has important value to Hawaiian people and people of other ethnic backgrounds in the state. The burial is recommended for preservation in place with preservation treatments outlined in a burial treatment plan (BTP) to be prepared for and approved by the Hawai'i Island Burial Council (HIBC) and the Hawai'i State Historic Preservation Division (SHPD).

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#### **INTRODUCTION**

At the request of East West Realty, Scientific Consultant Services, Inc. (SCS) conducted an archaeological inventory survey (AIS) of a 5.0-acre portion of TMK: (3)-7-6-021:017 located in Hōlualoa 1<sup>st</sup> Ahupua'a, North Kona District, Island of Hawai'i, Hawai'i (Figure 1 and Figure 2). The project area is bounded on the north and west by undeveloped cattle pasture, on the south by a seasonal gulch, and on the west by developed residential and farm land (Figure 3). The project area lands were used for cattle pasture and agriculture from the early 1900s to the present. The property is owned by Kona Three, LLC. The owner's mailing address is 181 Kalanianaole Street Hilo, HI 96720-4703.

#### **METHODS**

The archaeological inventory survey was undertaken in accordance with Hawai'i Administrative Rules 13§13-284 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports contained in Hawai'i Administrative Rules 13§13-276.

#### ARCHIVAL METHODS

In addition to referencing available resources at SCS, archival research was conducted in the State Historic Preservation Division (SHPD) report database and library facility (Hilo, HI), the Hawai'i County land records office, the *Waihona 'Aina Mahele* database website, Ulukau database website, the Papakilo database website, the Hawaiian collections holdings at the University of Hawai'i-Hilo Library, and the Hawaii State Library system. Archival work consisted of research on the history and archaeology of the project area, as well as specific searches of previous archaeological studies in and around the current project area. Historic land use data, land ownership, maps, and narrative information were obtained from the Hawai'i County land records office, Hawaiian internet sites, and the University of Hawai'i, Hilo.

#### FIELD METHODS

Inventory survey field work was conducted March and April 2012 (120 Manhours total) by Joe Farrugia, B.A.; Tomasi Patolo, B.A.; Suzan Escott, B.A.; and Glenn Escott, M.A. Glenn Escott provided overall project direction and is the principle investigator for this study.



**Figure 1:** 5,500 K-Series Map of Hawai'i Showing Location of Project Area (National Geographic Topo!, 2003. Data Sources: National Geographic Society, USGS).



**Figure 2:** 7.5-Minute Series USGS Topographic Map Showing Location of Project Area (Kailua Quad, ESRI, 2013. Data Sources: National Geographic Society, USGS).



**Figure 3:** Aerial Photograph of Project Area a, Hōlualoa, HI, Zone 5 North, 189445 m E, 2171790 m N. (Google Earth, 2013 Image. Data Sources: Digital Globe, GeoEye, Earthstar, USDA, and USGS).

There were three main field components to the Inventory Survey process: pedestrian survey of the entire project area; plotting located sites on a project area map with Global Position System (GPS) Universal Transverse Mercator (UTM) units (Zone 5 North) using WSGS84 datum; and individual site mapping and recording. A series of north/south transects spaced 2.0 to 4.0 meters apart were walked across the entire project area. Ground cover consisted of tall California and Guinea grass, koa haole, kiawe, and a few kukui trees. Ground visibility was fair to poor. Color photographs were taken with a 3.2 mega-pixel digital camera using a 25 cm long north arrow scale divided into 10 cm black and white increments.

Site boundaries were determined by the aerial extent of features and by feature function and temporal association. Features that were in close proximity to each other and that appeared to have functional and temporal associations suggesting they were constructed and used as a functional set of features--those features were included together as a single site. Features that were beyond twenty to thirty meters away from each other, or that were constructed at very different times, or for different very purposes, were separated into individual sites.

Features at the vast majority of sites were selected for test excavation to determine site function, construction method, and temporal association. Three types of hand excavation were utilized depending on the size of features and desired percentage to be excavated, desired percentage of screening, and overall goals of excavation: Test Units (TU), Stratigraphic Trenches (ST), and Shovel Probes (SP).

A total of eighty-six shovel probes, eleven stratigraphic trenches, and eleven testunits were excavated at twenty-six features of eleven individual sites. Thirty-eight shovel probes, two stratigraphic trenches, and four test-units were excavated at seven features at Site 29244. One test-unit was excavated at Site 29247. Twenty-two shovel probes and two test-units were excavated at Site 29248. Seven shovel probes and a stratigraphic trench were excavated at Site 29249. Two test-units were excavated at Site 29252. Twelve shovel probes and two test-units were excavated at Site 29254. Three stratigraphic trenches were excavated at Site 29257. Seven shovel probes were excavated at Site 29260. Five stratigraphic trenches were excavated at Site 29261.

Test-units were excavated as  $0.5 \ge 0.5 \ge 0.5 \ge 1.0$  meter, or  $1.0 \ge 1.0$  meter units, dug in both natural and arbitrary 10 centimeter levels. These were excavated at features that were thought to have a high potential to yield functional and temporal diagnostic artifacts, and used where vertical control would contribute to this data. Shovel probes (SP) were units that were roughly 0.4 x 0.4 meters square, and were used to examine stratigraphy, and assess the presence or absence of cultural deposits. Test-unit and shovel probe excavations were screened for cultural material through 1/8<sup>th</sup> inch mesh. Stratigraphic profiles were drawn for test-units. Stratigraphic trenches were larger units excavated through features to document feature construction. Matrix removed from stratigraphic trenches was visually inspected for the presence of artifacts and was not screened. Profiles were drawn for all stratigraphic trenches.

Cultural material was recorded by type on standard SCS excavation forms and collected. Soil colors were recorded using Munsell color charts, soil composition was recorded with the aid of the U.S. Department of Agriculture Soil Survey Manual on standard soil stratigraphy forms, and profiles were drawn. Overview photographs were taken of individual site features, sites, excavations, and the project area. Color photographs were taken with a 3.2 mega-pixel digital camera using a 20 cm long north arrow scale divided into 10 cm black and white increments.

## LABORATORY METHODS

Inventory of midden and artifacts collected from the test excavations were weighed and analyzed by layer of provenience within each excavation unit. This report contains tables containing an inventory of all artifacts collected during archaeological excavation. Volcanic-glass and basalt debitage was counted and described in terms of core, primary, secondary, interior, exterior, or non-diagnostic flakes.

For all other artifacts, dimensions, weight, count, and diagnostic characteristics were recorded. The characteristics and types of bottles and plateware recovered were recorded and used to date the items where possible. Laboratory references used to type and date bottles and plateware include Deats (1998), Goodman (1998), Hume (1972 and 1978) Rock (1981), and Toulouse (1971).

All artifact data were tabulated. Field notes, maps, cultural material, and photographs pertaining to this project are currently being curated at the SCS facilities on the Island of Hawai'i.

#### **ENVIRONMENTAL SETTING**

The current project area consists of an undeveloped 5.0-acre portion of TMK: (3) 7-6-021:016. The project area is situated on fairly steeply sloping land with level areas in between elevation breaks. The project area is between 600 to 680 feet (183 to 207 meters) above mean sea level (amsl). The project area lands are part of a large former cattle ranch and agricultural area that was started in the early 1900s. The lower portion of the project area is still used to pasture cattle. The project area and surrounding lands were bulldozed sometime between the 1940s and 1970s. Evidence of bulldozing is visible in aerial photographs as alternating bands of cleared bulldozer tracks and bands of push pile (see Figure 3). Pedestrian survey confirmed the linear bands in the aerial photographs are bulldozer-cleared paths and linear piles of bulldozed rock along the cleared bulldozer paths. The former Kona Sugar Company railroad bed is present along the western edge of the project area.

The project area ground surface is a Hualālai lava flow dating between 5,000 and 10,000 years before present (ybp) (Wolfe and Morris 1996). Soil in the project area is Punalu'u Series (rPYD series) extremely rocky peat with six to twenty percent slopes (Sato 1973:48). The majority of the project area has been bulldozed in the past and the present ground surface is rocky soil.

Rainfall in the project area is very low, less than thirty inches per year. There is a seasonal gulch along the southern edge of the project area. This region is extremely dry, hot, and somewhat barren except for thick California grass (*Urochloa mutica*), Guinea grass (*Megathyrsus maximus*), and some koa haole (*Leucaena leucocephala*), *kiawe* (*Prosopis pallida*), and *kukui* nut (*Aleurites moluccana*) trees (Starr Environmental 2016).

#### HISTORICAL AND CULTURAL CONTEXTS

Kona is divided into two sections: North Kona or *Kona 'akau*, and; South Kona, or *Kona hema* (Maly 1996). *Kona 'akau* was further subdivided into north (called *Kekaha*) and south (called *Konakai 'ōpua*) areas, with the division between the two at the *ahupua 'a* of Keahuolu. The project area is in Hōlualoa 1<sup>st</sup> Ahupua'a (Figure 4) within the area of *Konakai 'ōpua* in *Kona 'akau*. Hōlualoa means (literally) "long sled course" (Pukui *et al.* 1974:48). Hōlualoa 1<sup>st</sup> is a traditional *ahupua 'a* stretching from the ocean to the foot of Hualālai in the uplands. The coastline of Hōlualoa 1<sup>st</sup> Ahupua'a is primarily low rock cliffs.

Very little is recorded of Hōlualoa Ahupua'a in traditional oral accounts. *The Heart Stirring Legend of Ka-Miki*, published in the Hawaiian language newspaper *Ka Hoku o Hawaii* and translated by Maly (1993) contains the only description of Hōlualoa. The legend is set in the 13<sup>th</sup> century but also reflects more recent influences (Maly and Maly 2002: 17). According to the narrative,

The lands of Hōlualoa were named for the chief of that name; both Hōlualoa and Puapua'a were high chiefs, who controlled the lands from mountain to sea, which bear their names... Kaluaokalani served as a priest of Hōlualoa at the temple of Pākiha. This *heiau* was near the contest field of Hōlualoa... The lands of this region are named for various *ali'i*, all of whom were related. When the chief Hōlualoa took up the challenge against Kepaka'ili'ula on behalf of the Kona chiefs, Hōlualoa called upon his god *Kālaipāhoa* to assist him in his battle... Hōlualoa was the first chief to call upon the god *Kālaipāhoa*, and this was the beginning of this gods' use by the chiefs of Hawai'i [Maly 1993:208-209].

## **PRE-CONTACT ERA**

Hōlualoa, Kona, and much of the leeward side of Hawai'i Island, while well populated at the time of European Contact, were settled later than the windward side. Many archaeologists believe that Hawai'i Island was first settled around A.D. 1,000 by people sailing from the Marquesas (Athens et al. 2014; Dye 2011; Kahn et al. 2014; Kirch 2011; Kirch and McCoy 2007; McCoy 2005 and 2007; Mulrooney et al. 2011; Reith et al. 2011; Wilmhurst et al. 2011a and 2011b).

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**Figure 4:** Map of Hōlualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a Showing Location of Project Area in Red Border (Alexander 1855).

An article published in the Journal of Archaeological Science reviewing radiocarbon dates recovered at archaeological sites on the Island of Hawai'i suggests that, by relying on only carbon samples from short-lived plant remains, the most reliable dates point to initial Polynesian colonization of Hawai'i Island occurring between A.D. 1220 and 1261 (Rieth et al. 2011:2747).

Early settlers founded settlements on the windward shores in likely places such as Waipi'o, Waimanu, and Hilo Bay. The windward, or *ko'olau* shores receive abundant rainfall and have numerous streams such as the Wailuku, Waiolama, 'Alenaio, and Wailoa that facilitated agricultural and fishpond production (Maly 1996:3). The windward shores also provide rich benthic and pelagic marine resources.

The dry leeward shores of Hawai'i Island presented a very different environment requiring a modified set of subsistence strategies. Archaeologists and historians are uncertain about the exact motives that lead to the establishment and spread of settlements on the leeward side of Hawai'i, but some suggest population pressure, dwindling fertile land, growing socio-political stratification, or simply the opportunity for a new start might have lead to new communities developing on the dryer west side of the island (Cordy 2000:130). The process was likely underway soon after initial settlement of Hawai'i Island (Cordy 2000).

During this period, areas of permanent habitation were established in Kona (Cordy 1981, 1995; Schilt 1984). Habitation was concentrated along the shoreline and lowland slopes, and informal fields were cleared at higher elevations where rainfall was higher. Agricultural fields and habitation areas expanded across the slopes and coastal area of Hualālai during the period between AD 1200 and 1400 (Burtchard 1995; Cordy 1995).

The development of extensive formal walled fields likely began sometime around AD 1400 to 1600. This period marks the initial construction of the Kona Field System (KFS) (Schilt 1984). The development of the KFS may be, in part, a by-product of the need to extract more subsistence resources from an increasingly limited agricultural base. The population in Kona increased dramatically during this period, as reflected in the abundant radiocarbon dates from habitation structures, shelter caves, and agricultural soils of this period (Burtchard 1995; Haun *et al.* 1998; Schilt 1984). During this period, the stratified chiefdom structure becomes clearly developed in the archaeological record.

Large residential complexes and *heiau* reflect the segregation of places and power for the growing hierarchy of high and lower chiefs, and ceremonial stewards (Cordy 1981; Haun *et al.* 1998; Hommon 1986). The produce from the formal walled fields were distributed to higher chiefs through a hierarchy of lower chiefs responsible for management and collection of the cultivated and wild resources.

By the time of the Competition Period (AD 1600 to 1800), the royal centers and larger *heiau* were in place, reflecting the growth in power of the rulers and chiefs in the region (Barrera 1971; Hammatt and Folk 1980). Resources may have reached their maximum carrying capacity, resulting in social stress between neighboring groups. Hostility between groups is reflected archaeologically with the development of refuge caves during this period (Schilt 1984). This volatile period was probably accompanied by internal rebellion and territorial annexation (Hommon 1986; Kirch 1985). Royal centers are located at Kailua, Hōlualoa, Kahalu'u, Kealakekua, and Honaunau (Cordy 1995).

The region of Hōlualoa developed into a royal center in the late 1600s to early 1700s under the reigns of Keakamahana (reigned 1680-1700) and Keakealaniwahine (reigned 1700-1720) (Cordy 2000:244). Many '*ali*'i and *konohiki* residences and numerous religious sites are known to have existed here. The majority of the *heiau* and royal residences were constructed along or near the coast, most notably at Kamoa Point south of the project area. The royal center at Hōlualoa was eclipsed in the second half of the 1700s by the royal center in the Kahalu'u and Keauhou region.

#### The Kona Field System

During his travels in the region in 1823 William Ellis noted that the area above and south of Kailua was:

quite a garden compared with that through which they had passed on first leaving the town. It was generally divided into small fields, about fifteen rods square, fenced with low stone walls, made of fragments of lava which had been gathered from the surface of the enclosures. These fields were planted with bananas, sweet potatoes, mountain taro, tapa trees, melons and sugar cane, flourishing luxuriantly in every direction [Handy 1940:114 and 162]. Rocky lands in the olden days were walled up all around with big and small stones of the patch until there was a wall about 2 feet high and in the enclosure were but weeds of every kind, ama'u tree ferns and so on, and then topped well with soil taken from the patch itself to enrich it [Handy 1940:147].

These gardens have been studied in some detail, and are often referred to as the "Kona Field System". Many of the archaeological projects conducted within Kona deal with components of the Kona Field System (Cordy 1995; Newman 1970; Schilt 1984). This area extends north at least to Ka'u Ahupua'a and south to Honaunau, west from the coastline and east to the forested slopes of Hualālai (Cordy 1995). A large portion of this area is designated in the Hawai'i SIHP (State Inventory of Historic Places) as Site 50-10-37-6601. The basic characteristics and general locations of the zones within the system as presented in Newman (1970) have been confirmed and elaborated on by more intensive and extensive ethnohistorical investigations (Kelly 1983).

The *kula* zone of the Kona Field System is the area from sea level to 150 m amsl. This lower elevation zone is traditionally associated with habitation and the cultivation of sweet potatoes (*uala*), paper mulberry (*wauke*), and gourds (*ipu*). Agricultural features, such as clearing mounds, planting mounds, planting depressions, modified outcrops, and planting terraces, are common throughout much of this zone (Hammatt and Clark 1980; Hammatt and Folk 1980; Haun *et al.* 1998; Schilt 1984).

Dwellings are often scattered throughout the agricultural portion of the *kula*, but they are commonly concentrated along the shoreline subdivision of the *kula* zone (Cordy 1981). The shoreline zone, extending inland approximately 200 m, was used primarily for permanent habitation and other non-agricultural activities, such as canoe storage, ceremonial and burial practices, recreation, and fishing-related activity.

