

An Archaeological Inventory Survey of a roughly 210-acre portion of the NELHA HOST Park situated North of Makako Bay Drive

TMKs: (3) 7-3-043:072, 073, 074, and 078 (por.)

‘O‘oma 1st and Kalaoa 5th *ahupua‘a*
North Kona District
Island of Hawai‘i

DRAFT VERSION



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August 2015

ASM Project Number 23390.00



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EXECUTIVE SUMMARY

At the request of Gregory Barbour, Executive Director, Natural Energy Laboratory Hawai'i Authority (NELHA), ASM Affiliates has prepared this Archaeological Inventory Survey for a roughly 210-acre portion of the NELHA Hawai'i Ocean and Technology (HOST) Park located north of Makako Bay Drive in 'O'oma 1st and Kalaoa 5th *ahupua'a*, North Kona District, Island of Hawai'i (TMKs: (3) 7-3-043:072, 073, 074, and 078 por.). A large portion of the land occupied by NELHA (roughly 450 acres, including the current study area in its entirety) was previously the subject of an archaeological reconnaissance survey and data recovery conducted by Barrera (1985a and 1989) that identified forty-five archaeological sites within the overall area, and eleven sites within the current study parcels. Also, a recent inventory survey update of proposed road corridors across the previously surveyed area (Rechtman and Clark 2012) documented three sites (all within the current study parcels) that were not identified by Barrera (1985a). As the earlier Barrera (1985a, 1989) studies no longer comply with the current regulatory standards, and as additional, previously unrecorded cultural resources are known to exist within the already surveyed areas, to assist in future planning NELHA has proactively contracted ASM Affiliates to complete an archaeological inventory of roughly 343 acres of undeveloped land they administer. This 210-acre study is the first phase (Phase I) of on-going archaeological inventory survey currently being conducted by ASM Affiliates within the NELHA administered lands. The second phase of archaeological investigation (Phase 2) includes a 110-acre area on the south side of Makako Bay Drive (Phase 2a), a 1.3-acre coastal lot adjacent to the existing Marine Mammal Center (Phase 2b), and an 11.5 acre coastal area at Ho'ona (Phase 2c).

As a result of the current inventory survey fieldwork seventy-three archaeological sites containing a total of 381 features were recorded within the study area. The sites include eight (SIHP Sites 2, 10160 to 10162, and 10188 to 10190) that were previously documented by Barrera (1985a, 1989), an additional feature of a site complex (SIHP Site 28813) recorded by Monahan et al. (2012) within the Queen Ka'ahumanu right-of-way, all three of the sites (SIHP Sites 29272 to 29274) previously documented by Rechtman and Clark (2012) within the study area, and sixty-one newly identified sites (SIHP Sites 30315 to 30375). Three sites previously recorded by Barrera (1985a) near the boundary of the current study area (on Parcels 073 and 074), consisting of two stone mounds (cairns) and a *pāhoehoe* excavation (SIHP Sites 10156 to 10158), were not relocated, and are thought to have been destroyed by modern disturbance. The archaeological sites encountered within the study area are organized and discussed in the body of this report by site type, arranged under the following headings (with the corresponding sites in parentheses): Trails and Roads (SIHP Sites 2, 29272, 29273, and 30315), Previously Identified Site Complexes (SIHP Sites 10161 and 28813), Lava Tubes and Lava Blisters (SIHP Sites 30316 to 30320), Rock Rings (SIHP Sites 10190, 30321 to 30347), Cairns (SIHP Sites 10160, 10162, 10187 to 10189, 29274, and 30348 to 30369), and *Pāhoehoe* Excavations (SIHP Sites 30371 to 30375).

The significance of SIHP Sites 2, 28813, 29272, 29273, and 29274 has already been evaluated (Monahan et al. 2012; Rechtman and Clark 2012) and DLNR-SHPD has approved those evaluations. SIHP Site 2 (the Māmalahoa Trail; 1847 Government Road) was determined significant under Criterion a, c, d, and e; SIHP Site 28813 was determined significant under Criterion d and e; SIHP Site 29272 (Kauhini Road) was determined to be significant under Criterion c, d, and e; SIHP Site 29273 was determined significant under Criterion c and d; and SIHP Site 29274 was determined significant under Criterion d only. All of the other sites recorded within the current study area are also assessed as significant under Criterion d for information they have provided relative to the history and prehistory of the current study area. SIHP Sites 30315, 30316 and 30319, as a *mauka/makai* trail route, a lava tube containing an important traditional cultural artifact, and a lava tube with petroglyphs, respectively, are additionally assessed as significant under Criterion e for the important traditional cultural value they hold for native Hawaiian people.

SIHP Site 2 has been previously recommended for preservation, and a preservation plan for the portion of the site across the current study area has already been prepared (Rechtman and Clark 2004). SIHP Site 28813 was previously recommended (Monahan et al. 2012) for partial preservation (Feature A) and partial data recovery (Features B-E); Feature F was not previously documented, but is also recommended for preservation. SIHP Sites 29272 and 29273 have previously been approved for limited preservation, and no further work is the approved treatment for SIHP Site 29274 (Rechtman and Clark 2012). Additionally, although not assessed for significance, Sites 10161, 10188, 10187, and 10191, were previously included in a data recovery conducted by Barrera (1989).

For the sixty-eight sites within the current study area that do not have previously approved treatments, two are recommended for preservation (SIHP Sites 30316 and 30319, both lava tubes), one is recommended for limited preservation (SIHP Site 30315, a *mauka/makai* trail), and the other sixty-five are recommended for no further work (see Table 13). A preservation plan addressing Sites 28813 Feature F, 29272, 29273, 30315, 30316, and 30319 should be prepared in accordance with HAR §13-277 and submitted to DLNR-SHPD for review and approval. It is further recommended that the preservation area for SIHP Site 28813 Feature F join with the preservation area created around Feature A within the adjoining highway corridor. It has been previously recommended for Site 29273 that the more intact eastern portion of the site that falls on the *mauka* edge and outside of the proposed road corridor be preserved, and for SIHP Site 29272 that NELHA work with the road design engineers to avoid as much of this site as is feasible and then develop a preservation plan for the portions of the site that will remain outside the roadway corridor after the proposed road construction has been completed (see Rechtman and Clark 2012). The same preservation strategy is recommended for Site 30315.

While not formally recommended for preservation, a number of other sites and features will be included in the preservation areas created for SIHP Sites 29272, 30315, 30316, and 30319, and within the previously established preservation easement for SIHP Site 2. Sites that are included within the already established SIHP Site 2 preservation easement include SIHP Sites 10187, 30367, and portions of 30372. Sites that will be included partially or wholly within the Site 30315, 30316, and 30319 preservation area include SIHP Sites 10160, 30318, 30329, 30353, and 30371. Additionally, portions of SIHP Sites 30372 and 30375 will be included in the preservation easement established for SIHP Site 29272.

It is the further recommendation of this study that a qualified archaeological monitor be present during ground-disturbing activities associated with development of the NELHA HOST Park and that a monitoring plan compliant with HAR §13-279 be prepared prior to the commencement of such activities.

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1. INTRODUCTION

At the request of Gregory Barbour, Executive Director, Natural Energy Laboratory Hawai'i Authority (NELHA), ASM Affiliates has prepared this Archaeological Inventory Survey for a roughly 210-acre portion of the NELHA Hawai'i Ocean and Technology (HOST) Park located north of Makako Bay Drive in 'O'oma 1st and Kalaoa 5th *ahupua'a*, North Kona District, Island of Hawai'i (TMKs: (3) 7-3-043:072, 073, 074, and 078 (por.); Figures 1 and 2). The HOST Park is an innovative green economic development park that is administered by NELHA, a State of Hawai'i agency administratively attached to the Department of Business, Economic Development, and Tourism (DBEDT). NELHA's stated mission is to develop and diversify the Hawai'i economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner. A 2011 Master Plan prepared by Group 70 International, Inc. (Figure 3) sets forth several cultural objectives (codified in the Strategic Plan adopted by the NELHA management in 2012) for future development of the lands administered by NELHA, including (1) Respect the cultural resources, Hawaiian cultural practices, and significance of archaeological sites at NELHA throughout the planning process; (2) Protect and manage cultural sites in a sustainable manner; (3) Protect the opportunities for individuals and groups to engage in cultural practices; (4) Define areas, criteria and support facilities for cultural resources and practices, as applicable, to allow for integrated planning and management; and (5) Preserve the cultural landscape to enhance meaning, relationships, and resources for modern appreciation, research, and practice (2011:1.3.1). The Master Plan acknowledges that, while a number of surveys of historical and archaeological resources have been undertaken within the 870 acres of land that NELHA occupies at Keāhole Point, the standards by which some of these studies were conducted might not meet current best practices.

A large portion of the land occupied by NELHA (roughly 450 acres, including the current study area in its entirety) was previously the subject of an archaeological reconnaissance survey and data recovery conducted by Barrera (1985a and 1989) that identified forty-five archaeological sites within the overall area, and eleven sites within the current study parcels. At that time, those investigations were sufficient for meeting the requirements of the County of Hawai'i Planning Department and the Department of Land and Natural Resources (DLNR) with respect to permit approvals for land-altering and development activities. In recent years, however, due to the age of the previous survey, the Department of Land and Natural Resources (DLNR)-State Historic Preservation Division (SHPD) has been recommending updated archaeological inspections of individual lease areas within the NELHA administered lands prior to permit approvals for construction activities (e.g. Rechtman 2010a, 2010b, 2010c, 2012a, 2012b). Also, a recent inventory survey update of proposed road corridors across the previously surveyed area (Rechtman and Clark 2012) documented three sites (all within the current study parcels) that were not identified by Barrera (1985a). Given that the earlier archaeological studies no longer comply with the current regulatory standards, and that additional, previously unrecorded cultural resources are known to exist within the already surveyed areas, to assist in future planning NELHA has proactively contracted ASM Affiliates to complete an archaeological inventory of roughly 343 acres of undeveloped land they administer. This 210-acre study is the first phase (Phase I) of on-going archaeological inventory survey currently being conducted by ASM Affiliates within the NELHA administered lands. The second phase of archaeological investigation (Phase 2) includes a 110-acre area on the south side of Makako Bay Drive (Phase 2a), a 1.3-acre coastal lot adjacent to the existing Marine Mammal Center (Phase 2b), and an 11.5 acre coastal area at Ho'ona (Phase 2c).

The current study was performed in compliance with Hawai'i Administrative Rules (HAR) 13§13–275, and in accordance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in HAR 13§13–276. This report documents the findings of the resurvey of the study area and is intended to fulfill the requirements of the County of Hawai'i Planning Department and the Department of Land and Natural Resources with respect to permit approvals for land-altering and development activities. The report contains background information outlining the study area's physical and cultural contexts, a presentation of previous archaeological work in the immediate vicinity of the property, and current survey expectations based on that previous work. Also presented is an explanation of the survey methods, descriptions of the resources encountered, interpretation and evaluation of those resources, and treatment recommendations for the documented sites.

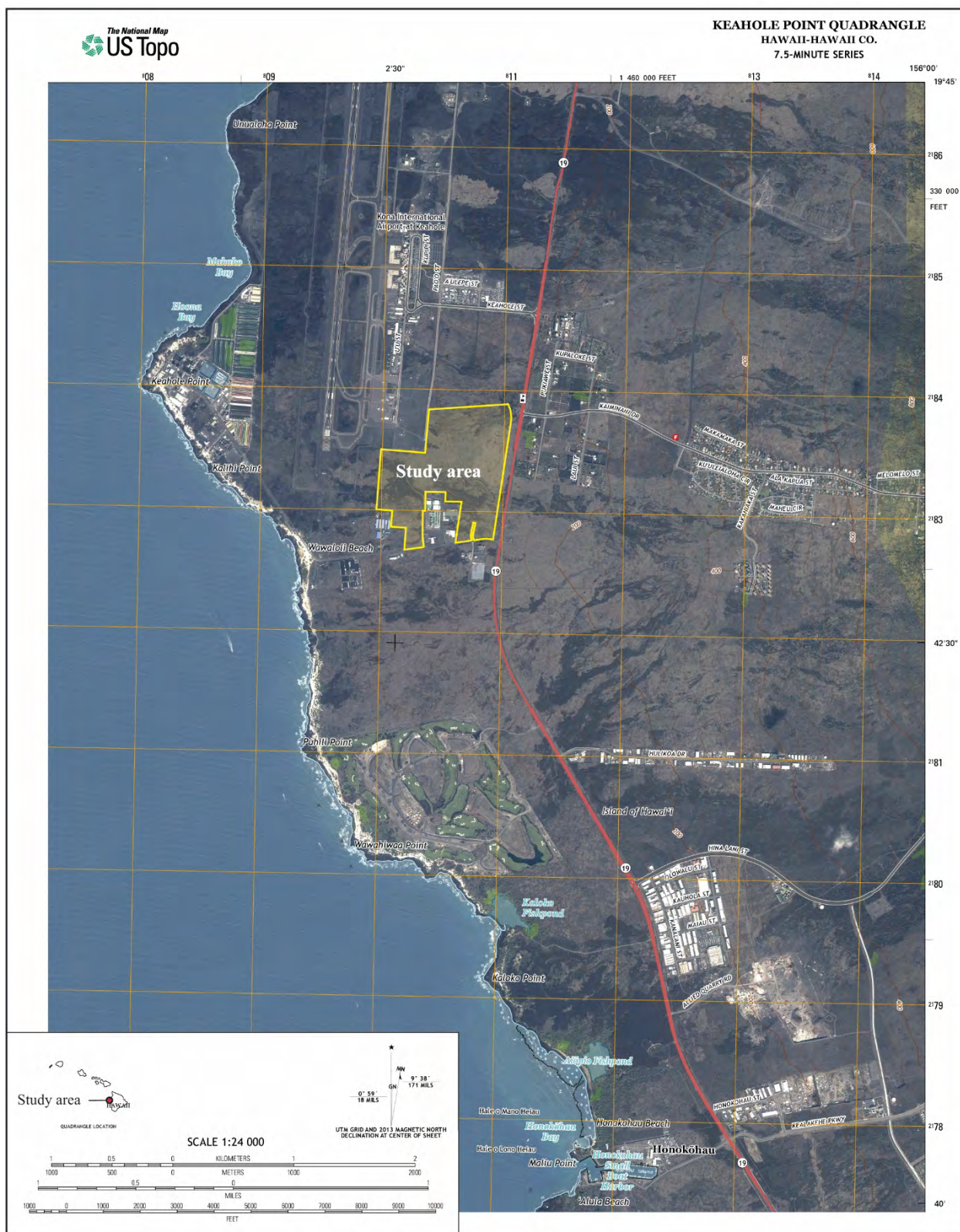
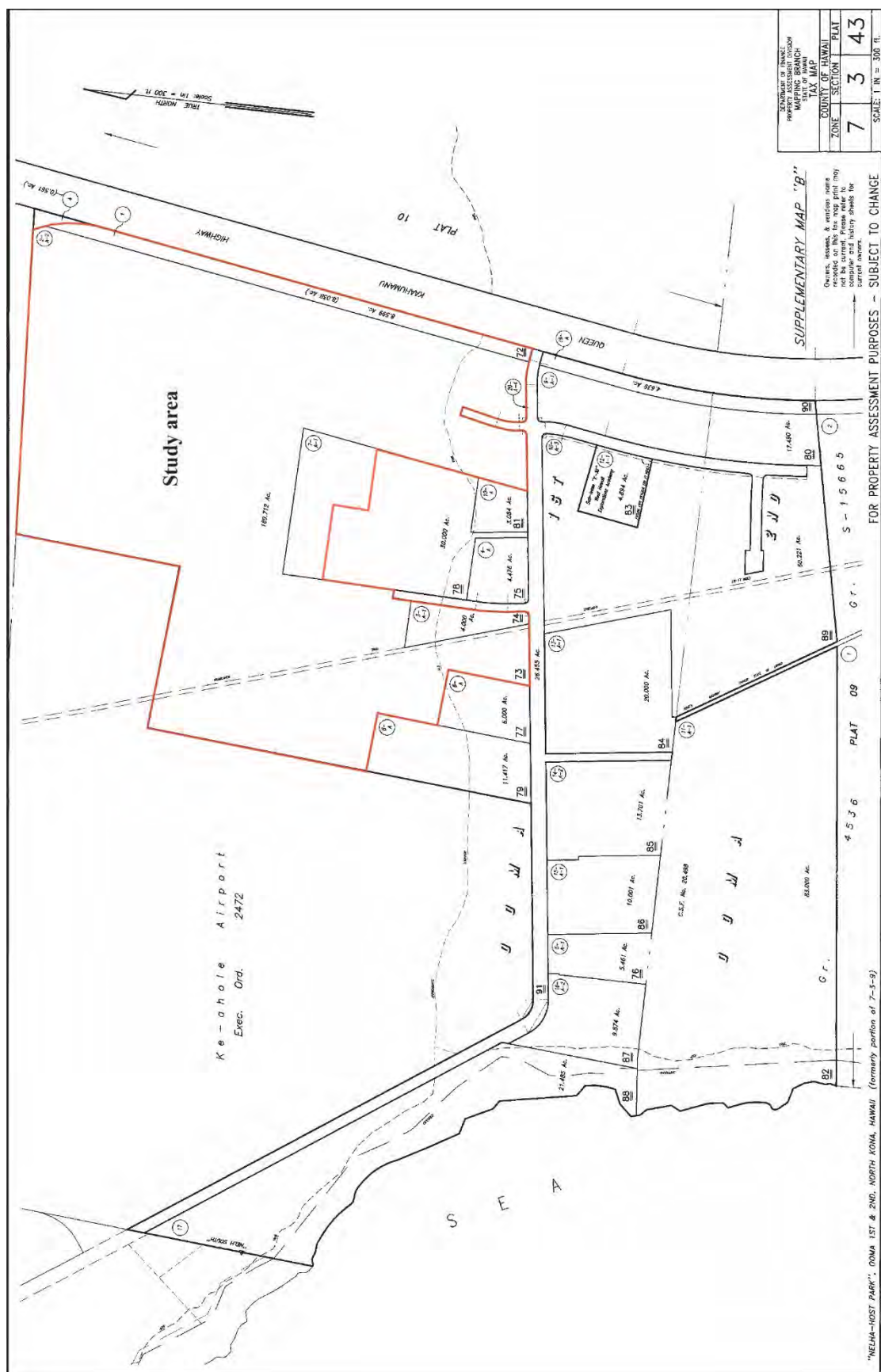


Figure 1. Study area location.



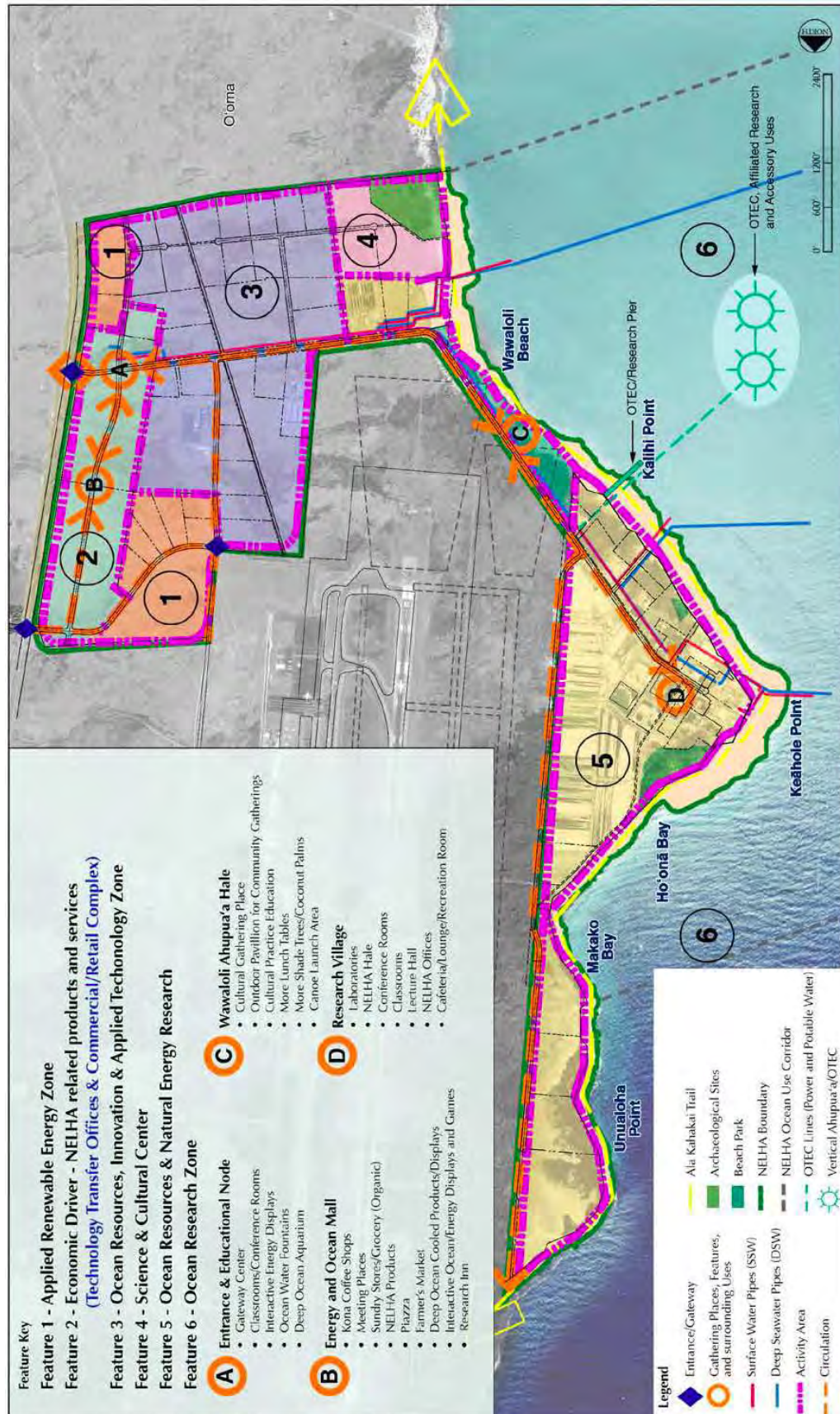


Figure 3. NELHA's Conceptual Master Plan (Group 70 2011).

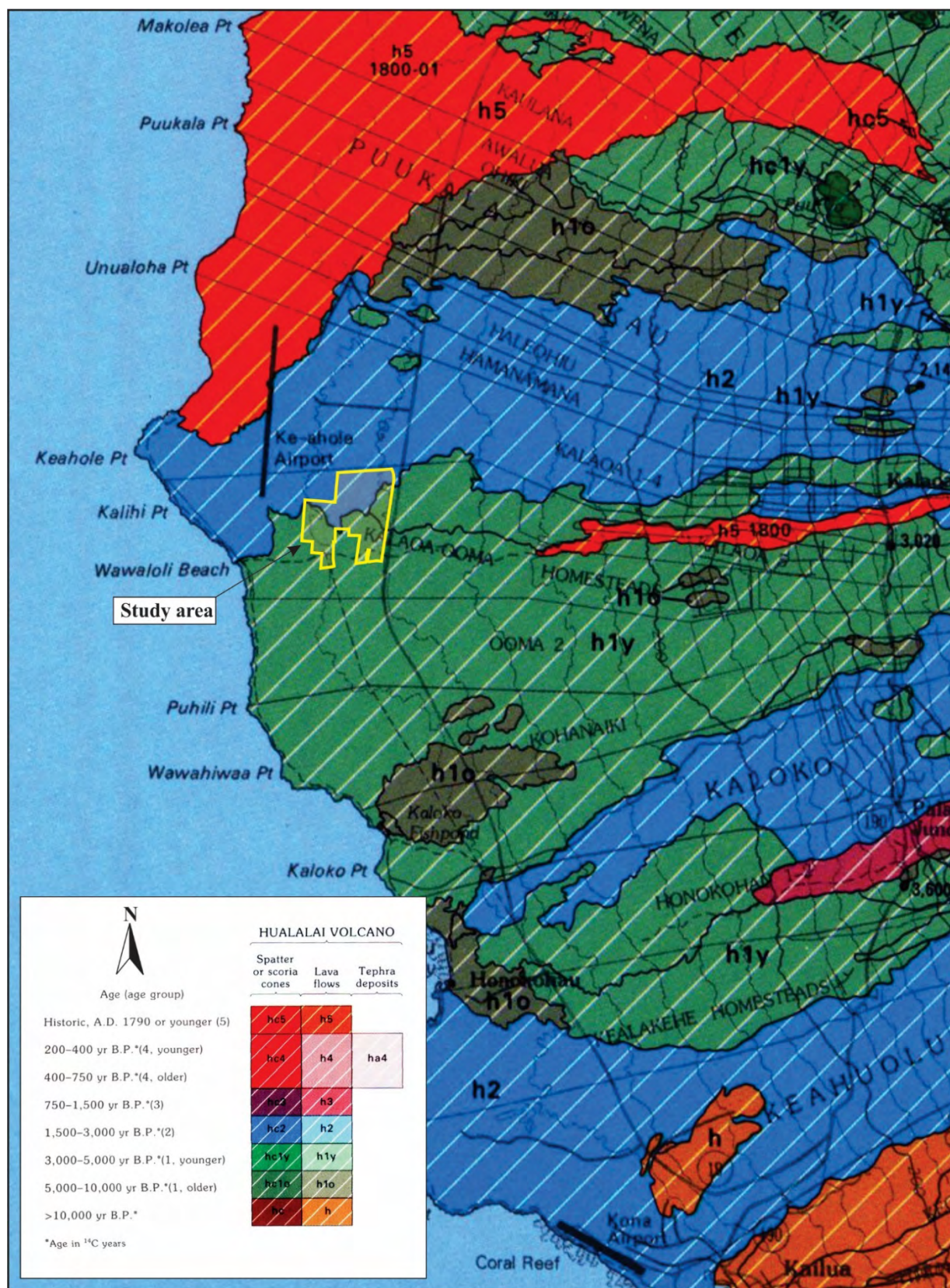
STUDY AREA DESCRIPTION

The current project area encompasses roughly 210 acres of undeveloped, State-owned lands (TMKs: (3) 7-3-043:072, 073, 074, and 078 por.) located north of Makako Bay Drive within NELHA's HOST Park at Keāhole Point, 'O'oma 1st and Kalaoa 5th *ahupua'a*, North Kona District, Island of Hawai'i (see Figures 1 and 2). Situated within the Kekaha region of North Kona, the principle environmental features of this area are a hot, dry climate, and extensive lava fields with little to no soil accumulation. Elevation within the study area ranges from roughly 12 to 40 meters (40 to 130 feet) above sea level, and the terrain is characterized by weathered *pāhoehoe* and 'a'ā flows that emanated from Hualālai Volcano between 1,500 and 5,000 years ago (Wolfe and Morris 1996). A *Geologic Map of the Island of Hawai'i* prepared by Wolfe and Morris (1996) shows two distinct lava flow groups crossing the NELHA lands, with the older lava substrate (h1y – 3,000 to 5,000 years B.P.) occurring in the southern portion of the current study area, and the younger lava substrate (h2 – 1,500 to 3,000 years B.P.) occurring in the northern portion (Figure 4). Very little soil has accumulated on the surface of these flows. Sato et al. (1973) designate the NELHA lands primarily as 'a'ā (rLV) and *pāhoehoe* (rLW) lava, with only a small amount of Punalu'u extremely rocky peat on 6 to 20 percent slopes (rPYD) occurring in the northeastern portion of the current study area adjacent to Queen Ka'ahumanu Highway (Figure 5).

In the field, the edges of four distinct lava flows are evident within the study area, two within each of the flow groups depicted by Wolfe and Morris (1996). The two lava flows of the older group (h1y-1 and h1y-2; Figure 6) form the lava substrate in the southern and northeastern portions of study area, with the more southern flow (h1y-1) consisting of weathered light brown *pāhoehoe* that has transitioned to dark brown slabby *pāhoehoe* and 'a'ā over much of its surface (Figure 7), and the more northeastern flow (h1y-2) consisting of weathered light brown *pāhoehoe* with some thin soil present in low spots that Sato et al. (1973) classify as Punalu'u extremely rocky peat (see Figure 5). A distinction between these two (h1y) lava flows is also made on the Wolfe and Morris (1996) map (see Figure 4). The two lava flows of the younger group (h2-1 and h2-2; see Figure 6) form the lava substrate in the northern portion of study area, with the most northern flow (h2-1) consisting of weathered light brown *pāhoehoe* that contains several lava tube entrances (Figure 8) and has transitioned to dark brown slabby *pāhoehoe* and 'a'ā in some areas, and the more southern flow (h2-2) consisting of silvery-black smooth *pāhoehoe* situated between the h2-1 flow and both the h1y flows. This flow appears to be the last to have occurred within the study area, as *kīpuka* of both the h1y-1 and h2-1 lava flows are evident within it (Figure 9).

The lower seaward slopes of the Kekaha region receive on average of only 10 inches of rain per year and have a mean annual temperature of 70 to 76 degrees Fahrenheit (Donham 1987). Consequently, the dominant vegetation within the current study area is primarily limited to fountain grass (*Pennisetum setaceum*) mixed with *uhualoa* (*Waltheria indica*), 'ilima (*Sida fallax*), and the occasional noni (*Morinda citrifolia*), Christmas-berry (*Schinus terebithifolius*), *kiawe* (*Prosopis pallida*), and *maiapilo* (*Capparis sandwichiana*). In general the vegetation cover (especially the fountain grass) is much thicker across the *pāhoehoe* flows in the upper portions of the study area near Queen Ka'ahumanu Highway (above roughly the 80-foot contour) than in the lower reaches (Figures 10 and 11). The amount of vegetation cover also varies by lava flow, with the 'a'ā flows containing almost no vegetation, and the older (h1y) *pāhoehoe* flows exhibiting thicker vegetation than the younger (h2) lava flows).

The study area is bounded to the east by the Queen Ka'ahumanu Highway (HWY 19) right-of-way, to the west and north by the Keāhole Airport property, and to the south by Makako Bay Drive (Figure 12) and five previously developed parcels within the HOST Park (including Koyo USA Corp., Enzimin, Hawai'i Deep Marine, Inc., Saver's Holding, Ltd., and Moana Technologies, LLC; see Figure 6). Parcel 072 (8.039 acres), adjacent to Queen Ka'ahumanu Highway, is designated a highway setback/open area, and will not be developed. Parcel 073, which makes up the bulk of the study area (189.712 acres), is planned as a mixed use area within the HOST Park (see Figure 3). Two paved stub roads (Kahilihili Street and Pāo'o Street; Figure 13) currently extend north from Makako Bay Drive for short distances into this parcel, and a section of Pāo'o Street has also been built south from the Keāhole Airport access road along its western boundary. Additionally, the Māmalahoa Trail (SIHP Site 2) crosses Parcel 073 within a 30-foot wide preservation easement (see Figure 2). A preservation plan previously prepared for this section of the trail (Rechtman and Clark 2004), stipulates that no construction or land modification is permitted within this preservation easement, and no buildings or fences will be erected (or ground-altering activity permitted) within an area extending an additional 10 feet on either side of the easement. Parcel 074 (4.0 acres), next to Makako Drive between the Māmalahoa Trail alignment and Pāo'o Street, is currently leased by the Ocean Institute, but has not been subject to any widespread development activity. Parcel 078 (30 acres) is currently leased to Koyo USA Corp., and current contains a deep sea water bottling plant; only a roughly 8 acre undeveloped portion of this parcel at its northern end is included in the current study area.



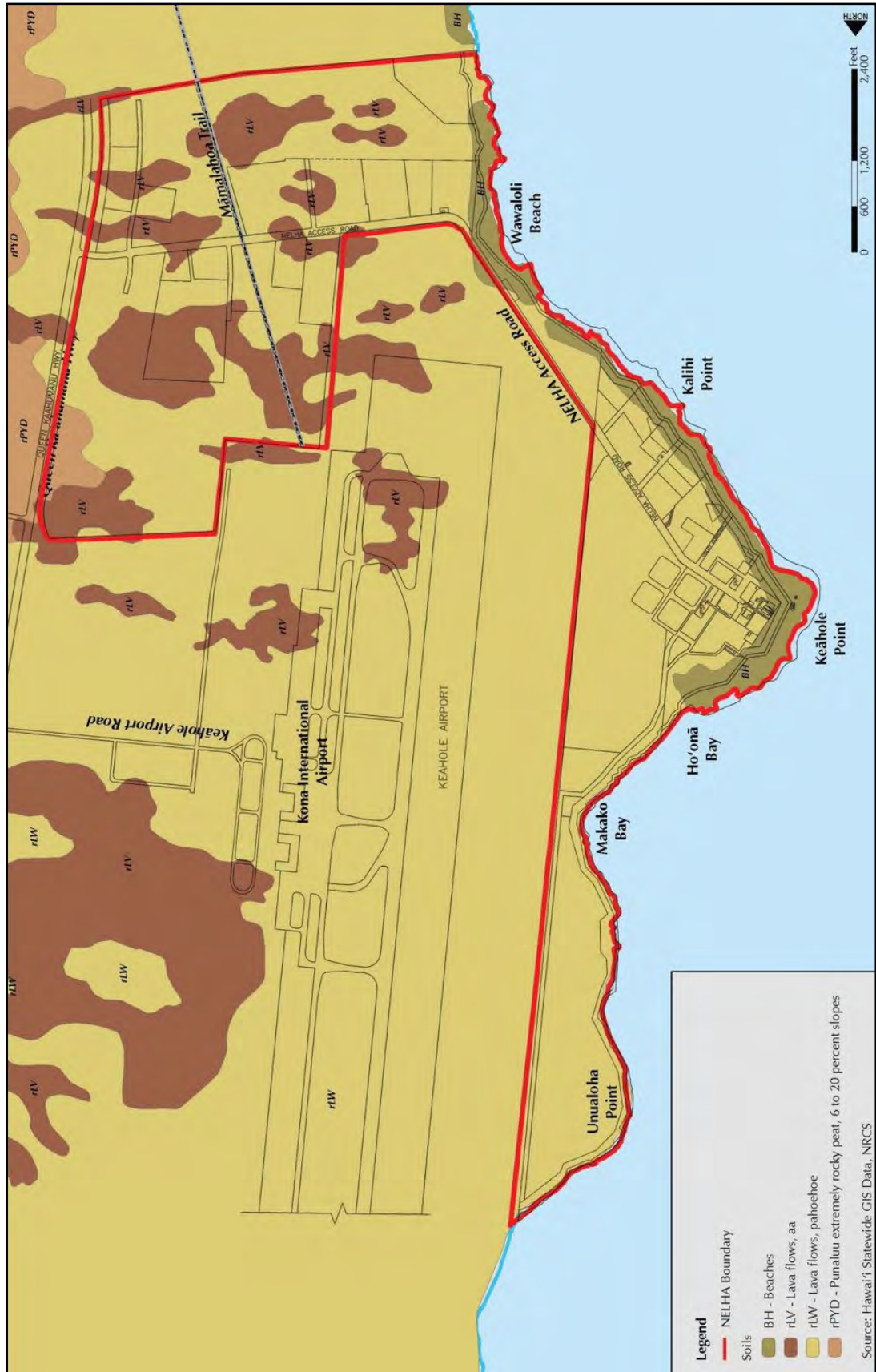


Figure 5. Soil map of the NELHA lands (from Group 70 2011).



Figure 6. Google Earth™ aerial image of the current study area showing the existing HOST Park infrastructure.



Figure 7. *Pāhoehoe* to *ʻaʻā* transition within the h1y-1 lava flow, view to the northwest.



Figure 8. Lava tube entrances in the surface of the h2-1 *pāhoehoe* flow, view to the west.



Figure 9. Small *kīpuka* of the h1y-1 lava flow (light brown) within the h2-2 lava flow (silvery-black), view to the southwest.



Figure 10. Vegetation on the h1y-2 lava flow near Queen Ka'ahumanu Highway, view to the west.



Figure 11. Vegetation on the h2-2 and h1y-1 ('a 'ā) lava flows near the western boundary of the study area, view to the east.



Figure 12. Makako Bay Drive along the southern edge of the current study area, view to the west.



Figure 13. Pāo'o Street, view to the north from Makako Bay Drive.

Modern disturbance within the study parcels is limited to some bulldozed and graded areas adjacent to Makako Bay Drive (Figure 14), within the northern portion of Parcel 078, at one area adjacent to Queen Ka'ahumanu Highway, and at one area on an 'a'ā flow adjacent to the western boundary; also several bulldozer paths (Figure 15) that, with the exception of one that follows the boundary of Parcel 078 and one that parallels Makako Bay Drive for a short distance, appear to have been created to access geotechnical boring locations. Finally, two areas near the Queen Ka'ahumanu Highway right-of way within Parcels 072 and 073 have been quarried for rock material by modern rock wall builders. These modern quarry locations include a large area on the h1y-2 lava flow (near the bulldozed, graded area next to the highway) where much of the *pāhoehoe* surface has been removed, and a series of smaller excavations on the h1y-1 *pāhoehoe* flow where associated modern debris (soda and beer cans) indicates that rocks were removed by modern individuals (see Figure 6). Some additional rock removal also appears to have occurred at selected locations along Makako Bay Drive, but in this area the disturbance is not widespread.



Figure 14. Bulldozed, graded area along Makako Bay, view to the north.

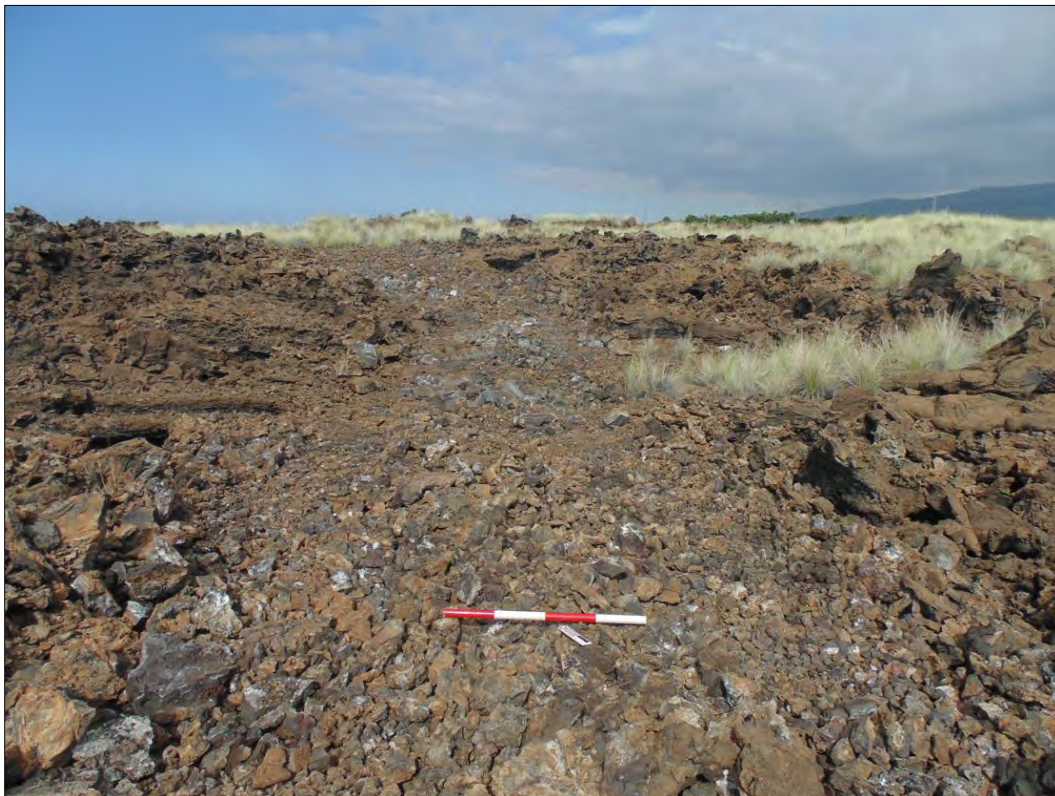


Figure 15. Bulldozed path used to access a geotechnical boring location, view to the north.

2. BACKGROUND

To generate a set of expectations regarding the nature of historic properties that might be encountered within the study area, and to establish an environment within which to assess the significance of any such resources, a general historical context for the region and archaeological studies previously conducted in the vicinity of the current study area are summarized.

CULTURE-HISTORICAL CONTEXT

One of the potential shortcomings of the earlier archaeological studies conducted by Barrera (1985a; 1989) within the NELHA's HOST Park lands, given current regulatory standards and practices, was in not providing sufficiently detailed cultural and historical contexts. While the physical study area for the current project is limited to a roughly 210-acre portion of 'O'oma 1st and Kalaoa 5th *ahupua'a* identified as TMK: (3) 7-3-043: 072, 073, 074, and 078 (por.), in an effort to provide a comprehensive and holistic understanding of the current study area, this section of the report examines the entire *ahupua'a* and their relationship to neighboring lands within the larger Kekaha region.

Rechtman and Maly (2003) and Rechtman (2006) previously prepared a Cultural Impact Assessments for this general region of North Kona. Extensive research for the Rechtman and Maly (2003) study was conducted by Kepā and Onaona Maly of Kumu Pono Associates using archival-historical resources found in the collections of the Hawai'i State Archives (HSA), State Land Division (LD), State Survey Division (SD), and State Bureau of Conveyances (BoC); the Bishop Museum Archives (BPBM); Hawaiian Historical Society (HHS); University of Hawai'i-Hilo Mo'okini Library; private family collections; and in the collection of Kumu Pono Associates. The Malys reviewed archival-historical literature from both Hawaiian and English language sources, including an examination of Hawaiian Land Commission Award records from the *Māhele 'Āina* (Land Division) of 1848; survey records of the Kingdom and Territory of Hawai'i; and historical texts authored or compiled by Malo (1951), I'i (1959), Kamakau (1961, 1964, 1976, and 1991), Ellis (1963), Fornander (1916-1919 and 1996), Thrum (1908), Stokes and Dye (1991), Beckwith (1970), Reinecke (n.d.); and Handy and Handy with Pukui (1972). Also reviewed were several native accounts from Hawaiian language newspapers (compiled and translated from Hawaiian to English, by Kepā Maly), and historical narratives authored by eighteenth and nineteenth century visitors to the region. The information was presented within thematic categories and ordered chronologically by the date of publication.

Much of the following discussion of culture-historical context for the Kekaha region is reproduced (modified and reorganized slightly) from the comprehensive background sections presented in the Rechtman and Maly (2003) and Rechtman (2006) cultural impact studies. Additional information and emphasis has been added in some sections to elucidate and highlight people, places, and events associated specifically with the current study area. It is a comprehension of this background information that facilitates a more complete understanding of the potential significance of the resources that exist within the current study area.

Natural and Cultural Resources in a Hawaiian Context

In Hawaiian society, natural and cultural resources are one and the same. Native traditions describe the formation (the literal birth) of the Hawaiian Islands and the presence of life on and around them in the context of genealogical accounts. All forms in the natural environment, from the skies and mountain peaks, to the watered valleys and lava plains, and to the shoreline and ocean depths were believed to be embodiments of Hawaiian deities. One Hawaiian genealogical account, records that Wākea (the expanse of the sky—father) and Papa-hānau-moku (Papa—Earth—mother who gave birth to the islands)—also called Haumea-nui-hānau-wā-wā (Great Haumea—Woman-earth born time and time again)—and various gods and creative forces of nature, gave birth to the islands. Hawai'i, the largest of the islands, was the first-born of these island children. As the Hawaiian genealogical account continues, we find that these same god-beings, or creative forces of nature who gave birth to the islands, were also the parents of the first man (Hāloa), and from this ancestor, all Hawaiian people are descended (cf. Beckwith 1970; Malo 1951:3; Pukui and Korn 1973). It was in this context of kinship, that the ancient Hawaiians addressed their environment and it is the basis of the Hawaiian system of land use.

An Overview of Hawaiian Settlement

Archaeologists and historians describe the inhabiting of these islands in the context of settlement that resulted from voyages taken across the open ocean. For many years, researchers have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawai'i were underway by A.D. 300, with long distance voyages occurring fairly regularly through at least the thirteenth century. It has been generally reported that the sources of the early Hawaiian population—the Hawaiian Kahiki—were the Marquesas and

Society Islands (Cordy 2000; Emory in Tatar 1982:16-18). More recently, Kirch (2011) has suggested that initial settlement of Hawaii may not have occurred until about A.D. 1000.

For generations following initial settlement, communities were clustered along the watered, windward (*ko‘olau*) shores of the Hawaiian Islands. Along the *ko‘olau* shores, streams flowed and rainfall was abundant, and agricultural production became established. The *ko‘olau* region also offered sheltered bays from which deep sea fisheries could be easily accessed, and near shore fisheries, enriched by nutrients carried in the fresh water, could be maintained in fishponds and coastal waters. It was around these bays that clusters of houses where families lived could be found (McEldowney 1979:15). In these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1972:287).

Following the initial settlement period, areas with the richest natural resources became populated and perhaps crowded, and by about A.D. 1200, the population began expanding to the *kona* (leeward side) and more remote regions of the island (Cordy 2000:130). In Kona, communities were initially established along sheltered bays with access to fresh water and rich marine resources. The primary “chiefly” centers were established at several locations—the Kailua (Kaiakeakua) vicinity, Kahalu‘u-Keauhou, Ka‘awaloa-Kealahakua, and Hōnaunau. The communities shared extended familial relations, and there was an occupational focus on the collection of marine resources. By the fourteenth century, inland elevations to around the 3,000-foot level were being turned into a complex and rich system of dryland agricultural fields (today referred to as the Kona Field System). By the fifteenth century, residency in the uplands was becoming permanent, and there was an increasing separation of the chiefly class from the common people. In the sixteenth century the population stabilized and the *ahupua‘a* land management system was established as a socioeconomic unit (see Ellis 1963; Handy et al. 1972; Kamakau 1961; Kelly 1983; and Tomonari-Tuggle 1985).

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

In the 1920s-1930s, Handy et al. (1972) conducted extensive research and field interviews with elder native Hawaiians. In lands of North and South Kona, they recorded native traditions describing agricultural practices and rituals associated with rains and water collection. Primary in these rituals and practices was the lore of Lono—a god of agriculture, fertility, and the rituals for inducing rainfall. Handy et al., observed:

The sweet potato and gourd were suitable for cultivation in the drier areas of the islands. The cult of Lono was important in those areas, particularly in Kona on Hawai‘i . . . there were temples dedicated to Lono. The sweet potato was particularly the food of the common people. The festival in honor of Lono, preceding and during the rainy season, was essentially a festival for the whole people, in contrast to the war rite in honor of Ku which was a ritual identified with Ku as god of battle. (Handy et al. 1972:14)

Handy et al. (1972) noted that the worship of Lono was centered in Kona. Indeed, it was while Lono was dwelling at Keauhou, that he is said to have introduced taro, sweet potatoes, yams, sugarcane, bananas, and ‘*awa* to Hawaiian farmers (Handy et al. 1972:14). The rituals of Lono “The father of waters” and the annual *Makahiki* festival, which honored Lono and which began before the coming of the *kona* (southerly) storms and lasted through the rainy season (the summer months), were of great importance to the native residents of this region (Handy et al. 1972: 523). The significance of rituals and ceremonial observances in cultivation and indeed in all aspects of life was of great importance to the well-being of the ancient Hawaiians, and cannot be overemphasized, or overlooked when viewing traditional sites of the cultural landscape.

Hawaiian Land Use and Resource Management Practices

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

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

Kona, like other large districts on Hawai'i, was further divided into *'okana* or *kalana* (regions of land smaller than the *moku-o-loko*, yet comprising a number of smaller units of land). In the region now known as Kona 'akau (North Kona), there are several ancient regions (*kalana*) as well. The southern portion of North Kona was known as "Kona kai 'ōpua" (interpretively translated as: Kona of the distant horizon clouds above the ocean), and included the area extending from Lanihau (the present-day vicinity of Kailua Town) to Pu'uohau (now known as Red Hill). The northern-most portion of North Kona was called "Kekaha" (descriptive of an arid coastal place). Native residents of the region affectionately referred to their home as *Kekaha-wai-'ole o nā Kona* (Waterless Kekaha of the Kona District), or simply as the *āina kaha*. It is within this region of Kekaha, that the lands of 'O'oma and Kalaoa are found.

The *ahupua'a* were also divided into smaller individual parcels of land (such as the *'ili*, *kō'ele*, *māla*, and *kīhāpai*, etc.), generally oriented in a *mauka-makai* direction, and often marked by stone alignments (*kuaiwi*). In these smaller land parcels the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people, who lived in a given *ahupua'a* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *ali'i* (see Kamakau 1961:372-377 and Malo 1951:63-67).

Entire *ahupua'a*, or portions of the land were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *ali'i-'ai-ahupua'a* (chief who controlled the *ahupua'a* resources). The *ali'i-'ai-ahupua'a* in turn answered to an *ali'i-'ai-moku* (chief who claimed the abundance of the entire district). Thus, *ahupua'a* resources supported not only the *maka'āinana* and *'ohana* who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning. In this system, the land provided fruits and vegetables and some meat in the diet, and the ocean provided a wealth of protein resources. Also, in communities with long-term royal residents, divisions of labor (with specialists in various occupations on land and in procurement of marine resources) came to be strictly adhered to. It is in this cultural setting that we find the present study area.

The *ahupua'a* of 'O'oma (historically, 'O'oma 1st and 2nd) and Kalaoa (historically, Kalaoa 1st – 5th) are two of some twenty ancient *ahupua'a* within the *'okana* of Kekaha-wai-'ole. The place name 'O'oma can be literally translated as concave. The place name Kalaoa can be literally translated as "the choker (as a stick for catching eels)" (Pukui et al. 1974:75). To date, no tradition explaining the source of the place names has been located. A few place names within 'O'oma were discussed in traditional accounts, thus we have some indication of the histories associated with that land.

While there are only limited native accounts that have been recorded about 'O'oma, we do know that the land was so esteemed, that during the youth of Kaiuikaouli (later known as Kamehameha III), the young prince—son of Kamehameha I and his sacred wife Keōpūolani—was taken to be raised near the shore of 'O'oma under the care of his stewards from infancy until he was five years old (Kamakau 1961:263-264). Again, this is a significant part of the history of this land, as great consideration went into all aspects of the young king's upbringing (see I'i 1959 and Kamakau 1961).

The Environmental Setting of 'O'oma and Kalaoa

The *ahupua'a* of 'O'oma and Kalaoa cross several environmental zones that are generally called *wao* in the Hawaiian language. These environmental zones include the near-shore fisheries and shoreline strand (*kahakai*) and the *kula kai/kula uka* (shoreward/inland plains). These regional zones were greatly desired as places of residence by the natives of the land.

While the *kula* region is now likened to a volcanic desert, native and historic accounts describe or reference groves of native hardwood shrubs and trees such as *'ūlei* (*Osteomeles anthyllidifolia*), *ēlama* (*Diospyros ferrea*), *uhiuhi* (*Caesalpinia kawaiensis*), and *ohe* (*Reynoldsia sandwicensis*) extending across the land and growing some distance shoreward. The few rare and endangered plants found in the region, along with small remnant communities of native dryland forest (Char 1991) give an indication that there was a significant diversity of plants growing upon the *kula* lands prior to the introduction of ungulates.

The lower *kula* lands receive only about 10 to 20 inches of rainfall annually, and it is because of their dryness, the larger region of which ‘O‘oma and Kalaoa are a part, is known as “Kekaha.” While on the surface, there appears to be little or no potable water to be found, the very lava flows which cover the land contain many underground streams that are channeled through subterranean lava tubes which feed the springs, fishponds and anchialine ponds on the *kula kai* (coastal flats). Also in this region, on the flat lands, about a half-mile from the shore, is the famed *Alanui Aupuni* (Government Trail), built in 1847, at the order of Kamehameha III. This trail or government roadway, was built to meet the needs of changing transportation in the Hawaiian Kingdom, and in many places it overlays the older near shore *ala loa* (ancient foot trail that encircled the island).

Continuing into the *kula uka* (inland slopes), the environment changes as elevation increases. This zone is called the *wao kanaka* (region of man) and *wao nahele* (forest region). Rainfall increases to 30 or 40 inches annually, and taller forest growth occurred. This region provided native residents with shelter for residential and agricultural uses, and a wide range of natural resources that were of importance for religious, domestic, and economic purposes. In ‘O‘oma and Kalaoa, this region is generally between the 1,200 to 2,200 foot elevation, and is crossed by the present-day Māmalahoa Highway. The highway is situated not far below the ancient *ala loa*, or foot trail, also known as *Ke-ala‘ehu*, and was part of a regional trail system passing through Kona from Ka‘ū and Kohala.

The ancient Hawaiians saw (as do many Hawaiians today) all things within their environment as being interrelated. That which was in the uplands shared a relationship with that which was in the lowlands, coastal region, and even in the sea. This relationship and identity with place worked in reverse as well, and the *ahupua‘a* as a land unit was the thread that bound all things together in Hawaiian life. In an early account written by Kihe (in *Ka Hōkū o Hawai‘i*, 1914-1917), with contributions by John Wise and Steven Desha Sr., the significance of the dry season in Kekaha and the custom of the people departing from the uplands for the coastal region is further described:

... ‘Oia ka wā e ne‘e ana ka lā iā Kona, hele a malo ‘o ka ‘āina i ka ‘ai kupakupa ‘ia e ka lā, a o nā kōnaka, nā li ‘i o Kona, pūhe‘e aku la a noho i kahakai kāhi o ka wai e ola ai nā kōnaka – It was during the season, when the sun moved over Kona, drying and devouring the land, that the chiefs and people fled from the uplands to dwell along the shore where water could be found to give life to the people. (*Ka Hōkū o Hawai‘i*, April 5, 1917 translated by Kepā Maly)

It appears that the practice of traveling between upland and coastal communities in the ‘O‘oma and Kalaoa *ahupua‘a* greatly decreased by the middle nineteenth century. Indeed, the only claimant for *kuleana* land in ‘O‘oma, during the *Māhele ‘Āina* of 1848—when native tenants were allowed to lay claim to lands on which they lived and cultivated—noted that he was the only resident in ‘O‘oma at the time (see *Helu* 9162 to Kahelekahi, in this study). This is perhaps explained by the fact that at time of the *Māhele* there was a significant decline in the Hawaiian population, and changes in Hawaiian land tenure led to the relocation of many individuals from various lands.

Native Traditions and Historical Accounts of ‘O‘oma, Kalaoa and the Kekaha Region

This section of the study presents *mo‘olelo*—native traditions and historical accounts (some translated from the original Hawaiian by Kepā Maly)—of the Kekaha region that span several centuries. There are very few accounts that have been found to date, that specifically mention ‘O‘oma and Kalaoa. Thus, narratives that describe neighboring lands within the Kekaha region help provide an understanding of the history of these *ahupua‘a*, describing features and the use of resources that were encountered on the land.

It may be that the reason there are so few accounts for ‘O‘oma, and Kalaoa is that those *ahupua‘a* may have been considered marginal settlement areas, occupied only after the better situated lands of Kekaha—those lands with the sheltered bays, and where fresh water could be easily obtained—were populated. As the island population grew, so too did the need to expand to more remote or marginal lands. This thought is found in some of the native traditions and early historic accounts below. However, as people populated the Kekaha lands, they came to value its fisheries—those of the deep sea, near shore, and inland fishponds.

Punia: A Tale of Sharks and Ghosts of Kekaha

The native account of Punia (also written Puniaiki – cf. Kamakau 1964), is perhaps among the earliest accounts of the Kekaha area, and in it is found a native explanation for the late settlement of Kekaha. The following narratives are paraphrased from Fornander’s *Hawaiian Antiquities and Folklore* (Fornander 1959):

Punia was born in the district of Kohala, and was one of the children of Hina. One day, Punia desired to get lobster for his mother to eat, but she warned him of Kai‘ale‘ale and his hordes of sharks who guarded the caves in which lobster were found. These sharks were greatly feared by all who lived along, and fished the shores of Kohala for many people had been killed by the sharks. Heeding his

mother's warning, Punia observed the habits of the sharks and devised a plan by which to kill each of the sharks. Setting his plan in motion, Punia brought about the deaths of all the subordinate sharks, leaving only Kai'ale'ale behind. Punia tricked Kai'ale'ale into swallowing him whole. Once inside Kai'ale'ale, Punia rubbed two sticks together to make a fire to cook the sweet potatoes he had brought with him. He also scraped the insides of Kai'ale'ale, causing great pain to the shark. In his weakened state, Kai'ale'ale swam along the coast of Kekaha, and finally beached himself at Alula, near the point of Maliu in the land of Kealakehe. The people of Alula, cut open the shark and Punia was released.

At that time Alula was the only place in all of Kekaha where people could live, for all the rest of the area was inhabited by ghosts. When Punia was released from the shark, he began walking along the trail, to return to Kohala. While on this walk, he saw several ghosts with nets all busy tying stones for sinkers to the bottom of the nets, and Punia called out in a chant trying to deceive the ghosts and save himself:

<i>Auwe no hoi kuu makuakane o keia kaha e!</i>	Alas, O my father of these coasts!
<i>Elua wale no maua lawaia o keia wahi.</i>	We were the only two fishermen of this place (Kaha).
<i>Owau no o ko'u makuakane,</i>	Myself and my father,
<i>E hoowili aku ai maua i ka ia o ianei,</i>	Where we used to twist the fish up in the nets,
<i>O kala, o ka uhu, o ka palani,</i>	The kala, the uhu, the palani,
<i>O ka ia ku o ua wahi nei la,</i>	The transient fish of this place.
<i>Ua hele wale ia no e maua keia kai la!</i>	We have traveled over all these seas,
<i>Pau na kuuna, na lua, na puka ia.</i>	All the different place, the holes, the runs.
<i>Make ko'u makuakane, koe au.</i>	Since you are dead, father, I am the only one left.

Hearing Punia's wailing, the ghosts said among themselves, "Our nets will be of some use now, since here comes a man who is acquainted with this place and we will not be letting down our nets in the wrong place." They then called out to Punia, "Come here." When Punia went to the ghosts, he explained to them, the reason for his lamenting; "I am crying because of my father, this is the place where we used to fish. When I saw the lava rocks, I thought of him." Thinking to trick Punia and learn where all the ku'una (net fishing grounds) were, the ghosts told Punia that they would work under him. Punia went into the ocean, and one-by-one and two-by-two, he called the ghosts into the water with him, instructing them to dive below the surface. As each ghost dove into the water, Punia twisted the net entangling the ghosts. This was done until all but one of the ghosts had been killed. That ghost fled and Kekaha became safe for human habitation. (Fornander 1959:9-17)

One of the earliest datable accounts that describes the importance of the Kekaha region fisheries comes from the mid-sixteenth century, following 'Umi-a-Liloa's unification of the island of Hawai'i under his rule. Writing in the 1860s, native historian, Samuel Mānaiakalani Kamakau (1961) told readers about the reign of 'Umi, and his visits to Kekaha:

'Umi-a-Liloa did two things with his own hands, farming and fishing...and farming was done on all the lands. Much of this was done in Kona. He was noted for his skill in fishing and was called Pu'ipu'i a ka lawai'a (a stalwart fisherman). Aku fishing was his favorite occupation, and it often took him to the beaches (Ke-kaha) from Kalahuipua'a to Makaula^[1]. He also fished for 'ahi and kala. He was accompanied by famed fishermen such as Pae, Kahuna, and all of the chiefs of his kingdom. He set apart fishing, farming and other practices... (Kamakau 1961:19-20)

In his accounts of events at the end of 'Umi's life, Kamakau (1961) references Kekaha once again. He records that Ko'i, one of the faithful supporters and a foster son of 'Umi, sailed to Kekaha, where he killed a man who resembled 'Umi. Ko'i then took the body and sailed to Maka'eo in the *ahupua'a* of Keahuolu. Landing at Maka'eo in the night, Ko'i took the body to the cave where 'Umi's body lay. Replacing 'Umi's body with that of the other man, Ko'i then crossed the lava beds, returning to his canoe at Maka'eo. From there, 'Umi's body was taken to its' final resting place... (Kamakau 1961:32-33).

As a child in ca. 1812, Hawaiian historian John Papa I'i passed along the shores of Kekaha in a sailing ship, as a part of the procession by which Kamehameha I returned to Kailua-Kona from his residency on O'ahu. In his narratives, I'i described the shiny lava flows and fishing canoe fleets of the "Kaha" (Kekaha) lands:

¹ Kalāhuipua'a is situated in the district of Kohala, bounding the northern side of Pu'uanahulu in Kekaha. Maka'ula is situated a few *ahupua'a* north of 'O'oma.

The ship arrived outside of Kaeleluluhulu, where the fleet for aku fishing had been since the early morning hours. The sustenance of those lands was fish.

When the sun was rather high, the boy [I'i] exclaimed, "How beautiful that flowing water is!" Those who recognized it, however, said, "That is not water, but pahoehoe. When the sun strikes it, it glistens, and you mistake it for water..."

Soon the fishing canoes from Kawaihae, the Kaha lands, and Ooma drew close to the ship to trade for the pa'i'ai (hard poi) carried on board, and shortly a great quantity of aku lay silvery-hued on the deck. The fishes were cut into pieces and mashed; and all those aboard fell to and ate, the women by themselves.

The gentle Eka sea breeze of the land was blowing when the ship sailed past the lands of the Mahaiulas, Awalua, Haleohiu, Kalaoas, Hoona, on to Oomas, Kohanaiki, Kaloko, Honokohaus, and Kealakehe, then around the cape of Hiiakanoholae... (I'i 1959:109-110)

Ka-Lani-Kau-i-ke-Aouli (Kamehameha III)

In ca. 1813, Ka-lani Kau-i-ke-aouli, who grew up to become Kamehameha III, was born. S.M. Kamakau (1961) tells us that the baby appeared to be still-born, but that shortly after birth, he was revived. Upon the revival of the baby, he was given to the care of Ka-iki-o-'ewa, who with Keawe-a-mahi and family, raised the child in seclusion at 'O'oma for the first five years of the young king's life. Kauikeaouli apparently held some interest in the land of 'O'oma 2nd through the *Māhele 'Āina*, as he originally claimed 'O'oma 2nd as his personal property, but later gave it up to the Kingdom (see records of *Māhele 'Āina* in this study).

Kamakau provides us with the following description of Kauikeaouli's birth and early life at 'O'oma:

Ka-lani-kau-i-ke-aouli was the second son of Ke-opu-o-lani by Kamehameha, and she called him Kiwala'o after her own father. She was the daughter of Kiwala'o and Ke-ku'i-apo-iwa Liliha, both children of Ka-Iola Pupuka-o-Hono-ka-wai-lani, and hence she [Ke-opu-o-lani] was a *ni 'aupi'o* and a *naha* chiefess, and the *ni 'aupi'o* rank descended to her children and could not be lost by them. While she was carrying the child [Kau-i-ke-aouli] several of the chiefs begged to have the bringing up of the child, but she refused until her *kahu*, Ka-lua-i-konahale, known as Kua-kini, came with the same request. She bade him be at her side when the child was born lest someone else get possession of it. He was living this side of Keauhou in North Kona, and Ke-opu-o-lani lived on the opposite side.

On the night of the birth the chiefs gathered about the mother. Early in the morning the child was born but as it appeared to be stillborn Kua-kini did not want to take it. Then came Ka-iki-o-'ewa from some miles away, close to Kuamo'o, and brought with him his prophet who said, "The child will not die, he will live." This man, Ka-malo-'ihi or Ka-pihe by name, came from the Napua line of kahunas descended from Makua-kau-mana whose god was Ka-'onohi-o-ka-la (similar to the child of God). The child was well cleaned and laid upon a consecrated place and the seer (*kaula*) took a fan (*pe'ahi*), fanned the child, prayed, and sprinkled it with water, at the same time reciting a prayer addressed to the child of God, something like that used by the Roman Catholics—

"He is standing up, he is taking a step, he walks"
(*Kulia-la, ka'ina-la, hele ia la*).

Or another—

*Huila ka lani i ke Akua,
Lapalapa ka honua i ke keiki
E ke keiki e, hooua i ka punohu lani,
Aia i ka lani ka Haku e,
O ku'u 'uhane e kahe mau,
I la'a i kou kanawai.*

The heavens lighten with the god,
The earth burns with the child,
O son, pour down the rain that brings the rainbow,
There in heaven is the Lord.
Life flows through my spirit,
Dedicated to your law.

The child began to move, then to make sounds, and at last it came to life. The seer gave the boy the name of "The red trail" (Ke-aweawe-'ula) signifying the roadway by which the god descends from the heavens.

Ka-iki-o-'ewa became the boy's guardian and took him to rear in an out-of-the-way place at 'O'oma, Kekaha. Here Keawe-a-mahi, the lesser chiefs, the younger brothers and sisters of Ka-iki-o-'ewa, and their friends were permitted to carry the child about and hold him on their laps (*uha*). Ka-pololu

was the chief who attended him; Ko'i-pepeleleu and Ulu-nui's mother [were] the nurses who suckled him. Later Ka-'ai-kane gave him her breast after she had given birth to Ke-kahu-pu'u. Here at 'O'oma he was brought up until his fifth year, chiefly occupied with his toy boats rigged like warships and with little brass cannon loaded with real powder mounted on [their] decks. The firing off of these cannon amused him immensely. He excelled in foot races. On one occasion when the bigger boys had joined in the sport, a [rascal] boy named Ka-hoa thought to play a practical joke by smearing with mud the stake set up to be grasped by the one who first reached the goal. He expected one of the larger boys to be the winner, but it was the little prince who first caught the stick and had his hands smeared. "You will be burnt alive for dirtying up the prince. We are going to tell Ka-pololu on you!" the boys threatened; but the prince objected, saying, "Anyone who tells on him shall never eat with me again or play with me and I will never give him anything again." Kau-i-ke-aouli was a splendid little fellow. He loved his playmates and never once did them any hurt, and he was kind and obedient to his teachers... (Kamakau 1961:263-264)

"Kaa'o Hooniua Puuwai no Ka-Miki" (The Heart stirring Story of Ka-Miki)

It is not until the early twentieth century, that we find a few detailed native accounts which tell of traditional features and residents of 'O'oma, Kalaoa, and the vicinity. The writings of John Whalley Hermosa Isaac Kihe, a native son of Kekaha, in Hawaiian language newspapers (translated by Kepā Maly from the original Hawaiian texts), share the history of the land and sense the depth of attachment that native residents felt for 'O'oma, Kalaoa, and the larger Kekaha-wai-'ole-o-nā-Kona.

Kihe (who also wrote under the name of Ka-'ohu-ha'aheo-i-nā-kuahiwi-'ekolu) was born in 1853, his parents were native residents of Honokōhau and Kaloko (his grandfather, Kuapāhoa, was a famed kahuna of the Kekaha lands). During his life, Kihe taught at various schools in the Kekaha region; served as legal counsel to native residents applying for homestead lands in 'O'oma and vicinity; worked as a translator on the Hawaiian Antiquities collections of A. Fornander; and was a prolific writer himself. In the later years of his life, Kihe lived at Pu'u Anahulu and Kalaoa, and he is fondly remembered by elder kama'āina of the Kekaha region. Kihe, who died in 1929, was also one of the primary informants to Eliza Maguire, who translated some of the writings of Kihe, publishing them in abbreviated form in her book "Kona Legends" (1926).

Writers today have varying opinions and theories pertaining to the history of Kekaha, residency patterns, and practices of the people who called Kekaha-wai-'ole-o-nā-Kona home. For the most part, our interpretations are limited by the fragmented nature of the physical remains and historical records, and by a lack of familiarity with the diverse qualities of the land. As a result, most of us only see the shadows of what once was, and it is difficult at times, to comprehend how anyone could have carried out a satisfactory existence in such a rugged land.

Kihe and his co-authors provide readers with several references to places and events in the history of 'O'oma, Kalaoa, and neighboring lands. Through the narratives, we learn of place name origins, areas of ceremonial significance, how resources were managed and accessed, and the practices of those native families who made this area their home.

One example of the rich materials recorded by native writers, is found in "*Ka'ao Ho'oniua Pu'uwai no Ka-Miki*" (The Heart Stirring Story of Ka-Miki). This tradition is a long and complex account, that was published over a period of four years (1914-1917) in the weekly Hawaiian-language newspaper *Ka Hōkū o Hawai'i*. The narratives were primarily recorded for the paper by Hawaiian historians John Wise and J.W.H.I. Kihe.

While "*Ka-Miki*" is not an ancient account, the authors used a mixture of local stories, tales, and family traditions in association with place names to tie together fragments of site-specific histories that had been handed down over the generations. Also, while the personification of individuals and their associated place names may not be entirely "ancient," such place name-person accounts are common throughout Hawaiian (and Polynesian) traditions. The English translations below are a synopsis of the Hawaiian texts, with emphasis upon the main events and areas being discussed. Diacritical marks and hyphenation have been placed to help with pronunciation of certain words.

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

uluhe fern which spreads across the uplands), who was one of the myriad of body forms of the goddess Haumea, the earth-mother, creative force of nature who was also called Papa or Hina. Among her many nature-form attributes were manifestations that caused her to be called upon as a goddess of priests and competitors (people, places named for them, and other place names are marked below with underlining):

...Kūmua was the husband of Ka-uluhe-nui-hihi-kolo-i-uka. The place that is named for Kūmua is in the uplands of Kohanaiki, an elevated rise from where one can look towards the lowlands. The shore and deep sea are all clearly visible from this place. The reason that Kūmua dwelt there was so that he could see the children and grandchildren of he and his wife.

Wailoa, a daughter, was the mother of Kapa'ihilani, also called Kapa'ihī. There is a place in the uplands of Kohanaiki, below Kūmua, to the northwest, a hidden water hole, that is called Kapa'ihī. Wailoa is a pond there on the shore of Kohanaiki. Because Wailoa married Kahunakalehu, a native of the area, she lived and worked there. Thus the name of that pond is Wailoa, and it remains so to this day.

Pipipi'apo'o was another daughter of Kūmua and Ka-uluhe-nui-hihi-kolo-i-uka. She married Haleolono, one who cultivated sweet potatoes upon the 'ilima covered flat lands of Nānāwale, also called Nāhi'ahu (Nāwah'iahu), as it has been called from before and up to the present time. Cultivating the land was the skill of this youth Haleolono, and because he was so good at it, he was able to marry the beauty, Pipipi'apo'o.

Pipipi'apo'o's skill was that of weaving pandanus mats, and there are growing many pandanus trees there, even now. The grove of pandanus trees and a nearby cave, is called Pipipi'apo'o to this day, and you may ask the natives of Kohanaiki to point it out to you.

Kapukalua was a son of Kūmua and Ka'uluhe. He was an expert at *aku* lure fishing, and all other methods of fishing of those days gone by. He married Kauhi'onohua a beauty with skin as soft as the blossoms of the *hīnano*, found in the pandanus grove of 'O'oma. This girl was pleasingly beautiful, and because of her fame, Kapukalua, the exceptionally skilled son of the sea spray of 'Apo'ula, secured her as his wife. Here, we shall stop speaking of the elders of Ka-Miki... [January 8, 1914]

The tradition continues, recounting the training of the brothers, and preparations of their *hālau ali'i* (royal compound) at Kohanaiki. At the dedication ceremonies it was revealed that one of the *kahuna* of the Kaha lands, had taken up the habit of killing people, and that he had also thought to take the lives of Ka-Miki and Ma-Ka'iole. We revisit the story here, and learn the name of a priest of 'O'oma and Kohanaiki—

...The sun broke forth and the voices of the roosters and the 'elepaio of the forests were heard resonating and rising upon the mountain slopes. The day became clear, with no clouds to be seen, it was calm. So too, the ocean was calm and the shore of La'i a 'Ehu (Kona) was calm. The flowers of the upland forest reddened and unfolded, and nodded gently in the *kēhau* breezes.

The priests gathered together to discuss these events and prepared to apologize to the children of the chief, asking for their forgiveness. They selected 'Elepaio, Pūhili, Kalua'ōlapa, and Kalua'ōlapa-uwila to go before the brothers for this purpose.

'Elepaio was the high priest of Honokōhau. The place where he dwelt bears the name 'Elepaio [an 'ili on the boundary of Honokōhau nui & iki]. It is in the great grove of 'ulu (*kaulu* 'ulu) on the boundary between Honokōhau-nui and Honokōhau-iki... [April 23, 1914]

Pūhili was the high priest of 'O'oma and Kohanaiki, the place where he lived is on the plain of Kohanaiki, at the shore, and bears his name to this day. It is on the boundary between Kohanaiki and 'O'oma.

Kalua'ōlapa was the high priest of Hale'ōhi'u and Kamāhoe, that is the waterless land of Kalaoa (Kalaoa wai 'ole). The place where he lived was in the uplands of Maulukua on the plain covered with 'ilima growth. This place bears his name to this day.

Kalua'ōlapa-uwila was the high priest of Kealakehe and Ke'ohu'olu (Keahuolu), and it was he who built the *heiau* named Kalua'ōlapa-uwila, which is there along the shore of Kealakehe, next to the road that goes to Kailua. The nature of this priest was that of a shark and a man. The shark form was named Kaiwi, and there is a stone form of the shark that can be seen near the *heiau* to this day.

These priests all went to the door of the house and presented the offerings of the black pig, the red fish, the black *‘awa*, the white rooster, the *malo* (loin clothes), and all things that had been required of their class of priests. They also offered their prayers and asked forgiveness for their misspoken words. They then called for their prayers to be freed and the *kapu* ended... [April 30, 1914]

Ka Punawai o Wawaloli (The Pond of Wawaloli)

Through the 1920s, up to the time of his death in 1929, J.W.H.I. Kihe continued to submit traditional accounts and commentary on the changing times to the paper, *Ka Hōkū o Hawai‘i*. In 1923, Kihe penned a series of articles, some of which formed the basis of Eliza Maguire’s *Kona Legends* (1926). One of the accounts, “*Ka Punawai o Wawaloli*” (The Pond of Wawaloli), describes that the pond of Wawaloli, on the shore of ‘O‘oma, was named for a supernatural ocean being, who could take the form of the *loli* (sea cucumber) and of a handsome young man. Through this account it is learned that people regularly traveled between the uplands and shore of ‘O‘oma; the *kula* lands were covered with *‘ilima* growth; and that a variety of fish, seaweeds, and shellfish were harvested along the shore. Also, the main figures in the tradition are memorialized as places on the lands of ‘O‘oma, Kalaoa, and neighboring *ahupua‘a*. These individuals and places include Kalua‘ōlapa (a hill on the boundary of Hāmanamana and Haleohi‘u), Wawaloli (a bay between ‘O‘oma and Kalaoa), Ho‘ohila (on the boundary of Kaū and Pu‘ukala), Pāpa‘apo‘o (a cave site in Hāmanamana), Kamakaoiki and Malumaluiki (locations unknown). The following narratives were translated by Kepā Maly from the original Hawaiian texts published in *Ka Hōkū o Hawai‘i* (September 23rd, October 4th & 11th, 1923):

The place of this pond (Wawaloli) is set there on the shore of ‘O‘oma near Kalaoa. It is a little pond, and is there to this day. It is very close to the sandy shore, and further towards the shore there is also a pond in which one can swim. There is a tradition of this pond, that is held dearly in the hearts of the elders of this community.

Wawaloli is the name of a *loli* (sea cucumber) that possessed dual body forms (*kino pāpālūa*), that of a *loli*, and that of a man!

Above there on the *‘ilima* covered flat lands, there lived a man by the name of Kalua‘ōlapa and his wife, Kamakaoiki, and their beautiful daughter, Malumaluiki.

One day the young maiden told her mother that she was going down to the shore to gather *limu* (seaweeds), *‘ōpihi* (limpets), and *pupu* (shellfish). Her mother consented, and so the maiden traveled to the shore. Upon reaching the shore, Malumaluiki desired to drink some water, so she visited the pond and while she was drinking she saw a reflection in the rippling of the water, standing over her. She turned around and saw that there was a handsome young man there, with a smile upon his face. He said... [September 27, 1923] “...Pardon me for startling you here as we meet at this pond, in the afternoon heat which glistens off of the pāhoehoe.”

She responded, “What is the mistake of our meeting, you are a stranger, and I am a stranger, and so we have met at this pond.” The youth, filled with desire for the beautiful young maiden, answered “I am not a stranger here along this shore, indeed, I am very familiar with this place for this is my home. And when I saw you coming here, I came to meet you.”

These two strangers, having thus met, then began to lay out their nets to catch *kala*, *uhu*, and *pālani*, the native fish of this land. And in this way, the beauty of the plains of Kalaoa was caught in the net of the young man who dwelt in the sea spray of ‘O‘oma.

These two strangers of the long day also fished for *hīnālea*, and then for *kaweke‘ā*. It was during this time, that their lines became entangled like those of the fishermen of Wailua (a poetic reference to those who become entangled in a love affair).

The desire for the *limu*, *‘ōpihi*, and *pūpū* was completely forgotten, and the fishing poles bent as the lines were pulled back in the sea spray. The handsome youth was moistened in the rains that fell, striking the land and the beloved shore of the land. The sun drew near, entering the edge of the sea and was taken by Lehua Island. Only then did these two fishers of the long day take up their nets.

Before the young maiden began her return to the uplands, she told the youth, “Tell me your name.” He answered her, “The name by which I am known is Wawa. But my name, when I go and dwell in the pond here, is Loli. And when you return, you may call to me with the chant:

<i>E Loli nui kīkewekewe</i> ²	Oh great Loli moving back and forth
<i>I ka hana ana kīkewekewe</i>	Doing your work moving back and forth
<i>I ku‘u piko kīkewekewe</i>	You are in my mind moving back and forth
<i>A ka makua kīkewekewe</i>	The parents moving back and forth
<i>I hana ai kīkewekewe</i>	Are at their work moving back and forth
<i>E pi‘i mai ‘oe kīkewekewe</i>	Won’t you arise moving back and forth
<i>Ka kaua puni kīkewekewe</i>	To that which we two desire moving back and forth
<i>Puni kauoha kīkewekewe</i>	Your command is desired moving back and forth

Having finished their conversation, the maiden then went to the uplands. It was dark, and the *kukui* lamps had been lit in the house. Malumaluiki’s parents asked her, “Where are your *limu*, ‘*ōpihi* and *pūpū*?” She replied, “It is proper that you have asked me, for when I went to the shore it was filled with people who took all there was? Thus I was left with nothing, not even a fragment of *limu* or anything else. So I have returned up here.”

Well, the family meal had been made ready, so they all sat to eat together. But after a short while the maiden stood up. Her parents inquired of this, and she said she was no longer hungry, and that her feet were sore from traveling the long path. So the maiden went to sleep. She did not sleep well though, and felt a heat in her bosom, as she was filled with desire, thus she had no sleep that night.

With the arrival of the first light of day, the Malumaluiki went once again down to the shore. Upon arriving at the place of the pond, she entered the water and called out as described above. Then, a *loli* appeared and turned into the handsome young man. They two then returned to their fishing for the *kala*, *uhu* and *pālani*, the native fish the land.

So it was that the two lovers met regularly there on the shore of ‘O‘oma. Now Malumaluiki’s parents became suspicious because of the actions of the daughter, and her regular trips to the shore. So they determined that they should secretly follow her and spy on her.

One day, the father followed her to the shore, where he saw his daughter sit down by the side of the pond. He then heard her call out —

<i>E Loli nui kīkewekewe</i>	Oh great Loli moving back and forth
<i>I ka hana ana kīkewekewe</i>	Doing your work moving back and forth
<i>I ku‘u piko kīkewekewe</i>	You are the center of my life moving back and forth
<i>Piko maika‘i kīkewekewe</i>	It is good moving back and forth
<i>A ka makua kīkewekewe</i>	The parents moving back and forth
<i>I hana ai kīkewekewe</i>	Are at their work moving back and forth
<i>E pi‘i mai ‘oe kīkewekewe</i>	Won’t you arise moving back and forth
<i>Ka kaua puni kīkewekewe</i>	To that which we two desire moving back and forth
<i>Puni kauoha kīkewekewe</i>	Your command is desired moving back and forth

[October 4, 1923]

“O Loli, here is your desire, the one you command, Malumaluiki, who’s eyes see nothing else.”

Her father then saw a *loli* coming up from the pond, and when it was up, it turned into the youth. He watched the two for a while, unknown to them, and saw that his daughter and the youth of the two body forms (*kino pāpālua*), took their pleasure in one another.

The father returned to the uplands and told all of this to her mother, who upon hearing it, was filled with great anger, because of the deceitfulness of her daughter. But then she learned that the man with whom her daughter slept was of dual body forms. Kamakaoiki then told Kalua‘ōlapa that he should “Go down and capture the *loli*, and beat it to death,” to which he agreed.

One day, Kalua‘ōlapa went down early, and hid, unseen by the two lovers. Malumaluiki arrived at the pond and called out, and he then memorized the lines spoken by his daughter. When she left, returning to the uplands, he then went to the pond and looked closely at it. He then saw a small circular opening near the top of the water in the pond. He then understood that that was where the

² “Kīkewekewe” is translated by Eliza Maguire (1926) as “charmer.” Kepā Maly was unfamiliar with this meaning of the word. It is most commonly used in the refrain of a song, and is here translated as “moving back and forth,” as the word is used in the spoken language. Kewe also means concave, similar to the place name ‘O‘oma.

loli came up from. He then slept that night and in the early morning, he went to the pond and set his net in the water. He then began to call out as his daughter had done with the above words.

When he finished the chant, the *loli* began to rise up through the hole, and was ensnared in the net. Kalua'ōlapa then carried him up onto the *kula*, walking to the uplands. On his way, he saw his daughter coming down, and he hid until she passed him by.

When the daughter arrived at the pond, she called out in the chant as she always did. She called and called until the sun was overhead, but the *loli* did not appear in the pond, nor did he come forward in his human form. Thus, she thought that he had perhaps died, and she began to wail and mourn for the loss of her lover. Finally as evening came, the beautiful maiden stood, and ascended the *kula* to her home.

Now, let us look back to the Kalua'ōlapa. He went up to his house and showed the *loli* to his wife. Seeing the *loli*, she told her husband, "Take it to the *kahuna*, Pāpa'apo'o who lives on the *kula* of Ho'ohila." So he went to the *kahuna* and explained everything that had occurred to him, and showed him the *loli* in his net. Seeing this and hearing of all that had happened, Pāpa'apo'o told the father to build an *imu* in which to *kālua* the great *loli* that moves back and forth (*loli kīkewekewe*). He said, "When the *loli* is killed, then your daughter will be well, so too will be the other daughters of the families of the land." Thus, the *imu* was lit and the supernatural *loli* cooked.

When the daughter returned to her home, her eyes were all swollen from crying. Her mother asked her, "What is this, that your eyes are puffy from crying, my daughter?" She didn't answer, she just knelt down, giving no response. At that time, her father returned to the house and saw his daughter kneeling down, and he said "Your man, with whom you have been making love at the beach has been taken by the *kahuna* Pāpa'apo'o. He has been cooked in the *imu* that you may live, that all of the girls who this *loli* has loved may live."

That pond is still there on the shore, and the place with the small round opening is still on the side of that pond to this day. It is something to remember those things of days gone by, something that should not be forgotten by those of today and in time to come. [October 11, 1923]

Ka Loko o Paaiea (The fishpond of Pā'aiea)

The tradition of *Ka loko o Paaiea* (The fishpond of Pā'aiea) was written by J.W.H.I. Kihe, and printed in *Ka Hōkū o Hawai'i* in 1914 and 1924. The narratives describe traditional life and practices in various *ahupua'a* of Kekaha, and specifically describes the ancient fishpond Pā'aiea. The following excerpts from Kihe's *mo'olelo*, include references to Wawaloli, on the shore of 'O'oma and Kalaoa. Pā'aiea, was destroyed by the Hualālai lava flows of 1801, reportedly as a result of the pond overseer's refusal to give the goddess Pele—traveling in human form—any fish from the pond:

Pā'aiea was a great fishpond, something like the ponds of Wainānālī'i and Kīholo, in ancient times. At that time the high chiefs lived on the land, and these ponds were filled with fat *awa*, 'anae, āhole, and all kinds of fish that swam inside. It is this pond that was filled by the lava flows and turned into *pāhoehoe*, that is written of here. At that time, at Ho'onā, there was a *Konohiki* (overseer), Kepa'alani, who was in charge of the houses (*hale papa'a*) in which the valuables of the King [Kamehameha I] were kept. He was in charge of the King's food supplies, the fish, the *hālau* (long houses) in which the fishing canoes were kept, the fishing nets and all things. It was from there that the King's fishermen and the retainers were provisioned. The houses of the pond guardians and *Konohiki* were situated at Ka'elehuluhulu and Ho'onā.

In the correct and true story of this pond, we see that its boundaries extended from Ka'elehuluhulu on the north, and on the south, to the place called Wawaloli (between 'O'oma and Kalaoa). The pond was more than three miles long and one and a half miles wide, and today, within these boundaries, one can still see many water holes.

While traveling in the form of an old woman, Pele visited the Kekaha region of Kona, bedecked in garlands of the *ko'oko'olau* (*Bidens* spp.). Upon reaching Pā'aiea at Ho'onā, Pele inquired if she might perhaps have an 'ama'ama, young āholehole, or a few 'ōpae (shrimp) to take home with her. Kepa'alani, refused, "they are *kapu*, for the King." Pele then stood and walked along the *kuapā* (ocean side wall) of Pā'aiea till she reached Ka'elehuluhulu. There, some fishermen had returned from *aku* fishing, and were carrying their canoes up onto the shore...

...Now because Kepa'alani was stingy with the fishes of the pond Pā'aiea, and refused to give any fish to Pele, the fishpond Pā'aiea and the houses of the King were all destroyed by the lava flow. In ancient times, the canoe fleets would enter the pond and travel from Ka'elehuluhulu to Ho'onā, at Ua'u'ālohi, and then return to the sea and go to Kailua and the other places of Kona. Those who traveled in this manner would sail gently across the pond pushed forward by the 'Eka wind, and thus avoid the strong currents which pushed out from the point of Keāhole

It was at Ho'onā that Kepa'alani dwelt, that is where the houses in which the chiefs valuables (*hale papa'a*) were kept. It was also one of the canoe landings of the place. Today, it is where the light house of America is situated. Pelekāne (in Pu'ukala) is where the houses of Kamehameha were located, near a stone mound that is partially covered by the *pāhoehoe* of Pele. If this fishpond had not been covered by the lava flows, it would surely be a thing of great wealth to the government today... [J.W.H.I. Kihe in *Ka Hoku o Hawaii*; compiled and translated by Kepā Maly, from the narratives written February 5-26, 1914 and May 1-15, 1924].

Na Ho'omanao o ka Manawa (The Recollections of a Native Son)

Later in 1924, Kihe, described the changes which had occurred in the Kekaha region since his youth. In the following article, titled *Na Ho'omanao o ka Manawa* (in *Ka Hōkū o Hawai'i* June 5th & 12th 1924), Kihe wrote about the villages that were once inhabited throughout Kekaha, identifying families, practices, and schools of the historic period (ca. 1860-1924). In the two part series (translated by Kepā Maly), he also shared his personal feelings about the changes that had occurred, including the demise of the families and the abandonment of the coastal lands of Kekaha.

There has arisen in the mind of the author, some questions and thoughts about the nature, condition, living, traveling, and various things that bring pleasure and joy. Thinking about the various families and the many homes with their children, going to play and strengthening their bodies.

In the year 1870, when I was a young man at the age of 17 years old, I went to serve as the substitute teacher at the school of Honokōhau. I was teaching under William G. Kanaka'ole who had suffered an illness (*ma'i-lolo*, a stroke).

In those days at the Hawaiian Government Schools, the teachers were all Hawaiian and taught in the Hawaiian language. In those days, the students were all Hawaiian as well, and the books were in Hawaiian. The students were all Hawaiian... There were many, many Hawaiian students in the schools, no Japanese, Portuguese, or people of other nationalities. Everyone was Hawaiian or part Hawaiian, and there were only a few part Hawaiians.

The schools included the school house at Kīholo where Joseph W. Keala taught, and later J.K. Ka'ailuwale taught there. At the school of Makalawena, J. Ka'elemakule Sr., who now resides in Kailua, was the teacher. At the Kalaoa School, J. U. Keawe'ake was the teacher. There were also others here, including myself for four years, J. Kainuku, and J.H. Olohia who was the last one to teach in the Hawaiian language. At Kaloko, Miss Ka'aimahu'i was the last teacher before the Kaloko school was combined as one with the Honokōhau school where W.G. Kanaka'ole was the teacher. I taught there for two years as well... [Kihe includes additional descriptions on the schools of Kona]

It was when they stopped teaching in Hawaiian, and began instructing in English, that significant changes took place among our children. Some of them became puffed up and stopped listening to their parents. The children spoke gibberish (English) and the parents couldn't understand (*nā keiki namu*). Before that time, the Hawaiians weren't marrying too many people of other races. The children and their parents dwelt together in peace with the children and parents speaking together... [June 5, 1924]

...Now perhaps there are some who will not agree with what I am saying, but these are my true thoughts. Things which I have seen with my own eyes, and know to be true... In the year 1870 when I was substitute teaching at Honokōhau for W.G. Kanaka'ole, I taught more than 80 students. There were both boys and girls, and this school had the highest enrollment of students studying in Hawaiian at that time [in Kekaha]. And the students then were all knowledgeable, all knew how to read and write.

Now the majority of those people are all dead. Of those things remembered and thought of by the people who yet remain from that time in 1870; those who are here 53 years later, we cannot forget the many families who lived in the various ('*āpana*) land sections of Kekaha.

From the lands of Honokōhau, Kaloko, Kohanaiki, the lands of ‘O‘oma, Kalaoa, Hale‘ohi‘u, Maka‘ula, Kaū, Pu‘ukala-‘Ōhiki, Awalua, the lands of Kaulana, Mahai‘ula, Makalawena, Awake‘e, the lands of Kūki‘o, Ka‘ūpūlehu, Kīholo, Keawaiki, Kapalaoa, Pu‘uanahulu, and Pu‘uwa‘awa‘a. These many lands were filled with people in those days.

There were men, women, and children, the houses were filled with large families. Truly there were many people [in Kekaha]. I would travel around with the young men and women in those days, and we would stay together, travel together, eat together, and spend the nights in homes filled with aloha.

The lands of Honokōhau were filled with people in those days, there were many women and children with whom I traveled with joy in the days of my youth. Those families are all gone, and the land is quiet. There are no people, only the rocks remain, and a few scattered trees growing, and only occasionally does one meet with a man today [1924]. One man and his children are all that remain.

Kaloko was the same in those days, but now, it is a land without people. The men, the women, and the children are all gone, they have passed away. Only one man, J.W. Ha‘au, remains. He is the only native child (*keiki kupa*) besides this author, who remains.

At Kohanaiki, there were many people on this land between 1870 and 1878. These were happy years with the families there. In those years Kaiakoili was the *haku ‘āina* (land overseer)...

Now the land is desolate, there are no people, the houses are quiet. Only the houses remain standing, places simply to be counted. I dwelt here with the families of these homes. Indeed it was here that I dwelt with my *kahu hānai* (guardian), the one who raised me. All these families were closely related to me by blood. On my fathers’ side, I was tied to the families of Kaloko [J.W.H.I. Kihe’s father was Kihe, his grandfather was Kuapāhoa, a noted *kahuna* of Kaloko]. I am a native of these lands.

The lands of ‘O‘oma, and Kalaoa, and all the way to Kaulana and Mahai‘ula were also places of many people in those days, but today there are no people. At Mahai‘ula is where the great fishermen of that day dwelt. Among the fishermen were Po‘oko‘ai mā, Pā‘ao‘ao senior, Ka‘ao mā, Kai‘a mā, Ka‘ā‘ikaula mā, Pāhia mā, and John Ka‘elemakule Sr., who now dwells at Kailua.

Ka‘elemakule moved from this place [Mahai‘ula] to Kailua where he prospered, but his family is buried there along that beloved shore (*kapakai aloha*). He is the only one who remains alive today...

At Makalawena, there were many people, men, women, and their children. It was here that some of the great fishermen of those days lived as well. There were many people, and now, they are all gone, lost for all time.

Those who have passed away are Kaha‘iali‘i mā, Mama‘e mā, Kapehe mā, Kauaionu‘uanu mā, Hopulā‘au mā, Kaihemakawalu mā, Kaomi, Keoni Aihaole mā, and Pahukula mā. They are all gone, there only remains the son-in-law of Kauaionu‘uanu, J.H. Mahikō, and Jack Punihaole, along with their children, living in the place where Kauaionu‘uanu and Ahu once lived.