Royal centers and high chiefly centers were also situated within the shoreline of the *kula*. These complexes include dwellings for rulers, chiefs, and the supporting populace, places of refuge, and other structures. Single, or clustered, burials are also situated in the shoreline, and near-shore *kula* (Han *et al.* 1986; Hammatt and Clark 1980; Hammatt and Meeker 1979). Burials occur in caves, within finely built platforms, cruder rock mounds, and houses in the shoreline, and are more often in the near-shore *kula* (Cordy 1995; Han *et al.* 1986; Schilt 1984; Tainter 1973; Tomonari-Tuggle 1993).

The large, and densely populated, royal centers were situated at several locations along the shoreline between Kailua and Honaunau (Cordy 1995; Tomonari-Tuggle 1993). The residential areas, large and small *heiau*, sporting areas, and burial clusters, are present continuously farther inland than the usual 200 meters for the shoreline habitation portion of the *kula*. Consequently, a variety of non-agricultural features are present in the *kula* near royal centers.

The *kalu* '*ulu* zone above 150 m amsl is a wetter region above the *kula* where bread fruit and other arboreal crops were cultivated (Kelly 1983). Sweet potatoes (*Ipomoea batatas*), *ti*, (*Cordyline fruticosa*) *wauke* (*Broussonetia papyrifera*), *taro* (*Colocasia esculenta*), and sugar cane (*Saccharum* sp.), planted among the arboreal crops, were mulched with grass (Menzies:1920:75-76). The current project area is in the *kalu* '*ulu* zone.

Above the *kalu 'ulu* zone, in the *'apa 'a* zone, fields with low stone walls were cultivated with bananas, sweet potatoes, *taro*, *wauke*, melons, *ti* and sugar cane. The *'apa 'a* zone was notable for fresh water springs. Above the *'apa 'a* zone was the *'ama 'u* zone where walled fields were created to grow plantains and bananas. Timber from various tree species was collected from the *'apa 'a* zone and the *'ama 'u* zone. Bird catching and other forest resources extraction activities were conducted in these upper two zones. Temporary habitations were constructed to be used seasonally when working in the uplands.

In the region, people initially moved into coastal settings *and* more upland settings (*e.g.*, the ' $\bar{a}pa$  'a agronomic zone) at the same time, essentially ignoring the drier intermediate zone (except, of course, as a throughway between their gardens and the sea). In this way, the first settlers could immediately plant seedlings in the wetter uplands, knowing the crops would succeed. Permanent settlement would have first been restricted to the coast, but the same people would have also been occupying the uplands (at least temporarily) as well. It is only later that the 'intermediate zone', which corresponds to the upper project area at Hōkūli'a (and the *kalu'ulu* agronomic zone), would have been utilized for planting.

## **POST-CONTACT ERA**

The extensive features of the Kona Field System were exploited and altered during the post-contact era. Walls, *kua 'iwi*, springs, and pathways created generations earlier were used and planted with alien cultigens (coffee, cotton, sugar, citrus, and sisal) and ultimately used as pastures for cattle.

Ranching has its roots in the first cattle and sheep brought to the island in 1793 and 1794 by Vancouver. Two cows, three bulls, five ewes, and five rams were released to prosper in the region of Kealakekua in 1794 (Vancouver 1967:(3)11). Kamehameha placed a ten-year *kapu* on the killing of cattle so that they would have the opportunity to multiply. A 486-acre stone corral was built in the uplands of Lehu'ula-Honua'ino, above Kāināliu where they were raised (Bowser 1880, cited in Maly and Maly 2001:285).

Two American captains, William Shaler and Richard Cleveland presented two horses to John Young in 1803. Cleveland later returned with more than 200 horses brought from California. Donkeys, mules and oxen were also imported for transportation and hauling. Goats were also brought to the island and left to multiply in the wild.

By 1813 to 1815 cows began overrunning agricultural fields and became a danger to travelers and residents (Ellis 1963: 291, Wilkes 1970: 204). A number of walls were commissioned to keep feral sheep, goats, and cattle out of agricultural areas and away from homes. By 1848, in Kona District a Great Wall (the Kuakini Wall) was constructed from Lanihau to 'Ōnouli (Maly and Maly 2001:286).

In 1830 Governor Kuakini moved to oversee and improve government cattle by constructing corrals. Liholiho visited the same year to witness strides made in the nascent cattle ranching industry. It was hoped that the exportation of tallow, hides, and salted beef would supplant the defunct Sandalwood trade as a major source of income. Several ventures related to ranching, including tallow making, tanning, saddle making, and blacksmithing were initiated (Bergin 2004: 156). Cowhide was tanned using the astringent bark of local trees (Wilkes 1970: 218). The lion's share of commercial enterprises on the island involved supplying whaling ships and the local market with beef.

The changing subsistence and trade regimes developed by incoming European and American settlers, as well as other historical factors, caused a depopulation of the coastal areas of Kona. Ranches were established at middle and upper elevations, and farms were established in the uplands where rainfall was higher and the temperatures were cooler. Cattle ranching and clearing for sugar cane and coffee removed many of the endemic species of plants. The suite of vegetation that existed prior to the pre-Contact era were replaced by *koa haole (Leucaena leucocephala)*, kiawe (*Prosopis pallida*), and other newly introduced invasive plant species.

Schools, churches, stores, and other businesses were also established in the uplands. During the late 1800s and early 1900s, coastal Kona was no longer the densely populated sociopolitical center it once was. It became a small cluster of houses along the trail from Kailua Bay to Keauhou (Tomonari-Tuggle 1993:15). Homesteads, ranches, and plantations developed in the uplands during this period as reflected in the pattern of Land Commission Awards (LCA) and Land Grants (LG) recorded during the Māhele.

## THE MĀHELE

With the coming of the Great Māhele (1848), the Alien Land Ownership Act and the Kuleana Act of 1850, the traditional Hawaiian archetype of land-use was essentially deconstructed and replaced with the European concept of fee-simple land ownership. Article IV of the Board of Commissioners to Quiet Land Titles was passed in December 1845 and began the legal process of private land ownership. Through the Māhele of 1847-48 and the Kuleana Act of 1850, land was made available for private ownership.

The Māhele established a board of five commissioners to oversee land claims and to issue patents and leases for valid claims. Many scholars believe that Kauikeaouli (Kamehameha III) was forced to establish laws in order to protect Hawaiian sovereignty and crown lands from foreigners who had already begun claiming ownership of land they were granted permission to use for homes and business interests (Daws 1968:111; Kame'eleihiwa 1992: 169-70, 176; Kelly 1983: 45; Kuykendall 1938(1): 145 footnote 47, 152, 165-6, 170;). Among other things, the foreigners were demanding private ownership of land to secure their island investments (Kame'eleihiwa 1992: 178; Kuykendall 1938(1): 138, 145, 178, 184, 202, 206, 271).

As legal statutes defining the Māhele continued to evolve (up to 1850), the lands of the kingdom of Hawai'i were divided among the king (crown lands), the *ali'i* and *konohiki*, and the government. Once lands were thus divided and private ownership was instituted, the *maka'āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living as stipulated in the Kuleana Act (1850). These claims, however, could not include any previously cultivated or presently fallow land, *okipu'u*, stream fisheries, or many other resources traditionally necessary for survival (Kame'eleihiwa 1992:295; Kelly 1983:45-76; Kirch and Sahlins 1992 vol.1:3, 135-137, and vol.2:2).

The right of claimants to land was based on the written testimony of at least two witnesses who could corroborate the claimant's long-standing occupation and use of the parcel(s) in question. The claimant might have been awarded a patent for the property, subsequently called Land Commission Awards (LCAs) (Chinen 1961:16).

The Land Commission awarded the majority of Hōlualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a to Victoria Kamāmalu Ka'ahumani IV, *Kahina Nui* of Hawai'i Island and Crown Princess of Hawai'i as Land Commission Award (LCA) Number 7713, 'Apana 43 (Figure 5). Several smaller LCA and LG properties were also recorded in the upland region of Hōlualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a (Figure 6). Twenty four Land Commission awards were recorded in Hōlualoa 1<sup>st</sup> Ahupua'a, the ahupua'a where the project area is located (see Figure 6 and Table 1).

All but two of the LC awards (LCA #3660to Munn and LCA #7713 to Kamāmalu) were *mauka* (east) of the current project area. Except for these two LC awards, the average award was 2.8 acres, most (n=16) were for less than 3.0 acres. Three Land Grants (LG #1592, 1602, and 3630) were also recorded in Hōlualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a. LG #1592 was a 25.0-acre parcel sold to Kealalio and LG #3630 was a 38.2-acre parcel sold to W.H. Cromwell. Almost all of the awards and grants were used as subsistence and commercial farm land, and some were used to pasture cattle.



Figure 5: Portion of Kailua Section, North Kona Map Showing Location of LCA 7713 and Project Area in Red Border (Aki 1952).



**Figure 6:** 7.5-Minute Series USGS Topographic Map Showing Location of Land Commission Awards, Land Grants, and the Project Area (National Geographic Topo!, 2003, Kailua Quad. Data Sources: National Geographic Society, USGS).

LCA#	AWARDED TO	AHUPUA'A	ACRES
3660	John G. Munn	Hōlualoa 1 <sup>st</sup>	111.5
4395	Kekoi	Hōlualoa 1 <sup>st</sup>	1.7
5552	Kauila	Hōlualoa 1 <sup>st</sup>	1.9
5554	Keawekolohe	Hōlualoa 1 <sup>st</sup>	11.27
5795	Keliikanakaole	Hōlualoa 2 <sup>nd</sup>	2.2
5810	Kaopukauila	Hōlualoa 1 <sup>st</sup>	1.74
5993	Leipalapala	Hōlualoa 2 <sup>nd</sup>	2.0
6063	Hāna	Hōlualoa 1 <sup>st</sup>	2.9
6107	Naai	Hōlualoa 1 <sup>st</sup>	3.94
7339	Kuaana	Hōlualoa 1 <sup>st</sup>	4.15
7340	Kama 2	Hōlualoa 1 <sup>st</sup>	2.5
7340:B	Kama 1	Hōlualoa 1 <sup>st</sup>	1.3
7443	Kalimapaa	Hōlualoa 1 <sup>st</sup>	1.94
7713	Kamamalu	Hōlualoa 1 <sup>st</sup> &	Large
	Txumumuru	Hōlualoa 2 <sup>na</sup>	Large
7746	Kamahalo	Hōlualoa 1 <sup>st</sup>	5.0
7794	Kauakini	Hōlualoa 1 <sup>st</sup>	1.8
7990	Pupuka	Hōlualoa 1 <sup>st</sup>	1.1
8015	Aipo	Hōlualoa 2 <sup>nd</sup>	1.4
8151	Hehena	Hōlualoa 1 <sup>st</sup>	2.3
8223	Ikaiaka	Hōlualoa 1 <sup>st</sup>	3.5
9915	Limahana	Hōlualoa 1 <sup>st</sup>	2.42
9932	Lumaawe	Hōlualoa 1 <sup>st</sup>	2.98
10770	Puuone	Hōlualoa 1 <sup>st</sup>	3.06
10400	Naaimakaohi	Hōlualoa 1 <sup>st</sup> & Hōlualoa 2 <sup>nd</sup>	3.5

**Table 1:** Land Commission Awards Recorded in Holualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a.

#### HISTORIC ERA

Formal cattle ranching began in the Kona region in the mid-1800s, but wild cattle may have been in the area as early as the late 1700s. The  $p\bar{a}$  ' $\bar{a}ina$  ('walls of the land'), native tenants' wall enclosures, were prevalent in the area, as indicated by their inclusion in many local Māhele testimonies. These were used to mark the boundary of properties and to keep livestock out of crop areas (Kuykendall 1957:318 note 76). Later, cattle ranchers built walls to control their cattle.

In the early 1840s, cattle were said to be "maintained on the *kula*," a mile from the coast where the ground was "covered with herbage" (Wilkes 1845:4, 95). Cattle, introduced to Kona by Vancouver in 1794, became a nuisance later, when their numbers increased. They fed on the grass of the kula and from time to time on the thatch of Hawaiians' homes and on vegetables in their gardens. The open upland fields, bounded only by low earth and stone walls, were in full cultivation in the 1850s [Kelly 1983:76].

Ranchers leased land below the railroad to graze cattle that they owned (Kelly 1983:111). Higher walls were built in the 1920s and 1930s to control animals. According to Joe Gomes, a longtime rancher in the area,

Walls about 3 ft high can keep donkeys penned. The usual wall is about 4 <sup>1</sup>/<sub>2</sub> ft high and keeps cattle in. For goats you need a wall 6 to 8 ft high. For wild pigs you need a 6 to 8 ft-high wall. They climb over lower walls easily. They come down from the mountains for macadamia nuts and also in mango season for mangoes [Kelly 1983:112].

Sugar was a major crop in Hawai'i as early as signing of the Reciprocity Treaty in 1876 (Kelly 1983:90). The sugar industry grew rapidly, and by 1899 the only sugar mill in the Kona area was built by the Kona Sugar Company. Many Chinese worked on the sugar plantations (Kelly 1983:111). They built a railroad in 1901 to haul cane from the fields to their mill site along the Wai'aha stream, north of the current project area. The stream did not provide enough water to mill cane year round and company failed in 1903. The Kona Sugar Company was bought by James Castel in 1906 and was later purchased by Japanese investors. The Kona Sugar Company continued to operate until 1926.

The railroad was bought by Kona Development Company, and was used for freight, sugarcane and by the Hawaiian Lumber Company. Sugar was grown above the railroad line. The cut sugar was delivered to the tracks with the assistance of gravity by wire cables and flumes. The rail line was seven miles long and extended from Hōlualoa to Keōpuka (Figure 7).

Cotton was grown on lands below the railroad tracks (Kelly 1983:111). Cotton gins were located south of the project area. Cotton was being picked as late as the 1930s. Other plants grown below the tracks in the dryer lands were sisal and tobacco (Kelly 1983:112).

Traditional Hawaiian subsistence practices, including the rights to collect resources from all ecological zones of one's *ahupua* '*a*, were challenged, restricted, or prevented. As private land owners considered their property off limits to others, cultivation and collection of resources on private land diminished. Individual Hawaiian cultural beliefs, specialized knowledge, and practices associated with the use of the different ecological resource zones also diminished. The development of cattle ranching and commercial crops, such as sugar cane and coffee, removed traditional cultigens and resources from large swaths of the lands of Kona.

The changing subsistence and trade regimes developed by incoming European and American settlers, as well as other historical factors, caused a depopulation of the coastal areas of Kona. Ranches were established at lower elevations and farms were established in the uplands where rainfall was higher and the temperatures were cooler. Schools, churches, stores, and other businesses were also established in the uplands. During the late 1800s and early 1900s, Hōlualoa was no longer the densely populated sociopolitical center it once was. The coastal area of Hōlualoa had become a small cluster of houses along the trail from Kailua Bay to Keauhou.

The project area is just *makai* (west) of the majority of land commission awards and is at the same elevation as portions of the land grants in the region. Based on historic documents, the project area and surrounding lands were likely being used for subsistence and commercial agriculture, as well as for cattle pasture from the mid to late 1800s. The project area might have been used later than surrounding lands because of its steep slopes and very rocky soil, but based on aerial photographs, the project area was bulldozed sometime around the 1950s in preparation for commercial agriculture.



**Figure 7:** Portion of 15-Minute Series USGS Topographic Map Showing Location of Railroad and Project Area (USGS 1928).

## PREVIOUS ARCHAEOLOGICAL STUDIES

There are at least 33 previous archaeological reports for lands near the current project area, including studies in Puapua'a  $2^{nd}$  and Hōlualoa  $1^{st}$ ,  $2^{nd}$ , and  $3^{rd}$  Ahupua'a (Table 2 and Figure 8). The studies were conducted from the coast to roughly 1,460 ft amsl and encompass the *kula* region (0-500 ft), the *kalu'ulu* region (500-1,000 ft), and the lower portions of the '*āpa'a* region (1,000-2,500 ft). Results of the previous archaeological studies are summarized below by elevation: studies numbered 1through 15 in Table 2 and Figure 8 are situated from the coast to Queen Ka'ahumanu Highway (0-360 ft amsl), studies 16 through 21 are located from above the Queen Ka'ahumanu Highway to just below Hualālai Road (306-760 ft amsl), and studies 22 through 24 are above Hualālai Road to just above Māmalahoa Highway (1,100-1,460 ft amsl).