At Kūki‘o, not one person remains alive on that land, all are gone, only the ‘a‘ā remains. It is the same at Ka‘ūpūlehu, the old people are all gone, and it is all quiet... [June 12, 1924]

Ko Keoni Kaelemakule Moolelo Ponoī – Kakau ponoī ia mai no e ia (The True Story of John Ka‘elemakule – Actually written by him³)

In the period between 1928 and 1930, John Ka‘elemakule Sr., who was a native of Kekaha, living at Mahai‘ula, Kaulana and Kohanaiki, wrote a series of articles that were published in serial form in *Ka Hōkū o Hawai‘i*. The story is a rich account of life in Kekaha between 1854 and 1900. Ka‘elemakule’s texts introduce us to the native residents of Kekaha, and include descriptions of the practices and customs of the families who resided there. In the following excerpts from Ka‘elemakule’s narratives (translated by Kepā Maly), we find reference once again to ‘O‘oma, Kalaoa, and neighboring lands, and the practices associated with procuring water in this region:

³ This account was published in serial form in the Hawaiian newspaper *Ka Hōkū o Hawai‘i*, from May 29, 1928 to March 18, 1930. The translated excerpts in this section include narratives that describe Mahai‘ula and nearby lands in Kekaha with references to families, customs, practices, ceremonial observances, and sites identified in text. The larger narratives also include further detailed accounts of Ka‘elemakule’s life, and business ventures. A portion of the narratives pertaining to fishing customs (November 13, 1928 to March 12, 1929), and canoeing practices (March 19 to May 21, 1929) were translated by M. Kawena Pukui, and may be viewed in the Bishop Museum-Hawaiian Ethnological Notes (BPBM Archives).

“Kekaha Wai Ole o na Kona” (Waterless Kekaha of Kona)

...We have seen the name “Kekaha wai ole o nā Kona” since the early part of my story in *Ka Hōkū o Hawai‘i*, and we have also seen it in the beautiful tradition of Mākālei. An account of the boy who dwelt in the uplands of Kekaha wai ‘ole, that was told by Ka-‘ohu-ha‘aheo-i-nā-kuahiwi-‘ekolu [the penname used by J.W.H.I. Kihe]. I think that certain people may want to know the reason and meaning of this name. So it is perhaps a good thing for me to explain how it came about. The source of it is that in this land of Kekaha even in the uplands, between Kaulana in the north and ‘O‘oma in the south, there was no water found even in the ancient times. For a little while, I lived in the uplands of Kaulana, and I saw that this land of Kekaha was indeed waterless.

The water for bathing, washing one’s hands or feet, was the water of the banana stump (*wai pūma‘ia*). The *pūmai‘a* was grated and squeezed into balls to get the juice. The problem with this water is that it makes one itchy, and one does not really get clean. There were not many water holes, and the water that accumulated from rain dried up quickly. Also there would be weeks in which no rain fell... The water which the people who lived in the uplands of Kekaha drank, was found in caves. There are many caves from which the people of the uplands got water... [September 17, 1929:3]

...The *kūpuna* had very strict *kapu* (restrictions) on these water caves. A woman who had her menstrual cycle could not enter the caves. The ancient people kept this as a sacred *kapu* from past generations. If a woman did not know that her time was coming and she entered the water cave, the water would die, that is, it would dry up. The water would stop dripping. This was a sign that the *kapu* of Kāne-of-the-water-of-life (Kaneikawaiola) had been desecrated. Through this, we learn that the ancient people of Kekaha believed that Kāne was the one who made the water drip from within the earth, even the water that entered the sea from the caves. This is what the ancient people of Kekaha wai ‘ole believed, and there were people who were *kia‘i* (guardians) who watched over and cleaned the caves, the house of Kāne... [September 24, 1929:3]

When the *kapu* of the water cave had been broken, the priest was called to perform a ceremony and make offerings. The offerings were a small black pig; a white fish, and *āholehole*; young taro leaves; and *awa*. When the offering was prepared, the priest would chant to Kane:

<i>E Kane i uka, e Kane i kai,</i>	O Kane in the uplands, O Kāne at the shore,
<i>E Kane i ka wai, eia ka puaa,</i>	O Kane in the water, here is the pig,
<i>Eia ka awa, eia ka luau,</i>	Here is the ‘awa, here are the taro greens,
<i>Eia ka ia kea.</i>	Here is the white fish.

Then all those people of the uplands and coast joined together in this offering, saying:

<i>He mohai noi keia ia oe e Kane,</i>	This is a request offering to you o Kāne,
<i>E kala i ka hewa o ke kanaka i hana ai,</i>	Forgive the transgression done by man,
<i>A e hoomaemae i ka hale wai,</i>	Clean the water house (source),
<i>A e hoonui mai i ka wai o ka hale,</i>	Cause the water to increase in the house,
<i>I ola na kanaka,</i>	That the people may live,
<i>Na ohua o keia aina wai ole.</i>	Those who are dependent on this waterless land.
<i>Amama.</i>	It is finished...

[October 1, 1929:3; Kepā Maly, translator]

It is not surprising today, when we hear of caves in which cultural materials are found. Along trails, near residences, and in once remote areas, a wide range of uses occurred. Caves in the Kekaha lands were used to store items, keep planting shoots cool and fresh for the next season, to hide or take shelter in, to catch water, and for burial.

Land Tenure in ‘O‘oma, Kalaoa, and Vicinity

Through the traditions and early historical accounts cited above, we see that there are descriptions of early residences and practices of the native families on the lands of ‘O‘oma, Kalaoa, and within greater Kekaha. Importantly, we find chiefly associations with the land of ‘O‘oma 2nd, as documented by the residency of the chiefs Kaikio‘ewa, Keaweamahi, their families and retainers, while they were serving as the guardians of the young king, Kauikeaouli (Kamehameha III in ca. 1813-1818; Kamakau 1961 and Gov. Kapeau, 1847 in this study). Among the earliest government records documenting residency are those of the *Māhele ‘Āina* (Land Division), Interior and Taxation Departments, Roads and Public Works, and the Government Survey Division.

2. Background

This section of the study describes land tenure (residency and land use) and identifies families associated with ‘O‘oma, Kalaoa, and its neighboring lands. The documentation is presented chronologically within the following subsections, The *Māhele ‘Āina* (1848): Disposition of ‘O‘oma and Kalaoa, Land Grants in ‘O‘oma, Kalaoa, and Vicinity (1855-1864), Trails and Roads of Kekaha (Governmental Communications), The Government Homesteading Program in Kekaha, Field Surveys of J.S. Emerson (1882-1889), The Kalaoa-‘O‘oma Homesteads, and Twentieth Century Land Tenure in the Vicinity of the Current Study Area. A review of the records below reveals that none of the claims by native tenants made during the *Māhele*, nor any of the purchases of Royal Patent Grants, included lands that are a part of the current study area.

The Māhele ‘Āina (1848): Disposition of ‘O‘oma and Kalaoa

In Precontact Hawai‘i, all land, ocean, and natural resources were held in trust by the high chiefs (*ali‘i ‘ai ahupua‘a* or *ali‘i ‘ai moku*). The use of land, fisheries and other resources were given to the *hoa‘āina* (native tenants) at the prerogative of the *ali‘i* and their representatives or land agents (*konohiki*), who were considered lesser chiefs. By 1845, the Hawaiian system of land tenure was being radically altered, and the foundation for implementing the *Māhele ‘Āina* was set in place, system of fee-simple right of ownership.

As the *Māhele* evolved, it defined the land interests of Kauikeaouli (King Kamehameha III), some 252 high-ranking *Ali‘i* and *Konohiki*, and the Government. As a result of the *Māhele*, all land in the Kingdom of Hawai‘i came to be placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) *Konohiki* Lands (cf. Indices of Awards 1929). The “Enabling” or “*Kuleana Act*” of the *Māhele* (December 21, 1849) further defined the frame work by which *hoa‘āina* (native tenants) could apply for, and be granted fee-simple interest in “*Kuleana*” lands (cf. Kamakau in *Ke Au Okoa* July 8 & 15, 1869; 1961:403-403). The *Kuleana Act* also reconfirmed the rights of *hoa‘āina* to access, subsistence and collection of resources necessary to their life upon the land in their given *ahupua‘a* (“Enabling Act”⁴, August 6, 1850 – HSA DLNR 2-4).

In the *Buke Kakau Paa no ka Mahele Aina* (Land Division Book), between Kamehameha III and his supporters, we learn that by the time of the *Māhele ‘Āina*, ‘O‘oma was divided into two *ahupua‘a*, ‘O‘oma 1st and 2nd; and Kalaoa into five *ahupua‘a*, Kalaoa 1st through 5th. During the *Māhele*, Kalaoa 1st–5th and ‘O‘oma 2nd were held by Kamehameha III, and then subsequently assigned to the Government land inventory on March 8, 1848. All but Kalaoa 5th, which is not listed in the *Māhele Book*⁵, were returned to Kamehameha III by the various *Konohiki* in lieu of commutation fees on other lands (Soehren 2005; Table 1). Kalaoa 1st was returned by Keaweamahe (Buke *Māhele*, February 2, 1848:73), the wife of Kaikio‘ewa, the guardian of the Kauikeaouli (Kamehameha III) at ‘O‘oma; Kalaoa 2nd was returned by Kinimaka (Buke *Māhele*, February 9, 1848:128), the husband of the high chiefess Kaniu and the *hanai* father of the young King Kalākaua; Kalaoa 3rd was returned by Hewahewa (Buke *Māhele*, February 14, 1848:168), the *kahuna nui* (high priest) of Kamehameha I and II; Kalaoa 4th was returned by William Pitt Leleiohoku (Buke *Māhele*, January 28, 1848:25), the adopted son of Governor George Kuakini (he had received Kaukai’s lands upon his death in 1844) and husband of Ruth Ke‘elikōlani; and ‘O‘oma 2nd was returned by the *kahuna* Kekaha (Buke *Māhele*, February 14, 1848:158). ‘O‘oma 1st, on the other hand, was claimed by, and awarded to, Moses Kekūāiwa (brother of Kamehameha IV and V, and Victoria Kamāmalu), one of the children of Kīna‘u and M. Kekūānao‘a, thus, a grandson of Kamehameha I (Buke *Māhele*, January 27, 1848:13-14). Moses Kekūāiwa died on November 24, 1848, and his father, Mataio Kekūānao‘a, administrator of the estate, relinquished in commutation, his rights to ‘O‘oma 1st, giving the land over to the Government land inventory (Foreign Testimony Volume 3:408).

Table 1. Distribution of Kalaoa and ‘O‘oma during the *Māhele ‘Āina* of 1848 (Soehren 2005).

<i>Ahupua‘a</i>	<i>Returned by</i>	<i>Retained by</i>	<i>Kuleana</i>
Kalaoa 1 st	Keaweamahe	Government	-
Kalaoa 2 nd	Kinimaka	Government	-
Kalaoa 3 rd	Hewahewa	Government	-
Kalaoa 4 th	Leleiohoku	Government	-
Kalaoa 5 th	-	Government	2
‘O‘oma 1 st *	Kekuauiwa	Government	-
‘O‘oma 2 nd	Kekaha	Government	-

*Land surrendered to Government in lieu of commutation fee subsequent to the *Māhele* of 1848.

⁴ See also “*Kanawai Hoopai Karaima no ko Hawaii Pae Aina*” (Penal Code) 1850.

⁵ Kalaoa 4th and 5th both may have originally belonged to Leleiohoku (Native Register Vol. 8:514, 516).

In 2000, Kumu Pono Associates digitized the entire collection of handwritten records from the *Māhele* 'Āina. Most of the records are in the Hawaiian language. An extensive review of all the records identifies only one native tenant who filed a claim of residency and land use in 'O'oma during the *Māhele*. The claim—*Helu* 9162, by Kahelekahi—was not awarded, and except for an entry in Native Register Volume 8 (Figure 16), there is no further record of the claim. Below, is a copy of the original Hawaiian text from the Native Register. The account is of particular interest as Kahelekahi reported that in 1848, he was the only resident in 'O'oma:

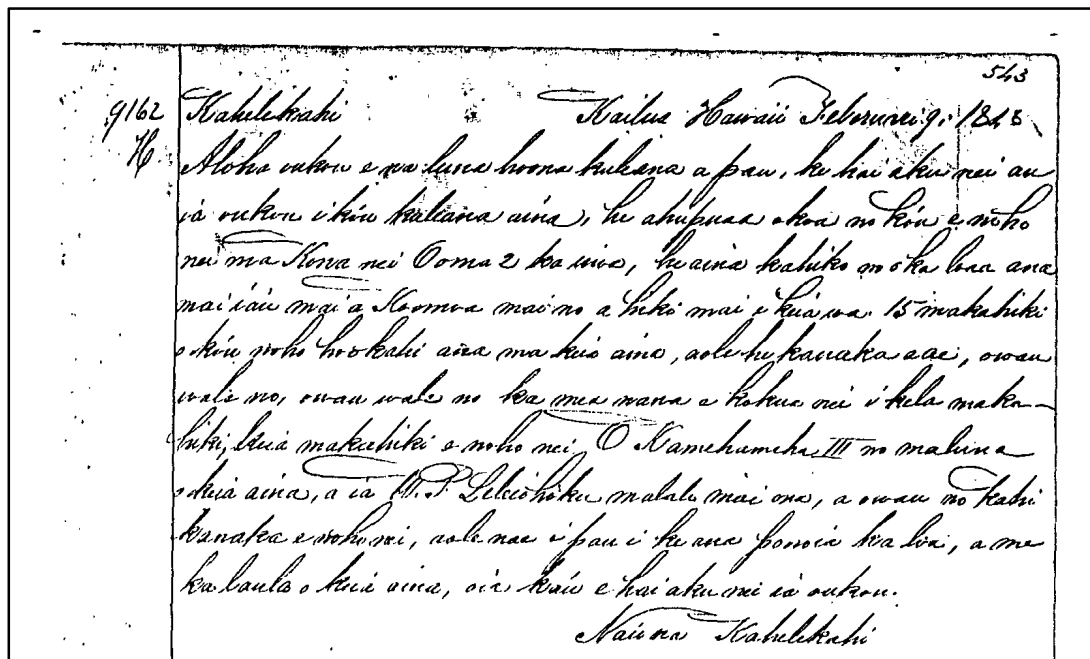


Figure 16. Copy of Native Register Vol. 8:543 Helu 9162, claim of Kahelekahi for *kuleana* at 'O'oma.

Kahelekahi – Helu 9162

Kailua, Hawaii February 9, 1848

Greetings to all of you commissioner who quiet land titles, I hereby tell you of my claim for land. I have an entire *ahupuaa* situated there in Kona, its name is Ooma 2. It is an old land gotten by me from Koomoa, and held to this time. For 15 years, I have been the only one residing on this land, there are no other people, only me. I am the only one, there is no one living here to help from one year to the next year. Kamehameha III is the one above, who has this land, and W.P. Leleiohoku is below him, and I am the one man dwelling there. The survey of the length and width of this land is not accurately completed. That is what I have to tell you.

Done by me, Kahelekahi

[Native Register Vol. 8:543; translated by Kepā Maly]

In Kalaoa 5th two *kuleana* claims were awarded – LCAw. 7899 to Kupuoē and LCAw. 7937 to Kukaauī – both of which were located next to one another in the *mauka* portion of the *ahupua'a* (a third *kuleana* was claimed but not awarded). Kupuoē's and Kukaauī's awards in Kalaoa 5th (Figures 17 and 18) are as follows:

Kupuoē (Kupuae) – Helu 7899

Kailua, Hawaii Jan. 2, 1849

Kanahele sworn [the whole *ili* claim is an error] He has seen the house lot and the place Kupuoē had cultivated. There are 12 partially cultivated *kihapais* in Kaweo *ili* of Kalaoa 5 *ahupuaa*. It has not been enclosed completely, one house is for Kupuoē. In Kalaoa 4, 8 *kihapais* have been cultivated. Kupuoē's land is from Kaainoa in 1843, no one has objected to him. Kukaanio sworn they [Kanahele and Kukaanio] both have known in the same way.

[Native Testimony 4:540; translated by Kepā Maly]

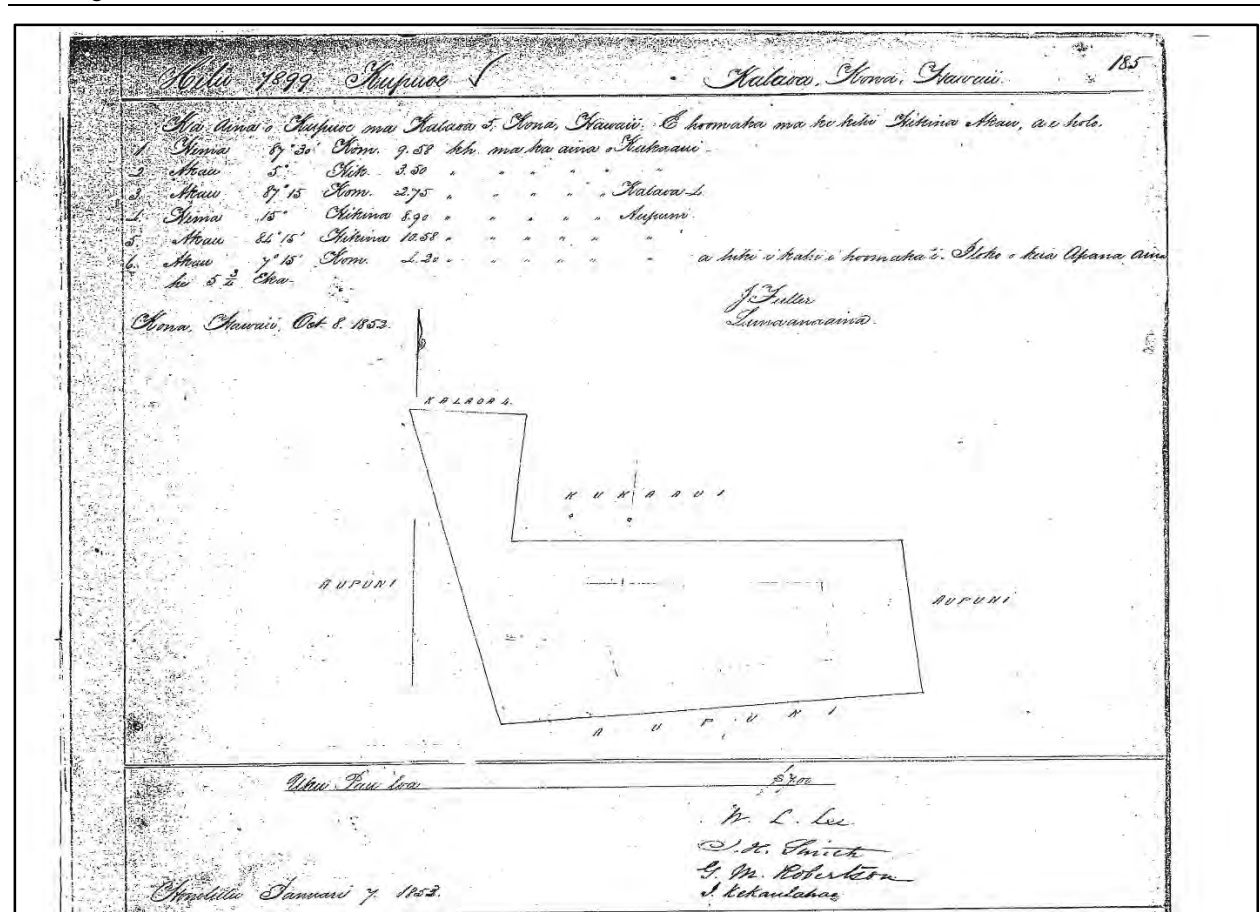


Figure 17. LCAw. 7899 awarded to Kupuoē (*Māhele* Book Vol. 7:185).

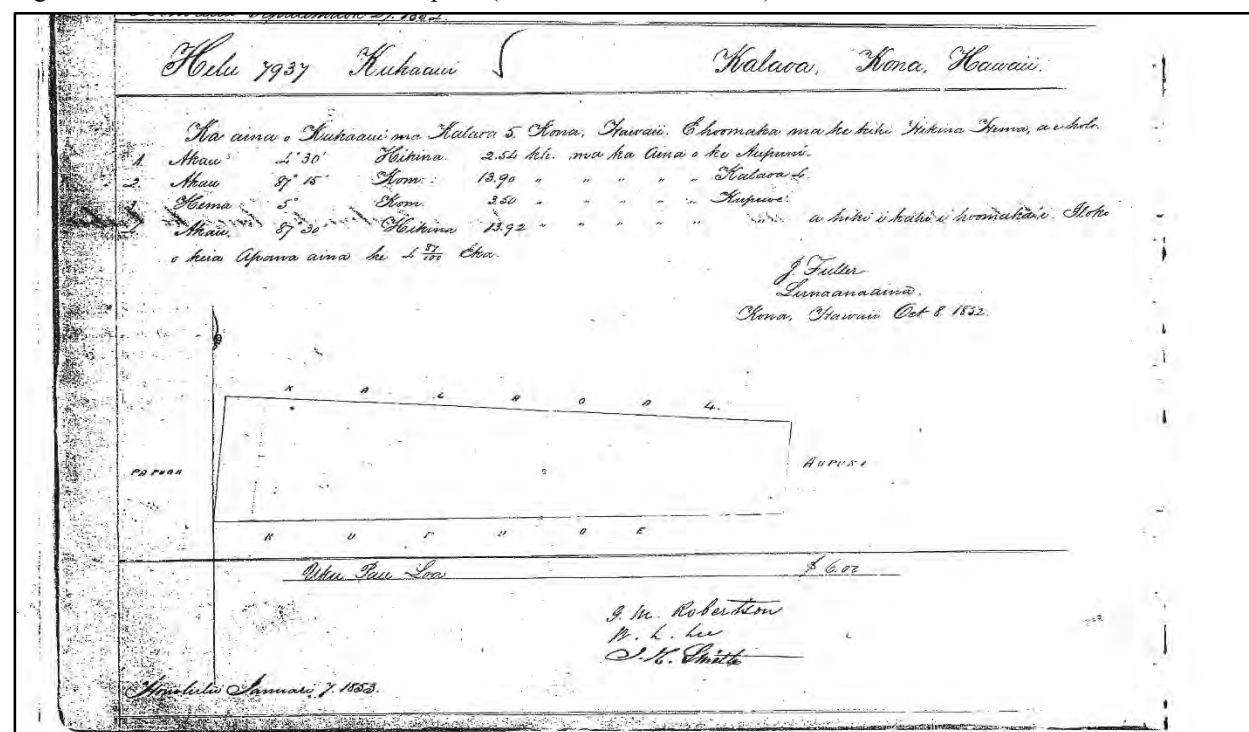


Figure 18. LCAw. 7937 awarded to Kukaau'i (*Māhele* Book Vol. 7:184).

Kukaaui (Kukaani/Kukaanio) – Helu 7937

Greetings to all of you Land Commissioners: I hereby petition for my ili in the ahupua'a [possessed by] Leleiohoku, in Kailua, Hawaii, which is as follows: it is an entire ill in the corner of Kalaoa 5 - its name is Kahuku. It is bounded on the north by Kahuku, on the east by Kapulehu [Ka'ūpūlehu], on the south by Kawao, on the west by Kihalau. That is it, for your information, the commissioners to quiet land titles.

KUKAAUI

[Native Register 8:453-454; translated by Kepā Maly]

Kanahele sworn He has seen the place Kukaani had cultivated. It is an error that he had included the whole ili in his claim. The Kahuku ili of Kalaoa 5 ahupuaa, 9 Kihapais are at Kalaoa [Kalaoa] 4, 8 have been partially cultivated. He does not know the boundaries and is expecting the surveyor to establish boundaries upon his arrival.

Land is from Kaluaonaona [Kalimaonaona] in 1848, no one has objected to Kukaani. Kupuoē sworn they both have known alike in the things mentioned about this land.

[Native Testimony 4:539-540; translated by Kepā Maly]

The unawarded *kuleana* in Kalaoa 5th was claimed by Kanahele under two separate numbers (LCAws. 7926 and 7939), and was apparently also in the more *mauka* portion of the *ahupua'a*. The original Hawaiian text from the Native Register for both claims are presented below (Figures 19 and 20) followed by translations.

7926 Kanahele
 Aloha oukou a fau loa e ka poe hōma kuleana pahale, ke hō-
 fūi aku nei au i kēu pahale ma Kōmanii i Kalaoa 5, ma ke
 Ahupuaa Leleiohoku ma Kailua, eia ma kapuai o ka loa
 538, eia ma kapuai o ka loa 396, eia ma kapuai o kēu pa-
 hale, i kēu oukou a fau loa e ka poe hōma kulea-
 na pahale. Kāia ma Kanahele.

Figure 19. Copy of Native Register Vol. 8:514 Helu 7926, claim of Kanahele for *kuleana* at Kalaoa 5th.

7939 Kanahele
 Aloha oukou a fau loa e ka poe hōma kuleana uia, ke hō-
 fūi aku nei au i kēu wahi ili uia ma uia o ke ahupuaa
 o Leleiohoku i Kalaoa 5, i Kailua i Kōmanii, eia ma ka
 uia o kēu wahi ili uia, ma ka uia o Kōhōlona, ma ka
 Kōhōlona o Kailua. Ma ka hōma o Kōhōlona, Ma ka
 Kōhōlona o Kailua, eia la. Kāia ma Kanahele

Figure 20. Copy of Native Register Vol. 8:516 Helu 7939, claim of Kanahele for *kuleana* at Kalaoa 5th.

Kanahele – Helu 7926

Greetings to the Land Commissioners: I hereby petition for my house lot at Kalaoa 5 on Hawaii, in the ahupua'a of Leleiohoku in Kailua. It is 528 feet by 396 feet. That is the size of my house lot, for your information, O Land Commissioners.

KANAHELE

[Native Register Vol. 8:514; translated by *Waihona 'Aina*]

Kanahele – Helu 7939

Greetings to the Land Commissioners: I hereby petition for my 'ili of land in the middle of the ahupua'a of Kalaoa 5, of Leleiohoku, in Kailua, Hawaii. My land is as follows: On the north is Haleolono, on the east is Kalulu, on the south is Kaholo Two, on the west is Keahole. That is it.

KANAHELE

[Native Register Vol. 8:516; translated by *Waihona 'Aina*]

Four other individuals (John Nawahie, Paina, Kalei, and Kaikeleaukai) also claimed *kuleana* in the neighboring Kalaoa *ahupua'a*, but none of these were awarded. Two of these claimants (Paina and Kaikeleaukai) and both of the *kuleana* recipients in Kalaoa 5th were listed as residents of Kalaoa *ahupua'a* in 1849, as was Halekahi who claimed land in 'O'oma, when S. Haanio, Tax Assessor of North Kona, submitted a report to the Board of Education regarding those individuals who were subject to the Tuesday Tax Laws (*Poalua*), to be worked as a part of the School Tax requirements of the time. At the time of Haanio's report, three individual families were identified as residents of 'O'oma and sixteen collectively in the Kalaoa *ahupua'a*. Residents in the neighboring land of Kohanaiki were also listed. The residents of this are in 1849 were:

Kalaoa: 1. Kila, 2. Piena, 3. Nakuala, 4. Kupono, 5. Loa, 6. Kaeha, 7. Keliipuipui, 8. Kapuolokai, 9. Kaainoa, 10. Paina, 11. Kalimaonaona, 12. Kaikeleaukai, 13. Kanahele, 14. Kukaani, 15. Kupuai, and 16. Helekahi

Ooma: 1. Kalua, 2. Kamaka and 3. Mamali

Kohanaiki: 1. Hulikoa, 2. Kaoeno, 3. Honolii and 4. Awa [HSA – Series 262, Hawaii 1849].

Unfortunately, there is no indication of where people were living at the time. Based on traditional patterns of residency in the region, it is likely that they had primary residences in the uplands, near sheltered *māla 'ai* (agricultural fields), and kept near shore residences for seasonal fishing, collection of salt, and other resources of the coastal zone. Of the names given for 'O'oma and Kalaoa, descendants of some of these family lines are known to still be residing in the Kekaha region.

Land Grants in 'O'oma, Kalaoa 5th, and Vicinity (1855-1864)

In conjunction with the *Māhele*, the King also authorized the issuance of Royal Patent Grants to applicants for tracts of land, larger than those generally available through the Land Commission. The process for applications was set forth by the "Enabling Act" of August 6, 1850, which set aside portions of government lands for grants.

Section 4. Resolved that a certain portion of the Government lands in each Island shall be set apart, and placed in the hands of special agents to be disposed of in lots of from one to fifty acres in fee simple to such natives as may not be otherwise furnished with sufficient lands at a minimum price of fifty cents per acre. [HSA – "Enabling Act" Series DLNR 2-4]

The Kingdoms' policy of providing land grants to native tenants was further clarified in a communication from Interior Department Clerk, A. G. Thurston, on behalf of Keoni Ana (John Young), Minister of the Interior; to J. Fuller, Government Land Agent-Kona:

February 23, 1852

...His Highness the Minister of the Interior instructs me to inform you that he has and does hereby appoint you to be Land Agent for the District of Kona, Hawaii. You will entertain no application for the purchase of any lands, without first receiving some part, say a fourth or fifth of the price; then the terms of sale being agreed upon between yourself and the applicant you will survey the land, and send the survey, with your report upon the same to this office, for the Approval of the Board of Finance, when your sales have been approved you will collect the balance due of the price; upon the receipt of which at this office, the Patent will be forwarded to you.

Natives who have no claims before the Land Commission have no Legal rights in the soil.

They are therefore to be allowed the first chance to purchase their homesteads. Those who neglect or refuse to do this, must remain dependent upon the mercy of whoever purchases the land: as those natives now are who having no kuleanas are living on lands already Patented, or belonging to Konohikis.

Where lands have been granted, but not yet Patented, the natives living on the land are to have the option of buying their homesteads, and then the grant be located, provided this can be done so as not to interfere with them.

No Fish Ponds are to be sold, neither any landing places.

As a general thing you will charge the natives but 50 cents pr. acre, not exceeding 50 acres to any one individual.

Whenever about to survey land adjoining that of private individuals, notice must be given them or their agents to be present and point out their boundaries...

[Interior Department Letter Book 3:210-211]

Between 1855 and 1864, at least six applications were made for land in the *ahupua'a* of 'O'oma and Kalaoa 5th, and four of them were patented. The applications were made by:

Grant	Applicant	Land	Acreage	Book and Year
1590	Kauhini	Hamanamana, Kalaoa and Ooma 1	1,816	8:1855 (canceled)
1599	J. Hall	Ooma 2	101.33	8:1855 (canceled)
1600	Kaakau	Ooma 2	58.5	8:1855
1609	Kama	Kalaoa 5	45	8:1855
2027	Kameheu	Ooma 2	101.33	11:1856 (same area as Grant 1599)
2031	Koanui	Ooma 1	24.5	11:1856
2972	Kaakau & Kama	Kalaoa 5 & Ooma 1	515	14:1864

["Index of all Grants Issued...Previous to March 31, 1886;" 1887]

The grants to Ka'akau and Kameheu were patented by 1859, as recorded in the following letter:

April 8, 1859

S. Spencer, Interior Department Clerk;

to Lot Kamehameha, Minister of the Interior;

Lands in Puaa and Ooma 2 in Kona, Hawaii which were sold by the Government Agent:

Royal Patent 1600, Kaakau 58 50/100 acres in Ooma \$29.25

Royal Patent 2027, Kameheu, 101 33/100 acres in Ooma \$38.00

[HSA – Interior Department, Lands]

In the years following issuance of the first Royal Patents, native tenants and others continued to express interest in the lands of 'O'oma and Kalaoa *ahupua'a*. Applications were made to either lease or purchase portions of the remaining government lands. In 1865, Government Surveyor and Land Agent, S.C. Wiltse, wrote to the Minister of the Interior, describing the condition and status of the lands remaining to the government.

September 5, 1865

S.C. Wiltse, Government Surveyor and Land Agent;

to F.W. Hutchinson, Minister of the Interior.

Kona Hawaii. Government Lands in this District not Sold;

also those Sold and Not Patented:

...“Kalaoa 5th”

Not in the Mahele book but believed to be Gov't. land. This land above the Govt. Road has been sold and Patented. Below the road I have surveyed 515 acres which was sold by Sheldon to “Kaakau” & “Kama” who paid him \$165.00. As no valuation was made of this land per acre by Sheldon I afterwards valued it myself as follows, 300 Ac. at 50 cts. per acre, 215 at 25 cts. per Ac. The balance due according to this valuation including Patent was \$42.75 which was paid to me in March 1864 and forwarded by me to your office. The survey of this land is in your office. If the payments made are satisfactory, these men would be very glad to get their Patent.

2. Background

This is a piece of 3rd rate land, used only as goat pasture, no improvements on it. Makai of this survey is about 400 Ac. remaining to the Govt., but of very little value.

“Ooma 1st & 2nd”

The best part of these lands have been sold, there remains to the Govt. the forest part, 2 or 300 Ac., and the makai part some 1500 Ac., about 500 of which is 3rd rate land, the balance rocks.

“Kohanaiki”

The forest part of this land is all that remains to the Gov’t., this is extensive, extending to the mauka side of the forest. It may contain 1500 to 2000 Ac.

The makai part of this land containing 220 Ac. has been sold both by Sheldon and myself. In April 1863 I was surveying in Kona when “Nahuina” (who lives on the adjoining land of “Kaloko”) applied to me to survey the makai part of the Gov’t. land Kohanaiki which he wished to purchase. I inquired whether he had applied to Sheldon for this lands (Sheldon was then in Honolulu) he told me that he had not, but would do so immediately, if it was necessary he would go to Honolulu for that purpose. I told him that I was then writing to Sheldon and I would make the application for him which I did, but never got an answer. I wrote several times to him about that time, for information about Gov’t. lands, but he declined to answer my letters.

On the 30th of May following, I surveyed said piece of land for “Nahuina.” When I was making this survey “Kapena” (who bought this land from Sheldon) was present, and afterwards went to Honolulu and payed Sheldon for this land.

“Nahuina” had the money then to pay for this land, and I told him to keep it until he knew who he was paying it to. I was perfectly satisfied then that Sheldon’s transaction as Gov’t. land Agt. was not honest. Mr. Sheldon had then been away from Kona nearly three months, he had previous to this resigned his office as Judge and taken up his residence permanently in Honolulu. Afterwards when requested by Mr. S. Spencer to act as land Agt. for Kona, “Nahuina” payed me for this land at 25 cents per Acre. Its only value is for a place for a residence on the beach.

I have been thus particular in giving you the history of this affair, so that you might be able to decide which of the parties were intitled to said land... [HSA – Interior Department, Lands]

Historical records document that the primary use of the *kula* – lowlands in the Kekaha region, was for goat ranching, with limited cattle ranching. Throughout the 1800s, most of the cattle ranching occurred on the *mauka* slopes nearer the old upper government road.

Summary of Land Tenure Described in Grant Records

Grant No.’s 1600 (for Kaakau) and 2031 (for Koanui) are situated on the *mauka* side of the Alanui Aupuni (the Upper Government Road, near present-day Māmalahoa Highway) in ‘O’oma 1st and 2nd *ahupua’a*.

Grant No. 1599 (surveyed for Kauhini), was situated across the *kula* lands from O’oma 1st in the south, to Hāmanamana, in the north. Communications from the 1880s, indicate that the parcel was never patented, though Kauhini had lived in ‘O’oma 1st, through the time of his death (before 1888). J.S. Emerson’s Register Map No. 1449 (Figure 21), identifies a Triangulation Station in ‘O’oma 1st as “Kauhini.” At almost the same time that Kauhini’s grant was surveyed, other grants in Kalaoa and ‘O’oma covering a portion of the area described under Kauhini’s grant were patented, including one to Kakau and Kama in Kalaoa 5th (Royal Patent Grant No. 2972). In 1888, this confusing situation was brought to the government’s attention in a letter from more than 70 native residents of ‘O’oma and the larger Kekaha region, when the Minister of the Interior was developing homestead lots for applicants (see communications below).

Grant No. 2027 (for Kameheu), situated in ‘O’oma 2nd, extends from the *makai* edge of the Upper Government Road, to a short distance below the historic Homestead Road between Kaloko and Kalaoa, at about 900 feet above sea level (see Figure 21).

‘O’oma grantee Kaakau (Grant No. 1600), also held an interest in Grant No. 2972 in the land of Kalaoa 5th and ‘O’oma 1st, which he shared with his relative, Kama. Historic survey records (in Register Maps and Survey Field Books) do identify “Kama’s house” near the Wawaloli pond (Register Map No. 1449) in ‘O’oma 1st. The same house is later identified as “Keoki Mao’s House” (Register Map No. 1280; Figure 22). Kama also received Grant 1609 in Kalaoa 5.

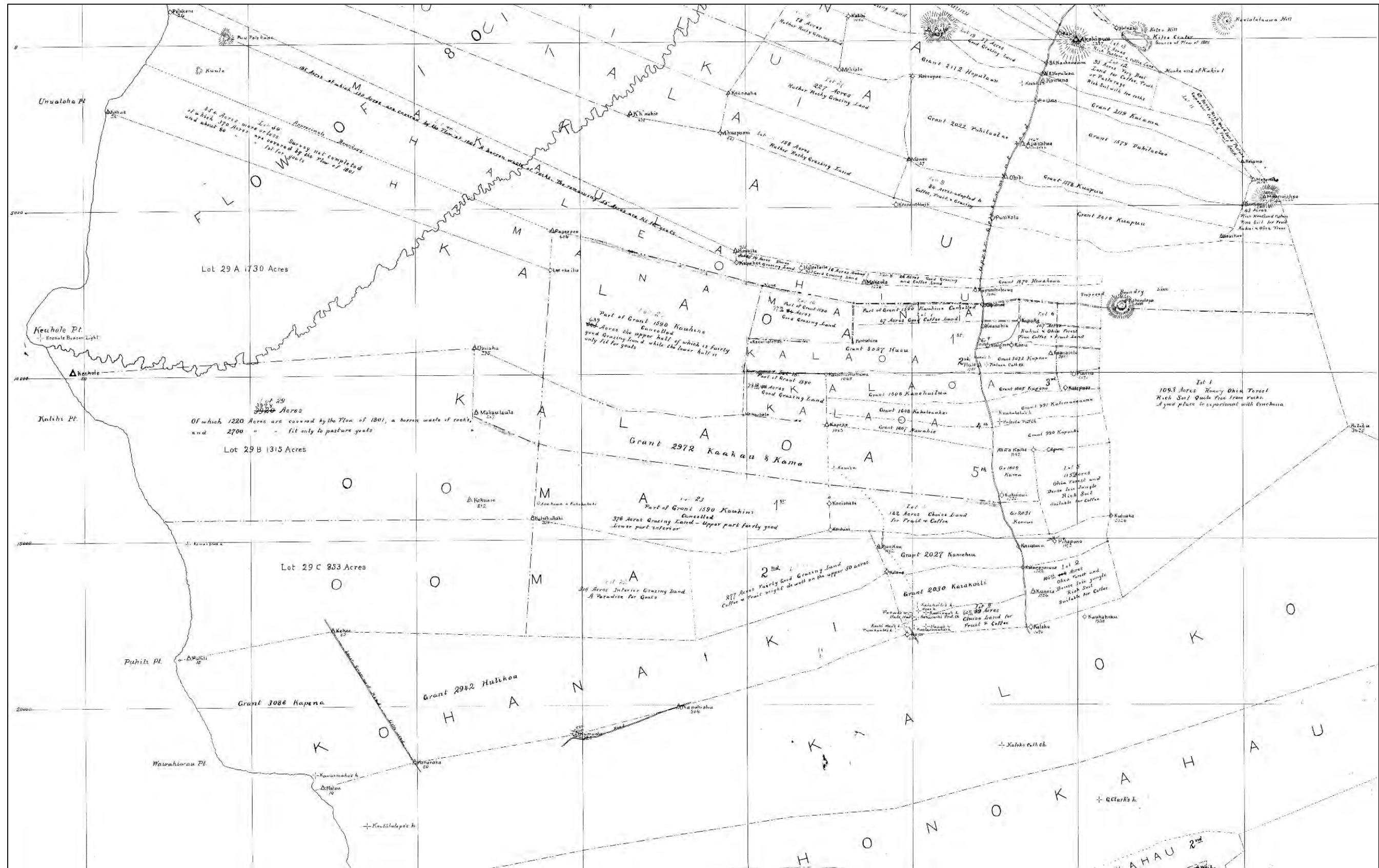


Figure 21. Portion of Hawai'i Registered Map No. 1449 (prepared by J. S. Emerson, Sept. 1888).

2. Background

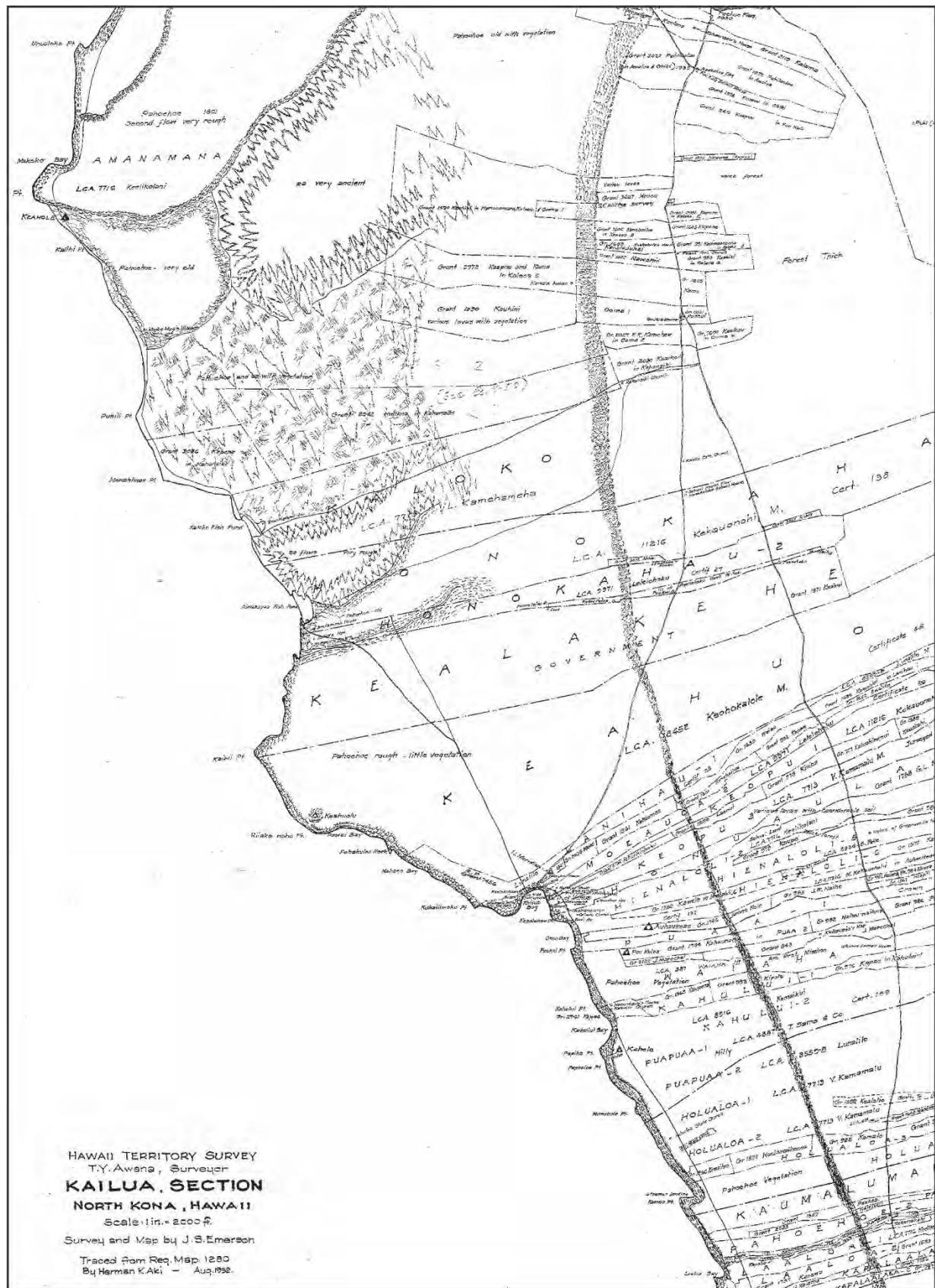


Figure 22. Portion of Hawai'i Registered Map No. 1280.

In 1888, government surveyor J.S. Emerson identified Kama as a resident in ‘O‘oma, near the *mauka* government road (see communication below). This Kama is identified in oral history interviews as being an elder of the Kamaka line, from whom the often-mentioned Palakiko Kamaka and others descend. A temporary beach shelter—in the vicinity of “Kama’s House” marked near the shore of ‘O‘oma 1st on Register Maps 1449 and 1280 (see Figures 21 and 22)—remained in use by family members at least until the outbreak of World War II.

While no formal awards or grants of land appear to have been made for the near shore *kula* or beach lands, it is logical to assume that families living in the uplands of the ‘O‘oma, Kalaoa, and Kohanaiki *ahupua‘a*, made regular visits to the near shore lands. The practice of continued travel between upland residences and near-shore shelters, is also described by *kūpuna* Peter K. Park, and Elizabeth Lee, who was born and raised in the *mauka* section of ‘O‘oma, and by other *kūpuna* from neighboring lands (Rechtman and Maly 2003).

No records indicating that the above Royal Patent Grantees had applied for coastal parcels as a part of their original claims were found by Rechtman and Maly (2003). A further review of the *Māhele* records was also made to determine if any of the grant applicants had been *Māhele* claimants (as is sometimes the case). Their names did not appear in the Register or Testimony volumes for the area.

Ka ‘Āina Kaha—(A Native’s Perspective)

In 1875, J.P. Puuokupa, a native resident of Kalaoa wrote a letter to the editor of the Hawaiian newspaper, *Ku Okoa*, responding to a letter which had been previously published in the paper (written by a visitor to Kona). The first account apparently described the Kekaha region as a hard land that presented many difficulties to the residents. It was also reported that a drought on Hawai‘i had significantly impacted crop production, and that a “famine” was occurring. Puuokupa, responded to the account and described the situation as he knew it, from living upon the land. His letter is important as it provides us with an explanation as to why people of the region—including ‘O‘oma and Kalaoa—lived mostly in the uplands, for it was there that the rich soils enabled residents to cultivate the land and sustain themselves.

Mai Kailua a hiki i Kiholo—(From Kailua to Kiholo)

...The people who live in the area around Kailua are not bothered by the famine. They all have food. There are sweet potatoes and taro. These are the foods of these lands. There are at this time, breadfruit bearing fruit at Honokohau on the side of Kailua, and at Kaloko, Kohanaiki, Ooma and the Kalaoas where lives J.P. [the author]. All of these lands are cultivated. There is land on which coffee is cultivated, where taro and sweet potatoes are cultivated, and land livestock is raised. All of us living from Kailua to Kalaoa are not in a famine, there is nothing we lack for the well being of our bodies.

Mokuola⁶ is seen clearly upon the ocean, like the featherless back of the ‘*ukeke* (shore bird). So it is in the uplands where one may wander gathering what is needed, as far as Kiholo which opens like the mouth of a long house into the wind. It is there that the bow of the boats may safely land upon the shore. The livelihood of the people there is fishing and the raising of livestock. The people in the uplands of Napuu are farmers, and as is the custom of those people of the backlands, they all eat in the morning and then go to work. So it is with all of the native people of these lands, they are a people that are well off.

...As was said earlier, coffee is the plant of value on these lands, and so, is the raising of livestock. From the payments for those products, the people are well off, and they have built wooden houses. If you come here you shall see that it is true. Fish are also something which benefits the people. The people who make the *pai ai* on Maui bring it to Kona and trade it. Some people also trade their *poi* for the coffee of the natives here... (J.P. Puuokupa, in *Ku Okoa* November 27, 1875; translated by Kepā Maly)

Trails and Roads of Kekaha

Alahele (trails and byways) and *alaloa* (regional thoroughfares) are an integral part of the cultural landscape of Hawai‘i. The *alahele* provided access for local and regional travel, subsistence activities, cultural and religious purposes, and for communication between extended families and communities. Trails were, and still remain important features of the cultural landscape. Traditional and historical accounts (cited in this study) describe at least two

⁶ *Moku-ola* — literally: Island of life — is a poetic reference to a small island in Hilo Bay which was known as a place of sanctuary, healing, and life. By poetic inference, the Kekaha region was described as a place of life and well-being.

2. Background

traditional trails that were of regional importance which pass through the lands of ‘O‘oma and Kalaoa. One trail is the *alaloa*—parts of which were modified in the 1840s and later, into what is now called the *Alanui Aupuni* (Government Road) or Māmalahoa Trail or King’s Highway—that crosses the *makai* (near shore) lands, linking royal centers, coastal communities, and resources together. The other major thoroughfare of this region is “*Kealaehu*” (The path of Ehu), which passes through the uplands, generally a little above the *mauka* Government Road or old Māmalahoa Highway, out to the ‘Akāhipu‘u vicinity, and then cuts down to Kīholo in Pu‘u Wa‘awa‘a. From Kīholo, the *makai alaloa* and Kealaehu join together as the *Alanui Aupuni*, and into Kohala, passing through Kawaihae and beyond. The *mauka* route provided travelers with a zone for cooler traveling, and access to inland communities and resources. It also allowed for more direct travel between the extremities of North and South Kona (cf. Malo 1951; I‘i 1959; Kamakau 1961; Ellis 1963; and *Māhele* and Boundary Commission Testimonies).

In addition to the *alalele* and *alaloa*, running laterally with the shore, there are another set of trails that run from the shore to the uplands. By nature of traditional land use and residency practices, every *ahupua‘a* also included one or more *mauka-makai* trail. In native terminology, these trails were generally known as—*ala pi‘i uka* or *ala pi‘i mauna* (trails that ascend to the uplands or mountain). Some of these trails are described in native accounts and oral history interviews (Rechtman and Maly 2003).

Following the early nineteenth century, western contact brought about changes in the methods of travel (horses and other hoofed animals were introduced). By the mid-nineteenth century, wheeled carts were also being used on some of the trails. In the Kona region portions of both near shore and upland *ala hele-ala loa* were realigned (straightened out), widened, and smoothed over, while other sections were simply abandoned for newer more direct routes. In establishing modified trail—and early road-systems—portions of the routes were moved far enough inland so as to make a straight route, thus, taking travel away from the shoreline.

It was not until 1847, that detailed communications regarding road construction on Hawai‘i began to be written and preserved. It was also at that time that the ancient trail system began to be modified and the alignments became a part of a system of “roads” called the “*Alanui Aupuni*” or Government Roads. Work on the roads was funded in part by government appropriations, and through the labor or financial contributions of area residents and prisoners working off penalties (see communications below). The following letters provide readers with a historical overview of the *Alanui Aupuni*, and travel through the Kekaha region. Of particular interest, are those communications addressing the lower Government Road (underlining, italics, and square brackets have been added).

June 26, 1847

George L. Kapeau to Keoni Ana

I have received your instructions, that I should explain to you about the *alaloa* (roadways), *alahaka* (bridges), lighthouses, markets, and animal pounds. I have not yet done all of these things. I have thought about where the *alanui heleloa* (highways) should be made, from Kailua to Kaawaloa and from Kailua to Ooma, where our King was cared for ^[7], and then afterwards around the island. It will be a thing of great value, for the roads to be completed. Please instruct me which is the proper thing for me to do about the *alaloa*, *alahaka*, and the laying out of the *alaloa*... [HSA – Interior Department Misc., Box 142; Kepā Maly, translator]

August 13, 1847

Governor of Hawaii, George L. Kapeau; to

Premier and Minister of Interior, Keoni Ana

Aloha oe e ka mea Hanohano –

I have a few questions which I wish to ask you. Will the police officers be required to pay, when they do not attend the Tuesday (*Poalua*) labor days? How about parents who have several children? What about school teachers and school agents? Are they not required to work like all other people when there is Government work on the roads and highways?

I believe that school agents, school teachers and parents who have several children, should only go and work on the weeks of the public, and not on the *konohiki* days...

...The roads from Kailua and down the *pali* of Kealakekua, and from Kailua to Honokohau, Kaloko, Ooma, at the places that were told our King, and from thence to Kaelehuluhulu [at Kaulana in Kekaha], are now being surveyed. When I find a suitable day, I will go to Napoopoo immediately,

⁷ For the first five years of his life (until ca. 1818), Kauikeaouli was raised at ‘O‘oma, by Ka-iki-o-‘ewa and Keawe-a-mahi *mā* (see Kamakau 1960; and this study).

to confer with the old timers of that place, in order to decide upon the proper place to build the highway from Napoopoo to Honaunau, and Kauhako, and thence continue on to meet the road from Kau. The road is close to the shore of Kapalilua...

The width of the highways around Hawaii, is only one fathom, but, where it is suitable to widen where there is plenty of dirt, two fathoms and over would be all right... If the roads are put into proper condition, there are a lot of places for the strangers to visit when they come here. The Kilauea volcano, and the mountains of Maunaloa, Maunakea, Hualalai.

There is only one trouble to prevent the building of a highway all around, it is the steep gulches at Waipio and Pololu, but this place can be left to the very last... [HSA – Roads, Hawaii]

March 29, 1848

Governor Kapeau; to Minister of the Interior, Keoni Ana:

[Acknowledging receipt of communication and answering questions regarding construction methods used in building the roads.]

...I do not know just what amount of work has been done, but, I can only let you know what has come under my notice.

The highway has been laid from Kailua to Kaloko, and running to the North West, about four miles long, but it is not completely finished with dirt. The place laid with dirt and in good condition is only 310 fathoms.

The highway from Kealakekua to Honaunau has been laid, but is not all finished, and are only small sections... [HSA – Roads, Hawaii]

July 9, 1873

R.A. Lyman; to

E.O. Hall, Minister of the Interior.

Notifies Minister that the road from Kiholo to Kailua needs repairing. [HSA – Interior Department – Land Files]

August 14, 1873

R.A. Lyman; to

E.O. Hall, Minister of the Interior:

I have just reached here [Kawaihae] from Kona. I have seen most of the roads in N. Kona, and they are being improved near where the people live. If there is any money to be expended on the roads in N. Kona, I would say that the place where it is most needed is from Kiholo to Makalawena, or the Notch on Hualalai.

This is the main road around the island and is in very bad condition. Hardly anyone lives there, and there are several miles of road across the lava there, that can only be worked by hiring men to do it. There is also a road across a strip of Aa a mile & a half or 2 in length in the south end of S. Kohala next to the boundary of N. Kona, that needs working, and then the road from here [Kawaihae] to Kona will be quite passable... [HSA – Roads, Hawaii]

November 4, 1880

J.W. Smith, Road Supervisor, North Kona; to

A.P. Carter, Minister of the Interior:

...Heretofore I have been paying one dollar per day, but few natives will work for that, they want \$1.50 per day. Thus far I have refused to pay more than \$1.00 and have been getting men for that sum.

The most urgent repairs are needed on the main road from Kaupulehu to Kiholo, and north of Kiholo to the Kohala boundary, a distance of about 20 miles... [HSA – Roads, Hawaii]

Kailua Nov. 19th, 1880

Geo. McDougall; to

A.P. Carter, Minister of the Interior —

...I noticed among the appropriation passed by the last Legislature, an item of \$5000 for Roads in North Kona Hawaii — as I am very much interested about roads in this neighbourhood, I take the

liberty to express my opinions what is wanted to put the roads in good repair and give the most satisfaction to all concerned.

The Road from Kailua going north for about eight miles to where it joins the upper Road, has never been made, it is only a mule track winding through the lava. It could cost to make it a good cart road, fully two thousand dollars. And from Kailua to where it joins the South Kona road, about 12 miles was made by Gov. Adams, and is in pretty much the same state as he left it, only a little worse of the wear of 20 years or more, it could cost to make it in good repair about 15 hundred dollars. Then we could have 20 miles of good road... [HSA – Interior Department Letters]

March 21st, 1885

C.N. Arnold, Road Superintendent-in-Chief, Hawaii; to

Charles Gulick, Minister of Interior:

...In accordance with your instructions I beg to hand you the following list of names as being those I would select for Supervisors in the different Road Districts under my charge:

... Judge J.K. Hoapili, North Kona District...

Hoping these parties may meet with your approval... [HSA – Roads, Hawaii]

March 1886

Petition to Charles Gulick, Minister of the Interior:

[Signed by 53 residents of North Kona, asking that the appropriated funds be expended for the Kailua-Kohanaiki Road]:

We the people whose names are below, subjects of the King, residing in North Kona, Island of Hawaii:

The funds have been appropriated by the Legislature for the opening of the road from Kailua to Kohanaiki, therefore, we humbly request that the road be made there. The length of this road being thought of is about five miles more or less. The road that is there at the present time is not fit for either man nor beast.

Your people have confidence that as so explained, you will kindly grant our request, and end this trouble in our District...

[those signing included names of individuals known to have ties to the 'O'oma vicinity]: ... J. Kamaka, Kuakahela, Kahulanui, & Palakiko... [HSA – Roads Hawaii; Maly, translator]

March 9th, 1887

C.N. Arnold, Road Superintendent-in-Chief, Hawaii; to

Chas. Gulick, Minister of the Interior:

[Arnold provides documentation of the early native trail from Kailua to the upper Kohanaiki region, and its' ongoing use at the time. He also notes that McDougall (resident at Honokōhau) and others are presently in the business of dairy ranching]:

...The enclosed petition [cited above] has just come to hand from North Kona. The petitioners are mistaken when they say that any special appropriation has been made for this road as there has never been a Government road in this part of the District. There is however an old native trail which has always been used as a short cut, from the lower part of the district between Keahou [sic] and Kailua, by persons who were traveling to Kawaihae and Waimea. The opening of a good road here would be a great convenience to the traveling public and also a great accommodation to a great many people who live on, or nearly on the line of it. I may mention among the number, Messrs. McDougall and Clark who are engaged in dairy ranching near the head of the proposed line. I may also mention that I, with Mr. Smith, made a preliminary survey of it, at the request of His Majesty the King, who is also interested in the opening of this road, as it opens up all of His Kailua lands for settlement. I regard the road as necessary for the above reasons.

From the preliminary survey made, I estimate that a wagon road 12 feet wide will cost from Kailua to the *mauka* Govt. road at Kohanaiki \$6000. The length of the road is 5 $\frac{3}{4}$ miles. The elevation of highest point (*mauka* Road) is 1600 feet above tide at Kailua. Mr. Smith Supt. of Public Works has all the notes of the survey, and can give you full information in regard to this matter... [HSA – Roads, Hawaii]

July 14th, 1887

C.N. Arnold, Road Superintendent-in-Chief, Hawaii; to

L.A. Thurston, Minister of the Interior:

...In obedience to your request I beg to hand you the following list of the District Supervisors under my jurisdiction:

...North Kona – Hon. J.K. Nahale; Native... [HSA – Roads Hawaii]

March 8, 1888

J. Kaelemakule; Supervisor, North Kona Road Board; to

L.A. Thurston, Minister of the Interior.

[Kaelemakule provides Thurston with an overview of work on the roads of North Kona, and describes the Government roads (*Ala nui Aupuni* or *Ala loa*) which pass through the Kekaha region]:

The road that runs from Kailua to Kohanaiki, on the north of Kailua, perhaps 6 miles. It is covered with aa stone, and is perhaps one of the worst roads here. The Road Board of North Kona has appropriated \$200 for work in the worst areas, and that work has been undertaken and the road improved. The work continues at this time. This is one of the important roads of this district, and it is one of the first roads that should be worked on.

The government road or ala loa from upland Kainaliu (that is the boundary between this district of South Kona) [Kealahou], runs straight down to Kiholo and reaches the boundary of the district adjoining South Kohala, its length is 20 and 30 miles. With a troubled heart I explain to your Excellency that from the place called Kapalaoa next to South Kohala until Kiholo – this is a very bad section of about 8 miles; This place is always damaged by the animals of the people who travel along this road. The pahoe-hoe to the north of Kiholo called Keahou, is a place that it is justified to work quickly without waiting. Schedule A, attached, will tell you what is proposed to care for these bad places...

Schedule A: [Appropriations needed]

The road from Kailua to Kohanaiki, and then joining with the inland Government Road – \$500.

The upland Road from Kainaliu to the boundary adjoining S. Kohala – \$1,500.00. [HSA – Roads Hawaii; Kepā Maly, translator]

September 30, 1889

Thos. Aiu, Secretary, North Kona Road Board (for J. Kaelemakule); to

L.A. Thurston, Minister of the Interior.

[Provides Thurston with an overview of work on the roads of North Kona, and identifies individuals who are responsible for road maintenance (cantoniers) in various portions of the district; several of the individuals named were also old residents and applicants for Homestead lots. Of interest, Kaelemakule's report indicates that maintenance of the Alanui Aupuni which crossed into the kula lands of 'O'oma and Kalaoa, had not been assigned to anyone (see report of Dec. 22, 1890)]:

1. In that section of the road which proceeds from Kailua near the shore to Kohanaiki, Mano is the cantonier.
2. That section of the road from Kukuioohiwai to Keahuolono, Paiwa is the cantonier...
3. That section of road from Kailua to the shore of Honokohau, Keaweiwi is the cantonier ...
4. That section of road from Kukuioohiwai to Lanihau along the upland road, Isaac Kihe is the caretaker...

The work done along these sections is the cutting of brush – guava, lantana and such – which trouble the road, and the removal of bothersome stones... [HSA – Roads Hawaii; Kepā Maly, translator]

December 22, 1890

J. Kaelemakule; Supervisor, North Kona Road Board; to

C.N. Spencer, Minister of the Interior

[Reports on the cantoniers assigned to road work in various sections of North Kona. As in 1889, apparently no one was assigned to the lower *Alanui Aupuni* through the 'O'oma kula lands. Though Kaelemakule did include the road section on the land, extending through Kalaoa, on his attached diagram; Figure 23]:

2. Background

...I forward to you the list of names of the cantoniers who have been hired to work on the roads of this district, totaling 15 sections; showing the alignment of the road and the length of each of the sections. The monthly pay is \$4.00 per month, at one day of work each week. The board wanted to increase it to two days a week, but if that was done, there would not have been enough money as our road tax is only \$700.00 for this district... You will receive here the diagram of the roads of North Kona. [HSA – Roads Hawaii; Kepā Maly, translator]

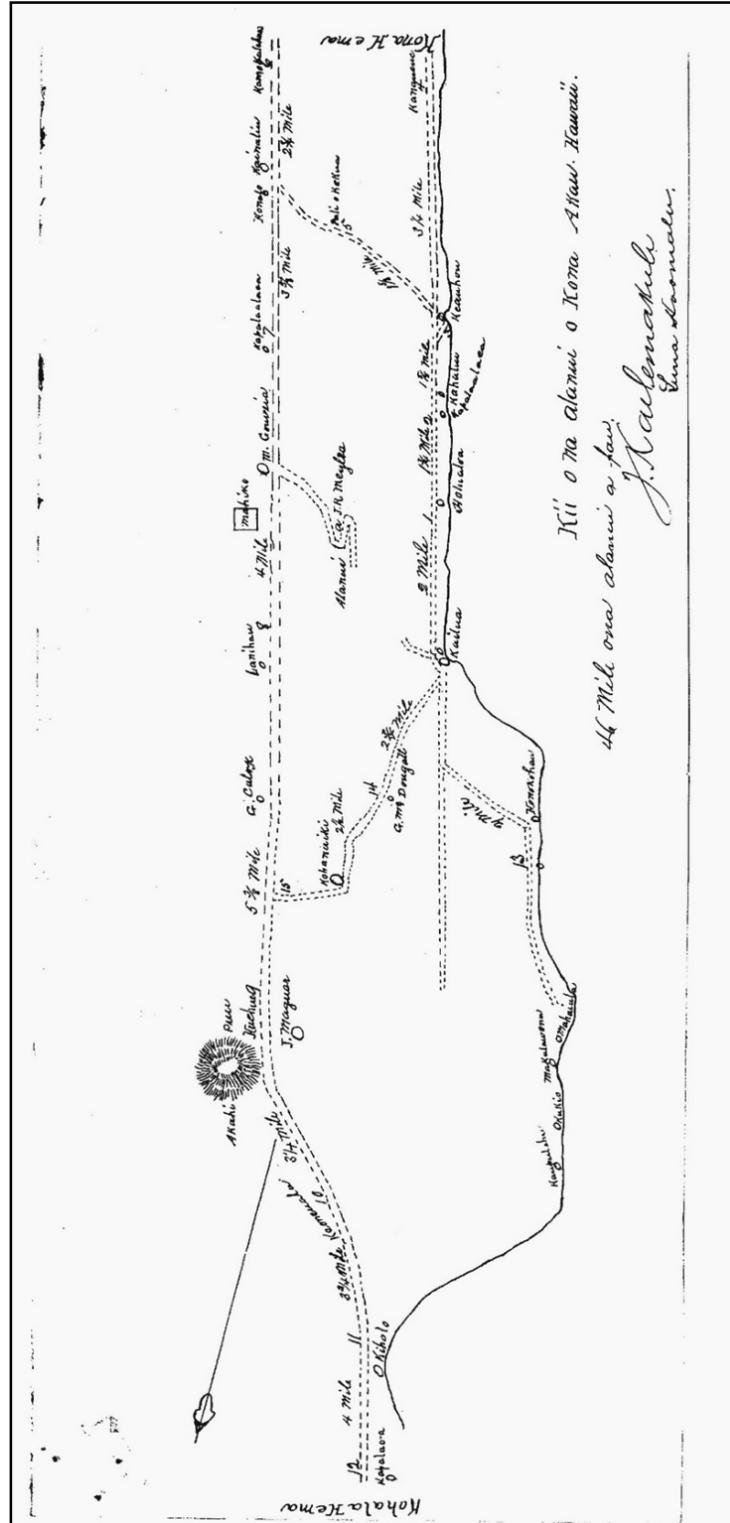


Figure 23. *Kii o na alanui o Kona Akau* (diagram of the roads of North Kona); J. Kaelemakule Sr., Road Supervisor (HSA – Roads, Hawaii; December 22, 1890).

The Government Homesteading Program in Kekaha

Following the *Māhele* and Grant programs of the middle 1800s, it was found that many native tenants still remained on lands for which they had no title. In 1884, the Hawaiian Kingdom initiated a program to create Homestead lots on Government lands—a primary goal being to get more Hawaiian tenants in possession of fee-simple property (Homestead Act of 1884). The Homestead Act allowed applicants to apply for lots of up to 20 acres in size, and required that they own no other land.

On Hawai‘i, several lands in the Kekaha region of North Kona, were selected and a surveying program was authorized to subdivide the lands. Initially, those lands extended from Kohanaiki to Kūki‘o. Because it was the intent of the Homestead Act to provide residents with land upon which they could cultivate crops or graze animals, most of the lots were situated near the *mauka* road (near the present-day Māmalahoa Highway) that ran between Kailua and ‘Akāhipu‘u.

Early in the process, native residents of Kekaha began writing letters to the Minister of the Interior, observing that 20 acre parcels were insufficient “to live on in every respect.” They noted that because of the rocky nature of the land, goats were the only animals that they could raise, and thus, try to make their living (cf. State Archives–Land File, December 26, 1888, and Land Matters Document No. 255; and communications below).

During the first years of the Homestead Program, all of the remaining government lands in the Kekaha region, from Kohanaiki to Kūki‘o 2nd, had been leased to King David Kalākaua for grazing purposes. The following lease was issued, with the notation that should portions of the land be desired for Homesteading purposes, the King would relinquish his lease:

August 2nd 1886

General Lease 364

Between His Majesty Kalakaua;

and Walter M. Gibson, Minister of the Interior

[Lease of unencumbered government lands between Kealakehe to Kukio 2nd]:

...Oma [Ooma] No. 1 & 2 – yearly rent Ten dollars...

Each and every of the above mentioned lands are let subject to the express condition that at any time during the term of this lease, the Minister of the Interior may at his discretion peaceably enter upon, take possession, and dispose of such piece or pieces of land included in the lands hereby demised, as may be required for the purposes of carrying out the terms and intent of the Homestead Laws now in force, or that may be hereafter be enacted during the term of this lease... [State Land Division Lease Files]

By 1889, the demand for homestead lots in the Kekaha lands was so great that King Kalākaua gave up his interest in the lands:

January 22, 1889

J.W. Robertson, Acting Chamberlain;

to J.A. Hassinger, Chief Clerk, Interior Department

[Regarding termination of Lease No. 364 for lands from Kukio to Kohanaiki]:

...I have the honor to acknowledge the receipt of your communication, of the 17th, instant, informing me that you are directed, by His Excellency the Minister of the Interior, to say, that he desires to take possession of the lands, described in Government Lease No. 364, for Homestead purposes, and requests the surrender of the lease.

His Majesty the King, is willing, for the purpose of assisting in carrying out the Homestead Act, to accede to the terms of the lease, so far as to give up only such portions of the lands, as are suitable to be apportioned off for Homestead purposes.

It has come to the knowledge of His Majesty, that several of the applicants for portions of the above lands, are already in possession of lands elsewhere, and living in comfortable homes. They are not poor people, nor are they entitled to the privilege of obtaining lands under the Homestead Act, but are desirous of obtaining more of such property, for the purpose of selling or leasing to the Chinese, which class is beginning to outnumber the natives in nearly every district...

His Majesty is desirous of retaining the balance of lands, that may be left after the apportionment has been completed; and also desires to lease remnants of other Government lands in that section of the Island...

2. Background

Reply attached – Dated January 22, 1889:

The lands of Kohanaiki and Kalaoa and Makaula have been divided up into Homestead lots, and taken up.

Lands marked * are in Emerson's List of lands to be sold. Emerson's List attached.

His Majesty has paid rent to Aug. 22, 1889. Another rent is due in adv. from this date...

* Kukio 2	* Maniniowali
* Mahaiula	* Kaulana
* Awalua	Puukala
+ Makaula	+ Kalaoa 1, 2, 3, 4 & 5
* Ooma 1 & 2	+ Kohanaiki

Lease cancelled by order – Minister of Int. August 2, 1889 [HSA – Interior Department, Lands]

One of the significant issues that arose with the development of homesteads in the Kekaha region, involved the lands of 'O'oma, Kalaoa, and Hāmanamana, which had been surveyed for Kauhini in 1855, under Grant No. 1590. The grant was apparently never patented, and questions regarding the government's authority to divide portions of the 'O'oma-Kalaoa-Hāmanamana lands into Homestead lots were raised. Adding to the confusion, in 1888, John A. Maguire was also making his move from Kohala to Kona, and in the process of establishing his Huehue Ranch. One of the lands he reportedly purchased was covered under the unperfected Grant No. 1590. Thus, homestead applicants and program managers met with a wide range of challenges during the program's history.

Early Homestead Communications (1888-1890)

There are a number of letters between native residents (applicants for Homestead lands) and government agents, documenting the development of the homesteading program and residency in Kekaha. Tracts of land in Kohanaiki, 'O'oma, Kalaoa and neighboring *ahupua'a* were let out to native residents, and eventually to non-native residents as well. Those lands which were not sold to native tenants were sold or leased to ranching interests—most of which came under John A. Maguire of Huehue Ranch.

One requirement of the Homestead Program was that lots which were to be sold as homesteads to the applicants, needed to be surveyed. J.S. Emerson, one of the most knowledgeable and best-informed surveyors to work in Kona, began surveying the Kekaha region homestead lots in 1888. Emerson's letters to Surveyor General, W. D. Alexander, provide valuable historical documentation about the community and land. Writing from 'O'oma in April 1888, Emerson spoke highly of the Hawaiian families living on the land; he also described land conditions and weather at the time. In the letter, we find that questions regarding the status of several lands in Kona had arisen, and that John A. Maguire was planning to "settle" in Kona. Emerson's letters along with those below from the native tenants of the land, provide first-hand accounts of the land development of the communities in Kekaha. The following communications are among those found in the collection of the Hawai'i State Archives (HSA).

May 1888

J.W.H. Isaac Kihe, Jr., et al.; to L.A. Thurston, Minister of the Interior

[Petition with 71 signatures, regarding discrepancy in land grant to Kauhini in Kalaoa and Ooma; and desires that said land be divided into Homestead Lots for applicants]:

...We, the undersigned, subjects residing within the boundaries of Kekaha, from Kohanaiki to Makalawena, and Whereas, the land said to belong to Kauhini is within the boundaries above set forth; Whereas, some doubt and hesitancy has come into our minds concerning the things relating to said land of Kauhini, and that it is proper that a very careful investigation be made, because, we have never known said Kauhini to have lands in the Kalaoas and Ooma 1, and because of such doubt, the Government sold some pieces in said land of 687 acres to Kama, Kaakau and Hueu, and they have been living with all the rights for 20 years and over, on pieces that were acquired by them. Therefore, we leave this request before your Excellency, the honorable one, with the grounds of this request:

First: The said land of Kauhini is not a land that is clear in every way, so that it can be shown truthfully and clearly that it belongs to Kauhini and his heirs – said kuleana.

Second: The land said to belong to Kauhini was only surveyed, but the money was not paid, that is the price for the land, only the payment for the survey was paid. We are ready with witnesses to prove this ground, as well as other grounds.

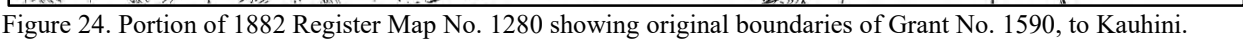
...We ask your honor that this matter be traced in the Government Departments, so as to find out the truth, there is much trouble and uncertainty about this land.

May 16, 1888

...I have been directed by the Honorable Minister of the Interior, to say, that your request asking that Kauhini's interest in the lands of Kalaoa & Ooma 1 be investigated, and to let you know the you are wanted to send, or to bring here to Honolulu, 2 or 3 good witnesses, and all the papers found by you or them, concerning this land of Kauhini... [HSA Interior Department Lands]

J.F. Brown, Government Surveyor; to L.A. Thurston, Minister of the Interior

...With reference to the letter of inquiry of numerous natives in N. Kona, Hawaii, I beg to report: That as regards the land belonging to Kauhini, I find that Grant 1590 on record and signed in due form, assigned to Kauhini something over 1800 acres shown in sketch by yellow tinted boundary line. At the bottom of the page however and in different handwriting is the following remark "Memo – this to be cancelled" S.S. (Stephen Spencer)?



Later the grants shown in sketch by blue lines were issued to the parties indicated in the sketch, and this fact together with the memo attached to the Grant, and the statements and beliefs of the natives leads me to think that the Grant to Kauhini was actually cancelled, but of this I have not yet obtained further proof than I have here given... [HSA – Interior Department, Lands]

May 1888 - J.W.H.I. Kihe, Jr.; to L.A. Thurston, Minister of the Interior:

...Oh honorable one, I am ready with the right witnesses to come when I receive the order, and if you agree, oh honorable one, to help with the fares for us on the vessel, and for our support while staying there and coming back.

Proofs are ample to prove that the land belongs to the Government, when I arrive with the witnesses, according to what you wish to be done... [HSA – Interior Department, Lands]

[Applying to purchase remnant lands from Makaula to Ooma 2nd, as a native Hui; and that land not be sold to outsiders.]

...We the undersigned, kamaaina (old residents) who reside from “Makaula” to “Ooma 2,” joining “Kohanaiki,” hereby petition and we also file this petition with you, and for you to consider and conferring with the Minister of the Interior, whether to consent or refuse the petition which we humbly file, and at the same time setting forth the nature of the land and the boundaries desired.

We ask that all be sold to us as a Hui, that the remnants of all the Government lands from “Hamanamana” to “Ooma 2 (two),” that is from the Government remnant of “Hamanamana, Kalaoa 1, 2, 3, 4, 5, Ooma 1 & 2” running until it meets the sea. Being the remnants remaining from the “Homesteads” lately, and remaining after the sale of the lands formerly sold by the Government, these are the remnants which we wish to buy as a “HUI.” If you consent, and also the “Minister of the Interior,” for these reasons:

1. The “remnants of Government lands” aforesaid, join our land kuleanas and were lately surveyed, and for that reason we believe it proper that they be sold to us.
2. The “kuleanas” that were surveyed for us are not sufficient to live on in every respect, they are too small, and are not in accordance with the law, that is one hundred acres, (Laws 1888).
3. Because of our belonging to, and being old residents of said places, is why we ask that consent be granted us for the sale to us and not to any one from other places, or we may be put to trouble in the future.

With these reasons, we leave this with you, and for you to approve, and we also adhere to our first offer per acre, and the explanations in regards to said offer.

FIRST: The price per acre to be 10 cents per acre.

SECOND: The nature of the land is rocky and lava stones in all from one and to the other, and there is only one kind of animal which can roam thereon, and it is goats, and that is the only thing to make anything out of, and to benefit us if we acquire it.

THIRD: If this land is acquired by others, they will probably cause us trouble, because the kuleanas which we have got are very small and not enough, not 20 acres of the land were acquired by us; very few of the lots reach 20 acres or more.

And because of these reasons and the explanations herein, we leave before your Excellency for the granting of the consent or not... [HSA – Interior Department, Lands]

ca. February 1889

Petition of J.W.H. Isaac Kihe, Jr. and 21 others;

to L.A. Thurston, Minister of the Interior

[Transmitting first payment for Homestead Land from Makaula to Kohanaiki]:

...We, the ones whose names are below, persons who but for the pieces of “Homestead” lands from Makaula to Kohanaiki, present to you documents of proof and money as first payment of ten (\$10.00) dollars in the hands of J. Kaelemakule, the Agent appointed for the “Homestead” lands in North Kona, Hawaii.

We ask that the Agreements be sent up, with the Government for five years to J. Kaelemakule, the Agent here, in number the same as there are names below...

- | | | |
|---------------------------|------------------|-----------------|
| 1. J.W.H. Isaac Kihe, Jr. | 9. P. Nahulanui | 17. Keawehawaii |
| 2. S. Mahauluae | 10. Kaukaliinea | 18. D. Kaninau |
| 3. D.P. Manuia | 11. Kamahiai (w) | 19. Mokuaiikai |
| 4. S.M. Kaawa | 12. C.K. Kapa | 20. Nuuanau |
| 5. H.P. Ku | 13. P.K. Kanuha | 21. S. Kaimulua |
| 6. W.N. Kailiino | 14. J. Haau | 22. J. Kaloa |
| 7. Z. Kawainui | 15. G. Mao | |
| 8. Kikane | 16. J. Pule | |
- [HSA – Interior Department Document No. 227]

February 18, 1889

J. Kaelemakule, Land Agent; to L.A. Thurston, Minister of the Interior:

I am sending the correct report of the applicants for homestead lands here in North Kona, and their respective names, and the amount they have paid for their initial deposits in order that the agreements will be made correctly...

Pule \$10.	Keoki Mao \$10.	Mahuluae \$10.	Haau \$10.
Nuuanu \$10.	Manuia \$10.	Kaukaliinea \$10.	Kamahiai (w) \$10.
Kaawa \$10.	Kaninau \$10.	J. Kaelemakule \$10.	Kawainui \$10.
Mokuaiikai \$10.	Keawehawaii \$10.	Nahulanui \$10.	Kaloa \$10.
Haiha \$10.	Kapa \$10.	Kaumulua \$10.	Isaac Kihe \$10.
Kailiino \$10.	Kanuha \$10.	Ku \$10.	Kikane \$10.

[HSA – Interior Department, Lands]

October 7, 1889

J. Kaelemakule, Land Agent; to L.A. Thurston, Minister of the Interior:

...The applications of Kahinu and Lilinoe which were sent down during the month of August, please have the lots changed, because the map of Ooma has arrived with new numbers, as follows: Kahinu, Lot 51; Lilinoe, Lot 49, in Ooma 1st ... [HSA – Interior Department, Lands]

October 10, 1889

J.W.H. Isaac Kihe, Secretary; to L.A. Thurston, Minister of the Interior:

...I leave some more names who make applications for homestead lands here in North Kona... The places wanted by those named are:

Pika Kaninau at Ooma 1
 Kahinu at Ooma 2
 Keaweiwi at Ooma 2... [HSA – Interior Department, Lands]

October 28, 1889

J. Kaelemakule, Land Agent; to L.A. Thurston, Minister of the Interior:

...The eight lots in Ooma have all been taken, none are left... These lots have been very quickly taken by the bidders, before the issuance of the notice from the Minister... Bear in mind the agreements for Kahinu and Lilinoe... [HSA – Interior Department, Lands]

December 31, 1890

J.W.H.I. Kihe, Jr.; to C.N. Spencer, Minister of the Interior:

We, the undersigned, who are without homes, and are destitute and have no place to live on, and whereas, the government has permitted all the people who have no lands, and that they receive homesteads, and for that reason, your humble servants make application that our application may be speedily granted which we now place before Your Excellency, that the Government land which was divided and surveyed by Joseph S. Emerson, be immediately sub-divided, the same being portions of Kalaoa 5 and Ooma, on the mauka side of Kama (k), Koanui (k), to the junction with Ooma of Kaakau (k), containing an area of one hundred and fifteen acres (115), and it is those acres which your applicants are applying for before Your Excellency, and where as your applicants are

native Hawaiians by birth, residing at Kalaoa, North Kona, Island of Hawaii. And the minds of your servants hope and desire to have a place to live on in the future, and to have a home for all time, and Your Excellency, your servants humbly place their petition with the hope that you will grant this application...

M.E. Kuluwaimaka (k)

H. Hanawahine (k)

D.W. Kanui (k)

Mr. Kahumoku (k)

[HSA – Interior Department, Lands]

July 30, 1890

Petition of Kaihemakawalu and 63 native residents of Kekaha;

to C.N. Spencer, Minister of the Interior

[Requesting that lands available for Homesteading be sub-divided and granted to applicants]:

...We, the undersigned, old-timers living from Kealakehe to Kapalaoa, who are subject to taxes, and who have the right to vote in the District of Kona, Hawaii, and ones who are really without lands, and who wish to place this application before Your Excellency, that all of these Government lands here in North Kona, be given to the native Hawaiians who are destitute and poor, being the lots which were sub-divided by the Government which are lying idle and for which no Agreements have been given out, and also the lots which were granted Agreements and issued in the time when Lorrin A. Thurston was Minister of the Interior, and also the lots which still remain undivided. All of these Government lands are what we are now again asking that the dividing and sub-dividing be continued in these remnants of Government lands, until all of the poor and needy ones are provided for.

Your Excellency, we ask that no consent whatever be given to permitting lands to be acquired by the rich through sale at auction, or by lease, and if there is to be any lease, then to be leased to the poor ones, if they are supplied with homes.

Your Excellency, we ask that you immediately send copies of all agreements of the Government lands which were cut up and sub-divided, which are remaining and have no documents for those lots. And we also ask that a surveyor be sent now to again survey and sub-divide the remaining Government lands, being the Government lands of Kaulana, Mahaiula, Kukio 1 & 2, mauka of the Government Road, and Kalaoa 5 & Ooma 1, mauka of the Government Road, joining Kama's and Koanui's.

And now, Your Excellency, we also ask that all of the pieces of Government land lying idle outside of these lands which have been sub-divided, and lands which are to be sub-divided, applied for above, to be allowed to be leased to use for five cents per acre, because, they are rocky and pahoehoe lands only left, and the number of acres being about three thousand and over, thereby giving the Government some income from these which have been lying idle and without any value... [HSA – Interior Department, Lands]

Field Surveys of J.S. Emerson (1882-1889)

Among the most interesting historic Government records of the study area—in the later nineteenth century—are the communications and field notebooks of Kingdom Surveyor, Joseph S. Emerson. Born on O'ahu, J.S. Emerson (like his brother, Nathaniel Emerson, a compiler of Hawaiian history) had the ability to converse in Hawaiian, and he was greatly interested in Hawaiian beliefs, traditions, and customs. As a result of this interest, his letters and field notebooks record more than coordinates for developing maps. While in the field, Emerson also sought out knowledgeable native residents of the lands he surveyed, as guides. Thus, while he was in the field he also recorded their traditions of place names, residences, trails, and various features of the cultural and natural landscape (including the extent of the forest and areas impacted by grazing). Among the lands that Emerson worked in was the greater Kekaha region of North Kona, including the lands of 'O'oma, Kalaoa, and vicinity.

One of the unique facets of the Emerson field notebooks is that his assistant J. Perryman, was also a sketch artist. While in the field, Perryman prepared detailed sketches that help to bring the landscape of the period to life. In a letter to W.D. Alexander, Surveyor General, Emerson described his methods and wrote that he took readings off of:

...every visible hill, cape, bay, or point of interest in the district, recording its local name, and the name of the *Ahupuaa* in which it is situated. Every item of local historical, mythological or geological interest has been carefully sought & noted. Perryman has embellished the pages of the field book with twenty four neatly executed views & sketches from the various trig stations we have occupied... [Emerson to Alexander, May 21, 1882; HSA – DAGS 6, Box 1]

Discussing the field books, Emerson also wrote to Alexander, reporting “I must compliment my comrade, Perryman, for his very artistic sketches in the field book of the grand mountain scenery...” (HSA – HGS DAGS 6, Box 1; Apr. 5, 1882). Later he noted, “Perryman is just laying himself out in the matter of topography. His sketches deserve the highest praise...” (ibid. May 5, 1882). Field book sketches and the Register Maps that resulted from the fieldwork provide a glimpse of the country side of more than 100 years ago.

Field Notebooks and Correspondence from the Kekaha Region

The following documentation is excerpted from the field notebooks and field communications of J. S. Emerson. Emerson undertook his original surveys of lands in the Kekaha region in 1882-1883 (producing Register Maps No. 1278 and 1280; see Figure 22). Subsequently, in 1888-1889, Emerson returned to Kekaha to survey out the lots to be developed into Homesteads for native residents of ‘O‘oma, Kalaoa and vicinity (see above, The Government Homesteading Program in Kekaha). Through Emerson’s letters and notes taken while surveying, we learn about the people who lived on the land—some of them identified in preceding parts of the study—and about places on the landscape. The numbered sites and place names cited from the field books coincide with sketches prepared by Perryman, which are shown as figures in the current study.

J.S. Emerson Field Notebook Vol. 111 Reg. No. 253
West Hawaii Primary Triangulation, Kona District
Akahipuu; May 27, 1882
 (Figure 25)

Site # and Comment:

- ...6 – Koanui’s frame house. E.G. In Honokohau – nui.
 - 23 – Kaloko-nui fish pond. Tang. S. end by Nuuanu’s grass house.
 - 24 – Wall between fish pond of Kaloko nui and iki.
 - 25 – Kaloko iki fish pond. Tang. N. extremity.
 - 26 – Kawaimaka’s frame house. In Kohanaiki.
 - 27 – Lae o Wawahiwaa. Rock cape. In Kohanaiki.
 - 28 – Keoki Mao’s grass house. In Ooma.
 - 29 – Pahoehoe hill. Between Ooma and Kalaoa 5.
 - 30 – Lae o Keahole. Extremity. In Kalaoa 5.
 - 31 – Lae o Kukaenui. Resting place for boats.
 - 32 – Makolea Bay.
- [Notebook 253:53]

While taking sightings from Keāhole, Perryman prepared additional sketches of the landscape. One sketch on page 69 of the field book (Figure 26) depicts the view up the slope of Hualālai. Dated June 4, 1882, the sketch is of importance as it also depicts Kalaoa Village and church; the upper Government road; Kohanaiki Village; and two trails to the coast, one trail to Honokōhau, and the other near the Kaloko-Kohanaiki boundary. Use of these trails continued through the 1950s. The other sketch on page 73 of the field book (dated June 8, 1882) depicts the coastline south from Keāhole, to an area beyond Keauhou (Figure 27). Of interest, we see only the near-shore “Trail” in the foreground, with no trail on the *kula* lands. Then a short distance south, a house is depicted on the shore, in the ‘O‘oma vicinity (identified as the house of Kama or Keoki Mao on Emerson’s Register Maps). And a little further beyond (south of) the house, two trails are indicated—presumably the *Alanui Aupuni* on the *kula* lands to ‘O‘oma, and the near shore trail, seen coming in from Honokōhau.

While surveying the uplands on Hualālai in August 1882, Perryman drew a sketch of the Keāhole-Honokōhauiki coastal lands. This sketch (Figure 28) from field Book No. 254 shows the reverse view of Figure 24. Noting again, that the only trail given at that time, was the near shore trail, running out of Honokōhau-Kaloko, Kohanaiki, ‘O‘oma and on to Keāhole.

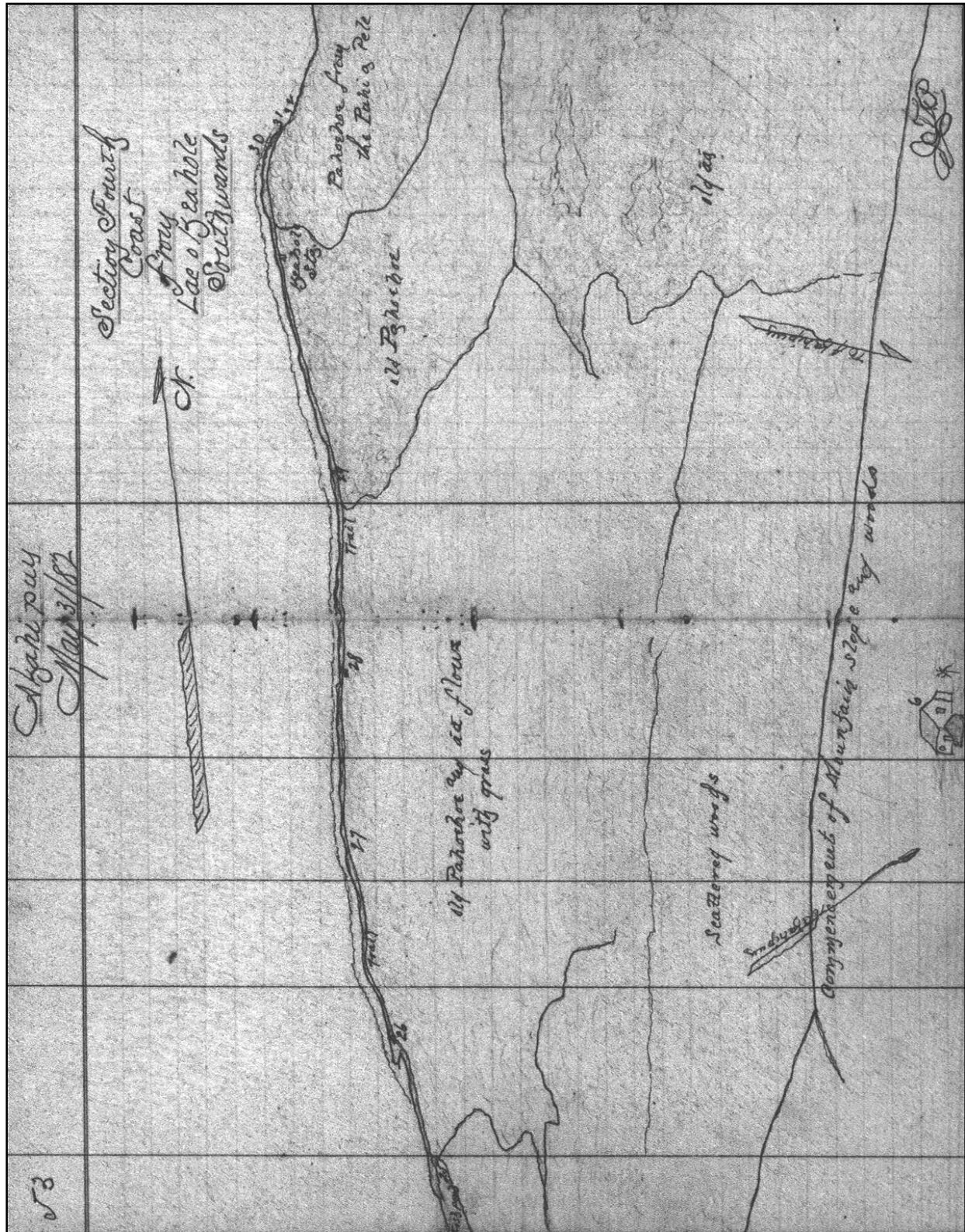


Figure 25. J. S. Emerson, field notebook map, Book 253:53 (State Survey Division).