Project Number (Figure 8)	Reference	Type of Study	Area in Acres	Results
1	Landrum et al. 1990	Archaeological Inventory Survey	N/A	46 Sites
1	Calis et al. 2004	Archaeological Data Recovery	N/A	10 Sites
2	Carlson & Rosendahl 1990	Archaeological Inventory Survey	65	64 Sites
3	Haun et al. 1998	Archaeological Inventory Survey	15	31 Sites
4	Hammatt & Folk 1981	Archaeological Survey	20	20 Sites
4	Hammatt et al. 1986	Archaeological Survey & Excavations	20	21 Sites
5	Haun & Henry 2001	Archaeological Data Recovery	1.59	1 Site
6	Escott 2013	Archaeological Inventory Survey	1.962	2 Sites
7	Sinoto 1979	Archaeological Reconnaissance Survey	6	Rock Walls
8	Hammatt 1979b	Archaeological Survey	22	3 Sites
9	Hammatt 1979c	Archaeological Survey	23	39 Sites
10	Conolly & Gunness 1979	Archaeological Reconnaissance Survey	46.8	80 Sites
10	Hammatt 1979a	Archaeological Inventory Survey	46.8	11 Sites
10	Hammatt 1980	Archaeological Survey & Excavation	103	88 Sites
11	Nelson et al. 205	Archaeological Inventory Survey	28	22 Sites
12	Rosendhal 1978	Archaeological Reconnaissance Survey	2.5	1 Site
12	Soehren 1980a	Archaeological	n/a	7 Sites

**Table 2:** Inventory of Previous Archaeological Investigations.

Project Number (Figure 8)	Reference	Type of Study	Area in Acres	Results
		Reconnaissance Survey		
12	Wolforth et al. 2000	Archaeological Inventory Survey	8	7 Sites
13	Barrera 1995	Archaeological Reconnaissance Survey	17	3 + several ag. mounds
13	Haun & Henry 2000	Archaeological Inventory Survey	17	12 (104 Features, 82 of Which Were Agricultural)
14	Rosendahl 1989	Archaeological Field Inspection	6	Modified Outcrops
15	Schilt 1984	Archaeological Study	17	134 Sites
16	Walker & Rosendahl 1988	Archaeological Reconnaissance Survey	104	67 Sites
16	Graves & Goodfellow 1993	Archaeological Data Recovery	104	58 Sites
16	Maly & Rosendahl 2006	Archaeological Preservation Plan	104	67 Sites
17	Hammatt et al. 1992	Archaeological Survey	174	71 Sites
18	Soehren 1980b	Archaeological Reconnaissance Survey	16	1 Site
19	Rechtman 2006	Archaeological Inventory Survey	1.008	2 Sites
20	Rosendahl 1988	Archaeological Reconnaissance Survey	17	17 Sites
20	Fager & Graves 1993	Archaeological Inventory Survey	17	17 Sites
21	Dircks et al. 2013	Archaeological Inventory Survey	10.266	1 Site (149 Historic to Modern Farming Features)
22	Desilets et al. 2004	Archaeological Inventory Survey	11.7	1 Homestead Features
23	Rechtman 2013		29	24 Sites
24	Clark & Rechtman 2006	Archaeological Inventory Survey	2.7	6 Historic Era Sites



**Figure 8:** 7.5-Minute Series USGS Topographic Map Showing Location of Previous Archaeological Studies and Project Area (Kailua Quad, ESRI, 2013. Data Sources: National Geographic Society, USGS).

## **REGIONAL PREVIOUS ARCHAEOLOGICAL STUDIES**

**1. Landrum et al. 1990, and Calis et al. 2004.** PHRI, Inc. conducted an archaeological inventory survey (Landrum et al. 1990) and SCS, Inc. conducted data recovery investigations (Calis et al. 2004) at the Kahakai development project. The project area is located within the lower elevations of Puapua'a 2<sup>nd</sup> Ahupua'a. Pre-Contact era to early post-Contact era cave shelters, agricultural rock clearing mounds, burials, shrines, and a possible heiau were identified during the AIS study. A heiau complex, several burials, and five permanent habitation sites were recommended for preservation. All of the preservation sites are near the coast.

**2. Carleson and Rosendahl 1990.** PHRI, Inc. conducted an archaeological inventory survey of 65 acres between Kuakini and Queen Ka'ahumanu highways in Puapua'a 2<sup>nd</sup> Ahupua'a. Their study recorded 64 archaeological sites including pre-Contact era habitation, agricultural, and burial sites. Seven sites were assessed as significant and recommended for preservation (Carleson and Rosendahl 1990: 34).

**3. Haun et al. 1998**. PHRI, Inc. conducted an archaeological inventory survey of the proposed Ali'i Drive corridor through several ahupua'a. Numerous pre-Contact era site complexes were recorded in Puapua'a 2<sup>nd</sup> and Hōlualoa 1<sup>st</sup> through 4<sup>th</sup> Ahupua'a. The site complexes included a large number of agricultural features, as well as habitation, burial, and ceremonial features.

**4. Hammatt and Folk 1981, and Hammat et al. 1986.** Two archaeological surveys were conducted on a 20-acre parcel of below Kuakini Highway. The first study recorded 20 sites, and the second recorded 21 sites. None of the sites were recommended for preservation (Hammatt and Folk 1981: ii, and Hammatt et al. 1986: 87). The report also recommended that the one documented burial be relocated.

**5. Haun & Henry 2001.** Haun and Associates conducted an archaeological data recovery study at a c-shape enclosure located on 1.59 acres of land below Queen Ka'ahumanu Highway

**6.** Escott 2013. SCS conducted an archaeological study on1.962 acres of land near the intersection of Kuakini and Queen Ka'ahumanu highways. Two historic era ranch walls were recorded during the study.

**7.** Sinoto 1979. Aki Sinoto recorded several Historic era ranch rock walls on a six acre parcel of land just mauka of Ali<sup>•</sup>i Drive.

**8. Hammatt 1979b.** The Archaeological Research Center, Inc. conducted an archaeological survey of 22 acres just south of Kuakini Highway. Three archaeological sites were recorded during the study. None of the sites were recommended for preservation (Hammatt 1979b: ii, and 10).

**9. Hammatt 1979c.** The Archaeological Research Center, Inc. conducted an archaeological survey of 23 acres located in the near coastal portion of Hōualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a. Thirty nine archaeological sites were recorded during the study. The report recommended that all burials, including a known cemetery site be relocated elsewhere (Hammatt 1979a: 5). None of the remaining sites (pre-Contact era habitation and agriculture sites) were recommended for preservation in place.

**10.** Conolly and Gunness 1979, and Hammatt 1979a and 1980. The Archaeological Research Center, Inc. conducted an archaeological survey of 103 acres within the near coastal portions of Hōlualoa 1<sup>st</sup> through 4<sup>th</sup> Ahupua'a (Hammatt 1980). One hundred and thirty six archaeological sites were recorded on the project area. Sites recorded included pre-Contact era habitation, agriculture, a burial, and a ceremonial site. The Hammatt report recommended that a heiau (Site 6661) was significant and should be preserved in place (Hammatt 1980: 4). The report also recommended that the one documented burial be relocated to the perimeter of heiau (Site 6661) and be preserved. No other sites were recommended for preservation.

**11. Nelson et al. 2005.** An archaeological inventory survey was conducted by Rechtman Consulting on 28.0 acres located in the near coastal portion of Hōlualoa 2<sup>nd</sup> Ahupua'a. A total of 22 sites containing 150 features were recorded. The sites were primarily pre-Contact era agricultural and habitation sites, though five burial sites, a possible heiau, and a trail were also documented on the project area.

**12. Rosendahl 1978, Soehren 1980a, Wolforth et al. 2000**. PHRI conducted an archaeological inventory survey of eight acres of coastal Hōlualoa 3<sup>rd</sup> Ahupua'a and recorded seven archaeological sites including three Historic era rock walls, three residential sites, and Hikapaia Heiau.

**13. Barrera 1995, Haun & Henry 2000**. Barrera (1995) recorded a possible burial platform, two habitation site, and agricultural rock clearing mounds and modified outcrops during a reconnaissance survey of 17 acres in near coastal Hōlualoa  $2^{nd}$  Ahupua'a. Haun and Associates conducted an archaeological inventory survey of the property and recorded 12 sites with 104 features (Haun and Henry 2000:14). The majority of features (n=82) were pre-Contact era agricultural rock clearing mounds. Eleven permanent habitation and on one temporary habitation feature were also recorded during the study.

**14. Rosendahl 1989.** PHRI conducted an archaeological field inspection of 6.0 acres of land just below Queen Ka'ahumanu Highway in Hōlualoa 2<sup>nd</sup> Ahupua'a. Several modified outcrops were recorded in the letter report. There were no other archaeological features identified on the project area.

**15.** Schilt 1984. The Bishop Museum conducted an archaeological study of the Kuakini Highway Realignment Project located roughly along present day Queen Ka'ahumanu Highway and recorded 39 sites Puapua'a 2<sup>nd</sup> and Hōlualoa 1<sup>st</sup> and 2<sup>nd</sup> Ahupua'a. Twenty two of the sites were pre-Contact to early post-Contact era agricultural gardens and modified outcrops (rock clearing). There were also traditional habitation platforms and trails, as well as Historic era roads and walls recorded during the study.

## 16. Walker and Rosendahl 1988, Graves and Goodfellow 1993, and Maly and

**Rosendahl 2006**. An archaeological reconnaissance survey (Walker and Rosendahl 1988), an archaeological data recovery study (Graves and Goodfellow 1993), and an archaeological preservation plan (Maly and Rosendahl 2006) were conducted by PHRI, Inc. for 104 acres in the upland region of Puapua'a  $2^{nd}$  Ahupua'a. A total of 67 sites were documented within the project area, including traditional KFS sites, temporary habitation sites, three burials, and a *heiau*. The archaeological preservation plan recommended that the three burials be relocated to the *heiau* site, and that the *heiau* be preserved as a formal historic preservation area (Maly and Rosendahl 2006).

**17. Hammatt et al. 1992.** An archaeological survey was conducted by Cultural Surveys Hawai'i on 174 acres of land in the upland region of Hōlualoa 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> Ahupua'a. The project area lands had been heavily bulldozed during the modern era for ranching and agricultural purposes. Despite the bulldozing, seventy one sites were recorded during the study, including temporary habitation features, rock walls, agricultural features, and

three burial sites. Many of the sites were determined to be associated Historic era ranching and agriculture.

18. Soehren 1980b. Soehren conducted an archaeological reconnaissance survey of
 16.0 acres above Queen Ka'ahumanu Highway in the inland region of Hōlualoa 1<sup>st</sup>
 Ahupua'a (Soehren 1980b). A single enclosure was identified during the survey.

**19. Rechtman 2006**. An archaeological inventory survey was conducted by Rechtman Consulting, LLC on a roughly one-acre parcel located *makai* of Queen Ka'ahumanu Highway in Hōlualoa 2<sup>nd</sup> Ahupua'a. Two rock walls were recorded on the project area. The report recommended no further work at the two rock wall sites.

20. **M. Rosendahl 1988, Fager & Graves 1993**. Fager and Graves (1993) conducted an archaeological inventory survey of 17.0 acres just mauka of Queen Ka'ahumanu Highway in Hōlualoa 3<sup>rd</sup> Ahupua'a. Seventeen sites containing 27 pre-Contact to early post-Contact era agricultural features, including rock mounds, modified outcrops, C-shape enclosures, terraces, walls, and rock enclosures, were recorded.

**21. Dircks et al. 2013.** Rechtman Consulting conducted an archaeological inventory survey of 10.266 acres of land located between 840 and 920 ft amsl in Hōlualoa  $1^{st}$  and  $2^{nd}$  Ahupua'a. One Historic era to modern era homestead/agriculture site (Miyose Farm) containing 149 features was recorded during the survey.

**22.** Desilets et al. 2004. Desilets et al. (2004) conducted an archaeological inventory survey of 11.7 acres of land in the ' $\bar{a}pa$  'a region of Hōlualoa 1<sup>st</sup> Ahupua'a. A single site associated with Historic era and modern era homesteads, commercial agriculture (coffee), and ranching was recorded. Features included rock walls, roads, coffee terraces, and buildings.

**23. Rechtman 2013**. Rechtman Consulting conducted and archaeological inventory survey of 29 acres of land located in the ' $\bar{a}pa$  'a region of Hōlualoa 1<sup>st</sup> Ahupua'a. Twenty four sites were recorded. The majority of the sites were associated with Historic era and modern era homesteads, commercial agriculture. Features included rock walls, roads, and remnants of structures. A single pre-Contact era to early post-Contact era residential and agricultural site was also recorded.

**24. Clark & Rechtman 2006**. Rechtman Consulting conducted an archaeological inventory survey of 2.7 acres of land located in the ' $\bar{a}pa$ 'a region of Hōlualoa 1<sup>st</sup> Ahupua'a. Six sites were recorded, including five ranch walls and an area of coffee terraces.

A number of conclusions can be made from the previous archaeological studies. A primary conclusion is that the majority of habitation features, especially permanent habitation features, are located from the coast to about 360 ft amsl, below the present day Queen Ka'ahumanu Highway. The same is true of ceremonial features, burials, and, to a lesser extent, agricultural features. The density of agricultural features and habitation features, mostly temporary habitation features, in the upland regions between 360 ft amsl and 700 ft amsl is much lower than the site density in the coastal *kula* and lower *kalu'ulu* regions of the KFS. The pre-Contact traditional Hawaiian settlement and agricultural patterns are strongly oriented to the *kula* and lower *kalu'ulu* regions.

Even though cattle ranching and commercial agriculture may have removed some archaeological sites from the ground surface in the *kalu 'ulu* region, there appear to be fewer sites than at lower elevations. The majority of sites in the *kalu 'ulu* region are KFS agricultural sites including rock clearing mounds, modified outcrops, garden enclosures, and low garden walls. Within the lands of the current project, it is clear that ranching and commercial agricultural practices have removed and damaged many of the pre-Contact era sites from the ground surface (see the Hammatt et al. 1992 summary below). Moreover, many of the sites identified near the current project area are associated with Historic era ranching and commercial agriculture.

A second conclusion is that the establishment of Historic era homesteads, ranches, and commercial agriculture seems to have removed, or obscured, the majority of pre-Contact era sites in the upper *kalu 'ulu* and lower ' $\bar{a}pa$ 'a regions. It might be that pre-Contact uses in these regions did not involve the construction of large or permanent features, as in the lower regions of Kona. It is also likely that Historic era ranching and commercial agriculture in the lower ' $\bar{a}pa$ 'a region have caused large scale land alterations through the use of bulldozers for pasture and garden. It is possible that traditional features were disassembled to build rock walls and coffee terraces.
## **CURRENT PROJECT AREA SPECIFIC PREVIOUS ARCHAEOLOGY**

Lands of the current AIS study are most closely related to sites identified in the northern portion of the archaeological study conducted by Hammatt et al. (1992). The northern portion of that study encompassed 66.039 acres of land located between 320 to 690 feet (98 to 210 meters) amsl [TMK: (3) 7-6-021:016 and 017] (Figure 9). The current project area is located at the southeastern corner of the northern portion of the Hammatt et al. (1992) project area. In August of 2016, SCS conducted an archaeological sites inspection (Escott 2016) of the 20 previously recorded archaeological sites and the remains of two modern agricultural areas (Table 3) identified in the northern portion of the Hammatt et al. (1992) project area.

The project area and surrounding lands were bulldozed sometime between the 1940s and 1970s. Evidence of bulldozing is visible in aerial photographs as alternating bands of cleared bulldozer tracks and bands of push pile. Pedestrian survey confirmed the linear bands in the aerial photographs are bulldozer-cleared paths and linear piles of bulldozed rock along the cleared bulldozer paths.

Seven of the 20 archaeological sites (SIHP #10015, 10017, 10018, 10020, 10033, 10034, and 10049) were recorded by CSH in tabular format only (Table 2). These are sites identified during the pedestrian survey that were determined to be associated with modern clearing and agricultural activities, or were natural geological features, and no written description or plan maps were generated. Written descriptions of the remaining 13 sites are in the CSH AIS report. Excavations were conducted at ten of the 13 sites. There are plan view figures for four of the 13 sites.

## SIHP #10011 (CSH Site 9)

Site 10011 is a rectangular platform on slightly sloping bulldozed pasture land. As described by CSH, the feature has formal construction elements suggesting possible use other than agricultural rock clearing, including larger rocks (small boulders) forming an outer perimeter with smaller rocs (cobbles) forming the interior top surface. The outer perimeter is stacked one to two courses high and is roughly faced along the south side. The top surface of the platform is a slightly uneven and level rock paving.



**Figure 9:** 7.5-Minute Series USGS Topographic Map Showing Location of Northern Portion of Hammatt et al. (1992) Sites and Current Project Area (ESRI, 2011. Sources: National Geographic Society, USGS. Kealakekua Quadrangle).