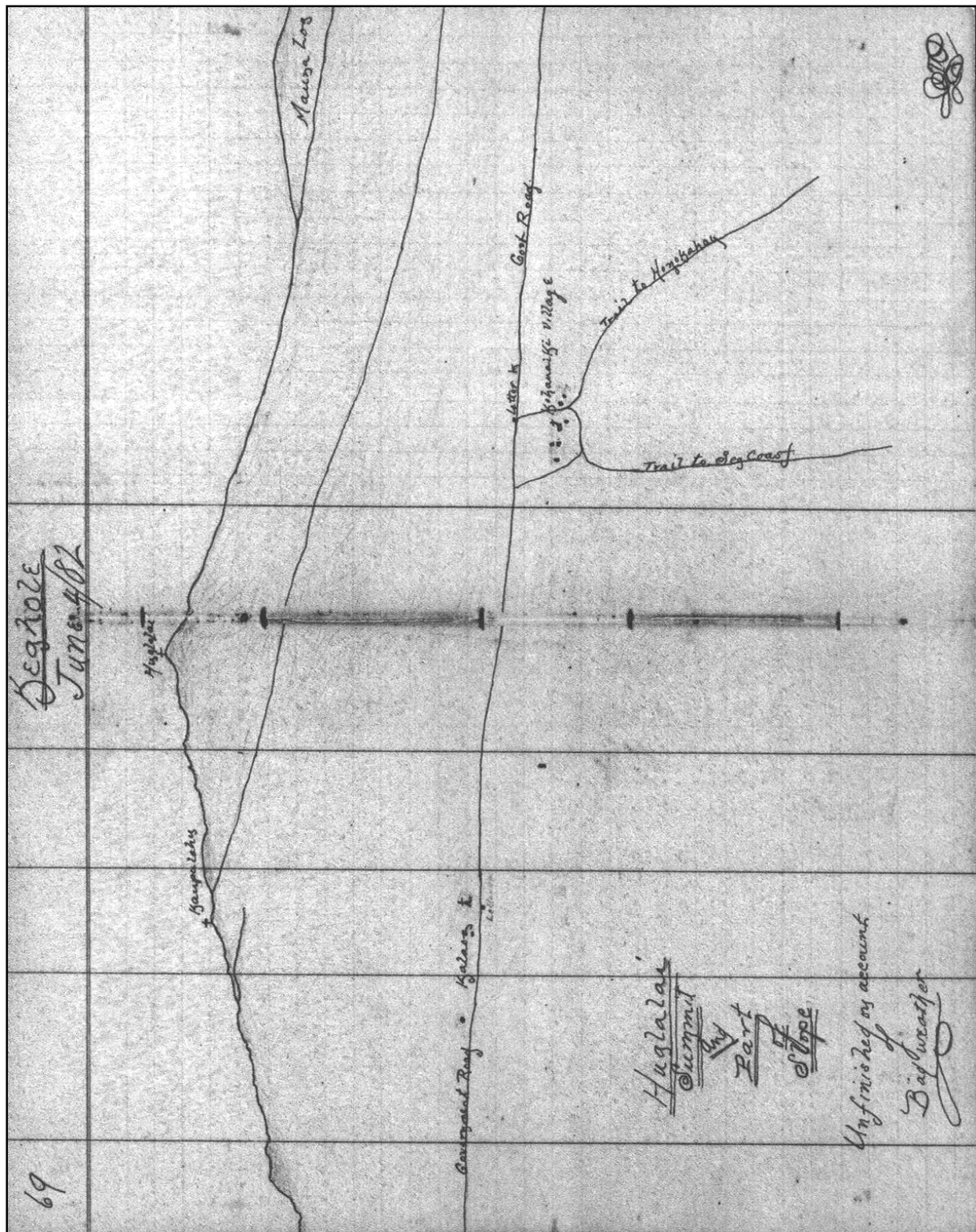


Figure 26. J. S. Emerson, field notebook map, Book 253:69 (State Survey Division).

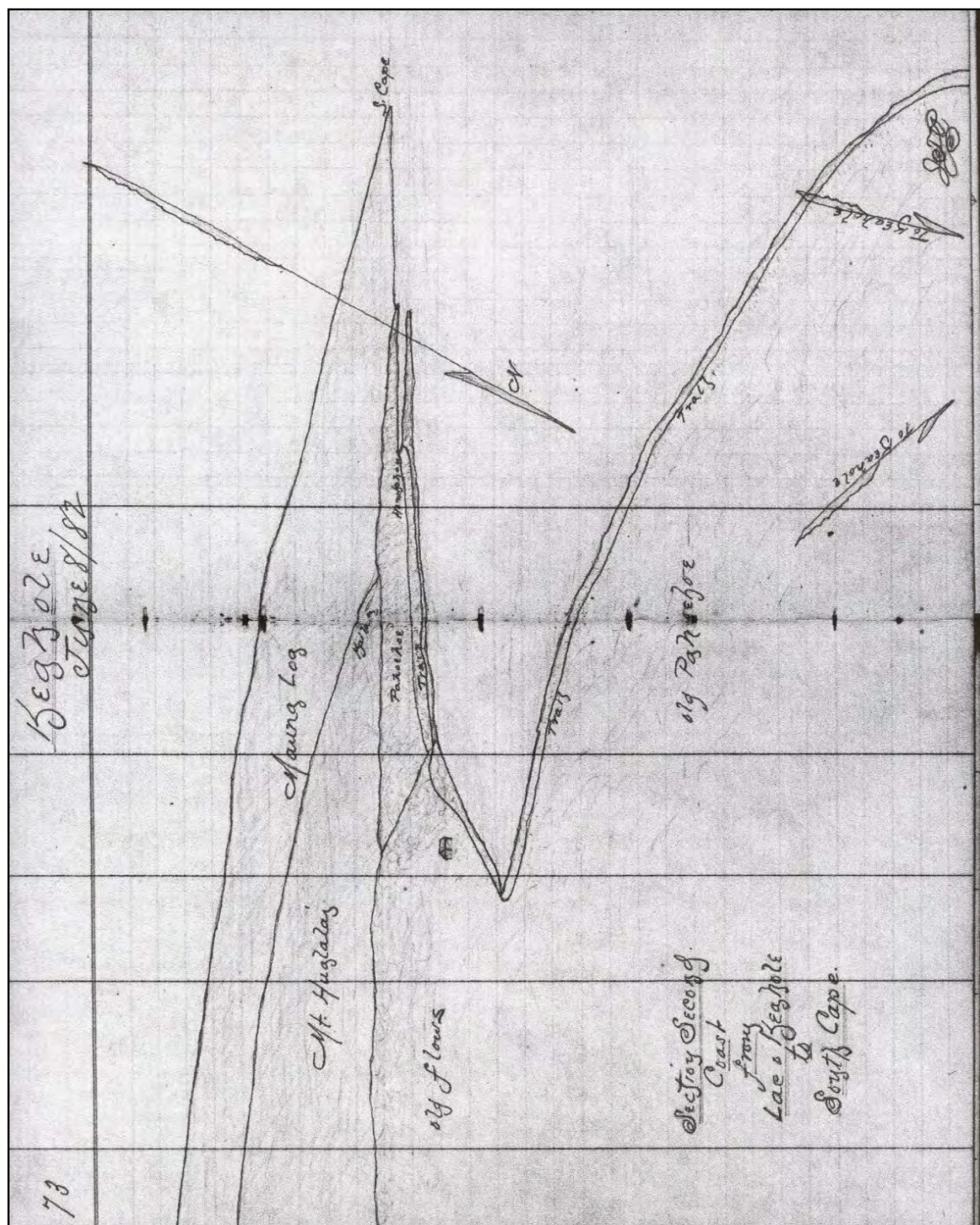


Figure 27. J. S. Emerson, field notebook map, Book 253:73 (State Survey Division).

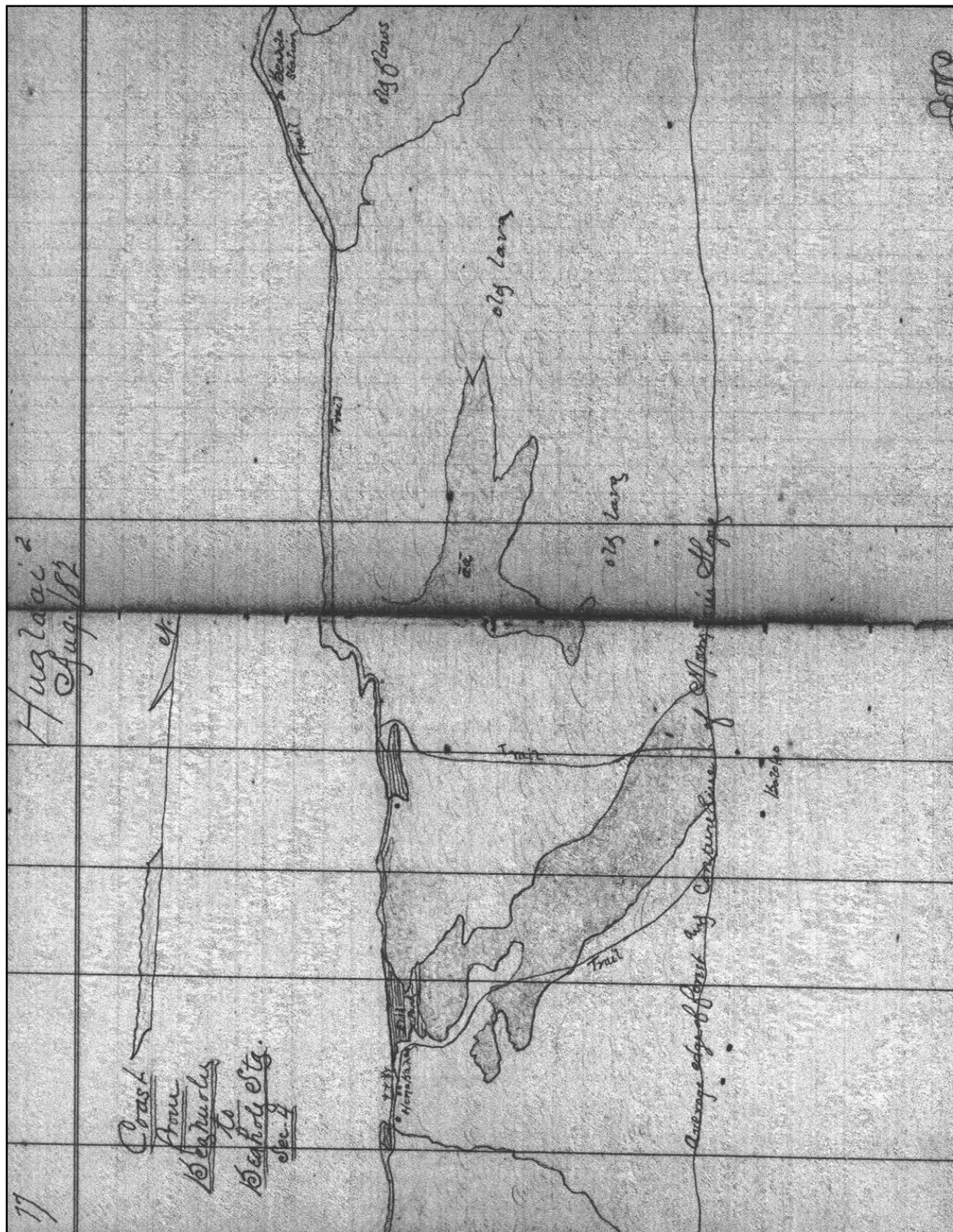


Figure 28. J. S. Emerson, field notebook map, Book 254:77 (State Survey Division).

2. Background

While surveying the ‘O‘oma and Kalaoa homestead lots in 1888-1889, Emerson camped near Kama’s house in ‘O‘oma 1st. The following communications were sent by Emerson to W.D. Alexander, and tell us more about the people of the land, their beliefs, and commentary on then current events in the Kingdom. Of interest, we also find that J.W.H. Isaac Kihe, whose writing of traditions, and as a representative of the native families in the land application process—which have been cited extensively in this study—is also mentioned in Emerson’s narratives:

April 8, 1888

...Our tent is pitched in Ooma on the *mauka* Govt. road at a convenient distance from Kama’s fine cistern which supplies us with the water we need. The pasturage is excellent and fire wood abundant. As I write 4:45 P.M. the thermometer is 71°, barometer 28.78. The entire sky is overcast with black storm clouds over the mountains. The rainy season comes late to Kona this year and has apparently just begun. We have had about three soaking rains with a good deal of cloud & drizzle. We are now having a gentle rain which gladdens the residents with water for their cisterns... We have set a large number of survey signals and identified many important corners of Gov’t. lands etc. from Puhiapale on the boundary of Kaupulehu to the boundary line of Kaloko. The natives welcome us and do a great deal to help the work along. Tomorrow I expect to go to Kuili station with a transit and make a few observations & reset the old signal... The Kamaainas tell me that Awakee belongs to the Gov’t. though I see it put down as LCA 10474 Namauu no Kekuanaoa.

They also tell me that the heirs of Kanaina estate still receive rent for the Ahupuaa of Kaulana, though I have recorded as follows in my book, Kaulana ½ Gov’t. per civil Code 379, ½ J. Malo per Mahele Bk. Title not perfected; all Gov’t. Please examine into the facts about Kaulana and instruct me as to what I shall do about it. Kealoha Hopulaau rents it and if it is Gov’t. land the Gov’t. should receive the rent or sell it off as homesteads. It is a desirable piece of land, a part of it at least...

[HSA – HGS DAGS 6, Box 2]

April 17, 1888

...The work is being pushed rapidly and steadily forward. The natives render me most valuable assistance and find all the important corners for me as fast as I can locate them. It is hard getting around on account of the rocks & stones, to say nothing of trees etc., but there is a great deal of really fine land belonging to the Government, admirably adapted to coffee etc. The more I see of it the better it appears.

As to Kaulana, if I hear nothing to the contrary from you, I will leave it all as Gov’t. land.

Mr. McGuire [sic] of Kohala, the representative for that district, proposes to settle in Kona. He has bought Grant 1590, Kauhine, in Ooma, Kalaoa etc. and wants the Gov’t. to make good to him the amount taken from him by Grants 2972, Kaakau & Kama, and 3027, Hueu, which occupy portions of the same land granted to Kauhine. If his title is good, would it not be just to leave Kaakau & Kama as well as Hueu in possession of their lots where they have lived for over 20 years, and give McGuire an area in adjoining lands equal to that taken from him by these two grants.

It is said that Chas. Achi has written to the natives that Grant 1590, Kauhine, has been cancelled. Will you learn the true state of the case and be so kind as to inform me...

[HSA – HGS DAGS 6, box 2 Jan.-Apr. 1888]

In his field book notes, on May 1st, 1888, Emerson noted that he had placed the “Pulehu” station on the “ground by ahu, about 4 feet makai of Kama’s goat pen, on the iwi aina between Kalaoa 5 and Ooma 1...” (J.S. Emerson Field Book 291:83).

In the same field book on May 19th, 1888, while surveying the area near the boundary of ‘O‘oma 1st and 2nd, at the 325 foot elevation, Emerson cited off of a station named “Kahokukahi.” The point is “on the entrance of the cave, Kahokukahi... The above is the vertical entrance of a famous ana kaua, which extends for a long distance to the E. and to the W...” (J.S. Emerson Field Book 291:137). An “ana kaua” would be a place, where during times of war, people could hide and fortify themselves. Emerson’s description indicates that the cave runs some distance *mauka* and *makai* of “Kahokukahi.”

On May 23, 1888, Emerson surveyed Pūhili, the boundary between Kohanaiki and ‘O‘oma 2nd. He observed, “Large [mark] on solid pahoe hoe, on bound. bet. Kohanaiki & Ooma, by the sea, near the end of a cape... Station mark, drill hole in stone, 9 ft. S. of the S. corner of an old “kahua hale” on white sand...” (J.S. Emerson Field Book 291:151).

Returning to his “old camp Ooma,” in August 1888, Emerson submitted the following letter to Alexander:

August 25th, 1888

...I have to report that the very intricate and irregular remainder of Gov't. land situated in Kealakehe is cut up into homesteads, ready for the committee to estimate its values. The job has been made unusually long & tedious by the absurd arrangement of the old kuleanas scattered around at random. I have also run out the boundaries of Papaakoko, ready for fencing. Thursday P.M. I made my way through a heavy rain to this place and set up tent in the storm. It rained a good deal every day since and is raining now. In spite of the weather the work of cutting up Ooma 1st goes bravely on. I have a huge umbrella to camp under while it rains. I propose to finish up Ooma 1st & return to Honolulu by the next trip of the *Hall*.

Kailua beach is the great rendezvous for men & asses from all parts of the country when the steamer arrives from Honolulu. It has in consequence become the natural place to tell and hear gossip & news. Here, the sand-lot orator, mounted on a packing box, can address the largest crowd. T.N. Simeona, who stole the church money, keeps the pound and takes care of the court house wanting to make a speech, repaired to the beach last Wednesday morning and is reported to have made a windy harangue to the effect that the King was hewa and that the Ministers were pono! Up to that time he had always been the contemptible too of the King's party and was loud in his denunciation of the Government. I explain this change in his talk by his wish to retain his Gov't. billets & his desire to avoid arrest as a rebel.

A native man told me the other day (Wednesday) that the Cabinet was hewa in two things viz.

1st They taxed chickens, banana trees and many other things that had not been heretofore taxed.

2nd They arrested and sent to Molokai many who were not lepers. For these reasons many justified Wilcox for trying to out the ministers.

There is a sturdy old native living at Kaloko named Kealiihelepo, whom I greatly respect. Said he to me “When King Kalakaua returned from his foreign trip he made a speech at Kailua and said that ‘in foreign lands the foreign God was losing his power. His former worshippers were deserting him. That the old Hawaiian Gods were still mana and them he would worship.’” But said Kealiihelepo “The King was mistaken. Our old Gods were once mighty, but the coming of the foreigner with his Gods has robbed them of their strength. Therefore the King has made the mistake to oppose the God who is now in power, and Jehovah is opposing him. Hence the King's pilikia.”

You are entirely justified in calling Kona “that heathen district.”

[HSA – HGS DAGS 6, box 2 Jan.-Apr. 1888]

On October 14th 1888, Emerson wrote to Alexander, briefing him on conversations he was having with J.W.H. Isaac Kihe, his “encyclopedia,” “the son of a famous sorcerer.” Later, Emerson used many of the notes taken during his conversations with Kihe, to develop his paper on Hawaiian religion (Emerson 1892). J.W.H. Isaac Kihe, was the son of Kihe, who was the son of Kuapahoa, of Kaloko (notes of J.S. Emerson, September 25, 1915; in collection of the Hawaiian Historical Society). While at ‘O‘oma, Kihe described the various nature forms taken by the deceased, and their role in the spiritual practices. On October 14th Kihe named for him some of the gods called upon by those who practiced the Kahuna Kuni sorcery.

Ooma

October 14, 1888

J.S. Emerson; to W.D. Alexander:

...I have just been having a chat with a son of a famous sorcerer, with the following for a summary of what he said.

There are four gods worshipped by murders and sorcerers viz:

- (1). Kui-a-Lua, the god of the Lua, Mokomoko, Haihai and other forms of violence.
- (2). Uli, the god of the Anaana, Kuni, Hoopiopio and Lawe Maunu.
- (3). Kalaipahoa, god of the Hoounauna, Hookomokomo and Hooleilei.
- (4). Hiiaka-i-ka-poli-o-Pele, the goddess of the Poi uhane, Apo leo, Pahiuhui and Hoonoho uhane...

[J.S. Emerson, in collection of the Hawaiian Historical Society]

2. Background

Emerson's 1888-1889 survey and subdivision of the Akahipuu Section of North Kona (between the *ahupua'a* of Kohanaiki and Makaula), originally conceived of as twenty-nine lots extending from the ocean to above the upper Government Road (see Figure 21), was later revised to include fifty-nine homestead lots ranging in size from less than 4 acres to more than 45 acres, all located in the *mauka* portions of the *ahupua'a* (Figure 29). The newly created lots included (by *ahupua'a* from south to north) thirty-three in Kohanaiki (Lots 1-33; the Kohanaiki Homesteads), four in 'O'oma 2nd (Lots 56-59), eight in 'O'oma 1st (Lots 48-55), one in Kalaoa 4th (Lot 47), two in Kalaoa 3rd (Lots 34 and 46), one in Kalaoa 2nd (Lot 35), three in Kalaoa 1st (Lots 36, 38, and 40), six in Hamanamana (Lots 37, 39, 41, and 42-44), and one in Makaula (Lot 45). Emerson did not divide the *mauka* lands of Kalaoa 5th, which already belonged to Kaakau and Kama (Grant Nos. 1609 and 2972). The newly created homestead lots in 'O'oma were soon purchased by native residents of the area, who had long been desirous of obtaining these lands (see above). An 1893 letter from J. Kaelemakule, Land Agent, to J.A. King, Minister of the Interior, lists some of the applicants for the homestead lots in 'O'oma 2nd Ahupua'a:

June 22, 1893

J. Kaelemakule, Land Agent; to J.A. King, Minister of the Interior:

...I am forwarding you with this, the copy of the agreement of Wm. Harbottle, and some applications as herein below set forth (see Figure 28):

- # 107, Kalua (w), for Lot # 59, Map 6, Ooma;
- # 108, G.M. Paiwa, for Lot # 56, Map 6, Ooma;
- # 109, Namakaokalani, for Lot # 58, Map 6, Ooma;
- # 110, Pika Kaninau, for Lot # 57, Map 6, Ooma.

Lot # 57 above set forth, was formerly agreed with D. Kealoha Hoopii, but this applicant left altogether and lived a long time in Kohala, and has done nothing towards the land, and has never signed the agreement to this day. As two years have gone by, I thought it would be better to give the lands to the new applicant... [HSA – Interior Department, Lands]

The four Homestead lots in 'O'oma 2nd, located between 700 and 1,100 feet elevation and containing 40.50 to 45 acres each (see Figure 28), were eventually patented (from *makai* to *mauka*) to:

- James Kuhaiki – Right of Purchase Lease # 75, Lot 59 (Patented to Mrs. Hattie Kinoulou; Grant No. 9468);
- Jno. Kainuku – C.O. No. 33, Lot 58 (not granted by 1902);
- Holokahiki – C.O. No. 11, Lot 57 (cancelled; R.P.L. # 59 to Jno. Broad; Grant No. 5912); and
- E.M. Paiwa – Grant No. 4273, Lot 56.

The eight Homestead lots in 'O'oma 1st, extending from 1,022 feet elevation to the old Māmalahoa Highway and containing approximately 15 to 25 acres each, were sold between 1895 and 1899 (from *makai* to *mauka*) to:

- S. Kane – Grant No. 3819, Lot 55; 1896
- Loe Kumukahi – Grant No. 3820, Lot 54; 1896
- Papala (w) – Grant No. 3820 B, Lot 53; 1896
- Kaulainamoku – Grant No. 3821, Lot 52; 1896
- L. Kahinu – Grant No. 3805, Lot 51; 1895
- J. Hoolapa – Grant No. 3804, Lot 50; 1895
- J.M. Lilinoe – Grant No. 4343, Lot 49; 1899
- J. Palakiko – Grant No. 3822, Lot 48; 1899

Except for the Homestead parcels and the two lots patented to Koanui and Keone, no other land in 'O'oma 1st was sold during this time. The land was retained by the government and portions leased out for grazing (see General Lease No.'s 590 and 604). In 'O'oma 2nd, *makai* of the four newly created homestead lots, were two lots consisting of approximately 1,333 acres—the first lot from above the shore to the 1847 *Alanui Aupuni*, containing approximately 302 acres, and the other lot extending *mauka* from the same *Alanui Aupuni*, to about the 700 foot elevation (containing approximately 1,031 acres; Figure 30). In 1899, John A. Maguire, founder of Huehue Ranch applied for a Patent Grant on both of the *makai* lots, but he only secured Grant No. 4536, for the lower parcel of 302 acres, in 'O'oma 2nd. Maguire's Huehue Ranch did hold General Lease No.'s 1001 and 590 for grazing purposes on the remaining government lands—both below and above the *mauka* highway—in 'O'oma 2nd.

AIS of TMKs: (3) 7-3-043:072, 073, 074, and 078 (por.), 'O'oma 1st and Kalaoa 5th, North Kona, Hawai'i

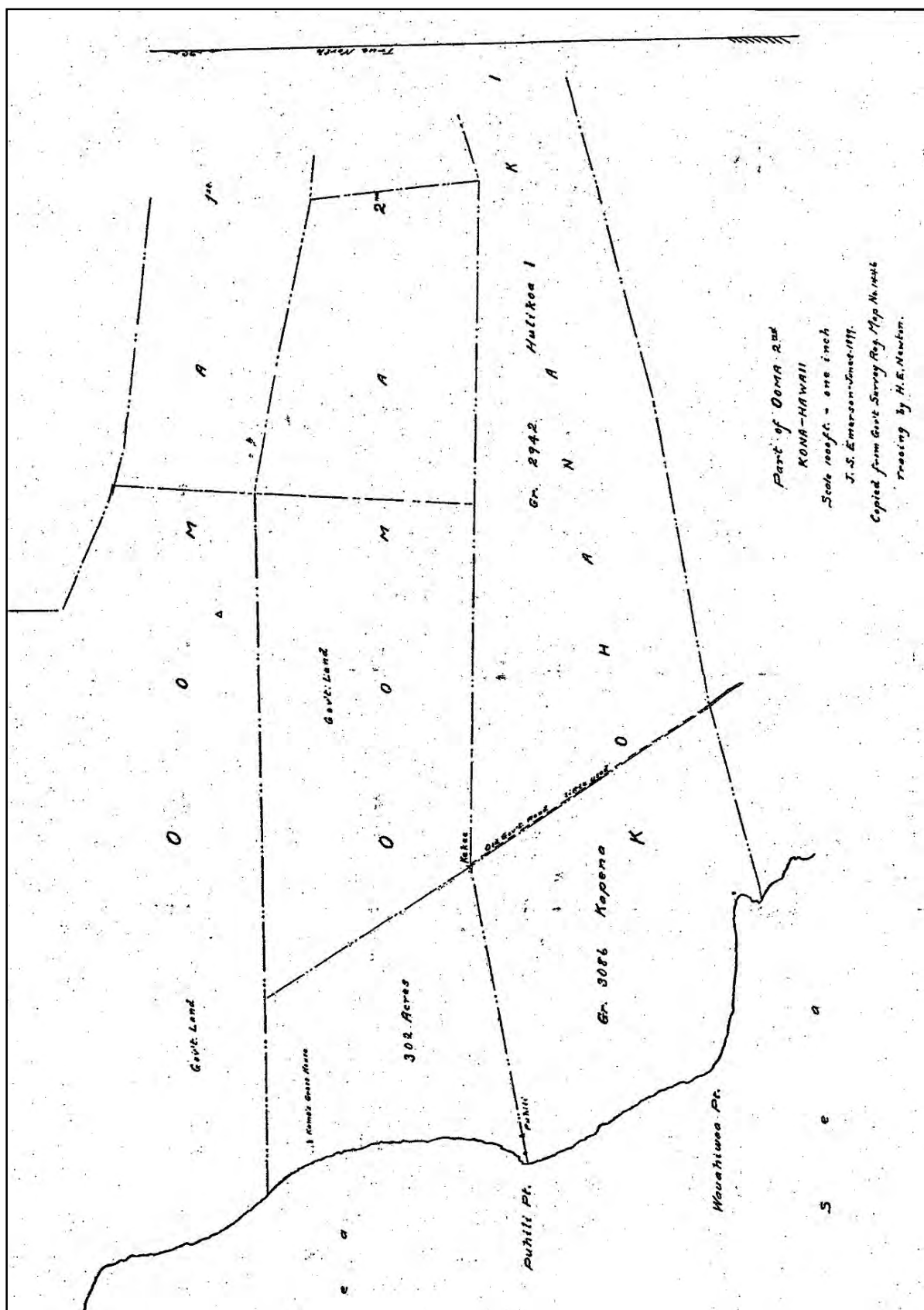


Figure 30. 1899 Grant Map No. 4536 showing *makai* portion of 'O'oma 2nd to John A. Maguire.

The notes of survey from Maguire's Grant No. 4536 describes the near shore parcel in 'O'oma 2nd, and it also references one of the prominent cultural-historical features on the boundary between 'O'oma 2nd and Kohanaiki, an "old 'Kahua hale' on white sand..." The "kahua hale" being an old house site. The notes of survey (see Figure 30) read:

Grant No. 4536

To J.A. Maguire

Purchase Price \$351.00

A Portion of Ooma 2nd, N. Kona, Hawaii Applied for by J.C. Lenhart, June 8, 1899.

Beginning at Puhili Gov't. trig. St. on the boundary between Kohanaiki and Ooma marked by a drill hole in stone 9 feet South of the South corner of an old "Kahua hale" on white sand at a point from which

Akahipuu Gov't. trig. Sta. is N 55° 27' 39" E true 32634.7 feet

Keahole Gov't. Trig. Sta. is N 21° 52' 36" W true 9310.5 ft.

Keahuolu Gov't Trig. Sta. is S 22° 24' 36" E true 20,141.8 ft., and running —

1. S. 79° 26' W. true 298.0 feet along Gr. 3086 Kapena, to a large [mark] on solid pahoehoe by the sea at Puhili Point, thence continuing the same line to the sea shore and along the sea shore to a point whose direct bearing and distance is:

2. N. 4° 54' W. true 4192.0 feet;

3. Due east true 2920.0 feet along Ooma 1st;

4. S. 31° 30' E. true 3920.0 feet along reservation for Gov't. Road 30 feet wide;

5. S 79° 45' W. true 4387.0 feet along Grant 3086 Kapena, to initial point and including an area of 302 acres.

The Kalaoa- 'O'oma Homesteads

In March and April of 1902, S. M. Kananui and his assistant George F. Wright surveyed and subdivided 1,736 acres of land in the *makai* portions of 'O'oma 1st and Kalaoa 5th *ahupua'a* into fifteen homestead lots (Lots 1-15) known collectively as the Kalaoa-'O'oma Homesteads (Figure 31). They also surveyed the remaining portions of the boundary of 'O'oma 2nd (the area leased to J. A. Maguire), laid out a road from the homesteads to the *mauka* Government Road, laid out a realigned portion of the *makai* Government Road, and accurately surveyed two miles of coastline. The *Report of the Surveyor of the Territory of Hawai'i for the Year Ending June 30th, 1902* contains the following account of that survey:

...Mr. Kananui's party travelled overland to Ooma, which is situated about five or six miles North of Kailua, North Kona. March 20th. until April 30th. was taken up with the subdividing of 1736 acres of land situated in Ooma I and Kalaoa V, into fifteen homesteads of from 100 to 130 acres each, also with the running out of the boundary of the remaining portion of Ooma II, below the Government Road, a tract of 1031 acres. A 50 foot road, a little over three and one half miles in length and from two to six per cent grade was run through the homesteads to connect with the Government Road. Another road, a little over one and one half miles through the lower section of these lands, was run, and over two miles of coast line was accurately located. (Wall 1902:5)

Following the initial survey of the homesteads the fifteen lots were further subdivided into twenty-five lots (all but Lots 3, 13, 14, and 15 were divided roughly in half and designated as Lots 1A and 1B, 2A and 2B, etc...). The current study area includes portions of Lots 3A, 5A, 5B, 6A, 6B, 7A, and 7B. The road to the *mauka* Government Road laid out by Kananui and Wright in 1902 splits the Kalaoa-'O'oma Homesteads in half, and appears to approximate the boundary between Kalaoa 5th (to the north) and O'oma 1st (to the south), while at the same time maintaining the appropriate grade. This road was never built, nor was the *makai* Government road ever realigned, and although there were several applicants for the Kalaoa-'O'oma Homesteads, by ca. 1910 only two of the *mauka*-most lots had been patented (Lots 13 and 15). Applicants for land in 'O'oma 1st and Kalaoa 5th at this time (from *makai* to *mauka*) included:

- H. Greyson – Right of Purchase Lease # 35; Lot 1-B (cancelled); Greyson's parcel was just *mauka* of the shore line exclusion in Kalaoa 5th.
- Kanealii – Right of Purchase Lease # 30; Lot 4-B (cancelled); Kanealii's parcel was just *mauka* of the shore line exclusion in 'O'oma 1st.
- C. W. Heremona – Right of Purchase Lease # 31; Lot 3-A (cancelled); Heremona's parcel was along the *makai* edge of the realigned Government Road in O'oma 1st.

2. Background

- S. Kupuoā – Right of Purchase Lease # 34; Lot 5 (cancelled); Kupuoā's parcel was along the *mauka* edge of the realigned Government Road in Kalaoa 5th.
- Wm. Kouhi – Right of Purchase Lease # 32; Lot 9 (cancelled); Kouhi's parcel was *mauka* of Kupuoā's parcel in Kalaoa 5th.
- J.W. Wahinekapu – Right of Purchase Lease # 29; Lot 11 (cancelled); Kouhi's parcel was *mauka* edge of Kouhi's parcel in Kalaoa 5th.
- Wm. Keanaaina – Right of Purchase Lease #33; Lot 13 (Patented by Grant No. 5472); The *makai* end of Wm. Nuuanu Keanaaina's Grant 5472, is situated at approximately 325 feet above sea level in 'O'oma 1st.
- J. Maiola – Right of Purchase Lease # 28; Lot 14 (cancelled); J. Maiola's parcel was situated about 525 feet above sea level in 'O'oma 1st.
- K. Kama Jr. – Right of Purchase Lease #27; Lot 15 (Patented by Grant No. 5046); The *makai* end of K. Kama's Grant No. 5046, is situated at approximately 725 feet above sea level in 'O'oma 1st.

With the exception of Lots 13 and 15 (totaling 252.5 acres), the *makai* lands of the Kalaoa-'O'oma Homesteads (1,485.5 acres) were never patented and remained in the inventory of Government Lands. By the early twentieth century the coastal lands of Kekaha were only sparsely populated, as most of the residents, with the drastic changes in land tenure that occurred during the second half of the nineteenth century, had either moved away or chosen to reside permanently in the more agriculturally productive uplands (Rechtman and Maly 2003).

Twentieth Century Land Tenure in the Vicinity of the Current Study Area

Kama 'āina who have participated in oral history interviews (see Rechtman and Maly 2003), describe on-going travel between the uplands and coastal lands of 'O'oma, Kalaoa and other *ahupua'a* in Kekaha throughout the twentieth century. The primary method of travel between 1900 and 1947, was by foot or on horse or donkey, and those who traveled the land, were generally residents of the 'O'oma, Kalaoa, Kohanaiki Homesteads and other lands in the immediate vicinity. The 1924 U.S.G.S. Keāhole Point quadrangle (Figure 32) shows a trail/road, labeled "Kauhini Road" descending from the uplands of Kalaoa 4th/5th through the study area to Wawaloli (beach/pond) at the shore of 'O'oma 1st. An upper portion of this road, labeled "Alanui Kauhini" is shown on an 1889 map prepared by J.S. Emerson (see Figure 29). Kauhini Road was likely named for a former resident of the Kalaoa/'O'oma area, who had applied for the Grant No. 1599 in the uplands of those *ahupua'a* in 1855, but who moved away before the grant was patented (see above, Summary of Land Tenure Described in Grant Records). On the 1924 U.S.G.S. map, Kauhini Road is shown crossing the realigned 1847 Government Road and continuing to the near shore *alaloa*. On a 1930 Treasury Department map of a portion of North Kona (Figure 33), the full extent of Kauhini Road, both the original (existing) and realigned (never built) 1847 Government Road, and the Kalaoa-'O'oma Homestead lots and road are shown. The near shore trail on both maps is depicted along the coast between the *ahupua'a* of Honokāhau and Kalaoa 4th, where it terminates at the Keāhole Point lighthouse and light keeper's residence.

The lighthouse at Keāhole Point started as a wooden mast beacon constructed sometime after 1906, and in 1910 the Territory of Hawai'i set aside the land at Keāhole Point for use as a lighthouse reservation (Moore et al. 1999). According to Dean (1991), John Makahi serviced the light from 1909 to 1912 and Samuel Leleo was the light keeper until 1914 when a "new" concrete lighthouse was constructed. Between 1915 and 1919 the light was attended to by Haliaka Kahananui, a resident of Kalaoa *mauka* (Kahananui received Grant No. 3750, Homestead Lot 47, in Kalaoa 4th along the southern edge of Kauhini Road in 1895; see Figure 29). Kahananui "was responsible for refilling and lighting the gas light in the lighthouse on a weekly basis," following "a trail to the coast, walking or riding on horseback the 3 miles from her home" (Moore et al. 1999:17). Her service ended when the oil lamps were replaced with battery powered electric lights.

After World War II, retired military vehicles became available to the public, and after that time, the *Alanui Aupuni* and some of the smaller trails along the shore were modified for vehicular traffic. The primary routes of travel through the 1960s, descended from upland Kohanaiki and Kaloko, or came out of Kailua. In the 1950s, Hu'ehu'e Ranch bulldozed a Jeep road to the shore at Kaloko. The ranch, and some individuals who went to the shore either as a part of their ranch duties, or for leisure fishing along the coast, used this Jeep road. The 1959 U.S.G.S. Keāhole Point quadrangle (Figure 34) shows that Kauhini Road and the near shore *alaloa* were also converted to "Jeep Trails" by this time. The *Alanui Aupuni* was modified for vehicular travel from Kailua, to at least as far as Honokāhau and Kaloko *ahupua'a*, and remained in use through the 1970s.

ALS of TMKs: (3) 7-3-043:072, 073, 074, and 078 (por.), 'O'oma 1st and Kalaoa 5th, North Kona, Hawai'i

2. Background

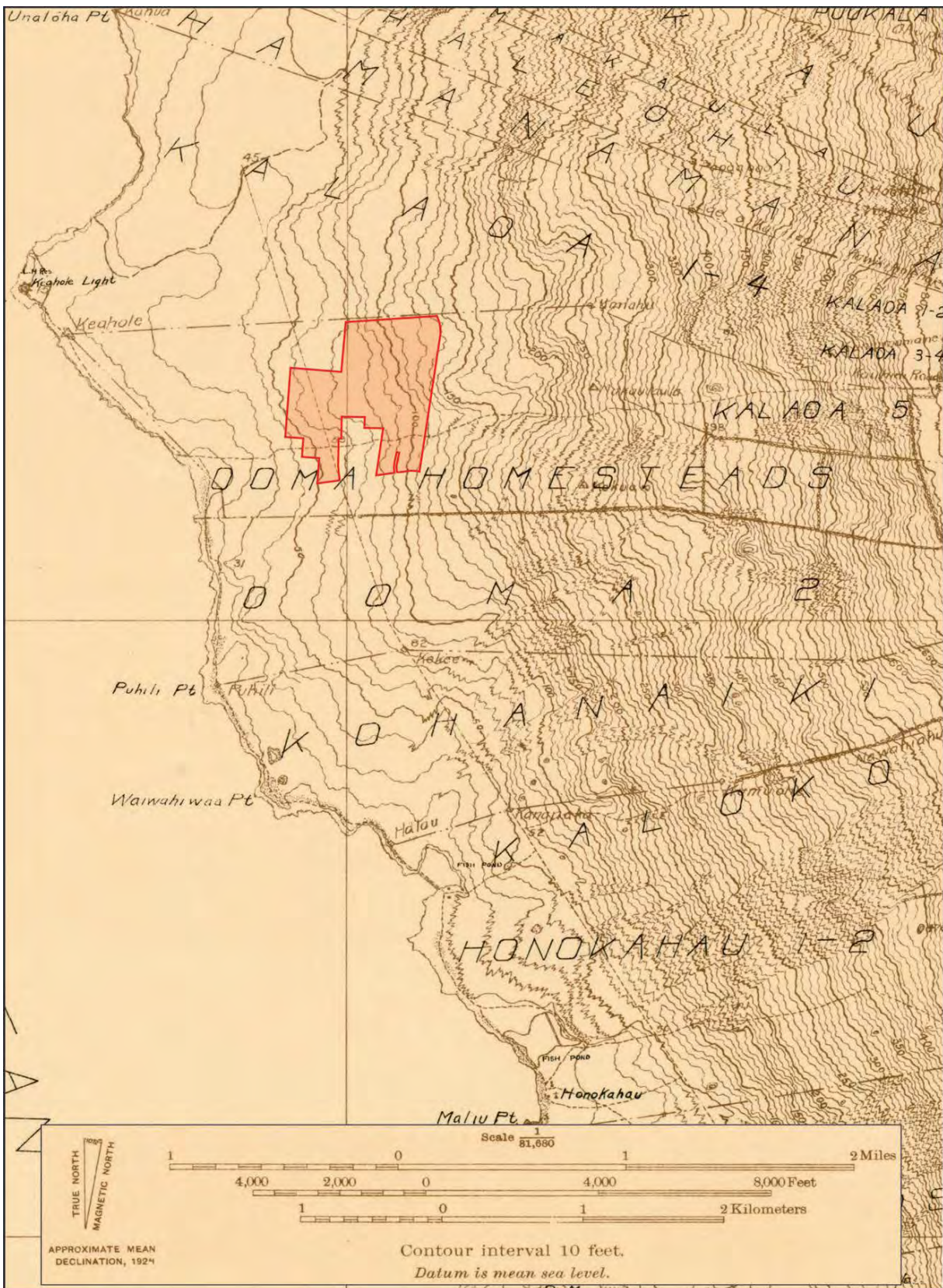


Figure 32. Portion of the 1924 U.S.G.S. Keāhole Point quadrangle showing the current study area in red.



Figure 33. Portion of North Kona Island of Hawai'i showing the *ahupua'a* between Kau and Kealahou (July 1930).

2. Background

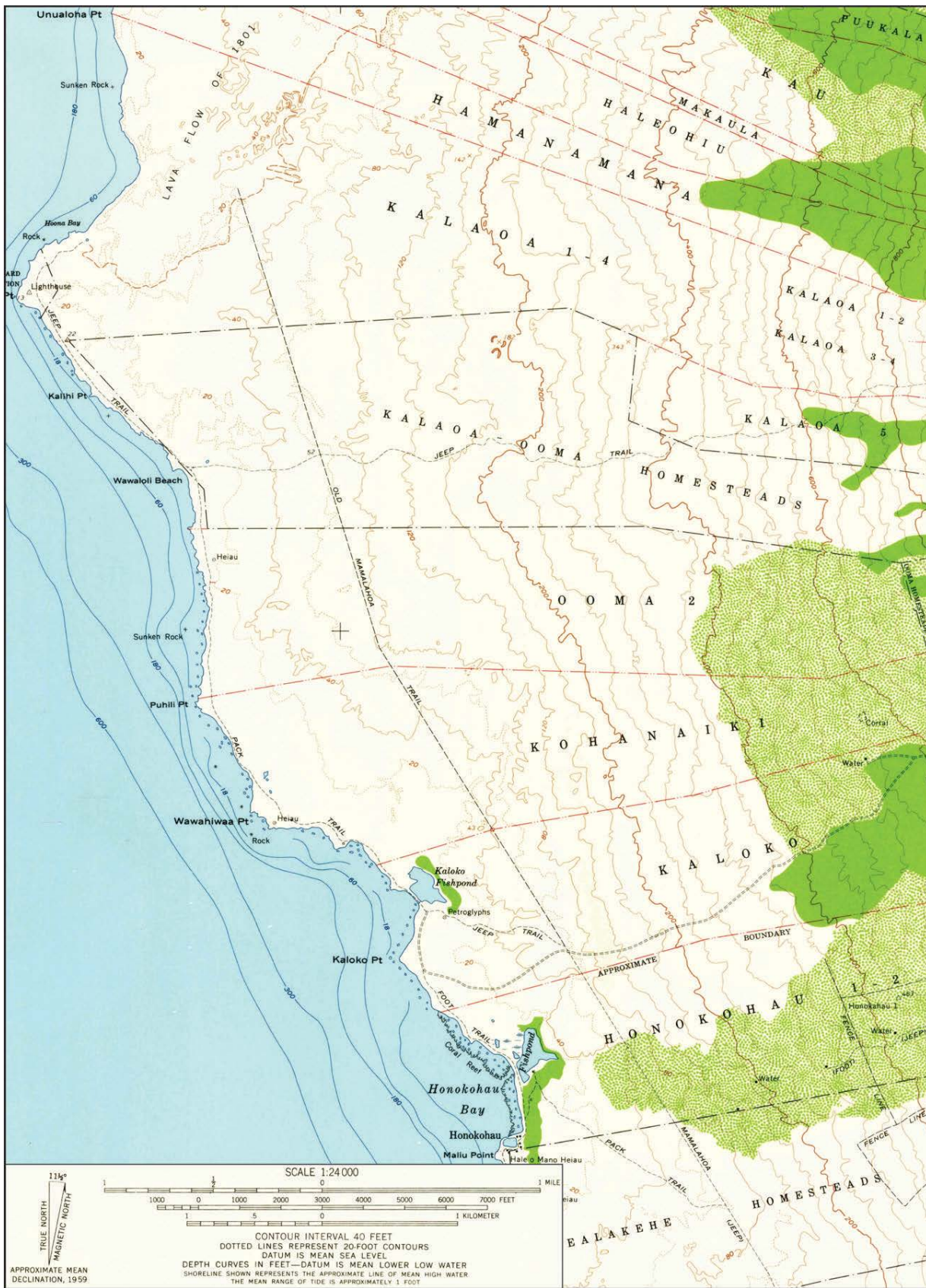


Figure 34. Portion of the 1959 U.S.G.S. Keāhole Point quadrangle.

The coastal lands of Kekaha in the vicinity of the current study area, many of which became State-owned lands after statehood in 1959, remained untouched by modern development through the 1960s (Figure 35). It was not until 1968 when construction began on a section of the new Queen Ka‘ahumanu Highway right-of-way between Kealahou and the newly planned Keāhole Airport on State-owned lands in Awalua, ‘Ōhiki, Pu‘ukala, Kau, Maka‘ula, Haleohi, Hamanamana, and Kalaoa 1st-4th ahupua‘a that the landscape of Kekaha began to drastically change. Work on the Keāhole Airport facility began on May 27, 1969, when the first 1,000 pound ceremonial charges of dynamite signaled the start of construction, and was completed thirteen months later (Figure 36), when the airport was dedicated on July 1, 1970 (<http://hawaii.gov/hawaiiaviation/hawaii-airfields-airports/hawaii/kona-international-airport-at-keahole/>). The Keāhole Point airport facility has substantially expanded since its 1970 dedication. The Queen Ka‘ahumanu Highway, between the airport and Kawaihae, was completed by ca. 1973, once again opening up travel across the *kula kai* (shoreward plains) of Kekaha to the general public.

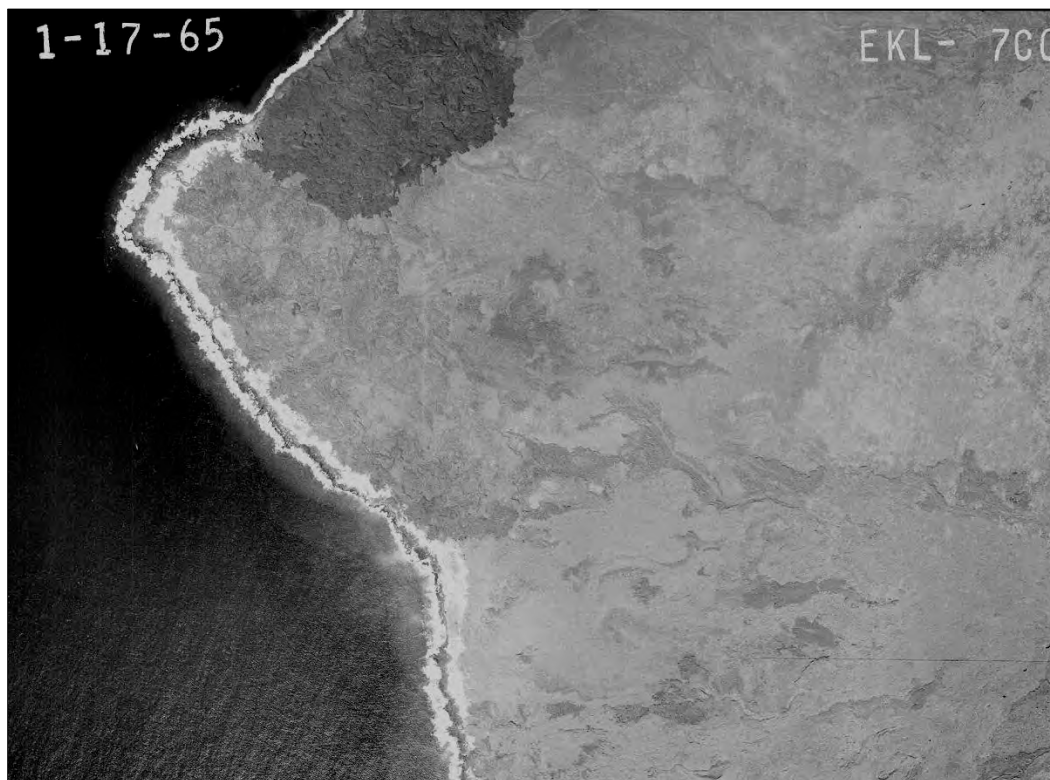


Figure 35. January 17, 1965 aerial photograph showing the Kekaha lands in the vicinity of the current study area.

The construction of the Queen Ka‘ahumanu Highway to Keāhole Airport opened up access to the Kekaha lands in the vicinity of the current study area, and created opportunities for further development of these lands. Recognizing the area’s potential for ocean related research, thermal energy conversion demonstration, and aquaculture, the State of Hawai‘i, in 1974, established the Natural Energy Laboratory of Hawai‘i (NELH) at Keāhole Point (Group 70 2011). The initial NELH site (Figure 37) consisted of an access road easement from the highway and 322 acres of coastal land adjacent to (south and west of) the airport. The access road (Makako Bay Drive) was in place by 1977 (Figure 38), and construction of the initial offices, research facilities, and an Ocean Thermal Energy Conversion (OTEC) plant at NELH had begun by ca. 1980 (Figure 39). After the construction of the NELH access road, Kauhini Road and the coastal Jeep Road were no longer regularly used to access the shoreline in the vicinity of the current study area. In 1986, in an effort to provide sites for the commercialization of research activities initiated at NELH, the State added an additional 548 acres of land (including the current study area) for the creation of the Hawai‘i and Ocean Technology (HOST) Park. These two properties, although their missions were complementary, were administered separately until 1990, when the State Legislature (Chapter 227D, HRS) consolidated management of NELH and HOST Park’s 870 acres of lands and facilities (Figure 40) under a single state agency, the Natural Energy Laboratory of Hawai‘i Authority (NELHA) (Group 70 2011). Today, with several deep water pipelines pumping seawater at a rate of more than 43,000 gallons per minute to the facility, there are more than forty tenants engaged in aquaculture, water bottling, energy projects, research, and education on the NELHA lands.

2. Background



Figure 36. Oblique aerial view of the completed Keāhole Airport facility taken on October 6, 1971.

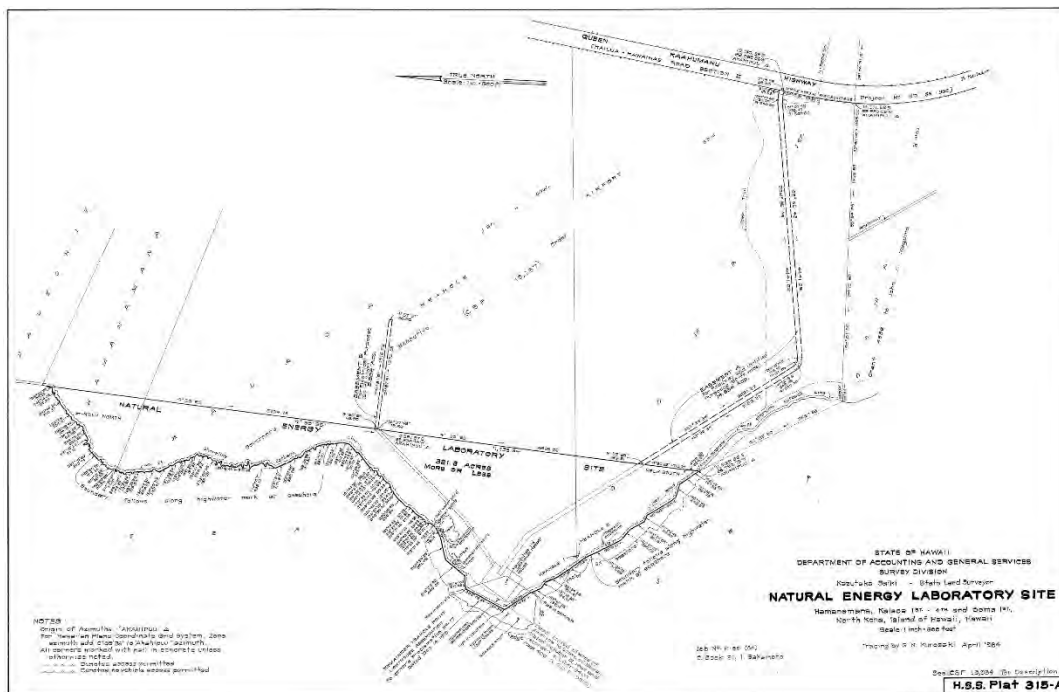


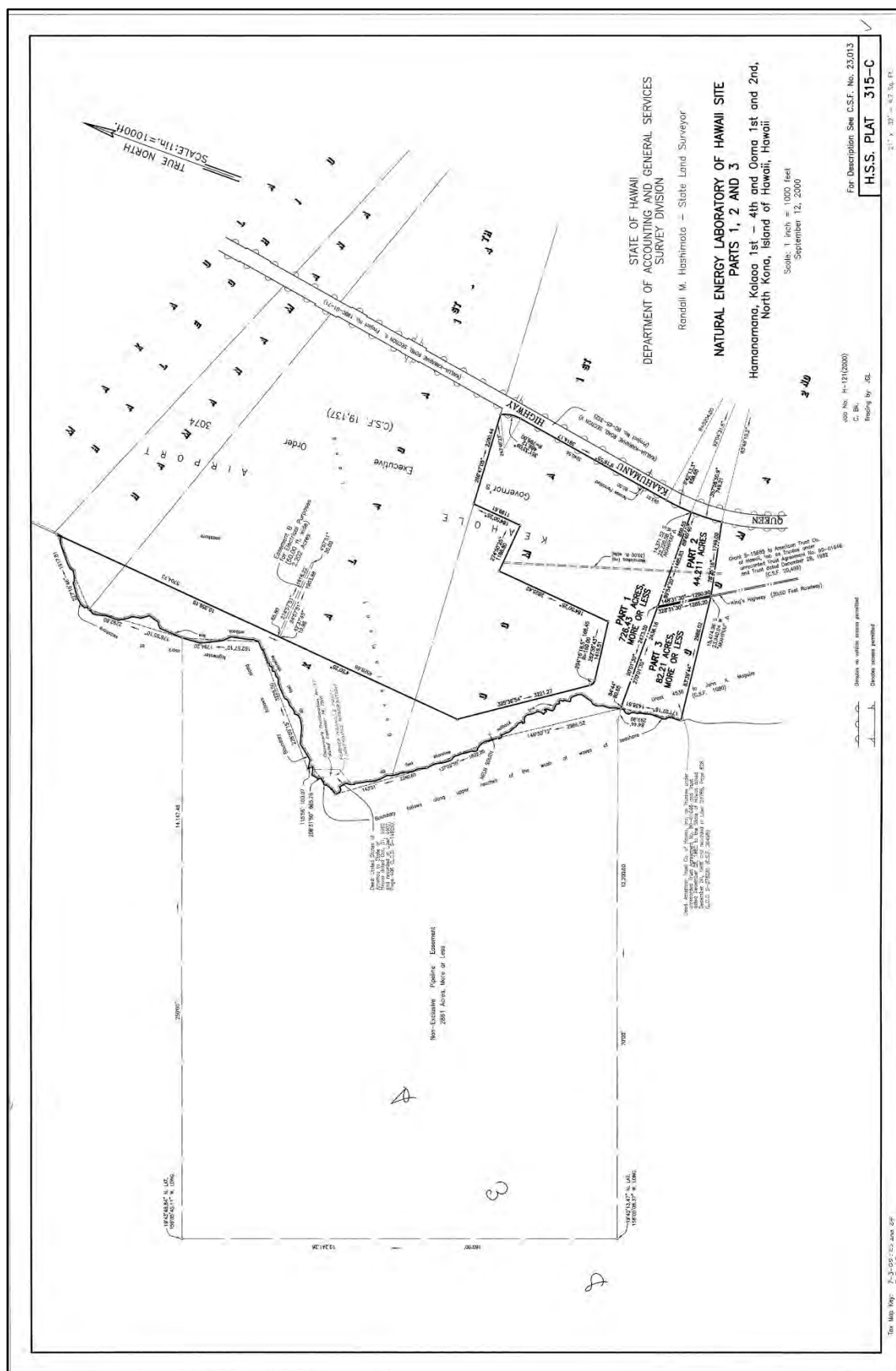
Figure 37. Map of the initial 322-acre NELH site (traced by G.H. Kurosaki on April 1984).



Figure 38. March 27, 1977 aerial photograph showing the completed NELH access road.



Figure 39. Oblique aerial view of the initial NELH facilities under construction in 1980.

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PREVIOUS ARCHAEOLOGICAL STUDIES

The NELHA HOST Park lands encompassed by the current study area were previously the subject of an archaeological reconnaissance survey conducted by Barrera (1985a). As a result of that survey, Barrera identified forty-five sites, twelve of which were situated within (or adjacent to) the current study area (SIHP Sites 2, 10156, 10157, 10158, 10159, 10160, 10161, 10162, 10187, 10188, 10189, and 10190). Barrera (1989) later conducted archaeological data recovery at selected sites within the NELHA administered lands, including at four of the sites contained within the current study area (SIHP Sites 10161, 10187, 10188, and 10190). More recent studies conducted within and adjacent to the NELHA HOST Park, in areas that were previously surveyed by Barrera, have shown that while no additional sites are present in some areas (Rechtman 2007, 2010a, 2010b, 2010c, 2012a, 2012b), they are present in others (Rechtman and Clark 2012). Rechtman and Clark (2012) recently recorded three sites within the current study area (SIHP Sites 29272, 29273, and 29274) that were not identified by Barrera (1985a).

To assist in generating a set of expectations regarding the nature of additional historic properties that may be encountered within the current study area, the following archaeological background summarizes the findings of not only the studies discussed above, but all relevant studies previously conducted in the coastal portions of ‘O‘oma 1st and 2nd and Kalaoa 5th *ahupua‘a* (Table 2), from Reinecke’s (n.d.) 1929-1930 survey of the coastal sites of West Hawai‘i to Monahan et al.’s (2012) inventory survey for the proposed widening Queen Ka‘ahumanu Highway. The locations of the previously conducted studies, relative to the current study area, are shown in Figure 41.

Table 2. Archaeological studies conducted in the coastal portions of ‘O‘oma and Kalaoa *ahupua‘a*.

<i>Year</i>	<i>Author</i>	<i>Area</i>	<i>Type of Study</i>
n.d.	Reinecke	Various	Survey
1968	Ching and Rosendahl	Honokohau to Pu‘ukala	Survey
1969	Ching et al.	‘O‘oma 2 nd to Pu‘ukala	Survey and Testing
1975	Rosendahl and Kirch	‘O‘oma/Kalaoa	Reconnaissance Survey
1975	Cordy	Various	Survey and Testing
1976	Rosendahl	‘O‘oma/Kalaoa	Reconnaissance Survey
1977	Davis	‘O‘oma/Kalaoa	Survey
1978	Rogers-Jourdane	‘O‘oma/Kalaoa	Reconnaissance Survey
1979	Barrera	‘O‘oma/Kalaoa	Survey and Testing
1984	Clark	‘O‘oma 1 st to Hamanamana	Reconnaissance Survey
1985a	Barrera	‘O‘oma/Kalaoa	Reconnaissance Survey
1985b	Barrera	‘O‘oma 2 nd	Reconnaissance Survey
1985	Cordy	‘O‘oma/Kalaoa	Archaeological Review
1986	Cordy	‘O‘oma 2 nd	Field Check
1987	Donham	‘O‘oma 2 nd	Survey and Testing
1989	Barrera	‘O‘oma/Kalaoa	Data Recovery
1992	Barrera	‘O‘oma 2 nd	Data Recovery
1999	Moore et al.	Kalaoa 5 th	Inventory Survey
2000	Corbin	‘O‘oma 2 nd	Data Recovery
2001	Roberts and Roberts	Kalaoa 5 th	Data Recovery
2001	Roberts	Kalaoa 5 th	Preservation Plan
2004	Rechtman and Clark	‘O‘oma/Kalaoa	Preservation Plan
2006	Rechtman and Clark	‘O‘oma 2 nd	Preservation Plan
2007	Rechtman	‘O‘oma 2 nd	Update Inventory Survey
2010a	Rechtman	‘O‘oma 1 st	Field Inspection
2010b	Rechtman	‘O‘oma 1 st	Field Inspection
2010c	Rechtman	Kalaoa 5 th	Field Inspection
2012a	Rechtman	‘O‘oma 1 st	Field Inspection
2012b	Rechtman	‘O‘oma 1 st	Field Inspection
2012	Rechtman and Clark	‘O‘oma/Kalaoa	Update Inventory Survey
2012	Monahan et al.	Various	Inventory Survey

2. Background

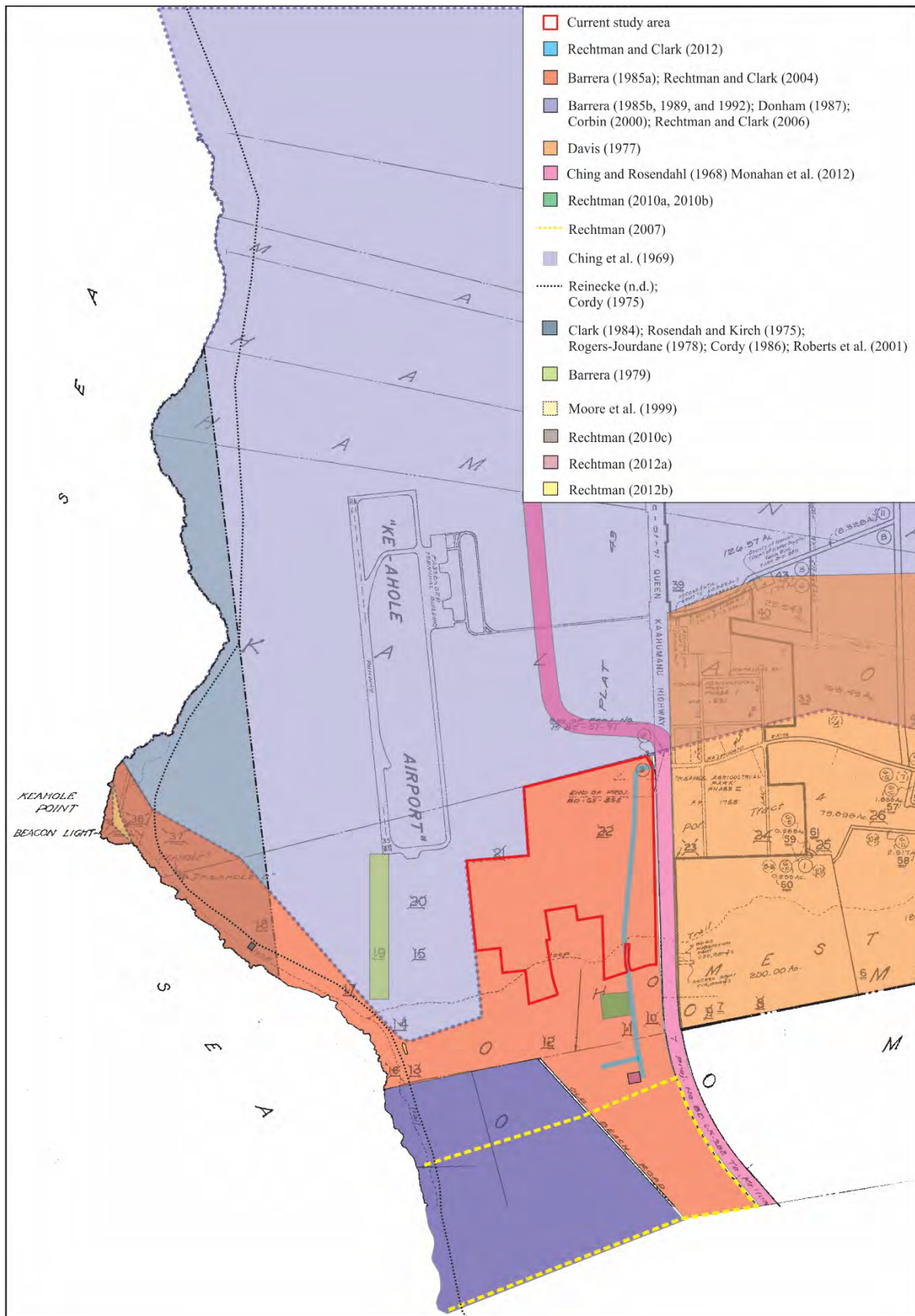


Figure 41. Previous archaeological studies conducted in the vicinity of the current study area.

In 1929-1930, the Bishop Museum contracted John Reinecke to conduct a survey of Hawaiian sites in West Hawai'i; this was the first attempt at a survey of sites of varying function, ranging from ceremonial to residency and resource collection (Reinecke n.d.). A portion of Reinecke's survey fieldwork, extended north from Kailua as far as Kalāhuipua'a, and included the coastal portions of the 'O'oma and the Kalaoa *ahupua'a*. During his study, Reinecke traveled along the shore, documenting near-shore sites. Where he could, he spoke with the few native residents he encountered. Among his general descriptions of the Kekaha region, Reinecke observed:

This coast formerly was the seat of a large population. Only a few years ago Keawaiki, now the permanent residence of one couple, was inhabited by about thirty-five Hawaiians. Kawaihae and Puako were the seat of several thousands, and smaller places numbered their inhabitants by the hundreds. Now there are perhaps fifty permanent inhabitants between Kailua and Kawaihae—certainly not over seventy-five.

When the economy of Hawaii was based on fishing this was a fairly desirable coast; the fishing is good; there is a fairly abundant water supply of brackish water, some of it nearly fresh and very pleasant to the taste; and while there was no opportunity for agriculture on the beach, the more energetic Hawaiians could do some cultivation at a considerable distance *mauka*.

The scarcity of remains is therefore disappointing. This I attribute to four reasons: (1) those simply over looked, especially those a short distance mauka, must have been numerous; (2) a number must have been destroyed, as everywhere, by man and by cattle grazing; (3) the coast is for the most part low and storm-swept, so that the most desirable building locations, on the coral beaches, have been repeatedly swept over and covered with loose coral and lava fragments, which have obscured hundreds of platforms and no doubt destroyed hundreds more; (4) many of the dwellings must have been built directly on the sand, as are those of the family at Kaupulehu, and when the posts have been pulled up, leave no trace after a very few years.

The remains on this strip of coast have some special characteristics differentiating them from the rest in Kona. First, there is an unusual number of petroglyphs and papamu, especially about Kailua and at Kapalaoa. Second, probably because of the strong winds, there are many walled sites, both of houses and especially of temporary shelters... (Reinecke n.d.:1-2)

The following site descriptions are quoted from Reinecke's manuscript of fieldwork conducted between Pūhili Point on the Kohanaiki-'O'oma 2nd boundary, and Keāhole Point near the Kalaoa 5th boundary. In the site descriptions below, Reinecke references the occurrence of at least six house sites; seven enclosures and pens (one of which is an "old cattle pen"); eleven terraces and platforms (one of which he felt was a "heiau"); two caves; two ahu; a stepping stone trail; three waterholes and a well; and eleven rock shelters. Apparently, no one was residing in the area at the time of his field survey. Reinecke's description of the features, albeit limited, contains valuable information about site condition and provides a seventy plus year perspective on natural degradation along this coastline (c.f., Donham 1987:7). Reinecke's site descriptions, from south to north, across 'O'oma 2nd, 'O'oma 1st, and Kalaoa 5th *ahupua'a* (Sites 66 to 85), are as follows:

Site 66. Very doubtful dwelling site. Then a row of sand-covered platforms at the border of the sand and the beach lava, enough for 6-10 homes. Remains of an old, large pen.

Site 67. Dry well on the crest of the beach.

Site 68. Water hole, two small platforms, four or more shelters, pens with very small platform.

Site 69. Large cattle pen. Doubtful old, rough platform at its north end. Remains of two old platforms by an ahu to the north.

Site 70. Walled platform, S.E. corner terraced, badly broken down. Platform mauka. The walls of this and of Site 73 are built of thin pieces of pahoehoe surface lava, rather unusual in appearance.

Site 71. A knob partly walled on its slopes, with house site. Adjoining it on the south is a rough platform with three smooth boulders – heiau and kuula? Back of this a house platform and a platform about a fine shelter cave. Another platform and wall are about a slight natural depression filled with bones, including those of a whale.

Site 72. Ruins of a pen.

Site 73. Apparently a modern dwelling site of unusual construction; two terraces of pebbles, the upper 29x25x2 in front and 4-5' high elsewhere; the lower 19x10x25x3, with a three-sided pen at N.E.; surrounded by a carefully laid wall.

2. Background

- Site 74. A shelter about a shallow cave; remains of another shelter; an ahu.
- Site 75. Trace of site; house platform; enclosure on shore. There are many faint traces of sites on this strip of coast. Toward the north is an unmistakable small site.
- Site 76. Modern shelter pen; house or shelter site; shelter mauka by kiawe tree.
- Site 77. Platform; tiny pen; sites of some kind marked by stones in lines on the pahoe-hoe flow.
- Site 78. Slightly brackish springs and pools; house site, shelters, stepping stone path leading to the walled house site...
- Site 79. An old platform; remains of pen; second old platform.
- Site 80. An old platform; traces of several ruins on the beach.
- Site 81. Two pens, one with modern house platform; several ruins along the coast; a heap of stones on the pahoe-hoe – probable dwelling site.
- Site 82. Cairn on knob; dwelling site adjacent to south.
- Site 83. A string of ruined sites in the coral sand. Two dwelling sites on the pahoe-hoe stand out. There even seems to be a papamu, (?) 11x10 – a sign of leisured settlement. More traces of ruins follow.
- Site 84. By the Keahole boundary ahu: small platform and enclosure, with walled cave behind.
- Site 85. A broken series of ruined platforms, some apparently large, running along the coast.
- [Reinecke n.d.:15-16]

No further archaeological study of this area was undertaken until the late 1968 when, prior to the construction of Queen Ka'ahumanu Highway and the Keāhole Airport, Francis Ching, Jr. of the DLNR- Division of State Parks and Paul H. Rosendahl, a graduate student at the University of Hawai'i conducted an archaeological reconnaissance survey of Section I of the Kailua-Kawaihae Road Corridor and the proposed Keāhole Point Airport (Ching and Rosendahl 1968). This survey, which covered the initial road corridor extending from Honokāhau to the airport and the airport area itself, was accomplished by helicopter with 4-wheel drive vehicles and helicopter landings used for ground checks. In the vicinity of the current study area three lava tube systems – one in 'O'oma 2nd *mauka* of the highway, one in Kalaoa 5th *mauka* of the highway, and one (with four openings) in Kalaoa 4th *makai* of the highway – were identified. The lava tubes were assigned temporary identification numbers, plotted on a large scale map, briefly described, and photographed. An interesting array of artifacts were recovered from the lava tubes and photographed, including fishhooks, adzes, abraders, a coral saw, and stone sinkers. Ching and Rosendahl recommended that all of the sites be salvaged archaeologically prior to construction of the airport and roadway.

Additional archaeological survey at the proposed Keāhole Point Airport and salvage operations along the route of the proposed airport access road were conducted by Francis Ching, Deborah Cluff, and Thomas Riley of the DLNR- Division of State Parks between December 26, 1968 and January 4, 1969 (Ching et al. 1969). The survey area was expanded, and initial survey was once again by helicopter with follow-up ground survey conducted south of the 1801 lava flow, within the highway corridor, and along trails. Apparently more than 500 archaeological features were recorded (Clark 1984), and some of the sites along the road corridor were excavated (Cordy 1985), but unfortunately the preliminary report submitted for the study (on the shelves at the UH Hilo Mookini Library, Hawaiian Collection), which does include a site location map, lacks any specific site information and is missing the chapter on the road corridor work. None of the recorded sites are situated within the current study area. An appendix to the Ching et al. (1969) report prepared by Jeanie Peterson (1969) does briefly discuss the trails identified during the study, but also does not include any specific trail descriptions.

In 1971-72, DLNR-Division of State Parks began an inventory of known archaeological sites on the Island of Hawai'i and visited the sites Reinecke (n.d.) recorded along the 'O'oma-Kalaoa coastline. These sites were assigned State Inventory of Historic Places (SIHP) site numbers, site forms were completed, and sketch maps were made. Reinecke's sites were assigned SIHP Sites 1911–1920.

In 1975, Paul H. Rosendahl and Patrick V. Kirch of the B. P. Bishop Museum conducted an archaeological reconnaissance survey of the Natural Energy Laboratory Hawai'i (NELH) facility at Keāhole Point (Rosendahl and Kirch 1975). This brief two day survey included a corridor that extended from Queen Ka'ahumanu Highway to the coast along the 'O'oma 1st/2nd boundary and then along the shore to Keāhole Point. Fourteen sites and site complexes along the coast were identified and briefly described in the survey report.

Later, in November/December of 1975, Ross Cordy carried out an intensive survey and subsurface testing program along the coast of ‘O‘oma, Kalaoa, and seven other *ahupua‘a* of Kekaha, and synthesized the data he generated as part of his doctoral dissertation (Cordy 1981). The survey covered the immediate shoreline area extending to roughly a quarter or a half-mile inland in some areas, and located and mapped all sites fitting Cordy’s criteria (size, form, etc.) for permanent habitation. Test units were excavated at twenty sites; volcanic glass and surface artifacts were collected from others. The methods and interpretive analyses used by Cordy are reported on in Cordy (1978, 1981) and Cordy and Kaschko (1980).

In May of 1976 Rosendahl returned to NELH and conducted a one day reconnaissance survey of an alternative road corridor between Queen Ka‘ahumanu Highway and the coast, and an area along the periphery of the airport property. Rosendahl (1976) noted several cairns and apparent foot trails, but did not describe them or plot them on a map.

In 1977, Bertell D. Davis of the Archaeological Research Center Hawai‘i, Inc. (ARCH) surveyed the Keāhole Agricultural Park located in Kalaoa 1st–4th, Kalaoa 5th and ‘O‘oma 1st *ahupua‘a* along the *mauka* edge of Queen Ka‘ahumanu Highway, directly opposite the current study area (see Figure 41). As a result of the survey, Davis (1977) recorded twenty-two archaeological sites including surface complexes of habitation features, lava tubes used for habitation and refuge, a wall, several cairns or *ahu*, and two trails. Four large lava tube habitation sites, two smaller shelter caves, and six of the surface sites were the subject of an archaeological data recovery project conducted by ARCH in 1980 (Hammatt and Folk 1980).

In May of 1978 Elaine Rogers-Jourdane of the B. P. Bishop Museum conducted an archaeological reconnaissance survey of additional areas within the Natural Energy Laboratory Hawai‘i at Keāhole Point, including the access road corridor previously surveyed by Rosendahl and Kirch (1975) and the development footprint for the initial office and research facilities. During the Rogers-Jourdane (1978) study eleven site areas were located, briefly described, and photographed. Feature types identified with the survey area included cairns, walls, cave shelters, a modified depression, enclosures, and platforms. All of the site areas noted by Rogers-Jourdane (1978) were situated in the coastal portion of the NELH property. The reconnaissance survey was followed by a more intensive survey and salvage excavations (Rosendahl 1980) at eight of the eleven sites identified by Rogers-Jourdane (1978). The excavations yielded data, including traditional Hawaiian artifacts such as files, abraders, fishhooks, and octopus lures, and later Historic artifacts, that attested to the extent of marine resource exploitation in the area.

In January of 1979, William Barrera of Chiniago Inc. surveyed two emergency service road corridors extending off either end of the of the Keāhole Airport runway. The southern corridor extended across Kalaoa 5th into ‘O‘oma 1st *Ahupua‘a*, and contained two sites – a cave shelter and a feature complex composed of two enclosures, a C-shape shelter, four walls, and two mounds. A test unit was excavated within an L-shaped enclosure that was part of the feature complex recorded in ‘O‘oma 1st *Ahupua‘a*.

In 1984, Stephan D. Clark of the B. P. Bishop Museum conducted an archaeological reconnaissance of the entire *makai* portion of the NELH facility between Hamanamana and ‘O‘oma 1st *Ahupua‘a*. Clark (1984) identified twenty-four sites with more than sixty individual features including eight platforms, fourteen enclosures, two Historic house sites, four trails five cairns, two *papamū*, nine rock-filled crevices, a petroglyph area, two C-shaped shelters, four walls, and numerous rock alignments. The previously identified sites were correlated with their earlier Reinecke (n.d.), Rosendahl and Kirch (1975), and Cordy (1978) Bishop Museum site numbers; newly identified sites were assigned new Bishop Museum site numbers. Clark notes that in the vicinity of NELH “few features are found further inland on the barren pāhoehoe lava flows”, and that, “those present include cave shelters, *ahu*, enclosures, and trails” (1984:11).

In 1984, William Barrera of Chiniago Inc. began a series of archaeological studies, survey and data recovery that included most of the previously surveyed NELH lands, and all of the newly created HOST Park lands (Barrera 1985a, 1985b, 1989). The first study, an archaeological reconnaissance survey of a 450-acre portion of the NELH and HOST Park lands located between Queen Ka‘ahumanu Highway and the coast in Kalaoa 5th, ‘O‘oma 1st and 2nd *ahupua‘a* (Barrera 1985a), included the northern portion of the area previously surveyed by Clark (1984), and the current study area in its entirety (see Figure 41). During this survey Barrera conducted pedestrian sweeps across the area at intervals of 100-feet looking for evidence of past use. He identified 45 sites including the Māmalahoa Trail (SIHP Site 2) and four other sites previously assigned the SIHP designations (Sites 1917, 1919, 5603, and 5604), and 40 sites not previously assigned SIHP designations (Sites 10151-10190).

Specifically the sites recorded by Barrera (1985a) included the Māmalahoa Trail, fourteen habitation shelters or shelter complexes, two midden scatters, twelve isolated stone mounds, four mound complexes, a habitation cave, three *pāhoehoe* excavations, six C-shaped enclosures, and two “petroglyphs” interpreted as Historic boundary markers (Site 10178). Twenty three of the recorded sites were situated at elevations proximate to the current study area (greater than

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40-feet above sea level; Table 3), and twelve of those sites, if still extant, have the potential to be situated within (or adjacent to) the current study area (SIHP Sites 2, 10156, 10157, 10158, 10160, 10161, 10162, 10187, 10188, 10189, and 10190; Appendix A). None of the sites were recorded in detail, but all were briefly described, plotted on a scaled map of the project area (Figure 42), and photographed; some artifacts were also surface collected by Barrera (Cordy 1985). Barrera summarizes his findings as follows:

The sites located during this reconnaissance indicate a light, probably temporary utilization of the inland area and primary concentration of settlement at the coast. Such inland features as were found are small, scattered mounds and crude shelters with little or no midden deposits. The coastal sites, on the whole, can be characterized as large, well built structures of a more permanent nature, as evidenced by the presence of considerably greater amounts of midden materials and artifacts. (1985a:48)

Table 3. Sites identified by Barrera (1985a) at elevations proximate to the current study area (at elevations greater than 40 feet above sea level).

<i>SIHP #</i>	<i>Site Type</i>	<i>Ahupua'a</i>	<i>Approx. Elevation (ft. above sea level)</i>
2*	Māmalahoa Trail	‘O‘oma 1, 2, Kalaoa 5	50-90
10151	Midden scatter	‘O‘oma 1	70
10152	Stone mound	‘O‘oma 1	70
10153	Stone mound	‘O‘oma 1	70
10154	Habitation shelter	‘O‘oma 2	110
10155	Habitation cave	‘O‘oma 2	85
10156*	Stone mound	‘O‘oma 1	60
10157*	Stone mound	‘O‘oma 1	60
10158*	<i>Pāhoehoe</i> excavation	‘O‘oma 1	90
10159*	Four C-shaped shelters	‘O‘oma 1	60
10160*	Stone mound	Kalaoa 5	95
10161*	Stone mound/C-shaped shelter complex	Kalaoa 5	115
10162*	Stone mound	Kalaoa 5	80
10163	C-shaped shelter	‘O‘oma 2	70
10164	<i>Pāhoehoe</i> excavation	‘O‘oma 1	60
10165	C-shaped shelter	‘O‘oma 1	55
10172	C-shaped shelter	‘O‘oma 1	50
10173	C-shaped shelter	‘O‘oma 1	45
10178	Historic petroglyphs	‘O‘oma 2	55
10187*	Four stone mounds	Kalaoa 5	60
10188*	Two stone mounds	Kalaoa 5	55
10189*	Stone mound	‘O‘oma 1	50
10190*	C-shaped shelter	‘O‘oma 1	55

*Site potentially located within or adjacent to the current study area.

Following the completion of this initial study, Barrera (1985b) conducted an archaeological reconnaissance of a 314-acre parcel occupying the entire seaward portion O‘oma 2nd Ahupua‘a between the coastal jeep road and the previous survey area for a private (‘O‘oma II) resort development (the northern portion of this area would eventually become part of the NELHA administered lands). As a result of the reconnaissance survey Barrera (1985b) located and briefly described some of the sites previously documented by Cordy (1975), and recorded an additional twenty-nine new sites containing a total of fifty-six features. A later DLNR-SHPD field check of the area (Cordy 1986; see below) concluded that while the inland portion of the Barrera (1985b) project area had been adequately surveyed, the coastal portion had not. Cordy (1986:5) found the survey to be deficient because it did not include the coastal portion of the parcel between the Jeep road and the ocean, and it failed to record numerous small coastal sites that were noted, but not reported on. Cordy (1986) actually identified six new sites during the field check. The Barrera (1985b) survey area would later be re-examined by Donham (1987).

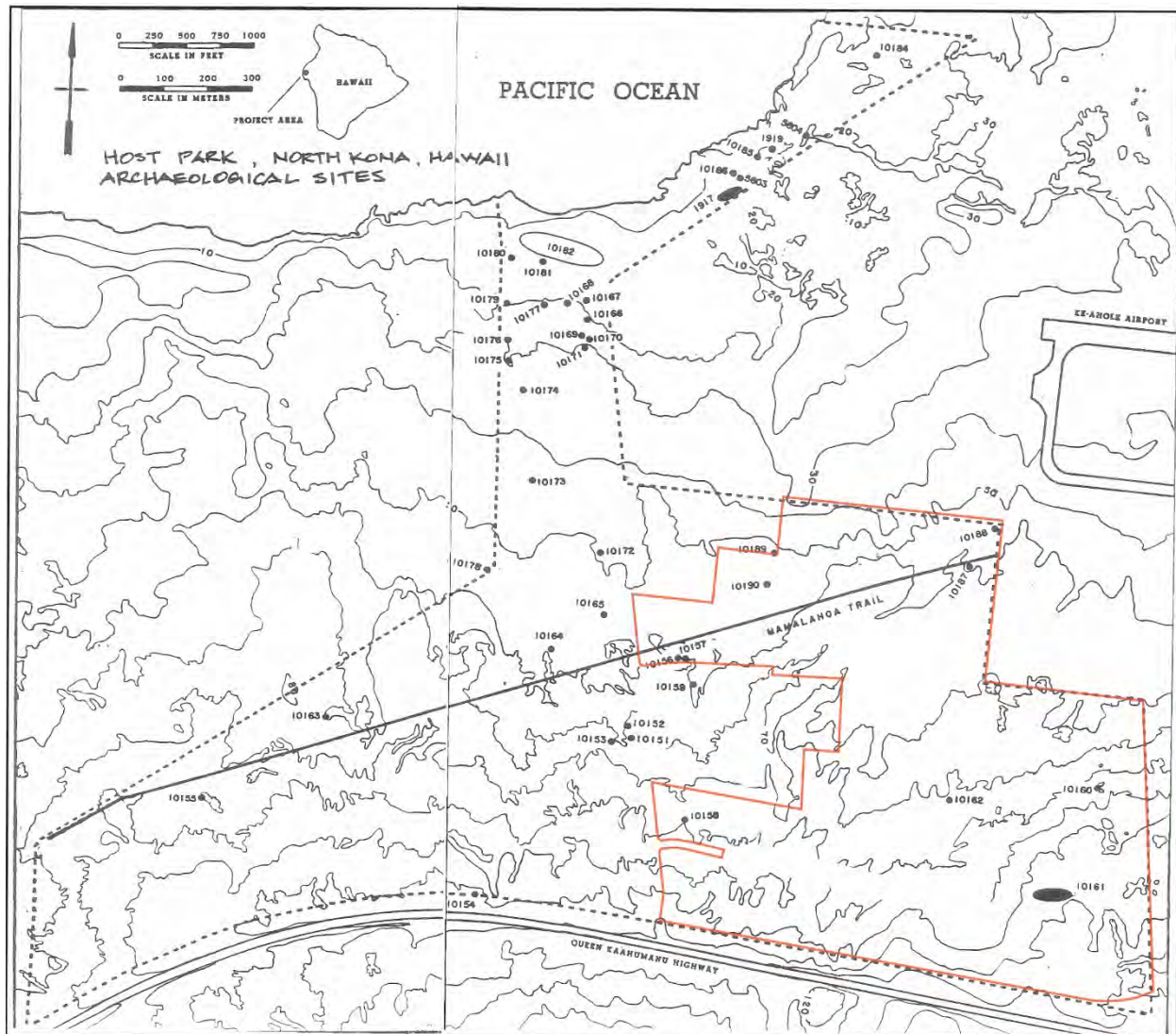


Figure 42. Barrera's (1985a) site location map showing the current study area (outlined in red).

2. Background

In 1985 Ross Cordy, while at the Historic Sites Section of the DLNR-Division of State Parks, prepared a working paper summarizing the archaeology of 'O'oma and Kalaoa *ahupua'a* (Cordy 1985). The paper synthesizes the collective site data and presents a summary of site patterning by environmental zones (i.e. the coastal zone, barren zone, and upland forest zone). In the barren zone, which includes the current study area, Cordy notes that:

Interestingly, from the 20 foot contour c. 0.8–1.4 km (0.5–0.9 miles) inland, the site density is extremely low in these ['O'oma and Kalaoa] *ahupua'a*. Here, sites consist of a few inland heading trails (Peterson [1969]), the early Historic Mamalahoa Trail which runs parallel to the shore, a few C-shaped enclosures and caves quite possibly located along these trails, and cairns along or quite possibly along these trails. Deposits in the clearly temporary habitation sites (caves and c-shapes) are again quite shallow – with some exceptions.

At the inland end of the barren zone at 200–400 foot elevation, the density of sites in Kalaoa 5 and Ooma 1 increases. (No sites have been found at this elevation in Kalaoa 1–4 – Davis 1977.) In these *ahupua'a* a large number of cave shelters were found located in lava tubes off lava sinks, and the floor of the sinks also had features. Deposits, other than in platforms, varied in depth from 5–30 cm, and many areas back in the tube shelters and on the sink floors had no surface deposits. These caves had extensive features reflecting recurrent, short-term usage – multiple hearths, many tiny platforms and enclosures (Hammatt and Folk 1980). Davis (1977) suggests that surface cairns in the vicinity might mark trails, and the Ching, Cluff & Riley [Ching et al. 1969] site location map shows trails heading inland toward this area. Thus these caves may well be shelters associated with the trails. One permanent house of historic (1800s) age is present at the upper end of the barren zone in this area – a typical walled compound with an internal house enclosure and other features (6417). [1985:32]

In conclusion, noting the sprawl of encroaching development that has gradually moved into the area in the nearly twenty years since the opening of Queen Ka'ahumanu Highway and the Keāhole Airport, Cordy (1985) offers expectations and recommendations for further study in the *ahupua'a* (also by environmental zones). Cordy suggests that “in the barren zone, widely scattered remnants of temporary occupation (caves, cave-sink complexes, c-shaped shelters, shell scatters, etc.), markers (cairns), and perhaps some inland heading trails are expected” (1985:43). He also notes that one type of site yet to be found in the *ahupua'a* (with the exception of the remains of a few single individuals in barren zone caves) are burial sites, and suggests that since most larger coastal platforms have already been investigated, burial caves in the barren zone are the likely site type in which to expect additional burials.

In early June 1986, Ross Cordy, still at the Historic Sites Section of the DLNR-Division of State Parks, was asked by the 'O'oma II resort planners to review the reconnaissance survey prepared by Barrera (1985b). Cordy (1986) found that Barrera had failed to identify some of the previously recorded sites in the coastal portion of the *ahupua'a* (Cordy 1975, 1981), and poorly described others, raising concerns that inland sites had also been missed. On June 12, 1986, in an effort to evaluate the thoroughness of the earlier survey work, Cordy conducted a field check of a portion of the inland area (extending beyond the Barrera 1985b survey area into the 1985a survey area) and a small part of the coastal section (see Figure 41). Cordy identified six new sites (seven features) within the inland field check area, but described them as “minor sites,” and indicated that only limited additional information would need to be collected at inland areas to “verify ideas on site function” (1986:5). In contrast, in the coastal area, Cordy reported that Barrera's “survey definitely is not complete enough for inventory purposes” (1986:5), and recommended that more intensive survey be conducted both *mauka* and *makai* of the coastal Jeep road to identify smaller sites, and adequately record the previously documented larger sites.

To remedy the deficiencies of the earlier archaeological work, the 'O'oma II resort planners hired Paul H. Rosendahl, Inc. (PHRI) to conduct additional archaeological survey and subsurface testing within the 314-acre study area. Fieldwork was conducted on July 16–23, 1986, and the results of the study (Donham 1987) were presented as an appendix to an Environmental Impact Statement prepared for the 'O'oma II resort development in 1991. Donham (1987) recorded a total of seventy-four sites containing 279 features – forty seven of which, containing ninety-five features, had been previously identified by Cordy (1975, 1986) and Barrera (1985b). The recorded sites included numerous formal feature types that were interpreted as having been used for temporary and permanent habitation, ceremonial, burial, transportation, quarry, and indeterminate purposes. The revised findings indicated that the earlier Barrera (1985b) study had indeed been inadequate, especially in the coastal portions of the project area. Two of the sites reported on by Donham (1987) were later the subject of an archaeological data recovery report prepared by Corbin (2000).

Following the completion of the Barrera (1985a, 1985b) reconnaissance surveys, but prior to the Donham (1987) survey, a mitigation program entitled “Hawaii Ocean Science and Technology Park Work Program for Archaeological Data Recovery” was generated by DLNR-SHPD for the Barrera (1985a) project area. Three levels of further work were called for in the plan including additional recording only (SIHP Sites 10154, 10159, 10161, 10163, 10165, 10170, 10172, 10173, 10179, 10180, 10187, 10188, and 10190), further recording and excavation (SIHP Sites 10166, 10171, 10175, and 10182), and excavation only (SIHP Sites 1917, 1919, and 10185). Four of the sites recorded by Barrera (1985a) within the current study area were included for additional recording in this data recovery plan (SIHP Sites 10161, 10187, 10188, and 10190; see Table 3). Barrera (1989) also provided SIHP designations, descriptions, and plan views for sites recorded by Cordy (1975) and Clark (1984) within the coastal portions of the NELH and HOST Park lands (SIHP Sites 10191-10214). Figure 43 shows the locations of all of these sites. During the course of the data recovery fieldwork six more sites in the coastal area, including three sites originally documented by Clark (1984) were added to the original scope of work and also excavated (SIHP Sites 10169, 10170, 10181, 10194, 10201, and 10214).

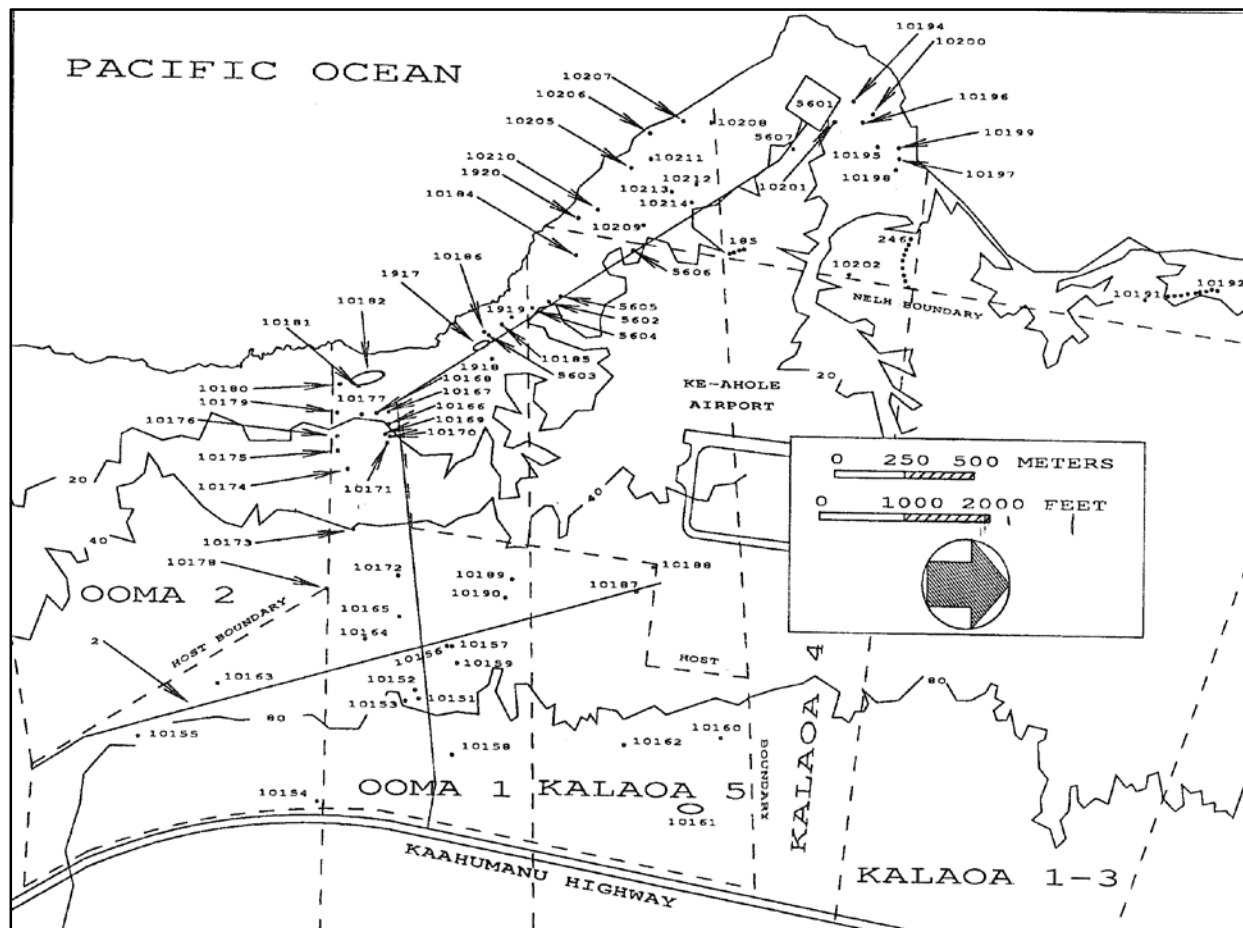


Figure 43. Barrera's (1989) site location map showing all of the sites in the project area.

The data recovery program at the NELH and HOST Park lands (in 'O'oma 1st and 2nd and Kalaoa 4th and 5th *ahupua'a*) was implemented by Barrera (1989). The four sites situated within the current study area were mapped and described in greater detail, but no excavation was undertaken at them (Appendix B). In describing the findings of the data recovery excavations, Barrera (1989) suggests that the earliest occupation of the general study area likely occurred around the middle of the sixteenth century, with occupation continuing and increasing throughout the seventeenth and early eighteenth centuries, but that by the end of the eighteenth century, most of the sites had been abandoned. The archaeological evidence overwhelmingly indicated that the exploitation of marine resources was the primary occupation of residents at the coastal structures in 'O'oma and Kalaoa. Human skeletal remains were identified at one of the excavated sites, a small well-constructed *ahu* on the *pāhoehoe* between the NELH access road and the coast (SIHP Site 10214).

In 1992, Barrera excavated three additional sites (SIHP Sites 16093, 16094, and 16132) situated near the coastal/inland boundary of 'O'oma 2nd Ahupua'a established by Cordy (1986). These sites were located in the northern

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portion of the Barrera (1985b) and Donham (1987) survey areas on a parcel of land that that was transferred to NELHA control subsequent to the Donham (1987) study. The three features excavated during the investigation – each “a well constructed platform or straight-sided cairn” that was “built over some sort of modified natural feature” with “more than usual amounts of coral fragments” (Barrera 1992:13) – were interpreted by Barrera as having some sort of unspecified ceremonial association.

In this same area in 1999, near the coastal/inland boundary of ‘O‘oma 2nd Ahupua‘a in the northern portion of the Barrera (1985b) and Donham (1987) survey area near the sites excavated by Barrera (1992), PHRI (Corbin 2000) extensively excavated two habitation complexes (SIHP Sites 1916 and 18028). Radiocarbon dates collected from the sites indicated that both of the complexes were established around A.D. 1600 to 1650, and that, based on the artifact assemblage, the exploitation of marine resources was the primary activity of residents of there.

Also in 1999, Archaeological Consultants of the Pacific, Inc. (Moore et al. 1999) conducted an archaeological inventory of the land around the Keāhole Point lighthouse in Kalaoa 5th Ahupua‘a. One site of historic significance was identified within the project limits (SIHP Site 21350). This site consisted of the concrete lighthouse structure itself (Feature A; built in 1915) and three adjacent petroglyphs including a faint, indecipherable image (Feature B), and two sets of Historic names of individuals associated with the lighthouse and the coastal lands of Kalaoa (Features C and D). The lighthouse structure was replaced in 2009. Archaeological monitoring of the replacement by Rechtman Consulting, LLC revealed no additional sites or features in the area (Ketner and Rechtman 2009).

In 2001, Garcia and Associates (GANDA) conducted archaeological data recovery at three sites within NELHA, in the coastal portion Kalaoa 5th Ahupua‘a (Roberts and Roberts 2001). The three sites (SIHP Sites 10211, 10212, and 10213; see Figure 43), originally documented by Clark (1984), included two rock shelters and a complex containing a small platform, a C-shaped enclosure, and an anthropomorphic petroglyph. Radiocarbon analyses did not provide a clear indication of the chronology of site occupation, but the recovered cultural material suggested temporary, recurrent use of the rock shelters beginning during the Precontact Period and lasting into the Historic Period, that the C-shaped enclosure may have been infrequently utilized for short-term habitation purposes, and that the small platform, based on the presence of coral, was likely a fishing shrine.

With the exception of the 2001 data recovery discussed above, most of the more recent archaeological work within the NELHA administered lands has focused on preservation planning, updates of earlier archaeological surveys, and field inspections of specific development parcels. A preservation plan for SIHP Site 10211 in coastal Kalaoa 5th Ahupua‘a was prepared by Roberts (2001), the section of the Māmalahoa Trail (SIHP Site 2) across the NELHA lands was prepared by Rechtman and Clark (2004), and a preservation plan for seven sites (SHIP Sites 1913, 1914, 1915, 16132, 18025, 18026, and 18027) in ‘O‘oma 2nd Ahupua‘a, within the northern portion of the Barrera (1985b) and Donham (1987) survey area, was prepared by Rechtman and Clark (2006). To the south of NELHA, an update inventory survey of the southern portions of the combined Donham (1987) and Barrera (1985a, 1985b) project areas (see Figure 41) was conducted by Rechtman (2007). This update inventory survey revealed the presence of two additional sites (SIHP Site 25932 and 26678) within the Barrera (1985b) and Donham (1987) survey area. Both sites consisted of lava tubes containing human skeletal remains that were located approximately 200 meters *makai* of the Māmalahoa Trail (SIHP Site 2). One site previously recorded by Barrera (1985a), a crude C-shaped shelter (SIHP Site 10163), was not relocated during the update survey.

Field inspections of specific development parcels within the NELHA HOST Park, in areas that were previously surveyed by Barrera (1985a), have generally matched the findings of the early reconnaissance survey, confirming the lack of sites in some areas (Rechtman 2010a, 2010b, 2010c, 2012a), and the presence of previously recorded sites in others (albeit with some modern disturbance that has impacted or completely removed some of the features from the site; Rechtman 2012b). A 2012 archaeological inventory survey update conducted by Rechtman Consulting, LLC (Rechtman and Clark 2012) for the proposed NELHA Roads C, D, and E within a roughly 60 meter wide road corridor across the HOST Park lands previously surveyed by Barrera (1985a) did, however, reveal the presence of three archaeological sites that had not been previously documented (SIHP Site 29272, 29273, and 29274). The undocumented sites included two *mauka/makai* trail segments (a stepping-stone trail and a trail/road that corresponds to the location of the Kauhini Road shown on the 1924 U.S.G.S. Keāhole Point quadrangle; see Figure 32) and a grouping of two cairns thought to mark a turn in the Kalaoa-‘O‘oma Homestead road laid out by surveyors in 1902, situated north of the NELHA access road within the Road C corridor across the current study area (Figure 44); south of the access road the *makai* end of a Historic wall along the boundary of ‘O‘oma 1st and 2nd ahupua‘a (SIHP Site 6432) that was previously documented by Davis (1977), but not included in the findings of Barrera (1985a), was recorded. Limited preservation was the recommended treatment for the boundary wall and trails, and no further work was recommended for the two cairns (Rechtman and Clark 2012). Sites 29272, 29273, and 29274 are discussed in further detail below (with updated descriptions) in the findings section of this report.

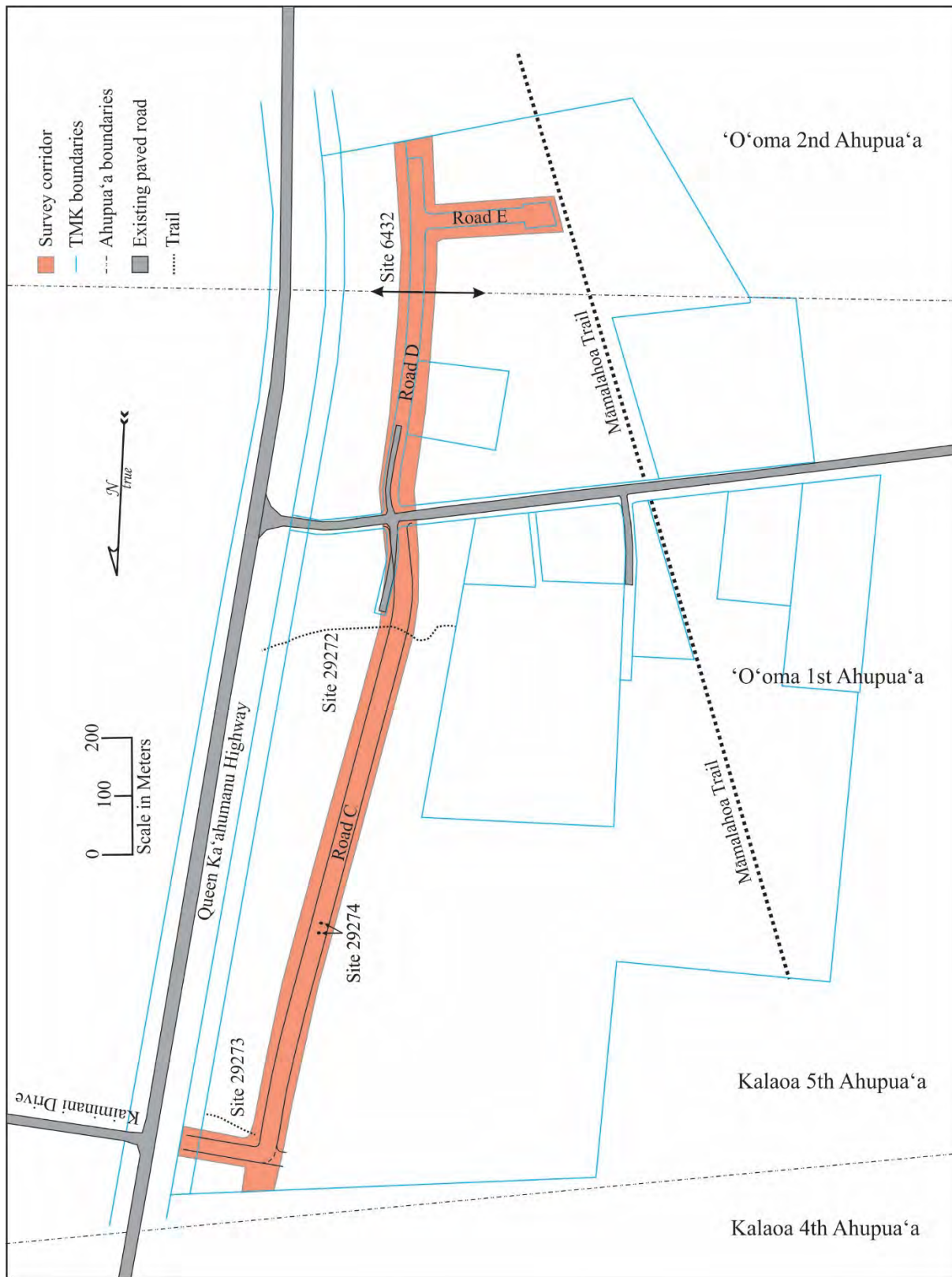


Figure 44. Rechtman and Clark's (2012) site location map.

2. Background

The Queen Ka‘ahumanu Highway right-of-way, which forms the *mauka* boundary of the current study area and was originally surveyed for archaeological sites by Ching and Rosendahl (1968), has been the subject of several recent surveys conducted by Cultural Surveys Hawai‘i, Inc. (CSH) (Walsh and Hammatt 1995; Monahan et al. 2011; Monahan and Wilkinson 2012; Monahan and Yucha 2012), culminating in an archaeological inventory survey for the proposed Phase II widening between Kealakehe and the Keāhole airport prepared by Monahan et al. (2012). As a result of this study four archaeological sites, were recorded within the right-of-way adjacent to the current study area (Figure 45). These sites include a portion of the same trail alignment as was recorded by Rechtman and Clark (2012) within the NELHA Road C corridor (SIHP Site 29272), a *pāhoehoe* excavation (SIHP Site 28811), a filled crevice (SIHP Site 28812), and a complex of five modified lava blisters (SIHP Site 28813) interpreted as agricultural planting areas (Appendix C). While the initial Walsh and Hammatt (1995) survey of the right-of-way had failed to identify any of these sites, two of the sites (SIHP Site 28811 and 28812), and one feature of a third site (Feature A of SIHP Site 28813) were included in the Monahan et al. (2011) report. During subsequent consultation with the Kaloko-Honokāhau National Park Service (NPS) staff and other Native Hawaiian Organizations (NHOs), however, it became clear that a number of features within the road corridor had been overlooked during the earlier surveys (Monahan and Wilkinson 2012; Monahan and Yucha 2012). Site 29272 and the four additional features of Site 28813 adjacent to the current survey area were pointed out to CSH archaeologists by Isaac Harp (2011), a member of one of the NHOs that provided comments on the 2011 inventory report; these features were subsequently recorded and incorporated into the Monahan et al. (2012) inventory survey. As a result of that study Sites 28811 and 28812 were recommended for data recovery, and Sites 29272 and 28813 were recommended for partial data recovery and partial preservation.

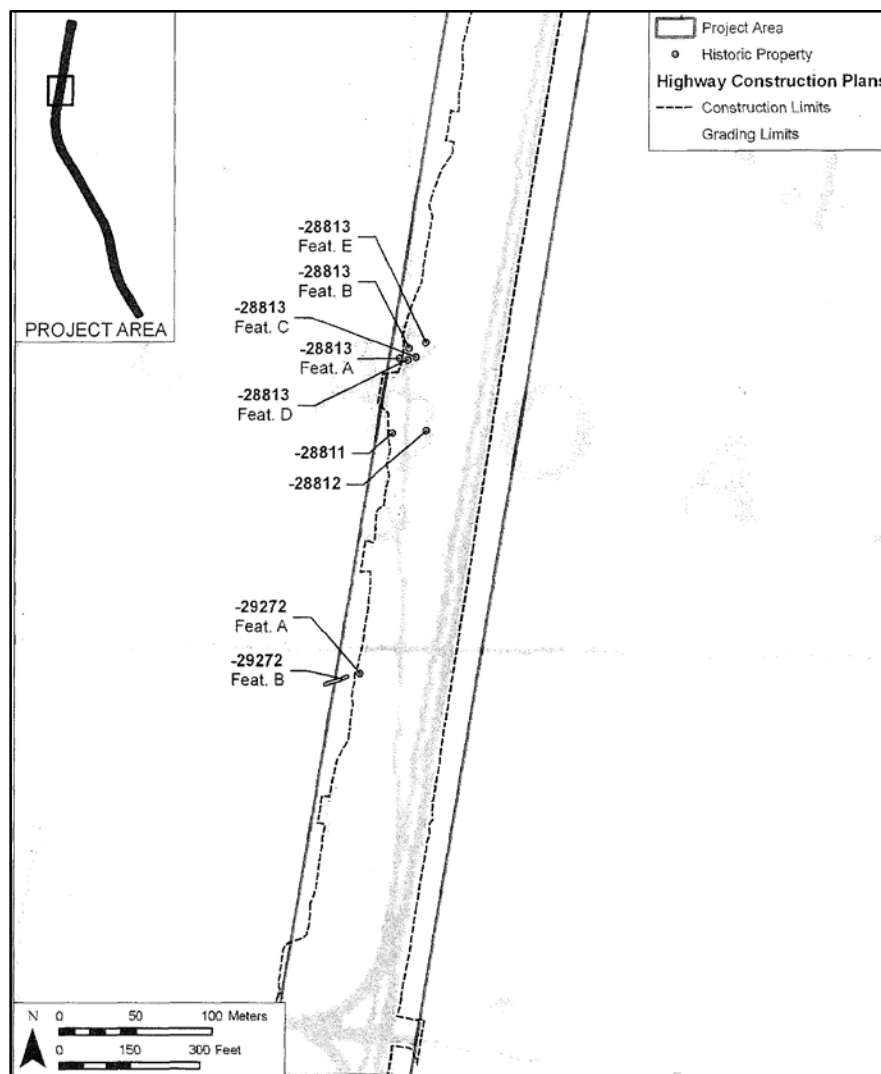


Figure 45. Portion of the Monahan et al. (2012) site location map showing the sites recorded adjacent to the *mauka* boundary of the current study area.

3. CONSULTATION

As part of the current project, we consulted with two individuals (Isaac “Paka” Harp and Justin Ahsing) of native Hawaiian ancestry that have shown past and current interest in the archaeology of the current study area. Both have been and are actively involved in the Section 106 consultation for the Queen Ka‘ahumanu Highway widening project, a segment of which, borders the current study area. During the aforementioned Section 106 consultation, Paka Harp was quite outspoken about his perceived inadequacy of the archaeological survey (Monahan et al. 2011) and he took it upon himself to survey section of the corridor that had been previously surveyed by professional archaeologists. As a result, Mr. Harp located several archaeological features that were missed during the earlier survey, and SHPO directed the professional archaeologists to go back into the field and recorded these features and amend their report (Monahan et al. 2012). Mr. Ahsing, a resident of Kailapa Hawaiian Home Land in South Kohala is currently working as a cultural monitor for the Queen Ka‘ahumanu Highway widening project, and has expressed a great interest in the archaeological sites of the North Kona and South Kohala coastal regions.

Both Isaac Harp and Justin Ahsing met with Matthew Clark and Robert Rechtman in the field at the conclusion of the fieldwork to visit the recorded archaeological sites within the current study area. Both expressed their confidence in the archaeological fieldwork that was done, but added that monitoring of any future development activities would also be a good idea. When asked specifically about potential future development they expressed a desire to preserve the trails and the lava tubes where possible. Both also agreed that with respect to the large wooden object located within SIHP Site 30316 it would be best to remove the item and curate it in a controlled environment.

Earlier conducted oral-historical interviews (Maly 1998, 2000; Maly and Maly 2003; Rechtman and Maly 2003) contain traditional information specific to Kalaoa and ‘O‘oma as well as to the general Kekaha area. This information is used in the current study with respect to interpretation and discussion. Interviewees relevant to the current study, many of whom have since passed away, included: Valentine K. Ako, George Kinoulu Kahananui Sr., Samuel Keanaaina, Malaea Agnes Keanaaina-Tolentino, Peter Keka, and Peter Keikua‘ana Park; and all of whom used the *mauka/makai* and coastal trails of immediate study area. Kupuna Peter Park makes specific mention of using the homestead trail (identified as SIHP Site 29272) to go down to Wawaloli (Maly and Maly 2003:A115). The general *kama‘āina* perspective collectively summarized in these earlier studies is germane to all future potential development of the Kekaha region:

When asked about proposed development . . . the interviewees all speak with hesitancy. It is difficult for them to see the landscape that they have known all their lives, and for which traditions were handed down, change. All interviewees believe that *ilina* (burial sites) should be preserved in place; likewise, should any *heiau*, or other important sites be located, they should be protected. It is also believed that the *Alanui Aupuni* and *mauka/makai* trails should be preserved. Whenever possible all sites, such as shelters, house sites, petroglyphs, walls, and other features should be protected. (Rechtman and Maly 2003)

NELHA anticipates a future partnership with the Hawai‘i Department of Transportation (HDOT) and the Federal Highway Administration (FHWA) with respect to future planned roadway projects within the current study area. Any such future projects that involves FHWA and the use of federal funds will be subject to Section 106 of the National Historic Preservation Act (NHPA); and while any such projects can confidently utilize the archaeological information contained in the current study, to comply with NHPA Section 106 additional project specific consultation will need to be conducted.

4. PROJECT AREA EXPECTATIONS

The comprehensive set of project area expectations presented below is based on the expected settlement patterns for the barren zone of the Kekaha Region of North Kona and the findings of prior archaeological studies conducted within and adjacent to the current study area (Barrera 1985a, 1989; Clark and Rechtman 2012; Monahan et al. 2012). Cordy (1985) provides a summary of expected site patterns by environmental zone (i.e. the coastal zone, barren zone, and upland forest zone) specific to the *ahupua'a* of 'O'oma and Kalaoa. In the lower barren zone of these *ahupua'a*, from roughly the 20-foot contour to about 0.8–1.4 kilometers (0.5–0.9 miles) inland, Cordy (1985:43) indicates that site density is extremely low, and that the expected site types in this area are limited to a few inland heading trails, the early Historic Māmalahoa Trail (SIHP Site 2) extending parallel to the shore, cairns possibly marking the trail routes, and widely scattered C-shaped enclosures and caves, also possibly located along the trail routes, that contain shallow cultural deposits indicative of use for temporary habitation purposes.

Previous archaeological survey of the current study area (Barrera 1985a, 1989; Rechtman and Clark 2012) has generally confirmed Cordy's (1985) model of expected site patterning. Barrera (1985a), during his reconnaissance survey of 450-acres within NELHA, identified and briefly described twelve archaeological sites within or immediately adjacent to the current study area (see Figure 42 and Appendix A). The sites included the 1847 Government Road (Māmalahoa Trail; SIHP Site 2), five individual stone mounds (SIHP Sites 10156, 10157, 10160, 10162, and 10189), two complexes of associated stone mounds (SHIP Sites 10187 and 10188; containing four mounds and two mounds respectively), a complex containing four stone mounds and three C-shaped shelters (SIHP Site 10161), a complex of four associated C-shaped shelters (SHIP Site 10159), an individual C-shaped shelter (SIHP Site 10190), and a *pāhoehoe* excavation (SIHP Site 10158). Barrera (1989) later revisited four of these sites (SIHP Sites 10161, 10187, 10188, and 10190; see Figure 42) and provided additional documentation including plan views and more detailed descriptions (see Appendix B). As a result of the "data recovery" Barrera (1989) suggested that the C-shaped structures at Sites 10161 and 10190 (and by association the stone mounds at Site 10161) were utilized for temporary habitation purposes during the Precontact Period. While Barrera did not offer functional interpretations for the other two sites, he did conclude that the stone mounds at Site 10187, based on their association with the Māmalahoa Trail (SIHP Site 2), were constructed sometime after the middle of the nineteenth century.

It is possible that all but one of the sites previously documented by Barrera (1985a, 1989) within, or nearby, the current study area, given the reported site locations (see Figure 42) and the subsequent development of certain parcels within the NELHA HOST park (see Figure 5), will still be present. It is unlikely that Site 10159, consisting of four C-shaped shelters identified by Barrera (1985a), will be relocated, as the plotted location of this sites places it adjacent to Makako Bay Drive within the previously developed Hawai'i Deep Marine, Inc. parcel. Additionally, Sites 10156, 10157, and 10189 are situated near graded areas along the boundary of the study area, and may have been damaged or destroyed by modern development activities. Site 2, the Māmalahoa Trail, extends across the study area within a 30-foot wide preservation easement, and is known to still exist. The archaeological preservation plan for this site (Rechtman and Clark 2004) indicates that the trail is periodically maintained across the NELHA lands by a Kona community group, suggesting that the site may have been modified since it was last recorded.

Also known to exist within the study area are two *mauka/makai* trails (SIHP Sites 29272 and 29273) and a grouping of two cairns (SIHP Site 29274) recorded by Rechtman and Clark (2012). These sites were not identified by Barrera (1985a), indicating that other additional sites may also be present within the previously surveyed areas. While the *mauka* portions of the Site 29272 and Site 29273 trail alignments, extending to the *mauka* boundary of the current study area, were previously mapped (see Figure 44), additional trail sections may be identified in the *makai* portion of the study area. As indicated by Cordy (1985), if additional sections of these trails or other trails are identified, they are likely to be marked by cairns, and other temporary habitation structures, such as C-shaped enclosures or caves, could occur along their routes. Site 29272 appears to be the alignment of Kauhini Road shown on the 1924 U.S.G.S. Keāhole Point quadrangle (and on other maps as early as 1889) and still shown as a jeep trail on the current TMK plat for the study area (see Figure 2). Rechtman and Clark (2012) suggest that the cairns of Site 29274 are Historic survey markers indicating a turn in a proposed roadway through the Kalaoa-'O'oma Homesteads laid out by surveyors in 1902. These two cairns are quite similar to the "stone mounds" recorded by Barrera (1985a, 1989), which could indicate that a number of additional Historic survey markers associated with the creation of the Kalaoa-'O'oma Homesteads are also present within the study area. Adjacent to the *mauka* boundary of the study area, within the Queen Ka'ahumanu right-of-way. Monahan et al. (2012) documented a portion of the Site 29272 trail, a *pāhoehoe* excavation (SIHP Site 28811), a filled crevice (SIHP Site 28812), and a complex of five modified lava blisters (SIHP Site 28813) interpreted as agricultural planting areas (see Figure 45 and Appendix C). It is possible additional features of sites similar to these will also be found within the current study area.

5. FIELDWORK

Fieldwork for the current study was conducted on October 28-30, November 10-14 and 17-21, 2015 by Matthew R. Clark, B.A., Ashton K. Dircks-Ah Sam, B.A., J. David Nelson, B.A., Owen F. Moore, M.A., Genevieve L. Glennon, B.A., and Samuel K. Plunkett, B.A., under the direction of Robert B. Rechtman, Ph.D.

METHODS

The surface of the entire study area was visually inspected for archaeological features at the outset of the current fieldwork (on October 28-30, 2015). The initial survey utilized north-south pedestrian transects with fieldworks spaced at fifteen meter intervals. During the transect sweeps point locations for all of the potential archaeological features or feature complexes encountered within the study area were generated and marked on a scaled map (1 centimeter to 20 meter) of the study area using a Garmin Vista HCx handheld GPS device (set to the NAD 83 datum). This initial survey map was built upon throughout the fieldwork to create a scaled plan view of the entire project area showing all of the site and feature locations, isolated artifact locations, the study area terrain and the distinct lava flow edges, the vegetation cover, and all areas of modern disturbance. During subsequent fieldwork (on November 10-14 and 17-21, 2015) all of the potential feature locations identified during the initial transect sweeps were revisited, cleared of vegetation (or in the case of lava tubes or lava blisters explored fully), and examined for formal architectural traits or cultural debris indicative of past human activity. If no indicators of past human activity were identified at a potential feature – for instance, if the potential feature had indicators solely of modern activity or construction, or appeared to have been created solely as a result of modern ground disturbance (i.e. bulldozing or rock quarrying); or if the potential feature was a natural formation of the lava flow (such as a lava tube, blister, sink, or depression) with no modification or associated cultural debris – then no further work was conducted. Those features that did possess indicators of non-modern, past human activity were subject to further archaeological inventory survey level recording.

More than 350 distinct archaeological features were identified and subsequently documented within the current study area. The vast majority of these features were *pāhoehoe* excavations (n=255) and cairns (n=69), followed by rock rings (n=35), lava tubes/blisters (n=5), trails/roads (n=4), concentrations of surface debris (n=2), and modified bedrock depressions (n=1). Given that the potential for the collection of empirical data varied at each of these general feature types, so did the methodology and extent of archaeological recordation employed. The specific formal traits used to segregate the identified archaeological remains into distinct formal and functional categories will be discussed in further detail below (in the findings section of this report); here only the field methodology used to record the various feature types, and the analytical methods used to group them into the archaeological sites that are the subject of this report, are presented. None of the identified features had architectural traits or cultural deposits that were suitable for excavation, therefore no subsurface testing was conducted as part of this inventory survey.

Every feature identified within the current study area was either correlated to an existing State Inventory of Historic Places (SIHP) site number, or assigned a new temporary site designation. Each *pāhoehoe* excavation and cairn identified within the study area was assigned a numerical designation (by feature type) as it was recorded (X-1, X-2, X-3, etc. in the case of *pāhoehoe* excavations and C-1, C-2, C-3, etc. in the case of cairns). Specialized forms (Figures 46 and 47) were used to document locational, dimensional, and formal information for all sixty-nine (100%) of the cairns, and fifty-three (20%) of the *pāhoehoe* excavations; individual photographs (with a meter stick and north arrow for scale and orientation) were also taken of all of the cairns and of the twenty percent of the *pāhoehoe* excavations that were subject to more detailed study. At the remaining eighty percent of the *pāhoehoe* excavations only general area photographs were taken (at various locations across the study area), and general observations regarding the nature and associations of these ubiquitous features and the terrain in which occur were recorded. UTM point locations for all of the cairns and *pāhoehoe* excavations were collected using a Trimble Geo XH Geo Explorer 6000 series handheld GPS receiver (set to the NAD 83 Hawai'i datum) and processed using GPS Pathfinder Office and ArcMap 10.1 software.

All of the non-*pāhoehoe* excavation and non-cairn features (i.e. the rock rings, the lava tubes and lava blister, the trails, the collections of surface debris, and the modified bedrock depression) that did not have an existing SIHP designation were assigned temporary site numbers (T-1, T-2, T-3, etc.) in sequential order as they were recorded (the SIHP designations assigned to the sites that had been previously recorded were retained). Isolated or stand-alone features of this type were assigned their own temporary site numbers, as were groups of features that appeared interrelated based on proximity, form, or presumed age. The features of multi-component sites were assigned alphabetical feature designations (A, B, C, etc.) in sequential order as they were recorded (again the existing feature designations for multi-component sites that had been previously recorded were retained). After being cleared of

5. Fieldwork

vegetation, all of features and sites of this type were mapped in detail (using a measuring tape and compass), photographed (with and without a meter stick and north arrow for scale and orientation), and described using standardized site record forms (when cairns or *pāhoehoe* excavations were present in close proximity to these sites, or were part of a previously recorded site, they too were mapped, photographed, and described). Each feature in each non-*pāhoehoe* excavation and non-cairn site was marked in the field with a metal site tag containing the ASM project number, the site number, the date the site was recorded, and the recorder's initials. All of the site boundaries and feature locations were recorded using a Trimble Geo XH Geo Explorer 6000 series handheld GPS receiver (set to the NAD 83 Hawai'i datum) and processed using GPS Pathfinder Office and ArcMap 10.1 software.

Cairn Recordation Form			Project Name:	Project No.	Page ___ of ___
Cairn #:	Disk#:	Frame#:			
Length: _____m Dir. _____	Width: _____m Dir. _____	Height: _____cm			
Approx. # of cobbles: _____			<div style="display: flex;"> <div style="flex: 1;">Plan sketch</div> <div style="flex: 1;">Elevation sketch</div> </div>		
Setting: _____					
Associations: _____					
Associated debris: _____					
Additional comments: _____			North: _____ View to: _____ (Not to scale)		

Figure 46. Example of the cairn recordation form used during the current study.

Pāhoehoe Excavation Record			Project Name:	Project No.	Page ___ of ___
Feature #:	Disk#:	Frame#:			
Length: _____m Dir. _____	Width: _____m Dir. _____	Depth: _____cm			
Approx. # of excavated cobbles: _____			<div style="display: flex;"> <div style="flex: 1;">Plan sketch</div> <div style="flex: 1;">Elevation sketch</div> </div>		
Setting: _____					
Associations and debris: _____					
Additional comments: _____					
			North: _____ (Not to scale)		

Figure 47. Example of the *pāhoehoe* excavation record form used during the current study.

Upon completion of the fieldwork the temporary sites and features identified in the field were arranged into the archaeological sites that are the subject of this report. One of the major issues confronting archaeologists investigating tracks of land on Hawai'i Island, where the sometimes ubiquitous stone structures take on a bewildering variety of forms and sizes, especially in the lowland zones (Kirch 1985), is that of defining site boundaries. Hawai'i is not unique in this; in fact, an extensive body of worldwide archaeological literature exists on the subject (c.f. Binford 1972 for a discussion). Kirch notes that in Hawai'i the term "site" has been applied in a number of ways by archaeologists, but that it is most commonly "applied to single constructions, or to an aggregation of spatially associated structures" (1985:38). Weisler and Kirch (1985) developed a well-defined hierarchical system for labeling and analyzing the components of Hawaiian sites. In their system individual architectural elements comprise the lowest component level. The architectural components may stand alone or be combined to form features. Features, which typically comprise spatially bounded or delineated areas, may be combined to form compound structures or may stand alone on the landscape. According to Kirch, "the groupings or aggregations of architectural components, features, and compound structures over the landscape are termed complexes (such as all of the features and structures that make up a residential unit)" (1985:39). In the Weisler and Kirch (1985) system the term "site" is used at any level as a convenient labeling device. A similar hierarchical system was used for grouping features and defining site boundaries within the current study area.

It is important to keep in mind that from a Hawaiian cultural perspective the entire project area might be viewed as a single cultural landscape that records the diachronic story of an *'ohana holo'oko'a 'āpa'akuma* (Rechtman et al. 2001) and their land. However, for analytical and planning purposes the features that make up the archaeological landscape must be separated into administrative sites. The primary criteria used for defining site boundaries within the study area were feature form, proximity, and temporal affiliation; secondary criteria considered when defining the boundaries of a site were the impressionistic associations and discrete connections noted between proximate features in the field. Also considered were previously identified site boundaries.

For the purposes of the current study the SIHP site and feature designations for all previously recorded sites and features were maintained, and when additional features of a multi-component site were identified, they were assigned the next alphabetical feature designation in the previously used sequence. Otherwise, at the newly identified sites, all of the above listed criteria for defining site boundaries were considered, and are briefly discussed here by formal feature type, but are elaborated upon further below (in the findings section of this report). For *pāhoehoe* excavations the temporary field designations (X-1, X-2, X-3, etc.) were maintained, and the excavations were grouped into sites based upon relative proximity and discrete associations observed in the field. The *pāhoehoe* excavations identified within the current study area are thought to have been created primarily as a result of quarrying activity for construction materials, but other alternative functional interpretations are also discussed below.

Cairns were assigned to sites based upon proximity, temporal affiliation, location, and the impressionistic associations and discrete connections noted between them and other proximate features in the field. Essentially, cairns associated with trails were assigned to those trail sites, cairns with similar formal traits or temporal affiliations located in close proximity to one another were grouped together, and isolated or individual cairns were assigned their own discrete site designation. All of the cairns recorded within the current study area are interpreted as visual markers on the landscape.

The boundaries of trail and road sites are implicit in their form, and as such, each distinct trail/road within the current study area has its own discrete site designation. Features recorded along the routes of the trails and roads, such as cairns, debris scatters, or natural resting places, were assigned feature designations of the trail/road sites. *Mauka/makai* trails in the barren *kula kai* of Kekaha typically served as pedestrian routes of travel between the coastal and upland areas, or as pathways to local resources. Trails of the Historic Period were also used for horse and donkey travel, and later on for Jeep travel. The Māmalahoa Trail, or 1847 Government Road, which crosses the current study area, was the primary route of near shore transportation from Kailua to points north during the second half of the twentieth century. As Cordy (1985) indicates, other feature types in the barren zone of the *ahupua'a* of 'O'oma and Kalaoa are often found along the routes of trails.

Like trails, the boundaries of lava tube and lava blister sites are also implicit in their form. All interconnected, subsurface lava tube passageways, tube openings, and lava sinks recorded during the current study were assigned their own discrete site designation that included all other feature types contained within them, but none of the features on the surface above them. The lava tubes and blisters identified within the current study area were used primarily for storage, shelter, and short-term habitation purposes.

Finally, each rock ring (or adjoining set of rock rings) identified within the study area, as long as it was not already associated with a previously recorded site complex, was assigned its own SIHP site number. Discrete associations and proximity to other similar features were not considered when assigning site boundaries to this formal feature type, largely because the function and temporal affiliation of these minimally constructed features, found only on flat *pāhoehoe* bedrock surfaces with no associated cultural debris, is unknown. Barrera (1985a, 1989) previously described features of this type as C-shaped structures used for temporary habitation purposes; further inspection of the rock rings identified within the current study area, however, suggests that this is a unique feature type, clearly distinct from the ubiquitous C-shaped structures widely described elsewhere in Hawaiian archaeological literature (c.f. Kirch 1985), and that these features are unlikely to have been used for habitation purposes. A number of possible alternative functional interpretations for the rock ring features are offered below (in the findings section of this report).

FINDINGS

As a result of the current inventory survey fieldwork seventy-three archaeological sites containing a total of 381 features were recorded within the study area (Figure 48 and Table 4). The sites include eight (SIHP Sites 2, 10160 to 10162, and 10188 to 10190) that were previously documented by Barrera (1985a, 1989), an additional feature of a site complex (SIHP Site 28813) recorded by Monahan et al. (2012) within the Queen Ka'ahumanu right-of-way, all three of the sites (SIHP Sites 29272 to 29274) previously documented by Rechtman and Clark (2012) within the study area, and sixty-one newly identified sites (SIHP Sites 30315 to 30375). Three sites previously recorded by Barrera (1985a) near the boundary of the current study area (on Parcels 073 and 074), consisting of two stone mounds (cairns) and a *pāhoehoe* excavation (SIHP Sites 10156 to 10158; see Figure 42), were not relocated, and are thought to have been destroyed by modern disturbance. The following description of the archaeological sites encountered within the study area is organized by site type, arranged under the following headings (with the corresponding sites in parentheses): Trails and Roads (SIHP Sites 2, 29272, 29273, and 30315), Previously Identified Site Complexes (SIHP Sites 10161 and 28813), Lava Tubes and Lava Blisters (SIHP Sites 30316 to 30320), Rock Rings (SIHP Sites 10190, 30321 to 30347), Cairns (SIHP Sites 10160, 10162, 10187 to 10189, 29274, and 30348 to 30369), and *Pāhoehoe* Excavations (SIHP Sites 30371 to 30375).

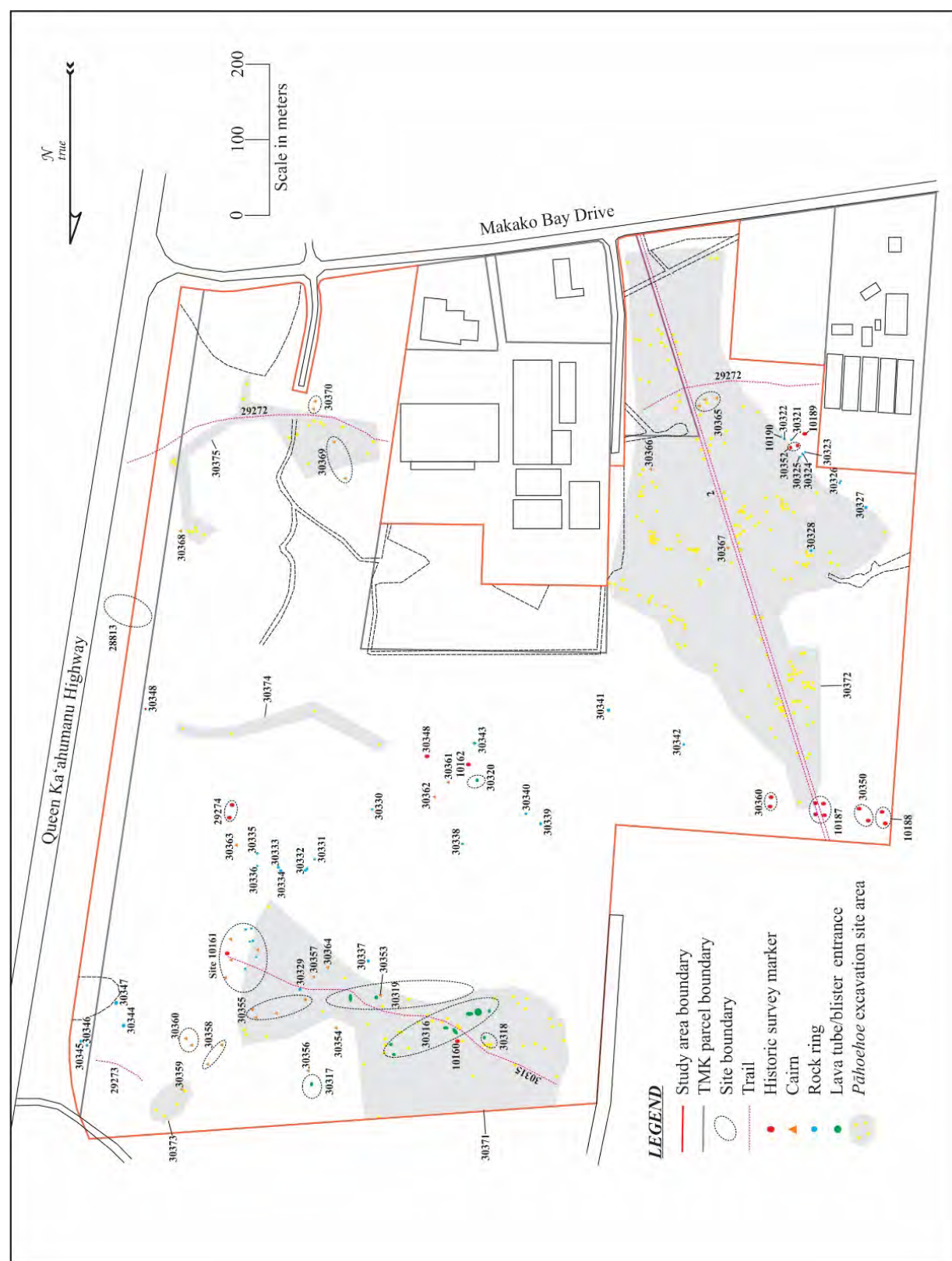


Table 4. Archaeological sites identified within the current study area.

<i>SIHP Site No.*</i>	<i>Site Type</i>	<i>Site Function</i>	<i>TMK: (3) 7-3-43:</i>	<i>No. of features</i>
2	Kerbstone lined road	1847 Government Road	073, 074	3
10160	Cairn	Historic survey marker	073	1
10161	Cairn/rock ring complex	Unknown/various	073	11
10162	Cairn	Historic survey marker	073	1
10187	Cairn complex	Historic survey markers	073	4
10188	Cairn complex	Historic survey markers	073	2
10189	Cairn	Historic survey marker	073	1
10190	Rock ring	Unknown	073	1
28813**	Modified depression complex	Agricultural	072	6
29272	Trail/roadway	<i>Mauka/makai</i> trail- Kauhini Road	072, 073, 074	5
29273	Stepping-stone trail	<i>Mauka/makai</i> trail	073	1
29274	Cairn complex	Historic survey markers	073	2
30315	Cairn marked trail	<i>Mauka/makai</i> trail	073	15
30316	Lava tube	Habitation/shelter/storage	073	6
30317	Lava tube	Shelter	073	1
30318	Lava tube	Habitation	073	1
30319	Lava tube	Habitation/storage	073	1
30320	Lava blister	Shelter	073	1
30321	Rock ring	Unknown	073	1
30322	Rock ring	Unknown	073	1
30323	Rock ring	Unknown	073	1
30324	Rock ring	Unknown	073	1
30325	Rock ring	Unknown	073	1
30326	Rock rings	Unknown	073	2
30327	Rock ring	Unknown	073	1
30328	Rock ring	Unknown	073	1
30329	Rock ring	Unknown	073	1
30330	Rock ring	Unknown	073	1
30331	Rock ring	Unknown	073	1
30332	Rock ring	Unknown	073	1
30333	Rock ring	Unknown	073	1
30334	Rock ring	Unknown	073	1
30335	Rock ring	Unknown	073	1
30336	Rock ring	Unknown	073	1
30337	Rock ring	Unknown	073	1
30338	Rock ring	Unknown	073	1
30339	Rock ring	Unknown	073	1
30340	Rock ring	Unknown	073	1
30341	Rock ring	Unknown	073	1
30342	Rock ring	Unknown	073	1
30343	Rock ring	Unknown	073	1
30344	Rock ring	Unknown	073	1
30345	Rock ring	Unknown	072	1
30346	Rock ring	Unknown	072	1
30347	Rock ring	Unknown	073	1
30348	Cairn	Historic survey marker	073	1
30349	Cairn	Historic survey marker	073	1
30350	Cairn complex	Historic survey marker	073	2
30351	Cairn complex	Historic survey marker	073	2
30352	Cairn complex	Historic survey marker	073	2

*SIHP Site numbers are preceded by the state, island, and U.S.G.S. quad prefix 50-10-27-.

Table 4 continued on next page.

**Only one feature of Site 28813 recorded by Monahan et al. (2012) is situated within the study area.

Table 4. Continued.

<i>SIHP Site No. *</i>	<i>Site Type</i>	<i>Site Function</i>	<i>TMK: (3) 7-3-43:</i>	<i>No. of features</i>
30353	Cairn	Marker	073	1
30354	Cairn	Marker	073	1
30355	Cairn complex	Markers	073	4
30356	Cairn	Marker	073	1
30357	Cairn	Marker	073	1
30358	Cairn complex	Markers	073	2
30359	Cairn	Marker	073	1
30360	Cairn complex	Markers	073	2
30361	Cairn	Marker	073	1
30362	Cairn	Marker	073	1
30363	Cairn	Marker	073	1
30364	Cairn	Marker	073	1
30365	Cairn complex	Markers	073	3
30366	Cairn	Marker	073	1
30367	Cairn	Marker	073	1
30368	Cairn	Marker	073	1
30369	Cairn complex	Markers	073	2
30370	Cairn complex	Markers	073	2
30371	<i>Pāhoehoe</i> excavation complex	Assay/Quarry/Unknown	073	45
30372	<i>Pāhoehoe</i> excavation complex	Quarry/Unknown	073, 074	184
30373	<i>Pāhoehoe</i> excavation complex	Quarry/Unknown	073	4
30374	<i>Pāhoehoe</i> excavation complex	Assay/Unknown	073	4
30375	<i>Pāhoehoe</i> excavation complex	Quarry/Unknown	072, 073	20

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

End of Table 4.

Trails and Roads

Sections of four trails/roads were identified and documented within the current study area (Table 5 and Figure 49). The trail/road sites include a portion of the 1847 *makai* Government Road (the Māmalahoa Trail; SIHP Site 2), a section of the *mauka/makai* Kauhini Road (SIHP Site 29272), and two additional *mauka/makai* trail routes consisting of a stepping-stone trail across an ‘a‘ā lava surface (SIHP Site 29273) and a cairn marked trail alignment across a *pāhoehoe* lava surface (SIHP Site 30315). The Māmalahoa Trail (SIHP Site 2) was previously documented within the study area by Barrera (1985a); a preservation plan for the section of the site that crosses the NELHA lands was prepared by Rechtman and Clark (2004), and the site currently extends across Parcels 073, and 074 within a 30-foot wide preservation easement (see Figure 2). Sites 29272 and 29273 were previously documented within the study area by Rechtman and Clark (2012). An additional section of the site adjacent to the study area within the Queen Ka‘ahumanu right-of-way was documented and tested by Monahan et al. (2012). A general discussion of the trails and roads of Kekaha is presented below followed by detailed descriptions of the sites themselves. Significance evaluations and treatment recommendations for the trail/road sites are presented at the conclusion of this report.

Table 5. Trails and road sites identified within the current study area.

<i>SIHP No. *</i>	<i>Formal Type</i>	<i>Functional Type</i>	<i>Age</i>
2	Kerbstone lined trail	1847 Government Road	Historic
29272	Trail/Roadway	<i>Mauka/makai</i> trail-Kauhini Road	Precontact/Historic/Modern
29273	Stepping-stone trail	<i>Mauka/makai</i> trail	Precontact
30315	Cairn marked trail	<i>Mauka/makai</i> trail	Precontact/Historic

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

Trails were (and still remain) an integral part of the cultural landscape of Hawai‘i that provided access for local and regional travel, subsistence activities, cultural and religious purposes, and for communication between extended families and communities. Along the trails of Kekaha are found a wide variety of cultural resources, including, but not limited to residences (both permanent and temporary), enclosures and exclosures, walls, alignments, agricultural complexes, resting places, shelters, storage areas, resource collection sites, ceremonial features, *ilina* (burial sites), petroglyphs, secondary trails, and other sites of significance that were important to those who once lived and travelled

in the region (Rechtman and Maly 2003). Collectively the trail routes identified within the current study area are indicative of general travel and settlement patterns of the wider Kekaha and North Kona regions from initial peopling and subsequent population expansion of the Precontact Period, through the Historic Period, into Modern times. An understanding of the trail routes is the key to interpreting past human activity within the current study area where, until recent times in this section of the arid *kula kai* (shoreward plains) of Kekaha between the coastal and upland settlement and resource zones, travel from place to place was the primary human activity.

Most trails in ancient Hawai'i began as unplanned, informal pathways that formed over time, as a result of frequent use (Hommon 2013), as the first settlers of an area established residency, sought out the diverse resources of their newly settled lands, and expanded. Eventually, the resulting network of trails included lateral trails (*alalehe*) that followed the shore linking the various communities and *ahupua'a* of each region, and *mauka/makai* trails – trails that extended from the shore to the uplands (generally known as – *ala pi'i uka* or *ala pi'i mauna*). *Mauka/makai* trails were typically found within each *ahupua'a*, and they connected the coastal communities with upland settlement, agricultural, and resource areas. Site 29272 in 'O'oma 1st Ahupua'a and Site 30315 in Kalaoa 5th Ahupua'a are examples of two *mauka/makai* trails identified within the current study area (see Figure 49). A third trail, Site 29273, a short section of trail that also extends *mauka/makai* within Kalaoa 5th Ahupua'a, may have been a secondary route used for local travel or the extraction of local resources. As the various trail networks expanded throughout the Precontact Period, regional thoroughfares (*alaloa*) were established that linked diverse communities around the entire island. In Kekaha, at the time of Western contact, two traditional trails were of regional importance – the near shore *alaloa*, and the upland route of *Kealaehu* (The path of Ehu; Rechtman and Maly 2003). The *alaloa* across 'O'oma and Kalaoa *ahupua'a* followed the coast *makai* of the current study area.

In ancient Hawai'i trails were maintained solely for foot travel (Kirch 1985). Their design was typically determined by the environmental zone and the natural topography of the land, and tended to meander following the easiest terrain between two points of travel. Owing to the varied terrain of Kekaha, the trails of this area exhibit a variety of construction methods, including the making and marking of cleared, worn paths on *pāhoehoe* or 'a'ā lava surfaces (such as at Sites 29272 and 30315), cobble or slab stepping-stones across 'a'ā flows (such as at Site 29273), and trails across sandy shores and dry rocky soils. Apple (1965) notes that stone cairns often marked the best route across smooth *pāhoehoe* surfaces where trail construction was not necessary; a technique that is evident within the current study area at Site 30315. For nighttime travel coral was sometimes placed along trail routes to help travelers find their way in the moonlight (Hommon 2013). A few instances of kerbstone or coral-cobble lined trails were also found in Precontact Hawai'i, but as Apple (1965) relates most trails lined with kerbstones were built or modified for horse travel during the nineteenth century, after Western contact.

By the mid-nineteenth century, as wheeled carts and draft animals became more common in the Kona District, portions of the nearshore *alaloa*, the upland route of *Kealaehu*, and the less widely used *alalehe* connecting them were realigned (straightened out), widened, and smoothed over, while other sections were simply abandoned for newer more direct routes (Rechtman and Maly 2003). These modified trail routes became a part of a system of "roads" called the *Alanui Aupuni*, or Government Roads. SIHP Site 2 is the designation for the *makai* Government Road through Kekaha (built in ca. 1847), an alignment that later become known as the Māmalahoa Trail or King's Highway, a portion of which crosses the current study area (see Figure 49). In establishing this road, portions of the nearshore *alaloa*, including the section across the *ahupua'a* of 'O'oma and Kalaoa, were abandoned and the new road was realigned far enough inland to make a straight route across the landscape (Figure 50), and thus cut down on travel times to and from Kailua (or points in between). Where the 1847 Government Road crosses the lands of 'O'oma and Kalaoa, Rechtman and Maly (2003) note that the alignment includes several construction methods, such as being lined with curbstones; elevated; and with stone filled "bridges" in areas that level out the contour of the roadway.

The realignment of the *alaloa* in favor of the 1847 Government Road took travel away from the coast, an area that had once been well settled, but that by the mid-1800s was only sparsely populated, as most of the residents of Kekaha had chosen to reside permanently in the more agriculturally productive upland areas (Rechtman and Maly 2003). Work on the roads was funded in part by Government appropriations, and through the labor or financial contributions (tax) of area residents and prisoners working off penalties; in general, in lieu of paying a tax, adult residents of a given *ahupua'a* had to devote a portion of their time to maintaining the Government Roads across that *ahupua'a*. By the middle to late 1800s, the *kula* lands, from around the 900-foot elevation to the shore, were primarily used for goat, cattle, and donkey pasturage. The families of the uplands regularly traveled to the coast via trails to go fishing, or to round up cattle, goats, or donkeys (Rechtman 2006). In some cases they likely even crossed the current study area on Sites 29272 and 30315, both of which exhibit signs of this period of use. Maps of the late nineteenth century show the Government Road as the primary route of travel across the *makai* lands of Kekaha, but do not generally show the *mauka/makai* trails traveled by the residents of the uplands to the coast.



Figure 49. Trail/road sites identified within the study area.



Figure 50. Portion of the *Alanui Aupuni* (SIHP Site 2) crossing the *kula kai* lands of ‘O‘oma (from Rechtman and Maly 2003).

Oral history interviews with *kama‘āina* of the Kekaha region (in Maly and Maly 2003, Rechtman and Maly 2003, and Rechtman 2006) describe continued travel between the uplands and coastal lands of ‘O‘oma and Kalaoa, and between other *ahupua‘a* of the region throughout the twentieth century. During the first half of the century the primary method of travel was by foot or on horse or donkey, and those who traveled the lands were generally residents of the area. The use of some trails, like Site 30315 within the current study area, which lacks any evidence of cultural debris post-dating ca. 1920, may have been discontinued around this time as the population of Kekaha dwindled and other travel routes were improved. A July 1930 map of the *ahupua‘a* between Kau and Kealahou in North Kona (see Figure 33) depicts three trails in the vicinity of the current study area (the trails routes are likely copied from the 1924 U.S.G.S. Keāhole Point quadrangle), including a coastal trail to the Keāhole Point lighthouse, the *makai* Government Road (SIHP Site 2), and a *mauka/makai* trail route extending from Wawaloli at the coast of ‘O‘oma 1st Ahupua‘a across the current study area (as SIHP Site 29272) to the upper Government Road in Kalaoa 4th Ahupua‘a. This third trail is labeled “Kauhini Road” on the 1924 U.S.G.S. Keāhole Point quadrangle (see Figure 32). The 1930 map also shows a planned realignment of the *makai* Government Road within ‘O‘oma and Kalaoa *ahupua‘a* (to the west of the current alignment of SIHP Site 2 along the boundary of ‘O‘oma-Kalaoa Homestead Lot 6B), and a proposed new *mauka/makai* road through the ‘O‘oma-Kalaoa Homesteads (near the approximate boundary of the two *ahupua‘a*), neither of which was ever built.

Following World War II, retired military vehicles became available to the public, and after that time the *Alanui Aupuni* and some of the smaller trails along the shore were modified for vehicular traffic (Rechtman and Maly 2003). The *mauka/makai* trail to Wawaloli (SIHP Site 29272; Kauhini Road) continued to be used to access the coastal lands by residents of Kekaha throughout this period (see Maly and Maly 2003), and it too, as shown on the 1959 U.S.G.S. Keāhole Point quadrangle (see Figure 34), was eventually modified into a Jeep Trail. The *makai* Government Road was modified from Kailua to at least Kaloko-Honokōhau, and it remained in use for vehicular traffic through the 1970s. It was not until the Queen Ka‘ahumanu Highway opened in ca. 1973, however, that travel across the *kula kai* (shoreward plains) was once again made possible for the general public. The portion of the jeep trail to Wawaloli *makai* of the highway may have seen continued use for coastal access until the late 1970s when the existing NELHA access road (Makako Bay Drive) was constructed. It is within the general culture-historical context outline above that the physical remains of the four trail sites recorded within the current study area are described below.

SIHP Site 2

Site 2 is the SIHP designation for the 1847 *makai* Government Road, also referred to as the Māmalahoa Trail and the King's Highway. A preservation plan (Rechtman and Clark 2004) was previously prepared for the section of trail that crosses the NELHA property, and that portion of the trail is contained within an established preservation easement that extends 15 feet on either side of the trail centerline (see Figure 2). As dictated by the preservation plan, no construction or land modification is permitted within this preservation easement, and no buildings or fences will be erected (or ground-altering activity permitted) within an area extending an additional 10 feet on either side of the easement; effectively creating a 25-foot preservation buffer on either side of the trail centerline. The trail site has been maintained (kerbstone replacement and vegetation removal) over the years through the efforts of a community-based group composed of student volunteers from Kealahou Intermediate School, members of Kohanaiki 'Ohana, and *kūpuna* of the area. A sign along the trail to the south of the primary NELHA access road reads in part "MAMALAHOA TRAIL PROJECT...A collaborative project with Kealahou Intermediate School 8th graders and the Kohanaiki Ohana. This project started in Oct. 1992 and continues with an annual maintenance program". The maintenance appears to have occurred primarily on the trail section to the south of the NELHA access road. That portion of the trail contains less vegetation and the kerbing has been more recently modified than the section to the north.

The section of trail situated within the current study area (Figure 51) extends northwest from the northern edge of the NELHA access road (Makako Drive; Figure 52) for roughly 850 meters across TMKs: (3) 7-3-043:073 and 074 to the Keāhole Airport property, where it has been destroyed by the construction of the airport. The trail is visible across the landscape as a straight, kerbstone alignment, approximately 2 meters wide (Figure 53), which has been elevated in certain locations where it crosses low spots with stone filled "bridges" that level out the contour of the roadway (Figure 54). For much of its length across the study area the surface of the trail is paved with small cobbles, but in areas where it crosses smooth *pāhoehoe* the natural ground surface has been left unmodified (Figure 55). The cobbles used to construct this Historic roadway were quarried from the adjacent lava flows; 184 distinct quarry locations (*pāhoehoe* excavations) associated with the trail were noted within the current study area, and are described below as Site 30372. Cultural debris observed along the trail route includes several fragments of marine shell, water-rounded chunks of coral, water-worn cobbles, and bottle fragments (see Figure 51).

Also noted adjacent to Site 2 within the study area were seven cairns and two natural lava formations – an area beneath overhanging bedrock and a partial *pāhoehoe* dome – that may have been used as a rest area and as a storage location respectively. Four of the cairns, at the northwestern end of Site 2 near the airport property (see Figure 48), appear to mark the location where the Kalaoa-Ooma Homestead road, laid out by surveyors in 1902, was planned to cross the Government Road. The road was never built, but its location shown on the early twentieth century homestead maps of (see Figure 33). These four cairns (SIHP Site 10187) were previously documented by Barrera (1985) and are described in detail below. The other three cairns are located at the southeastern end of the trail section where it adjoins bulldozing along the northern edge of Makako Bay Drive. Bulldozer scarring and the lack of weathering on the rocks used to build these three cairns clearly indicates that they are modern constructions built after the creation of the NELHA access road, and were thus not recorded as archaeological features.

The naturally sheltered area beneath overhanging bedrock is located roughly 8 meters *mauka* of the trail alignment and 30 meters southeast of Site 10187 along the northern edge of an area of a raised section of 'a 'ā flow (see Figure 51). The overhang area, which measures 7.2 meters long by 1.8 meters deep by up to 1.5 meters tall, appears to have been created when the northern half of a small tube collapsed, leaving a sunken crescent shaped area covered by arching bedrock (Figure 56). This overhang offers the only shade anywhere along the Government Road within the current study area. Cobbles beneath the overhang, within an area measuring 2.4 meters (east/west) by 1.8 meters (north/south), seem to have been manipulated to create a somewhat level surface in the shade (Figure 58). This shaded area could have been utilized as a trailside rest spot, although the lack of cultural debris beneath the overhang indicates that it was infrequently visited.

The partial *pāhoehoe* dome that may have been used for storage purposes is located along the *makai* edge of the Government Road roughly 300 meters northwest of Makako Bay Drive (see Figure 51). This natural feature of the lava flow is situated 1.5 meters from the trail edge, and has a triangular opening that faces east (Figure 58). It measures 1.2 meters wide by 60 centimeters deep by 1 meter tall. A single piece of water-rounded coral is currently housed inside the small chamber (Figure 59), but some loose slabs in front of the opening suggest that it could have once been concealed and used to store other items needed by Historic travelers along Government Road through Kalaoa and 'O'oma, such as drinking water. Both the overhang shelter and potential storage area are situated within the existing preservation easement for Site 2.

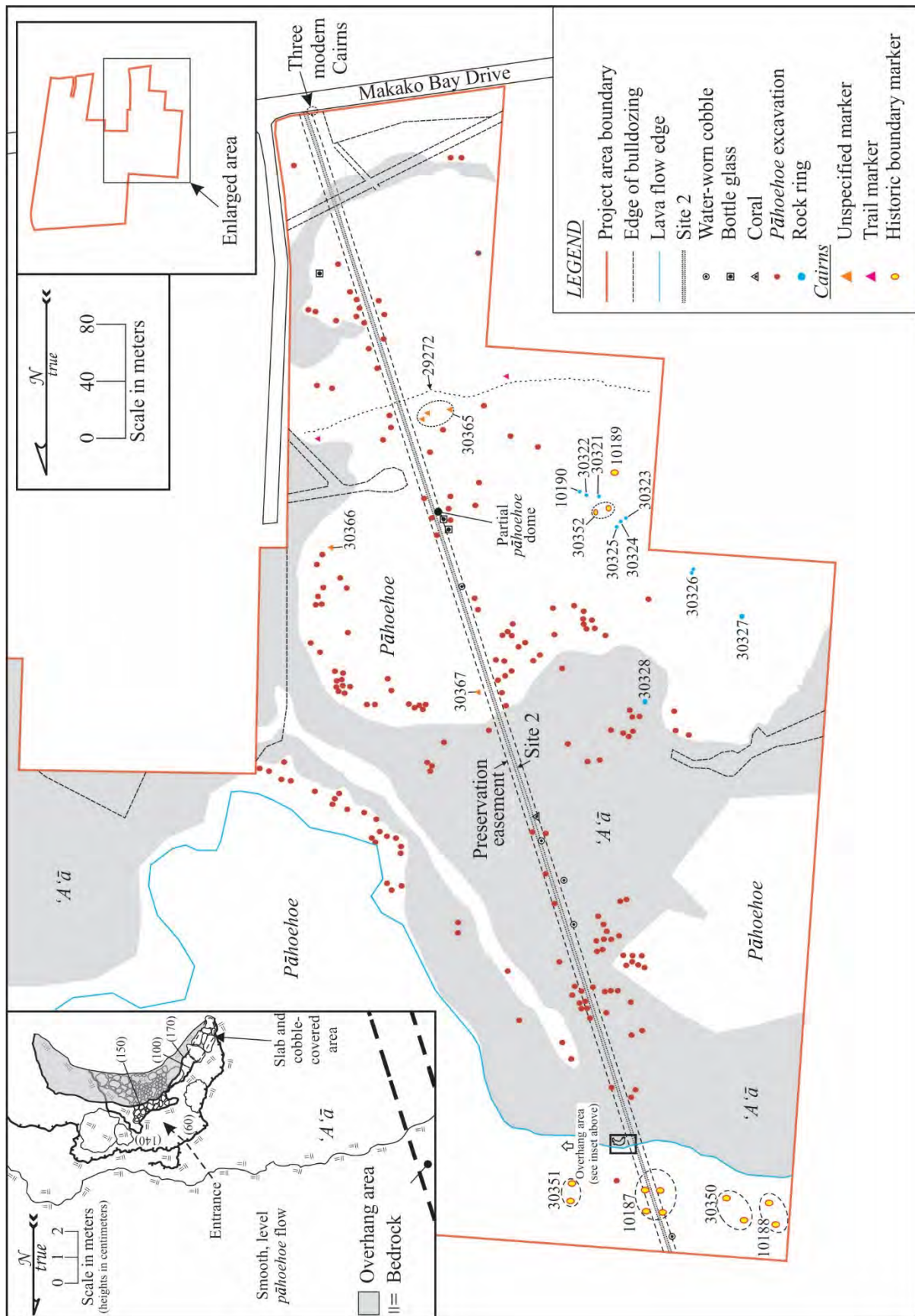


Figure 51. SIHP Site 2 plan view.



Figure 52. SIHP Site 2, view to the northwest from Makako Bay Drive showing the 1847 *makai* Government Road crossing the current study area.

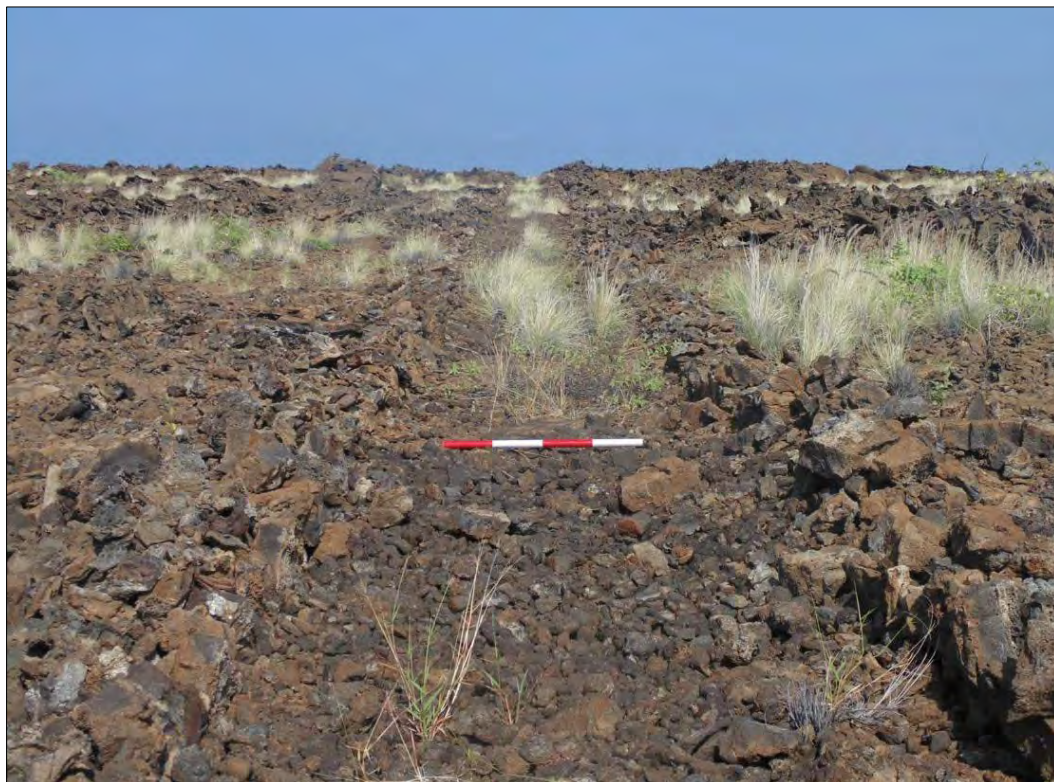


Figure 53. SIHP Site 2, the 1847 *makai* Government Road crossing the current study area, view to the northwest.

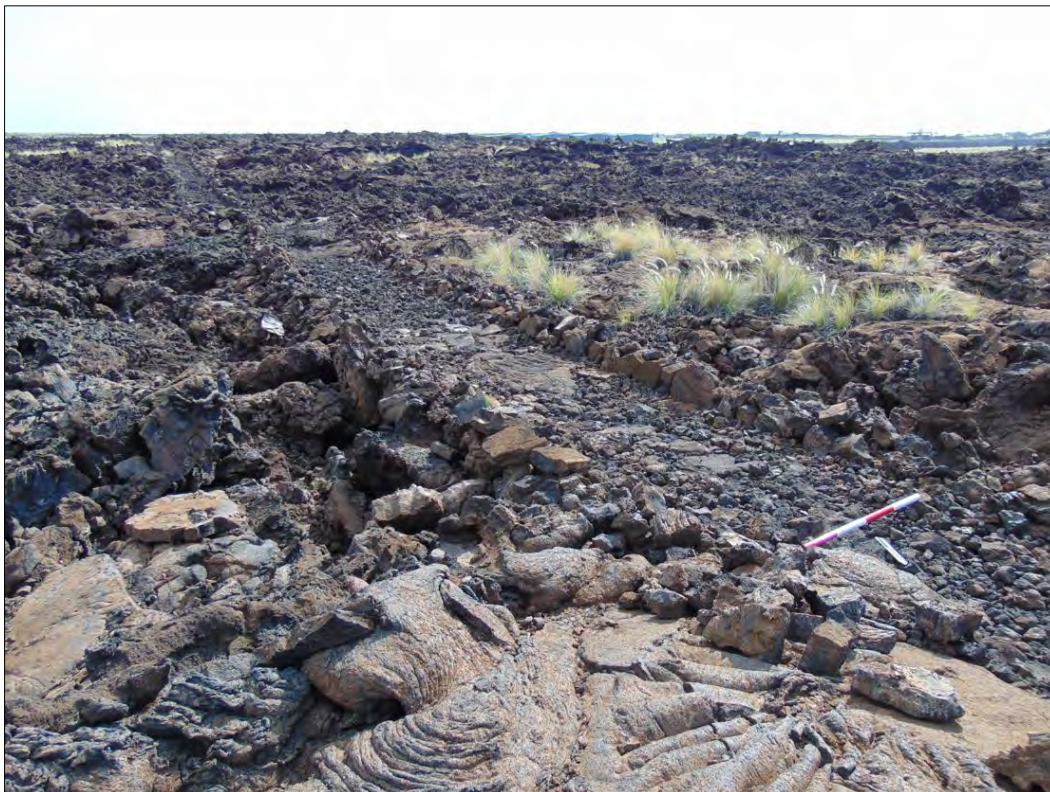


Figure 54. SIHP Site 2, stone filled “bridge” along the route of the 1847 *makai* Government Road, view to the south.



Figure 55. SIHP Site 2, the 1847 *makai* Government Road crossing the current study area, view to the southeast.



Figure 56. SIHP Site 2, possible overhang shelter area along the *mauka* edge of the trail, view to the south.



Figure 57. SIHP Site 2, level cobble floor in the shade beneath overhang, view to the south.



Figure 58. SIHP Site 2, possible storage area along the *makai* edge of the trail, view to the southwest.



Figure 59. SIHP Site 2, close-up of the possible storage area along the *makai* edge of the trail showing the piece of coral within, view to the southwest.

SIHP Site 29272

Site 29272 is a trail/road that extends east/west across the southern portion of the current study area (see Figure 49). The trail/road, which shows up on several late nineteenth century and early twentieth century maps extending from Wawaloli at the coast of ‘O‘oma 1st Ahupua‘a to the Upper Government Road in Kalaoa 4 Ahupua‘a (see Figures 32 and 33), and which is still shown on the current TMK plat (see Figure 2), likely began as a Precontact Period *mauka/makai* trail route that was later converted to a jeep road (possibly during the 1940s) and used until the mid-1970s for 4WD coastal access. A *mauka* portion of the trail, between Homestead lots 46 and 47 in Kalaoa 4th Ahupua‘a, was recorded as SIHP Site 21186 by Barrera (1997). An 1889 homestead map of those properties labels the trail “Kauhini Road”, as does the 1924 U.S.G.S. Keāhole Point quadrangle (see Figure 32). The road, which seems to have originated from an earlier Precontact, *mauka/makai* trail route, was likely named by J.S. Emerson after Kauhini, the 1855 recipient of more than 1,800 acres of land (Grant No. 1590) in the upper portions of ‘O‘oma and Kalaoa *ahupua‘a* through which the *mauka* portion of the trail passes. Kauhini’s grant was never patented, however, and was later divided up and sold as several smaller grant parcels (see Early Homestead Communications 1888-1890 presented above in the Culture-Historical Context section of this report).

Within the current study area a short section of the trail north of the current termination of Kahilihili Street was recorded by Rechtman and Clark (2012), and another short section of Site 29272, between Queen Ka‘ahumanu Highway and the *mauka* boundary of the current study area, was documented by Monahan et al. (2012), who excavated three test units in the surface of the bulldozed road bed, but did not recover any cultural material (see Appendix C). Neither of these previous studies identified this trail as the former route of Kauhini Road. Two sections of the Site 29272 trail/road route, located roughly 200 meters north of Makako Bay Drive and meandering east/west across varied terrain on TMKs: (3) 7-3-043:072, 073, and 074, are still extant within the current study area (Figure 60). The two sections, discussed below as the *mauka* and *makai* sections, are present on either side of the Koyo USA water bottling facility, which was built across an approximately 250 meter long portion of the site. The *mauka* section of the trail/road (previously recorded by Rechtman and Clark 2012) extends roughly 330 meters between Koyo USA and the highway right-of-way, and the newly recorded *makai* section extends roughly 265 meters between Koyo USA and the previously developed Moana Technologies, LLC aquaculture facility. The varied terrain crossed by the trail consists of areas of gently sloping, smooth *pāhoehoe*, rough slabby *pāhoehoe*, and raised ‘a‘ā flows.

Evidence of both a Precontact/Historic foot trail and a Historic/Modern Jeep road are evident along the route of Site 29272. The foot trail, characterized by a relatively dark (50 to 80 centimeter wide) worn path where it crosses smooth *pāhoehoe* (Figure 61), and by a cleared, slightly sunken (50 to 80 centimeter wide) path where it crosses ‘a‘ā (Figures 62 and 63), is evident for about ninety percent of the total length of the site within the current study area (see Figure 60). The presence of horseshoes along the route of Site 29272 indicates that the trail was also a route of horse and Donkey travel during the Historic Period. The Historic/Modern Jeep road is traceable throughout the entire length of the site within the study area. The Jeep road was created by a small bulldozer that was used to break up undulations in the lava in order to make vehicular access easier, and in some cases possible, across the varied terrain of the study area. Where smooth, level *pāhoehoe* is present, the only evidence of the Jeep road is a single set of closely spaced bulldozer tracks. For much of the length of Site 29272, the Jeep road either straddles or extends alongside the worn foot path; the only exception is a 100 meter long portion of the road, in the center of the *mauka* section, where the Jeep road veers to the north of the foot trail to avoid a nearly vertical *pāhoehoe* flow edge with a 1.3 meter tall drop-off along one side (see Figure 60).

In a few areas, cobbles are placed along the edge of the Jeep road or in low spots to “bridge” them, indicating that hand modification of the horse trail or Jeep road also occurred (Figure 64). Approximately 3 meters north of the bedrock contour drop-off that the footpath descends is a constructed alternate route (see Figure 63). The alternate route was constructed by filling a wide crack in the bedrock contour, which created a level middle landing area (Figure 65). The crack was filled with medium to large cobbles on the upper surface, and on the western exposed edge of the filled area is a stacked retaining wall that spans the 1 meter wide void and stands 1.2 meters tall (Figure 66).

Two cairns (Cairns 1 and 2) are present along the foot trail near the Jeep road diversion in the *mauka* section of Site 29272 (see Figure 60). Cairn 1 is a leaning stack of three slabs located on the north side of the trail (Figure 67). This cairn measures 70 centimeters long (east/west) by 30 centimeters wide (north/south) and stands 25 centimeters tall. It consists of a total of four slabs, three of which are leaning, and have collapsed from a vertical stack. Cairn 2 is a stack of two medium slabs located on the north side of the trail in the *mauka* section, 2 meters west of Cairn 1. The cairn measures 30 centimeters long (east/west) by 20 centimeters wide (north/south) and stands 20 centimeters tall (Figure 68).

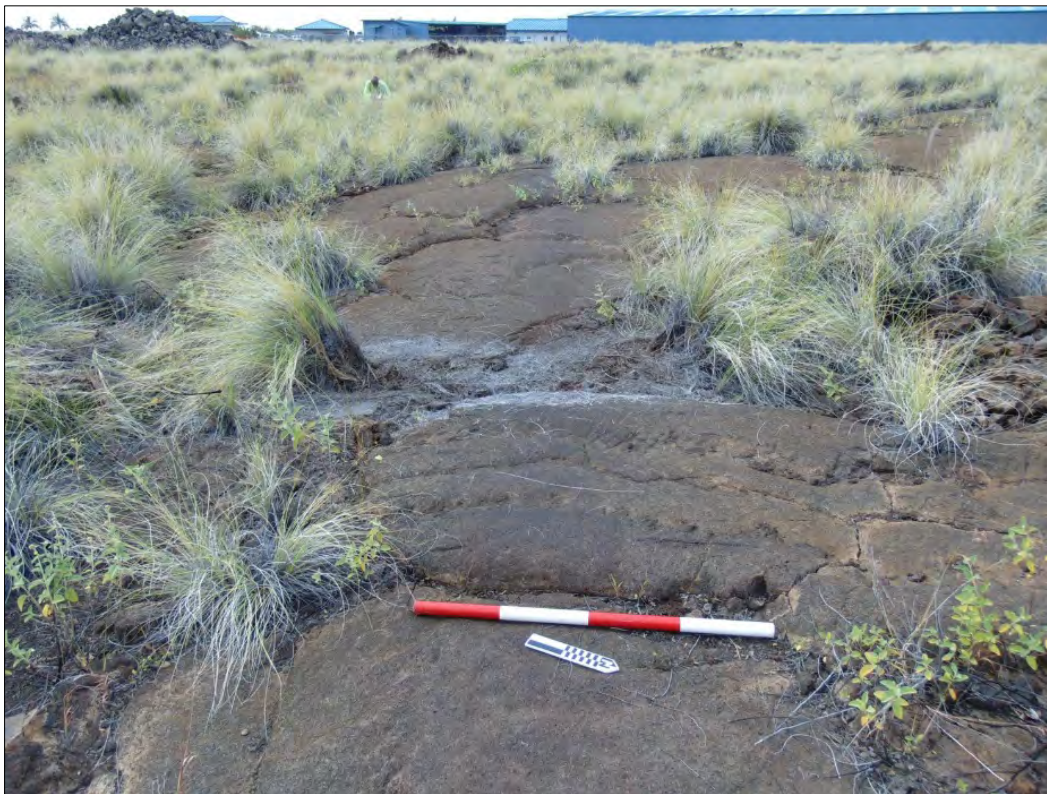


Figure 61. SIHP Site 29272, worn footpath across level *pāhoehoe* bedrock, view to the west.



Figure 62. SIHP Site 29272, foot path across '*a'ā*', view to the west (the grass growth occurs within the trail alignment; the meter stick and north arrow are placed to the south of the alignment).



Figure 63. SIHP Site 29272, foot path transitioning from *pāhoehoe* to 'a'ā, view to the east.



Figure 64. SIHP Site 29272, portion of jeep trail with an aligned cobble edge and infilling of a bedrock low spot, view to the south.

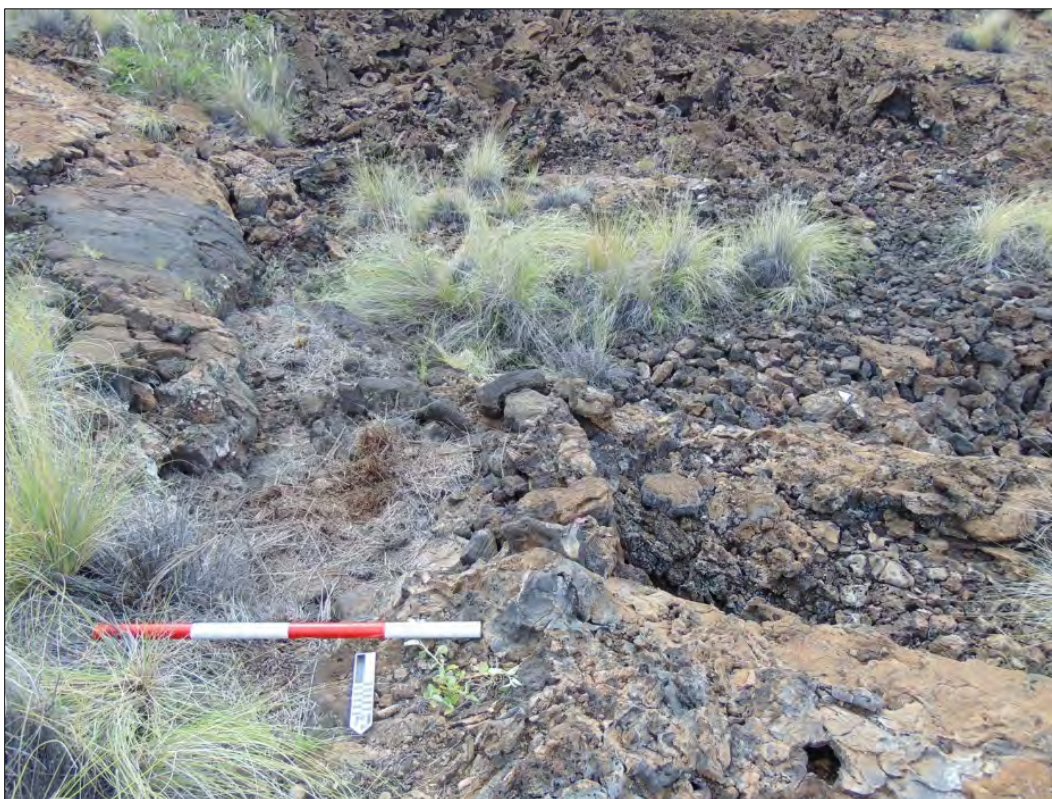


Figure 65. SIHP Site 29272, alternate route north of a bedrock drop-off, view to the south.



Figure 66. SIHP Site 29272, stacked retaining edge of a filled crack constructed for the alternate route, view to the east.



Figure 67. SIHP Site 29272, Cairn 1, view to the southwest.



Figure 68. SIHP Site 29272, Cairn 2, view to the west.

Two cairns are also present along the *makai* section of Site 29272 (see Figure 60), one near the *makai* side of the Koyo USA property (Cairn 3), and another (Cairn 4) *makai* of the Māmalahoa Trail (SIHP Site 2) alignment. Cairn 3 consists of a vertical stack of five slabs, with five other adjacent slabs located on the north side of the trail at the east end of the *makai* section (Figure 69). The cairn measures 70 centimeters long (north/south) by 30 centimeters wide (east/west) and stands 40 centimeters tall. Cairn 4 consists of six *pāhoehoe* slabs located on the south side of the trail in the center of the *makai* section. The cairn measures 50 centimeters in diameter and stands 50 centimeters tall (Figure 70). The cairn is constructed on smooth level *pāhoehoe* bedrock, and is located at point where the trail changes direction slightly to the north. Where the Site 29272 Jeep road crosses the Māmalahoa Trail (SIHP Site 2), the kerbstones of the Historic trail have removed to allow for vehicular access across it (Figure 71).

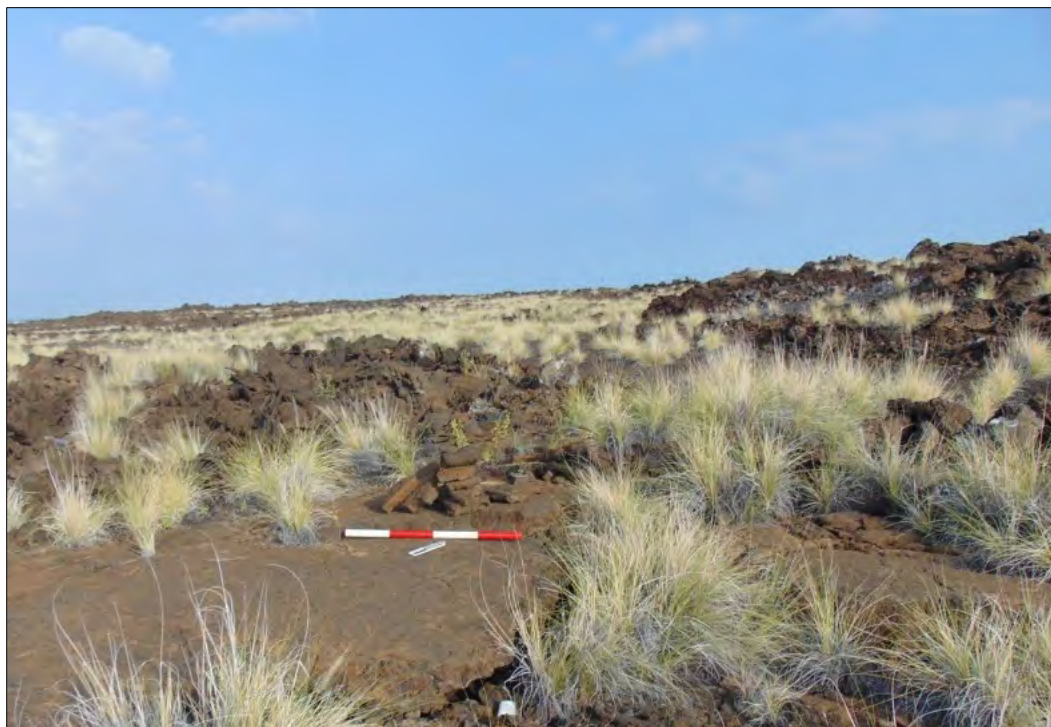


Figure 69. SIHP Site 29272, Cairn 3, view to the northwest.

Cultural material items deposited along the route of the Site 29272 trail are numerous and varied, and date to both the use of the Precontact/Historic foot path and horse trail, and the later Historic/Modern Jeep road (see Figure 60). Material items seemingly associated with the earliest use of the trail include marine shell fragments (mostly *Cellana* sp.; five locations), horseshoes (5 locations; Figure 72), and perhaps coral (32 locations; Figure 73). Material items seemingly associated with the Jeep road include aluminum pull tab beverage cans (Figure 74), tin cans, glass bottles (mostly beer; Figure 75), gallon glass jugs, a muffler (Figure 76), and a few other metal parts such as nuts and bolts from vehicles. Two bullet shell casings were also observed near the trail in the western portion of the *mauka* section.

SIHP Site 29273

Site 29273 is a *mauka/makai* trail segment that skirts an elevated outcrop of rough lava in the northeastern portion of the current study area (see Figure 49). This trail, originally documented by Rechtman and Clark (2012), consists of a single row of *pāhoehoe* slabs set in an 'a 'ā and slabby *pāhoehoe* substrate to facilitate ease of walking. There are two relatively intact stepping stone alignments separated by a 25 meter gap where the ground surface is relative smooth *pāhoehoe* (Figure 77). In the eastern alignment, which extends for 20 meters, the slabs are tightly spaced (Figure 78); and in the 37 meter long western alignment the slabs are further apart (Figure 79). In both directions beyond the recorded alignments the trail could not be discerned on the relatively smooth *pāhoehoe* ground surface. No additional cultural material was observed at this site. Given the lack of historic (or modern) debris, it appears as though this trail segment has a Precontact origin. This trail does not appear to have been a “major” transportation route, but rather may have been part of a localized trail network connecting sites in the shoreward and lower *kula* portions of the Kalaoa-‘O‘oma area.

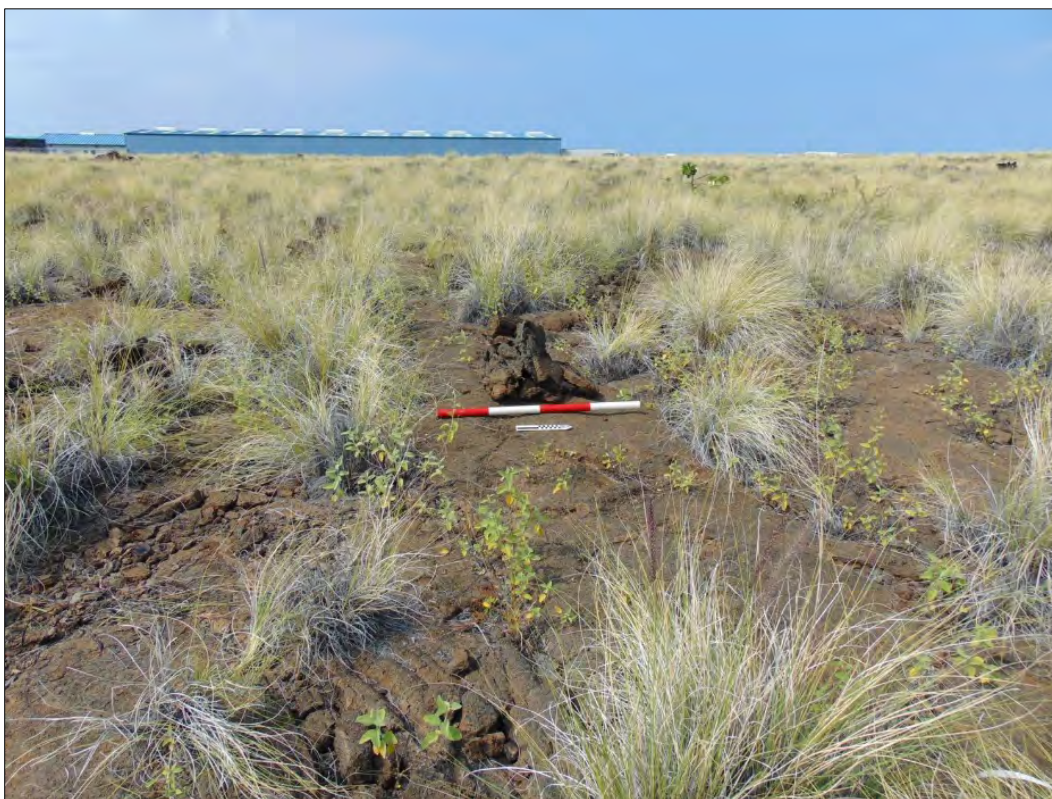


Figure 70. SIHP Site 29272, Cairn 4, view to the west.