SIHP#	CSH Site#	Туре	Function	Age	Excavation	Level of AIS Recording	Site Assessment
10011	9	Platform	Ag. Clearing	Prehistoric	Tested	Description	AIS Site Description Correct
10012	10	Platform & Wall	Burial	Prehistoric	Excavated	Description, Planview, & Profiles	AIS Site Description Correct
10013	11	Enclosure & Lava Tube	Habitation	Prehistoric	Excavated	Description & Planview	AIS Site Description Correct
10015	13	Terrace	Road Bed	Historic	No	Tabular	AIS Site Description Correct
10017	15	Platform	Cattle Ramp	Historic	No	Tabular	Bulldozed – No Longer Present
10018	16	Enclosure	Agricultural	Historic	No	Tabular	Natural Bedrock Outcrop
10019	17	6 Rock Mounds	Ag. Clearing	Historic	Tested	Description	AIS Site Description Correct
10020	18	Platform	Ag. Clearing	Historic	No	Tabular	Natural Bedrock Outcrop
10033	112	Planting Complex	Coffee Ag	Historic	No	Tabular	Bulldozed – No Longer Present
10034	113	Platform	Ag. Clearing	Historic	No	Tabular	AIS Site Description Correct
10049	216	Terraces	Agriculture	Historic	No	Tabular	Bulldozed – No Longer Present
10067	232	Terraces	Habitation	Prehistoric	Tested	Description	AIS Site Description Correct
10068	233	Enclosure	Habitation	Prehistoric	Tested	Description & Planview	AIS Site Description Correct
10069	234	Modified Bluff/Platform	Habitation	Historic	Tested	Description	AIS Site Description Correct
10070	235	U-Shape Enclosure	Agriculture	Historic	Tested	Description	AIS Site Description Correct
10071	237	Platform	Habitation	Prehistoric	No	Description	Relocated - Bulldozed
10072	238	Modified Bluff	Ag. Clearing	Historic	Tested	Description	AIS Site Description Likely Correct
10073	239	Platforms	Ranching/Ag.	Historic	No	Description	Relocated - Bulldozed
10074	240	Enclosure	Coffee Work Shed	Historic	Tested	Description	AIS Site Description Likely Correct
10075	241	Enclosure	Pig Pen	Historic	No	Description, Planview, & Profile	AIS Site Description Likely Correct
		Historic Planting Terraces	Agriculture	Modern	No	On Project Map	AIS Site Description Likely Correct
		Bluff Terraces	Agriculture	Modern	No	On Project Map	AIS Description Correct

**Table 3:** Inventory of Hammatt et al. (1992) Archaeological Sites Inspection and Assessment Results.

CSH excavated a 1.5 m wide trench through the platform and recovered three cowrie shells, suggesting the platform is a rock clearing mound. The location of the trench within the feature, the length of the trench, and the methods used to recover cultural material are not described in the CSH AIS. While the form, construction method, location of the feature suggest it is a temporary habitation feature or a feature used for activities associated with agriculture, the small amount of cultural material recovered from subsurface excavation suggest it is a rock clearing mound. The platform appears to be unaltered and is in good condition.

#### SIHP #10012 (CSH Site 10)

Site 10012 is a rectangular burial platform (mound) and rock wall segment on slightly sloping bulldozed pasture land. The platform was excavated by CSH and the *iwi* were reinterred at Pu'uhonua o Hōnaunau National Historic Park (NHP). The platform has been bulldozed and only the base of the feature remains. SCS excavated a 1.0 m by 1.0 m test-unit in the center of the feature during the sites inspection and assessment work (Escott 2016) to determine the presence or absence of *iwi*. The test-unit was excavated to bedrock and all material was screened through 1/8<sup>th</sup> inch mesh screen. There were no *iwi* fragments and no other cultural material recovered from the excavation. The platform has been bulldozed and is in poor condition.

The L-shape rock wall segment was located approximately 95.0 meters southwest of the burial platform. It is roughly 23.0 m long (NE/SW) by 1.0 m wide and between 0.5 and 0.9 m in height. The wall is constructed of angular and subangular cobbles and small boulders. It is cobble core filled and bi-faced. The wall is partially collapsed in places and is in good condition.

## SIHP #10013 (CSH Site 11)

Site 10013 is a roughly square habitation enclosure and a small modified lava tube. The enclosure appears to have been partially bulldozed after the CSH AIS fieldwork was completed, as the wall heights are much lower than those described in the AIS report. Rocks from the bulldozed walls are piled along the edges of the enclosure. The base of the enclosure walls is still evident on the ground surface. The CSH AIS lava tube description was assessed to be correct. The interior of the short lava tube is not modified. Site 10013 has been altered by bulldozing and is in fair to poor condition.

#### <u>SIHP #10015 (CSH Site 13)</u>

Site 10015 is a modern dirt road bed.

## SIHP #10017 (CSH Site 15)

Site 10017 is described in the CSH pedestrian survey summary table as a cattle loading ramp. The area where Site 10017 was plotted on the project map is an area of bulldozed pasture with numerous large bulldozer push piles. CSH determined through consultation with SHPD and Hawai'i County Planning that the feature did not warrant a written description in the CSH AIS report. It is possible that the feature was determined to be a bulldozer pile after CSH first identified it, or it might have been bulldozed later. The possible cattle loading ramp (Site 10017) appears to have been bulldozed or was originally a bulldozer push pile.

## SIHP #10018 (CSH Site 16)

Site 10018 is described in the CSH pedestrian survey summary table as an enclosure. The area where Site 10018 was plotted on the project map is an area of natural bedrock outcrop surrounding a large tamarind tree. The bare bedrock outcrop encloses a roughly level area of soil. There are no modifications to the outcrop. CSH did not include a site description or map of the enclosure in the AIS report, likely because it was determined to be natural. There are not other archaeological features in the area around the bedrock outcrop. A final possibility is that the Site 10018 feature was bulldozed after the CSH AIS work was completed.

## SIHP #10019 (CSH Site 17)

Site 10019 is six rock clearing mounds located along the southeast edge of a seasonal gulch. The presence of a metal file recovered during excavation of one of the mounds suggests the mounds are modern. The rock mounds, appear to have been impacted by flood events, they are partially collapsed, and are in fair to poor condition.

#### SIHP #10020 (CSH Site 18)

Site 10019 is described in the CSH pedestrian survey summary table as a platform. The area where Site 10019 was plotted on the project map is an area of bulldozed pasture with natural bedrock outcrops and loose rocks. A roughly rectangular pile of natural bedrock boulders was identified at the location of Site 10019. The boulders are naturally occurring bedrock small boulders and cobbles. There is a portion along the west side of the pile that appears to contain bulldozer push from a nearby wall

breach. The top of the rock pile is uneven but somewhat level. There is no stacking or facing apparent on the rock pile. The pile is natural, but its roughly rectangular shape and somewhat level top surface make it appear to be a possible archaeological feature. It is likely that CSH added the feature to their pedestrian survey summary table for these reasons. CSH did not include a site description or map of the feature in the AIS report, likely because it was determined to be natural.

### SIHP #10033 (CSH Site 112)

Site 10033 is described in the CSH pedestrian survey summary table as a planting complex associated with modern coffee agriculture. There were coffee trees in the area when CSH conducted their AIS fieldwork. The area where Site 10033 was plotted on the project map is an area of bulldozed pasture along the southeast edge of a seasonal gulch. During the current sites inspection, it was apparent that the ground surface in this area has been impacted by flood events and bulldozing. There are no longer coffee trees and there is only a single short wall segment in the area where Site 10033 was previously identified. The planting features are no longer present.

The L-shape wall segment is roughly  $5.0 \text{ m} \log (\text{N/S})$  by 1.0 m wide and is 1.0 m in maximum height. The wall is constructed of angular and subangular cobbles and small boulders. It is cobble core filled and bi-faced. The wall has been bulldozed on both ends and is in fair condition.

## SIHP #10034 (CSH Site 113)

Site 10034 was described in the CSH pedestrian survey summary table as a platform (rock mound). It was determined through consultation with SHPD and Hawai'i County Planning that the features did not warrant a written description in the CSH AIS report. The feature was relocated along the north edge of a seasonal gulch during the current site inspection. The platform appears to have been bulldozed. Currently, the feature is a roughly 2.5 m long (E/W) by 1.8 m wide by 0.35 m high concentration of rock. The base of the platform appears to be intact in the ground surface. It is possible that the feature was in this state when CSH first identified it, or it might have been bulldozed later. The feature is most likely a rock clearing mound. It has been impacted by bulldozing and is in poor condition.

#### SIHP #10049 (CSH Site 216)

Site 100493 is described in the CSH pedestrian survey summary table as two linear agricultural terraces. The area where Site 10033 was plotted on the project map is along the bulldozed north bank of a seasonal gulch. During the current sites inspection, it was apparent that the ground surface in this area has been impacted by flood events and bulldozing. Site 10049 has been bulldozed and is no longer present.

## SIHP #10067 (CSH Site 232)

Site 10067 is a rock wall and several soil retaining terraces constructed on the sloping north bank of a seasonal gulch. Cultural material recovered from excavations suggests the site is Prehistoric in age and is likely associated with temporary habitation and agriculture. The site appears to be unaltered and is in good condition.

## SIHP #10068 (CSH Site 233)

Site 10068 is a small rectangular enclosure. Cultural material recovered from excavations suggests the site is Prehistoric in age and is likely associated with temporary habitation. The site has been bulldozed and only the base of the enclosure walls remains, except for the southeast corner of the enclosure which remains standing.

#### SIHP #10069 (CSH Site 234)

Site 10069 is a modified bluff/platform. Cultural material recovered from excavations suggests the site is a Prehistoric volcanic-glass tool working site associated with nearby agriculture. The site had been bulldozed prior to the CSH AIS. It is in poor condition.

## SIHP #10070 (CSH Site 235)

Site 10070 is U-shape enclosure. The feature construction, the lack of cultural material recovered from test excavation, and the enclosure's proximity to Historic era agricultural rock clearing mounds all suggest the enclosure is related to Historic era agriculture, most likely coffee growing. The site had been partially bulldozed prior to the CSH AIS. It is in poor condition.

#### SIHP #10071 (CSH Site 237)

Site 10071 was described in the CSH pedestrian survey summary table as a rectangular platform. The feature was relocated along the north edge of a seasonal gulch during the current site inspection and appears to have been bulldozed after the CSH AIS

fieldwork. The feature is now a roughly 5.8 m long (E/W) by 5.0 m wide concentration of loose rocks on the bulldozed level ground surface. There are bulldozer track marks on the loose rocks and on surrounding exposed bedrock. The feature is in poor condition.

### SIHP #10072 (CSH Site 238)

Site 10072 includes two large modified outcrops, terraces, rock clearing mounds, and level soil areas. Test excavation of the largest bedrock did not contain cultural material. A small amount of sea urchin shell was recovered from additional testing of one of the rock mounds. The CSH AIS interpreted the site as associated with Historic era agriculture. It is possible based on the feature types and construction method that the site is associated with pre-Contact era agriculture, though the limited subsurface test excavations to date do not support this interpretation. The site appears to be unaltered and is in good condition.

#### SIHP #10073 (CSH Site 239)

Site 10073 was described in the CSH AIS report as two platforms or cattle loading chutes or ramps. The features were both relocated along the edge of a *maukamakai* ranch road during the current site inspection and appear to be bulldozer push piles. It is possible that the features were in this state when CSH first identified them, or they might have been bulldozed later. The two features at Site 10073 appear to be bulldozer push piles.

## SIHP #10074 (CSH Site 240)

Site 10074 is a roughly square rock enclosure likely used as a foundation for an Historic era structure associated with commercial agriculture. Cultural material recorded at the site included both Prehistoric and Historic era artifacts. The site was bulldozed at some time after the CSH AIS study. All that remains is the partially collapsed portion of what appears to be the southeast corner of the enclosure wall. The site is in poor condition.

### SIHP #10075 (CSH Site 241)

Site 10075 is a roughly square rock enclosure interpreted as an Historic era pig pen. The site appears to have been partially bulldozed at some time after the CSH AIS study. Portions of the wall corners remain and the walls are no longer as high as they are described in the CSH AIS report. The site is in poor condition.

### Historic Planting Terraces

The CSH AIS identified an area containing Historic era planting terraces within the northeast portion of Parcel 016. The features were relocated exactly where the CSH AIS project map showed them. The features included rock mounds, linear rock alignments, terraces, modified outcrops, and level soil areas. The features were not subjected to subsurface testing during the CSH AIS. It was likely determined through consultation with SHPD and Hawai'i County Planning that the features did not warrant testing or written descriptions. The features might be Historic in age.

#### **Bluff Terraces**

The CSH AIS identified an area containing bluff terraces within the southeast portion of Parcel 017. The features were relocated exactly where the CSH AIS project map showed them. The features were not described in the CSH study because it was determined that the features were modern bulldozer push piles. Pedestrian survey of the area for during the current sites inspection confirmed they are bulldozer push piles.

All but three (Site 10017, 10033, and 10049) of the 20 archaeological sites recorded in the CSH AIS are still present on the project area. Two sites (Site 10071 and 10073) were present but bulldozed to the point that a precise assessment was difficult to make. Although the CSH AIS site descriptions for Site 10071 and 10073 appear likely correct. Two sites (Site 10018 and 10020) were determined to be natural geological features.

Of the 13 sites that were not completely or badly impacted by bulldozing, ten were determined to be correctly recorded in the CSH AIS report, and three were determined to be likely correctly recorded in the CSH AIS report.

The Historic planting terraces recorded in the northeast portion of Parcel 016 was determined to be likely correctly recorded, and the bluff terraces recorded in the south east portion of Parcel 017 was determined to be correctly recorded in the CSH AIS report.

Based on the CSH AIS report and a February 8, 1993 Gamrex, Inc. letter to SHPD, CSH recorded 20 archaeological sites and two Historic/Modern era agricultural areas during their initial pedestrian survey. These sites were described in tabular format and a pedestrian survey summary was given to SHPD and Hawai'i County Planning for review. SHPD and County Planning then made a site visit to consult with CSH on the preliminary site interpretations and the appropriate level of documentation for each site. CSH then returned to selected sites and recorded written descriptions and made site and feature plan maps for sites that required them. The remaining sites were either determined to be natural or associated with Historic/Modern era commercial agriculture and no further documentation was required in the AIS report.

Overall, based on the SCS sites inspection and assessment (Escott 2016), the CSH AIS report correctly identified project area archaeological sites and tested, recorded, and interpreted them correctly. All of the Parcel 016 and Parcel 017 archaeological sites documented in the CSH AIS report were recommended for no further work (Hammatt et al. 1984:38). The recommendation was made as "the significant material from the study area has been recovered and further investigation would be of minimum productivity" (Hammatt et al. 1984:38).

The majority of sites (n=14) documented in the northern portion of the Hammatt et al. (1992) project area were interpreted as Historic era ranching and commercial agriculture features. Only six sites were interpreted as pre-Contact era to early post-Contact era, four of them were associated with temporary habitation, one with agricultural rock clearing, and one with burial practices.

# EXPECTED ARCHAEOLOGICAL PATTERNS

Based on previous archaeological studies, geological studies, historical research, interviews, and County Planning Department records it is expected that any archaeological sites remaining on the current project area will be related to traditional agriculture, temporary habitation, burial practices, and to post-Contact era ranching and agricultural activities.

It is likely that many of the pre-Contact to early post-Contact sites have been removed or disturbed by Historic era and modern ranching and commercial agriculture. This is especially true because the area around the current project era was used as cattle pasture from the Historic to the present. Additionally, the project area is in a location that was bulldozed sometime between the 1940s and the 1970s in preparation for a commercial agricultural project, most likely coffee growing. Aerial photos clearly show that bulldozer transects were cut north/south across the entire five-acre project area. Archaeological sites and features that are likely to remain on the project area will likely include pre-Contact era to early post-Contact era rock clearing mounds, terraces, small enclosures, and burials. It is also likely that Historic era and modern features related to ranching and agriculture will also be identified on the project area. These include primarily rock walls constructed to confine cattle.

# **RESULTS OF FIELDWORK**

Twenty two newly identified archaeological sites were recorded during the course of the archaeological inventory survey study (Table 4 and Figure 10). The sites are primarily agricultural complexes and terraces associated with pre-Contact era to Historic era agriculture. Several rock walls and enclosures are associated with Historic era agriculture and ranching. A pre-Contact era to later post-Contact era single lava tube burial was also recorded. A portion of the old railroad berm was also recorded along the eastern edge of the project area.

SITE 30591	Agricultural Complex
FUNCTION:	Agriculture
AGE:	Pre-Contact to Early Post-Contact Era
DIMENSIONS:	20.0 m (N/S) by 9.0 m by 0.95 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	SP-1, SP-2, SP-3
DESCRIPTION:	Site 30591 is an agricultural complex located within the

northern portion of the project area, immediately south of the north project area boundary (see Figure 10). The site is situated at 650 ft amsl on a west facing slope, among *koa haole* trees and Guinea grass ground cover.