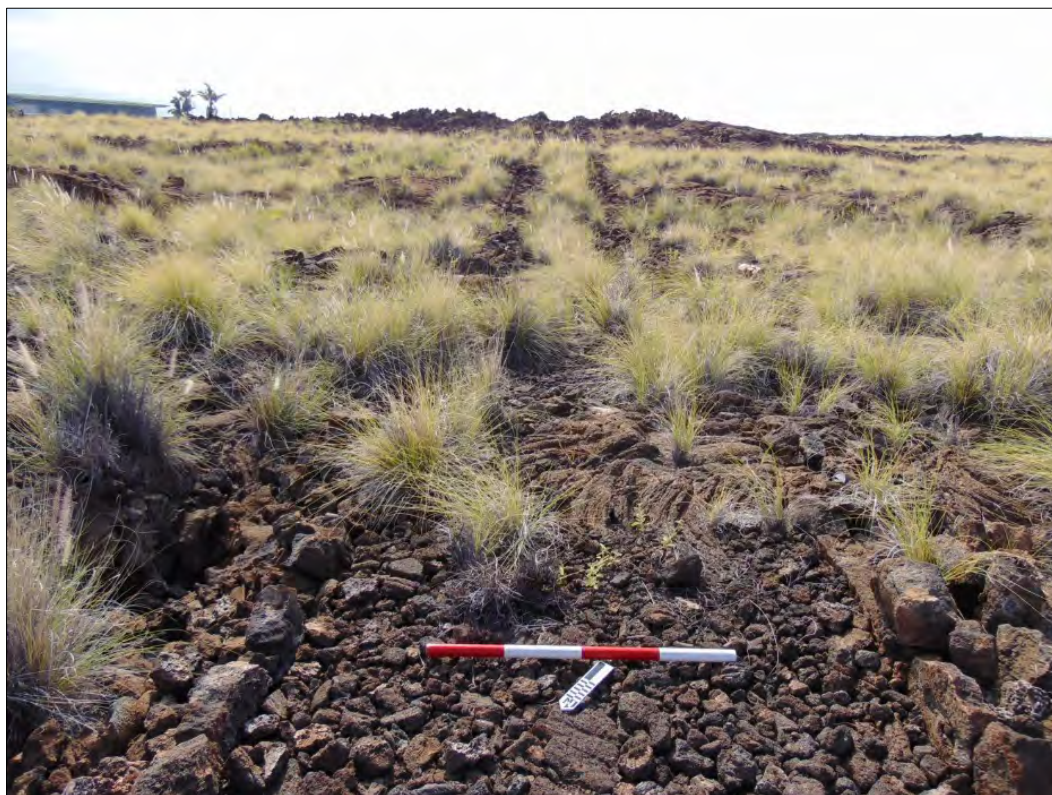


Figure 71. Intersection of SIHP Site 29272 and SIHP Site 2, the Māmalahoa Trail, view to the south.



Figure 72. SIHP Site 29272, one of five horseshoes seen along the trail, overview.



Figure 73. SIHP Site 29272, water-worn coral along the trail route, overview to the east.



Figure 74. SIHP Site 29272, pull tab cans, overview to the west.



Figure 75. SIHP Site 29272, amber glass beer bottle, view to the west.



Figure 76. SIHP Site 29272, muffler located near the intersection of the Jeep road and the Māmalahoa Trail (SIHP Site 2), view to the west.

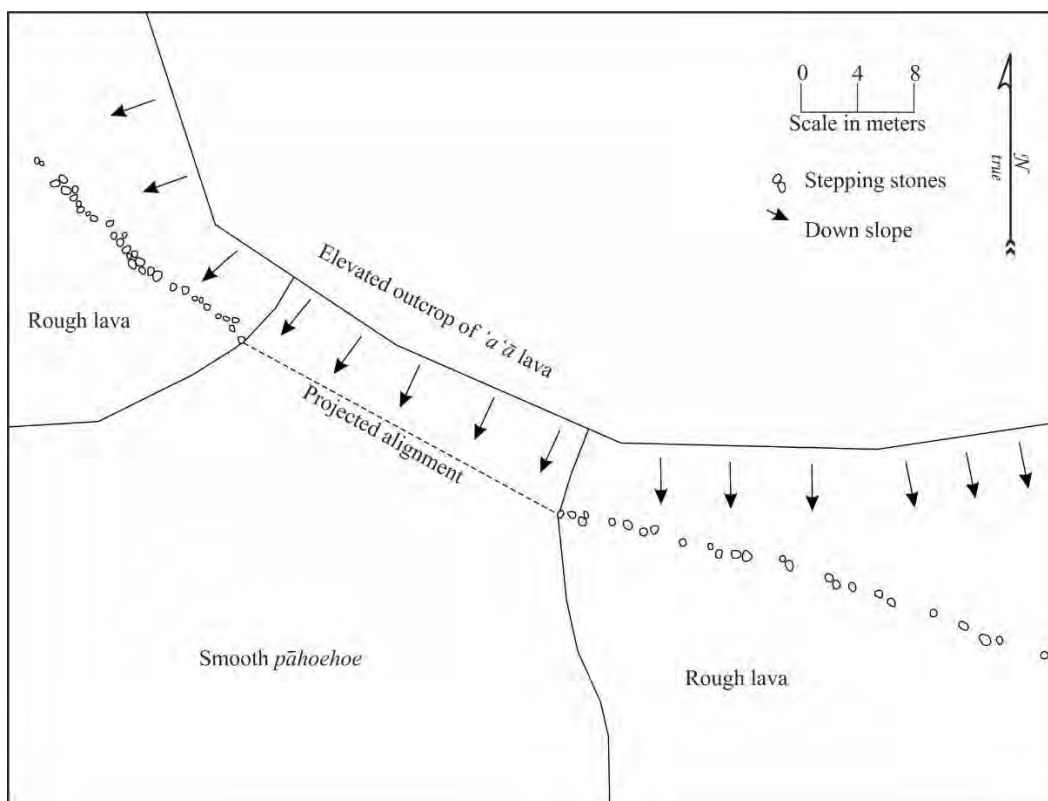


Figure 77. SIHP Site 29273 plan view.

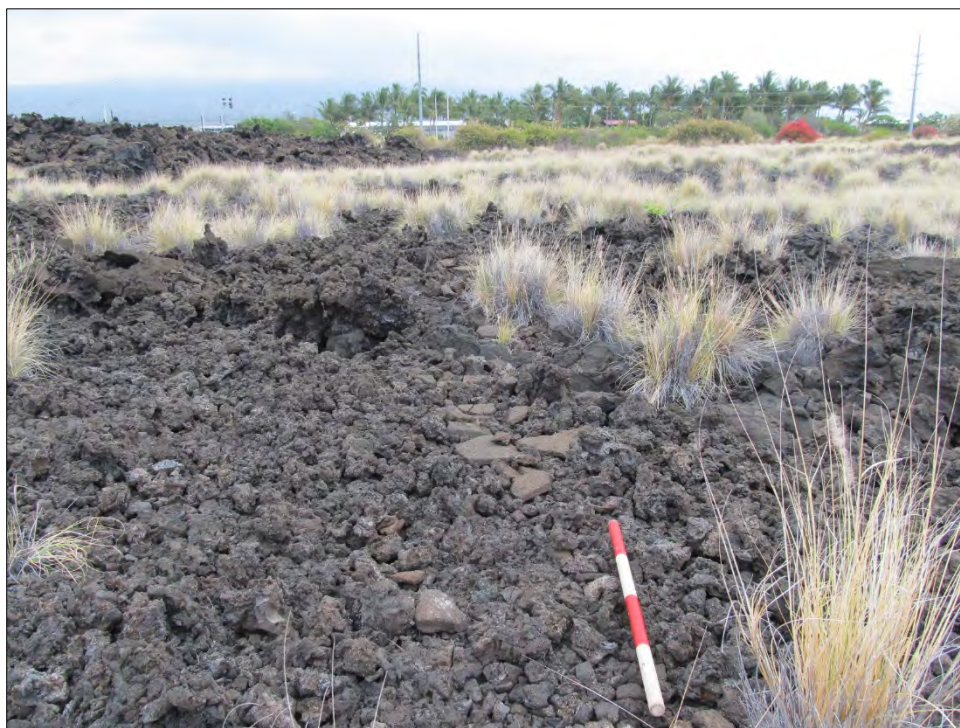


Figure 78. SIHP Site 29273, eastern stepping-stone alignment, view to the east.



Figure 79. SIHP Site 29273, western stepping-stone alignment, view to the east.

SIHP Site 30315

Site 30315 is a *mauka/makai* trail route that extends northwest/southeast across the northern portion of the current study area for approximately 500 meters between Keāhole Airport and SIHP Site 10161 (see Figure 49). The trail is situated on a slightly elevated flow of smooth *pāhoehoe* with very little vegetation (study area lava flow h2-1; see Figure 6) that also contains numerous *pāhoehoe* excavations and several lava tube openings (Figure 80); the *pāhoehoe* excavations (SIHP Site 30371) and lava tubes (SIHP Sites 30316, 30318, and 30319) are described as separate sites below. Marking the route of the trail are fourteen cairns (Features A-N; Table 6), and scattered bits of cultural debris indicative of Precontact and Historic travel, including marine shell, coral, stone artifacts, bottle glass, and two horseshoes (Figure 81). The trail itself is faintly visible in a few locations on the barren *pāhoehoe* flow, and across one short section of 'a'ā flow, as a cleared, worn, path roughly 50 centimeters wide, but is most easily followed by walking from one cairn to the next. Prior to the construction of Keāhole Airport, Site 30315 likely continued *makai* of the study area to Ho'ona Bay; *mauka* of Site 10161 modern rock removal for stone wall construction has erased all evidence of the trail from the surface of the study area. The following description of Site 30315 is presented as if traveling *mauka* along the trail from northwest to southeast.

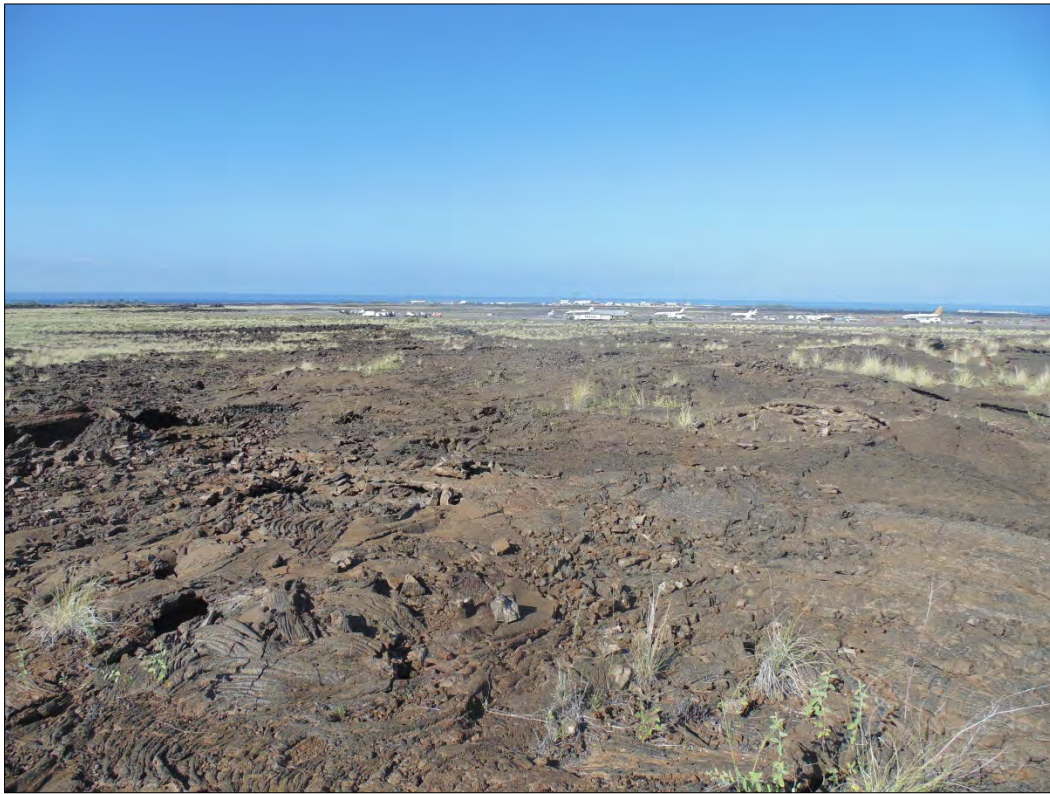


Figure 80. SIHP Site 30315, general terrain crossed by the trail, view to the northwest.

Beginning at the northwestern end of the trail, roughly 25 meters south the northern boundary of the study area and 60 meters east of Pāo'o Street, Site 30315 is marked by two cairns (Features A and B) situated 4.5 meters apart from one another on either side of the trail route (Figure 82). The cairns are each built on a raised bedrock outcrop, and the trail passes southeast through a low spot between them. Feature A (Figure 83), to the south of the trail route, consists of approximately forty small to medium cobbles piled to a height of 40 centimeters. This cairn is visible from some distance in all directions. Feature B (Figure 84), to the north of the trail route, consists of a pile of approximately thirty small to large slabs that has collapsed and now stands only 25 centimeters tall. This cairn is only visible from nearby locations. From Features A and B Site 30315 extends 115 meters southeast to Feature C, a pile of approximately twenty-five small to medium slabs piled to the south of the trail route on top of a narrow flow finger of slabby *pāhoehoe* (Figure 85). This 40 centimeter tall pile appears to be composed of slabs removed from the flow finger to allow for easier pedestrian (or equine) access across it. Between Features A/B and Feature C four fragments of water-rounded coral were noted along the route of Site 30315. Several additional coral fragments and a single shard of bottle glass were also noted scattered about on the bedrock surface to the south of the trail in this general area.

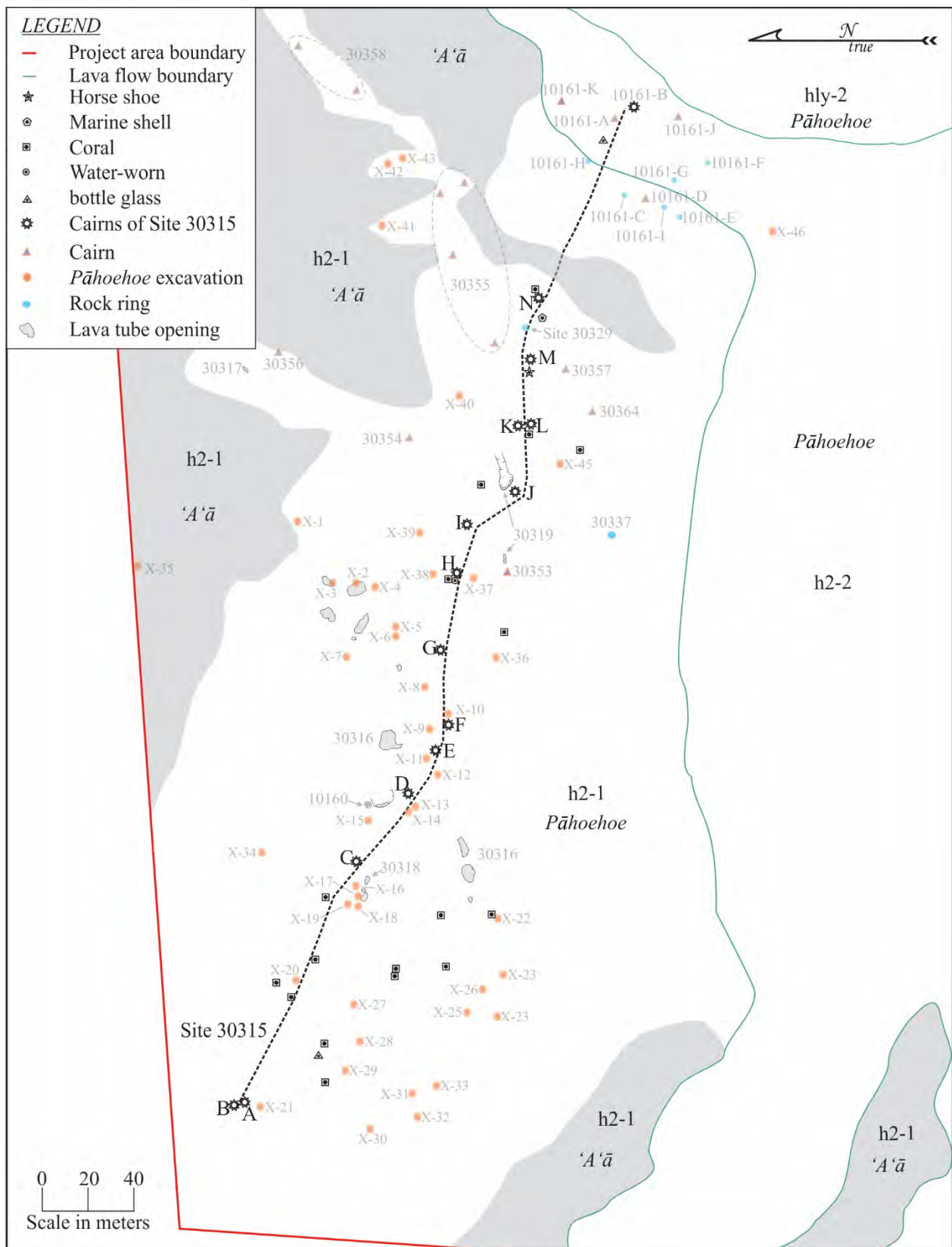
Table 6. Attributes of cairns along the route of SIHP Site 30315.

<i>Feature</i>	<i>Length (m)</i>	<i>Width (m)</i>	<i>Height (cm)</i>	<i>Description</i>
A	0.9	0.7	40	Approximately 40 small to medium cobbles piled on top of a tall, west facing, bedrock contour to the south of the trail
B	1.1	1.1	25	Approximately 30 small to large slabs piled (collapsed) on top of a low, southwest facing, bedrock contour to the north of the trail
C	0.5	0.5	40	Approximately 25 small to medium slabs piled to the south of the trail on top of a narrow flow finger of disaggregated <i>pāhoehoe</i> slabs
D	0.4	0.3	25	2 stacked slabs, 5 collapsed slabs, on overhanging bedrock along the north side of the trail adjacent to the Site 30316 Feat. F tube entrance
E	1.5	1.3	40	Roughly 150 small slabs heaped together in a mounded pile along the north side of the trail adjacent to a <i>pāhoehoe</i> excavation
F	0.4	0.4	20	10 small to large slabs loosely stacked (collapsed) along the southern edge of the trail adjacent to a <i>pāhoehoe</i> excavation
G	0.7	0.3	20	11 small to medium slabs formerly stacked, now collapsed along the northern edge of the trail
H	0.9	0.6	50	Approximately 30 medium to large cobbles loosely stacked/piled along the south side of the trail adjacent to a <i>pāhoehoe</i> excavation
I	1.0	0.6	15	3 large cobbles and 3 medium cobbles that have collapsed to the southwest along the north side of the trail
J	0.5	0.3	25	1 large cobble with 2 small cobbles collapsed to south on a bedrock contour along the south side of the trail
K	0.6	0.3	30	6 cobbles (1 large one) piled/collapsed on a slight bedrock rise along the north edge of the trail
L	0.6	0.4	20	3 medium cobbles placed together on a low bedrock ridge with a fourth cobble collapsed to the east along the south edge of the trail
M	0.8	0.6	10	3 slabs on a level <i>pāhoehoe</i> surface; formerly stacked, now collapsed along the south edge of the trail
N	0.8	0.6	50	8 large cobbles and 1 large slab loosely stacked/piled on level <i>pāhoehoe</i> bedrock along the north edge of the trail to the west of a finger of 'a 'ā

Feature C is situated 7 meters northeast of an opening to Site 30318, a small lava tube that based on the presence of bird bone, fish bone and *kukui*, appears to have been used for temporary habitation purposes; beyond (east of) Feature C the Site 30315 trail route winds past several more openings to two additional lava tube systems (SIHP Sites 30316 and 30319) that appear to have been used for both habitation and storage purposes. Feature D (Figure 86), consisting of two stacked slabs with five other slabs collapsed nearby, is situated along the north side of the trail on overhanging bedrock adjacent to one of the tube entrances (Site 30316 Feature F) roughly 30 meters southeast of Feature C. Although collapsed, the prominent location of this cairn makes it visible from some distance in all directions. A larger cairn situated near the same tube entrance to the north of Feature D was recorded by Barrera (1985) as SIHP Site 10160 (see description below); this cairn appears to be a Historic survey marker associated with the subdivision of the Kalaoa-‘O‘oma Homesteads, rather than a trail marker.

From Feature D, Site 30315 winds 28 meters southeast between several entrances to the Site 30316 lava tube before arriving at Feature E (Figure 87), a cairn situated along the north side of the trail route that consists of roughly 150 small slabs heaped together in a 40 centimeter tall mounded pile adjacent to a *pāhoehoe* excavation. A dense fragment of basalt, two coral fragments, and a small horseshoe were noted along this section of trail (see Figure 81). From Feature E, Site 30315 continues southeast for 13 meters to Feature F (Figure 88), located along the south side of the trail route, and then an additional 32 meters to Feature G (Figure 89) located along the north side of the trail. Both are similar cairns consisting of roughly ten slabs formerly stacked on top of one another, but now collapsed and standing only 20 centimeters tall. Feature F is adjacent to a *pāhoehoe* excavation.

5. Fieldwork



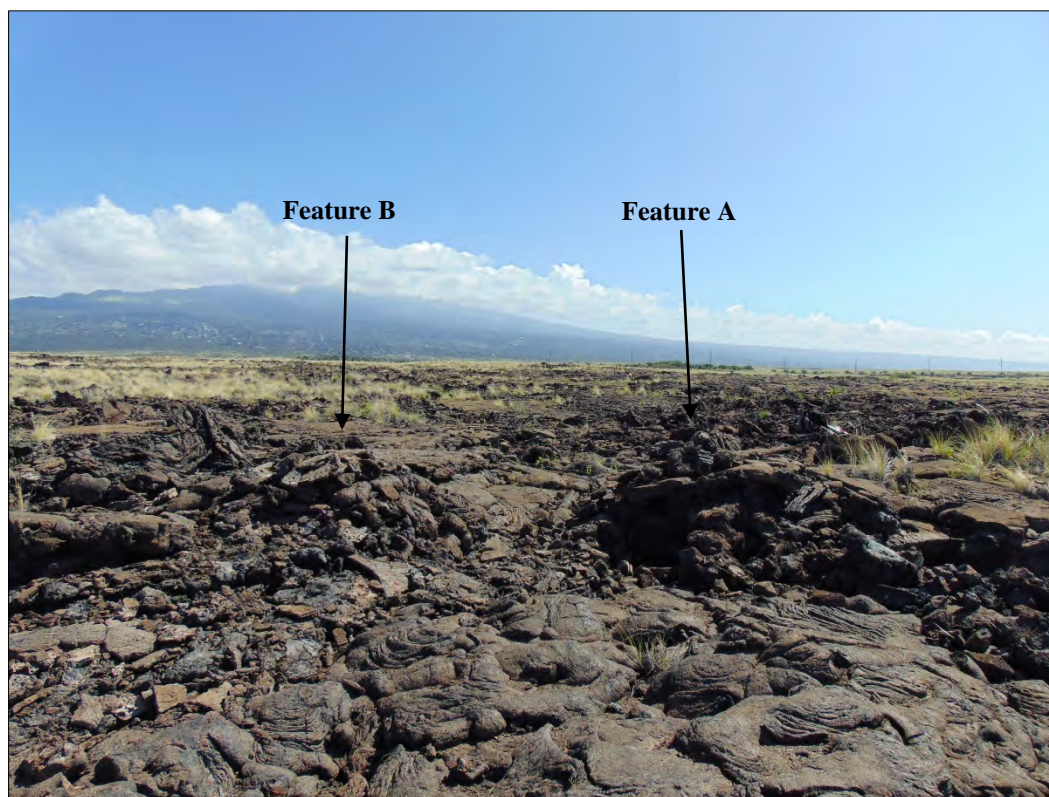


Figure 82. SIHP Site 30315 Features A and B, view to the southeast.

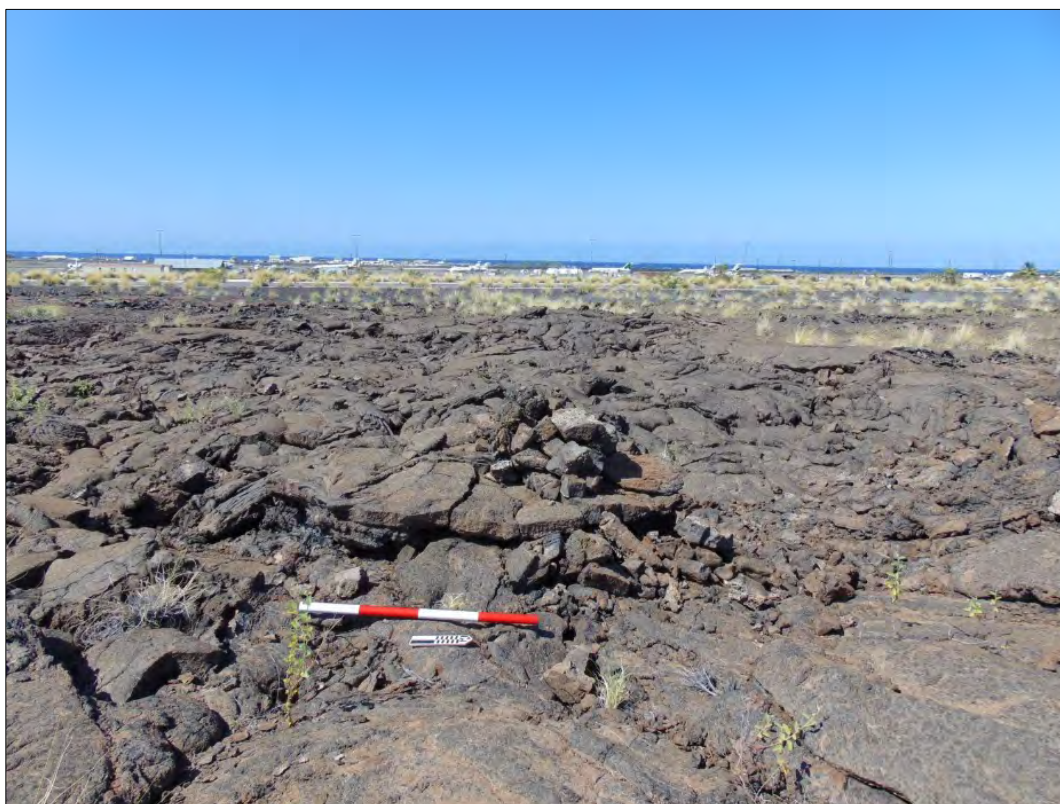


Figure 83. SIHP Site 30315 Feature A, view to the west.

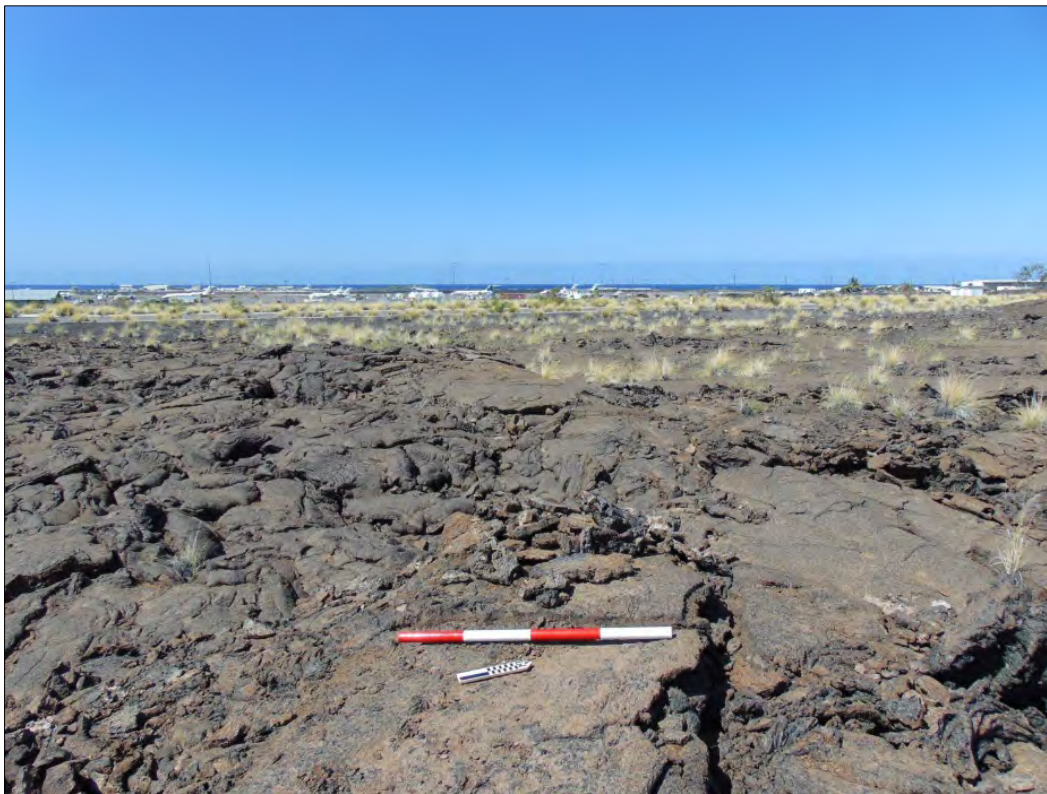


Figure 84. SIHP Site 30315 Feature B, view to the northwest.

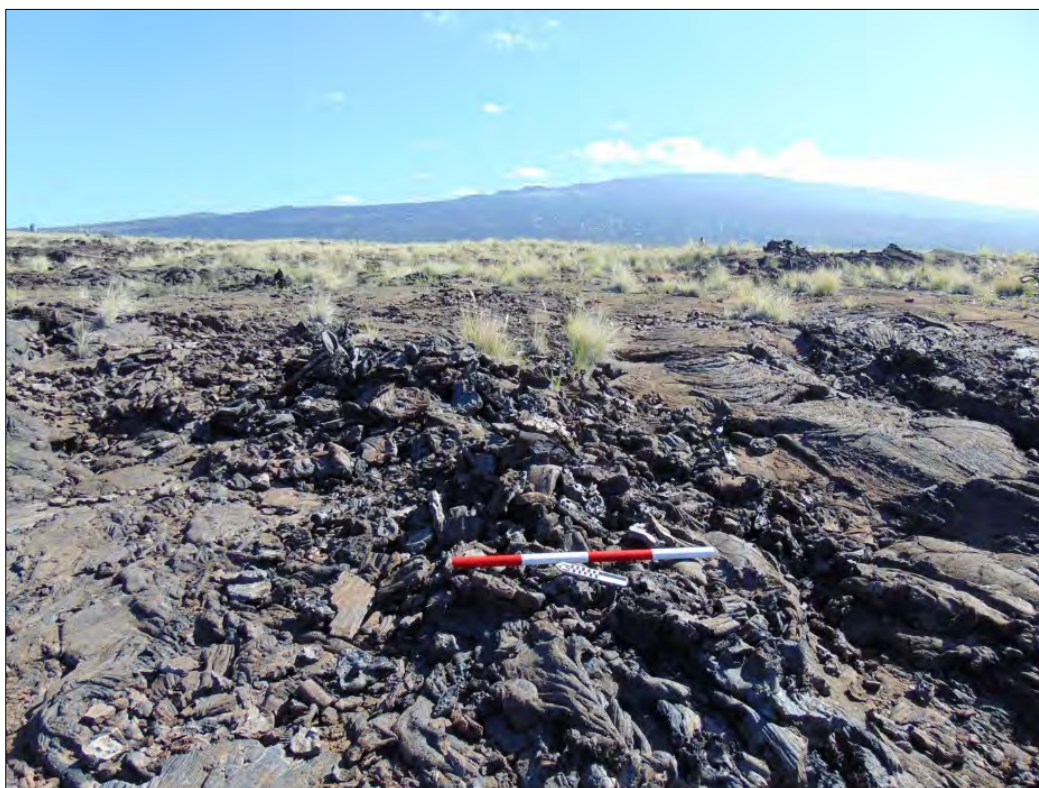


Figure 85. SIHP Site 30315 Feature C, view to the northeast.

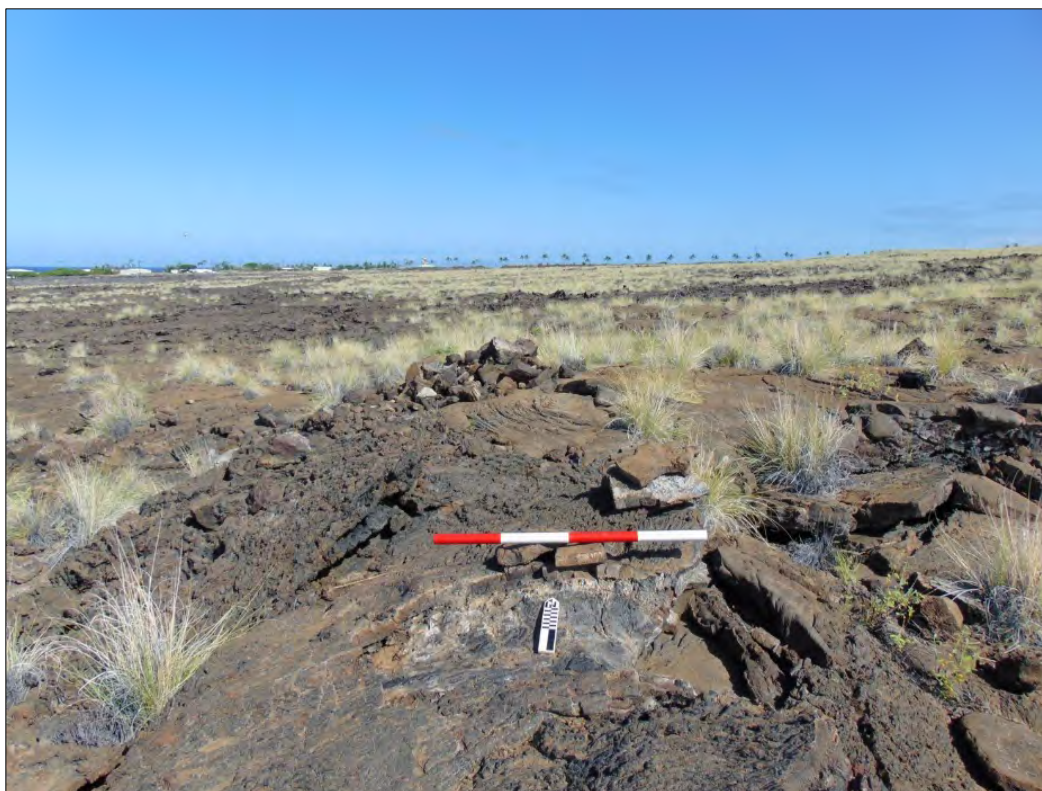


Figure 86. SIHP Site 30315 Feature D, view to the north With Site 10160 visible in the background.

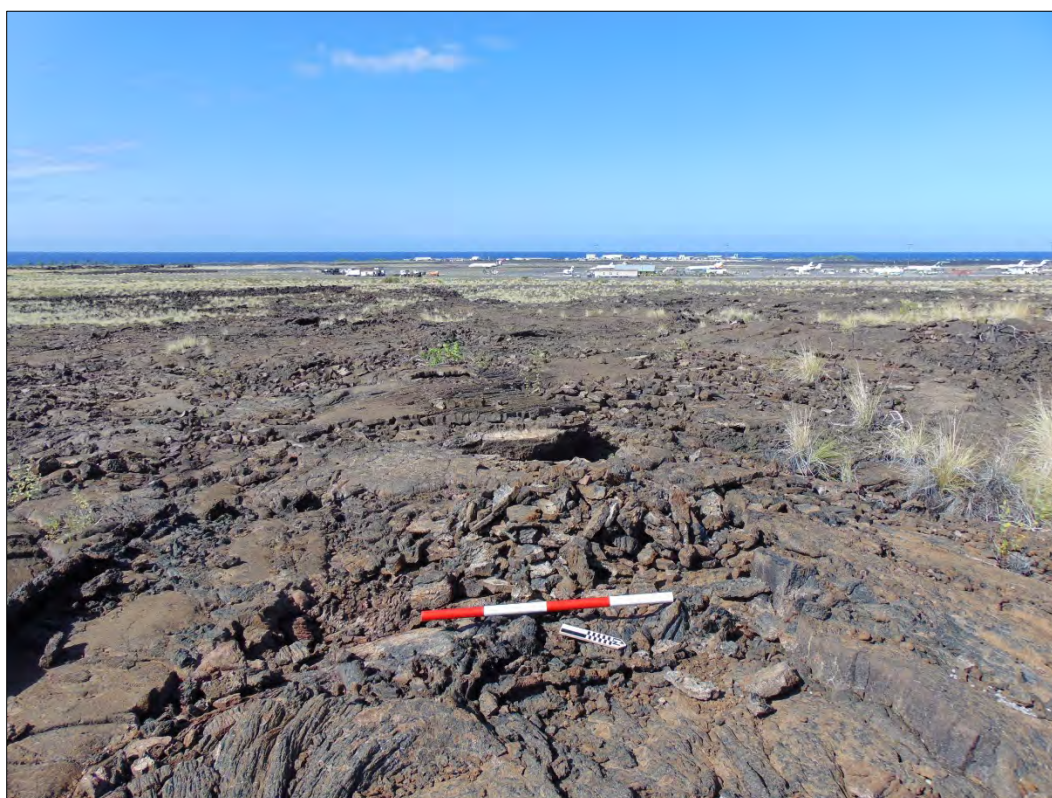


Figure 87. SIHP Site 30315 Feature E, view to the southwest.

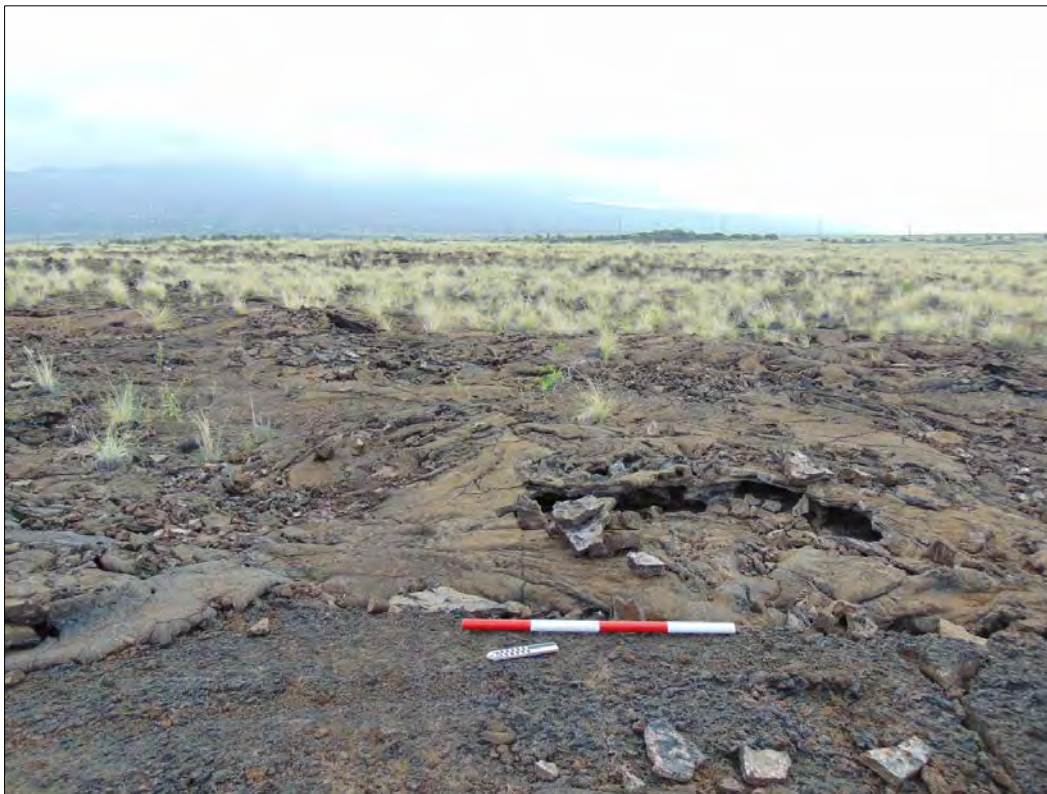


Figure 88. SIHP Site 30315 Feature F, view to the southeast.

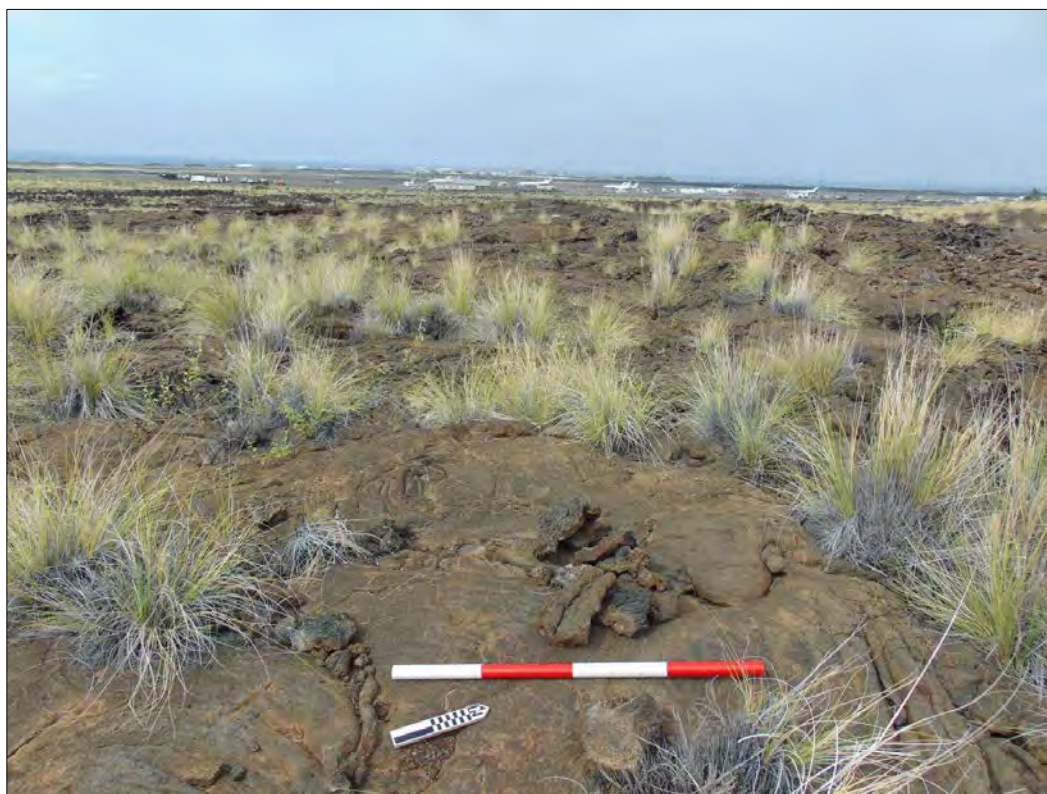


Figure 89. SIHP Site 30315 Feature G, view to the northwest.

From Feature G Site 30315 extends 35 southeast meters to Feature H (Figure 90), a cairn consisting of approximately thirty medium to large cobbles loosely stacked/piled to a height of 50 centimeters against a bedrock contour along the south side of the trail route adjacent to a *pāhoehoe* excavation. Three meters north of Feature H, on the opposite side of the trail, is a small lava blister with a large, rounded cobble of dense basalt cached within (Figure 91). The blister has a 1 meter by 0.9 meter opening (Figure 92), and interior heights ranging from 20 to 40 centimeters. The dense basalt cobble was found within the blister to the west of the opening. This nearly round cobble (18.5 x 18 x 17.5 centimeters) has scarring on all of its surfaces indicating that it likely functioned as a basher stone (Figure 93), perhaps used to remove material from some of the *pāhoehoe* excavations along the route of Site 30315. Two water rounded coral fragments and a *Drupa* sp. shell were also noted on the ground surface in the vicinity of Feature H, and another coral fragment and a dense basalt adze fragment (Figures 94 and 95) were noted next to one another on the ground 35 meters to the southwest of Feature H. The micro adze fragment (5 x 4.1 x 1.8 centimeters) exhibits polish on all four sides, and is from the cutting end of the basalt tool.

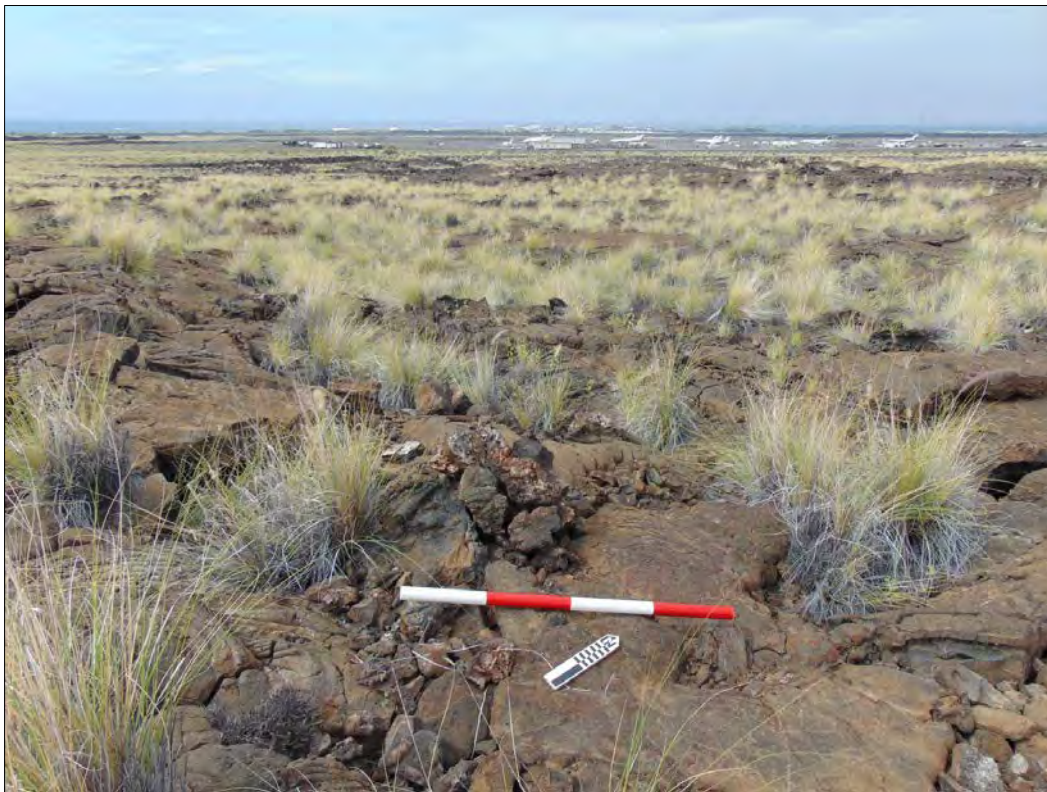


Figure 90. SIHP Site 30315 Feature H, view to the northwest.

From Feature H the Site 30315 trail continues 20 meters upslope to Feature I (Figure 96), a collapsed cairn consisting three large cobbles and three medium cobbles located along the northern edge of the trail route. The trail then continues 22 meters southeast to Feature J, and crosses between the two entrances to the Site 30319 lava tube (see Figure 81). Feature J, situated near the *mauka* entrance to Site 30319, along the south side of the trail, is a collapsed cairn consisting of a large cobble and two small cobbles on top of a bedrock contour (Figure 97). A small blister within the contour, to the east of the cairn, contains a small fragment of unidentified marine shell.

From Feature I the Site 30315 trail route turns east and skirts the southern edge of a natural sink, leading to the Site 30319 lava tube, for 27 meters before passing between Features K and L, two cairns perched on bedrock outcrops 4.3 meters apart from one another. Feature K (Figure 98) consists of six cobbles (1 large one) piled/collapsed (to a height of 30 centimeters) along the north edge of the trail route on a slight bedrock rise. Feature L (Figure 99) consists of three medium cobbles placed together (collapsed) on a low bedrock ridge along the south edge of the trail route with a fourth cobble tumbled down the ridge to the east. A single fragment of water-rounded coral was noted on the ground near Feature L.

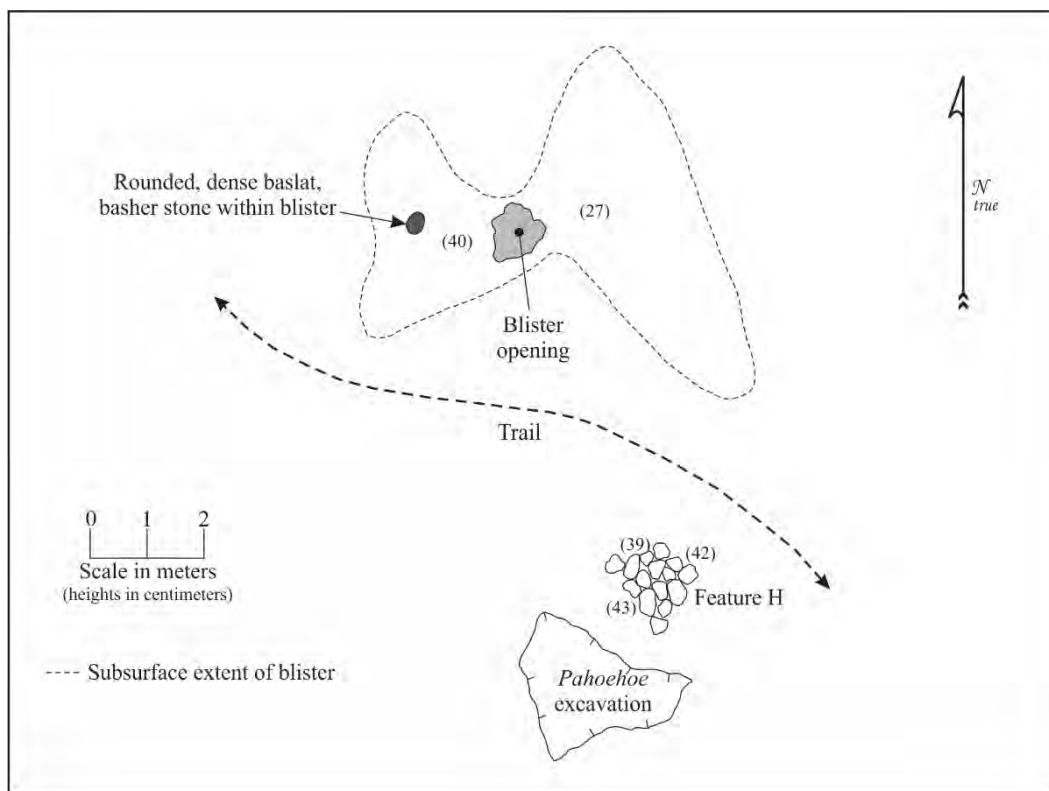


Figure 91. SIHP Site 30315 Feature H vicinity plan view.

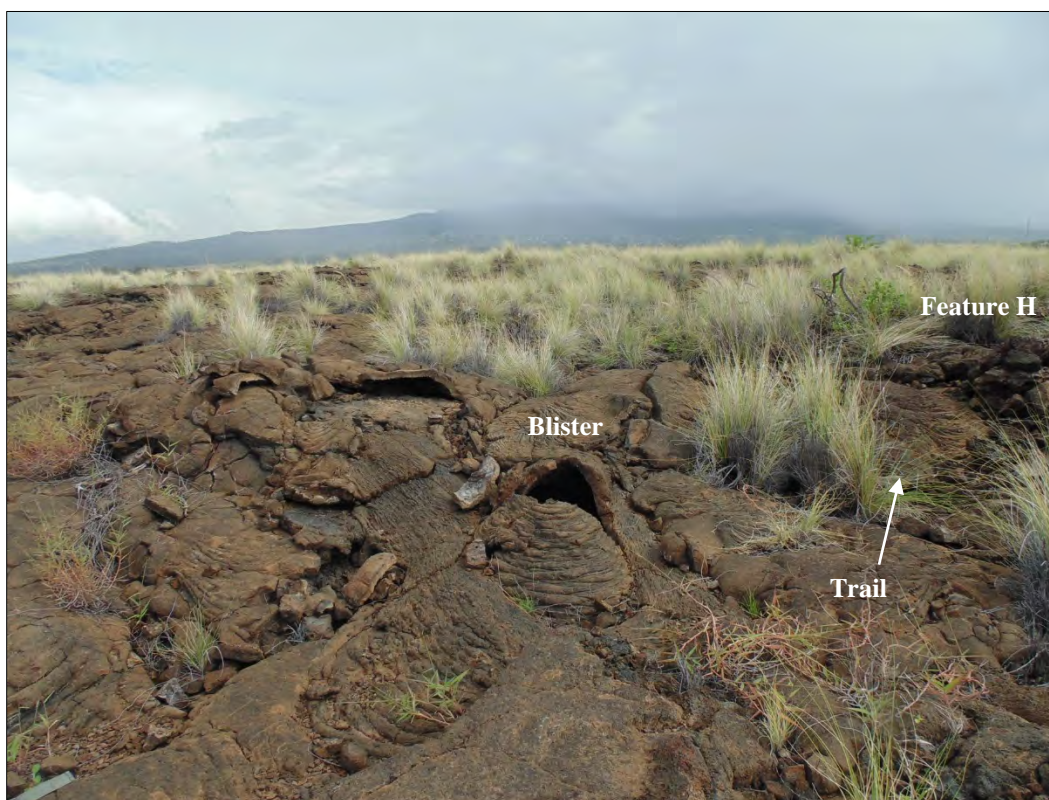


Figure 92. SIHP Site 30315, blister opening to the north of Feature H, view to the southeast.



Figure 93. SIHP Site 30315, basher stone cached within a lava blister near Feature H.



Figure 94. SIHP Site 30315, adze fragment identified 35 meters southwest of Feature H, top view.



Figure 95. SIHP Site 30315, adze fragment identified 35 meters southwest of Feature H, side view.

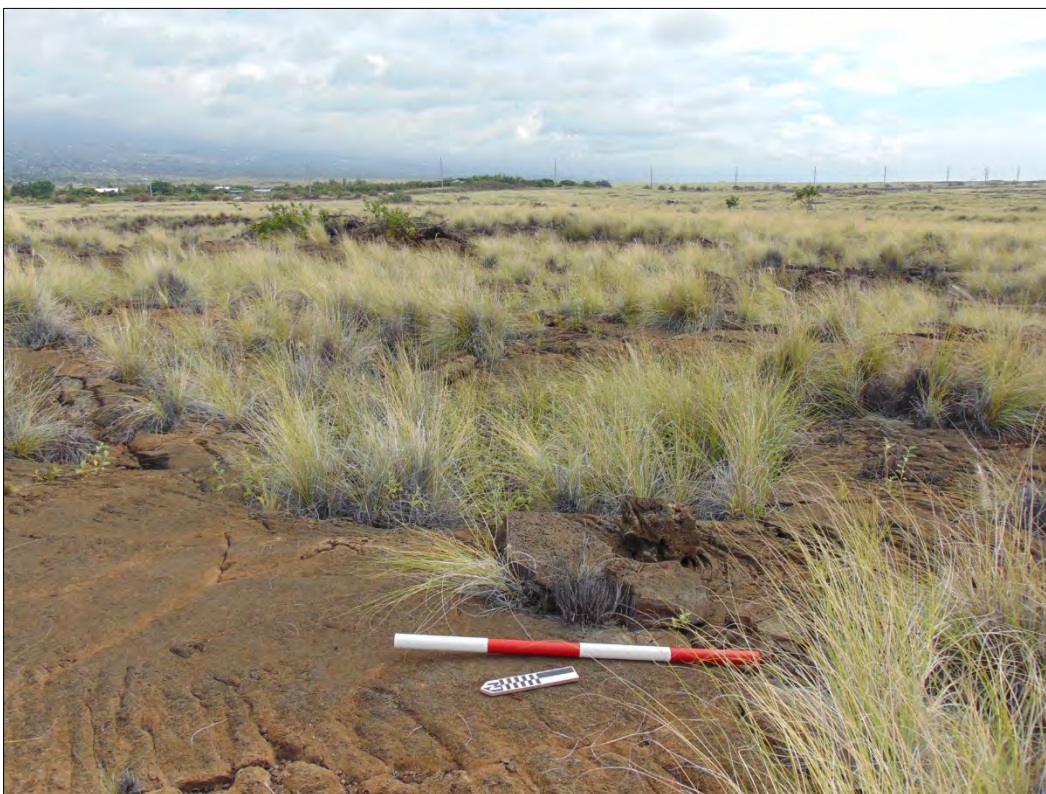


Figure 96. SIHP Site 30315 Feature I, view to the southeast.

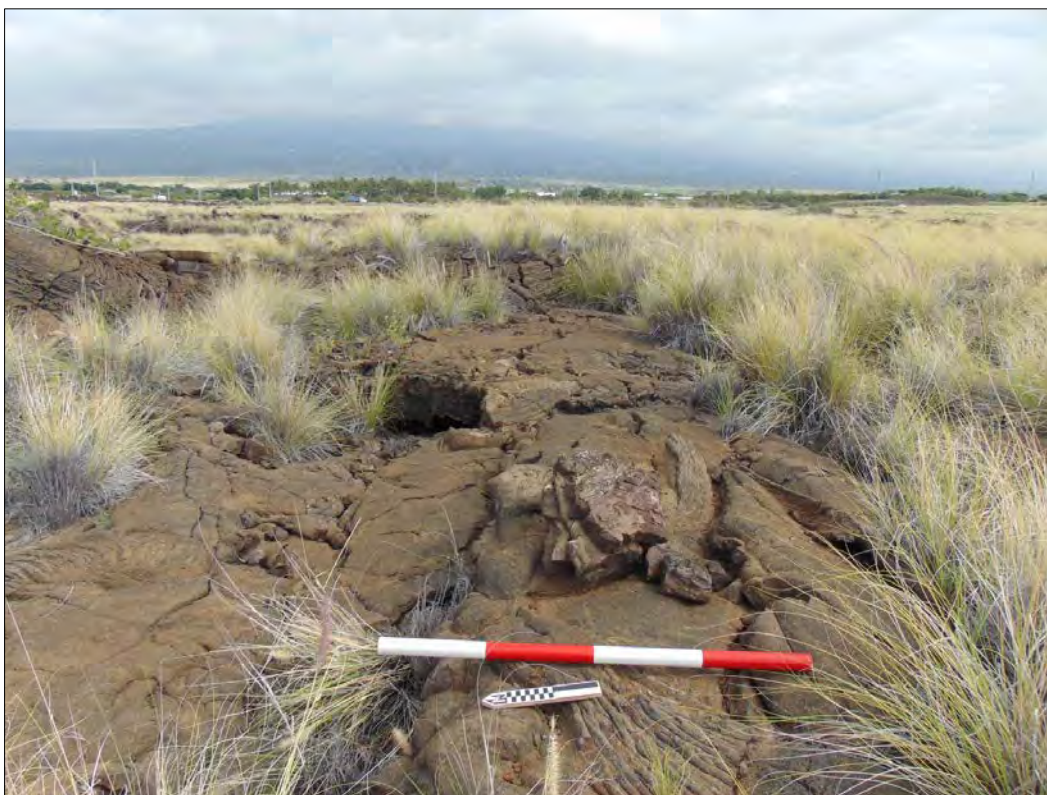


Figure 97. SIHP Site 30315 Feature J, view to the west.

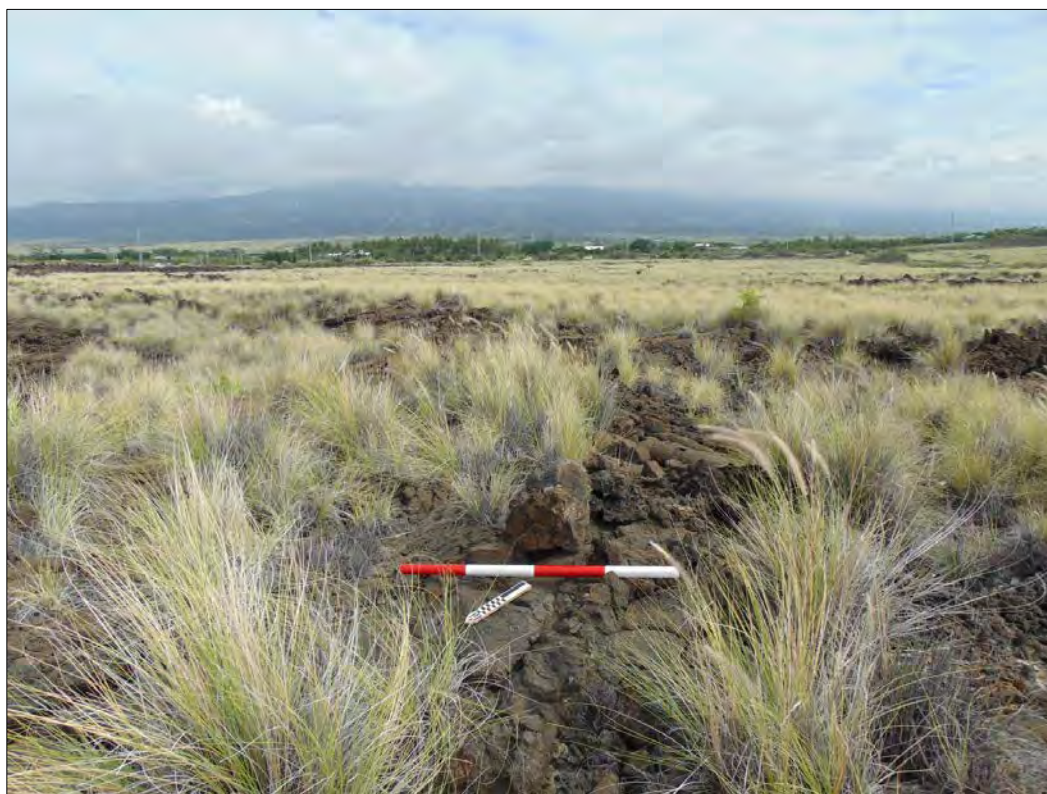


Figure 98. SIHP Site 30315 Feature K, view to the southeast.



Figure 99. SIHP Site 30315 Feature L, view to the west.

From Features K/L Site 30315 continues east to Feature M (Figure 100), a collapsed cairn along the southern edge of the trail route that consists of three slabs laying on a level *pāhoehoe* bedrock surface. A small horseshoe (Figure 101) was also noted at the location of Feature M, partially concealed beneath one of the slabs. From Feature M the trail once again turns southeast and continues for 30 meters to Feature N (Figure 102), a 50 centimeter tall cairn along the northern edge of the trail route that is constructed of eight large cobbles and one large slab loosely stacked/piled on level *pāhoehoe* bedrock to the west of a finger of ‘a‘ā. Between Features M and N (Figure 103) a water rounded coral fragment and a piece of marine shell (*Cypraea* sp.) were noted next to one another to the south of the trail route, and a rock ring (with a nearby coral fragment) was recorded along the northern edge of the trail route as SIHP Site 30329 (see description below). Three meters beyond Feature N Site 30315 crosses a 12 meter wide finger of ‘a‘ā. Across this flow finger the trail is evident as a roughly 50 centimeter wide path that has been cleared of larger cobbles, and is slightly recessed into the flow surface (Figure 104).

To the southeast of the finger of ‘a‘ā, Site 30315 enters a complex of features (cairns and rock rings) originally recorded by Barrera (1985a, 1989) as SIHP Site 10161 (see Appendix A and description below). The trail becomes difficult to follow in this area, but likely continued in the general direction of Feature A of Site 10161, a cairn located roughly 60 meters to the southeast. Roughly 50 meters from the edge of the ‘a‘ā flow, along the likely trail route within the boundaries of Site 10161, a broken bottle was noted on a bedrock surface (Figure 105). This aqua glass soda bottle has embossing on the base that reads “AB” over “E 9”, a mark that was used by the American Bottle Company between 1906 and 1917 (Lockhart et al. 2007). Site 30315, when in use during the Precontact and Historic Periods, likely continued beyond Site 10161 to an unknown inland location. The ground surface between Site 10161 and Queen Ka‘ahumanu Highway, where the trail would have continued, has been severely disturbed by modern rock quarrying for rock wall building, and as a result the trail route is no longer evident across the *mauka* portion of the study area.

Site 30315, given its location, the type and amount of cultural debris along its route, and the nearby lava tube shelters and habitations, likely served as the primary *mauka/makai* travel route for Kalaoa 5th Ahupua‘a from its inception during the Precontact Period until the ca. 1920s. Site 29273 may have been a branch trail off this main *mauka/makai* trail route.

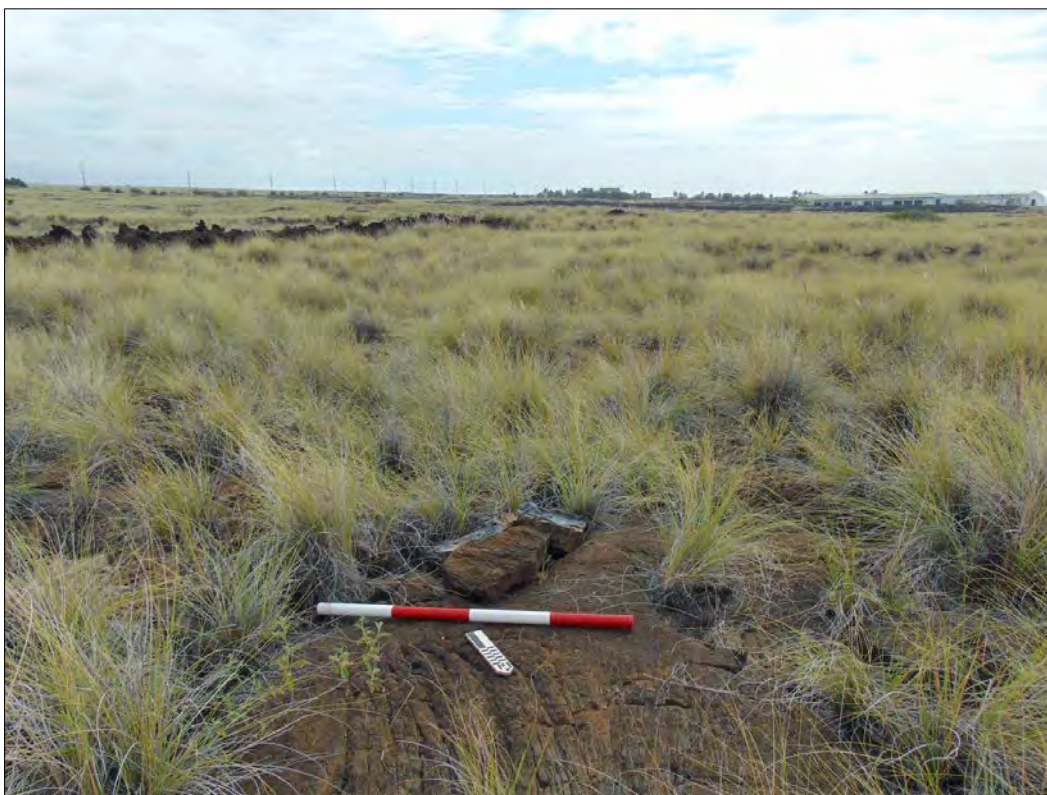


Figure 100. SIHP Site 30315 Feature M, view to the southwest.



Figure 101. SIHP Site 30315, small horseshoe discovered at Feature M, overview.

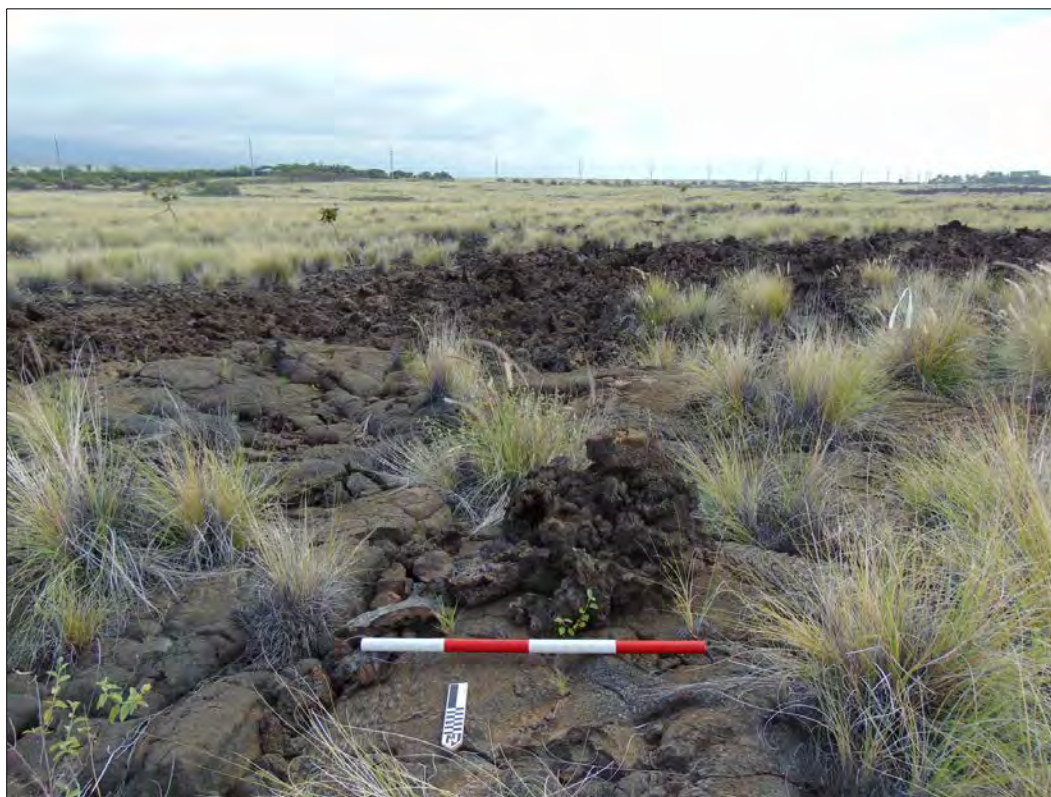


Figure 102. SIHP Site 30315 Feature N, view to the south.

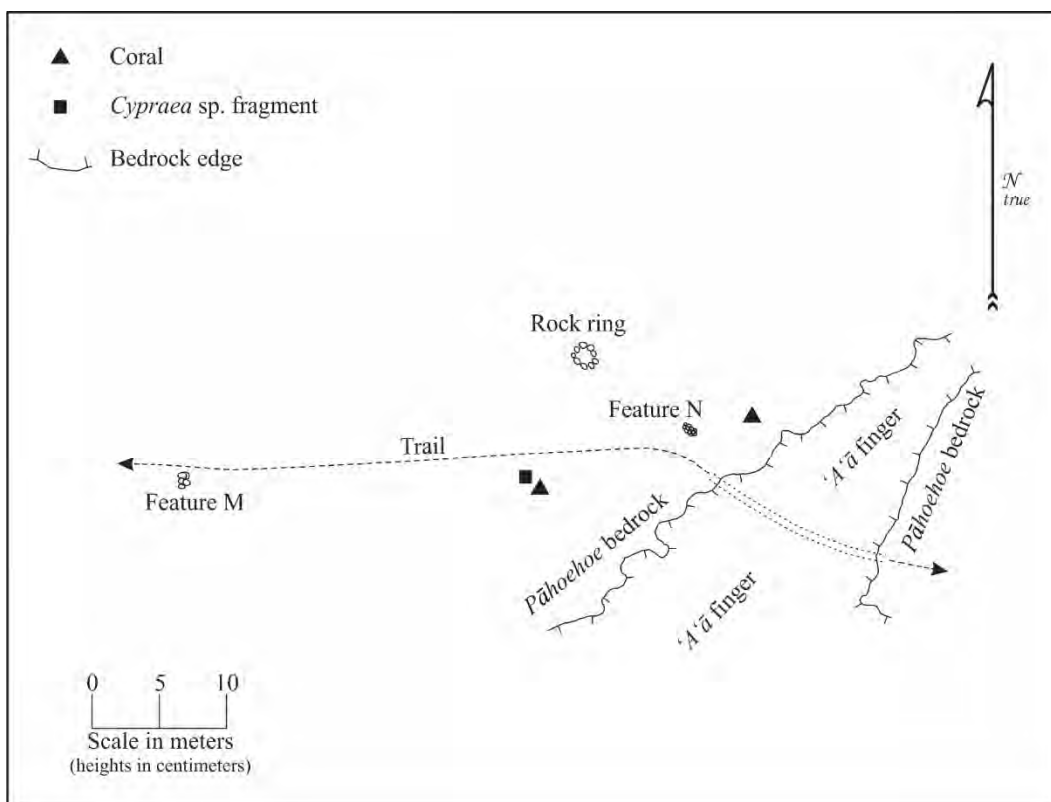


Figure 103. SIHP Site 30315 Features M and N vicinity plan view.



Figure 104. SIHP Site 30315, trail across 'a'ā to the southeast of Feature N, view to the southeast (with meter-stick placed lengthwise along trail route).



Figure 105. SIHP Site 30315, broken bottle fragments noted along the trail within the boundaries of Site 10161, overview to the west.

Previously Identified Site Complexes

Two previously recorded site complexes are present within, or partially within, the current study area (SIHP Sites 10161 and 28813; see Table 7 and Figure 48). Site 10161, first identified by Barrera (1985a) and later documented in more detail by Barrera (1989) (see Appendices A and B), is a complex of eleven features located at the southeastern end of the Site 30315 trail in the northeastern portion of the study area. Seven features of this site (Features A-G), including three cairns and four rock rings (referred to in the earlier studies as stone mounds and C-shaped structures), were documented at the complex by Barrera (1989); four additional features (Features H-K), two cairns and two rock rings located in close proximity to the previously recorded features, were added to the complex as a result of the current study. Barrera (1989) interpreted this complex of features as a probable Precontact Period temporary habitation area.

Table 7. Previously identified site complexes situated within the current study area.

<i>SIHP No.*</i>	<i>Formal Type</i>	<i>Functional Type</i>	<i>Age</i>
10161	Rock ring/Cairn complex	Various/Unknown	Historic/Precontact
28813	Modified bedrock depression complex	Agriculture	Precontact

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

Resurvey of the current study area, however, has shown that Barrera (1985a) did not identify all of the archaeological sites and features in the vicinity of Site 10161, and that the grouping of these features into a complex based solely on proximity, while fine for administrative purposes, may not have been the best strategy for analytical purposes (see discussion of fieldwork and analytical methods above). While this site is located along the route of a *mauka/makai* trail (albeit one that was not recognized by Barrera; SIHP Site 30315), and could have been used as an area for short-term habitation or rest, specific features within the complex seem to have specific functions not related to habitation at all. For instance, Feature A (a cairn), based on its location, seems to mark the route of the Site 30315 trail, and Feature B (a cairn), based on its formal attributes, seems to be a Historic marker left by surveyors during the 1902 survey of the Kalaoa-‘O‘oma Homesteads. Furthermore, the features described by Barrera (1989) as C-shaped structures, largely his reason for interpreting the complex as a Precontact temporary habitation area, are more than likely not habitation enclosures, and may have served some other, as yet unknown, function. For the reasons discussed above, only detailed descriptions of the features of Site 10161 are presented in this section of the report; potential functional interpretations and associations between the individual features of Site 10161 and other sites are presented below by feature type. Features C, F, G, H, and I are included in the discussion of rock ring sites identified within the study area, and Features A, B, D, E, F, and J are included in the discussion of cairns identified within the study area.

Site 28813, described by Monahan et al. (2011) (see Appendix C), is a complex of six features located along the eastern boundary of the current study area. Five features of this complex (Features A-E), all modified depressions (referred to as collapsed lava blisters), were documented by Monahan et al. (2012) within the Queen Ka‘ahumanu Highway right-of-way, along the *mauka* (eastern) boundary of the current study area. A sixth feature (Feature F), another modified (walled) depression, located nearby the five previously recorded features, but situated within the boundaries of the current study area on Parcel 072, was added to the complex as a result of the current study. Features A-E of Site 28813 were interpreted by Monahan et al. (2012) as having been used for Precontact agricultural purposes, a function that also seems possible for Feature F, given the presence of soil contained within the modified depression. Site 28813 is located on the oldest lava substrate (hly-2) in the only portion of the study area that has any soil accumulation (Punalu‘u extremely rocky peat on 6 to 20 percent slopes - rPYD) (see Figures 5 and 6), suggesting that opportunistic agriculture could have been possible at this location for certain crops adapted to the arid environment. Only Feature F of Site 28813 is described in detail below. For descriptions of the other features of Site 28813, and further discussion of site function, the reader is referred to Monahan et al. (2012) and Appendix C of this report.

SIHP Site 10161

Site 10161 is a complex of eleven features (Features A-K), five cairns and six rock rings, located at the southeastern end of the Site 30315 trail (Figure 106). This site was first identified by Barrera (1985a) during an archaeological reconnaissance survey of the NELHA lands, and described as “...one intact stone mound [Feature B], several dismantled or collapsed stone mounds, and a deteriorated c-shaped habitation shelter” (1985a:18). During subsequent archaeological “data recovery” at selected sites within the NELHA lands, Barrera (1989) prepared a plan view showing the locations seven features at Site 10161 (Features A-G), briefly described the features, and interpreted the complex, despite the lack of observed cultural debris and various formal types present, as a probable Precontact Period temporary habitation area (see Appendix B). Using the feature location map prepared by Barrera (1989:105) all seven of the above described features were relocated, and four additional features (Features H-K) in the immediate vicinity

of the previously recorded features were identified. During the current fieldwork each feature of Site 10161 was mapped in detail and described, and a plan view of the overall site, showing the relative locations of all eleven features and their proximity to the Site 30315 trail, was prepared (Figure 106). Detailed descriptions of Features A-K of Site 10161 follow below. Significance evaluations and treatment recommendations for the site is presented at the conclusion of this report.

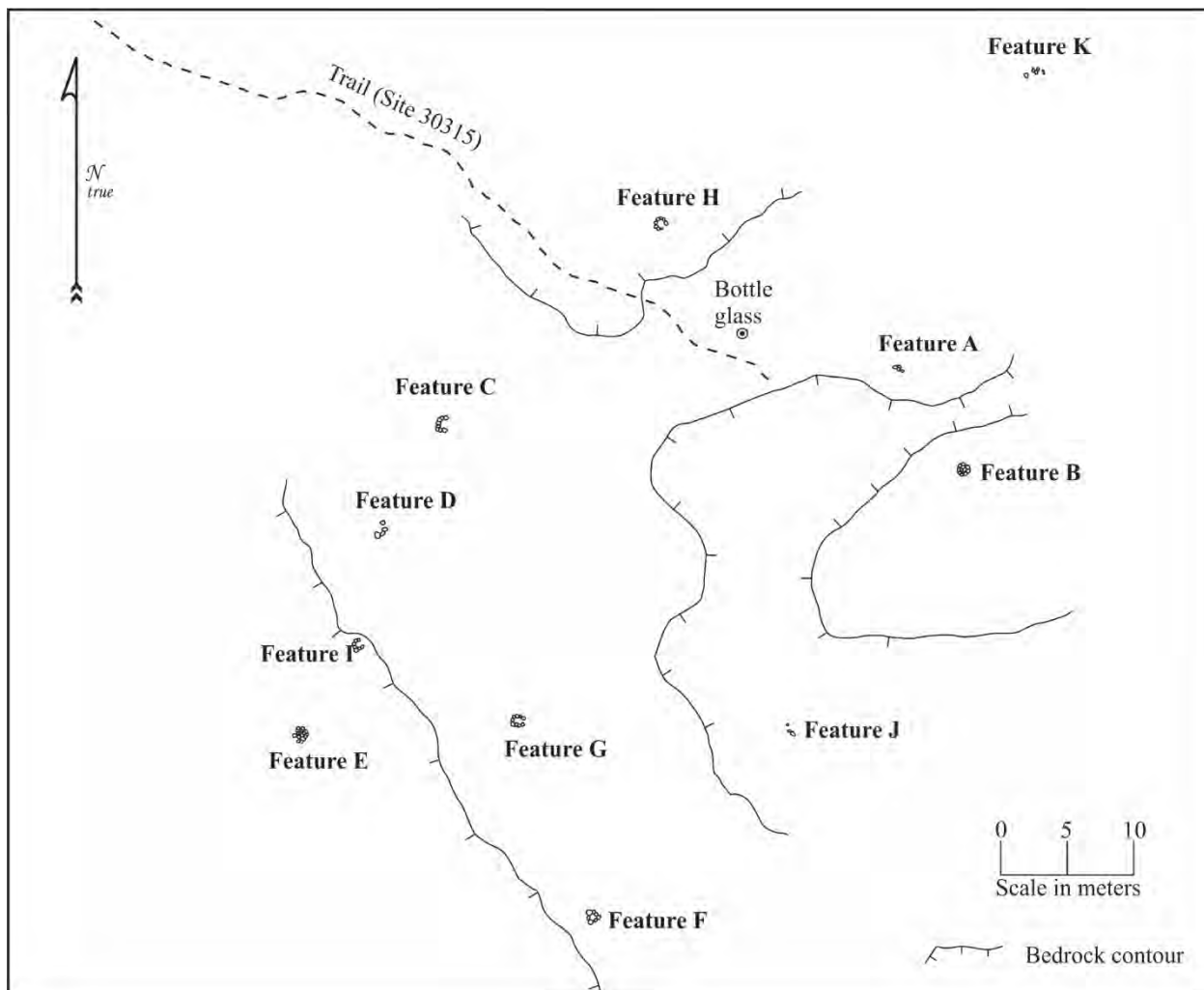


Figure 106. SIHP Site 10161 plan view.

Feature A

Feature A is a collapsed cairn situated 8 meters northwest of Feature B in the northeastern portion of Site 10161, near the projected route of the Site 30315 trail (see Figure 106). The cairn consists of eight medium to large cobbles in a linear pile (0.9 x 0.5 meters) on top of a southeast sloping edge of a *pāhoehoe* bedrock (Figure 107). A ninth cobble resting on the bedrock surface 40 centimeters east of the linear pile, indicates that the cobbles at Feature A may have once been stacked, but toppled over to the east at some point in the past. In its current condition Feature A stands only 25-35 centimeters tall. Given its formal attributes and location, Feature A likely served as a trail marker for Site 30315.

Feature B

Feature B is a well-constructed cairn located 8 meters southeast of Feature A in the northeastern portion of Site 10161 on a fractured *pāhoehoe* bedrock ground surface (see Figure 106). This roughly circular cairn (1.1 meters in diameter) consists of small to large *pāhoehoe* cobbles stacked up to 75 centimeters tall (Figure 108). Although the location this cairn of could suggest that, like Feature A, it too once marked the route of the Site 30315 trail, the formal attributes, which are similar to several other cairns recorded within the study area (i.e. SIHP Sites 10162, 10187, 10188, 10189, and 29274), suggest that Feature B is more likely a late nineteenth to early twentieth century survey marker associated with the creation of the *makai* lots of the 'O'oma-Kalaoa Homesteads.

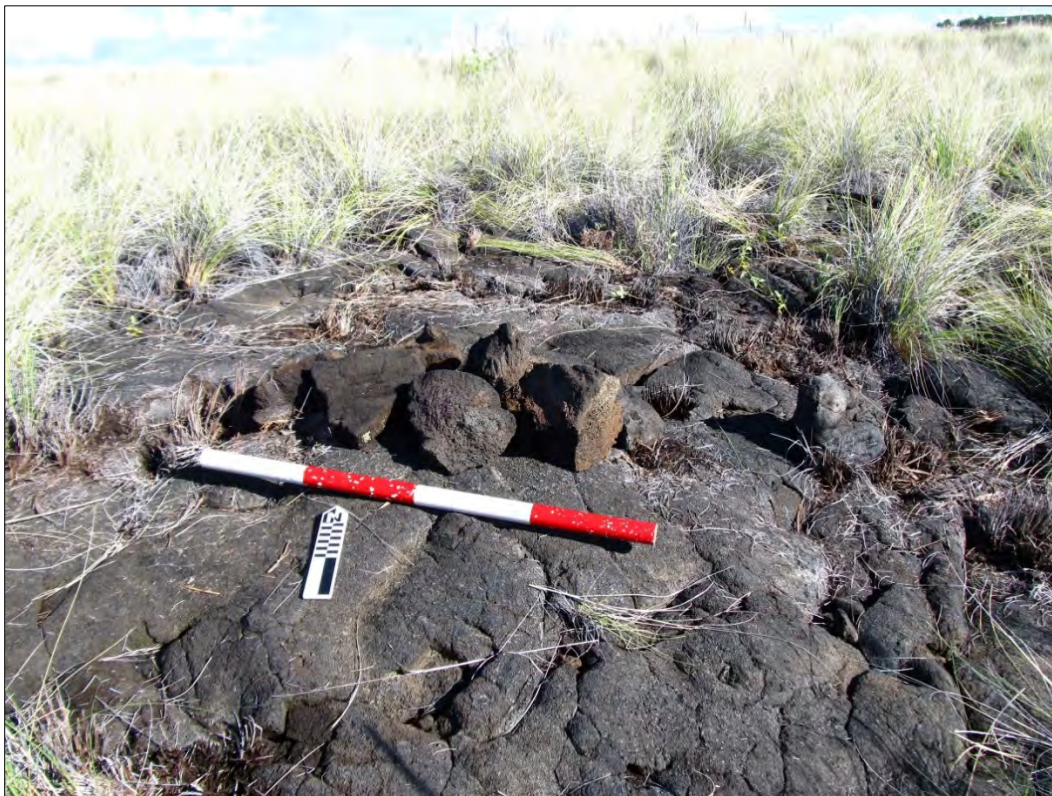


Figure 107. SIHP Site 10161 Feature A, collapsed cairn, view to the north.



Figure 108. SIHP Site 10161 Feature B, cairn, view to the north.

Feature C

Feature C is a semi-circular rock ring located roughly 35 meters west of Feature A in the northwestern portion of Site 10161 (see Figure 106). The rock ring is composed of small to large slabs on a flat *pāhoehoe* bedrock surface (Figure 109). It measures 2.2 meters (north/south) by 1.7 meters (east/west), and is open to the east (Figure 110). A couple of the slabs at the northern edge of the feature are standing on edge (upright), giving Feature C a maximum height of 30 centimeters tall.



Figure 109. SIHP Site 10161 Feature C, rock ring, view to the east.

Feature D

Feature D is a cairn located 9 meters south of Feature C along the western edge of Site 10161 (see Figure 106). The cairn (Figure 111) is comprised of roughly ten small to large slabs placed in a 2 meter by 1.6 meter pile standing 40 centimeters tall on a flat *pāhoehoe* bedrock surface (a few additional slabs were also noted on the bedrock surface as much as 40 centimeters from the main cluster). It is likely that the slabs were formerly stacked on top of each, and that Feature D served as a marker of some sort.

Feature E

Feature E is a collection of slabs (Figure 112) located approximately 16 meters south of Feature D in the southwestern portion of Site 10161 (see Figure 106). Feature E measures 2.1 meters (east/west) by 1.9 meters (north/south), and stands up to 20 centimeters tall (Figure 113). It is situated on flat *pāhoehoe* bedrock surface against a slight, southwestern facing bedrock contour. Although the interior space of the collection is filled with slabs, the size and shape of Feature E suggest that it may have once been a rock ring similar either to Feature C or Feature F.

Feature F

Feature F is a circular rock ring located roughly 25 meters southeast of Feature E in the southern portion of Site 10161 (see Figure 106). The ring is composed of small to large cobbles and slabs on a flat *pāhoehoe* bedrock surface (Figure 114). It measures 2.2 meters (north/south) by 2 meters (east/west), and stands roughly 20 centimeters tall (Figure 115). The rock material almost completely surrounds the interior space at Feature F, but the northern edge is not as well defined as the other edges, suggesting that ring could have “opened” in that direction at some point in the past.

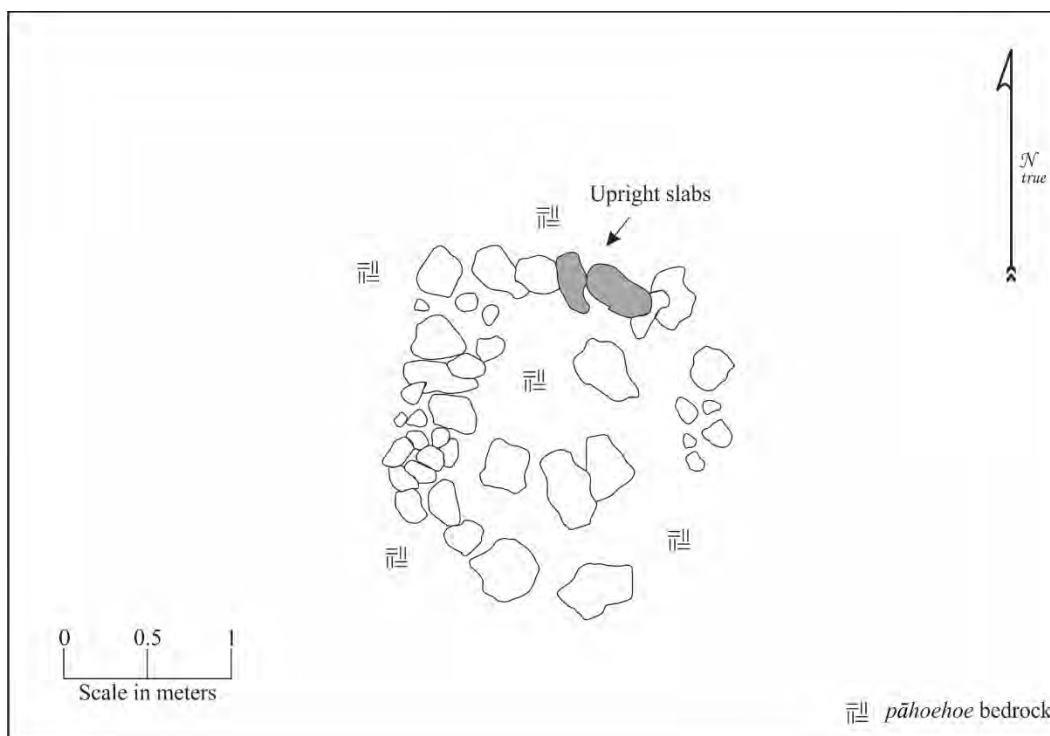


Figure 110. SIHP Site 10161 Feature C plan view.



Figure 111. SIHP Site 10161 Feature D, cairn, view to the south.



Figure 112. SIHP Site 10161 Feature E, rock ring, view to the north.

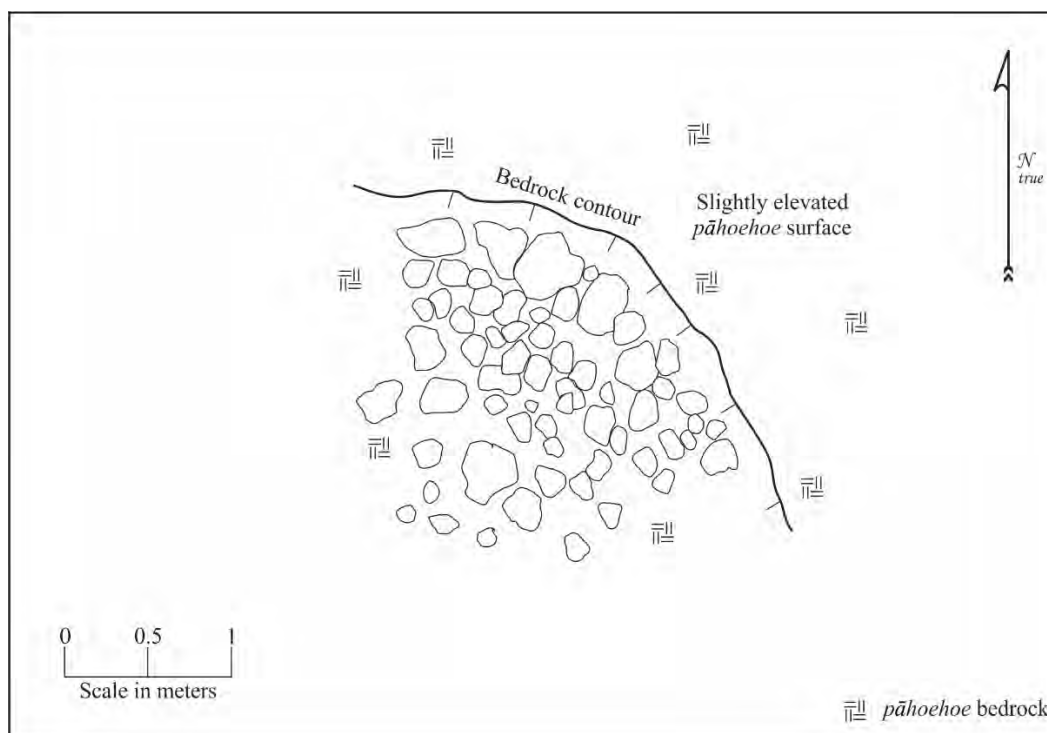


Figure 113. SIHP Site 10161 Feature E plan view.

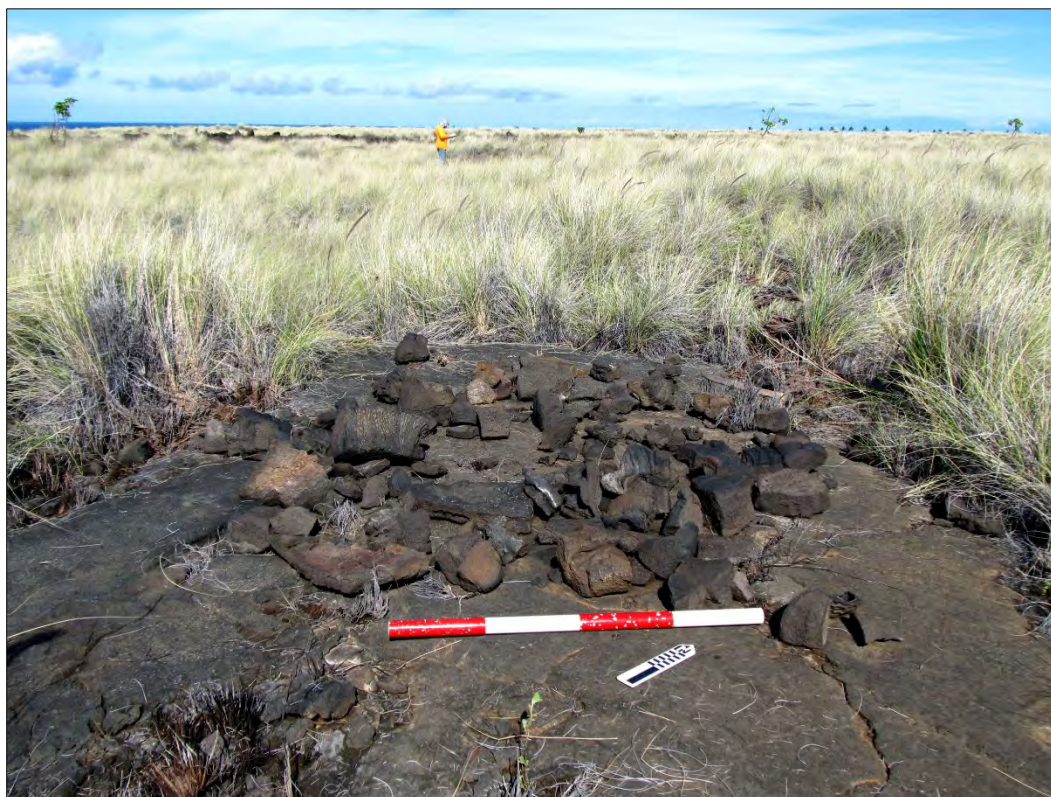


Figure 114. SIHP Site 10161 Feature F, rock ring, view to the northwest.

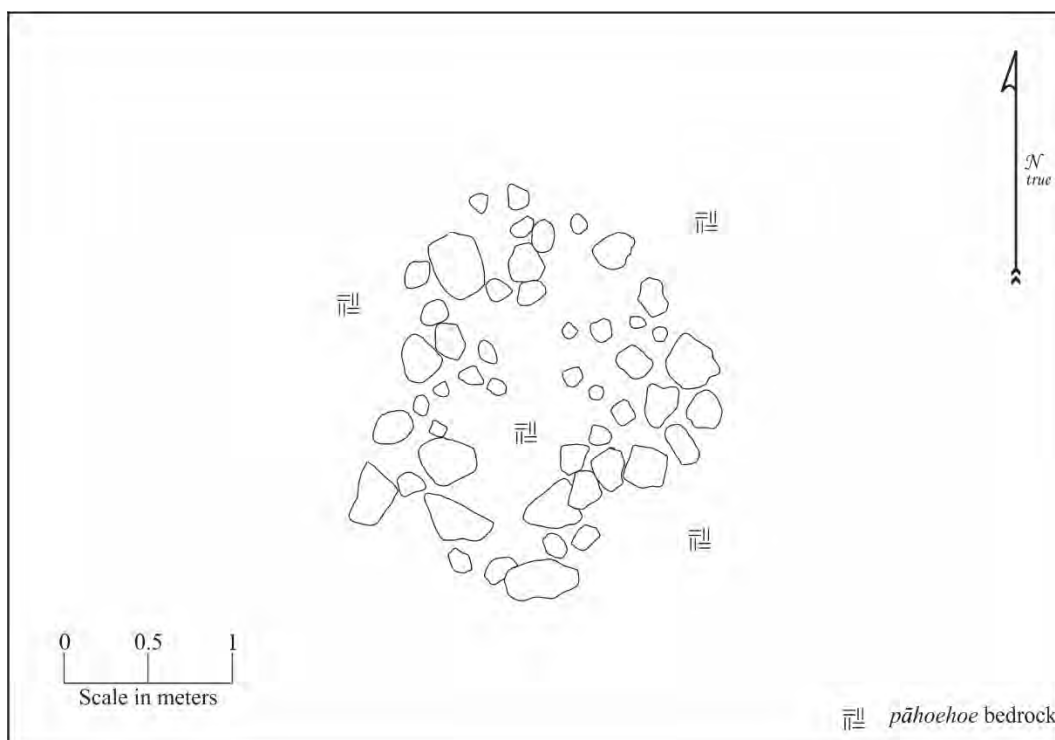


Figure 115. SIHP Site 10161 Feature F plan view.

Feature G

Feature G is a semi-circular rock ring located approximately 16 meters east of Feature E in the central-southern portion of Site 10161 (see Figure 106). This feature is composed entirely of small to large cobbles (no slabs) on a flat *pāhoehoe* bedrock surface (Figure 116). It measures 2.1 meters (north/south) by 1.8 meters (east/west), stands roughly 20 centimeters tall, and opens to the east (Figure 117).



Figure 116. SIHP Site 10161 Feature G, rock ring, view to the south.

Feature H

Feature H is a semi-circular rock ring located in the northern portion of Site 10161, roughly 21 meters northwest of Feature A (see Figure 106). This feature is located on flat *pāhoehoe* bedrock within the limits of Site 10161, but was not recorded by Barrera (1989). The feature consists of a circular alignment of cobbles and slabs with a possible gap on the north side, where it may have formerly opened (Figure 118). Feature H measures 1.6 meters (north/south) by 2 meters (east/west), and stands 0.2 meters high (Figure 119).

Feature I

Feature I is a semi-circular rock ring located in the western portion of Site 10161, 7 meters northwest of Feature E (see Figure 106). This feature is located on flat *pāhoehoe* bedrock within the limits of Site 10161, but was not recorded by Barrera (1989). The feature consists of a rough circular alignment of cobbles that is open to the east (Figure 120). It measures 1.8 meters (north/south) by 1.6 meters (east/west), and stands 0.2 meters high (Figure 121).

Feature J

Feature J is a collapsed cairn situated 25 meters southwest of Feature B and 21 meters northeast of Feature F in the southeastern portion of Site 10161 (see Figure 106). The cairn, which was not recorded by Barrera (1989), consists of two large cobbles and a large basal block of *pāhoehoe* set on a slight bedrock rise. The two cobbles were likely set on top of the *pāhoehoe* block in the past, but have collapsed to the north (Figure 122). Discoloration on the top surface of the block (a darker color) indicates where the two cobbles once sat. In its current condition Feature J measures 2.2 meters (north/south) by 0.6 meters (east/west), and stands up to 20 centimeters tall.

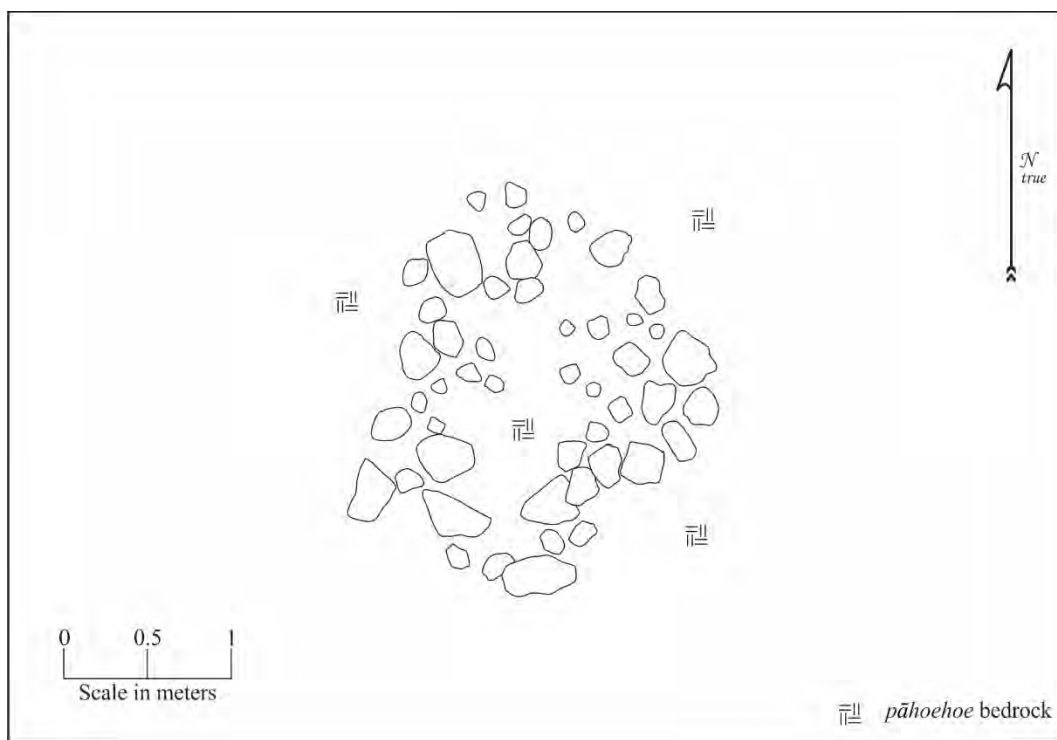


Figure 117. SIHP Site 10161 Feature G plan view.

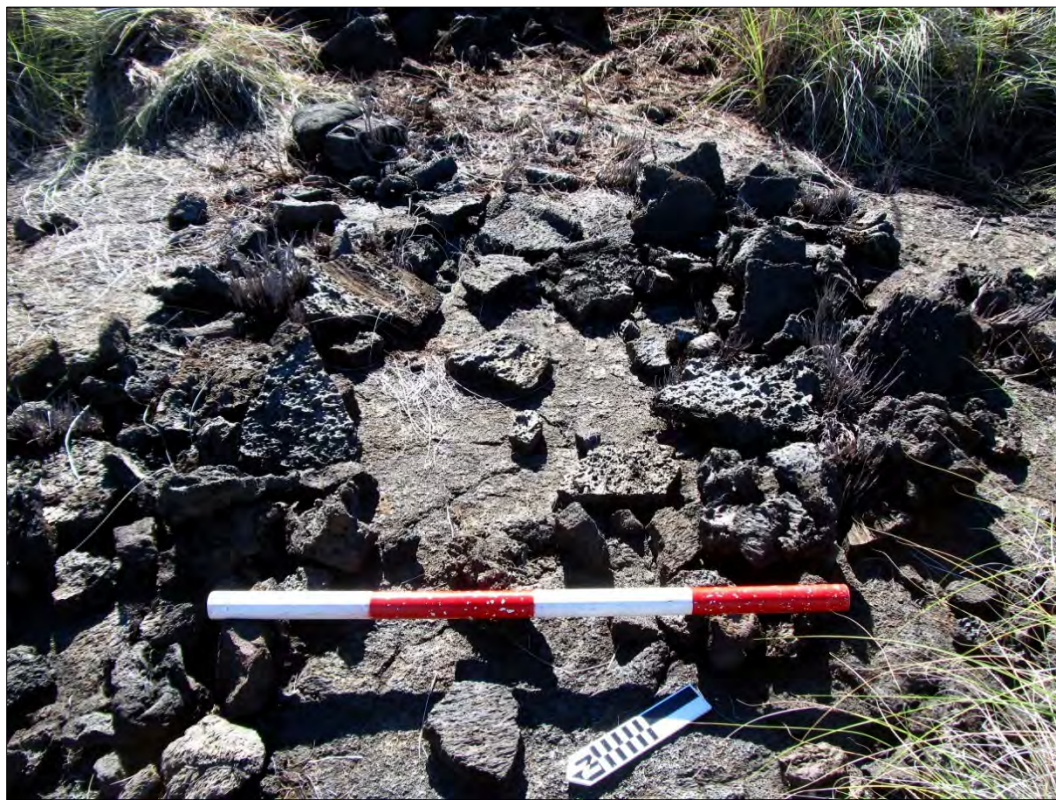


Figure 118. SIHP Site 10161 Feature H, rock ring, view to the southeast.

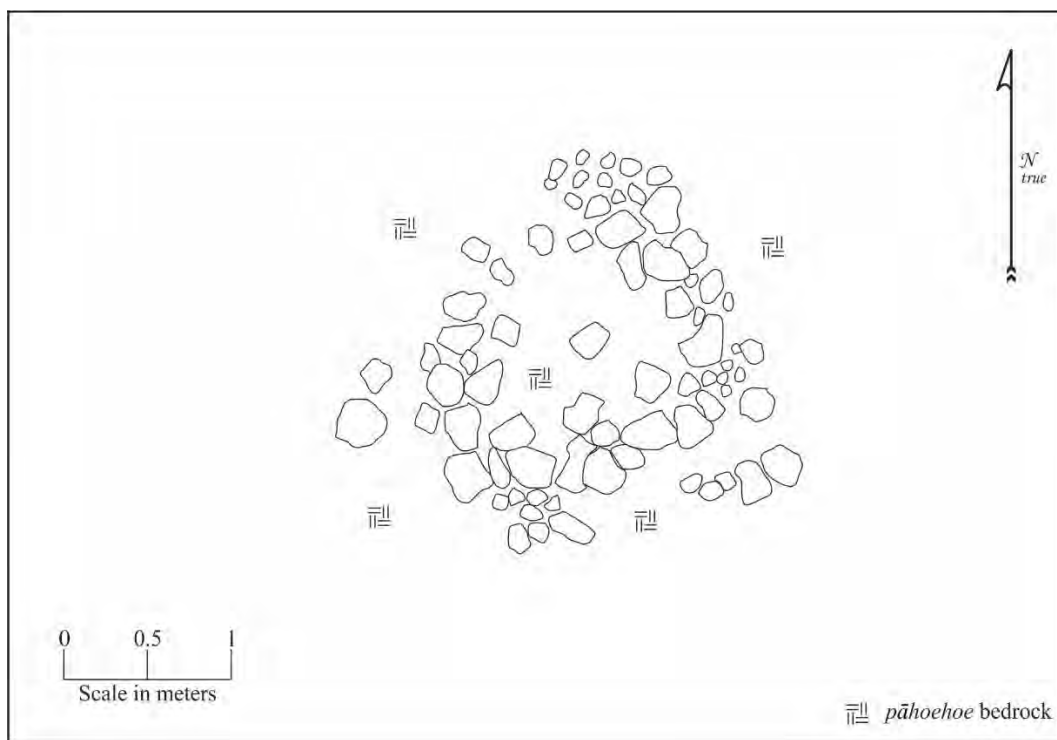


Figure 119. SIHP Site 10161 Feature H plan view.



Figure 120. SIHP Site 10161 Feature I, rock ring, view to the north.

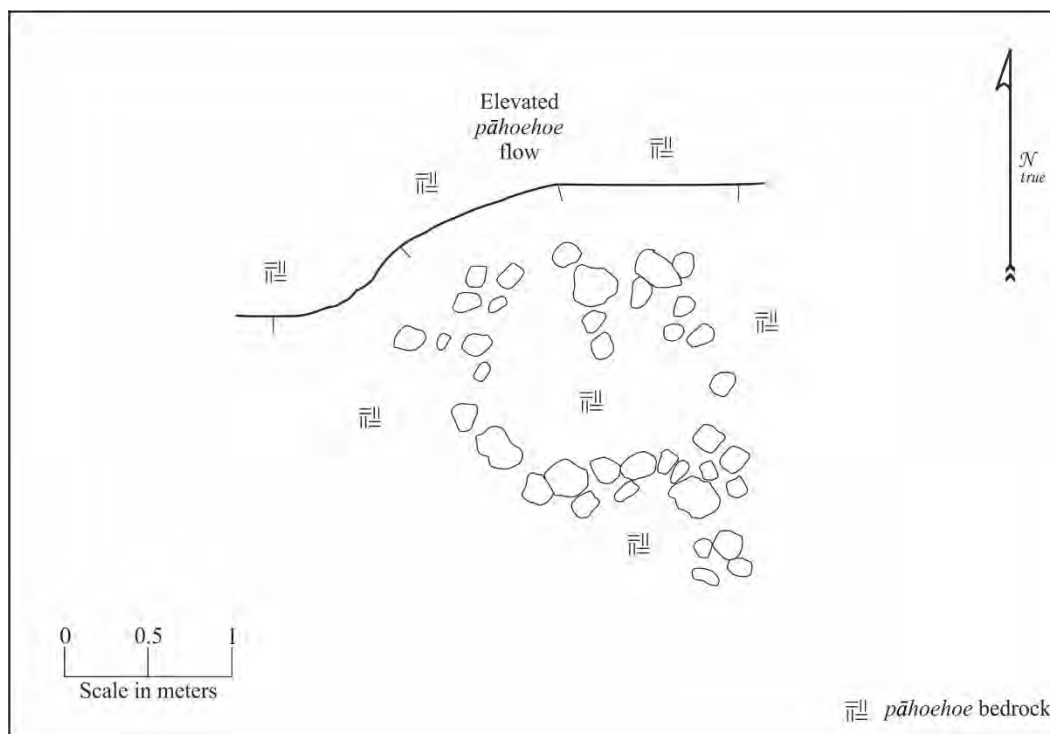


Figure 121. SIHP Site 10161 Feature I plan view.

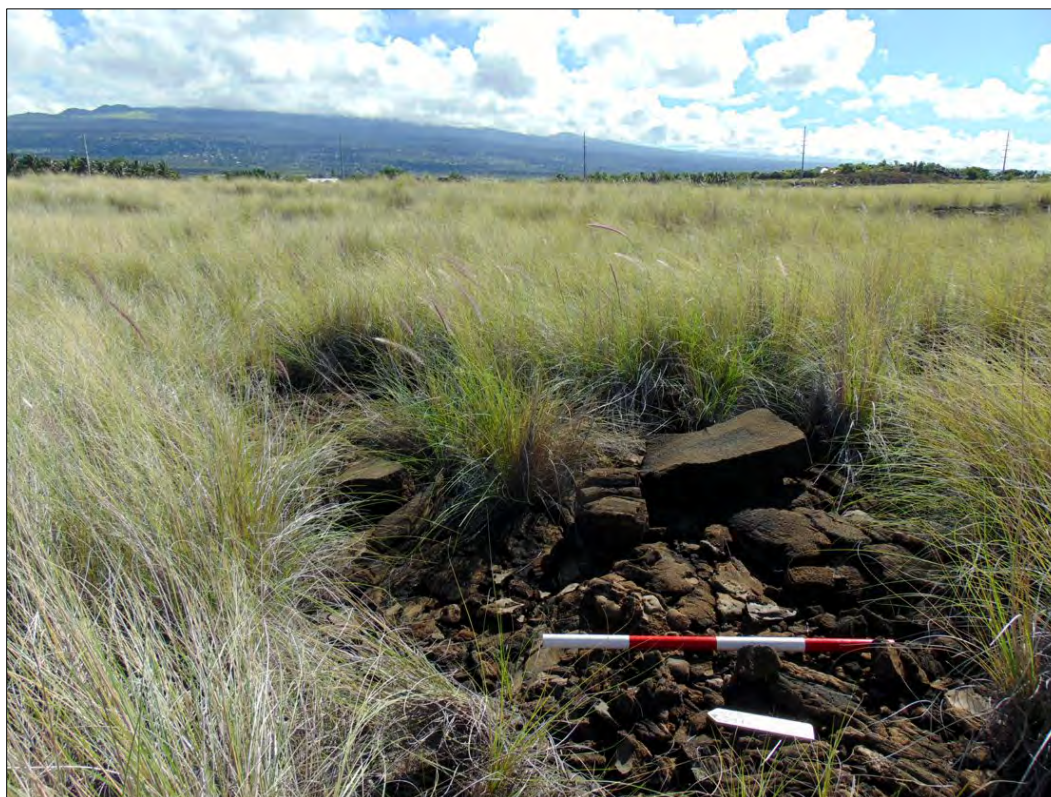


Figure 122. SIHP Site 10161 Feature J, collapsed cairn, view to the north.

Feature K

Feature K is a collapsed cairn situated 25 meters northeast of Feature A in the northeastern corner of Site 10161 (see Figure 106). The cairn, which was not recorded by Barrera (1989), consists of five medium to large cobbles that were likely formerly stacked, but are collapsed and scattered across the level bedrock surface of ropey *pāhoehoe* surrounding the feature (Figure 123). In its current condition Feature K measures 2.1 meters (east/west) by 0.5 meters (north/south), and stands up to 20 centimeters tall.

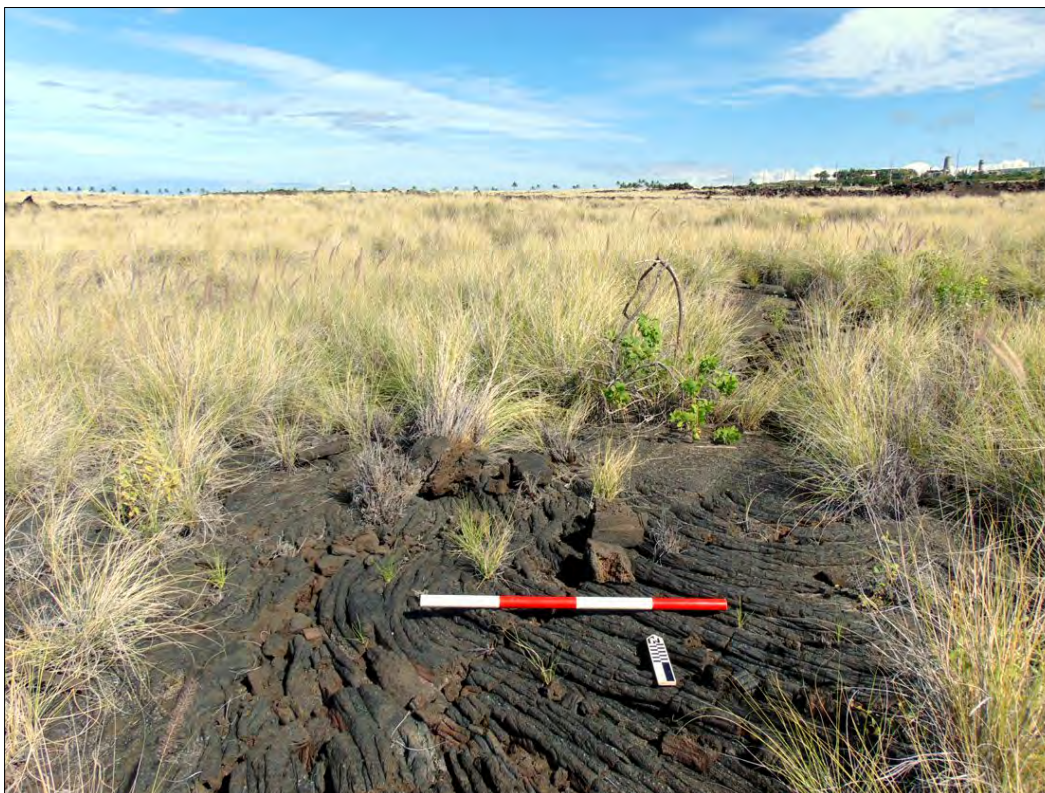


Figure 123. SIHP Site 10161 Feature K, collapsed cairn, view to the north.

SIHP Site 28813

Site 28813 is a complex of six similar features (Features A-F) located along the eastern boundary of the current study area (one feature) and within the Queen Ka'ahumanu Highway right-of-way (five features; see Figure 48). Site 28813 was originally recorded by Cultural Surveys Hawai'i, Inc. (CSH; Monahan et al. 2011) during an archaeological inventory survey of the Queen Ka'ahumanu Highway right-of-way, and described as a single feature site consisting of a modified lava blister (described as a modified bedrock depression for the purposes of this study). A subsequent re-survey of the same Queen Ka'ahumanu Highway corridor (Monahan et al. 2012), conducted by CSH after consultation with Native Hawaiian Organizations familiar with the area, identified four additional nearby bedrock depressions within the right-of-way that were similar to the earlier recorded feature. As a result of the new findings the first recorded modified bedrock depression was given the designation Feature A, and the four newly discovered features were given the designations Features B-E. No mention was made of Feature F, a similar modified (walled) bedrock depression located outside of the right-of-way within the current study area. Features A-E of Site 28813 were interpreted by Monahan et al. (2012) as having been used for Precontact agricultural purposes, a function that also seems possible for Feature F, given the presence of soil contained within the modified depression.

The relative locations of all six features of Site 28813 and a detailed plan view of Feature F is presented below as Figure 124. Descriptions of Features A-E of Site 28813 prepared by Monahan et al. (2012) are presented in Appendix C of this report. Feature F, contained within the current study area and not previously recorded, is described in detail below. The previously approved significance evaluations and treatment recommendations for all of the features of Site 28813 are discussed at the conclusion of this study.

Feature F

Feature F is a modified bedrock depression located 15 meters northwest of Feature A in the western portion of Site 28813 (see Figure 124). The depression measures 7.5 meters (east/west) by 5.5 meters (north/south), and its floor is approximately 1 meter below the outside ground surface (Figure 125). It appears that the depression formed when the roof of a natural blister within the *pāhoehoe* bedrock collapsed. The modification at Feature F is located along the northern edge of the collapsed blister, which is the lowest side of the natural depression (Figure 126). The modification along the north edge consists of stacked cobbles that extend 4.5 meters along the northwestern side, and an intermittent cobble alignment that extends 3.5 meters along on the northeastern side. The cobbles are stacked approximately 30 to 50 centimeters tall above the natural bedrock along the northwestern edge. It is likely that the cobbles used along the perimeter were cleared from the interior, which consists of a bedrock, boulders, and areas of level soil. Overhanging bedrock is present at the eastern and western ends of the depression, but the space beneath is low and shallow and not modified. No cultural debris was observed at Feature F, but given the presence of soil within, it is possible that this depression, like the other five previously recorded features at Site 28813, was an agricultural planting area.

A small bedrock depression located 2.5 meters to the northwest of Feature F was also investigated and mapped during the current fieldwork (see Figure 124). Although some soil is present within this roughly 3 meter long by 1.5 meter wide bedrock depression, no modification was observed (Figure 127), and the depression is considered a natural feature of the landscape that also could have been used for agricultural purposes at Site 28813.

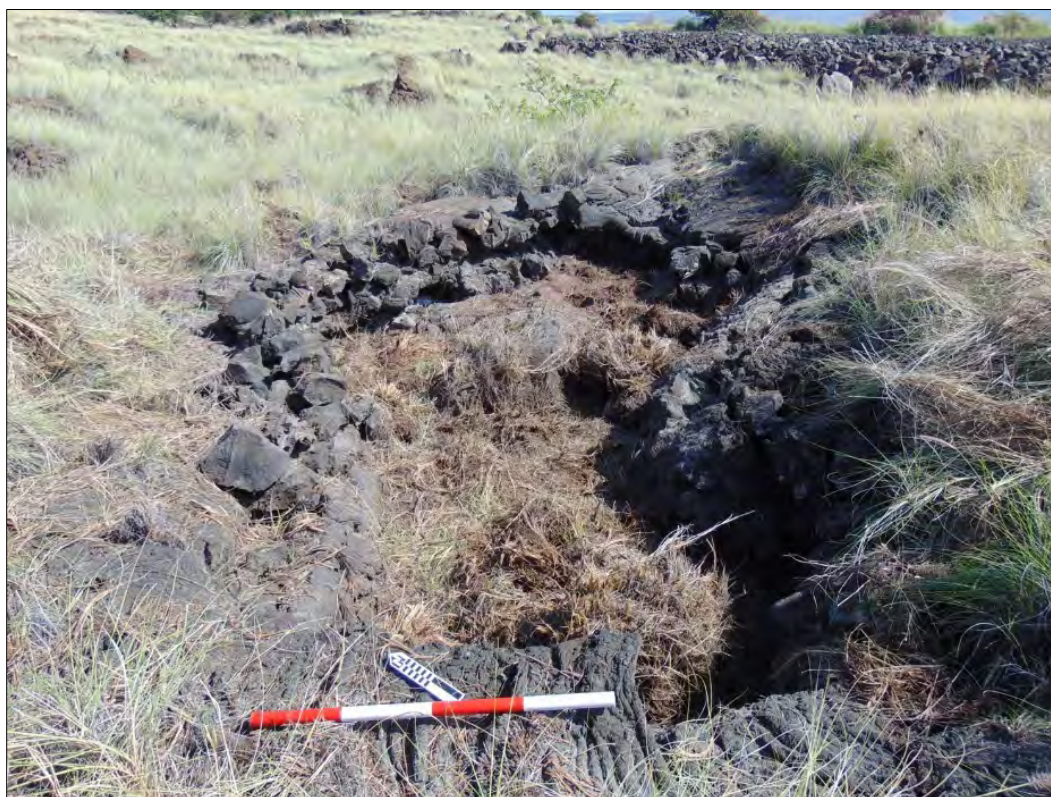


Figure 125. SIHP Site 28813 Feature F, modified bedrock depression, view to the northeast.

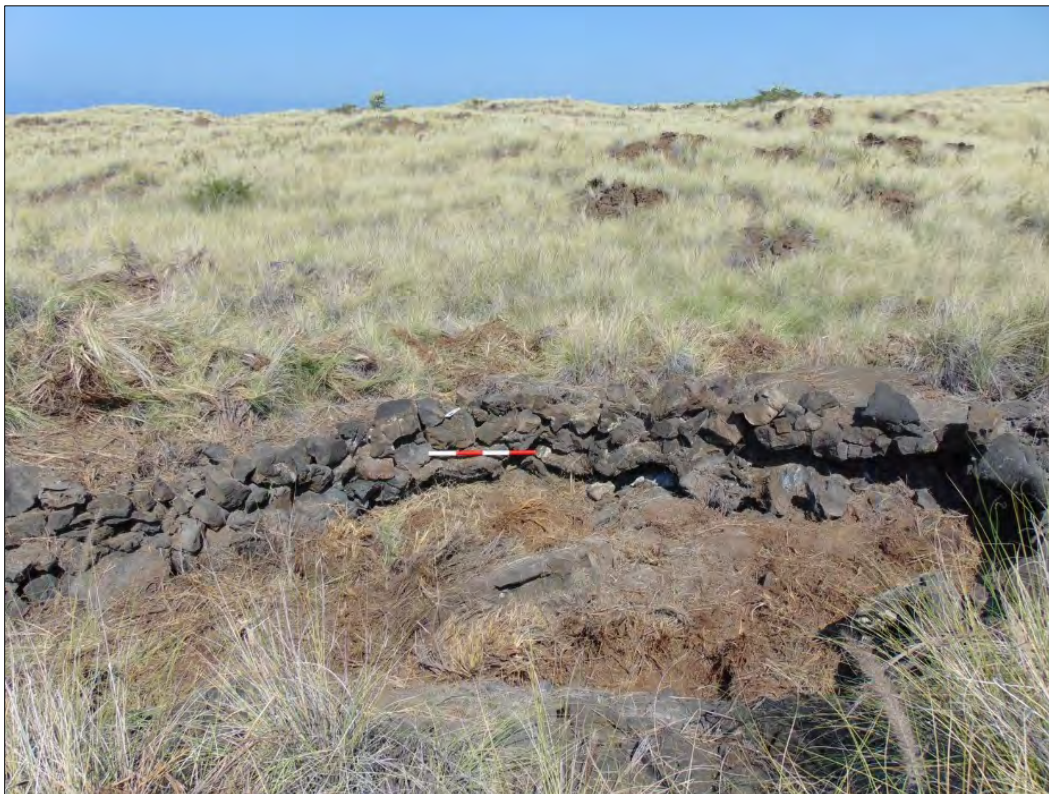


Figure 126. SIHP Site 28813, stacked cobbles along the northern edge of Feature F, view to the north.



Figure 127. SIHP Site 28813, unmodified bedrock depression to the northwest of Feature F, view to the north.

Lava Tubes and Lava Blisters

Four lava tube sites (SIHP Sites 30316 to 30319) and one lava blister site (SIHP Site 30320) were identified within the current study area (Table 8 and Figure 128). A lava tube is a natural tunnel within a solidified *pāhoehoe* lava flow that was formerly occupied by flowing molten lava. The lava tube is preserved as an elongate cave after the eruptive activity ends within a given lava flow and the molten rock drains away (Lockwood and Hazlett 2010). Lava tubes can be accessed in one of two ways: through sky lights (small openings in the ceiling of the tube) or through sinks (collapsed sections of the tube itself). A lava tube is only considered an archaeological site if cultural material or modification is present. A lava blister is a small hollow within a solidified *pāhoehoe* lava flow that formed from gas bubbles pushing up the lava's viscous surface during the flow event. Lava blisters become accessible when portions of the lava crust surrounding the hollow collapse inward or are pulled outward. A lava blister, like a lava tube, is also only considered an archaeological site if cultural material or modification is present. The lava tubes and lava blister encountered within the current study area were used for habitation, shelter, and storage purposes during the Precontact and early Historic Periods. None of these sites were identified by Barrera (1985a), although he did record a cairn (SIHP Site 10160) located immediately adjacent to one of the entrances to Site 30316 without mentioning the presence of the lava tube.

Table 8. Lava tube and lava blister sites identified within the current study area.

<i>SIHP No.*</i>	<i>Formal Type</i>	<i>Functional Type</i>	<i>Age</i>
30316	Lava tube	Shelter/Habitation/Storage	Precontact/Historic
30317	Lava tube	Shelter	Precontact
30318	Lava tube	Shelter	Precontact
30319	Lava tube	Habitation/Storage	Precontact/Historic
30320	Lava blister	Shelter	Precontact

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

For the Hawaiian population that once resided in Kekaha and the *ahupua'a* of Kalaoa and 'O'oma, lava tubes and blisters were an important natural resources that were utilized extensively in a diverse number of ways. Hammatt and Folk, who documented several lava tubes *mauka* of the current study area, point out that:

... in the context of a hot dry bare lava landscape [of Kekaha], they [lava tubes] offered an oasis for the Hawaiians. Not only did they provide shelter from the wind, sun and rain, they provided one of the few perennial sources of fresh water in an otherwise waterless environment. Occupation caves were selected with these considerations in mind. The temperature in the shelter of a sink overhang or tube entrance is noticeably cooler than the outside. A gourd container placed under a drip can supply a constant and reliable supply of cool water. Sinks and caves are an important and neglected aspect of Hawaiian settlement. We know now that the Hawaiians pursued everyday domestic life within these places and running into them to hide is only one late aspect of their use. Even today in Kona there are Hawaiians alive whose parents and grandparents have a memory of domestic life in caves. (1980:100)

The resources provided by lava tubes and blisters (such as shelter and water) could not be diminished by time or use. As fixed locations on the landscape determined by the lava flows themselves, these features, once discovered, were visited again and again, or occupied more or less permanently, as the first settlers of an area sought out the diverse resources of their newly settled lands and expanded. As Cordy (1985) suggests, the presence of lava tube (or lava blister) shelters would have played a significant role in determining the routes that *mauka/makai* trails took from the coast to the uplands across the lower barren zone of 'O'oma and Kalaoa *ahupua'a*. Cordy goes on to elaborate about the relationship between lava tubes and trails in the upper barren zone of the *ahupua'a*:

At the inland end of the barren zone at 200-400 foot elevation, the density of sites in Kalaoa 5 and Ooma 1 increases. . . In these *ahupua'a* a large number of cave shelters were found located in lava tubes off lava sinks, and the floor of the sinks also had features. Deposits, other than in platforms, varied in depth from 5-30 cm, and many areas back in the tube shelters and on the sink floors had no surface deposits. These caves had extensive features reflecting recurrent, short-term usage – multiple hearths, many tiny platforms and enclosures (Hammatt and Folk 1980). Davis (1977) suggests that surface cairns in the vicinity might mark trails, and the Ching, Cluff & Riley [Ching et al. 1969] site location map shows trails heading inland toward this area. Thus these caves may well be shelters associated with the trails. (1985:32)

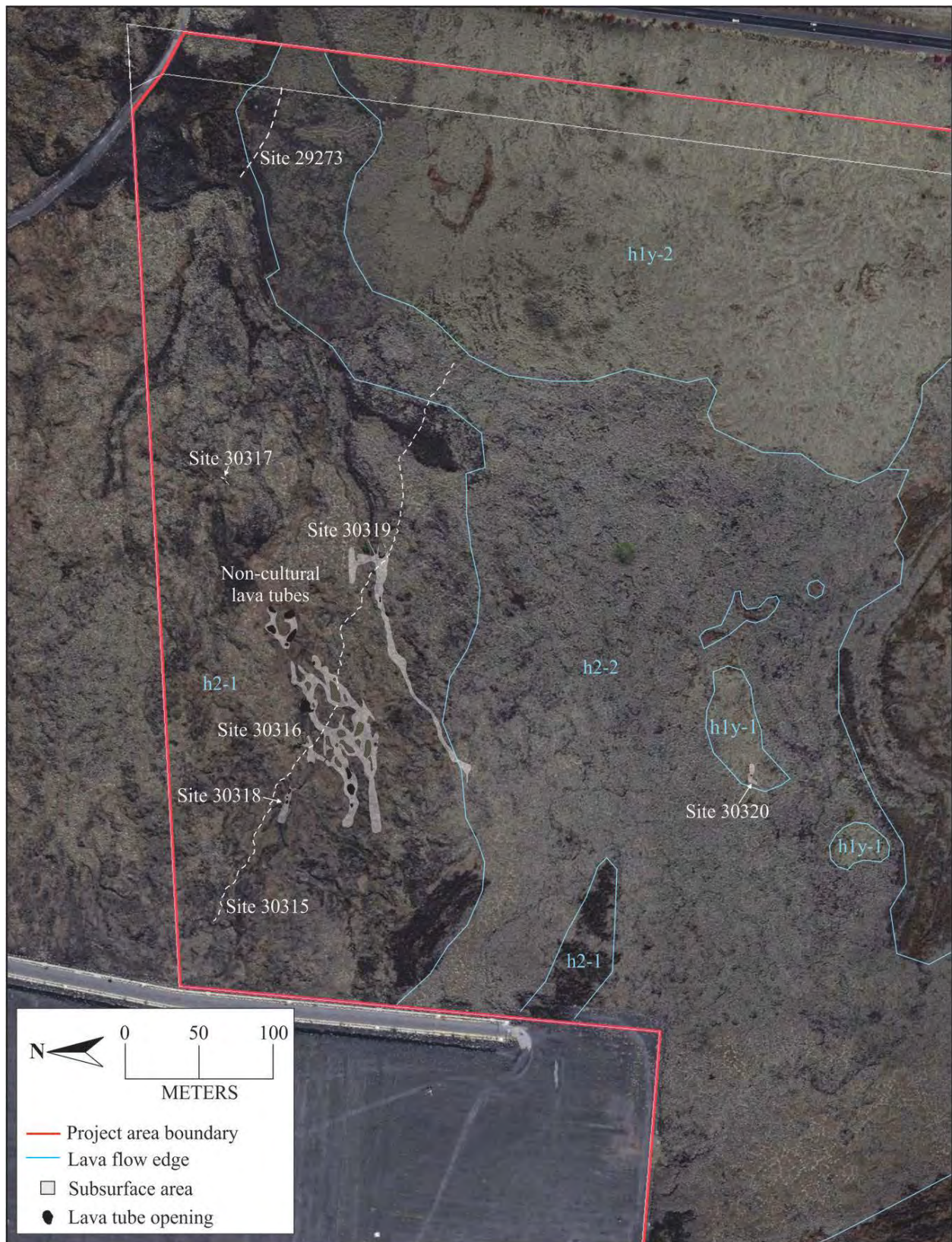


Figure 128. Locations of lava tube and lava blister sites situated within the current study area.

The proximity of the Site 30315 trail route (see above) to the lava tube sites recorded within the current study area exemplifies the lava tube/trail relationship discussed by Cordy (1985). All of the lava tubes identified within the study area occur within the 1,500-3,000 year old (h2-1) lava flow situated near the northern boundary of Parcel 073 (see Figure 6; the lava blister occurs within a raised dome of the older h1y-1 lava flow that is surrounded by the youngest h2-2 lava flow and located near the center of the study area). The Site 30315 trail meanders from *makai* to *mauka* across the elevated surface of this same lava flow, winding between the entrances to three of the lava tube sites (SIHP Sites 30316, 30318, and 30319), and passing nearby the fourth (SIHP Site 30317). A number of *pāhoehoe* excavations are also associated with the lava flow, the trail, and the lava tube entrances (see the description SIHP Site 30371 below). The Site 29273 trail is also situated on this lava flow, but the segment within the current study area is too short to make any positive connections between it and the recorded lava tubes. The lava blister site identified within the study area is not along a trail route that could be traced across the smooth *pāhoehoe* lava in its vicinity.

A number of lava tube sites have been previously recorded within the 1,500-3,000 year old (h2-1) lava flow that houses Sites 30316, 30317, 30318, and 30319. These previously recorded sites include five that were identified and briefly described by Ching and Rosendahl (1968), three to the north of the study area in Kalaoa 4th Ahupua'a (Temporary Sites 2 to 4), and one to the east of the study area in Kalaoa 5th Ahupua'a (Temporary Site 1; SIHP Site 262); three additional lava tubes (SIHP Sites 6418, 6420, 6421) and the previously identified Site 262 that were mapped and excavated by Hammatt and Folk (1980) to the east of the study area in Kalaoa 5th Ahupua'a (a lava blister, Site 6422, and another lava tube, Site 6423, were also recorded on the older (h1y-1) lava flow to the southeast of the current study area in 'O'oma 1st Ahupua'a by Hammatt and Folk (1980); and one that was documented to the north of the study area within the Queen Ka'ahumanu Highway right-of-way (SIHP Site 28814) by Monahan et al. (2012).

The sites recorded to the north of the study area by Ching and Rosendahl (1968) at proximate elevations contained deposits of marine shell and other cultural material indicative of both Precontact and early Historic use of the lava tubes for habitation, water catchment, and burial. Much of the reported on cultural debris was fishing related (i.e. fishhooks, abraders, sinkers, etc.). Two petroglyphs (geometric designs) were associated with one of the lava tube entrances. The lava tube site identified by Monahan et al. (2012) within the Queen Ka'ahumanu Highway right-of-way contained only two placed *pāhoehoe* boulders and no cultural material. The lava tubes that were extensively documented to the east of the study area in Kalaoa 5th Ahupua'a, those summarized by Cordy (1985:32) (see above quote), contained extensive architectural features and cultural deposits reflecting use for habitation, refuge, water catchment, and burial during the Precontact and Historic Periods. One of the lava tube sinks (SIHP Site 6418) was additionally interpreted as having been used for goat herding and corralling during the nineteenth century. Petroglyphs (anthropomorphic figures) were present at two of the lava tube sites documented by Hammatt and Folk (1980).

The lava tubes (SIHP Sites 30316 to 30319) and lava blister (SIHP Site 30320) recorded within the current study area do not, for the most part, appear to have been as well utilized, or contain as many artifacts, as those recorded by Ching and Rosendahl (1968) and Hammatt and Folk (1980), but they do contain more substantial cultural deposits than were reported on by Monahan et al. (2012) at Site 28813. It may be that many of the surface artifacts within these lava tubes have been removed by collectors since the opening of Queen Ka'ahumanu Highway and the Keāhole Airport in the early 1970s. Generally, the floors of these lava tubes consist of rough lava surfaces and the ceiling heights are low. No soil deposits, or cultural deposits with any stratigraphic deposition were observed anywhere within any of the lava tubes or the lava blister. Cultural debris associated with the lava tubes in the current study area includes marine shell, sea urchin fragments, fish bone, bird bone, *kukui* nut shell, water-worn cobbles, an urchin spine abradar, four coral abradars, bamboo (fishing) poles, and a carved wooden artifact (possibly an '*iako* from an outrigger canoe).

Sites 30317, 30318, and 30320 all contain sparse cultural deposits indicative of infrequent use as shelters, and do not have any architectural components. Site 30316, which connects to numerous sky lights and sinks, most of which are not well suited for habitation, appears to have been utilized primarily for shelter and storage purposes, but at one sink architectural features and associated marine shell debris suggest that recurrent short-term habitation may have also occurred. Several additional small lava tube openings that are connected by a subsurface passageway to the northeast of Site 30316, did not contain any cultural debris or modification, and were therefore not recorded as an archaeological site. Only Site 30319 contains architectural features and debris indicative primarily of recurrent habitation use (albeit limited use). This lava tube also contains a bamboo pole (suggesting use for storage) and has two associated petroglyphs, an anthropomorphic figure and a possible "goat" image, indicating that its use may have lasted into the early Historic Period. Although water was observed dripping from the ceilings of all of the lava tubes after a brief rain storm, no specific water catchment features were identified, and water catchment was not assigned as one of the primary lava tube functions. Detailed descriptions of the lava tube and lava blister sites recorded within the current study area are presented below. Significance evaluations and treatment recommendations for these sites are presented at the conclusion of this report.

SIHP Site 30316

Site 30316 is a lava tube located in the northern portion of the current project area (see Figure 128). The lava tube extends 130 meters (east/west) by 65 meters (north/south), and consists of a labyrinth of interconnected, subsurface passageways that are accessed by eight openings (Figure 129). Terrain in the vicinity of the site consists of an undulating smooth *pāhoehoe* flow with areas of slabby *pāhoehoe* and 'a'ā at the margins (h2-1; see Figure 6). The flow slopes moderately to the southwest, but the lava tube entrances are on a fairly level surface that is elevated above the terrain to the south of the flow. *Mauka* of Site 30316 are additional lava tube openings and blisters that were not modified and did not contain cultural materials. There are six archaeological features associated with Site 30316 including a marine shell scatter at one of the entrances (Feature A), a modified sink (Feature B), an opening with a bamboo fragment and water-worn cobble (Feature C), an opening with a stashed wooden implement (Feature D), a rock pile (Feature E), and an opening with a stashed bamboo pole (Feature F). Given the amount and type of debris present at Site 30316, it appears that the lava tube was utilized primarily during Precontact and into Historic times for shelter, temporary or recurrent habitation, and storage purposes. Each of the six features listed above is described in detail below.

Feature A

Feature A consists of a scatter of marine shell and urchin remains located just inside an opening of Site 30316 near the northeastern extent of the lava tube system (see Figure 129). At this location is a segment of the lava tube that is oriented roughly north/south, and has openings on the west and east sides. The west entrance consists of a bedrock shelf that stands 1 meter above the tube floor, and a domed ceiling that stands 1.8 meters above the floor (0.8 meters above the shelf; Figure 130). The eastern entry consists of cobbles and boulders that slope into the tube with a 2 meter wide by 1 meter tall opening. The interior area has a flat bedrock floor with a few large cobbles present, and the domed ceiling tapers from its maximum 1.8 meter height at the entrance to 1.5 meters tall for much of the 3 meter wide area between the two entrances. North of the two entrances, the tube extends 17 meters to the east, but the ceiling is very low and has a jagged floor. South of the two entrances, the tube constricts to a narrow passage that leads to a chamber. Southwest of the chamber is a low section that extends toward Feature B, but the low ceiling makes passage impossible. Extending to the southeast from the chamber is a passageway that accesses the *mauka* end of the lava tube system.

The marine shell scatter was observed in the area between the two entrances, and extends to the south into the small chamber that splits to the southeast and southwest, and covers an overall area of 8 meters (north/south) by 3 meters (east/west). The marine shell scatter is very light in density, and includes *Cypraea* sp. and *Echinoidea* sp. (Figure 131), charcoal, *kukui* nutshell, and an urchin (*Echinoidea* sp.) spine abrader that measures 3.5 centimeters long by 0.6 centimeters diameter (Figure 132). Feature A functioned as a temporary habitation with minimal occupation suggested by the limited marine shell accumulation.

Feature B

Feature B is a modified sink located at the northeast end of Site 30316, in an area surrounded by barren *pāhoehoe* lava containing numerous other non-cultural lava tube openings and *pāhoehoe* excavations (see Figure 129). The modified portion of the sink measures 10.2 meters long by 3 to 10 meters wide, while an unmodified shelf section of the sink continues to the northeast (Figures 133 and Figure 134). Modifications to the sink consist of two cleared overhang areas along the edges and a possible leveled area of cobbles at the center (Figure 135). The eastern most entrance to Site 30316 lava tube (Feature A) is situated along the southwest edge of the sink (Figure 136). The entrance to the tube measures 3.6 meters long by 0.8 meters tall and slopes slightly toward the west. Approximately 3.5 meters north of Feature A's entrance is a low-lying tube accessed from the upper section of the sink. The opening to this low-lying tube measures 2.2 meters long by 1.2 meters tall (Figure 137). It extends in a westerly direction for an undetermined distance (inaccessible due to low ceiling heights). On the interior ground surface roughly 30 centimeters from the opening is a single marine shell fragment.

Located roughly 3 meters northwest along the sink edge from the low-lying tube opening is a cleared overhang (Figure 138). The cleared overhang area measures 5.8 meters long by 2.4 meters wide and the opening measures 2 meters tall. Along the southern edge of the cleared area, at the base of the overhang opening is an alignment of loosely stacked cobbles on a fractured bedrock shelf (Figure 139). This cobble alignment measures 1.6 meters long and stands up to 0.9 centimeters tall. The interior of the cleared area consist of mostly level bedrock, and the cobbles cleared from the area were used in the alignment's construction. The overhang has an average ceiling height of 1.22 meters. Along the edges of the cleared area are scattered fragments of marine shell. Additional marine shell is concentrated along the northern overhang edge and against the alignment's northern edge.

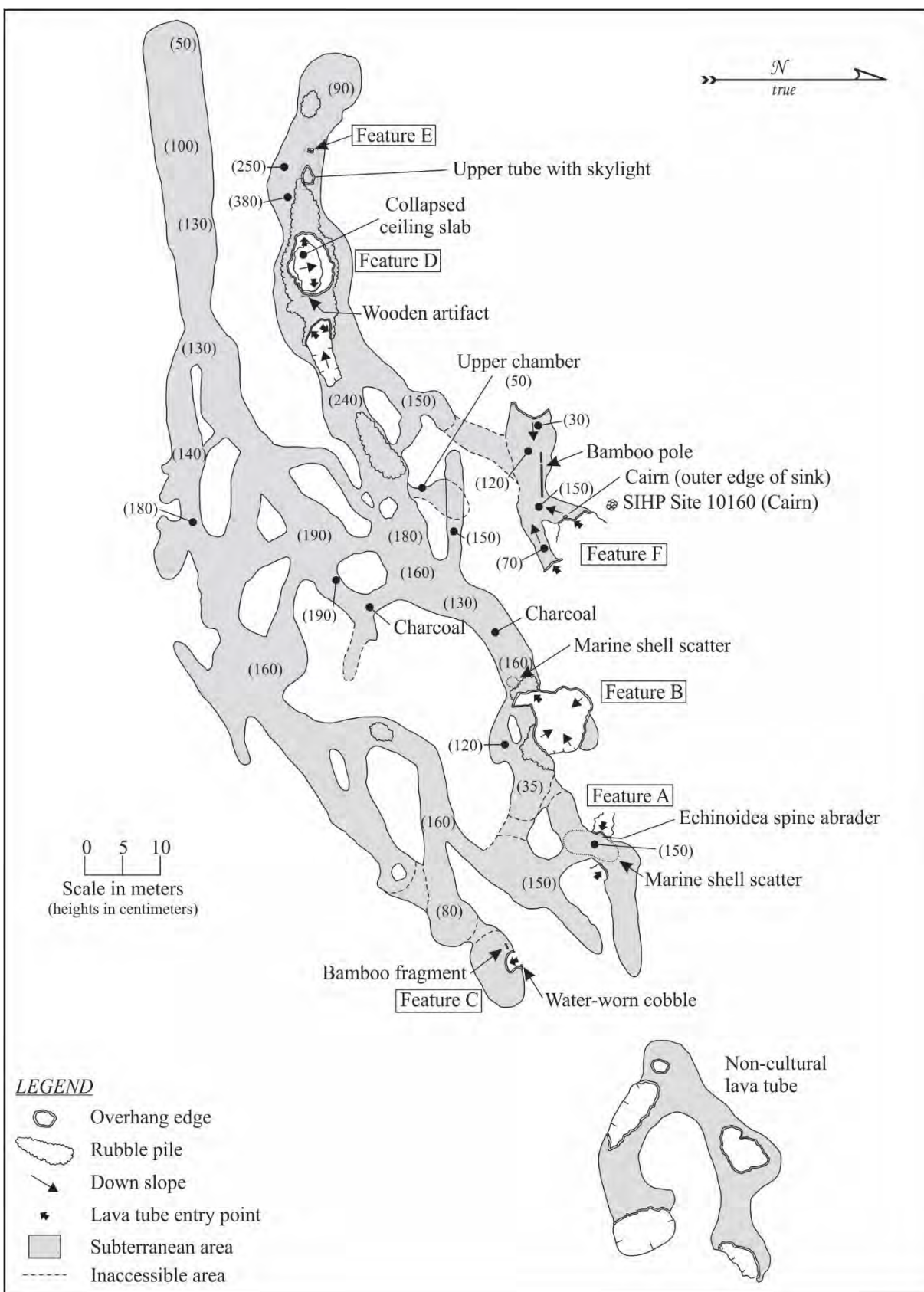


Figure 129. SIHP Site 30316 plan view.



Figure 130. SIHP Site 30316 Feature A, western opening, view to the east.



Figure 131. SIHP Site 30316 Feature A, *Echinoidea* sp. remains along the northwest wall of the lava tube, view to the northwest.



Figure 132. SIHP Site 30316 Feature A, *Echinoidea* sp. spine abradar.

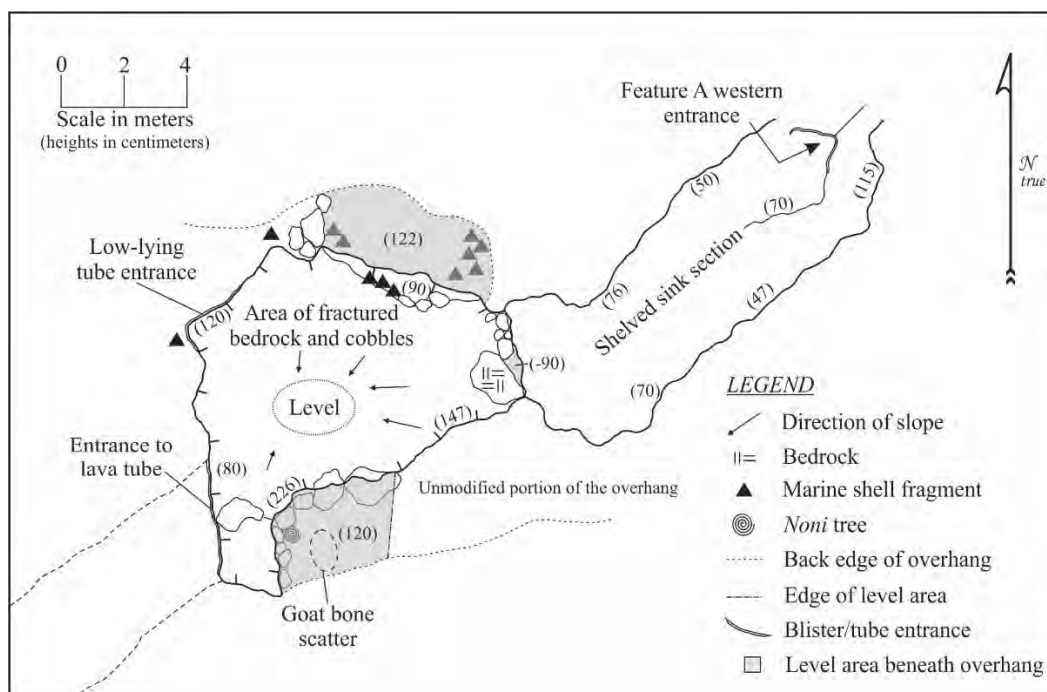


Figure 133. SIHP Site 30316 Feature B plan view.

Directly across the aforementioned overhang is a second modified overhang that is situated along the southern edge of the sink fronting the entrance to Feature A (see Figure 133). The modified/level area of this overhang measures 3.4 meters long by 2 meters wide and the opening is 2.2 meters tall (Figure 140). Beneath the overhang, floor to ceiling heights average 1.2 meters. No marine shell was observed within the modified portion of the overhang, but the ground surface consists of level bedrock that is cleared of cobbles, indicating that the shaded interior could have been used for shelter purposes. A goat skeleton is present in the central portion of the level area and a single *noni* (*Morinda citrifolia*) tree is growing along the west edge of the overhang. Beyond the cleared area, the overhang continues northeast along the sink's southeastern edge, but is unmodified and contains only jumbled cobbles on the bedrock floor.

Adjacent to the sink's northeastern edge is an unmodified shelf section that is a continuation of the natural sink (see Figure 133). This section of the sink measures 14 meters long by 4 meters wide. At the northeast end of this shelf section is the entrance to Feature A, a section of lava tube containing a marine shell scatter (see above).



Figure 134. SIHP Site 30316 Feature B, sink overview, northwest.



Figure 135. SIHP Site 30316 Feature B, base of sink, view to the east.

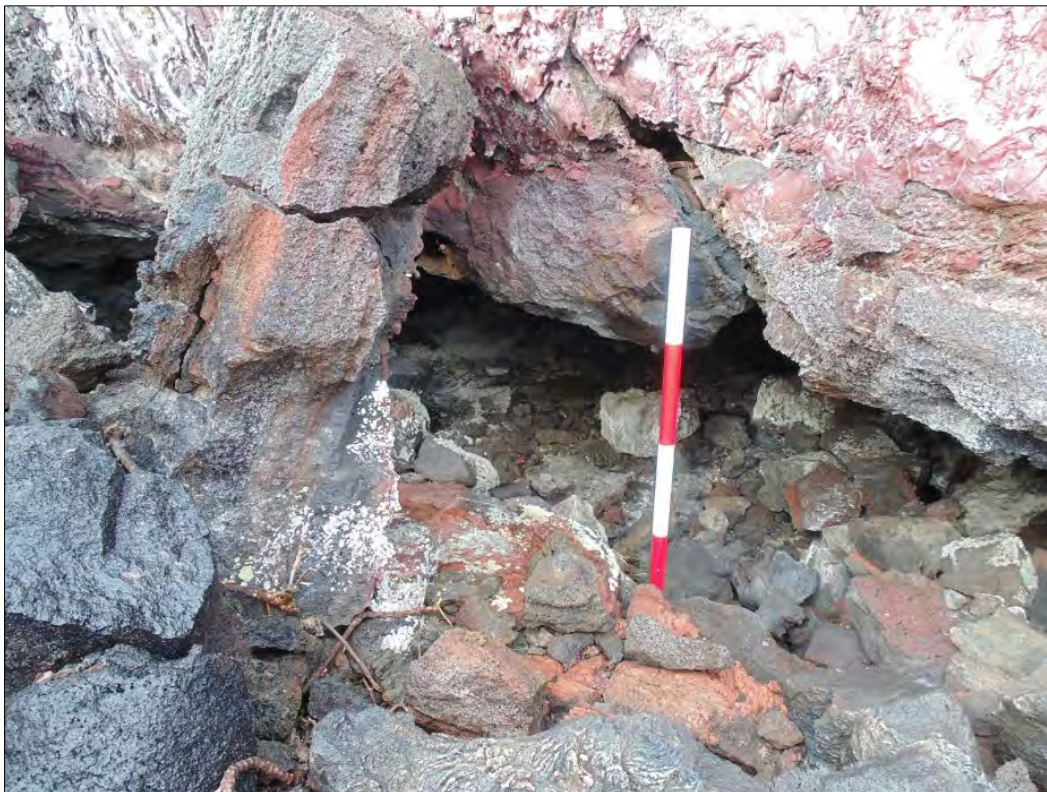


Figure 136. SIHP Site 30316, lava tube entrance in the southwestern portion of Feature B, view to the southwest.



Figure 137. SIHP Site 30316 Feature B, low-lying tube section opening, view to the northwest.

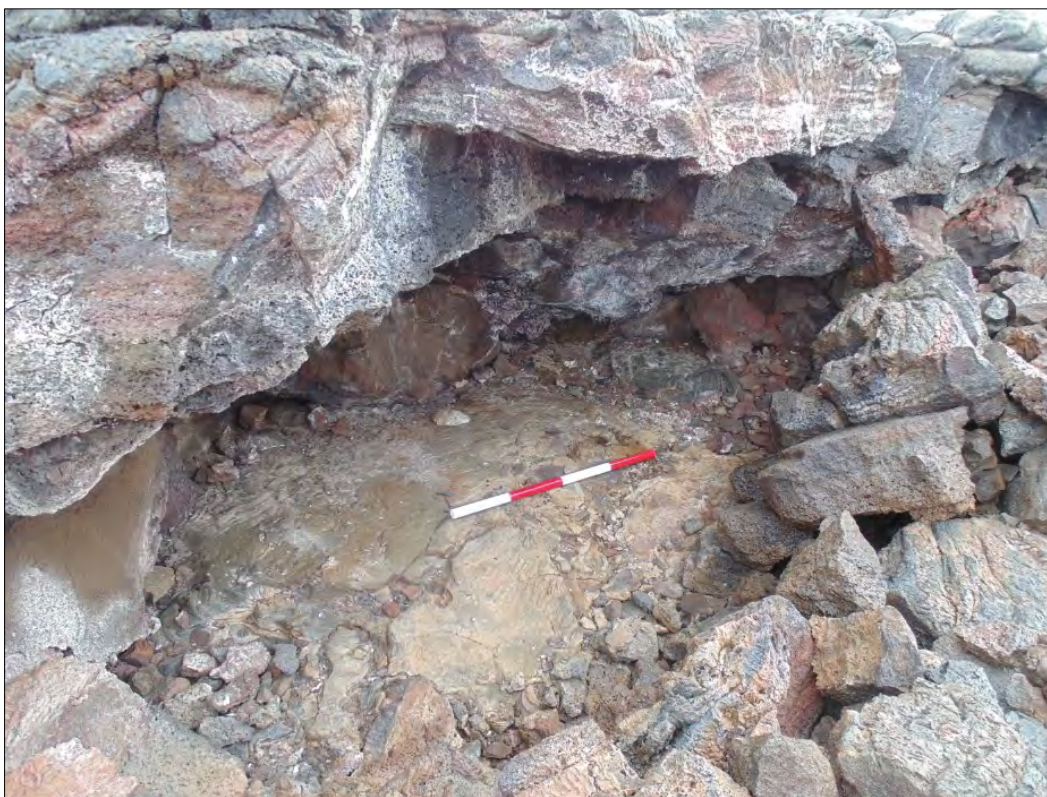


Figure 138. SIHP Site 30316 Feature B, modified overhang with stacking, view to the northeast.



Figure 139. SIHP Site 30316 Feature B, stacking beneath the overhang opening, view to the south.



Figure 140. SIHP Site 30316 Feature B, cleared overhang with goat bones, view to the south.

Feature C

Feature C is a portion of Site 30316 where two artifacts were observed near an entrance. Feature C is located at the *mauka*, or eastern end, of the lava tube system, connected to the *makai*, or western section, by a passage with a very low ceiling that was too narrow to inspect (see Figure 129). This section of lava tube lies beneath a domed *pāhoehoe* flow formation and the opening is located on the north side at the base of the slope (Figure 141). The opening measures 1.8 meters (north/south) by 1.3 meters (east/west), and the narrow entry measures 0.65 meters tall by 0.8 meters wide. Cobbles that are piled up below the western portion of the entrance appear to have fallen from the edge of the opening. The interior of the tube is a 6 meter (north/south) by 10 meter (east/west) chamber with a maximum ceiling height of 1.3 meters tall, and a floor of jagged bedrock with numerous ridges. This is a very difficult chamber to enter and move around in. Within the Feature C chamber are two artifacts: a section of bamboo and a water-worn cobble. The bamboo section, which measures 47 centimeters long by 7 centimeters in diameter, is located inside the tube along the north wall just *makai* of the piled cobbles at the entrance (Figure 142). The water-worn cobble, which measures 6 centimeters long by 5.3 centimeters wide by 2.5 centimeters thick, was observed amongst the cobbles on the ground along the east side of the entrance (Figure 143). The presence of these objects within a chamber that is difficult to access and uncomfortable to move around in may suggest that Feature C was primarily used for storage purposes.

Feature D

Feature D is the location of a carved, wooden implement that was found stashed within a rubble pile below the *makai* entrance to Site 30316 (see Figure 129). The area of the rubble pile in which the artifact was placed, is located directly below a bedrock bridge that separates two adjacent sinks at the *makai* end of Site 30316. The carved, wooden implement measures 1.8 meters long by 3.5-6.0 centimeters in diameter, and has a sweeping curved shape with a carved knob at each end. The curved implement was somehow carefully placed into the rubble pile from the top so that one end of the wooden piece can be seen within the upper portion of the rubble (Figure 144), and the other end can be seen protruding from the base of the rubble within the tube (Figures 145 and 146). Due to fear of damage, the artifact was not removed from the rubble to examine, and a complete view is not possible as a result of its current placement within the rubble pile. However, the carved knob ends and sweeping curved shape suggest it could be an *'iako*, or boom, of a single hull canoe (Buck 1957). Although the location of Feature D is at an easy access point to the Site 30316 lava tube system, and the interior of the tube has relatively tall ceiling heights at this location, no cobble modifications or any other cultural debris was observed. This suggesting that Feature D may have been a location reserved for storage.



Figure 141. SIHP Site 30316, opening of lava tube at Feature C, view to the east.



Figure 142. SIHP Site 30316, bamboo fragment inside the lava tube at Feature C, view to the north.



Figure 143. SIHP Site 30316, water-worn cobble at the Feature C lava tube entrance, overview to the east.



Figure 144. SIHP Site 30316 Feature D, carved knob at the upper end of the wooden implement, view to the east.



Figure 145. SIHP Site 30316 Feature D, carved knob at the lower end of the wooden implement, view to the north.

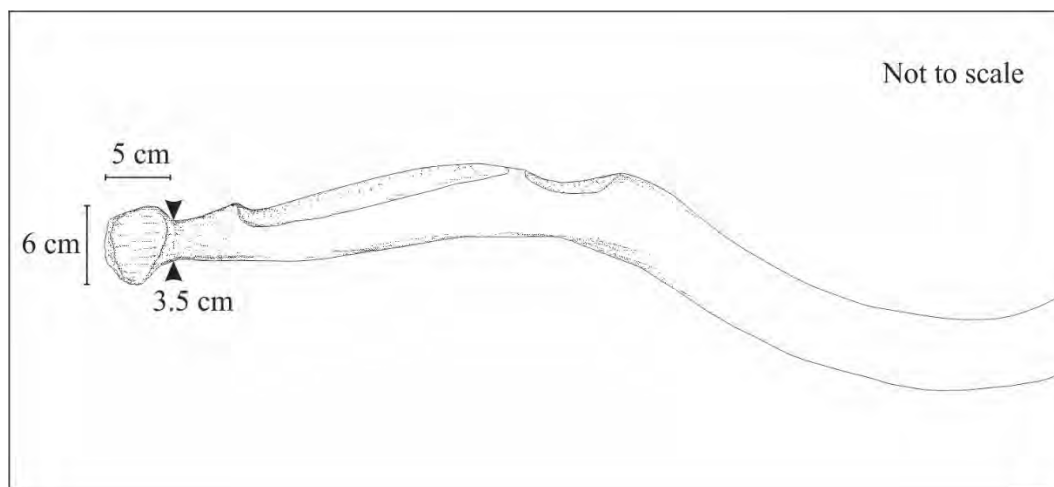


Figure 146. SIHP Site 30316 Feature D, sketch of lower end of wooden implement.

Feature E

Feature E is a small collection of cobbles located within the lava tube 11 meters west (*makai*) of the western most entrance to Site 30316 (see Figure 129). The collection consists of approximately ten medium to large ‘a ‘ā cobbles piled on the floor of the lava tube (Figure 147). It measures 70 centimeters long by 40 centimeters wide, and stands 30 centimeters tall. The cobbles are situated in the central part of the passage, on a very jagged bedrock floor. The function of the pile is not clear based solely on its surface attributes and location. Similar features in North Kona lava tubes have been interpreted as water catchment locations. It is possible that the pile may have been constructed under a former water drip, and used to hold a water collection container, but no water drips from the ceiling were observed at this location during the current fieldwork even though other active drips were present nearby after a fairly significant rainfall. The intended function of Feature E therefore remains uncertain.



Figure 147. SIHP Site 30316, Feature E cobble pile, view to the east.

Feature F

Feature F is a lava tube section within Site 30316 that contains a bamboo pole. Feature F is located on the northern side of the tube system, and is connected to the main section by a passageway with a very low ceiling that was too narrow to crawl through (see Figure 129). The entrance to this section of lava tube is located on a relatively elevated bedrock formation, 20 meters west of Feature B. Site 10160, a cairn, is located 2 meters north of the entrance sink, and a smaller cairn along the route of the Site 30315 trail is located on the edge of the entrance sink. The tube entrance at this location measures 1.6 meters wide by 0.8 meters tall (Figure 148). From the entrance, the tube descends a moderate slope to the southwest for 5 meters to a wider tube section with a 1.5 meter tall ceiling. The wider tube section measures 3 to 6 meters wide, and extends roughly 12 meters (east/west). A secondary, more constricted entrance descends to the wider portion from the east. At the western end of the wider portion is a 0.3 meter tall opening that is not accessible. The bamboo pole is located along the northern wall of the wider passage in two pieces (Figure 149). The eastern portion measures 4.1 meters long, and has a maximum diameter of 4 centimeters at its anterior end, and the western portion measures 1.4 meters long with a 1 centimeter diameter distal tip. The bamboo pole appears to be an implement used for fishing. No other cultural material was observed at Feature F, suggesting that the tube at this location was a fisherman's storage area for the bamboo pole.



Figure 148. SIHP Site 30316, entrance to Feature F lava tube segment, view to the south.



Figure 149. SIHP Site 30316 Feature F, bamboo pole, view to the north.

SIHP Site 30317

Site 30317 is a lava tube located in the northeast portion of the project area near the northern boundary of TMK: (3) 7-3-43:073, on a barren *pāhoehoe* flow containing several other lava tubes and numerous *pāhoehoe* excavations (see Figure 128). The tube can be accessed through three continuous openings within a lava overhang at the northeastern end of the accessible portion of the subsurface chamber (Figure 150). The *mauka* most opening measures 1.6 meters long by 0.65 meters tall; the middle opening, located roughly 1 meter west of the *mauka* opening, measures 1 meter wide by 0.9 meters tall; and the *makai* opening, located 1.3 meters west of the middle opening, measures 1.8 meters long by 90 centimeters tall. Fronting this opening, which appears to be the primary access point to the subsurface chamber, are two marine shell (*Cypraea* sp.) fragments on the bedrock ground surface.

The accessible portion of the lava tube measures roughly 60 meters long by about 6 meters wide on average (Figure 151). The interior of the tube consists of a jagged bedrock floor and has ceiling heights that vary from 27 to 137 centimeters tall (Figure 152). Two small skylights in the tube's ceiling are located west of the entrances. One of these is skylight's is located 7 meters east of the *makai* entrance, measuring 1.1 meters long by 0.5 meters wide, is large enough to access (Figure 153). No cultural material was observed within the tube itself.

Located 12.5 meters northeast of the *mauka* tube opening is a natural bedrock depression that is roughly rectangular in shape. This area of bedrock measures 6 meters long by 2.5 meters wide (Figure 154). Along the south edge of the bedrock area is a shallow overhang that extends the length of the depression. Along the west edge of the depression are two small water-worn cobbles. Given presence of water-worn cobbles and marine shell on the surface near Site 30317, and despite the lack of evidence, it seems likely that the interior of the lava tube, which is large enough to comfortably sit in once accessed, was likely used at least occasionally for shelter purposes.



Figure 150. SIHP Site 30317, three tube entrances, view to the southeast.

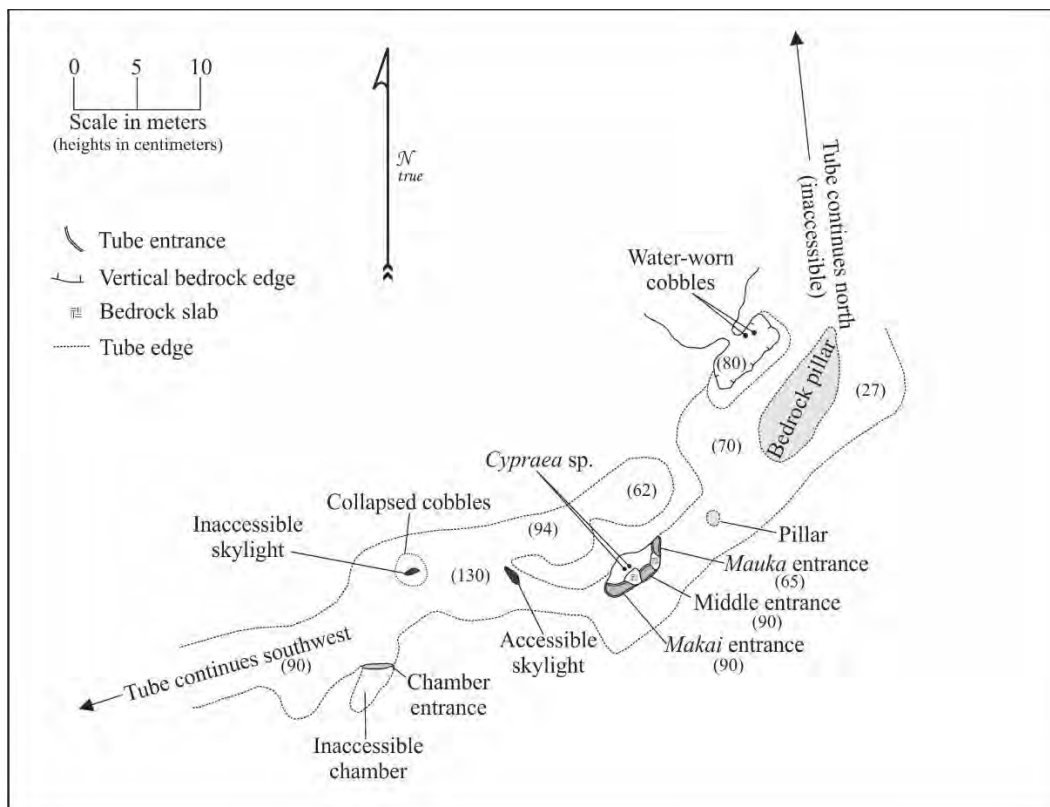


Figure 151. SIHP Site 30317 plan view.



Figure 152. SIHP Site 30317, interior of tube near entrances, view to the west.

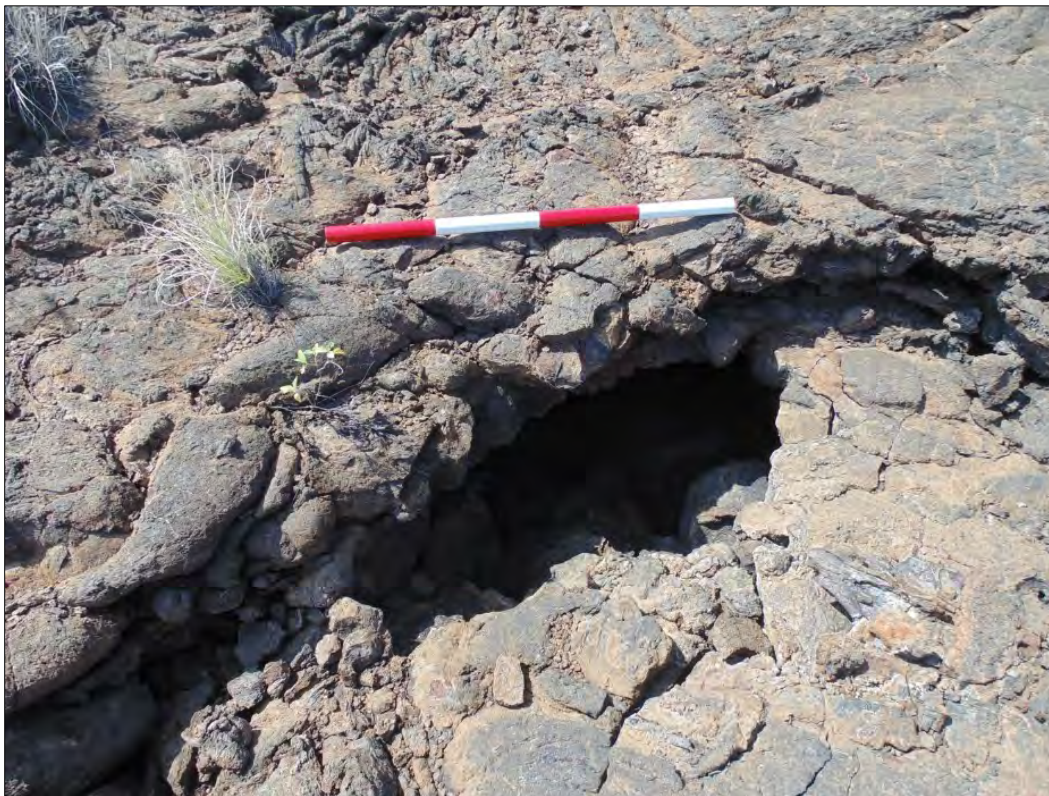


Figure 153. SIHP Site 30317, accessible skylight entrance, view to the west.



Figure 154. SIHP Site 30317, rectangular-shaped depression, view to the east.

SIHP Site 30318

Site 30318 is a lava tube located in the northeast portion of the project area on a barren *pāhoehoe* flow containing several other lava tubes, the Site 30315 trail, and numerous *pāhoehoe* excavations (see Figure 128). A large natural bedrock depression is located on the flow surface to the southeast of the tube's eastern termination. The tube itself measures 28 meters long by 3 to 5 meters wide (Figure 155). There are three vertical openings that access the lava tube (Figure 156). The eastern opening measures 3.8 meters long by 1 to 1.8 meters wide and has a maximum depth of 85 centimeters; the middle opening measures 1.4 meters long by 1.4 meters wide and has a maximum depth of 1 meter; the western opening measures 3.8 meters long by 2 meters wide and has a maximum depth of 1.1 meters. The easiest access to the tube is through the western end of the western opening (Figure 157). From that opening the tube extends in a westerly direction for 15 meters with an average width of 5 meters and floor to ceiling heights that range from 80 to 110 centimeters (Figure 158). The interior floor is fairly level and is comprised primarily of smooth bedrock with a few cobbles also present. Cultural material identified within Site 30318 includes a collection of unidentified fishbone located in the northwest portion of the tube near the north wall, and a small collection of bird bone with a few *kukui* (*Aleurites moluccana*) nutshell fragments on the floor against the tube's southern edge. The presence of this material suggests that Site 30318 was used on occasion as a habitation shelter.

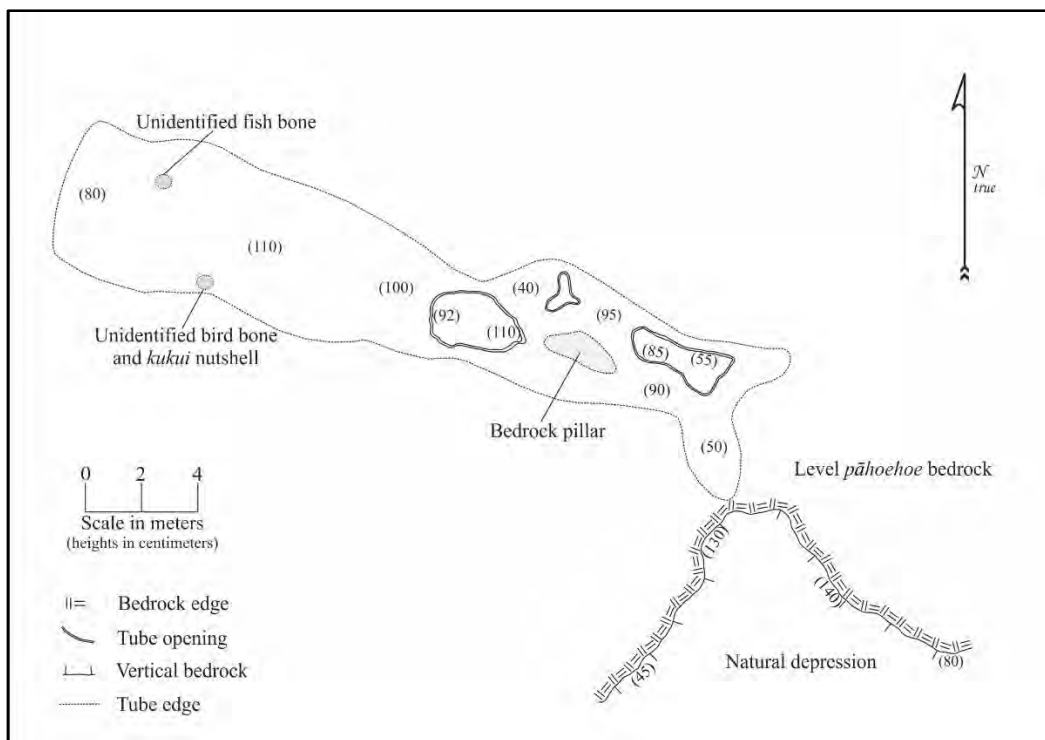


Figure 155. SIHP Site 30318 plan view.

SIHP Site 30319

Site 30319 is a lava tube located near the northern boundary of the project area, on a barren *pāhoehoe* flow containing numerous other lava tubes and *pāhoehoe* excavations and the Site 30315 trail (see Figure 128). The lava tube is accessed through two openings (Figure 159); the main entrance (*mauka* opening; Figure 160) at the east end of the tube and through a collapsed tube section (*makai* opening; Figure 161) located 26 meters to the west. Also, an inaccessible skylight in the ceiling of the tube is located between these two openings (Figure 162). The main entrance to Site 30319 is situated at the west end of a long, roughly 10 meter wide natural sink that extends 80 meters east of the entrance. The sink, near the tube opening, is most easily accessed from the west following a natural bedrock incline that measures 3 meters long by 1 meter wide and traverses the northern edge of the sink from west to east. Within the sink at the *mauka* opening of Site 30319 (Figure 163) are two areas of cleared/piled cobbles, one fronting the tube's entrance along its north edge and the other fronting the opening's south edge. A single marine shell (*Cypraea* sp.) fragment was noted on the ground surface within the sink near the base of the natural incline. The Site 30319 lava tube is described below in two sections; the first section extends from the *mauka* opening west to the *makai* opening, and the second section extends from the *makai* opening west to the western termination of the subsurface passageway.



Figure 156. SIHP Site 30318, series of tube openings, view to the northwest.



Figure 157. SIHP Site 30318, main entrance to the lava tube, view to the northwest.



Figure 158. SIHP Site 30318, interior of the lava tube, view to the west.

At the main entrance, the *mauka* opening measures 3.3 meters long by 1.14 meters tall. The subsurface passageway extending from the *mauka* opening to the *makai* opening measures 26 meters long by 5 to 6.5 meters wide and has ceiling heights that range from 0.85 to 2 meters tall. The ground surface in this section of the lava tube consists of sloping boulders extending 5.5 meters in from the opening, where it transitions to a level, but rough bedrock floor. There are two side passages along the tube edges. One is located along the northern wall, extending in a north direction. This side passage also has a sky light that is mostly obscured on the surface by cobbles placed on top of it (see Figure 159). A single urchin spine (*Echinoidea* sp.) was observed on the ground surface in this passage. The second side passage is located along the southern wall, approximately 1.25 meters above the tube floor. It extends 22.5 meters to the west from the *mauka* opening. A bamboo (fishing) pole is stashed within this passage (Figure 164). The bamboo pole measures 4.2 meters long and at its widest 3.5 centimeters in diameter. A small rock pile fronts the passage with the bamboo pole, at the base of the inaccessible skylight. Approximately 9 meters west of the rock pile, along the northern tube edge is a C-shaped enclosure (see Figure 159). This enclosure is built against the tube wall. It measures 1.8 meters long by 1 meter wide and is constructed of loosely stacked small to medium cobbles with a single upright slab along its east edge. The cobble edges have heights that vary from 39 to 78 centimeters tall.

In addition to the bamboo pole, cultural material on the tube floor in this section of Site 30319 includes marine shell (*Cellana* sp. and *Drupa* sp.), urchin fragments (*Echinoidea* sp.), two coral fragments, three coral abraders (Coral Abraders #1 through #3), a possible coral abrader, and two small sticks of wood. Coral Abrader #1 is located 2.5 meters northwest of the inaccessible skylight on the tube floor. It measures 8 centimeters in diameter by 4 centimeters thick (Figure 165). The second abrader (Coral Abrader #2) is located 6 meters west of the inaccessible skylight on the tube floor. It measures 6.5 meters long by 5 centimeters wide by 4.2 centimeters thick (Figure 166). The third abrader (Coral Abrader #3) is located 3.5 meters southeast of the inaccessible skylight, near the passage opening containing the bamboo pole. This abrader measures 12 centimeters long by 7 centimeters wide by 5 centimeters thick (Figure 167). This section of the lava tube, between the two openings at Site 30319, given the amount/type of cultural material and constructed features present, appears to have been utilized on a recurrent basis as the primary Precontact habitation area, and may have also been used for storage during the early Historic Period, as suggested by the presence of the bamboo fishing pole stashed in the side chamber.

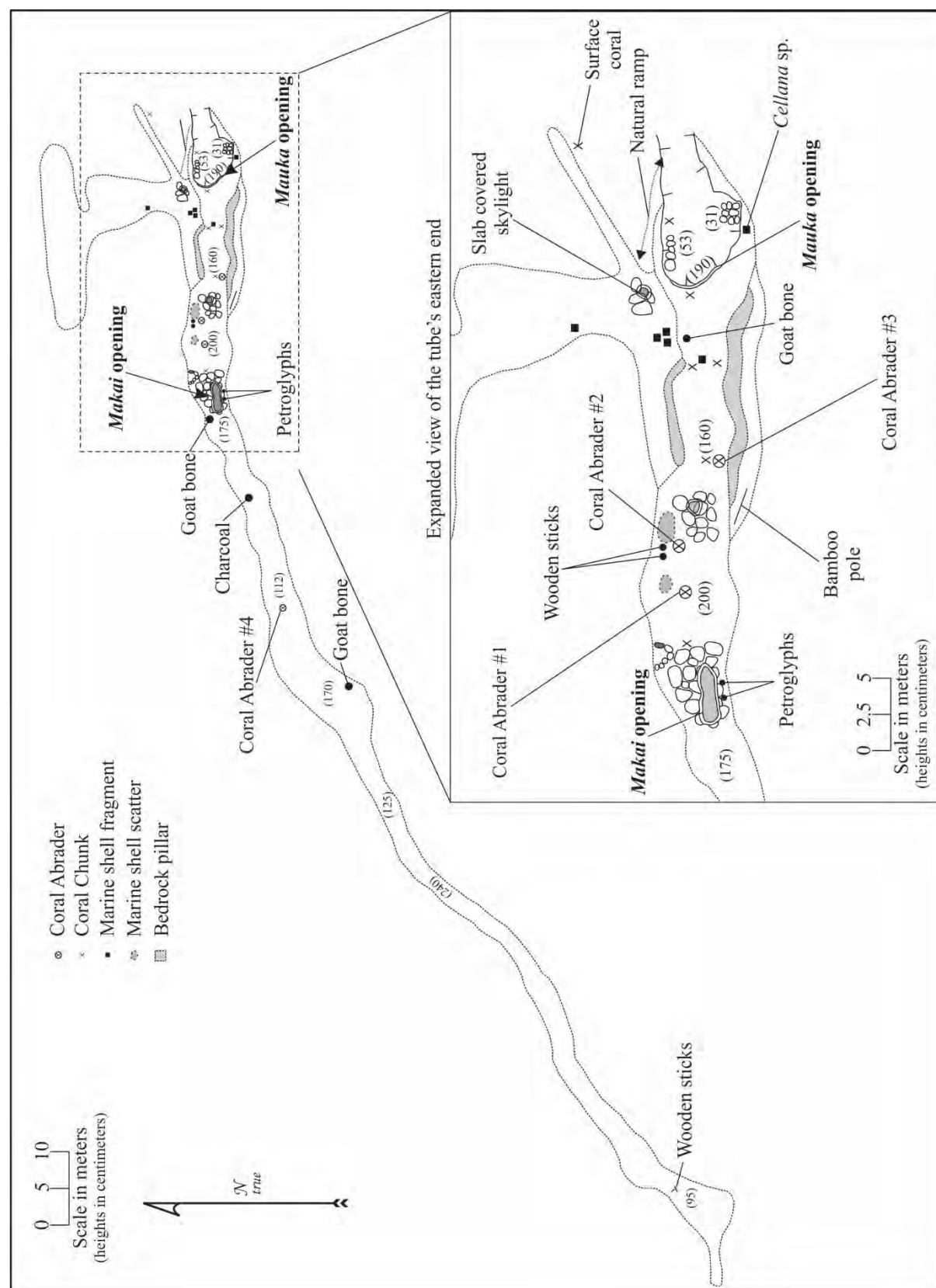




Figure 160. SIHP Site 30319, general sink area at the tube's main entrance, view to the west.



Figure 161. SIHP Site 30319, collapsed tube opening, view to the southeast.



Figure 162. SIHP Site 30319, inaccessible skylight located west of the tube opening, overview.



Figure 163. SIHP Site 30319, main entrance to the tube, view to the west.



Figure 164. SIHP Site 30319, bamboo pole in passage along the southern tube wall, view to the east.

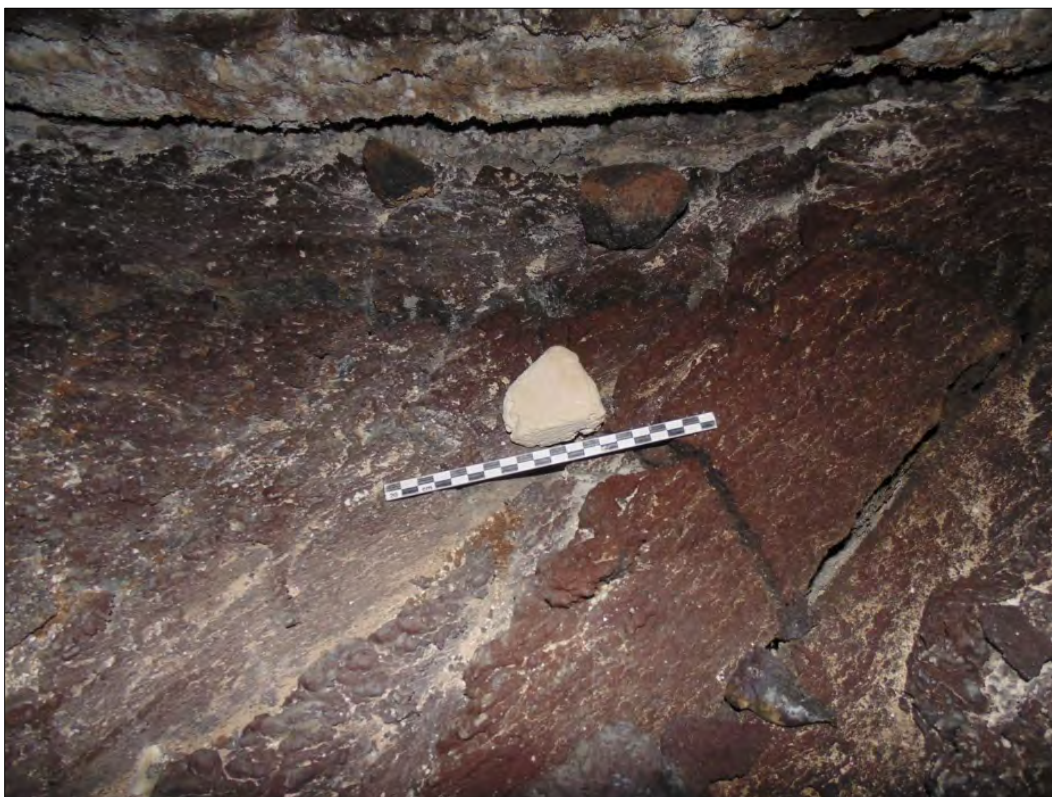


Figure 165. SIHP Site 30319, Coral Abrader #1, overview.