The complex is six terraces and planting features (Features 1 through 6) constructed on a level area along a west facing slope (Figure 11). The site is approximately 20.0 m in length (N/S) and 9.0 m wide, with a maximum height of 0.95 m. There is a *mauka/makai* rock alignment at the center of the site and level terraces extending north and south from the rock alignment. Feature 1 through Feature 4 are south of the alignment and Feature 5 and Feature 6 are north. There are three  $p\bar{a}hoehoe$  slabs along the south side of the central rock alignment that were placed with their longest axis oriented vertically.

Site #	Site Type	Features	Site Function	Age	Testing
30591	Agricultural Complex	6	Agriculture	Pre-Contact to Historic Era	SP-1, 2, 3
30592	Railroad Bed and Berm	1	Transportation	Historic Era	
30593	Lava Tube	1	Burial	Pre-Contact to Early Post-Contact Era	
30594	Agricultural Complex	6	Agriculture	Pre-Contact to Historic Era	SP-1 & 2
30595	Rock Wall	1	Ranching	Historic Era	
30596	Possible Hearth	1	Food Preparation	Historic Era	TU-1
30597	Rock Wall	1	Ranching	Historic Era	
30598	Rock Wall	1	Agriculture/Ranching	Pre-Contact to Historic Era	
30599	Platform & Enclosure	2	Ranching/Agriculture	Historic Era	SP-1 & 2, TU-1
30600	Terrace	1	Agriculture	Historic Era	SP-1
30601	Rock Wall	1	Ranching	Historic Era	
30602	Enclosure	1	Ranching/Agriculture	Historic Era	SP-1, 2, 3 & 4
30603	Enclosure	4	Ranching/Agriculture	Historic Era	SP-1 & 2
30604	Agricultural Complex	4	Agriculture	Pre-Contact to Historic Era	SP-1
30605	Rock Wall	1	Ranching/Agriculture	Historic Era	
30606	Rock Wall	1	Ranching/Agriculture	Pre-Contact to Historic Era	
30607	Agricultural Complex	7	Agriculture	Pre-Contact to Historic Era	SP-1 to SP-10
30608	Enclosure	1	Structure	Historic Era	
30609	Enclosure	1	Structure	Historic Era	
30610	Terrace	1	Agriculture	Pre-Contact to Historic Era	SP-1
30611	Agricultural Complex	3	Agriculture	Pre-Contact to Historic Era	SP-1, 2, 3
30612	Lava Blister	1	Refuse Dump	Historic Era	

**Table 4:** Inventory of Archaeological Sites Identified on the AIS Project Area.



**Figure 10:** 7.5-Minute Series USGS Topographic Map Showing Locations of Project Area Archaeological Sites (ESRI, 2011. Sources: National Geographic Society, USGS. Kealakekua Quadrangle).



Figure 11: Site TS-001 Plan View Map.

Feature 1 is an oval planting feature constructed along the central rock alignment and along the east side of the site (Figure 12). It is constructed of a single course of small basalt boulders and cobbles and is approximately 2.0 m in length (N/S) by 0.70 m wide, with a maximum height of 0.59 m. The feature is collapsed in some areas and is in fair condition.

Feature 2 is a rectangular soil filled terrace located immediately west of Feature 1 (Figure 13). It is constructed along the south side of the central rock alignment. The terrace is approximately 5.5 m in length (N/S) by 2.50 m wide, with a maximum height of 0.68 m. It is constructed of angular and sub angular basalt cobbles and small boulders ranging in size from 0.20 to 0.50 m. The feature is collapsed in some areas and is in fair condition.

Feature 3 is a small rectangular soil filled terrace located immediately south of Feature 1 (Figure 14). The terrace is approximately 3.50 m in length (N/S) and 1.40 m wide, with a maximum height of 0.70 m. It is constructed of angular and sub angular basalt cobbles and small boulders ranging in size from 0.20 to 0.70 m. The feature is collapsed in some areas and is in fair condition.

Feature 4 is a roughly rectangular terrace located immediately south of Feature 2 and Feature 4 (Figure 15). The terrace is approximately 5.0 m in length (NW/SE) by 3.40 m wide, narrowing slightly at the southern terminus, with a maximum height of 0.50 m. It is constructed of angular and sub angular basalt cobbles and small boulders ranging in size from 0.25 to 0.50 m. The feature is collapsed in some areas and is in fair condition.

Feature 5 is a roughly rectangular terrace located in the northwest corner of the site (Figure 16). The terrace is constructed along the northwest side of the central rock alignment. The terrace is approximately 8.0 m in length (N/S) by 4.0 m wide, with a maximum height of 0.70 m. It is constructed of angular and sub angular basalt cobbles and small boulders ranging in size from 0.25 to 0.70 m. The feature is collapsed in some areas, generally where smaller rocks have been utilized, and is in fair condition.

Feature 6 is a roughly rectangular terrace located in the northeast corner of the site (Figure 17). The terrace is constructed along the northeast side of the central rock alignment. The terrace is approximately 6.1 m in length (N/S) by 3.2 m wide, with a



Figure 12: Photograph of Site 30591 Feature 1 Looking Northeast.



Figure 13: Photograph of Site 30591 Feature 2 Looking North.



Figure 14: Photograph of Site 30591 Feature 3 Looking Northeast.



Figure 15: Photograph of Site 30591 Feature 4 Looking Southeast.



Figure 16: Photograph of Site 30591 Feature 5 Looking South.



Figure 17: Photograph of Site 30591 Feature 6 Looking North.

maximum height of 0.55 m. It is constructed of angular and sub angular basalt cobbles and small boulders, some as large as 0.50 m. The feature is collapsed in some areas and is in fair condition.

All of the terrace and planting features at Site 30591 are constructed of roughly piled rock. There is no formal stacking or facing evident in the feature construction. There were no cultural remains identified on the ground surface at the site. There is a fair amount of bulldozer pushed rock piled along the *mauka* (east) side of the site.

## Shovel Probe Testing

Three shovel probes (SP) were excavated at Site 30591. The shovel probes were excavated within the soil area of Feature 2, Feature 4 and Feature 5 terraces. The shovel probes were dug to depths ranging from 6.0 to 32.0 cmbs, and terminated on bedrock or large basalt rocks (Table 5). A single fragment of sea urchin spine was recovered from SP-1. SP-2 and SP-3 did not contain cultural material.

Feature	SP#	Depth (cm)	Layers	BOE	Artifacts
2	1	0 - 32 cm	Х	Basalt Rock	Urchin Spine Fragment
4	2	0 - 6 cm	Х	Basalt Rock	-
5	3	0 - 15 cm	Х	Basalt Rock	-

**Table 5:** Site 30591 Shovel Probe Results.

The piled rock construction of the site and the form of the terrace features suggest the site was constructed to retain soil for agricultural purposes. The lack of cultural material on the ground surface and the small amount of cultural material recovered from the shovel probes at Site 30591 supports the interpretation that the site consists of agricultural planting terraces and a small planting feature. Site 30591 has been slightly impacted by modern bulldozing, is partially collapsed in places, and is in fair to good condition. No further work is recommended at the site.

SITE 30592	Railroad Berm
FUNCTION:	Transportation
AGE:	Historic Era
DIMENSIONS:	265.0 m (SE/NW) by 2.50 m by 1.5 m max. height
CONDITION:	Good
SURFACE ARTIFACTS:	Modern Trash Debris
EXCAVATION:	None
DESCRIPTION:	Site 30592 is an Historic era railroad berm located along

the eastern boundary of the project area (see Figure 10). The railroad berm is approximately 265.0 m in length (SEN/W) and 2.5 m wide across the eastern edge of the project area. The berm continues north and south beyond the limits of the project area. The railroad bed is a level dirt and rock surface, and the berm is located along the west side of the railroad bed. The berm is a retaining wall constructed of small boulders and large cobbles stacked up to nine courses high (Figure 18). The berm is well faced with fairly tightly fitted natural rock. The rock has not been worked prior to stacking. The berm face slopes slightly toward the east as it approaches the top to prevent collapse.

The surface of the railroad bed has been bulldozed in the fairly recent past, likely during construction of the homes along the east edge of the project area property. Portions of the berm are partially collapsed in places. There is a fair amount of modern construction debris and refuse along the course of the railroad bed. The railroad berm is in good condition.

SITE 30593	Lava Tube
FUNCTION:	Burial
AGE:	Pre-Contact to Early Post-Contact Era
DIMENSIONS:	60.0 m (E/W) by 9.0 m by 0.95 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30593 is a Lava tube located at 610 ft amsl along the
central western portion of th	e project area, immediately east of the project area boundar

central western portion of the project area, immediately east of the project area boundary (see Figure 10). The site is situated on a western facing slope, among *koa haole* and trees with Guinea grass ground cover.



Figure 18: Photograph of Site 30592 Looking East.

The skeletal remains of a single individual were identified in a lava tube near the *makai* (west) boundary of the project area. The lava tube can be accessed through two openings, one at the *makai* end of the lava tube and a second, larger opening approximately 20.0 meters *mauka* (east) of the *makai* opening (Figure 19). The lava tube continues east 15.0 meters and east-southeast 25.0 to 30.0 meters from the *mauka* opening. A second tube, connecting to the east-southeast tube, continues west-southwest 30.0 meters.

The *makai* entrance is an approximately 0.9 m long (E/W) by 0.7 m wide hole in the exposed  $p\bar{a}hoehoe$  ground surface. The floor of the lava tube is 0.5 to 0.9 cm below the opening and is primarily bare lava with deposits of natural pebbles, small cobbles, and fine sediment washed into the tube from the opening and a second point in the tube approximately 6.0 m east of the opening. The tube slopes gently upward in an easterly direction. Sediment from a collapsed point 6.0 meters into the tube covers the lava tube floor in thicker deposits nearer to the point of collapse.

The distal end of a human femur, talus, metatarsal, and phalange were identified on the surface of the lava tube floor below the *makai* opening. The skeletal elements were small in size and were deteriorated, making positive identification difficult. The ilium of a small human pelvis was identified protruding from the sediment along the south wall of the lava tube, approximately 5.0 m *mauka* of the *makai* opening. Sediment was removed in small increments to expose the one half of a pelvis. Half of the ilium had deteriorated and was no longer present on the pelvis.

More sediment (4.0 to 8.0 cm in thickness) was removed to expose additional human skeletal elements located in close proximity to the pelvis. These included lumbar, thoracic, and cervical vertebrae; ribs; both clavicles and shoulder blades; the left ulna and radius; several phalanges; and two incisors and a molar.

The other half of the pelvis; cranium, mandible, other long bones, and remaining skeletal elements were not located in the limited removal of sediment. If these skeletal elements are buried beneath the sediment on the floor of the lava tube, they may no longer be articulated with the identified skeletal elements. It is possible that they have moved down slope of the *in situ* burial. This is likely, as a calcaneus, tarsals, and metatarsals were identified during a second, more thorough inspection of the lava tube floor under the *makai* opening—a distance of 5.0 m down slope of the burial location. At



Figure 19: Site 30593 Plan View Sketch Map.

least a portion of the femur and several foot bones have moved down slope of the original burial location.

Based on the limited removal of sediment from the skeletal elements, the burial is of a single individual in a supine position, arms at sides, with head located *mauka* (east) and feet *makai*. The size of the skeletal elements indicates a young adult of small stature or a subadult. The skeletal elements were fairly deteriorated so that sex and age could not be definitively ascertained.

SITE 30594	Agricultural Complex
FUNCTION:	Agriculture
AGE:	Historic Era
DIMENSIONS:	20.0 m (E/W) by 17.0 m by 0.70 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	Heavy gauge wire, golf balls
EXCAVATION:	SP-1, SP-2
DESCRIPTION:	Site 30594 is an agricultural complex located at 600 ft amsl

approximately 16.0 meters northwest of Site 30593, along the western project area boundary (see Figure 10). The site is situated on a west facing slope, among *koa haole* and trees with Guinea grass ground cover. The site is in an area of broken bedrock suggestive of an large outcrop or collapsed lava tube. The rock is mostly angular and slabby, though there are also subangular rocks at the site.

The complex is six narrow terraces (Features 1through 6) constructed on a moderately steep west facing slope (Figure 20). The site is approximately 20.0 m in length (E/W) by 17.0 m wide, with a maximum height of 0.70 m. Features 1 through 4 are roughly parallel and are situated with their long axis oriented north/south. Feature 1 is the uppermost terrace along the east side of the site. Feature 5 and Feature 6 are smaller terraces oriented northwest/southeast and are down slope of Features 1 through 4, along the west side of the site.

Feature 1 is a roughly rectangular soil filled terrace on the east side of the site (Figure 21). It is approximately 10.0 m long by 1.8 m wide, with a maximum height of 0.81 m. There is a retaining wall constructed of piled and stacked angular and subangular small boulders and cobbles along the west side of the level soil terrace. There is no formal facing evident in the retaining wall construction.



Figure 20: Site 30594 Plan View Map.



Figure 21: Photograph of Site 30594 Feature 1 Looking South.

There is another pile of rock *mauka* (east) of the soil filled terrace Feature 1 constructed of piled angular and sub angular basalt cobbles and boulders. There is no formal facing evident in the rock pile. The retaining wall to the west and the rock pile to the east are partially collapsed in some areas. It looks as though Feature 1 has been impacted by bulldozing, especially along the north side of the feature. Feature 1 is in fair condition.

Feature 2 is a linear soil filled terrace located west of Feature 1 (Figure 22). The terrace retaining wall trends N/S, curving down slope at its northern terminus. It is approximately 14.0 m in length by 1.20 m wide, with a maximum height of 0.70 m. The retaining wall of the terrace is constructed of piled angular and subangular basalt cobbles and small boulders ranging in size from 0.40 to 0.75 m. There is no formal facing evident in the terrace construction. It looks as though Feature 1 has been impacted by bulldozing, especially along the north side of the feature. The retaining wall is collapsed in some areas and is in fair condition.

Feature 3 is a linear soil filled terrace situated down slope, to the west, of Feature 2 (Figure 23). The terrace retaining wall trends N/S. It is approximately 14.0 m in length and 1.40 m wide, with a maximum height of 0.70 m. It is constructed of piled angular and sub angular basalt cobbles and small boulders, which range in size from 0.40 to 0.75 m. There is no formal facing evident in the terrace construction. The retaining wall is collapsed in some areas and is in fair condition.

Feature 4 is a rectangular rock and soil filled terrace located on the south end of Feature 3. The terrace retaining wall trends N/S and is approximately 7.0 m in length by 2.90 m wide, with a maximum height of 0.70 m. It is constructed of piled angular and sub angular basalt cobbles and small boulders, which range in size from 0.40 to 0.75 m throughout the southern portion of the feature. The northern portion is composed of larger rock, incorporating what are likely *in situ* boulders that continue south to form portions of the soil filled terrace. The level soil filled terrace at the south end of the feature is approximately 5.0 m in length and 4.0 m wide, with a maximum height of 0.82 m, and contains rock. There is no formal facing evident in the terrace construction. The feature is collapsed in some areas and is in fair condition.



Figure 22: Photograph of Site 30594 Feature 2 Looking South.



Figure 23: Photograph of Site 30594 Feature 3 Looking South.

Feature 5 is a soil filled terrace/enclosure situated down slope, to the west, of Feature 4 (Figure 24). It trends NW/SE, and is roughly oval. It is approximately 5.5 m in length by 3.40 m wide, with a maximum height of 0.60 m. It is constructed of piled and stacked angular and sub angular basalt cobbles and small boulders. The rock is stacked up to four courses high on bedrock along the westernmost perimeter of the feature. The eastern and southeastern portions of the feature incorporate naturally occurring small boulders into the construction. There is no formal facing evident in the terrace construction. Feature 5 is collapsed in some areas and is in fair condition.

Feature 6 is a level soil filled terrace situated down slope, to the west, of Feature 5 (Figure 25). The terrace retaining wall trends NW/SE curving up slope at either end. It is approximately 4.5 m in length by 1.0 m wide, with a maximum height of 0.80 m. It is constructed of angular and sub angular basalt cobbles and small boulders, which are stacked up to three courses high along the westernmost perimeter. There is some very rough facing evident in the terrace construction. The retaining wall is collapsed in some areas and is in fair condition.

A strand of heavy gauge wire and two golf balls were encountered on the ground surface at the site.

## Shovel Probe Testing

A total of two shovel probes were excavated within Site 30594 to determine site function and age. The shovel probes were excavated approximately 11.0 m from one another within the soil area of Feature 2 terrace (SP-1) and Feature 6 terrace (SP-2). The shovel probes were dug to depths ranging from 26.0 to 55.0 cmbs and terminated on bedrock or large basalt rocks (Table 6). There were no cultural materials recovered from the shovel probes.