Figure 166. SIHP Site 30319, Coral Abrader #2, overview.



Figure 167. SIHP Site 30319, Coral Abrader #3, overview.

The *makai* opening to Site 30319 is a collapsed section the lava tube's ceiling that measures 4.25 meters long by 1.6 meters wide (see Figures 159 and 161). The top of the collapsed section stands 0.7 to 1.5 meters tall above the jumbled/collapsed cobbles at the base of the opening. Beneath this collapsed opening, two petroglyphs were identified pecked into a smooth bedrock surface along the southern wall of the lava tube (Figures 168 and 169). The petroglyphs consist of an anthropomorphic figure with nearby zoomorphic figure within a 75 centimeter long by 20 centimeter area. The anthropomorph is a reclining human figure (18 centimeters tall by 14 centimeters wide) that has one arm up and one arm down with an open base triangle body and both legs bent in the same direction (Figure 170). The zoomorph appears to be a goat figure (15 centimeters wide by 10 centimeters tall) with two legs and a possible tail depicted (Figure 171). The presence of the goat motif (like that of the bamboo pole described above) indicates early Historic use of the Site 30319 lava tube.

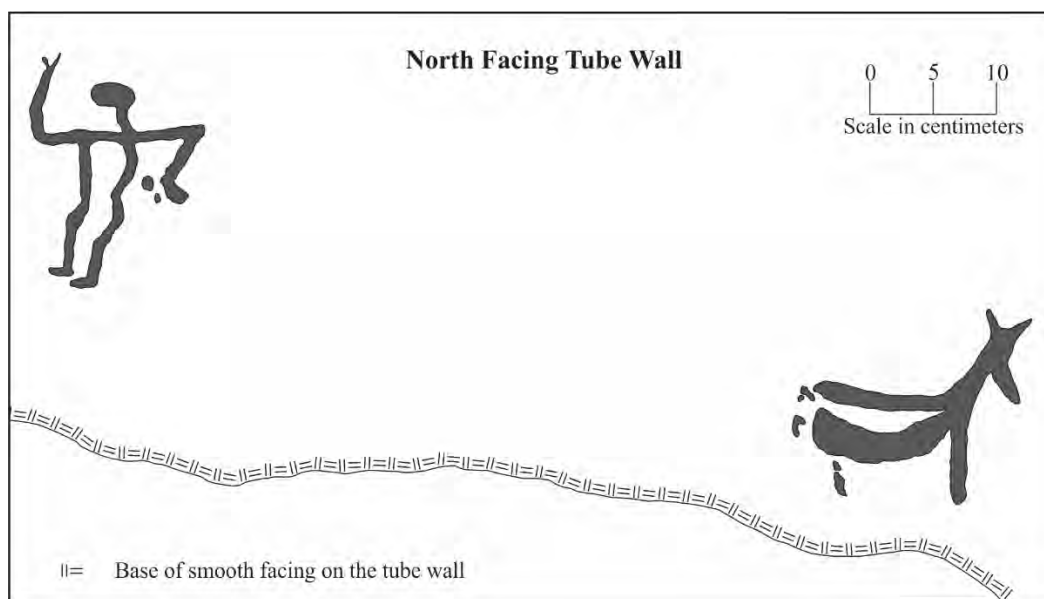


Figure 168. SIHP Site 30319 petroglyph drawing.

The western section of the tube extending from the *makai* opening to where the tube becomes inaccessible to the west, measures approximately 130 meters long with widths varying from 2.5 to 6 meters wide and ceiling heights ranging from 0.95 to 2.4 meters tall (see Figure 159). The lava tube floor in this section slopes gently to the west and consists of rough, jagged *pāhoehoe*. Cultural material observed within this portion of the site includes a small charcoal pile located 12 meters southwest of the collapsed section, a coral abrader (Coral Abrader #4) located 27.5 meters from the collapsed section, and two unidentified small wooden sticks at the back of the tube. The coral abrader appears complete, measuring 6 centimeters in diameter by 4 centimeters thick (Figure 172). The two wooden sticks, each measuring 50 centimeters long by 7 millimeters thick (Figure 173), are situated near the western termination of the lava tube, and resemble the sticks noted in the eastern portion of Site 30319. Two piles of goat bone are also present within the western portion of the lava tube.

SIHP Site 30320

Site 30320 is a blister with marine shell that is located in the central portion of the study area (see Figure 128). The blister is located within a raised *pāhoehoe* outcrop of a 3,000-5,000 year old lava flow (h1y-1) that is surrounded by a 1,500-3,000 year old lava flow (h2-2; see Figure 6). Site 30320 is accessed through a vertical entrance within a large crack at the top of the outcrop (Figures 174 and 175). The entrance measures 80 centimeters long by 40 centimeters wide and stands 1.2 meters above the interior floor. The blister measures 17 meters long by 5 meters wide overall, with ceiling heights that range from 30 to 88 centimeters. The floor of the blister is mostly level, but consists of jagged *pāhoehoe*. There are five small marine shell (*Cypraea* sp.) fragments within the blister near the opening.

On the bedrock surface, above the blister, the natural crack extends southwest and northeast from the opening (Figure 176). The crack to the southwest of the opening has been partially excavated, and two marine shell (*Cypraea* sp.) fragments were observed within the excavated area. A single *'ili'ili* pebble was also observed on the ground surface 2.3 meters east/southeast from the blister's opening. The presence of the marine shell and *'ili'ili* within and nearby the blister suggests that Site 30320 was used, at least on one occasion, as a shelter.



Figure 169. SIHP Site 30319, petroglyphs on the tube wall below the southern edge of the *makai* opening, view to the south.



Figure 170. SIHP Site 30319, reclining human figure petroglyph, view to the south.



Figure 171. SIHP Site 30319, petroglyph image resembling a goat, view to the south.



Figure 172. SIHP Site 30319, Coral abrader #4 in the western portion of the tube, overview.



Figure 173. SIHP Site 30319, unidentified wood sticks near the western termination of the lava tube, view to the west.

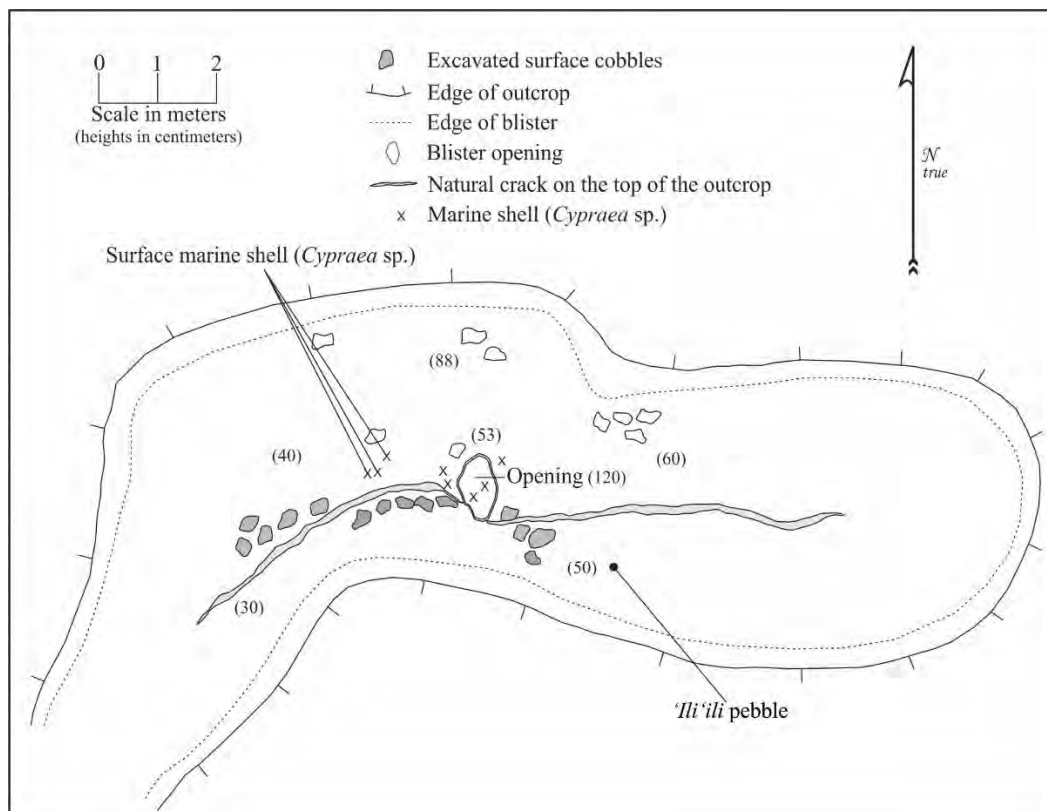


Figure 174. SIHP Site 30320 plan view.

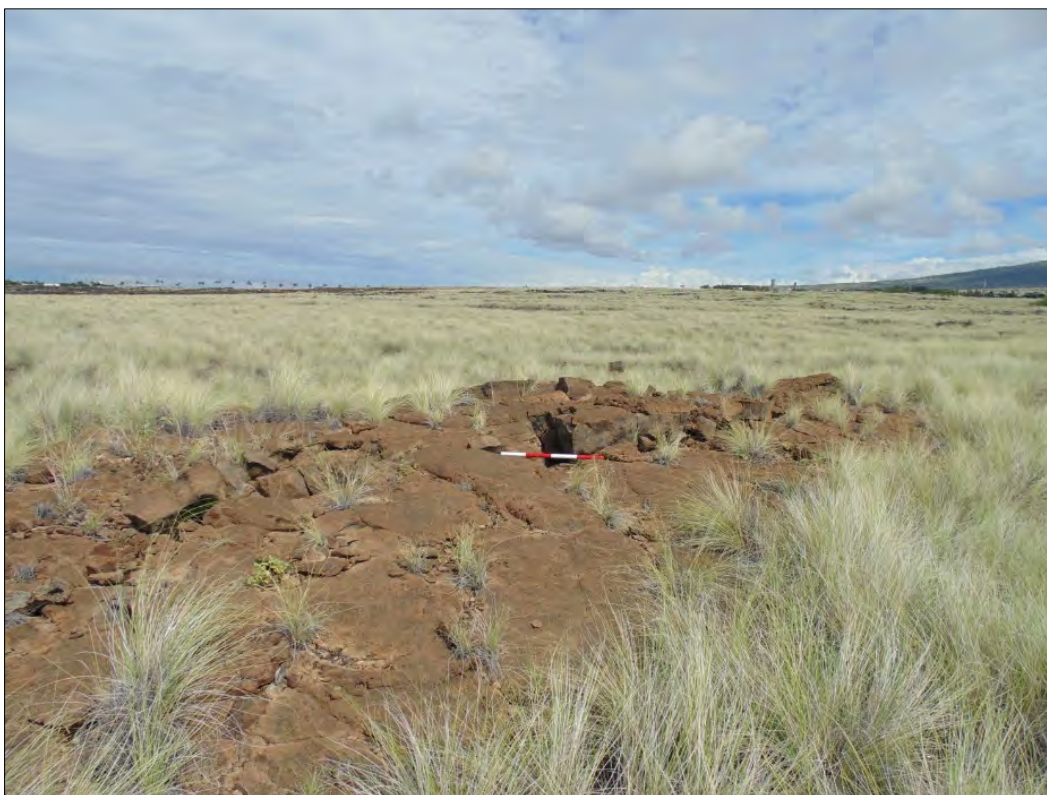


Figure 175. SIHP Site 30320, outcrop and blister opening, view to the north.

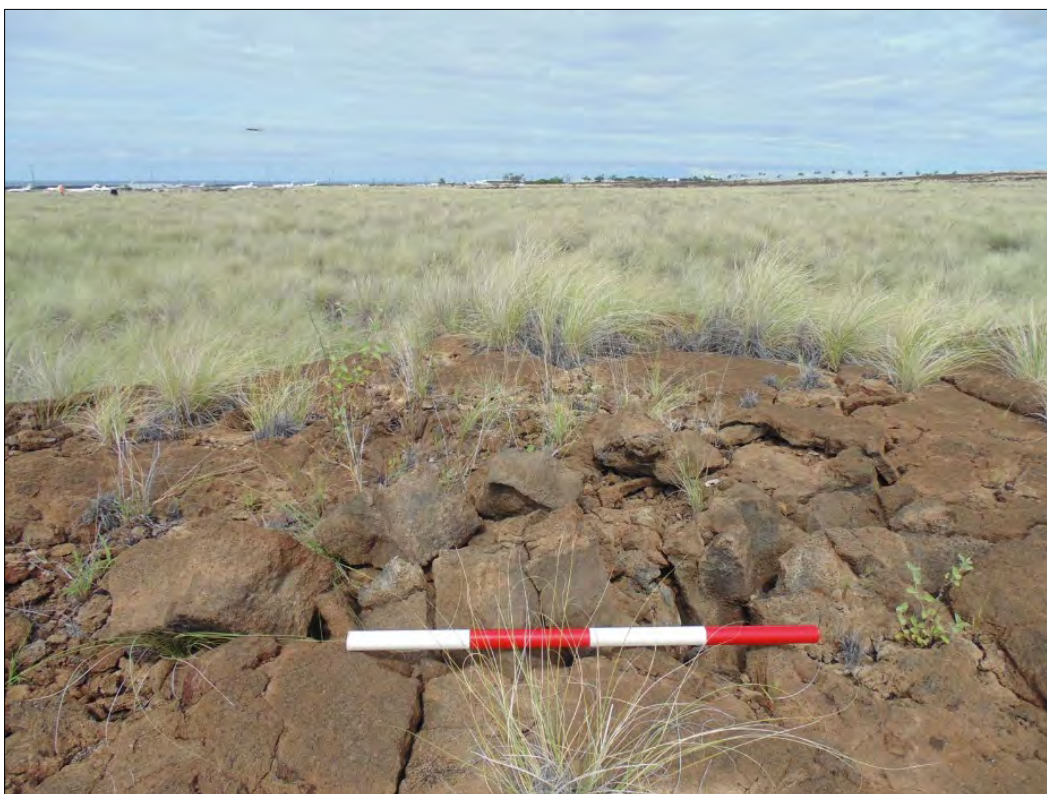


Figure 176. SIHP Site 30320, excavated crack to the southwest of the opening, view to the northwest.

Rock Rings

Thirty-five features interpreted as rock rings were identified within the current study area (Table 9 and Figure 177). Rock rings are minimally constructed circular or semi-circular arrangements of cobbles and slabs that surround, or partially surround, an interior space on a flat *pāhoehoe* bedrock surface. These features are typically single course, piled constructions. The height of the ring is generally determined by the height of the largest rock used in the construction (usually no more than 20 to 40 centimeters tall), and the rock material is always locally available *pāhoehoe* found in the immediate vicinity of the feature. No cultural debris was associated with any of the rock ring features. Five of the rock rings identified within the current study area (SIHP Site 10190 and Features C, E, F, and G of SIHP Site 10161) were previously recorded by Barrera (1985a, 1989) and interpreted as C-shaped structures used for Precontact Period temporary habitation purposes (see Appendices A and B). The other thirty rock rings were newly recorded during the current fieldwork and include two that were grouped into the Site 10161 complex (Features H and I) and twenty-eight that were assigned to twenty-seven distinct SIHP sites (twenty-six single feature sites, SIHP Sites 30321 to 30325 and 30327 to 30347, and one site with two adjoining rock rings, SIHP Site 30326). The six rock ring features of the previously recorded Site 10161 complex are described above, but are summarized here along with the features of

Table 9. Rock ring features identified within the current study area.

<i>Site #*/Feat. #</i>	<i>Shape</i>	<i>Dimensions (m)**</i>	<i>Type</i>	<i>Opens to</i>	<i>Lava flow</i>
10161 Feat. C	Semi-circular	2.2 x 1.7 x 0.3	Open	East	h2-2
10161 Feat. E	Circular	2.1 x 1.9 x 0.2	Closed	-	h2-2
10161 Feat. F	Circular	2.2 x 2.0 x 0.2	Closed	-	h2-2
10161 Feat. G	Semi-circular	2.1 x 1.8 x 0.2	Open	East	h2-2
10161 Feat. H	Semi-circular	2.0 x 1.6 x 0.2	Open	North	h2-2
10161 Feat. I	Circular	1.8 x 1.6 x 0.2	Closed	-	h2-2
10190	Semi-circular	2.4 x 1.2 x 0.46	Open	South	h1y-1
30321	Semi-circular	1.8 x 1.8 x 0.18	Open	South	h1y-1
30322	Circular	1.9 x 1.8 x 0.27	Closed	-	h1y-1
30323	Semi-circular	1.4 x 1.3 x 0.55	Open	Southeast	h1y-1
30324	Circular	2.8 x 2.4 x 0.36	Closed	-	h1y-1
30325	Semi-circular	2.2 x 1.0 x 0.26	Open	Southeast	h1y-1
30326 Feat. A	Circular	2.0 x 1.8 x 0.47	Closed	-	h1y-1
30326 Feat. B	Circular	2.2 x 1.9 x 0.15	Closed	-	h1y-1
30327	Circular	1.75 x 1.5 x 0.19	Closed	-	h1y-1
30328	Semi-circular	1.7 x 0.8 x 0.33	Open	West	h1y-1
30329	Circular	1.6 x 1.3 x 0.25	Closed	-	h2-1
30330	Semi-circular	1.8 x 1.5 x 0.4	Open	Southeast	h2-2
30331	Semi-circular	1.6 x 1.45 x 0.28	Open	Northwest	h2-2
30332	Circular	2.0 x 1.8 x 0.18	Closed	-	h2-2
30333	Semi-circular	1.8 x 1.5 x 0.28	Open	North	h2-2
30334	Circular	1.3 x 0.8 x 0.18	Closed	-	h2-2
30335	Semi-circular	1.3 x 1.2 x 0.2	Open	Northeast	h2-2
30336	Semi-circular	1.8 x 1.8 x 0.2	Open	Northwest	h2-2
30337	Circular	2.3 x 2.2 x 0.2	Closed	-	h2-1
30338	Semi-circular	2.15 x 1.7 x 0.22	Open	Southeast	h2-2
30339	Semi-circular	1.8 x 1.5 x 0.55	Open	West	h2-2
30340	Circular	1.5 x 1.5 x 0.2	Closed	-	h2-2
30341	Semi-circular	2.5 x 1.9 x 0.21	Open	Southeast	h2-2
30342	Semi-circular	1.6 x 1.3 x 0.45	Open	South	h2-2
30343	Circular	2.0 x 1.3 x 0.19	Closed	-	h2-2
30344	Semi-circular	1.8 x 1.3 x 0.3	Open	North	h2-2
30345	Semi-circular	1.5 x 1.3 x 0.2	Open	East	h2-2
30346	Semi-circular	1.8 x 1.6 x 0.25	Open	North	h2-2
30347	Semi-circular	1.8 x 0.4 x 0.35	Open	West	h2-2

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

**Length x width x height.

5. Fieldwork



Figure 177. Distribution of rock ring features identified within the current study area.

While Barrera (1985a, 1989) previously interpreted the five rock ring features he recorded within the current study area as C-shaped structures used for Precontact Period temporary habitation purposes, the identification of thirty additional features of this type, and further inspection of all of the rock rings identified, suggests that they are actually a unique feature type, distinct from the ubiquitous C-shaped structures widely described elsewhere in Hawaiian archaeological literature (c.f. Kirch 1985). Although the specific function and age of the rock ring features is not known, it seems unlikely (although not impossible), given their small size, low walls, and various shapes, that they were utilized for temporary habitation purposes. The attributes, distribution, and possible associations of the rock ring features contained within the study area are summarized below, and a number of possible alternative functional interpretations for these features are discussed.

The rock ring features recorded within the current study area are all small, low constructions, ranging from 1.3 to 2.8 meters in diameter and standing 0.18 and 0.55 meters tall. The rock rings take two primary forms, circular and semi-circular (see Table 9). The circular rock rings (n=14; 40%) entirely surround an interior space with no opening; the semi-circular rock rings (n=21; 60%) partially surround an interior space that is open on the opposite side. The semi-circular rock rings are similar in appearance to C-shaped structures, but typically C-shapes located in a given geographic context (ones that were utilized for Precontact temporary habitation purposes) are all oriented in a like manner, usually determined by the direction of the nighttime breezes (C-shapes in this part of North Kona often open to the west to block the prevailing off-shore breezes that blow down from the mountains at night). The semi-circular rock rings within the current study area open in several directions, including five to the southeast (24%), four to the north (19%), three each to the east (14%), south (14%) and west (14%), two to the northwest (10%), and one to the northeast (5%).

The rock rings, which are only found on smooth, flat, *pāhoehoe* bedrock surfaces within the current study area, are distributed in two general areas. Twenty-five of the rock ring features (71%) are located on the h2-2 lava flow and the southern edge of the h2-1 lava flow in the central to northeastern portion of the study area, while the other ten rock ring features (29%) are located on the h1y-1 lava flow in the southwestern portion of the study area (see Figure 177). The h2-2 lava flow, the youngest flow surface within the study area, consists entirely of smooth, silvery-black *pāhoehoe*, and contains twenty-three (two-thirds) of the rock ring features, distributed from southwest to northeast across the flow surface. The two rock rings along the southern edge of the h2-1 mixed *pāhoehoe* and 'a'ā lava flow occur on flat *pāhoehoe* surfaces near the features on the h2-2 lava flow. The remaining ten rock ring features are distributed from northwest to southeast across a level *pāhoehoe* surface of the h1y-1 lava flow (the oldest lava surface within the study area, consisting of mixed *pāhoehoe* and 'a'ā) west of the Māmalahoa Trail (SIHP Site 2) alignment, near the southwestern edge of a raised section of 'a'ā flow. At three different locations, six each of the rock ring features are clustered fairly close to one another; (1) within the Site 10161 complex on the h2-2 lava flow (Features C, E, F, G, H, and I), (2) south of the Site 10161 complex on the H2-2 lava flow (SIHP Sites 30331, 30332, 30333, 30334, 30335, and 30336), and (3) in the southwestern portion of the study area on the h1y-1 lava flow (SIHP Sites 10190, 30321, 30322, 30323, 30324, and 30325). The other seventeen rock ring features are all fairly widely dispersed.

The clusters of rock ring features at the Site 10161 complex on the h2-2 lava flow and on the h1y-1 lava flow in the southwestern portion of the study area are both associated (by proximity) with cairns (see Figure 48). Three cairns interpreted as Historic survey markers (SIHP Sites 10189 and 30352) are located in the immediate vicinity the cluster of rock rings on the h1y-1 lava flow, and five cairns (Features A, B, D, J, and K), one of which appears to be a Historic survey marker (Feature B), are located in the immediate vicinity of the Site 10161 rock rings. In a more general sense, all of the rock ring features on the h2-2 lava flow south of the Site 10161 complex are also associated by proximity with a Historic survey of the Kalaoa-'O'oma Homesteads, as they occur nearby the route of a road that was laid out by surveyors in 1902, but never built (see discussion of cairns below). Two of the rock ring features within the Site 10161 complex (Features C and H), and the Site 30329 rock ring, occur nearby the route of the Site 30315 trail. Two other rock rings (SIHP Sites 30345 and 30346) occur near the *mauka* termination of the Site 29273 trail. One of the rock rings on the h1y-1 lava flow (SIHP Site 30328) is situated in close proximity to several *pāhoehoe* excavations of Site 30372 (interpreted as the source of rock material for the construction of the 1847 Government Road; see below), and was built of *pāhoehoe* material taken from those excavations.

Given the formal attributes, distribution, and associations of the rock ring features recorded within the study area the following potential functional interpretations are offered: (1) that the rock rings are in fact C-shaped structures used for Precontact temporary habitation purposes, and that they may have been located along trail routes that are (for the most part) not evident and not marked across the *pāhoehoe* bedrock surfaces; (2) that they are associated with the collection or processing of a specific, but unknown, resource of the lower barren zone of the study *ahupua'a*; or (3) that they are associated with the 1902 survey of the Kalaoa-'O'oma Homesteads. As discussed above, given the lack

of associated cultural debris and the various orientations and formal attributes of the rock rings, the Precontact use of these features for temporary habitation purposes seems unlikely.

That these features were somehow related to the collection or processing of local resources such as plants (e.g. the collecting or drying of *pili* grass or medicinal herbs during the Precontact Period), animals (e.g. creating nesting habitat or trapping birds during the Precontact Period, or trapping goats during the Historic Period), or *pāhoehoe* (e.g. the stock piling rock materials for building purposes during any of the relative time periods), seems plausible, but it is difficult to explain how these rock rings would have been used in any of the ventures. The stock piling of rock material for construction purposes during the Historic Period seems the most likely of any of these scenarios, as the rocks could have been piled in a particular location and then picked up by cart and hauled across the *pāhoehoe* to the *makai* Government Road where they then could have been transported anywhere, or used to build the road itself; the rock rings could represent the base stones of piles that were left when the cart was full.

Along similar lines, given the relationship between several of the rock rings and the Historic survey markers recorded within the study area, it seems quite possible that these features are associated with the 1902 survey of the Kalaoa-‘O‘oma Homesteads (see Figure 31). The rings could represent stones used to hold the base of the transit tripod in place at various locations on the *pāhoehoe* surfaces while the surveyors were taking measurements during the months of May and April of that year (Wall 1902), or they could mark triangulation points used in the geodetic survey, or they could represent the bases of cairns that were built and later dismantled, or perhaps been used as temporary shelter locations. Again, however, the lack of associated cultural debris at any of the rock rings is troubling. If these features were indeed created during the Historic Period, one would expect to find at least some Historic debris, such as bottle glass or metal, in their vicinity.

Unless found in ethnographic-historical resources through direct ethnographic analogy, or through direct informant testimony, it is unlikely that the specific function of these rock ring features will ever be known. Regardless of function, the formal attributes of all twenty-nine rock ring sites recorded within the study area are described in detail below. Significance evaluations and treatment recommendations for the rock ring sites are presented at the end of this report.

SIHP Site 10190

Site 10190, originally documented by Barrera (1985a) as a C-shaped enclosure (see Appendix A), is a semi-circular rock ring located *makai* of the Māmalahoa Trail (SIHP Site 2), on a level *pāhoehoe* bedrock surface (see Figure 177). The site is situated 4.2 meters southeast of another rock ring (Site 30322) and approximately 30 meters east of the Site 10189 cairn (Figure 178). Site 10190 measures 2.4 meters long by 1.2 meters wide and opens to the south (Figure 179). It is constructed of roughly 40 small to medium *pāhoehoe* slabs and a few small cobbles (Figure 180), and has heights ranging from 8 centimeters (at the south edge) to 46 centimeters (along the north edge). The cobbles used to construct the semi-circular ring are taken from the fractured edges of the level *pāhoehoe* surface that surrounds Site 10190.

SIHP Site 30322

Site 30322 is a semi-circular rock ring located *makai* of the Māmalahoa Trail (SIHP Site 2) on a level *pāhoehoe* bedrock surface (see Figure 177). The site is situated 4.2 meters northwest of Site 10190 and 8 meters east/southeast of Site 30321 (see Figure 178). Site 30322 measures 1.8 meters long by 1.8 meters wide and opens to the south (Figure 181). It is constructed of roughly 30 small to medium *pāhoehoe* slabs that are piled to a maximum height of 4 centimeters at south end, and 18 centimeters along the north edge (Figure 182). The cobbles used to construct the semi-circular ring are taken from the fractured edges of the level *pāhoehoe* surface.

SIHP Site 30321

Site 30321 is a rock-ring located *makai* of the Māmalahoa Trail (SIHP Site 2) on a level *pāhoehoe* bedrock surface (see Figure 177). The site is situated 8 meters west/northwest of Site 30322 and 1.8 meters northeast of a small outcrop that rises above the level bedrock surface (see Figure 178). The rock ring measures 1.9 meters long by 1.8 meters wide and is constructed of roughly 50 small to medium *pāhoehoe* slabs and few small cobbles (Figures 183 and 184). It has heights varying from 7 to 27 centimeters, with the taller heights occurring along the north edge. The enclosed area consists of a cleared bedrock surface. The cobbles used to construct the circular ring are taken from the fractured edges of the level *pāhoehoe* surface.

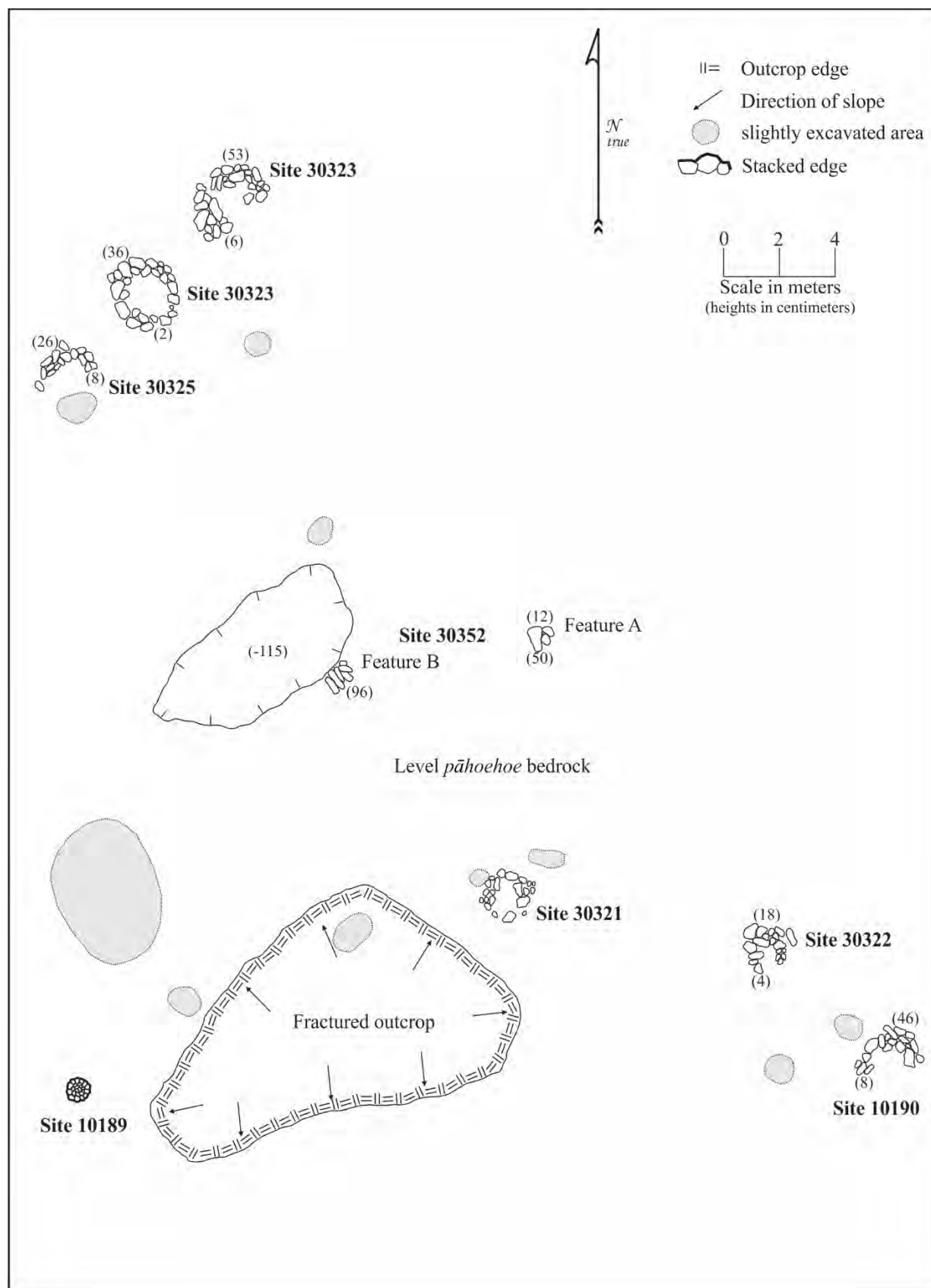


Figure 178. Plan view showing the relative locations of SIHP Sites 10189, 10190, 30322 to 30325, and 30352.

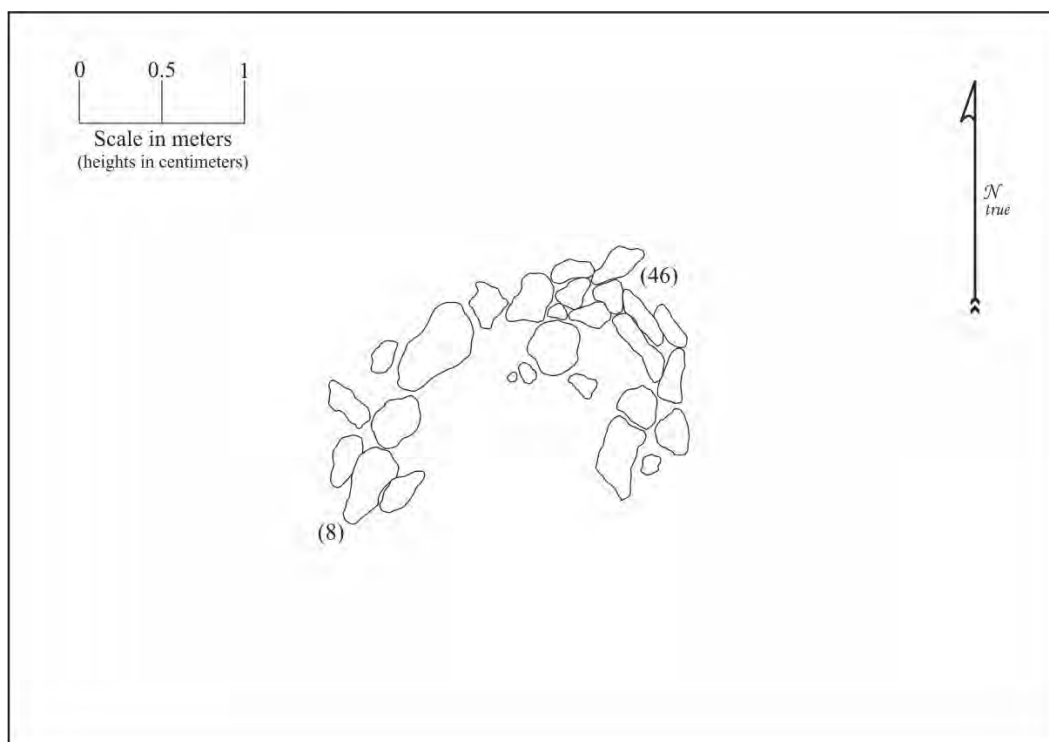


Figure 179. SIHP Site 10190 plan view.



Figure 180. SIHP Site 10190, semi-circular rock ring, view to the northeast.

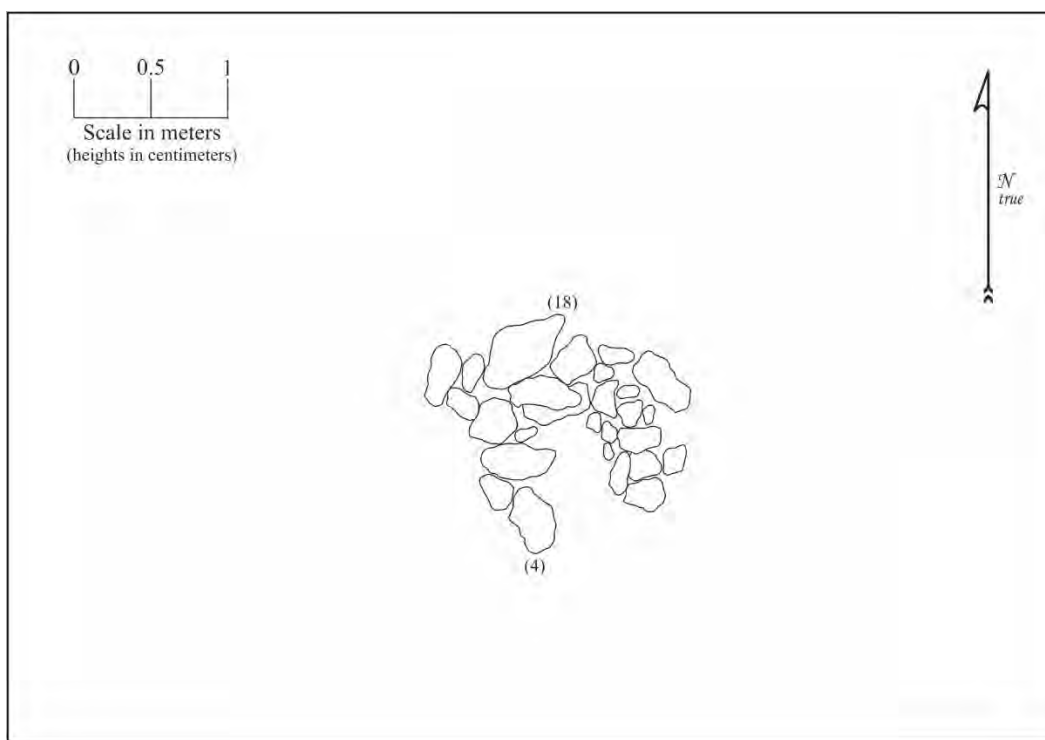


Figure 181. SIHP Site 30322 plan view.

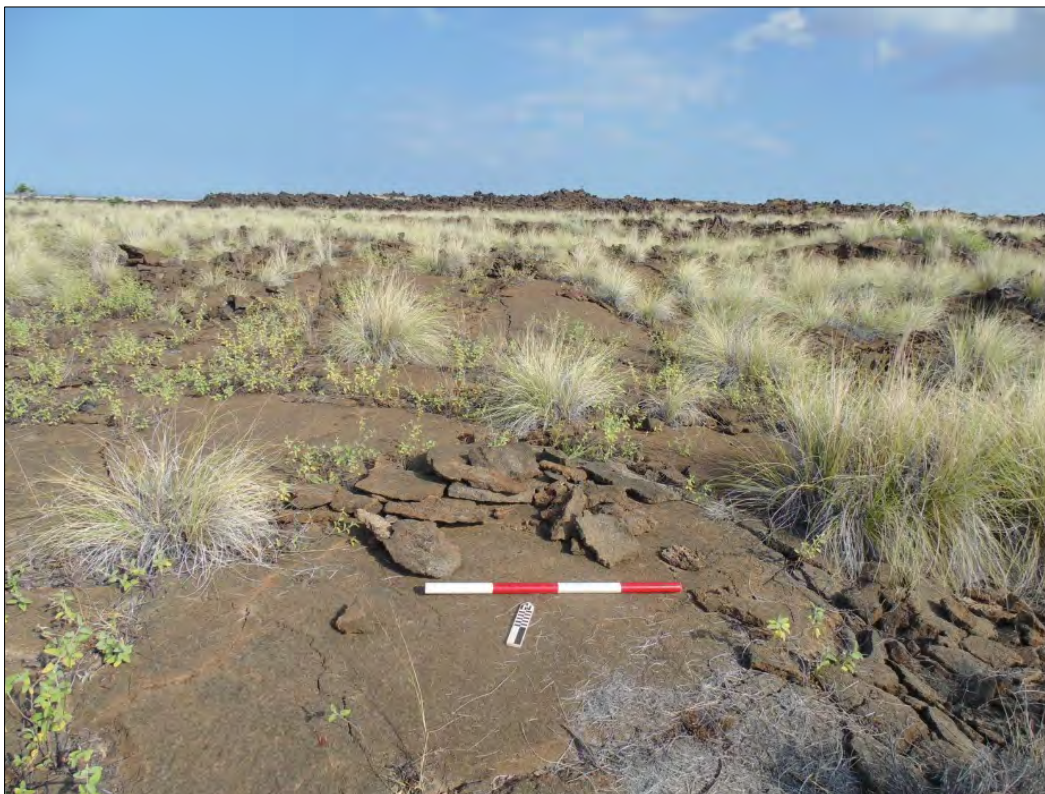


Figure 182. SIHP Site 30322, semi-circular rock ring, view to the north.

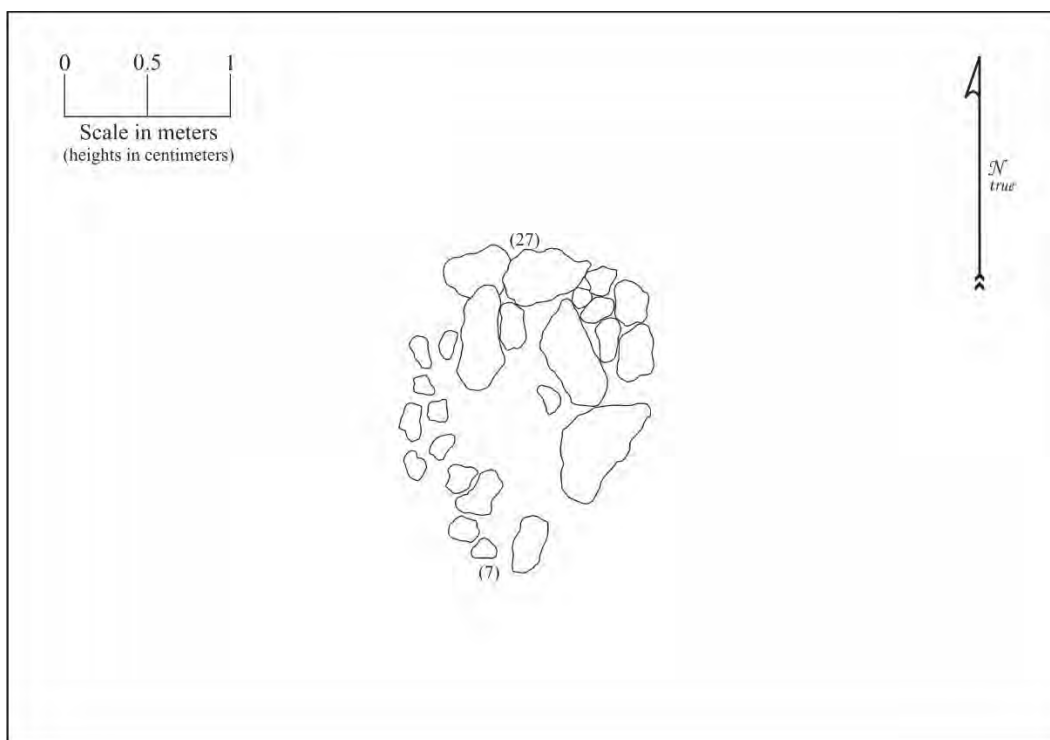


Figure 183. SIHP Site 30321 plan view.

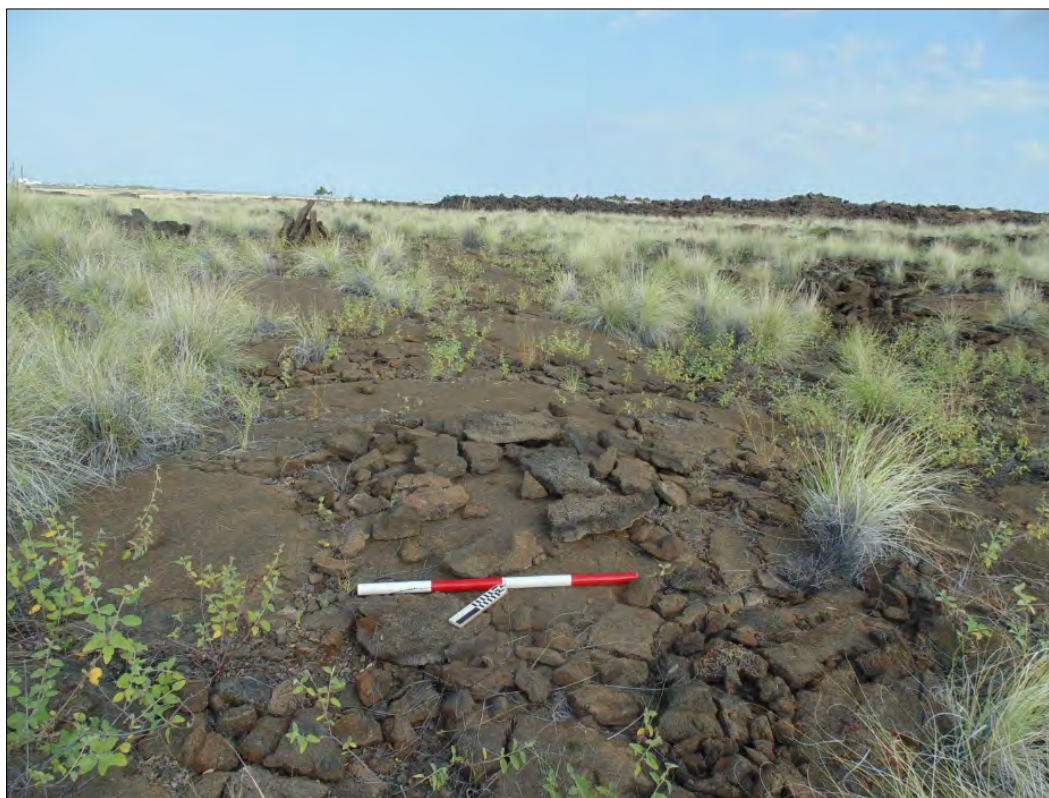


Figure 184. SIHP Site 30321, rock ring, view to the northwest.

SIHP Site 30323

Site 30323 is a semi-circular rock ring located *makai* of the Māmalahoa Trail (SIHP Site 2) on a level *pāhoehoe* bedrock surface (see Figure 177). The site is situated roughly 31 meters north of the Site 10189 cairn and 1.8 meters northeast of Site 30324 (see Figure 178). The rock ring measures 1.4 meters long by 1.3 meters wide and it opens to the southeast (Figure 185). It has heights along its edges that range from 6 to 55 centimeters tall, with the taller heights occurring along the northwestern edge where several of the slabs are standing on end and leaning against each other (Figure 186). Site 30323 is constructed of approximately eighty loosely piled small to medium *pāhoehoe* slabs that were taken from the fractured edges of the level *pāhoehoe* surface.

SIHP Site 30324

Site 30324 is a rock-ring located *makai* of the Māmalahoa Trail (SIHP Site 2) on a level *pāhoehoe* bedrock surface (see Figure 177). The site is situated approximately 1.8 meters southwest of Site 30323 and 1.6 meters northeast of Site 30325 (see Figure 178). It measures 2.8 meters long by 2.4 meters wide and is constructed of approximately seventy-five loosely piled small to medium *pāhoehoe* cobbles and slabs loosely stacked 2 to 36 centimeters tall (Figures 187 and 188). The enclosed interior surface consists of level bedrock that has been cleared of cobbles. The cobbles used to construct the semi-circular ring are taken from the fractured edges of the level *pāhoehoe* surface.

SIHP Site 30325

Site 30325 is a semi-circular rock ring located *makai* of the Māmalahoa Trail (SIHP Site 2) on a level *pāhoehoe* bedrock surface (see Figure 177). The site is situated 1.6 meters southwest of Site 30324 (see Figure 178). It measures 2.2 meters long by 1 meter wide and is constructed of approximately fifty loosely piled small to large *pāhoehoe* slabs and a few small cobbles (Figures 189 and 190). The semi-circular ring opens to the southeast and has heights that range from 8 to 26 centimeters. An excavated area of *pāhoehoe* surface material measuring 1.4 meters long by 1 meter wide is located 80 centimeters south of Feature C. It is likely that the cobbles used in the feature's construction were removed from this location.

SIHP Site 30326

Site 30326 consists of two adjacent rock rings (Feature A and Feature B) located in the southwestern portion of the project area roughly 58 meters northwest of Site 30323 (see Figure 177). The rock rings, which are situated side by side on a level *pāhoehoe* bedrock surface, occupy a combined area measuring 4.3 meters long by 2.1 meters wide (Figure 191). Each feature is described in detail below.

Feature A

Feature A of Site 30326 is a rock ring that measures 2 meters long by 1.8 meters wide and is constructed of small to medium *pāhoehoe* slabs and cobbles (Figure 192). It has exterior heights ranging from 7 to 47 centimeters tall and interior heights ranging from 7 to 34 centimeters tall (see Figure 191). The interior surface consists of level bedrock. It is likely that the slabs used in the construction of the feature were taken from a fractured *pāhoehoe* edge located immediately to the west of the feature.

Feature B

Feature B of Site 30326 is a rock ring located 50 centimeters east of Feature A (see Figure 191). It measures 2.2 meters long by 1.9 meters wide and is constructed of small to medium *pāhoehoe* slabs (Figure 193). The northwest edge of the feature has less slabs than the rest of the rock ring. It has exterior heights ranging from 5 to 15 centimeters and interior heights ranging from 8 to 9 centimeters tall. The interior surface consists of level bedrock. It is likely that the material used to construct the feature was taken from a fractured *pāhoehoe* edge located immediately to the northwest.

SIHP Site 30327

Site 30327 is a rough rock ring consisting of a collection of *pāhoehoe* cobbles and slabs on a bedrock surface 45 meters northwest of Site 30326 in the southwest portion of the project area (see Figure 177). Site 30327 measures 1.75 meters long by 1.5 meters wide and is constructed of approximately 80 small cobbles and slabs (Figure 194). It has heights along its edges ranging from 9 to 19 centimeters tall (Figure 195). A 60 centimeter by 40 centimeter area of excavated bedrock is located immediately west of the feature, indicating the location of the construction materials. No cultural material was observed at Site 30327, but a single marine shell (*Cypraea* sp.) fragment was noted on the ground surface 20 meters south of the rock ring.

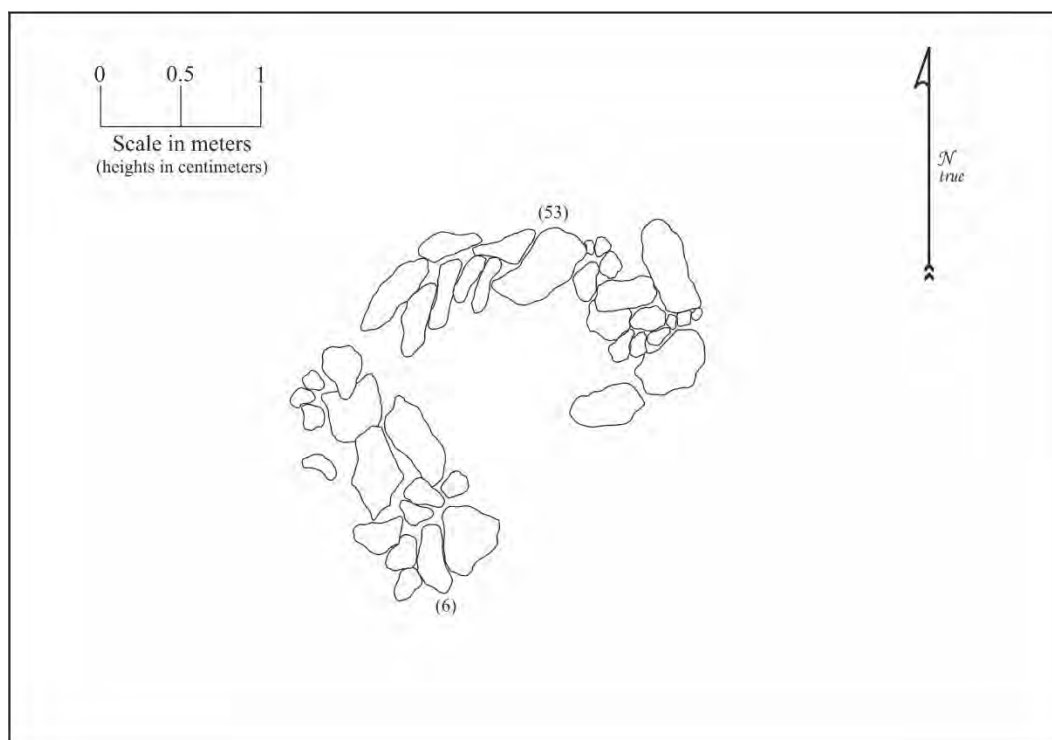


Figure 185. SIHP Site 30323 plan view.

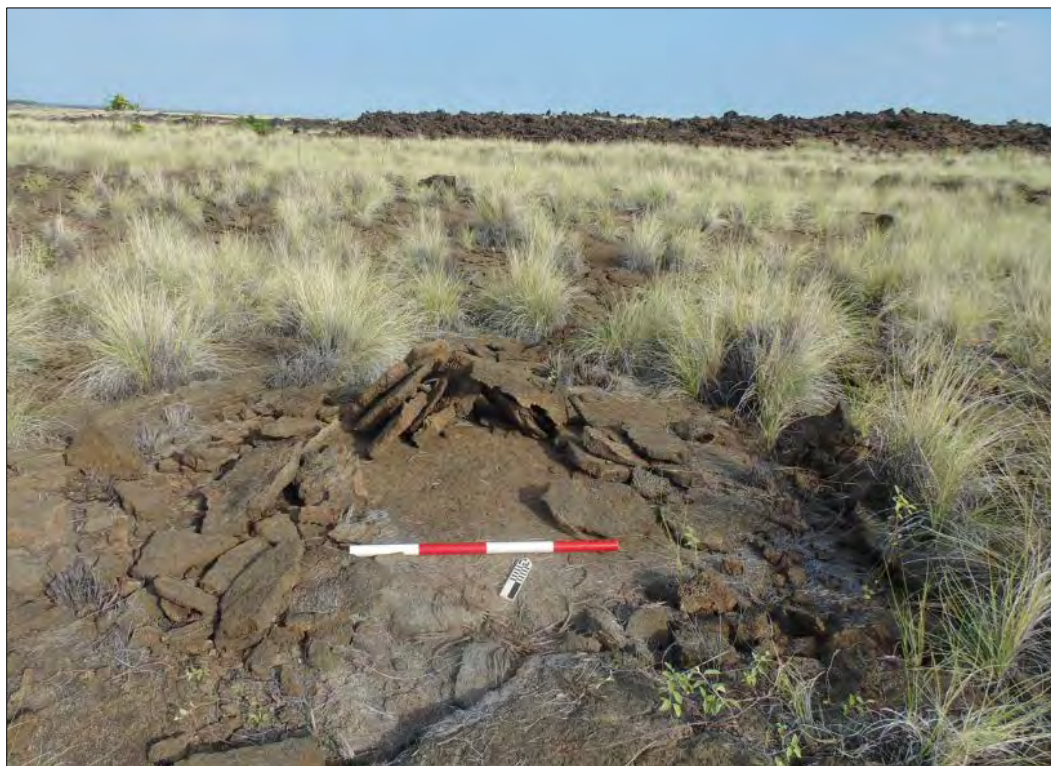


Figure 186. SIHP Site 30323, view to the northwest.

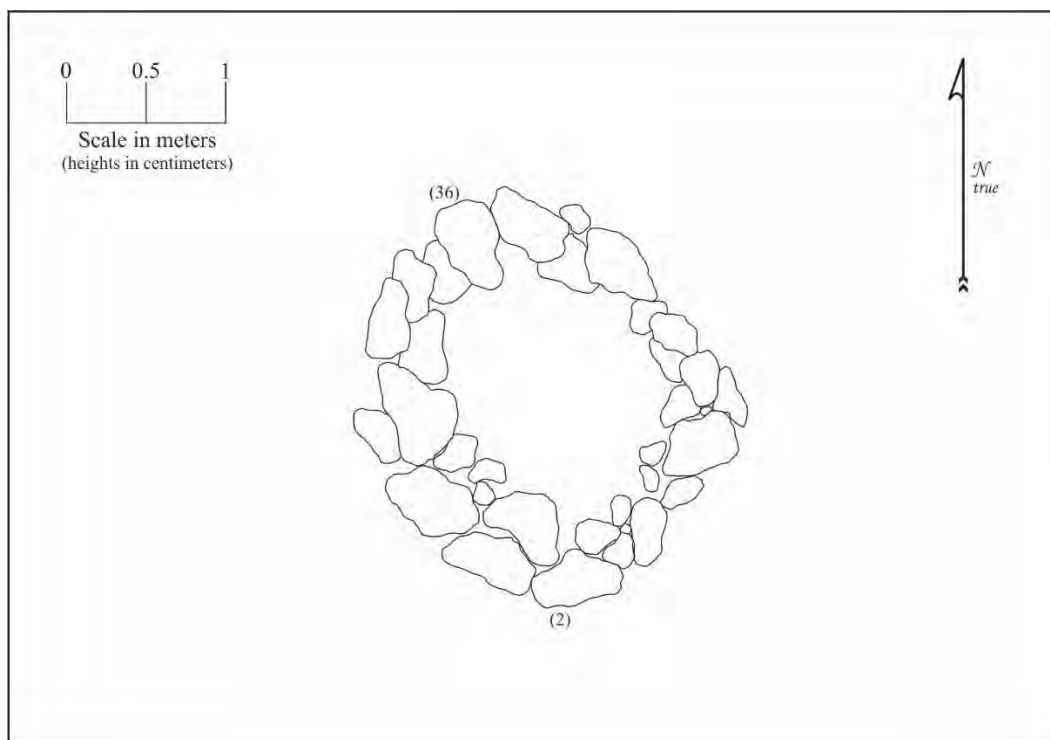


Figure 187. SIHP Site 30324 plan view.



Figure 188. SIHP Site 30324, rock ring, view to the northwest.

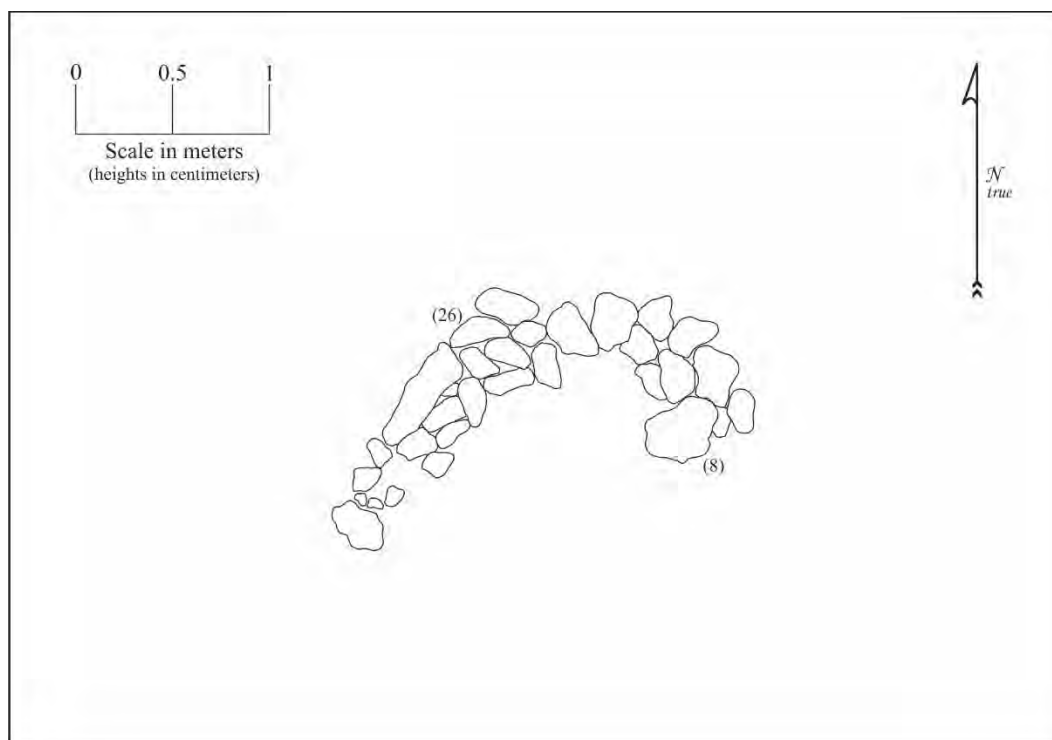


Figure 189. SIHP Site 30325 plan view.

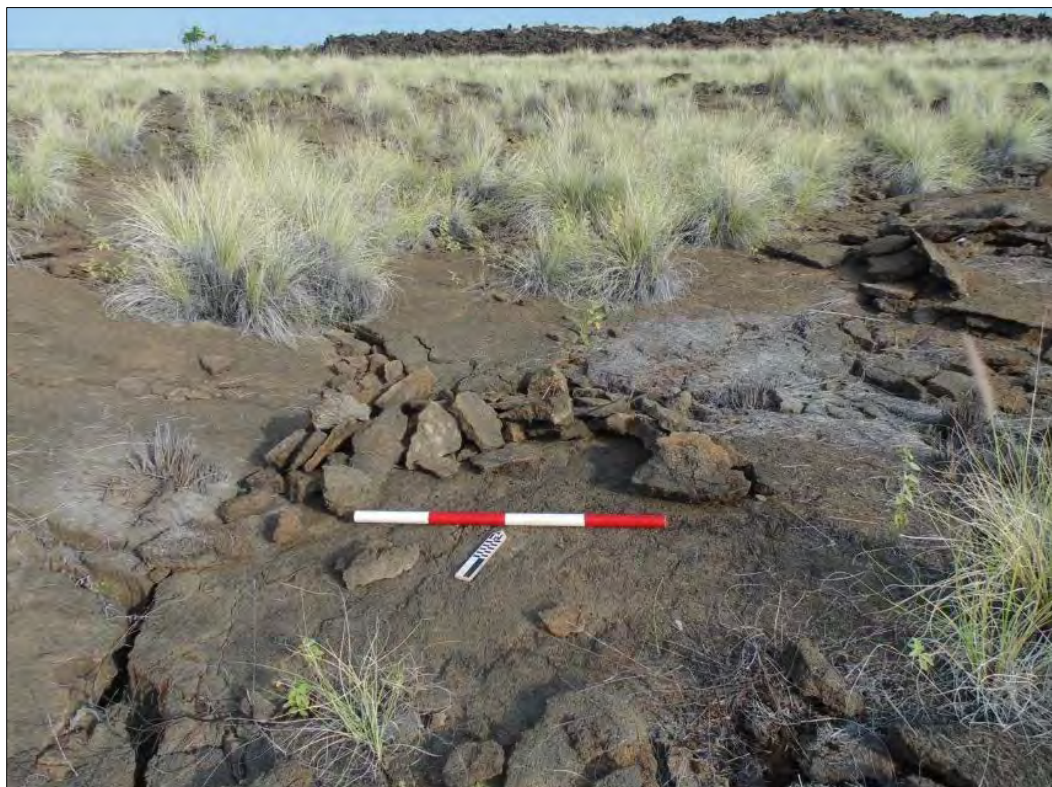


Figure 190. SIHP Site 30325, semi-circular rock ring, view to the northwest.

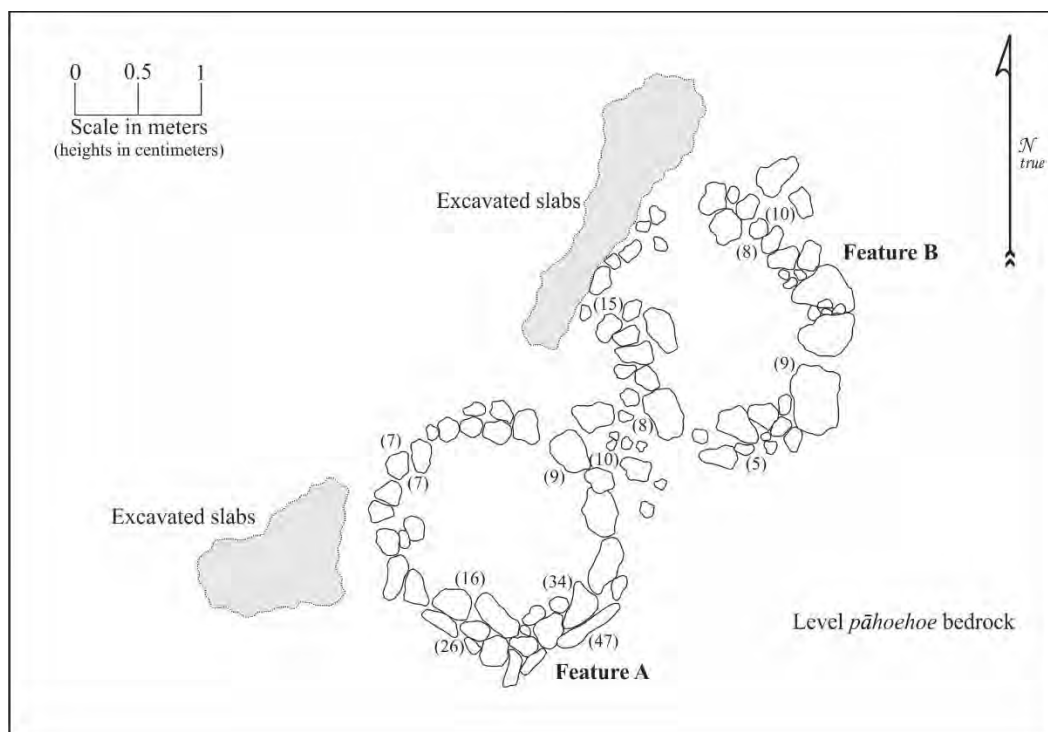


Figure 191. SIHP Site 30326 plan view.

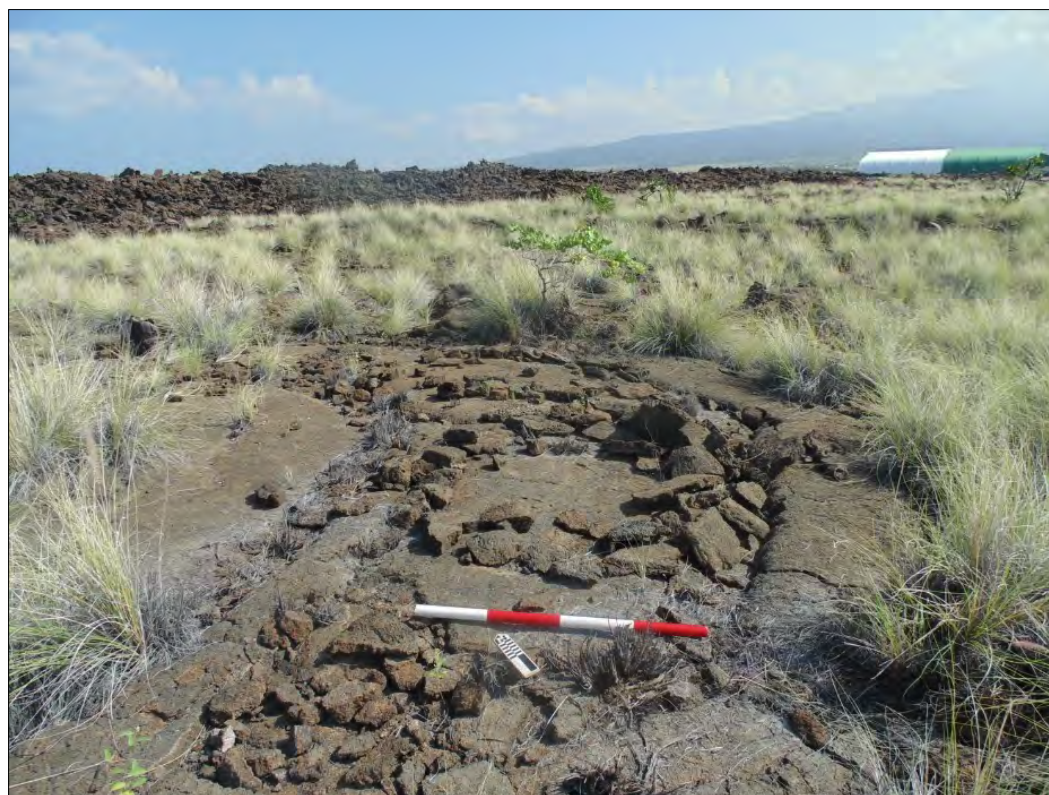


Figure 192. SIHP Site 30326 Feature A, view to the north with Feature B in the background.

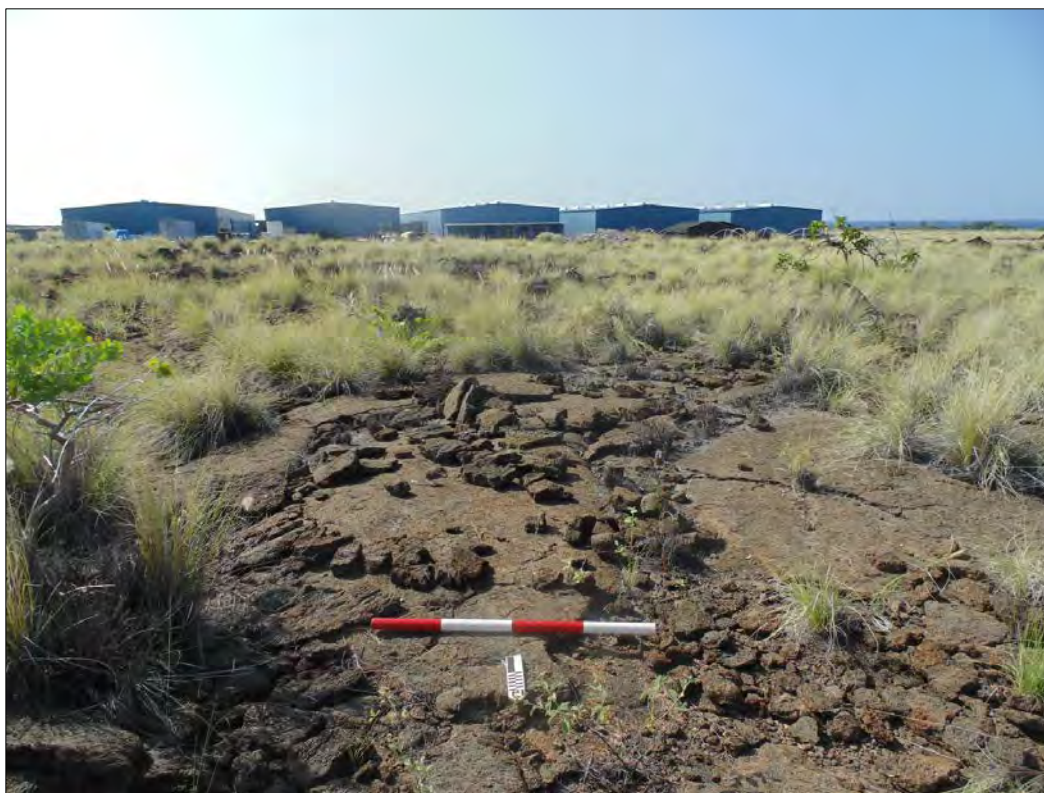


Figure 193. SIHP Site 30326 Feature B, view to the south with Feature A in the background.

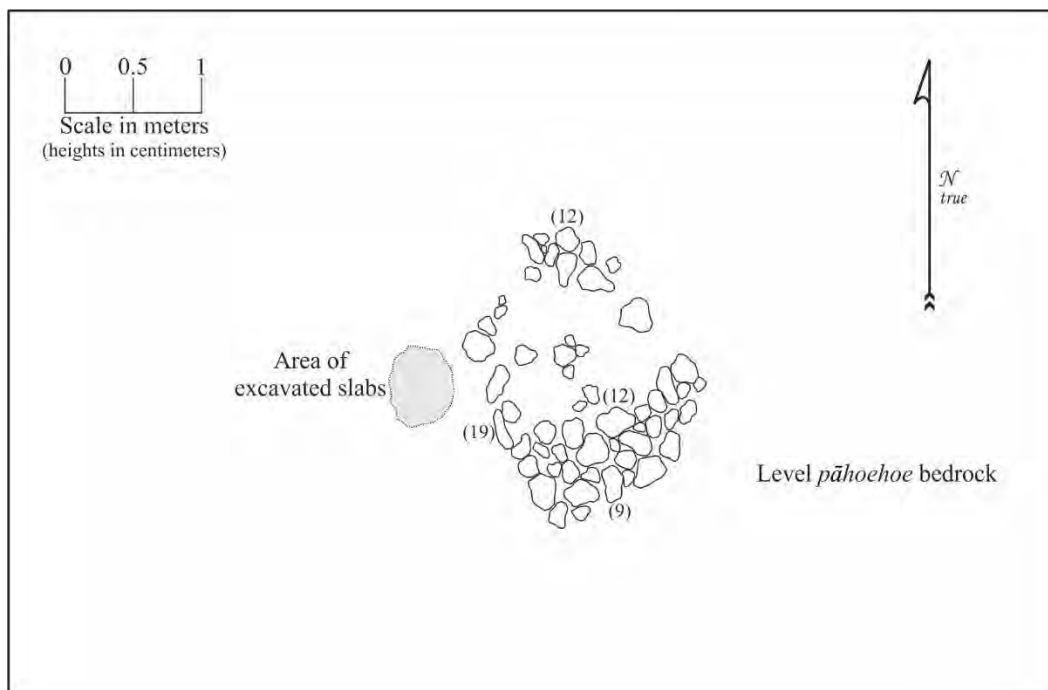


Figure 194. SIHP Site 30327 plan view.

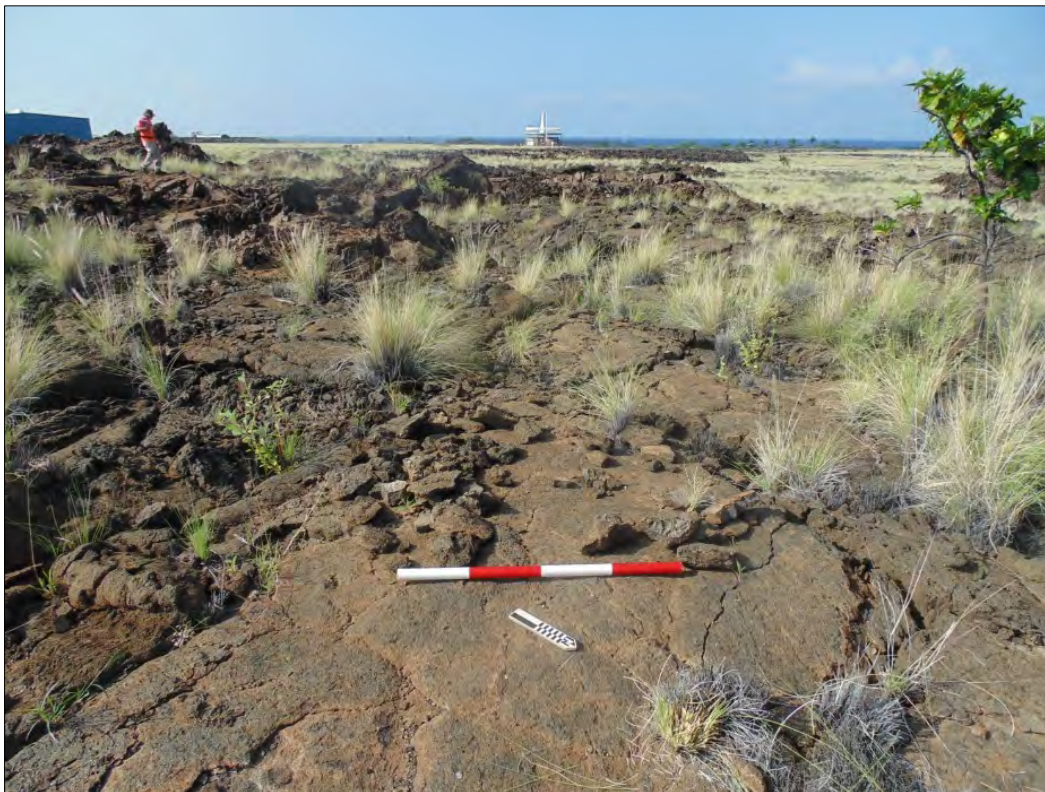


Figure 195. SIHP Site 30327, rough rock ring, view to the southwest.

SIHP Site 30328

Site 30328 is a semi-circular rock ring located west of the Māmalahoa Trail (SIHP Site T-2) on a fractured *pāhoehoe* bedrock surface at the southwestern edge of a raised 'a'ā flow formation (see Figure 177). The level *pāhoehoe* area also contains several *pāhoehoe* excavations (features of SIHP Site 30372; see below), and is surrounded by slabby *pāhoehoe* and rough 'a'ā bedrock (Figure 196). The level area of excavations measures 31 meters long by 15 meters wide (Figure 197). The semi-circular rock ring is located to the southwest of the excavations. It measures 1.7 meters long by 0.8 meters wide and opens to the west (Figure 198). The semi-circular ring is constructed of approximately thirty loosely piled small *pāhoehoe* slabs and cobbles and stands up to 33 centimeters tall. The material was likely taken from one of the nearby excavations. A single piece of marine shell (*Cellana* sp.) was observed on the ground surface 5.4 meters southwest of Site 30328 in a direction that is the easiest to access to the level bedrock area from.

SIHP Site 30329

Site 30329 is a rock ring located 2 meters north of the Site 30315 trail, in the northeastern portion of the current project area (see Figures 103 and 177). The site consists of approximately twenty medium to large cobbles arranged in a ring on a flat, level *pāhoehoe* bedrock surface. The ring measures 1.6 meters (north/south) by 1.3 meters (east/west), and stands up to 0.25 meters tall (Figures 199 and 200). The material used to build the ring appears to be immediately available source material. To the northeast of Site 30329 are several seemingly out of place scattered cobbles on the level *pāhoehoe* bedrock surface.

SIHP Site 30330

Site 30330 is a semi-circular rock ring located on the *pāhoehoe* surface of the h2-2 lava flow near several *kīpuka* of the h1y-1 lava flow in the central portion of the study area, roughly 130 meters southeast of Site 30338 (see Figure 177). The rock ring measures 1.8 meters by 1.5 meters and is constructed of approximately 40 cobbles and small slabs that form a flattened C-shape that opens to the east/southeast (Figure 201). The site is situated on a bedrock surface that slopes gently to the east for 2.5 meters to a small *kīpuka* of the older (h1y-1) lava flow. Heights along the edges range from 10 to 40 centimeters tall (Figure 202). The material used to build the site appears to be immediately available source material.

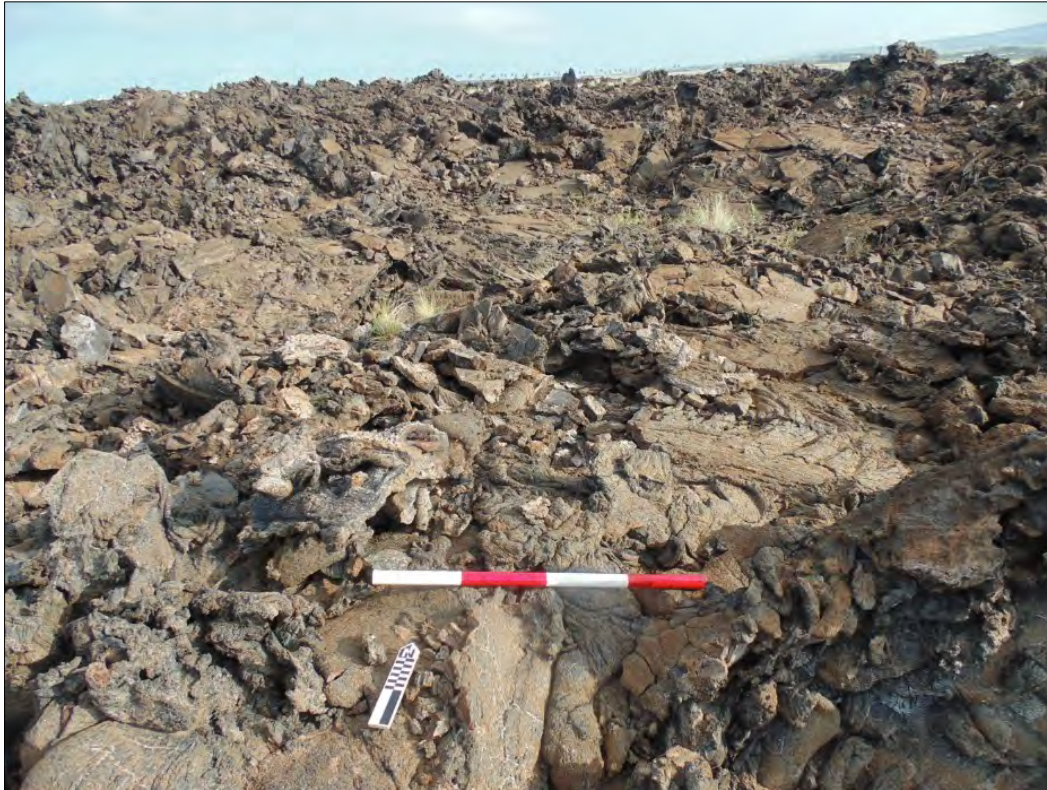


Figure 196. SIHP Site 30328, excavated lava flow in the vicinity of the semi-circular rock ring, view to the northwest.

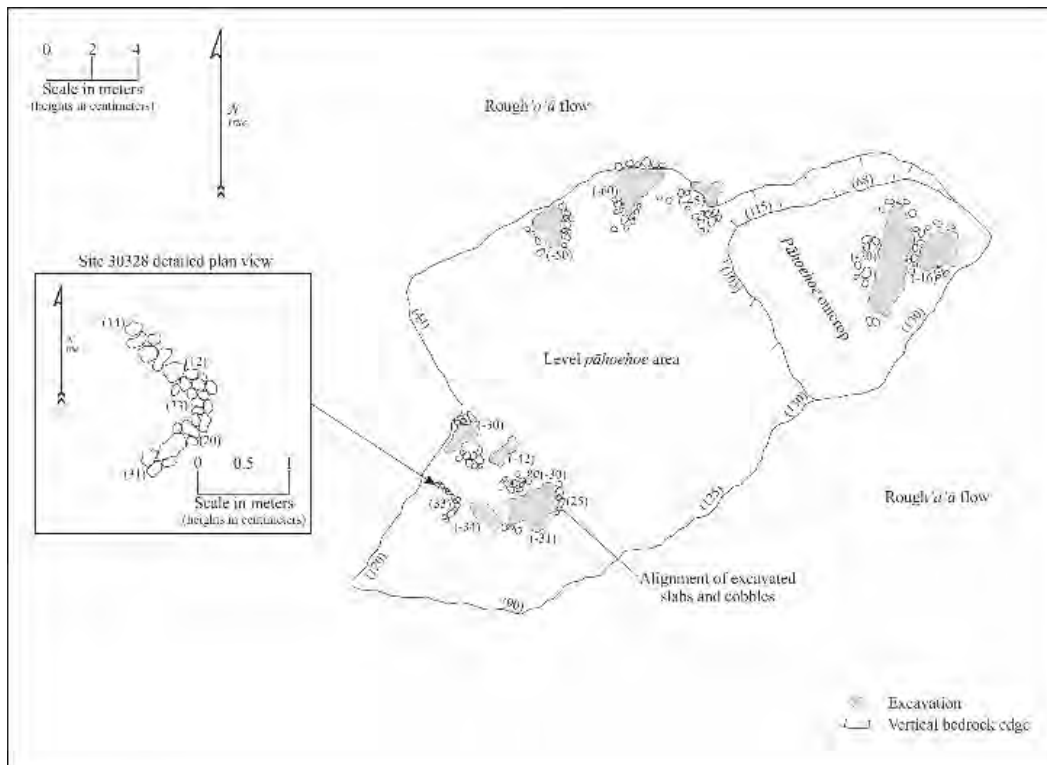


Figure 197. SIHP Site 30328 detailed and vicinity plan view.



Figure 198. SIHP Site 30328, semi-circular rock ring, view to the northeast.

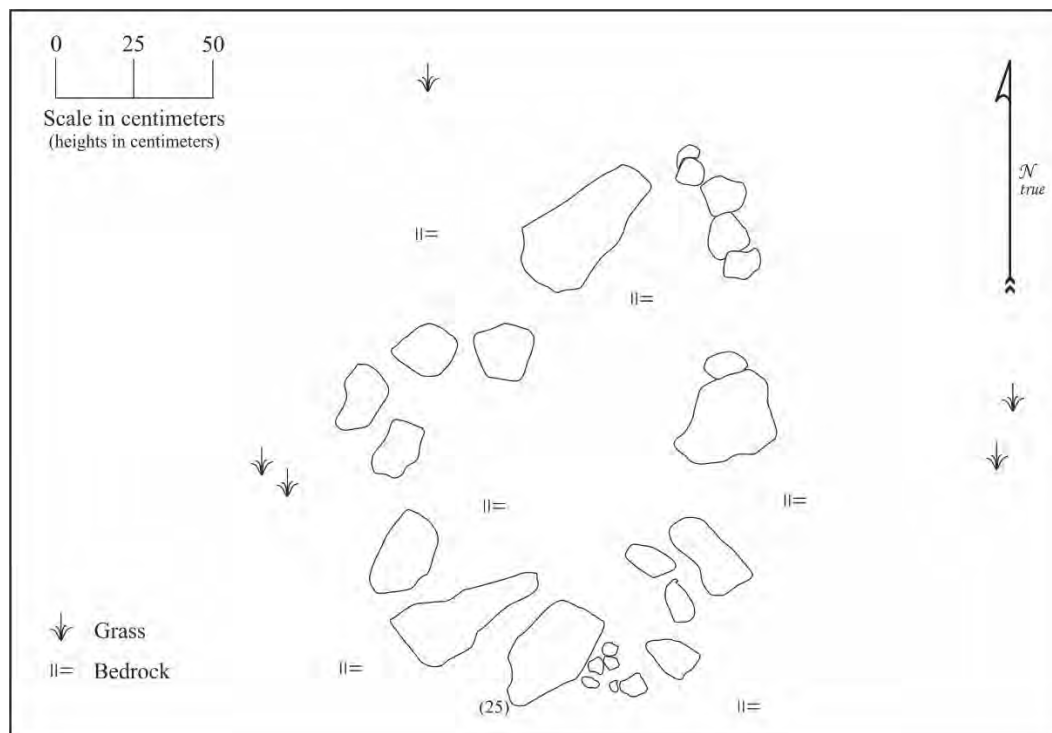


Figure 199. SIHP Site 30329 plan view.



Figure 200. SIHP Site 30329, view to the northeast.

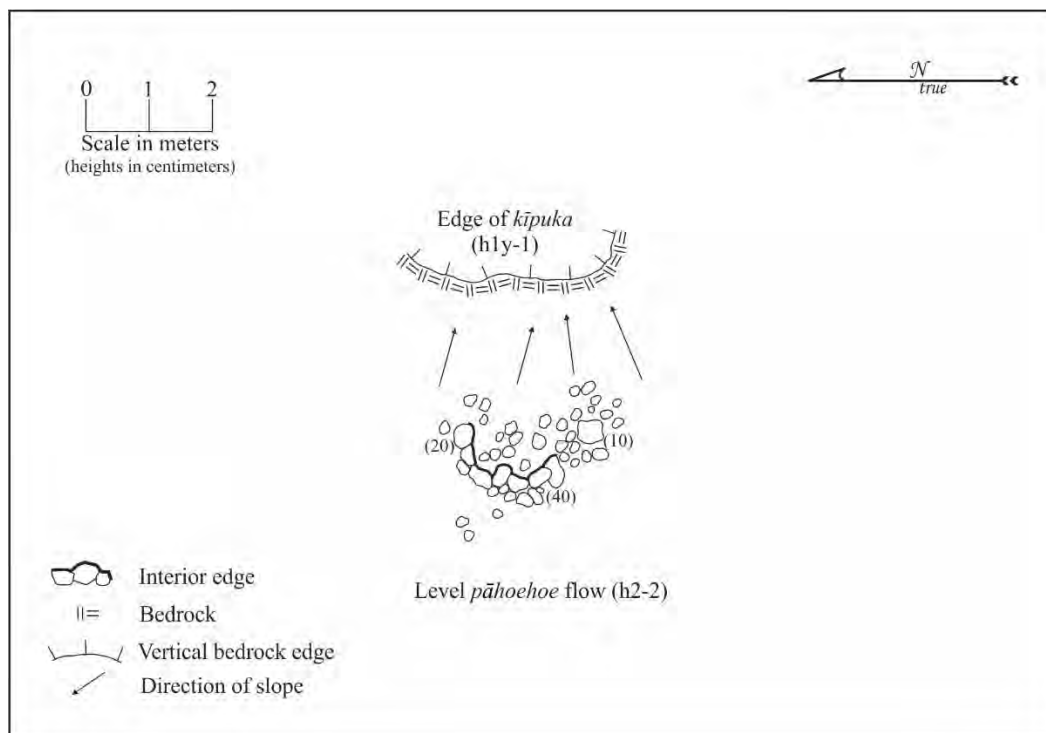


Figure 201. SIHP Site 30330 plan view.



Figure 202. SIHP Site 30330, semi-circular rock ring, view to the west.

SIHP Site 30331

Site 30331 is a semi-circular rock ring constructed on a level surface of (h2-2) *pāhoehoe* bedrock in the north-central portion of the project area, 12.5 meters southwest of Site 30332 (see Figure 177). Site 30331 measures 2.5 meters long by 1.6 meters wide with a 1.45 meter wide opening that faces northwest (Figure 203). It is constructed of approximately sixty-five loosely piled *pāhoehoe* slabs from immediately available source material (Figure 204). Along the back (southeast) edge of the feature the slabs are piled two to three tall. The exterior heights of the wall from 4 to 28 centimeters tall, while the interior heights range from 7 to 18 centimeters tall.

SIHP Site 30332

Site 30332 is rock ring with an adjacent scatter of slabs that is located on a level (h2-2) *pāhoehoe* bedrock surface in the north-central portion of the project area, 12.5 meters northeast of Site 30331 (see Figure 177). The ground surface between Site 30331 and Site 30332 consists of uneven (h2-2) *pāhoehoe* bedrock. The rock ring measures 2 meters long by 1.8 meters wide and opens to the west (Figure 205). It is constructed of approximately seventy-five small to medium sized *pāhoehoe* slabs of immediate available source material (Figure 206). The feature has interior heights ranging from 3 to 26 centimeters tall and exterior heights ranging from 7 to 29 centimeters tall. Adjacent to the north edge of the rock ring is a collection of approximately 75 small to medium *pāhoehoe* slabs (and a few small cobbles) spread over a 2.4 meter long by 2.3 meter wide area (Figure 207). The collection of slabs has heights ranging from 4 to 18 centimeters tall. This collection may represent a disturbed rock ring.

SIHP Site 30333

Site 30333 is a semi-circular rock ring located on a level (h2-2) *pāhoehoe* bedrock surface in the north-central portion of the project area, 4 meters south of Site 30334 (see Figure 177). The rock ring measures 1.8 meters long by 1.5 meters wide with a 1 meter wide opening along its northern edge (Figure 208). It is constructed of small to medium *pāhoehoe* slabs and cobbles (of immediately available source material) that attain a maximum height of 28 centimeters along the southeastern interior edge (Figure 209).

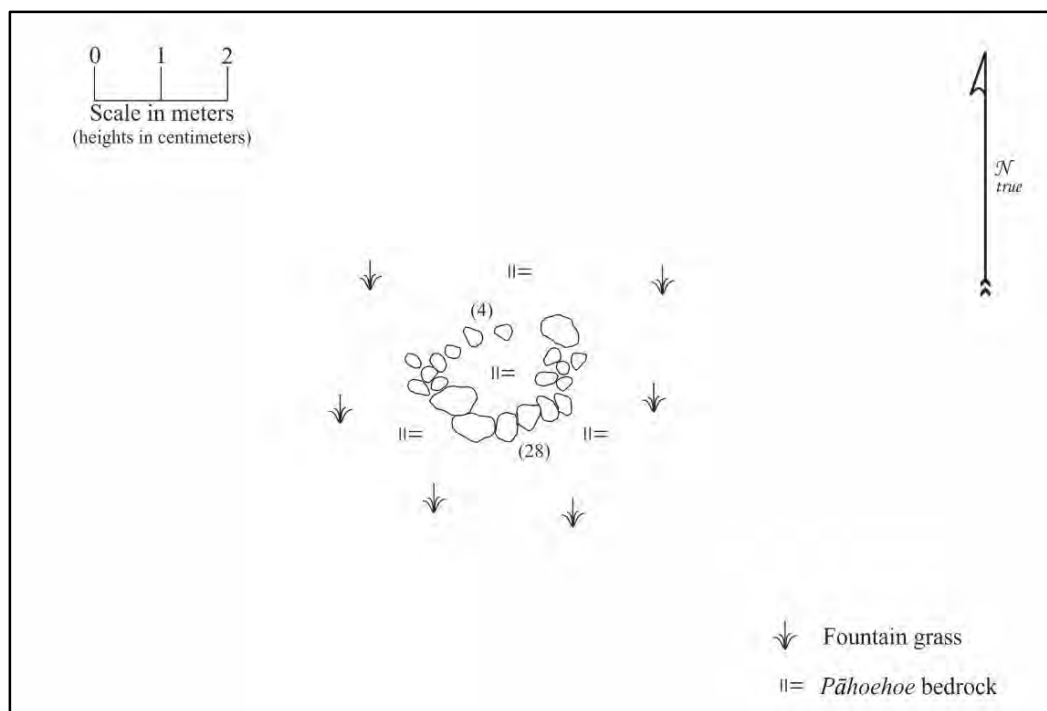


Figure 203. SIHP Site 30331 plan view.