SP#	Depth (cm)	Layers	BOE	Artifacts
1	0 - 55 cm	X	Basalt Rock	-
2	0 - 26 cm	X	Basalt Rock	-

#### **Table 6:** Site 30594 Shovel Probe Results.



Figure 24: Photograph of Site 30594 Feature 5 Looking Northeast.



Figure 25: Photograph of Site 30594 Feature 6 in Foreground and Feature 5 in Background, Looking North.

The terraces at Site 30594 are fairly crudely constructed and were not constructed with much formal stacking or facing. The Feature 1 through Feature 4 retaining walls almost look like linear piles of rock left along the outside edges of a bulldozer transect. The rock appears to be from a large concentration of naturally occurring bedrock on the ground surface, possibly the remains of a collapsed lava tube. However, the features also appear as though they could have been constructed as agricultural terraces, especially Feature 5 and Feature 6. Subsurface testing did not recover any cultural material. Site 30594 is interpreted as a pre-Contact era to Historic era agricultural site. The site is in fair condition and no further work is recommended.

SITE 30595	Rock Wall
FUNCTION:	Cattle Ranching
AGE:	Historic Era
DIMENSIONS:	90.0 m (E/W) by 1.10 m by 1.31m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30595 is the remains of an Historic era wall lo

DESCRIPTION: Site 30595 is the remains of an Historic era wall located between 630 and 690 ft amsl within the northern portion of the project area (see Figure 10). The wall trends *mauka/makai* and is located on west sloping land with *kukui* nut and *koa haole* trees and Guinea grass ground cover. The wall has been breach by bulldozing in several places and portions of the wall continue east off of the project area.

The wall is constructed of angular and subangular basalt cobbles and small boulders, incorporating boulders as large as 0.60 m at the base (Figure 26). It is bifaced and cobble core filled (Figure 27). The wall is approximately 90.0 m in long (E/W) where it crosses the project area by 1.10 m wide, with a maximum height of 1.31 m. The wall bisects the property east to west, terminating to the east at the Site 30592 railroad berm. The wall is constructed onto the south face of the railroad berm. The wall also continues to the west beyond the property boundary. A portion of the eastern wall segment, approximately 18.0 m, constitutes the southern boundary of Site 30602 enclosure. There is a 1.0 m breach in the wall for access to the enclosure.

There was no cultural material on the ground surface at the site. Site 305951 is an Historic era wall that has been altered by bulldozing, is partially collapsed in places, and is in fair condition. No further work is recommended at Site 30595.


Figure 26: Photograph of Site 30595 Wall Looking North.



Figure 27: Photograph of Site 30595 Wall Collapse Showing Cobble Core Fill, Looking North.

SITE 30596	Possible Hearth
FUNCTION:	Possible Cooking
AGE:	Historic Era
DIMENSIONS:	2.50 m (E/W) by 2.10 m by 0.85 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	TU-1
DESCRIPTION:	Site 30596 is a hearth located within the northwestern
corner of the project area (se	e Figure 10). The hearth is situated on an exposed bedr

corner of the project area (see Figure 10). The hearth is situated on an exposed bedrock outcrop in a level area, approximately 10.0 m east of the top of a shallow west facing slope. There are *koa haole* and *kukui* nut trees with Guinea grass ground cover throughout the area.

The hearth is constructed on a narrow finger of hollow  $p\bar{a}hoehoe$ . The top of the small  $p\bar{a}hoehoe$  "tube" is broken open in places. The hearth is constructed within an opening in the top of the small "tube." It is constructed of cobble and small boulder size  $p\bar{a}hoehoe$  slabs positioned in a roughly rectangular configuration around the opening (Figure 28 and Figure 29). The hearth is approximately 2.50 m in length (E/W) and 2.10 m wide, with a maximum height of 0.85 m. There was no cultural material identified on the ground surface at the site.

A 1.0 m by 0.5 m test-unit (TU-1) was excavated in the hearth to determine feature function and age. TU-1 was excavated as two stratigraphic layers (Layer I and Layer II) and terminated on bedrock at 28 cmbs (Figure 30).

Layer I (0-20 cmbs) was loose angular and subangular cobbles and small boulders removed from the center of the hearth. The base of Layer I was roughly even with the top of Layer II (Figure 31).

Layer II (20-40 cmbs) was loose (10YR3/2) very dark grayish brown fine sandy silt with less than 5% gravels and cobbles, and roughly 1% fine rootlets. Layer II terminated on bedrock (Figure 32). A small amount of midden and charred material was recovered from TU-1, Layer I.



Figure 28: Site 30596 Plan View Map.



Figure 29: Photograph of Site 30596 Hearth Looking West.



Figure 30: Site 30596 TU-1 North Profile.



Figure 31: Photograph of Site 30596 TU-1 Top of Layer II, Looking West.



Figure 32: Photograph of Site 30596 TU-1 Base of Excavation, Looking West.

SITE 30597	Rock Wall
FUNCTION:	Cattle Ranching
AGE:	Historic Era
DIMENSIONS:	145.0 m (E/W) by 0.90 m by 1.30 m in max. height
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30597 is an historic era rock wall located between 590

and 690 amsl along the southern boundary of the project area (see Figure 10). The *mauka/makai* wall is constructed along the north side of a seasonal gulch and marks the property boundary. There are *koa haole* and *kukui* nut trees with Guinea grass ground cover throughout the area.

The wall is constructed of stacked angular and subangular basalt cobbles and small boulders, incorporating small boulders as large as 0.50 m at the base (Figure 33). It is bifaced and cobble core filled. The rock wall is approximately 145.0 m long (E/W) where it crosses the project area by 0.90 m wide, with a maximum height of 1.30 m. The east terminus of the wall is at the east end of the project area. The wall continues downhill beyond the west property boundary. Portions of the wall are no longer present, and may have been removed by flood events. Site 30597 is an Historic era ranch wall, and although it has collapsed in some areas, it is generally in fair condition. There were no cultural remains encountered on the ground surface at the site. No further work is recommended at Site 30597.



Figure 33: Photograph of Site 30597 Wall with Gulch in Background, Looking South.

SITE 30598	Wall
FUNCTION:	Agriculture/Ranching
AGE:	Pre-Contact Era to Historic Era
DIMENSIONS:	110.0 m (N/S) by 1.30 m by 0.80 m in max. height
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30598 is a segment of a rock wall located between 600
and 690 ft amsl in the south	ern portion of the project area (see Figure 10). There are koa
haole and kukui nut trees wi	th Guinea grass ground cover throughout the area.

The wall is constructed of piled and stacked angular and subangular basalt small boulders, incorporating small boulders as large as 0.50 m throughout (Figure 34). The wall is roughly faced and is not cobble core filled. The rock wall is approximately 110.0 m long (E/W) where it crosses the project area by 0.90 m wide, with a maximum height of 1.30 m. The east terminus of the wall is along the east property boundary. The wall continues west beyond the west property boundary. The wall has been impacted by bulldozing and portions of the wall are no longer present. Site 30598 is a pre-Contact era agricultural wall or an Historic era ranch wall, and although it is collapsed in some areas, it is generally in fair condition. There were no cultural remains encountered on the ground surface at the site. No further work is recommended at Site 30598.

SITE 30599	Platform with Enclosure
FUNCTION:	Agricultural
AGE:	Historic Era
DIMENSIONS:	8.0 m (NW/SE) by 6.50 m by 1.40 m in max. height
CONDITION:	Fair, Slightly Altered
SURFACE ARTIFACTS:	Historic glass and metal
EXCAVATION:	Shovel Probe Testing (SP-1, SP-2), TU-1
DESCRIPTION:	Site 30599 is an enclosed platform located at 670 ft amsl

within the central eastern portion of the project area (see Figure 10). It is situated on a gentle west facing slope 20 meters west of Site 30592 railroad berm. There are *koa haole* trees and Guinea grass ground cover throughout the area.



Figure 34: Photograph of Site 30598 Wall Overview Looking West.

Site 30599 is a platform (Feature 1) and a roughly rectangular enclosure (Feature 2) measuring 8.0 m long (NW/SE) by 6.50 m wide (Figure 35). The Feature 1 platform is located at the north end of the site and the Feature 2 enclosure extends south from the platform.

The Feature 1 platform is approximately 2.0 m long (N/S) and 1.8 m wide, with a maximum height of 1.40 m. It is constructed of angular and subangular basalt cobbles and small boulders stacked three to four courses high (Figure 36). The outer perimeter of the platform is constructed with larger rocks (small boulder slabs) stacked on their flat sides with their longest edge facing the outer edge of the platform. The interior of the platform is constructed of smaller subangular rocks placed inside the larger perimeter rocks. The north and east sides of the platform are well faced. The west side of the platform is collapsed (Figure 37). The feature construction is similar to Historic era rock clearing mounds and platforms documented in Kona and other places on Hawai'i Island. A large water worn cobble, corrugated metal roofing, and bottle glass fragments were identified on, the Feature 1 platform.

The Feature 2 enclosure is rectangular in shape and measured 5.10 m long (NW/SE) by 4.80 m wide, with a maximum height of 0.35 m. The enclosure walls are constructed of small boulders and cobbles piled and some roughly stacked one to two courses wide and one to three course high (Figure 38). The enclosure opens to the south. The interior of the enclosure is level soil. A screw top jar, a Bakelite pot, bottle glass fragments, and two pieces of sheet metal were encountered on the surface at the site (Figure 39).

Two shovel probes and a test-unit (TU-1) were excavated at Site 30599 to determine the function and the age of the two features.

## Shovel Probe Testing

Two shovel probes were excavated in the level soil interior of Feature 2. The shovel probes were excavated approximately 4.2 m from one another within the enclosure. They were excavated to depths ranging from 34.0 to 37.0 cmbs and terminating on bedrock or large basalt rocks (Table 7).



Figure 35: Site 30599 Plan View Map.



**Figure 36:** Photograph of Site 30599 Feature 1 Platform with Top Cleared of Debris Showing Stacked Stone Construction, Looking West.



Figure 37: Photograph of Site 30599 Feature 1 Platform Showing West Side Collapse, Looking East.



Figure 38: Photograph of Site 30599 Feature 2 Enclosure Looking East.



Figure 39: Photograph of Surface Artifacts Collected at Site 30599.

SP#	Depth (cm)	Layers	BOE	Artifacts
1	0 - 34 cm	Х	Basalt Rock	Glass and metal fragments
2	0 - 37 cm	Х	Basalt Rock	Donkey shoe, glass, metal and
				plastic fragments

**Table 7**: Site 30599 Shovel Probe Results.

SP-1 contained a single bottle glass fragment, three pane glass fragments, and four rusted metal fragments. SP-2 contained a donkey shoe, a single piece amethyst bottle glass, a piece of plastic, and ten rusted metal fragments, three of which are nail fragments.

## <u>TU-1</u>

TU-1 was a 1.0 m by 1.0 m test-unit excavated in the center of the platform (see Figure 35). TU-1 was excavated as two natural stratigraphic layers to a maximum depth of 1.45 cm below the top surface of the platform and terminated on bedrock (Figure 40).

Layer I (0-90 cmbs) was loose cobbles and small boulders mixed with "O" Horizon organic detritus. A small amount of rusted metal fragments and modern bottle glass were recovered from Layer I.

Layer II (90-145 cmbs) was loose 10YR3/4 dark yellowish brown sandy silt, cobbles and small boulders, and loose bedrock slabs. A small amount of rusted metal fragments, a metal twist top bottle cap, a wire nail, and modern brown and clear bottle glass were recovered from Layer II. Slabs of bedrock were also removed from the base of TU-1. TU-1 terminated on bedrock (Figure 41).

Site 30599 is interpreted as an Historic era to Modern era commercial agriculture and ranching work area. Base on the platform construction, surface artifacts at the site, and the metal and glass recovered from TU-1, the site was likely constructed in the mid 1900s and was likely used for ranching and/or commercial agricultural activities through the 1960s. Site 30599 is slightly altered (Feature 1 partial collapse) and is in fair condition. No further work is recommended at Site 30599.



Figure 40: Site 30599 TU-1 South Profile.



**Figure 41:** Photograph of Site 30599 TU-1 Base of Excavation Looking East.

SITE 30600	Terrace
FUNCTION:	Agricultural
AGE:	Historic Era
DIMENSIONS:	4.0 m (E/W) by 4.30 m by 0.35m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	Shovel Probe Testing (SP-1)
DESCRIPTION:	Site 30600 is a three-sided terrace located at 660 ft amsl

approximately 35.0 meters south of Site 30599 (see Figure 10). It is situated on a gentle west facing slope with *koa haole* trees and Guinea grass ground cover. The enclosure is constructed of angular and subangular basalt small boulders piled one to two courses high and wide on the ground surface (Figure 42). It is approximately 4.0 m in length (E/W) and 3.30 m wide, with a maximum height of 0.35 m. There were no artifacts identified on the ground surface at the site.

## Shovel Probe Testing

A single shovel probe (SP-1) was excavated within the level soil interior of Site 30600 to determine the function and age of the terrace. The shovel probe was excavated to a depth of 30.0 cmbs and terminated on bedrock or a large basalt rock. The shovel probe matrix did not contain cultural material.

Based on the simple construction of the terrace, its size, and the proportionally large number of Historic era sites recorded on the project area, it is likely that Site 30600 is also an Historic era agricultural terrace, possibly associated with coffee growing. Site 30600 appears to be unaltered and is in good condition. No further work is recommended at Site 30600.



Figure 42: Photograph of Site 30600 Looking Southeast.

SITE 30601	Rock Wall
FUNCTION:	Ranching
AGE:	Historic Era
DIMENSIONS:	80.0 m (NW/SE) by 1.20 m by 1.50 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30601 is an Historic era wall located between 635 and

685 ft amsl within the northern portion of the project area (see Figure 10). The wall is oriented *mauka/makai* and is situated 10 meters north of and parallel to the Site 30595 wall (Figure 43). There are *kukui* nut and *koa haole* trees, and Guinea grass ground cover throughout the area.

The wall bisects the property east to west, and is constructed onto the Site F2 railroad berm to the east. The wall continues west beyond the west project area boundary (see Figure 10). The wall is approximately 80.0 m in long (E/W) where it crosses the project area by 1.20 m wide, with a maximum height of 1.50 m. It is constructed of stacked angular and subangular basalt cobbles and small boulders (Figure 44). The wall is bifaced and cobble core filled and is stacked up to seven courses high in some areas. A portion of the wall to the east, approximately 12.0 m, constitutes the northern boundary of the Site 30602 enclosure. There are sections of the wall which are reinforced with pig and barbed wire fencing attached to T posts. Site 30601 is an Historic era ranch wall, appears to be unaltered, and is in good condition. No further work is recommended at Site 30601.

SITE 30602	Enclosure
FUNCTION:	Ranching/Agricultural
AGE:	Historic Era
DIMENSIONS:	23.0 m (E/W) by 16.0 m by 2.10 m in max. height
CONDITION:	Fair
SURFACE ARTIFACTS:	Historic era bottle
EXCAVATION:	Shovel Probe Testing (SP-1, SP-2, SP-3, SP-4)
DESCRIPTION:	Site 30602 is an enclosure located between 680 and 685 ft
amsl within the northeastern	portion of the project area (see Figure 10). It is situated on a
gentle mauka/makai slope, v	vithin close proximity to the eastern project area boundary.

There are *koa haole* trees with Guinea grass ground cover throughout the area.



**Figure 43:** Site 30602 Plan View Map Showing Portions of Site 30592, Site 30595, and Site 30601.



Figure 44: Photograph of Site 30601 Rock Wall Looking North.

The enclosure is formed by utilizing and modifying several existing walls (see Figure 43). It is bounded to the east by a 16.0 m section of Site 30592 railroad berm, to the north by a 21.0 m section of Site 30601 wall, to the south by a 23.0 m section of Site 30595 wall (Figure 45) and to the west by a wall which spans the distance between Site 30601 and Site 30595, approximately 10.0 m. The Site 30602 wall is constructed of stacked angular and subangular basalt cobbles and small boulders. The western boundary wall of the enclosure varies in condition from good to almost nonexistent, with only the southernmost portion of the wall remaining. The intact wall segment is approximately 3.30 m in length and 0.90 m wide, with a maximum height of 1.30 m. There is a aqua colored bottle at the top of the wall segment (Figure 46). All other portions of the Site 30602 west wall have been altered to varying degrees. The mid section is completely gone with the exception of a few rocks, two of which remain in place.

A section of Site 30595 wall has been removed to create an entrance to Site 30602 enclosure interior. Exposed bedrock is visible within in the northeastern portion of the enclosure interior, encompassing approximately one third of the total area. There is a section of galvanized pipe is near the base of Site 30592 railroad berm. There is loose rock from collapsed portions of wall, which lie within the interior. The Site 30592 railroad berm portion of the enclosure to the east predates the other walls that form the enclosure and the western enclosure boundary wall is the most recently constructed.

## Shovel Probe Testing

A line of four shovel probes spaced roughly 3.0 meters apart were excavated within the level soil interior of the enclosure. The shovel probe line extended from the southwest corner, toward the northeast corner, terminating midway at a bedrock outcrop. The shovel probes were excavated to depths ranging from 27.0 to 60.0 cmbs and terminated on bedrock or large basalt rocks (Table 8).

SP#	Depth (cm)	Layers	BOE	Artifacts
1	0 - 60 cm	Х	Basalt Rock	Kukui Nut Shell
2	0 - 60 cm	Х	Basalt Rock	Kukui Nut Shell
3	0 - 47 cm	Х	Basalt Rock	-
4	0 - 27 cm	Х	Basalt Bedrock	-

Table 8:	Site 30602	Shovel Probe	<b>Results</b> .
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Figure 45: Photograph of Site 30602 West Wall (Left)and Site 30595 Wall (Right) Looking East.



Figure 46: Photograph of Site 30602 Enclosure Wall and Bottle.

Two of the four shovel probes contained unburned *kukui* nut shell. No other cultural material was recovered from the shovel probes. There were no cultural remains encountered on the ground surface at the site, with the exception of the bottle and the section of galvanized pipe.

Based on the construction style and the fact that the feature is constructed onto the Site 30592 railroad berm, Site 30602 is interpreted as an Historic era enclosure associated with ranching and commercial agriculture. The feature wall is partially collapsed and is in fair condition. No further work is recommended at Site 30602.

SITE 30603	Enclosure
FUNCTION:	Ranching/Agricultural
AGE:	Historic Era
DIMENSIONS:	35.0 m (NE/SW) by 24.0 m by 1.45 m in max. height
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	Shovel Probe Testing (SP-1, SP-2)
DESCRIPTION:	Site 30603 is an L-shape enclosure (Feature 1) and three
linear terraces (Feature 2, 3, a	and 4) located between 680 and 685 ft amsl immediately
west of Site 30602 (see Figur	re 10). It is situated on a gentle west facing slope among koa
haole trees with Guinea grass	ground cover.

The L-shape enclosure is constructed onto the south side of the Site 30595 rock wall and is approximately 35.0 m long (NE/SW) by 24.0 m wide (Figure 47). The enclosure walls are roughly 66.0 m long by 1.0 m wide with a maximum height of 1.45 m. The walls are constructed of stacked angular and subangular basalt cobbles and small boulders and is bifaced and cobble core filled (Figures 48, 49, and 50). A roughly 35.0 m segment of the Site 30595 rock wall forms the north boundary of the enclosure (Figure 51). The eastern enclosure wall segment is approximately 24.0 m long (NW/SW) and is mostly collapsed. Portions of the southern and western wall segments have also collapsed, although the easternmost segment of the southern wall is still intact.

There are three linear agricultural terraces (Features 2, 3, and 4) within the southeast corner of the enclosure (Figure 52 and Figure 53). The terraces are oriented NW/SE within the rocky soil interior of the enclosure. Feature 2 is furthest *makai* (west) and Feature 4 is furthest *mauka* (east).



Figure 47: Site 30603 Plan View Map.



Figure 48: Photograph of Site 30603 Southwest Corner of Enclosure Feature 1, Looking Northwest.



Figure 49: Photograph of Site 30603 Western South Wall of Enclosure Feature 1, Looking Southwest.



Figure 50: Photograph of Site 30603 Middle Corner of Enclosure Feature 1, Looking South.



Figure 51: Photograph of Site 30595 Wall Portion of Site 30603 Enclosure Feature 1, Looking North.



Figure 52: Photograph of Site 30603 Feature 2 Terrace Looking Southeast.


Figure 53: Photograph of Site 30603 Feature 2 Terrace (Center) and Feature Retaining Wall (Left), Looking Southeast.

The Feature 2 retaining wall is approximately 4.0 m in length and 1.0 m wide, with a maximum height of 0.60 m. The Feature 3 retaining wall is approximately 6.0 m in length and 0.50 m wide, with a maximum height of 0.60 m. The Feature 4 retaining wall is a more substantial construct than the others. It is approximately 7.0 m in length and 1.0 m wide, with a maximum height of 0.90 m.

# Shovel Probe Testing

Two shovel probes were excavated within the level soil surfaces of terraces Feature 2 (SP-1) and Feature 3 (SP-2) to determine function and age. The shovel probes were excavated approximately 4.0 m apart, were dug to depths ranging from 30.0 to 36.0 cmbs, and terminated on bedrock or large basalt rocks (Table 9). A small amount of unburned *kukui* nut shell was recovered from SP-2. No cultural material was identified on the ground surface at the site.

SP#	Depth (cm)	Layers	BOE	Artifacts
1	0 - 30 cm	X	Basalt Rock	-
2	0 - 36 cm	X	Basalt Rock	Kukui Nut Shell

Based on the construction style of the enclosure and the fact that the enclosure walls are constructed onto the Site 30595 wall, and the Site 30595 wall is constructed onto the Site 30592 railroad berm, Site 30603 is interpreted as an Historic era enclosure associated with agriculture and ranching. Site 30603 has been impacted by modern land clearing activities and is in fair condition. No further work is recommended at Site 30603.

SITE 30604	Agricultural Complex
FUNCTION:	Agricultural
AGE:	Pre-Contact Era to Historic Era
DIMENSIONS:	12.0 m (NW/SE) by 5.0 m
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	SP-1

DESCRIPTION: Site 30604 is an agricultural complex located at 675 ft amsl 2.0 meters south of Site 30602 (see Figure 10). It is situated on a gentle west facing slope with *koa haole* trees and Guinea grass ground cover throughout the area.

Site 30604 is a planting feature (Feature 1) and three terraces (Features 2, 3, and Feature 4) (Figure 54). Feature 1 is a possible oval planting feature located in the southeast corner of the site. It is constructed of angular basalt cobbles and small boulders piled one to two courses high and two to three courses wide on the ground surface (Figure 55). The feature is approximately 2.50 m in length (E/W) and 2.10 m wide, with a maximum height of 0.60 m. There were no cultural remains on the ground surface at Feature 1.

Feature 2 is a small two-sided terrace located along the northwest edge of Feature 1. The terrace is 2.70 long (NW/SE) by 1.5 m wide. The terrace retaining wall is 2.70 m long by 0.60 m wide and is 0.62 m in maximum height above the ground surface to the southwest. It is constructed of basalt cobbles and small boulders piled up to three courses high on the ground surface (Figure 56). There were no cultural remains on the ground surface at Feature 2.

Feature 3 is a linear terrace located along the northwest side of Feature 2. The terrace is 4.80 long (NW/SE) by 3.0 m wide. The terrace retaining wall is 2.70 m long by 1.0 m wide and is 0.85 m in maximum height above the ground surface to the southwest. It is constructed of basalt cobbles and small boulders piled up to three courses high on the ground surface (Figure 57). A section of galvanized pipe is situated along the easternmost portion of the terrace. There were no cultural remains identified at Feature 3.

#### Shovel Probe Testing

A shovel probe (SP-1) was excavated within the level soil of the Feature 3 terrace to determine function and age. SP-1 was excavated to a depth of 50.0 cmbs and terminated on bedrock or a large basalt rock. A railroad spike, a wire nail, and a volcanic-glass flake were recovered from SP-1 (Figure 58).



Figure 54: Site 30604 Plan View Map.



Figure 55: Photograph of Site 30604 Feature 1 Looking Southwest.



Figure 56: Photograph of Site 30604 Feature 2 Looking Southeast.



**Figure 57:** Photograph of Site 30604 Feature 3 Looking Southeast.



Figure 58: Photograph of Artifacts Recovered from Site 30604, Feature 3, SP-1.

Feature 4 is a two-sided terrace located along the north edge of Feature 1. The terrace is approximately 2.25 m long (NE/SW) by 2.0 m wide, and is 0.80 m in maximum height. It is constructed of angular and subangular basalt cobbles and small boulders piled on the ground surface (Figure 59). There is single strand wire within the western portion of the site.

It is possible that Site 30604 is a pre-Contact to early post-Contact era agricultural site. The single volcanic-glass flake suggests that area might have been used for agricultural and resource gathering. However, the proximity of Site 30604 to Site 30602 and the presence of the railroad spike and wire nail suggest that Site 30604 was definitely used during the Historic era. It is very likely that Site 30604 was an Historic era agricultural site associated with sugarcane or coffee growing.

SITE 30605	Rock Wall
FUNCTION:	Ranching
AGE:	Historic Era
DIMENSIONS:	90. m (E/W) by 0.75 m by 1.0 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30605 is an Historic era wall located between 600

685 ft amsl through the center of the project area (see Figure 10). The wall trends *mauka/makai* across the west facing slope. There are *kukui* nut and *koa haole* trees with Guinea grass ground cover throughout the area.

and

The wall bisects the property east to west, terminating to the east near the Site 30592 railroad berm and continuing to the west beyond the project area boundary. The wall is constructed of angular and subangular basalt cobbles and small boulders, incorporating some as large as 0.50 m (Figure 60). The wall is approximately 90.0 m long (E/W) where it crosses the project area by 0.75 m wide, with a maximum height of 1.0 m. It is a bifaced cobble core filled wall and is stacked up to five courses in height. The condition of the wall diminishes near its western terminus where it has collapsed. There were no cultural remains encountered within the area of the site. Site 30605 has been impacted by modern land clearing activities, is partially collapsed in places, and is in good condition. No further work is recommended for Site 30605.



**Figure 59:** Photograph of Site 30604 Feature 4 Looking South.



Figure 60: Photograph of Site 30605 Wall Looking Northeast.

SITE 30606	Rock Wall	
FUNCTION:	Ranching/Agricultural	
AGE:	Pre-Contact to Historic Era	
DIMENSIONS:	37.0 m (NW/SE) by 1.90 m by 1.30 m in max. height	
CONDITION:	Poor	
SURFACE ARTIFACTS:	None	
EXCAVATION:	None	
DESCRIPTION:	Site 30606 is an Historic era wall segment located at 62	
amsl within the southwester	n portion of the project area (see Figure 10) The wall tre	

DESCRIPTION: Site 30606 is an Historic era wall segment located at 620 ft amsl within the southwestern portion of the project area (see Figure 10). The wall trends northwest/southeast and is situated in an area with *koa haole* trees and Guinea grass ground cover.

The Site 30606 rock wall segment is located between the Site 30605 wall and the Site 30597 wall, and is less formally constructed than either of the two (Figure 61). The wall is approximately 37.0 m in length (NW/SE) and 1.90 m wide, with a maximum height of 1.30 m. Site 30606 is presently a rubble wall consisting of angular and sub angular basalt cobbles piled three to six courses high and three to four courses wide on the ground surface. There is no formal stacking or facing evident in the wall construction, though it might have been a stacked and faced wall that has been disturbed by modern land clearing activities. The majority of the western (downhill) portions of the wall have collapsed, with an increase in collapse in low lying areas. There were no cultural remains identified on the ground surface within at the site. Site 30606 is an Historic era rock wall associated with ranching. It has been altered by modern land clearing, is mostly collapsed, and is in poor condition.



Figure 61: Photograph of Site 30606 Rock Wall Looking North.

SITE 30607	Agricultural Complex
FUNCTION:	Agriculture
AGE:	Pre-Contact Era to Historic Era
DIMENSIONS:	55.0 m (NW/SE) by 27.5
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	Shovel Probe Testing (SP-1 through SP-10)
DESCRIPTION:	Site 30607 is an agricultural complex located between 620
and 630 ft amsl within the so	uthwestern portion of the project area, on a steep west facing
slope (see Figure 10). There	e are koa haole trees with Guinea grass ground cover
throughout the area.	

The Site 30607 agricultural complex includes seven terraces (Feature 1 through Feature 7) located north of wall Site 30597, south of wall Site 30605, west of wall Site 30598 and on both sides of wall Site 30606 (Figure 62). Feature 1 is a three-sided terrace located in the northeast corner of the site. The terrace retaining wall is constructed primarily of angular and subangular basalt cobbles and small boulders piled up to four courses in high (Figure 63). It is approximately 3.70 m in length (N/S) by 1.40 m wide, with a maximum height of 1.05 m. There is no formal stacking or facing in the feature construction. There were no cultural remains on the ground surface at Feature 1.

# Shovel Probe Testing

A shovel probe (SP-1) was excavated within the sloping soil interior of Feature 1 to determine function and age. The shovel probe was excavated to a depth of 37.0 cmbs and terminated on bedrock or a large basalt rock. SP-1 contained a total of five volcanic-glass fragments and several charcoal fragments.

Feature 2 is a three-sided terrace located within the central western portion of Site 30607. The terrace is situated on a west facing slope and is constructed along the west side of wall Site 30606. The northwest and southwest corners of the terrace are curved and the terrace retaining walls are constructed of angular and subangular basalt cobbles and small boulders piled on the ground surface (Figure 64). There is no formal stacking or facing evident in the feature construction. The terrace is approximately 10.0 m in length (E/W) and 6.0 m wide, with a maximum height of 1.10 m.



Figure 62: Site 30607 Plan View Map.



Figure 63: Photograph of Site 30607 Feature 1 Terrace Looking Southeast.



Figure 64: Photograph of Site 30607 Feature 2 Terrace (Background) and Site 305956 Wall (Foreground), Looking West.

There are large quantities of rock within the soil area of the terrace. Piled rock combined with rock which has collapsed from surrounding areas (Site 30606 rubble wall and elsewhere) is approximately 1.10 m in height and 2.10 m wide, dividing the surface of the terrace to form two areas. The westernmost area is approximately 7.5 m in length (E/W) and 5.5 m wide (Figure 65). The easternmost area is an enclosed area formed by rock piled on the surface of the terrace where it abuts Site 30606 (Figure 66). The enclosed area is approximately 5.0 m in length (N/S) and 2.5 m wide. There were no cultural remains at Feature 2.

# Shovel Probe Testing

Two shovel probes (SP-2 and SP-3) were excavated within the level soil interior of Feature 2 to determine feature function and age. The shovel probes were excavated approximately 4.5 m apart from one another within the western area (SP-2) and the eastern area (SP-3). The shovel probes were excavated to depths ranging from 34.0 to 43.0 cmbs and terminated on bedrock or large basalt rocks (Table 10). The shovel probes did not contain cultural material.

SP#	Depth (cm)	Layers	BOE	Artifacts
2	0 - 43 cm	X	Basalt Rock	-
3	0 - 34 cm	Х	Basalt Rock	-

#### **Table 10**: Site 30607 Feature 2 Shovel Probe Results.

Site Feature 3 is three-sided terrace located north of Feature 2. The terrace is situated on a west facing slope and is constructed along the west side of wall Site 30606. The northwest and southwest corners of the terrace are curved and the terrace retaining walls are constructed of angular and subangular basalt cobbles and small boulders piled on the ground surface (Figure 67). There is no formal stacking or facing evident in the feature construction. Feature 3 is approximately 7.5 m in length (N/S) and 7.0 m wide, with a maximum height of 0.60 m. The western portion of the terrace retaining is mostly collapsed. There were no cultural remains at Feature 3.



Figure 65: Photograph of Site 30607, Feature 2, Western Area Looking East.



Figure 66: Photograph of Site 30607, Feature 2, Eastern Area Looking East.



Figure 67: Photograph of Site 30607, Feature 3 Looking South.

#### Shovel Probe Testing

Two shovel probes (SP-4 and SP-5) were excavated within the level soil interior of Feature 3. The shovel probes were excavated approximately 2.5 m apart from one another. The shovel probes were excavated to depths ranging from 48.0 to 54.0 cmbs and terminated on bedrock or large basalt rocks (Table 11). SP-4 contained two volcanic glass flakes recovered between 0-15 cmbs, and small charcoal fragments recovered between 15-30 cmbs. SP-5 contained several charcoal fragments.

SP#	Depth (cm)	Layers	BOE	Artifacts
4	0 - 54 cm	X	Basalt Rock	Volcanic glass, Charcoal Fragments
5	0 - 48 cm	X	Basalt Rock	Charcoal Fragments

**Table 11**: Site 30607 Feature 3 Shovel Probe Results.

Feature 4 is a two-sided terrace located along the south edge of Feature 2. The terrace abuts the west edge of wall Site 30606. It is approximately 10.0 m in length (E/W) and 6.5 m wide, with a maximum height of 0.94 m. The terrace retaining wall is constructed of angular and subangular basalt cobbles and small boulders piled on the ground surface (see Figure 62). There is no formal stacking or facing evident in the feature construction. There is piled rock near the center of the terrace that divides the surface of the terrace into two areas. The easternmost area is enclosed by rock piled near the center of the terrace and by wall Site 30606 (Figure 68). The enclosed area is approximately 5.5 m in length (N/S) and 2.5 m wide. The westernmost portion is approximately 7.5 m in length (E/W) and 5.0 m wide (Figure 69). There south edge of the terrace is partially collapsed. There were no cultural remains at Feature 4.

#### Shovel Probe Testing

Two shovel probes (SP-6 and SP-7) were excavated within Site 30607 Feature 4 to determine feature function and age. The shovel probes were excavated approximately 4.5 m apart from one another within the eastern area (SP-6) and the western area (SP-7). The shovel probes were excavated to depths ranging from 32.0 to 55.0 cmbs and terminated on bedrock or large basalt rocks (Table 12). SP-7 contained a single fragment of dense crystalline basalt, possibly an unpolished exterior flake.



Figure 68: Photograph of Site 30607 Feature 4 Eastern Area Looking North.



Figure 69: Photograph of Site 30607 Feature 4 Western Area Looking Northwest.

SP#	Depth (cm)	Layers	BOE	Artifacts
6	0 - 55 cm	X	Basalt Rock	-
7	0 - 32 cm	X	Basalt Rock	Basalt Debitage

Table 12: Site 30607 Feature 4 Shovel Probe Results.

Feature 5 is a three-sided terrace located in the southeast corner of Site 30607 (see Figure 62). The terrace is approximately 7.5 m in length (N/S) and 3.0 m wide, with a maximum height of 1.20 m. The terrace retaining wall is constructed of angular and subangular basalt cobbles and small boulders piled on the ground surface (Figure 70). There is no formal stacking or facing evident in the feature construction. The west terrace retaining wall is collapsed, potentially brought about by *koa haole* tree growth, as well as the steepness of the slope. There were no cultural remains on the ground surface at Feature 5.

# Shovel Probe Testing

A shovel probe (SP-8) was excavated within the level soil interior of Feature 5. The shovel probe was excavated to a depth of 30.0 cmbs and terminated on bedrock or a large basalt rock. SP-8 contained several very small charcoal fragments which were not collected.

Feature 6 is a three-sided terrace located east of Feature 2 and Feature 4 (see Figure 62). The terrace retaining wall is angled, situated cross-slope and constructed of angular and subangular basalt boulders piled on the ground surface (Figure 71). The terrace is approximately 7.6 m in length (NW/SE) by 3.5 m wide, with a maximum height of 1.20 m. Portions of the retaining wall to the east ere collapsed. There were no cultural remains identified on the ground surface at Feature 6.

#### Shovel Probe Testing

A single shovel probe (SP-9) was excavated within the level soil interior of Feature 6. The shovel probe was excavated to a depth of 33.0 cmbs and terminated on bedrock or a large basalt rock. SP-9 did not contain cultural material.



Figure 70: Photograph of Site 30607 Feature 5 Looking South.



**Figure 71:** Photograph of Site 30607 Feature 6 Looking South.

Site 30607 Feature 7 is a three-sided terrace located west of Feature 1 (see Figure 62). The terrace is situated cross-slope and is constructed of piled angular and subangular basalt boulders piled on the ground surface (Figure 72). There is no formal stacking or facing evident in feature construction. The terrace is 8.60 m in length (NW/SE) by 2.90 m wide, with a maximum height of 0.60 m. There were no cultural remains on the ground surface within the area of Feature 7.

# Shovel Probe Testing

A single shovel probe (SP-10) was excavated within the level soil interior of Feature 10. The shovel probe was excavated to a depth of 37.0 cmbs and terminated on bedrock or a large basalt rock. SP-10 contained a single volcanic glass flake and five marine shell fragments recovered from 0-15 cmbs.



Figure 72: Photograph of Site 30607 Feature 7 Looking North.

SITE 30608	Enclosure
FUNCTION:	Structure
AGE:	Historic Era
DIMENSIONS:	7.5 m (N/S) by 3.3 m by 1.20 m in max. height
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30608 is a rectangular enclosure located at

DESCRIPTION: Site 30608 is a rectangular enclosure located at 670 ft amsl within the southeastern portion of the project area, roughly 15.0 m west of the Site 30592 railroad berm (see Figure 10). It is situated on a moderate west facing slope in an area of *koa haole* trees and Guinea grass ground cover.

The enclosure is rectangular and is constructed of angular and subangular basalt cobbles and small boulders, some of which are as large as 0.80 m (Figure 73). The wall is bifaced and cobble core filled. It is approximately 7.50 m in length (N/S) and 3.30 m wide, with a maximum height of 1.20 m. Portions of the walls to the north and southwest have collapsed, suggesting that the enclosure might have been impacted by heavy equipment.

It is possible that the enclosure was constructed by modifying a wall segment just west of the Site 30592 railroad berm wall. Rocks might have been removed from the ends of the wall to construct two walls (north and south walls) between the wall segment and the railroad berm to the east. The east wall of the enclosure is the railroad berm wall. There is single strand heavy gauge fencing wire within the interior of the feature. Based on construction method and proximity to the railroad berm, it is most likely that Site 30608is the remains of an Historic era structure. The enclosure has been altered by modern land clearing activities and is in fair condition.



Figure 73: Photograph of Site 30608 Enclosure Looking Southeast.

SITE 30609	Enclosure
FUNCTION:	Structure
AGE:	Historic Era
DIMENSIONS:	6.6m (N/S) by 4.5 m by 1.20 m in max. height
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 30609 is a rectangular enclosure located a

DESCRIPTION: Site 30609 is a rectangular enclosure located at 680 ft amsl approximately 14.0 meters northeast of Site 30609 (see Figure 10). It is situated on a moderate west facing slope close to the eastern project area boundary and just west of the Site 30592 railroad berm. There are *koa haole* trees and Guinea grass ground cover throughout the area.

The enclosure is rectangular and is constructed of angular and subangular basalt boulders, some of which are as large as 1.05 m (Figure 74 and Figure 75). The wall is bifaced and cobble core filled. It is approximately 6.60 m in length (N/S) and 4.5 m wide, with a maximum height of 1.20 m.

It is possible that the enclosure was constructed by modifying a wall segment just west of the Site 30592 railroad berm wall. Rocks might have been removed from the ends of the wall to construct two walls (north and south walls) between the wall segment and the railroad berm to the east. The east wall of the enclosure is the railroad berm wall.

Portions of the walls to the east have collapsed, indicating that this structure may have been impacted by heavy equipment. Site 30609 is approximately 14.0 m northeast of Site 30608, and is similar in construction. A single strand of heavy gauge fencing wire was found in the interior of this feature also. Based on construction method and proximity to the railroad berm, it is most likely that Site 30609 is the remains of an Historic era structure. The enclosure has been altered by modern land clearing activities and is in fair condition.



Figure 74: Photograph of Site 30609 Enclosure Looking East.



Figure 75: Photograph of Site 30609 Enclosure Looking Northeast.

SITE 30610	Terrace	
FUNCTION:	Agricultural	
AGE:	Pre-Contact Era Historic Era	
DIMENSIONS:	6.75 m (NW/SE) by 3.0 m by 0.40 m in max. height	
CONDITION:	Fair	
SURFACE ARTIFACTS:	None	
EXCAVATION:	Shovel Probe Testing (SP-1)	
DESCRIPTION:	Site 30610 is a three-sided terrace located at 675 ft amsl	
within the southeastern portion of the project area (see Figure 10). The site is situated on		
a west facing slope, to the southwest and down slope of Site 30608, within close		

proximity to the eastern project area boundary. There are *koa haole* trees and Guinea grass ground cover throughout the area.

The terrace is approximately 6.75 m long (NW/SE) by 3.4 m wide, with a maximum height of 0.40 m (Figure 76). The interior soil surface of the terrace slopes slightly to the west. The terrace retaining wall is constructed of piled angular and subangular basalt cobbles and small boulders, some as large as 0.45 m (Figure 77). Portions of the retaining wall to the southwest may have been removed by modern land clearing activities. There were no cultural remains encountered on the surface in the area of the terrace.

### Shovel Probe Testing

A single shovel probe (SP-1) was excavated within the soil filled interior of Site 30610. The shovel probe was excavated to a depth of 22.0 cmbs and terminated on bedrock or a large basalt rock. SP-1 contained several charcoal very small fragments of charred material which were not collected.



Figure 76: Site 30610 Plan View Map.


Figure 77: Photograph of Site 30610 Terrace Looking Southwest.

SITE 30611	Agricultural Complex
FUNCTION:	Agriculture
AGE:	Historic Era
DIMENSIONS:	10.0 m (N/S) by 7.0 m
CONDITION:	Good
SURFACE ARTIFACTS:	None
EXCAVATION:	Shovel Probe Testing (SP-1, SP-2, and SP-3)
DESCRIPTION:	Site 30611 is an agricultural complex located at 670 ft amsl
in the southeast portion of the	e project area (see Figure 10). The site is three terraces
(Features, 1, 2, and 3) situate	d on a west facing slope in an area of koa haole and kukui
nut trees with Guinea grass g	round cover.

Feature 1 is located at the northeast end of the site and is a roughly rectangular soil filled terrace approximately 6.5 m long (NW/SE) by 2.0 m wide, with a maximum height of 1.0 m along southwest edge (Figure 78). The terrace retaining wall is constructed of piled angular and subangular basalt cobbles and small boulders, some as large as 0.90 m (Figure 79). There is no formal stacking or facing evident in the feature construction. The northern portion of the terrace has collapsed in several areas. The southern portion is better preserved, where several large somewhat tabular boulders have been incorporated into the construction. There were no cultural remains identified at Feature 1.

# Shovel Probe Testing

A shovel probe (SP-1) was excavated within the level soil interior of Feature 1. The shovel probe was excavated to a depth of 29.0 cmbs and terminated on bedrock or a large basalt rock. SP-1 contained a single fragment of rusted metal.

Feature 2 is a two-sided terrace located at the south end of the site. The terrace retaining wall is constructed of piled angular and subangular basalt boulders, some as large as 0.75 m (Figure 80). There is no formal stacking or facing evident in the feature construction. The terrace is approximately 3.5 m in length (NW/SE) and 2.5 m wide, with a maximum height of 0.35 m, the surface of which slopes to the west. There were no cultural remains on the ground surface at Feature 2.



Figure 78: Site 30611 Plan View Map.



Figure 79: Photograph of Site 30611 Feature 1 Looking Southeast.



**Figure 80:** Photograph of Site 30611 Feature 2 Looking South.

# Shovel Probe Testing

A single shovel probe (SP-2) was excavated within the level soil interior of Feature 2. The shovel probe was excavated to a depth of 20.0 cmbs and terminated on bedrock or a large basalt rock. SP-2 did not contain cultural material.

Feature 3 is a roughly rectangular terrace located between Feature 1 and Feature 2 (see Figure 78). The terrace is approximately 3.40 m in length (NW/SE) by 2.25 m wide, with a maximum height of 0.52 m. The terrace retaining wall is constructed of piled angular and subangular basalt cobbles and small boulders, some as large as 0.75 m (Figure 81). A partial wall along the southeastern boundary of the Feature 3 terrace separates it from the Feature 2 terrace, which is situated to the immediate south. The intact portion of wall is 1.50 m, although it likely formerly continued southwest the entire length of the terrace, forming two separate terraces. There were no cultural remains on the ground surface at Feature3.

# Shovel Probe Testing

A single shovel probe (SP-3) was excavated in the level soil interior of Feature 3. The shovel probe was excavated to a depth of 11.0 cmbs and terminated on bedrock or a large basalt rock. Sp-3 did not contain cultural material.



**Figure 81:** Photograph of Site 30611 Feature 1 Looking Northeast.

SITE 30612	Lava Blister			
FUNCTION:	Refuse Disposal Area			
AGE:	Historic Era			
DIMENSIONS:	3.40 m (NE/SW) by 3.40 m by 1.15 m in max. height			
CONDITION:	Good			
SURFACE ARTIFACTS:	None			
EXCAVATION:	None			
DESCRIPTION:	Site 30612 is a small open lava blister located within the			
central southern portion of th	he project area (see Figure 10). The site is situated on a west			
facing slope approximately 1	0.0 meters east of wall Site 30598 (see Figure 37). There			

are koa haole trees with Guinea grass ground cover throughout the area.

The lava blister is opening is directly above the blister and measures 1.0 m long (N/S) by 0.65 m wide (Figure 82). The blister is approximately 3.40 m in length (NE/SW) and 3.40 m wide, with a maximum ceiling height of 1.15 m. A fair amount of Historic era refuse is scattered on the floor of the blister. Some of the items collected and photographed included glass bottles, fragments of ceramic and stoneware bowls and plates, rusted solder top cans, a section of corrugated roofing material, cow bones, and various glass and metal fragments (Figures 83, 84, and 85).

Site 30612 is an Historic era refuse disposal area. It is unaltered and in good condition. No further work is recommended for Site 30612.



Figure 82: Photograph of Site 30612 Blister Opening Looking North.



Figure 83: Photograph of Site 30612 Historic Era Bottles and Plateware.



Figure 84: Photograph of Site 30612 Soldered Cans.



Figure 85: Photograph of Site 30612 Historic Era Bottles.

## **CONCLUSION**

# DISCUSSION

Twenty two newly identified archaeological sites were recorded during the course of the archaeological inventory survey study. The sites are primarily agricultural terraces associated with pre-Contact era to Historic era agriculture. Several rock walls and enclosures are associated with Historic era agriculture and ranching. A pre-Contact era to later post-Contact era single lava tube burial was also recorded. A portion of the old railroad berm was also recorded along the eastern edge of the project area. Two Historic era rectangular enclosures that were also recorded just west of the railroad berm.

#### SIGNIFICANCE ASSESSMENTS

Sites identified during this project were assessed for their significance as outlined in Hawai'i Administrative Rules §13-275-6. To be assessed as significant a site must be characterized by one or more of the following five criteria:

- (a) It must be associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property.
- (b) It must be associated with the lives of persons significant in the past.
- (c) It must embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction.
- (d) It must have yielded or may be likely to yield, information important in prehistory or history.
- (e) Have important value to native Hawaiian people or other ethnicities in the state, due to associations with cultural practices and traditional beliefs that were, or still are, carried out.

All of the sites documented in this report were evaluated for their significance regarding prehistory (Table 13).

Site #	Site Type	Site Function	Age	Significance Criteria	Recommendation
30591	Agricultural Complex	Agriculture	Pre-Contact to Historic Era	d	No Further Work
30592	Railroad Bed and Berm	Transportation	Historic Era	a, c, d	Preservation
30593	Lava Tube	Burial	Pre-Contact to Early Post-Contact Era	d, e	Preservation
30594	Agricultural Complex	Agriculture	Pre-Contact to Historic Era	d	No Further Work
30595	Rock Wall	Ranching	Historic Era	d	No Further Work
30596	Possible Hearth	Food Preparation	Historic Era	d	No Further Work
30597	Rock Wall	Ranching	Historic Era	d	No Further Work
30598	Rock Wall	Agriculture/Ranching	Pre-Contact to Historic Era	d	No Further Work
30599	Platform & Enclosure	Ranching/Agriculture	Historic Era	d	No Further Work
30600	Terrace	Agriculture	Historic Era	d	No Further Work
30601	Rock Wall	Ranching	Historic Era	d	No Further Work
30602	Enclosure	Ranching/Agriculture	Historic Era	d	No Further Work
30603	Enclosure	Ranching/Agriculture	Historic Era	d	No Further Work
30604	Agricultural Complex	Agriculture	Pre-Contact to Historic Era	d	No Further Work
30605	Rock Wall	Ranching/Agriculture	Historic Era	d	No Further Work
30606	Rock Wall	Ranching/Agriculture	Pre-Contact to Historic Era	d	No Further Work
30607	Agricultural Complex	Agriculture	Pre-Contact to Historic Era	d	No Further Work
30608	Enclosure	Structure	Historic Era	d	No Further Work
30609	Enclosure	Structure	Historic Era	d	No Further Work
30610	Terrace	Agriculture	Pre-Contact to Historic Era	d	No Further Work
30611	Agricultural Complex	Agriculture	Pre-Contact to Historic Era	d	No Further Work
30612	Lava Blister	Refuse Dump	Historic Era	d	No Further Work

 Table 13:
 Inventory of Archaeological Sites Identified on the AIS Project Area.

## RECOMMENDATIONS

All of the sites were assessed as significant under criterion "d" as they are likely to yield information important to history. The railroad berm is also significant under criteria "a" and "c" as it is associated with events that have made a significant contribution to the broad patterns of our history and it embodies distinctive characteristics of the type, period, and method of railroad bed construction. The burial is also significant criterion "e" as it has important value to Hawaiian people and people of other ethnic backgrounds in the state. The burial is recommended for preservation in place with preservation treatments outlined in a burial treatment plan (BTP) to be prepared for and approved by the Hawai'i Island Burial Council (HIBC) and the Hawai'i State Historic Preservation Division (SHPD).

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