Figure 204. SIHP Site 30331, semi-circular rock ring, view to the south.

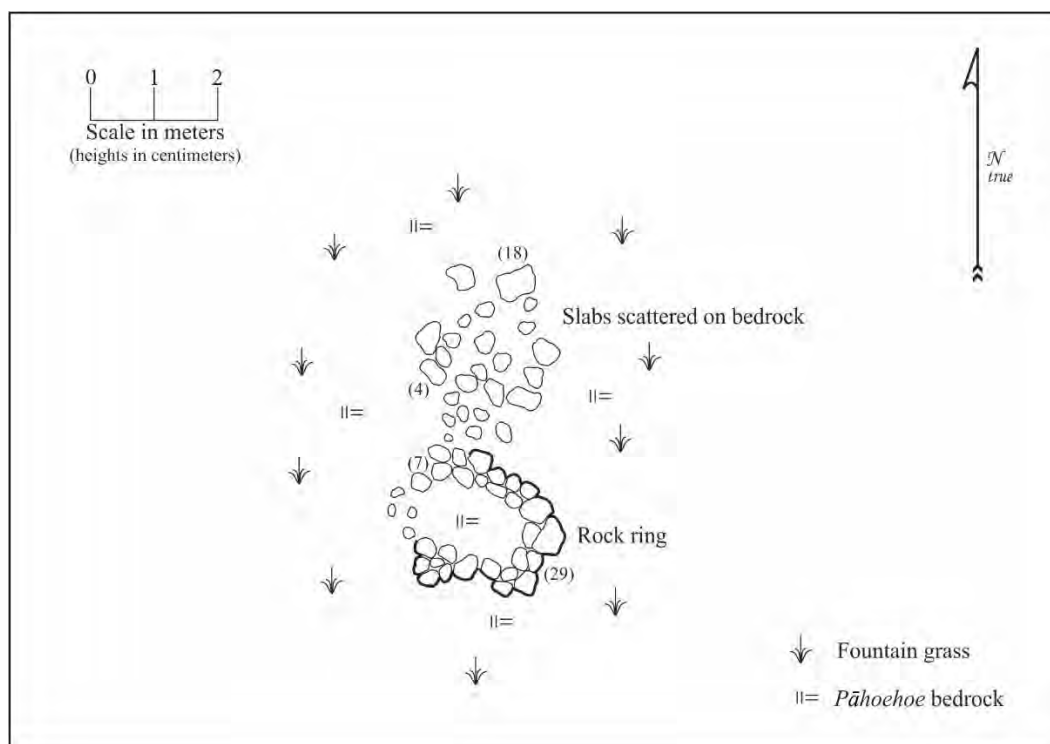


Figure 205. SIHP Site 30332 plan view.



Figure 206. SIHP Site 30332, rock ring, view to the east.



Figure 207. SIHP Site 30332, adjacent collection of slabs, view to the south.

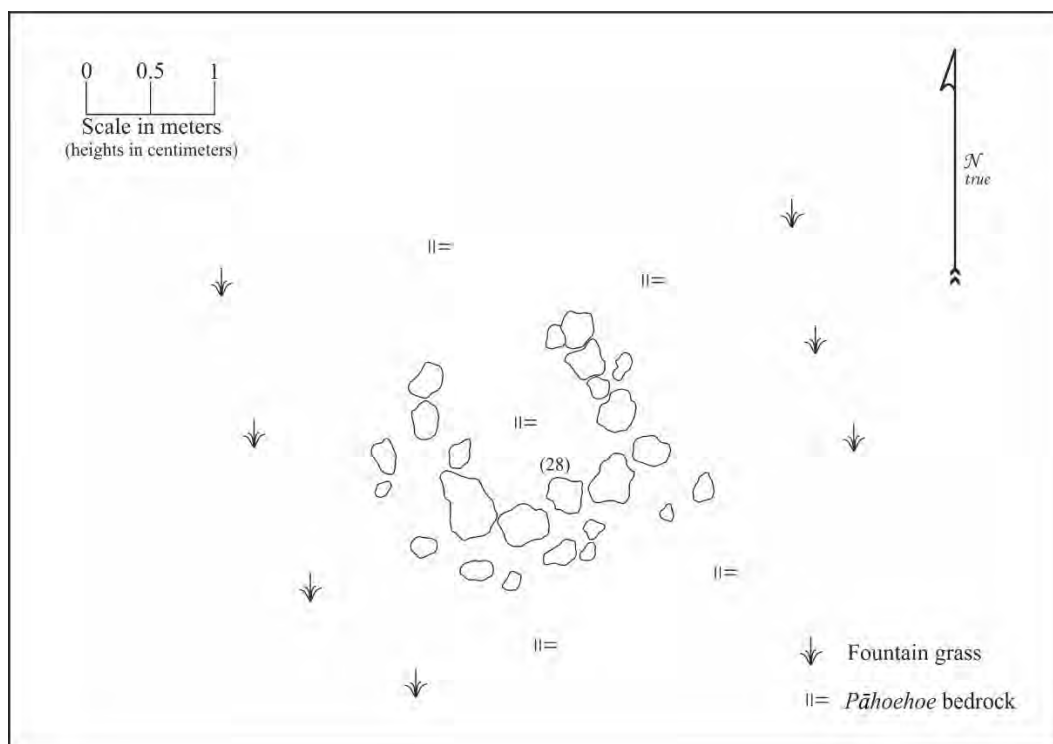


Figure 208. SIHP Site 30333 plan view.



Figure 209. SIHP Site 30333, view to the west.

SIHP Site 30334

Site 30334 is a small rock ring located on a level (h2-2) *pāhoehoe* bedrock surface in the north-central portion of the project area, 4 meters north of Site 30334 (see Figure 177). The collection of approximately thirty small to medium *pāhoehoe* slabs (of immediately available source material) measures 1.3 meters long by 0.8 meters wide (Figure 210). It has a maximum height of 18 centimeters, and forms a rock ring of medium slabs that is filled in the center with small slabs and a few cobbles (Figure 211).

SIHP Site 30335

Site 30335 is a semi-circular rock ring located on a level (h2-2) *pāhoehoe* bedrock surface in the north-central portion of the project area, 14.7 meters southwest of Site 30336 (see Figure 177). The rock ring measures 1.3 meters long by 1.2 meters wide and is constructed of approximately forty-five small to medium *pāhoehoe* slabs (piled up to two high) (Figure 212). The feature opens to the northeast and has an average interior height standing 16 centimeters tall, while along the exterior edge heights vary from 6 to 20 centimeters tall (Figure 213). The slabs used to construct the small ring are of immediately available source material.

SIHP Site 30336

Site 30336 is a semi-circular rock ring located on a level (h2-2) *pāhoehoe* bedrock surface in the north-central portion of the project area, 14.7 meters northeast of Site 30335 (see Figure 177). The rock ring measures 1.8 meters long by 1.8 meters wide and it opens to the northwest (Figure 214). It is constructed of approximately fifty small to medium *pāhoehoe* slabs and cobbles (of immediately available source material), and has heights ranging from 6 to 20 centimeters (Figure 215). The surrounding ground surface is mostly level exposed bedrock.

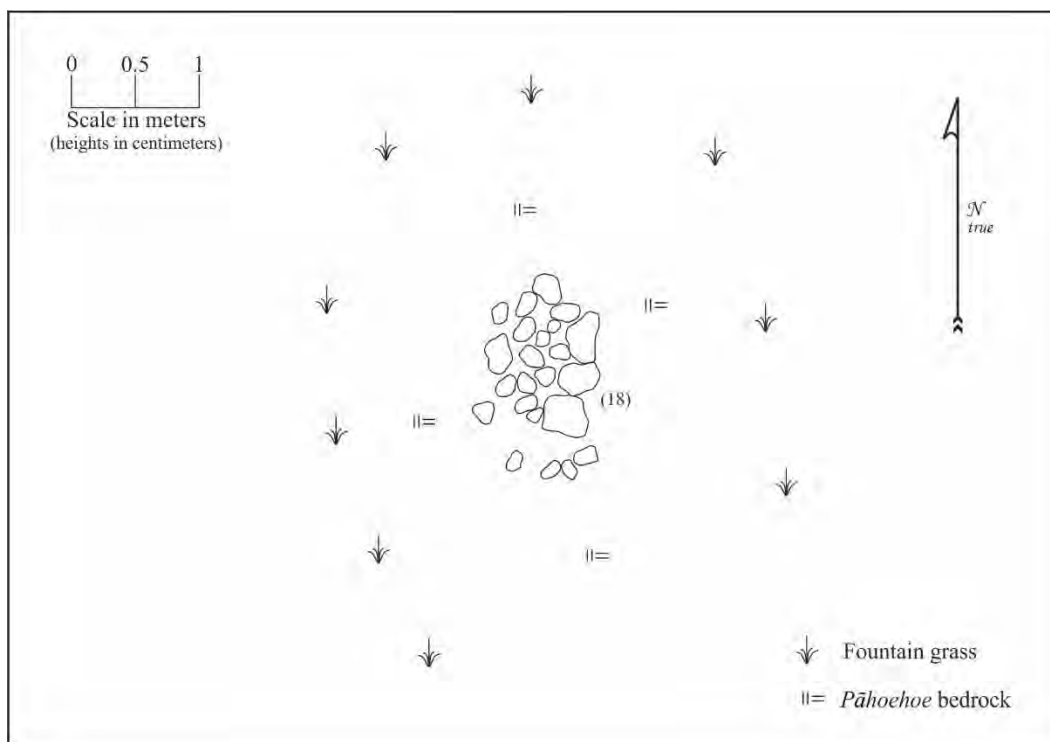


Figure 210. SIHP Site 30334 plan view.

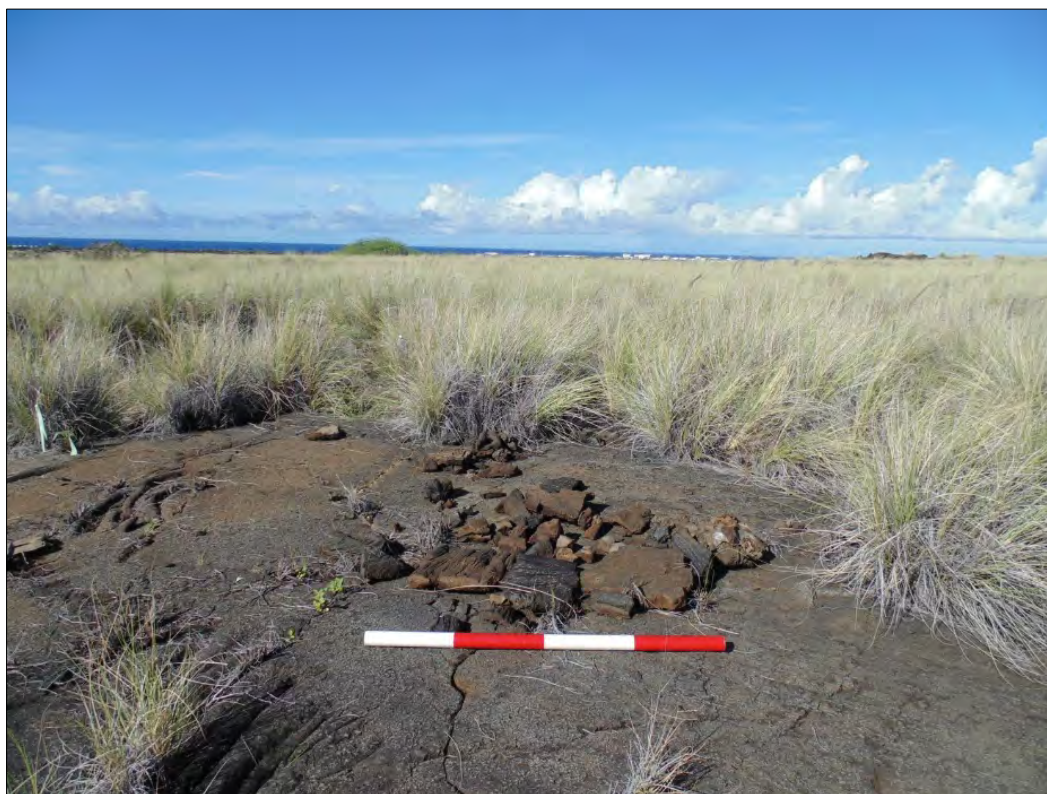


Figure 211. SIHP Site 30334, view to the west.

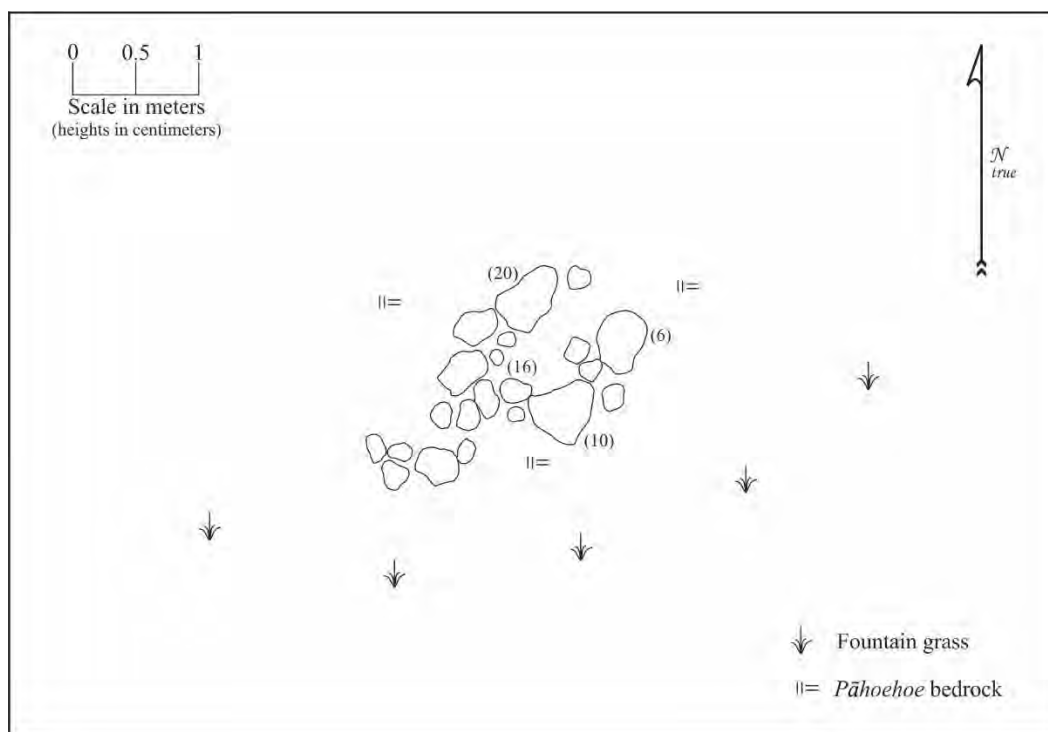


Figure 212. SIHP Site 30335 plan view.

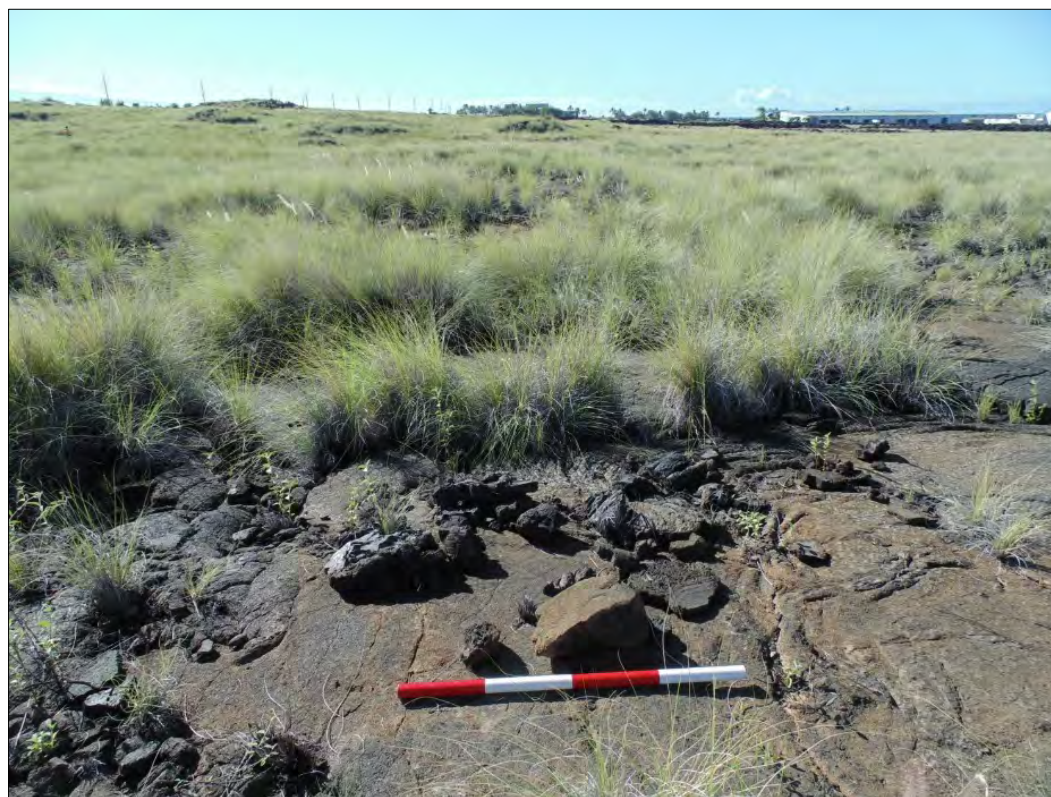


Figure 213. SIHP Site 30335, semi-circular rock ring, view to the southeast.

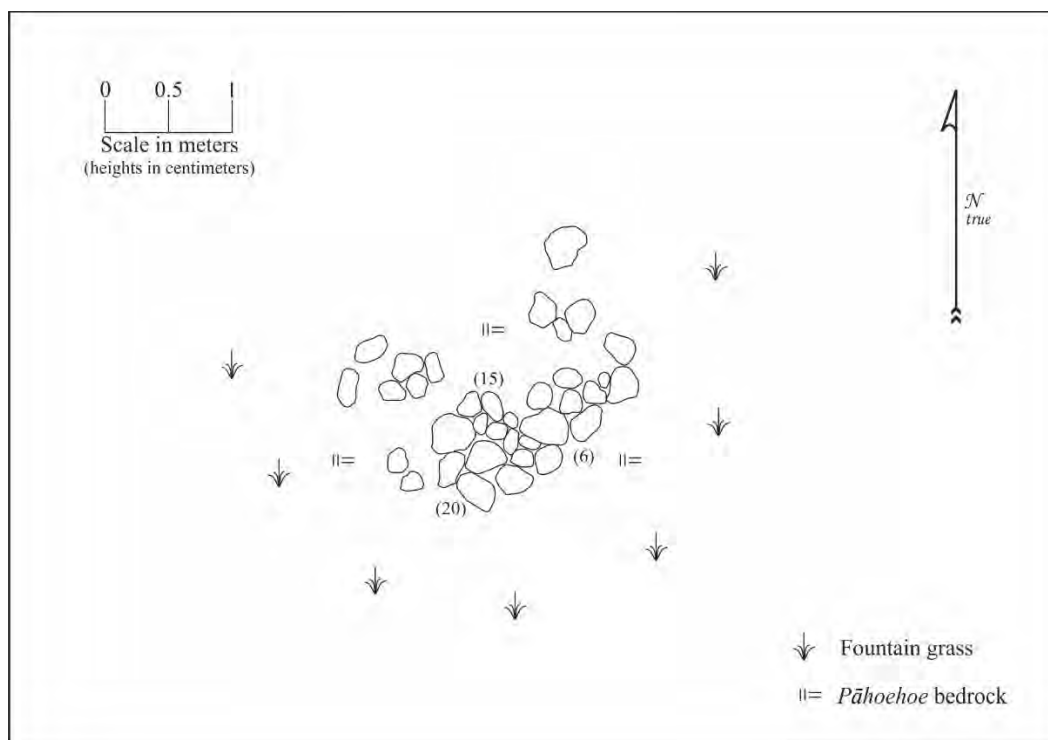


Figure 214. SIHP Site 30336 plan view.



Figure 215. SIHP Site 30336, semi-circular rock ring, view to the southeast.

SIHP Site 30337

Site 30337 is a rock ring located in the north-central portion of the project area along the southern edge of a barren (h2-1) *pāhoehoe* lava flow that also contains numerous lava tubes and *pāhoehoe* excavations (see Figure 177). The site is situated on a fairly level area of exposed bedrock that starts to slope to the west along the *makai* edge of the construction. The ring measures 2.3 meters long by 2.2 meters wide and is constructed of approximately seventy-five small to medium *pāhoehoe* slabs of immediately available source material (Figure 216). The edge of the rock ring has heights ranging from 6 to 20 centimeters (Figure 217). A few additional slabs are situated on the sloped bedrock surface roughly five meters west of Site 30337, and may represent some unused construction material.

SIHP Site 30338

Site 30338 is a semi-circular rock ring located in the north-central portion of the project area 85 meters northeast of Site 30320 (see Figure 177). It is situated on a level area of fracturing (h2-2) *pāhoehoe* bedrock. The rock ring measures 2.15 meters long by 1.7 meters wide and it opens to the southeast (Figure 218). It is constructed of approximately ninety-five small to medium *pāhoehoe* slabs (piled up to two high), and one large slab (Figure 219), all of immediately available source material. The interior area measures 0.9 meters by 0.9 meters and consists of bedrock with a few scattered small slabs. Site 30338 has interior heights ranging from 3 to 18 centimeters and exterior heights ranging from 3 to 22 centimeters. It is likely that the slabs used in the construction of Site 30338 came from a small area of excavated *pāhoehoe* located immediately north of the feature. This area of excavation measures 1.7 meters long by 1.2 meters wide.

SIHP Site 30339

Site 30339 is a semi-circular rock ring located on a level (h2-2) *pāhoehoe* bedrock ground surface 24 meters west/northwest of Site 30340 (see Figure 177). The rock ring opens to the west and it measures 1.8 meters (north/south) by 1.5 meters (east/west) by up to 0.55 meters tall (Figure 220). It is constructed of small to large *pāhoehoe* cobbles and slabs and two small boulders (Figure 221), all of immediately available source material.

SIHP Site 30340

Site 30340 is a rock ring located on a level *pāhoehoe* bedrock ground surface 24 meters east/southeast of Site 30339 (see Figure 177). The rock ring measures 1.5 meters in diameter (Figure 222). It is constructed of small to medium *pāhoehoe* cobbles and slabs that stand up to 20 centimeters tall. The crudely constructed ring is void of cobbles along the northwestern side (Figure 223). The rocks used in its construction are all of immediately available source material.

SIHP Site 30341

Site 30341 is a semi-circular rock ring located in the west-central portion of the project area on a level area of exposed (h2-2) *pāhoehoe* bedrock, 110 meters southeast of Site 30342 (see Figure 177). The rock ring measures 2.5 meters long by 1.9 meters wide and is constructed of loosely piled small to medium *pāhoehoe* slabs of immediately available source material (Figure 224). It opens to the southeast and has heights that range from 5 to 21 centimeters tall (Figure 225). The interior space is mostly filled with loose slabs on bedrock. It appears that the cobbles used in the construction of the feature were removed from an area of fracturing ropery *pāhoehoe* located 3 meters to the west of the construction.

SIHP Site 30342

Site 30342 is a semi-circular rock ring that is constructed on level (h2-2) *pāhoehoe* bedrock ground surface in the west-central portion of the project area, 110 meters northwest of Site 30341 (see Figure 177). The rock ring measures 1.6 meters (east/west) by 1.3 meters (north/south) and stands 0.45 meters tall (Figure 226). It opens to the south and is constructed of small to large *pāhoehoe* slabs, with a few small cobbles also present (Figure 227), all of immediately available source material. The interior space is mostly filled with loose slabs on bedrock.

SIHP Site 30343

Site 30343 is a rock ring situated on a level (h2-2) *pāhoehoe* bedrock surface in the central portion of the project area, 50 meters south of Site 30320 (see Figure 177). The rock ring measures 2 meters by 1.2 meters and is constructed of approximately one hundred small to medium *pāhoehoe* slabs and cobbles of immediately available source material (Figure 228). Some of the slabs along the southwest edge of the ring are piled so that they to lean against each other in a semi-upright fashion (Figure 229). Heights along the interior edge range from 5 to 19 centimeters tall and from 9 to 18 centimeters tall along the exterior edge. The interior surface of the feature consists of exposed, level bedrock.

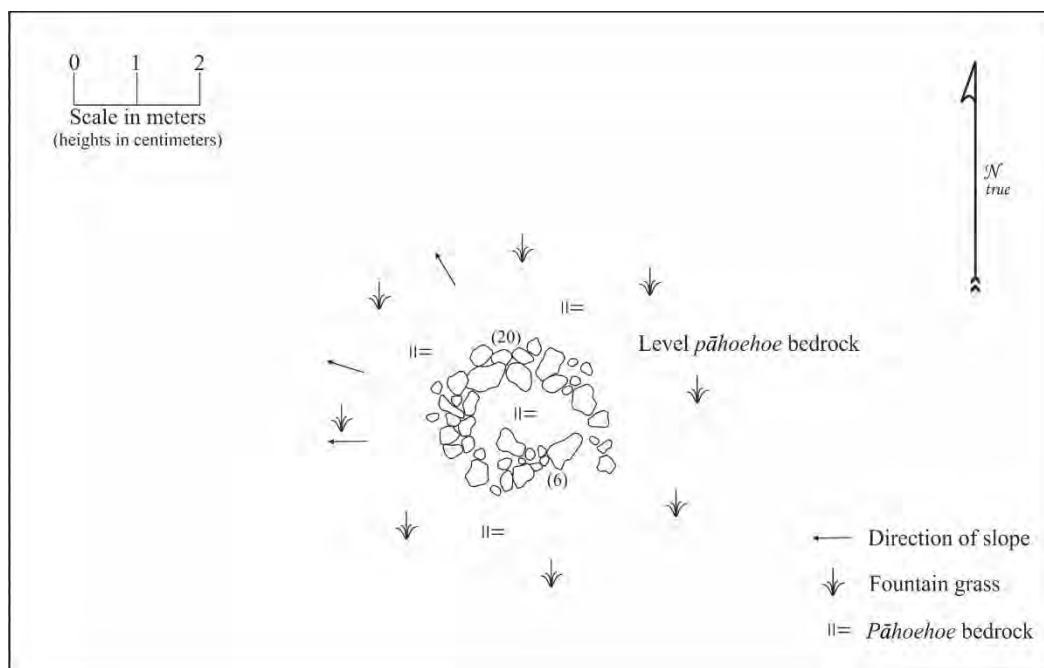


Figure 216. SIHP Site 30337 plan view.



Figure 217. SIHP Site 30337, rock ring, view to the north.

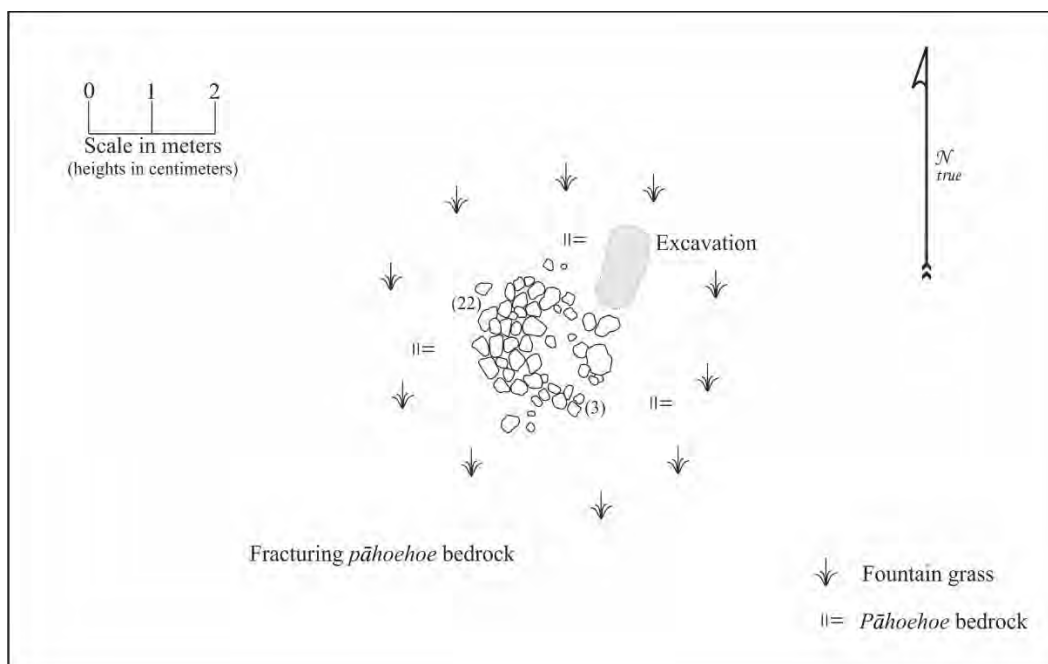


Figure 218. SIHP Site 30338 plan view.

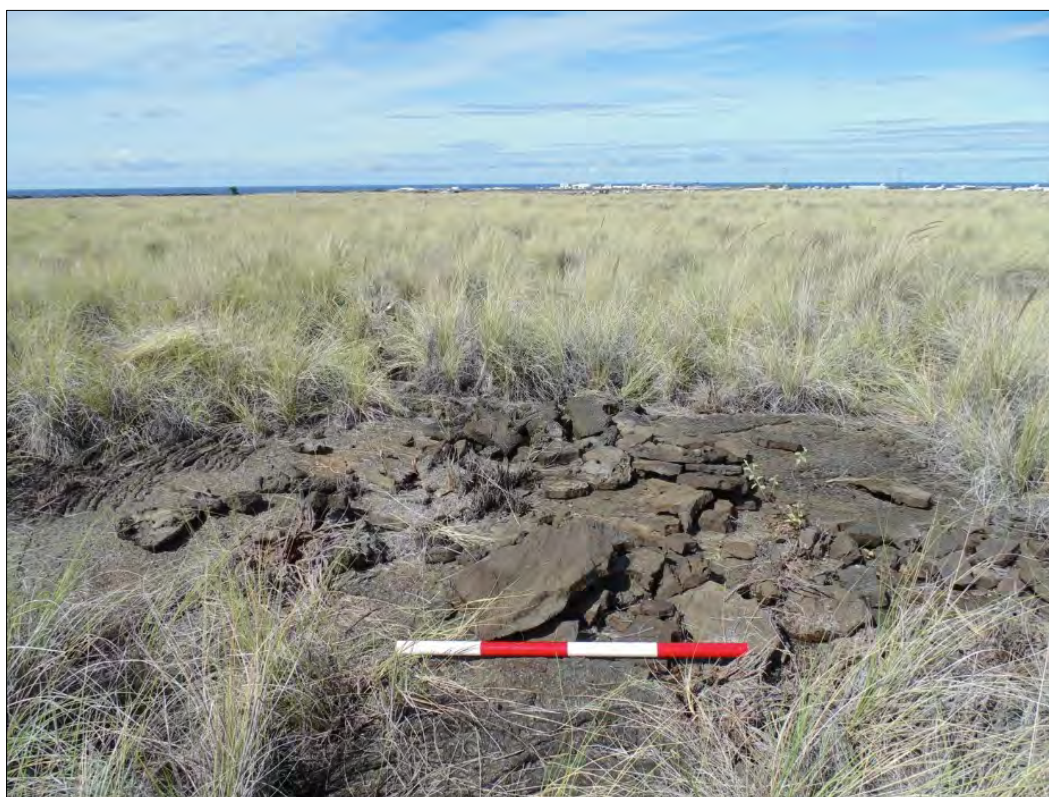


Figure 219. SIHP Site 30338, semi-circular rock ring, view to the southwest.

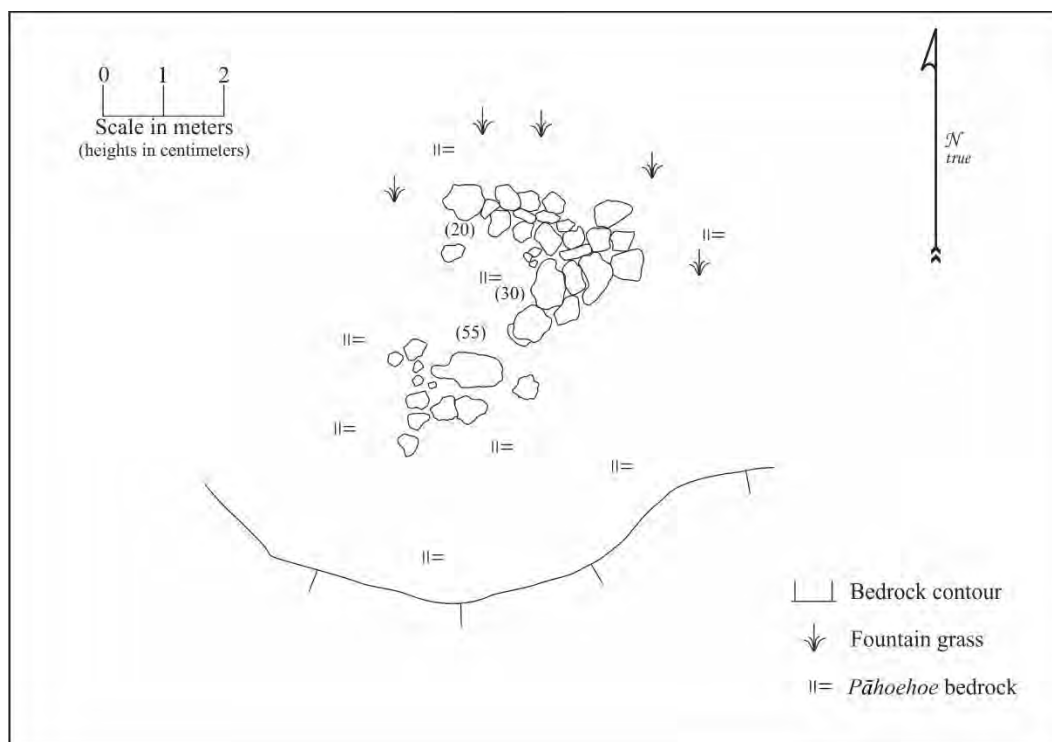


Figure 220. SIHP Site 30339 plan view.

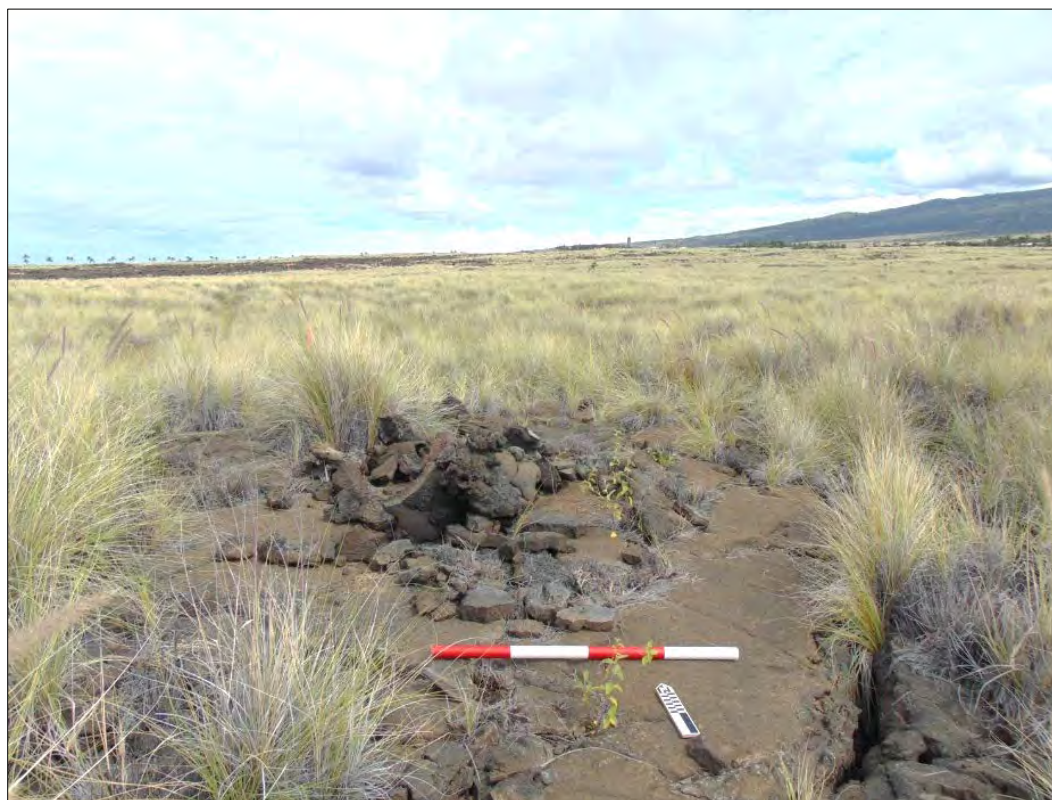


Figure 221. SIHP Site 30339, semi-circular rock ring, view to the north.

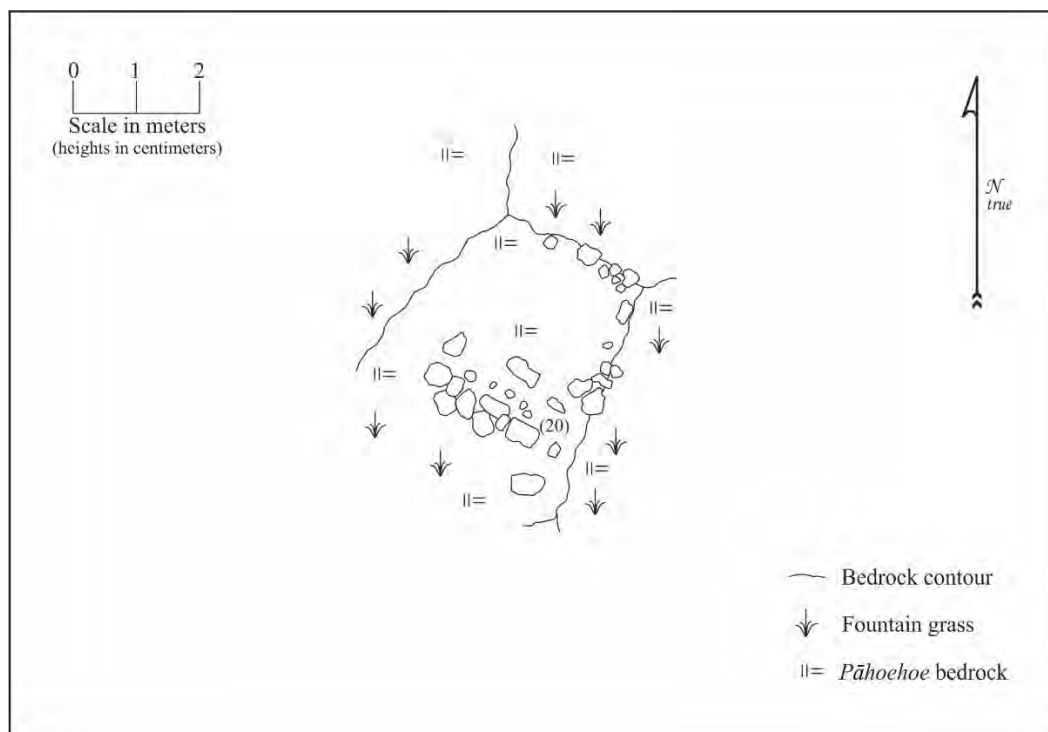


Figure 222. SIHP Site 30340 plan view.



Figure 223. SIHP Site 30340, rock ring, view to the east.

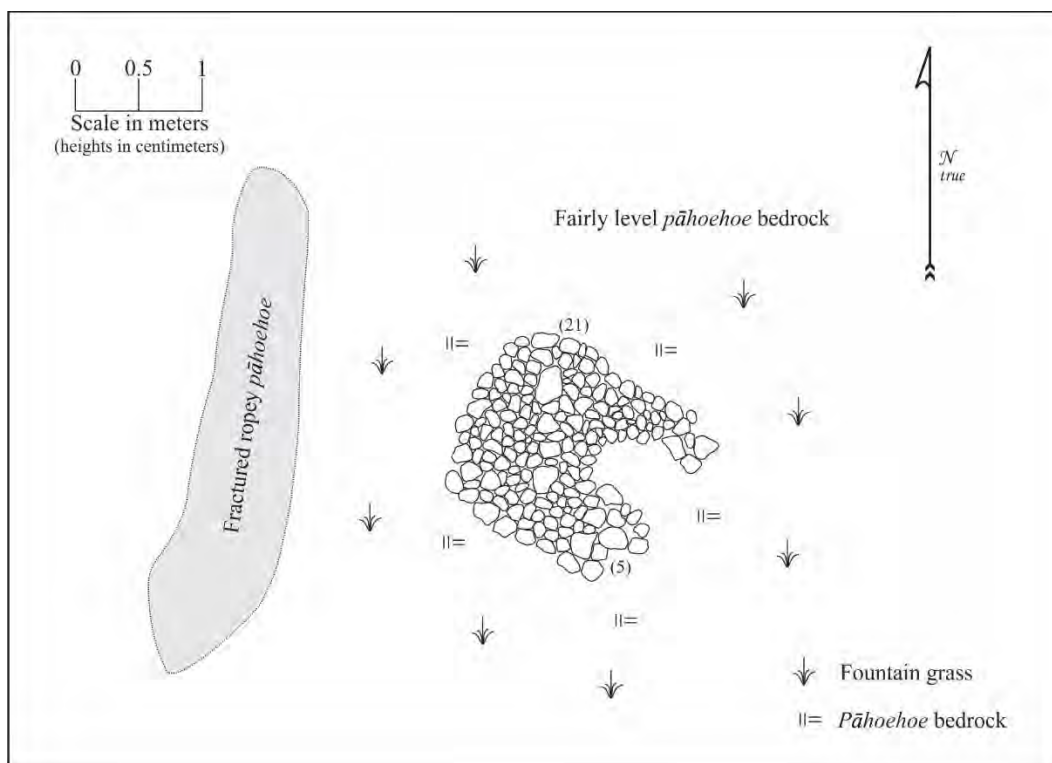


Figure 224. SIHP Site 30341 plan view.

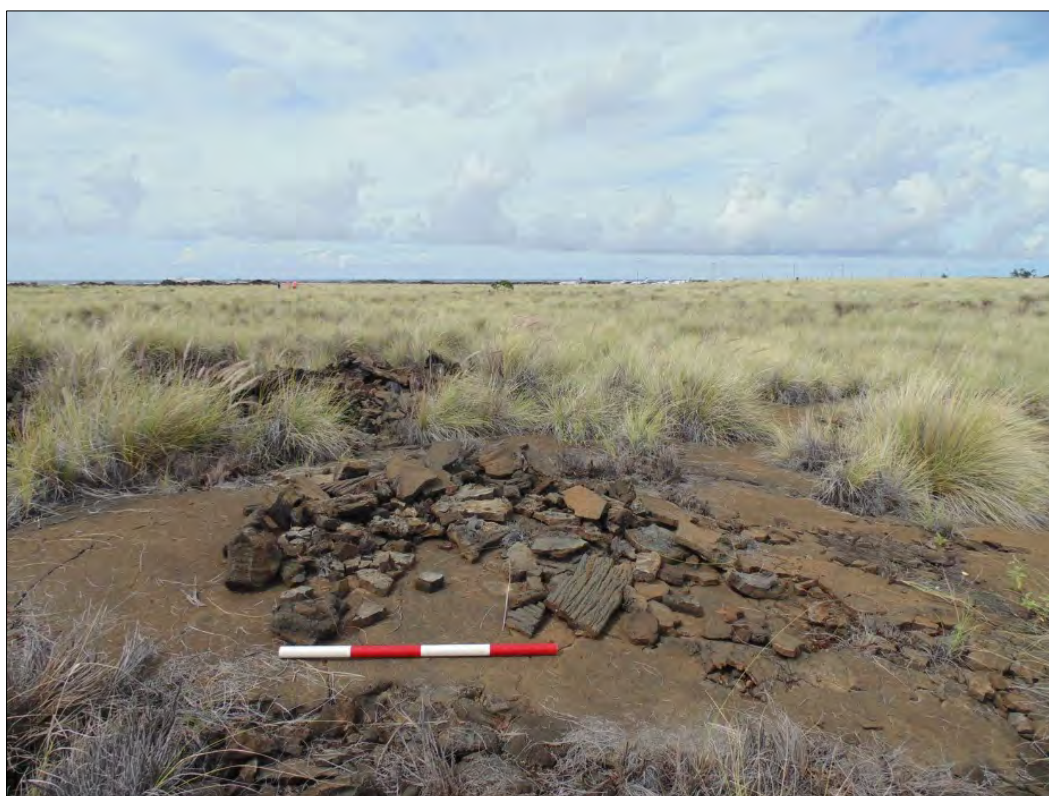
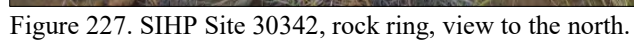


Figure 225. SIHP Site 30341, semi-circular rock ring, view to the west.



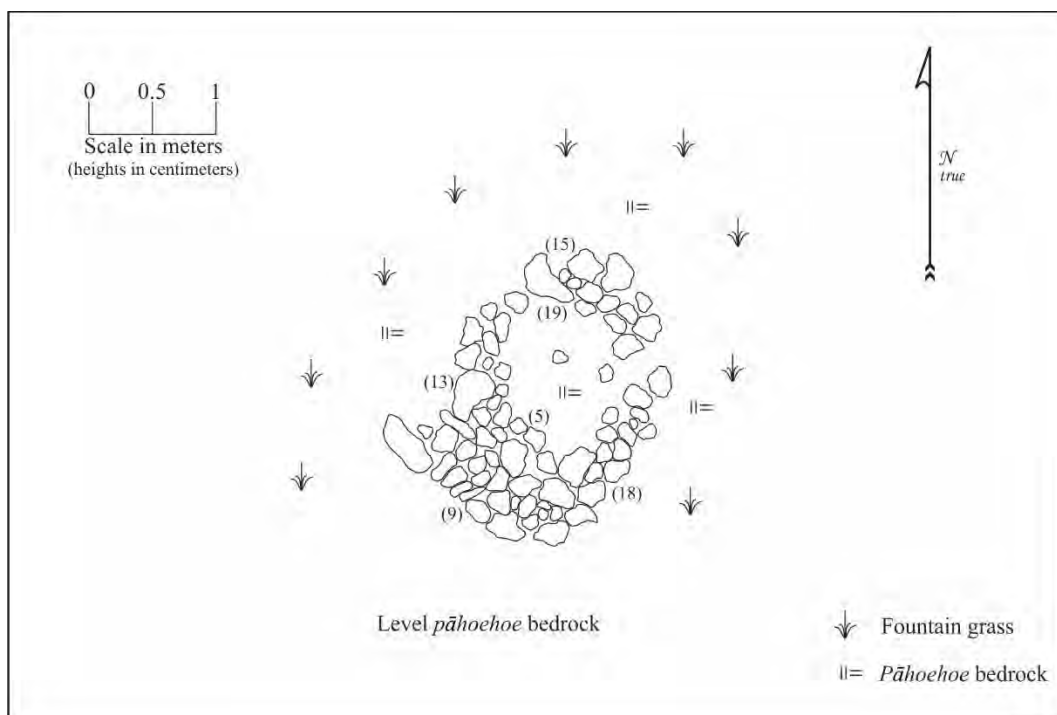


Figure 228. SIHP Site 30343 plan view.



Figure 229. SIHP Site 30343, rock ring, view to the north.

SIHP Site 30344

Site 30344 is a semi-circular rock ring located on level (h2-2) *pāhoehoe* bedrock ground surface in the northeastern portion of the current project area, 60 meters southwest of Site 30345 (see Figure 177). The rock ring measures 1.8 meters (north/south) by 1.3 meters wide (east/west) and stands 30 centimeters tall (Figure 230). It is constructed of medium to large to *pāhoehoe* slabs, with a few small cobbles scattered across the interior (Figure 231), all of immediately available source material. The ring is open to the north, and on the west edge is formed of an alignment of four upright slabs.

SIHP Site 30345

Site 30345 is a semi-circular rock ring located on level (h2-2) *pāhoehoe* bedrock ground surface in the northeastern portion of the current project area, 60 meters northeast of Site 30344 (see Figure 177). The ring opens to the east and measures 1.5 meters (north/south) by 1.3 meters (east/west) by up to 20 centimeters tall (Figure 232). It is constructed of immediately available source material consisting of small to large *pāhoehoe* slabs and cobbles, with several cobbles scattered across the interior. The edges are formed of roughly aligned, but mostly jumbled, cobbles (Figure 233).

SIHP Site 30346

30346 is a semi-circular rock ring located 6.3 meters northwest of 30345 near the *mauka* termination of Site 29273 (see Figure 177). The is situated on a level (h2-2) *pāhoehoe* bedrock surface and is constructed of roughly fifty *pāhoehoe* cobbles and slabs of immediately available source material arranged in a loose ring that opens to the north. It measures 1.8 meters long by 1.6 meters wide and has heights along the edges that vary from 20 to 25 centimeters (Figure 234). Several additional cobbles are piled in a line to the south of the ring (Figure 235). The line of cobbles is 2 meters long and it follows the underlying bedrock contour.

SIHP Site 30347

Site 30347 is a semi-circular rock ring located on level (h2-2) *pāhoehoe* bedrock ground surface in the northeastern portion of the current project area, 20 meters northeast of Site 30344 (see Figure 177). The pushed boulders along the northwestern edge of a large bulldozed area that extends west from Queen Ka‘ahumanu Highway is located roughly 5 meters east of 30347. The eastern edge of the rock ring is constructed of a line of roughly fifty loosely stacked *pāhoehoe* slabs of immediately available source material arranged in a north/south line that measures 1.8 meters long by 0.4 meters wide (Figure 236). The loosely stacked slabs along the east edge stand up to 35 centimeters tall (Figure 237). Loose cobbles are scattered on the ground surface to the west of the loosely stacked line of slabs, giving the feature the overall dimensions of 1.8 meters long by 1.6 meters wide, and suggesting that the semi-circular ring once opened to the west.

A collection of approximately twenty-five *pāhoehoe* slabs is situated 2.3 meters south of Site 30347, next to large boulder that toppled from the edge of the nearby bulldozed area (see Figure 236). The slab collection is situated on a gentle northwest facing (h2-2) bedrock slope (Figure 238). It measures 2.3 meters long by 1.4 meters wide and contains approximately five large slabs with the rest of the material consisting of smaller slabs. This collection of slabs does not seem to be a former rock ring but may have been a pile of slab associated with the construction of Site 30347 (Figure 239).

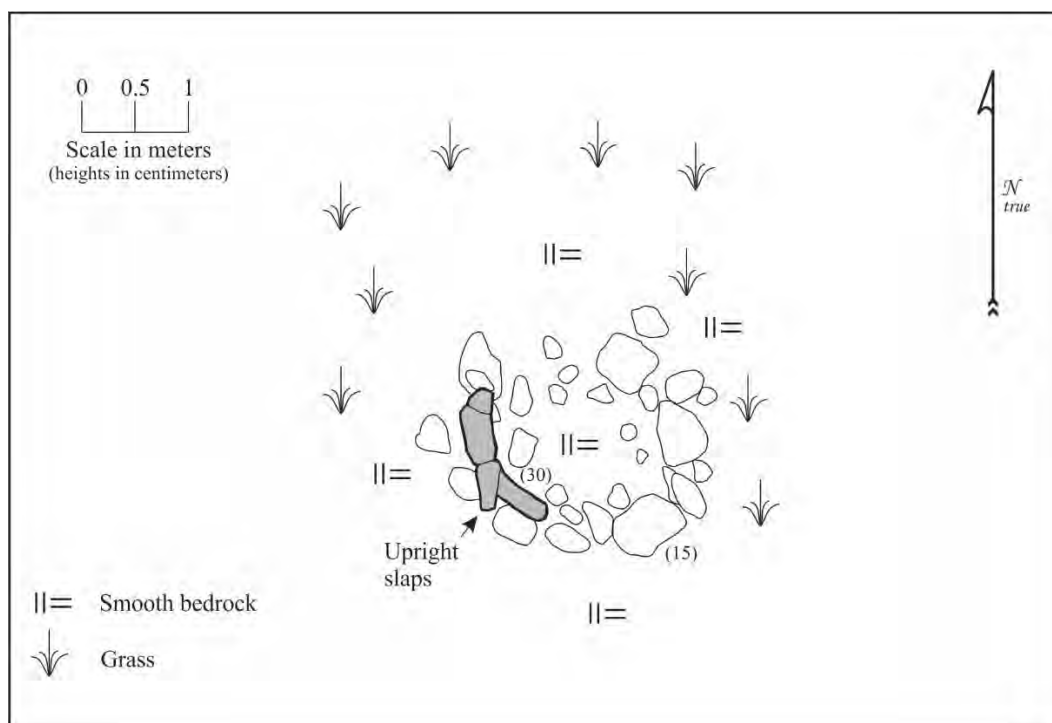


Figure 230. SIHP Site 30344 plan view.

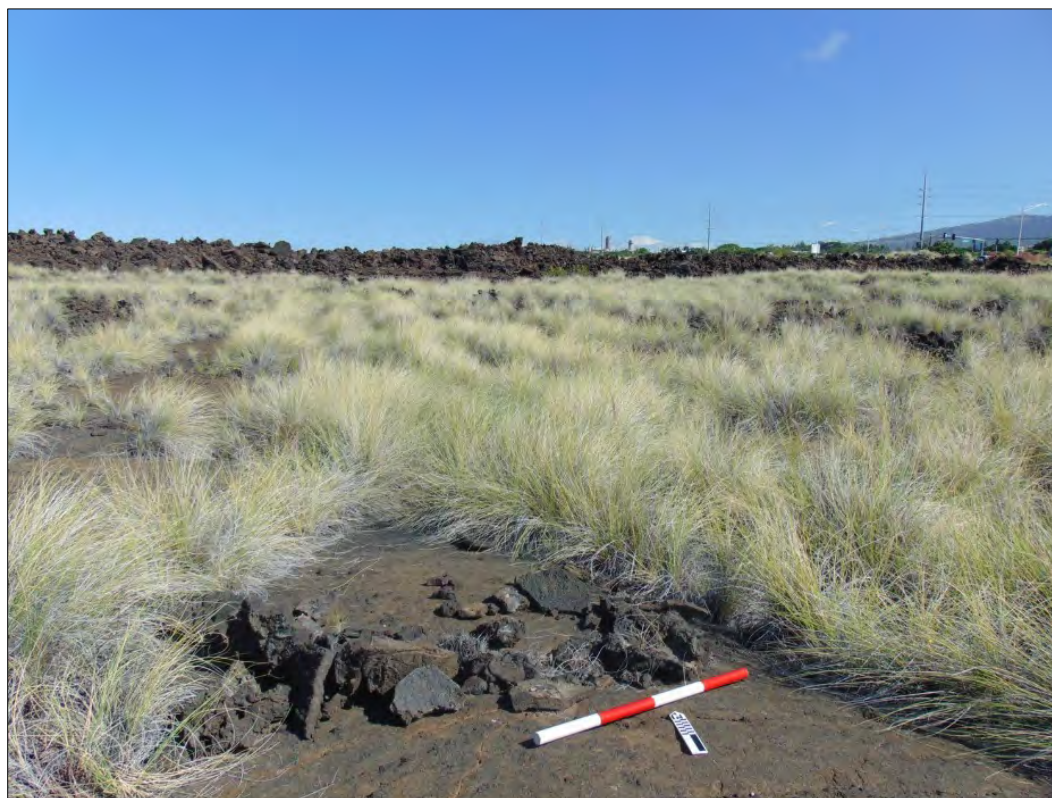


Figure 231. SIHP Site 30344, semi-circular rock ring, view to the north.

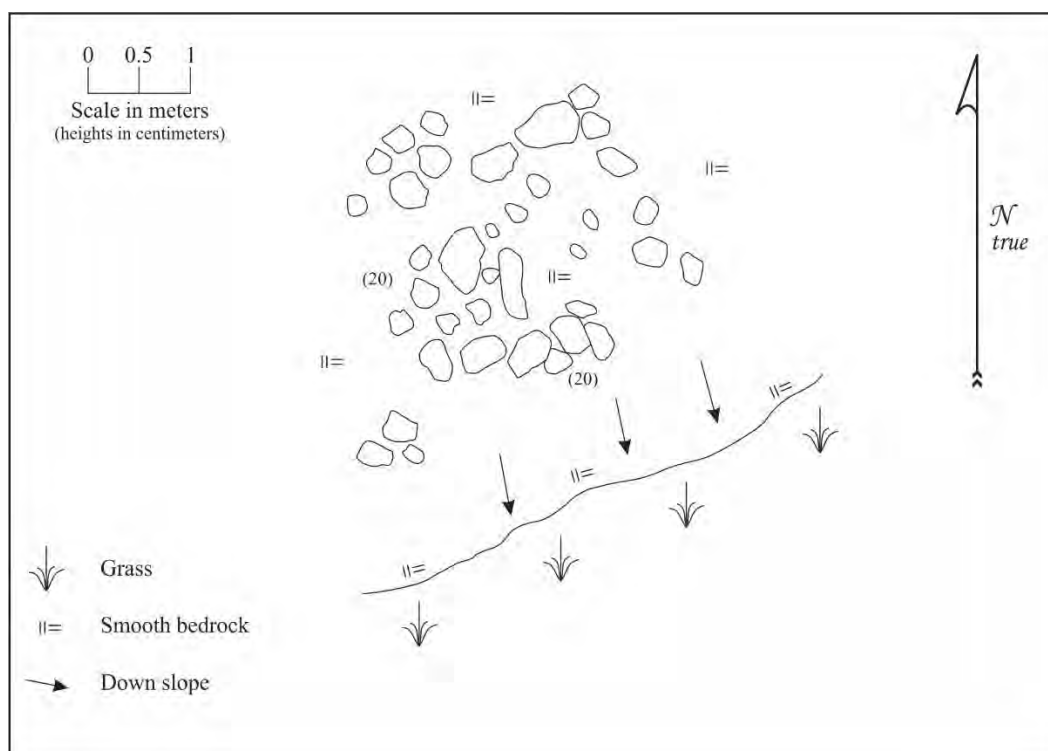


Figure 232. SIHP Site 30345 plan view.

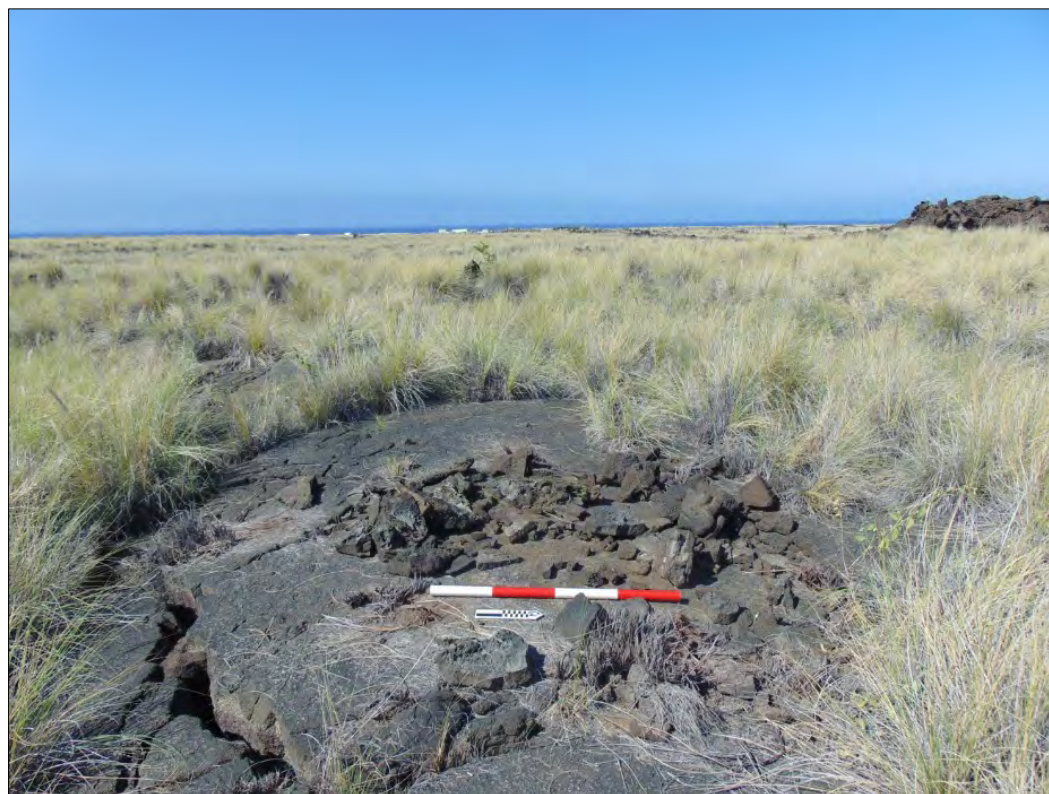


Figure 233. SIHP Site 30345, semi-circular rock ring, view to the west.

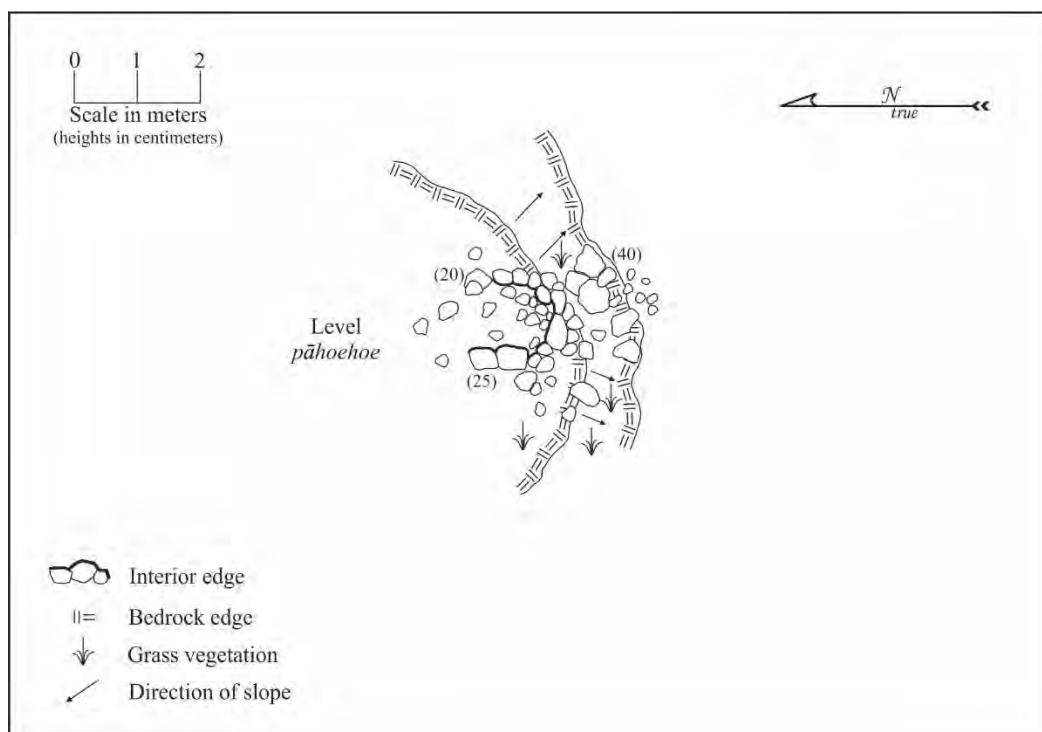


Figure 234. SIHP Site 30346 plan view.



Figure 235. SIHP Site 30346, semi-circular rock ring, view to the south.

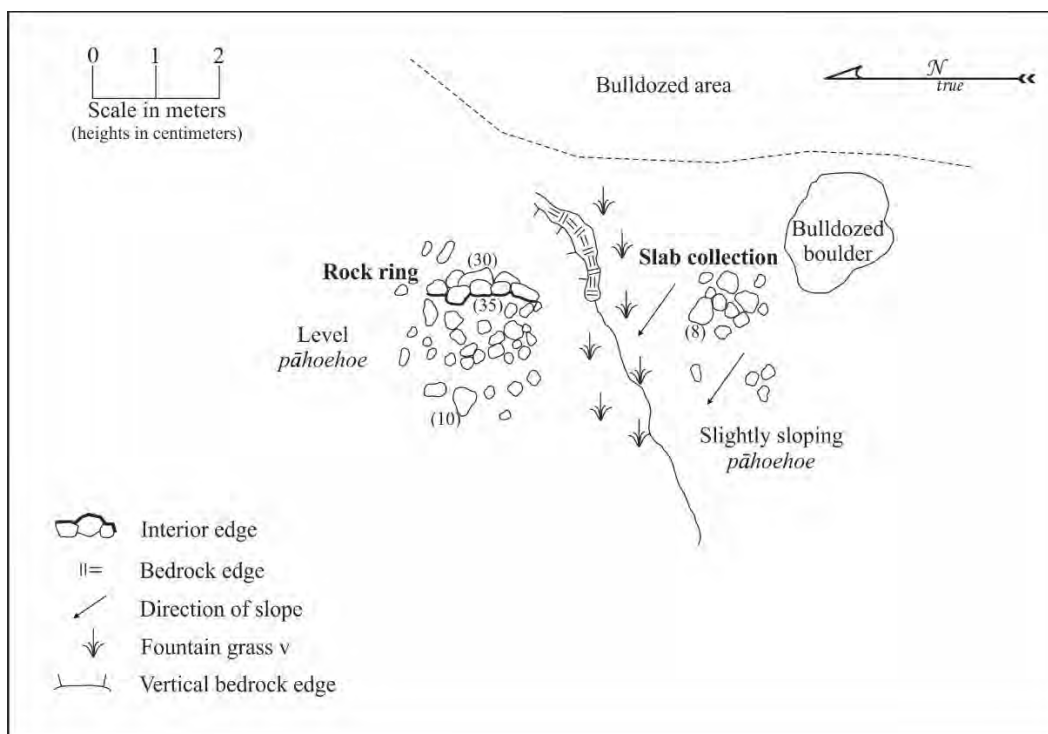


Figure 236. SIHP Site 30347 plan view.



Figure 237. SIHP Site 30347, semi-circular rock ring, view to the east.



Figure 238. SIHP Site 30347, collection of slabs south of the rock ring, view to the east.



Figure 239. SIHP Site 30347, collection of slabs with the rock ring in the background, view to the south.

Cairns

Sixty-nine cairn features were identified within the current study area (Table 10 and Figure 240). Cairns are conical rock piles that range in size from as few as two stones to as many stones as the individual purpose of construction requires. They range from loose piles of stones, to stones neatly stacked one on top of another, to *pāhoehoe* slabs propped upright, to mounds of stones with neatly stacked edges and nearly flat top surfaces. Cairns are typically constructed by an individual to mark a specific location, but the location referenced by the cairn is often restricted to a certain time and place, and only known to the individual who created the feature. The cairns identified within the current project area, for the most part, lack direct evidence of age or purpose of construction, but based on their formal attributes, location, and associations they were grouped into three general functional categories that include trail markers (n=18 or 26%), Historic survey markers (n=19 or 27.5%), and unspecified markers (n=32 or 46.5%). Additionally, a number of clearly modern cairns (i.e. cairns built of rocks with bulldozer scarring set on or adjacent to bulldozed surfaces) are present within the study area, but were not recorded, and are not discussed here. Many of the unspecified markers may actually be modern creations too (see Table 10), but lacking clear evidence to the contrary, they were recorded as archaeological sites and are discussed below.

Table 10. Cairn features recorded within the current study area.

<i>Site #/Feat.</i>	<i>Cairn type</i>	<i>Cairn function</i>	<i>Cairn age</i>
10160	Stacked mound	Survey marker	Historic
10161/A	Collapsed stack	Trail marker	Precontact/Historic
10161/B	Stacked mound	Survey marker	Historic
10161/D	Collapsed stack	Unspecified	Unknown
10161/J	Collapsed stack	Unspecified	Unknown
10161/K	Collapsed stack	Unspecified	Unknown
10162	Stacked mound	Survey marker	Historic
10187/A	Stacked mound	Survey marker	Historic
10187/B	Stacked mound	Survey marker	Historic
10187/C	Stacked mound	Survey marker	Historic
10187/D	Stacked mound	Survey marker	Historic
10188/A	Stacked mound	Survey marker	Historic
10188/B	Stacked mound	Survey marker	Historic
10189	Stacked mound	Survey marker	Historic
29272/1	Stacked slabs	Trail marker	Unknown/Modern
29272/2	Stacked slabs	Trail marker	Unknown/Modern
29272/3	Pile	Trail marker	Unknown/Modern
29272/4	Collapsed stack	Trail marker	Unknown/Modern
29274/A	Stacked mound	Survey marker	Historic
29274/B	Stacked mound	Survey marker	Historic
30315/A	Pile	Trail marker	Precontact/Historic
30315/B	Pile	Trail marker	Precontact/Historic
30315/C	Pile	Trail marker	Precontact/Historic
30315/D	Collapsed stack	Trail marker	Precontact/Historic
30315/E	Pile	Trail marker	Precontact/Historic
30315/F	Pile	Trail marker	Precontact/Historic
30315/G	Collapsed stack	Trail marker	Precontact/Historic
30315/H	Pile	Trail marker	Precontact/Historic
30315/I	Collapsed stack	Trail marker	Precontact/Historic
30315/J	Collapsed stack	Trail marker	Precontact/Historic
30315/K	Collapsed stack	Trail marker	Precontact/Historic
30315/L	Collapsed stack	Trail marker	Precontact/Historic
30315/M	Collapsed stack	Trail marker	Precontact/Historic
30315/N	Collapsed stack	Trail marker	Precontact/Historic

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

Table 10 continued on next page.

Table 10. Continued.

<i>Site #*/Feat.</i>	<i>Cairn type</i>	<i>Cairn function</i>	<i>Cairn age</i>
30348	Stacked mound	Survey marker	Historic
30349	Stacked mound	Survey marker	Historic
30350/A	Pile	Survey marker	Historic
30350/B	Collapsed mound	Survey marker	Historic
30351/A	Collapsed mound	Survey marker	Historic
30351/B	Collapsed stack	Survey marker	Historic
30352/A	Upright slabs	Survey marker	Historic
30352/B	Upright slabs	Survey marker	Historic
30353	Collapsed stack	Unspecified	Unknown
30354	Stacked slabs	Unspecified	Unknown/Modern
30355/A	Stacked slabs	Unspecified	Unknown/Modern
30355/B	Stacked slabs	Unspecified	Unknown/Modern
30355/C	Stacked slabs	Unspecified	Unknown/Modern
30355/D	Stacked slabs	Unspecified	Unknown/Modern
30356	Upright slab	Unspecified	Unknown
30357	Pile	Unspecified	Unknown
30358/A	Collapsed stack	Unspecified	Unknown/Modern
30358/B	Stacked slabs	Unspecified	Unknown/Modern
30359	Stacked slabs	Unspecified	Unknown/Modern
30360/A	Collapsed stack	Unspecified	Unknown/Modern
30360/B	Stacked slabs	Unspecified	Unknown/Modern
30361	Stacked cobbles	Unspecified	Unknown/Modern
30362	Collapsed stack	Unspecified	Unknown/Modern
30363	Pile	Unspecified	Unknown
30364	Stacked slabs	Unspecified	Unknown/Modern
30365/A	Pile	Unspecified	Unknown/Modern
30365/B	Collapsed stack	Unspecified	Unknown/Modern
30365/C	Stacked slabs	Unspecified	Unknown/Modern
30366	Stacked slabs	Unspecified	Unknown/Modern
30367	Collapsed stack	Unspecified	Unknown
30368	Stacked cobbles	Unspecified	Modern
30369/A	Stacked slabs	Unspecified	Unknown/Modern
30369/B	Stacked slabs	Unspecified	Unknown/Modern
30370/A	Stacked slabs	Unspecified	Unknown/Modern
30370/B	Stacked slabs	Unspecified	Unknown/Modern

*SIHP Site numbers are preceded by the State, Island,
and USGS quad prefix 50-10-27-.

End of Table 10.

All of the cairn features recorded within the current study area were classified by formal attributes into seven basic cairn types (see Table 10), including stacked mounds (n=14), collapsed mounds (n=2), piles (n=11), stacked slabs (n=17), stacked cobbles (n=2), collapsed stacks (n=20), and upright slabs (n=3). Stacked mounds are circular cairns (typically 1 meter in diameter) that are comprised of roughly 50 to 100 cobbles and slabs each, and generally have neatly stacked, nearly vertical edges greater than 50 centimeters tall. Collapsed mounds are the remnants of stacked mound cairns that have collapsed creating a mounded pile of roughly 50 to 100 cobbles that is less than 50 centimeters tall. Piles are cairns formed of grouped together cobbles and slabs that exhibit no signs former stacking; the size of a pile is dictated by the amount and size of the material used in its construction. Stacked slabs are cairns formed of *pāhoehoe* slabs stacked one on top of another. Stacked cobbles are cairns formed of primarily cobbles (*pāhoehoe* or 'a'ā) stacked one on top of another. Collapsed stacks are cairns that appear to have formerly been either stacked slab cairns or stacked cobble cairns that have toppled over. Upright slabs are cairns formed of *pāhoehoe* slabs that are propped upright.

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The sixty-nine recorded cairns are distributed across the entire study area from north to south and east to west, but are found exclusively on *pāhoehoe* bedrock surfaces. When examining the spatial relationships between the cairns (see Figure 240), three distinct *mauka/makai* groupings become evident; one in the northern portion of the study area, in the vicinity of the Site 30315 trail, where thirty-three cairn features were recorded; another in the central portion of the study area, extending from Queen Ka‘ahumanu Highway to the Keāhole Airport property at the Māmalahoa Trail (SIHP Site 2) in the vicinity of the Kalaoa-‘O‘oma Homestead road that was laid out by surveyors in 1902 (but never built), where nineteen cairns features were recorded; and a third in the southern portion of the study area, in the vicinity of the Site 29272 trail (Kauhini Road), where seventeen cairns were recorded. These cairn groupings suggest that cairn construction (i.e. the number of cairns in a given area) can be correlated to the ease of access to that area (i.e. the number of people passing through), a trend that continues to this day, as modern cairns are typically found in areas where the access is easiest (i.e. along roadways or adjacent to bulldozing and modern development).

The cairn type, combined with the cairn location, was used to classify the cairn features into relative age and functional categories (see Table 10). The stacked mounds, which are the most prominent type of cairn feature (ten of the twelve cairns recorded by Barrera (1985a, 1989) within the study area were this type of cairn), all appear to be Historic survey markers. Rechtman and Clark (2012) previously recognized that the two cairns of this type at Site 29274, when overlaid on a map of the Kalaoa-‘O‘oma Homesteads (Hawai‘i Registered Map No. 2123 prepared by the surveyors S.M. Kanakanui and G.F. Wright in May 1902; see Figure 31), fell at the exact location of a turn in the planned Kalaoa-‘O‘oma Homestead road. This road was laid out by surveyors in March and April of 1902 (Wall 1902), but was never built. An overlay of all sixteen of the stacked and collapsed mound cairns recorded within the current study area (Figure 241), shows that all but two of those cairns (SIHP Sites 10160 and 10161 Feature B) fall on or nearby that roadway, or next to the realigned route of the *makai* Government Road, and that four additional cairns (two upright slab cairns, a collapsed stack cairn, and a piled cairn at Sites 30352, 30350, and 30351) are also likely associated with the laying out of those roadways in 1902. Sites 10160 and 10161 Feature B, may mark triangulation points used in the geodetic survey of the homestead lots or other homestead boundaries. A stacked cobble cairn and a collapsed stack cairn (SIHP Sites 30361 and 30362) located in the central portion of the study area in the vicinity of the Site 10162 and 30349 Historic survey markers may also be associated with the homestead survey, or may be modern creations associated with a bulldozer cut that passes through that area. A piled cairn (SIHP Site 30363) located in the east-central portion of the study area in the vicinity the Site 29274 Historic survey markers could also be associated with the 1902 survey of the Kalaoa-‘O‘oma Homesteads, but as this cairn is not a stacked mound type, and its location did not align with any of the known survey points, its function remains unspecified.

Fifteen cairns in the northern portion of the study area that are directly associated with the route of the Site 30315 trail, consisting of six piled cairns and nine collapsed stack cairns (SIHP Sites 30315 Features A-N and 10161 Feature A), based on their formal attributes and association with the trail route, are all interpreted as trail markers thought to have been built during the Precontact or early Historic Period when the trail was in use. It is possible that two other cairns situated nearby the Site 30315 trail (SIHP Sites 30353 and 30357, a collapsed stack cairn and piled cairn, respectively), but not directly associated with the trail route itself, are in some way related to the use of that site. Fourteen other cairns in the northeastern portion of the study area near the *mauka* termination of Site 30315 (see Table 10 and Figure 240), all stacked slab or collapsed stack cairns (at SIHP Sites 10161, 30354, 30355, 30358, 30359, 30360, and 30364), may be modern creations (bulldozing and a road leading to the Keāhole Airport, make modern access to this area fairly easy). The four stacked slab cairns recorded as Site 30355, seem to mark the route of an infrequently used path leading from the direction of Queen Ka‘ahumanu Highway to Site 30315 at the Site 30319 lava tube entrance, and it is possible that the other cairns in this area served similar, or perhaps related, functions. The final cairn in the northeastern portion of the study area is an upright slab (SIHP Site 30356) that may mark the location of the Site 30317 lava tube shelter, and be related to that site.

The four cairns along Kauhini Road (SIHP Site 29272) in the southern portion of the study area are also interpreted as trail markers, but as that trail/road was used until the 1970s, and as all four are stacked slab cairns that do not appear to be particularly old, they are not assigned to one of the relative time periods. These cairns could in fact be modern creations, as could all thirteen of the other stacked slab cairns recorded within the study area (see Table 10), including five other cairns near the route of Site 29272 at Sites 30366, 30369, and 30370 (see Figure 240). Three additional cairns situated near the Site 29272 trail, including one piled cairn, one collapsed stack cairn, and one stacked slab cairn (SIHP Site 30365), may also be associated with the (modern) use of Kauhini Road. An aluminum foil pan, riddled with bullet holes, was found adjacent to one of the features of Site 30365, suggesting that the cairn may have been created to hold the target in place. The function of a collapsed stack cairn (SIHP Site 30367) located roughly 10 meters *mauka* of the Māmalahoa Trail (SIHP Site 2) in the southwestern portion of the study area is unspecified, but may be a survey point along the preservation easement of Site 2, or be associated with the use of the roadway itself.

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One cairn recorded within the current study area (SIHP Site 30368), in all likelihood, is a modern creation (see Table 10). This tall stacked cobble cairn, is precariously balanced and is not likely to have survived in its current form for any length of time. The location of the cairn near Queen Ka‘ahumanu Highway and the northeastern most *pāhoehoe* excavations of Site 30375, suggests that the cairn may have been erected to identify the location of rock material taken and used for modern rock wall construction.

The cairns recorded within the study area were assigned to sites based upon proximity, temporal affiliation, location, and the impressionistic associations and discrete connections noted between them and other proximate features in the field. Essentially, cairns associated with trails were assigned to those trail sites, cairns with similar formal traits or temporal affiliations located in close proximity to one another were grouped together, and isolated or individual cairns were assigned their own discrete site designation. Fourteen cairns were previously recorded within or adjacent to the current study area by Barrera (1985a, 1989) as “stone mounds” (see Appendices A and B). Twelve of these cairns were relocated (at SIHP Sites 10160, 10161, 10162, 10187, and 10189), but two cairns (SIHP Sites 10156 and 10157) located near the existing portion of Kahilihili Street were not (see Figure 42), and are thought to have been destroyed during the construction of that road. Two other cairns (SIHP Site 29274) previously recorded within the study area by Rechtman and Clark (2012), were also relocated. Three cairns recorded by Barrera (1989) and two cairns identified during the current fieldwork were grouped together with six rock rings as Site 10161 and are described above with that complex. Eighteen of the newly identified cairns were grouped with two of the trail sites (four at Site 29272 and fourteen at Site 30315) and are described above with those sites. The remaining thirty-nine cairns were grouped into nine cairn complexes (SIHP Sites 30350, 30351, 30352, 30355, 30358, 30360, 30365, 30369, and 30370) and fifteen individual cairn sites (SIHP Sites 30348, 30349, 30353, 30354, 30356, 30357, 30359, 30361, 30362, 30363, 30364, 30366, 30367, 30368, and 30370) and are described below with the previously recorded cairn sites (SIHP Sites 10160, 10162, 10187, 10189, and 29274). Significance evaluations and treatment recommendations for the cairn sites are presented at the conclusion of this report.

SIHP Site 10160

Site 10160 is a cairn that was originally recorded by Barrera (1985a) as a “stone mound” (see Appendix A). The cairn is located in the north central portion of the study area on a barren *pāhoehoe* flow, 18 meters north of another cairn (Feature D) marking the route of the Site 30315 trail (see Figure 240). It is situated on an elevated bedrock landform adjacent to (northwest of) an entrance (Feature F) to the Site 30316 lava tube and is constructed of roughly fifty loosely stacked small to large cobbles. Only the eastern edge of the cairn is still intact (Figure 242), the western edge has collapsed down slope to the west (Figure 243). In its current condition the cairn measures 1.3 meters by 1 meter and has a maximum height of 50 centimeters. A thin layer of excavated bedrock adjacent to the north edge of the cairn may be the source of the material used to construct Site 10160. Given the size and shape of Site 10160, the cairn is interpreted as a Historic survey marker. It is likely that this survey marker, like several other similar cairns within the study area, was erected by surveyors laying out the Kalaoa-‘O‘oma Homestead lots in 1902 (see Figure 241). The specific purpose of marking this particular location, however, is unknown.

SIHP Site 10162

Site 10162 is a cairn that was originally recorded by Barrera (1985a) as a “stone mound” (see Appendix A). The cairn is located in the central portion of the study area on a level *pāhoehoe* bedrock ground surface that is surrounded by fountain grass (see Figure 240). It is a well formed circular cairn with sloped sides, constructed of approximately fifty neatly stacked large cobbles (Figure 244). A wooden lathe reading “Arch Site 4” is stuck in the center of the feature. Given the size and shape of Site 10162, the cairn is interpreted as a Historic survey marker. The location of Site 10162 suggests that it was erected to mark a surveyed change in direction along the north side of the Kalaoa-‘O‘oma Homestead road laid out by surveyors in 1902, but never built (see Figure 241).

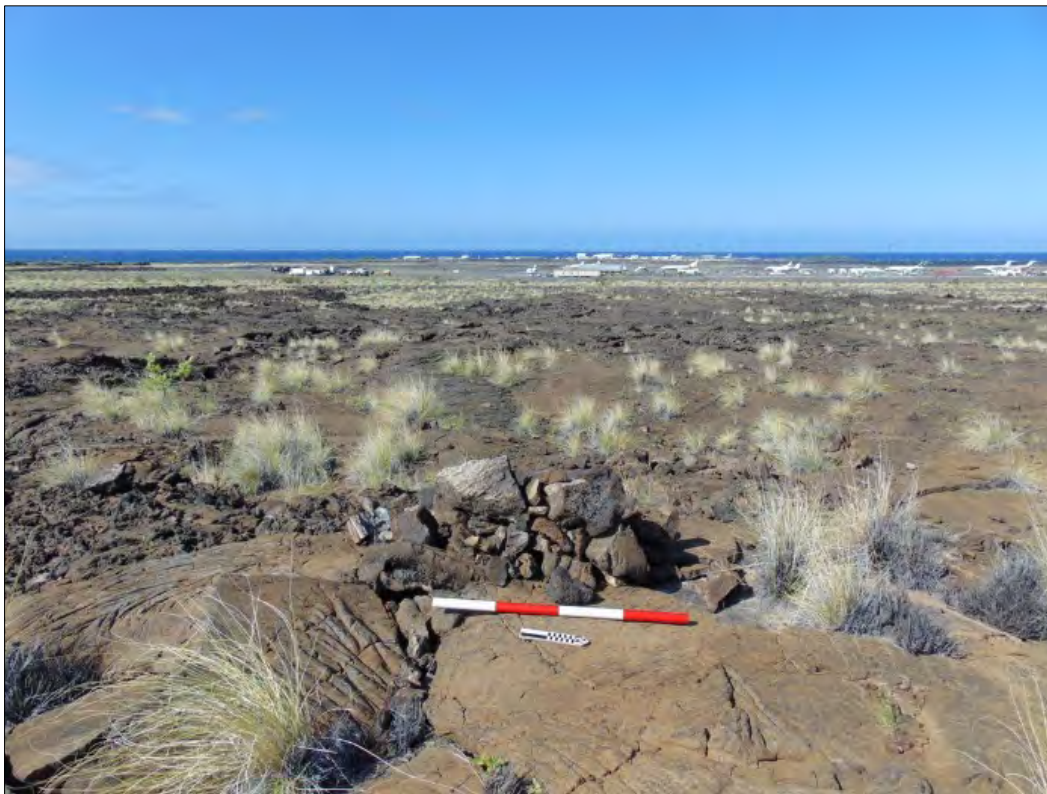


Figure 242. SIHP Site 10160, view to the west.

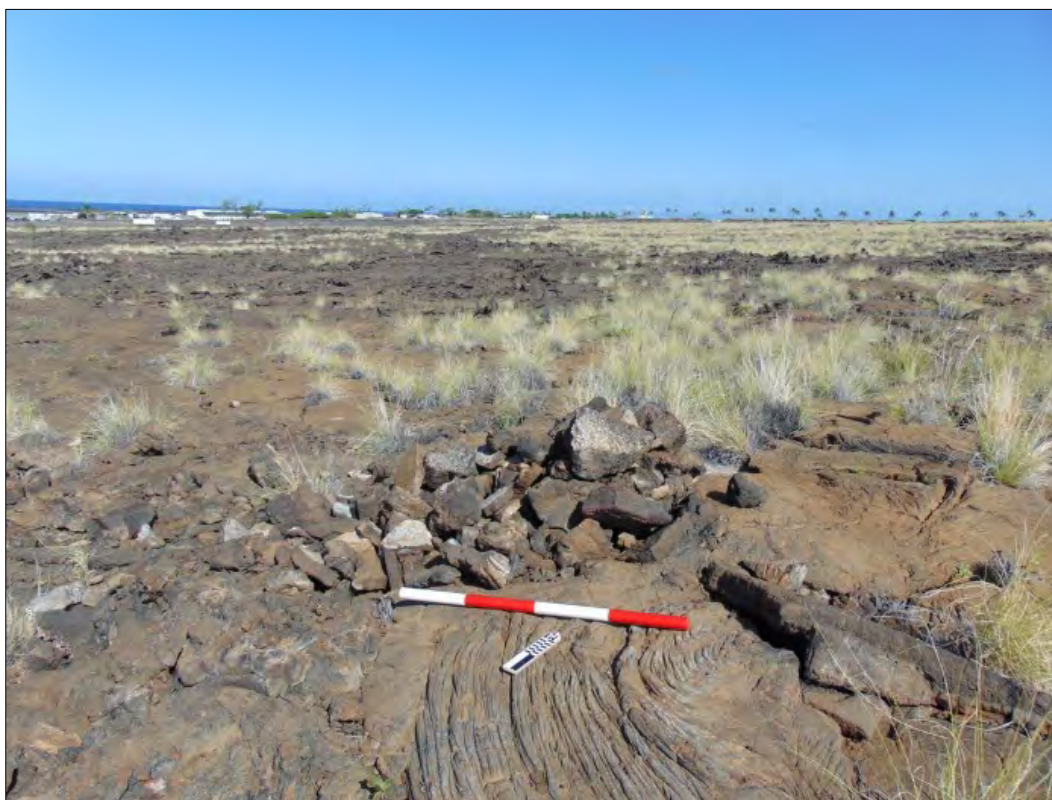


Figure 243. SIHP Site 10160, view to the northwest.

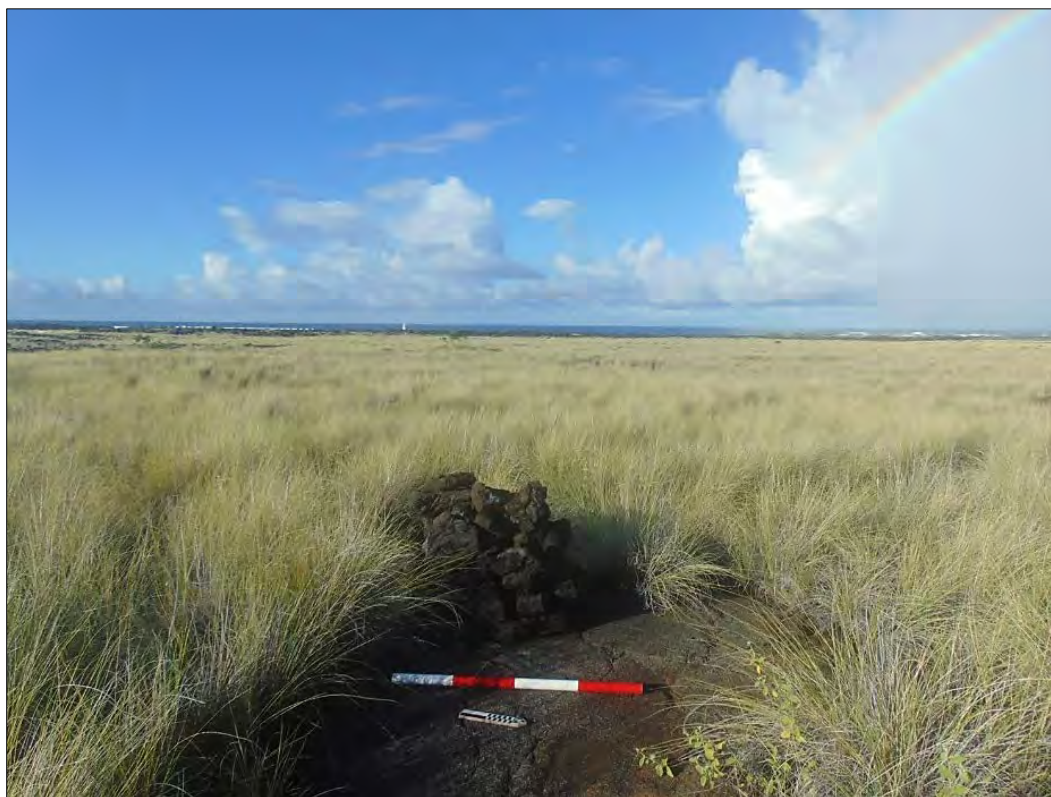


Figure 244. SIHP Site 10162, view to the southwest.

SIHP Site 10187

Site 10187 is a complex of four cairns (Features A-D) that were previously documented by Barrera (1985a, 1989) as “four stone mounds” (see Appendices A and B). The cairns are located in the northwestern corner of the current study area, roughly 30 meters south of the Keāhole Airport property (see Figure 240). They are situated on a flat *pāhoehoe* bedrock ground surface within an 18-meter (north/south) by 15-meter (east/west) area that spans the Māmalahoa Trail (SIHP Site 2), with two cairns on either side of the Historic roadway (Figure 245). As described by Barrera (1989) the material used to build the cairns was taken from the kerbing of the 1847 Government Road (SIHP Site 2; the Māmalahoa Trail) at this location, indicating a Historic date for the construction of the site. Barrera (1989) did not offer an interpretation of the function of Site 10187, but based on the results of the current study it appears that all four cairns are Historic survey markers. The location of the cairns suggests that Site 10162 was erected to mark the point at which the Kalaoa-‘O‘oma Homestead road and the realigned *makai* Government Road (SIHP Site 2) through the homesteads were to intersect (see Figure 241). Both of these roads were laid out by surveyors in 1902, but never built.

Cultural debris likely associated with the Māmalahoa Trail, but found in the vicinity of Site 10187, includes a light green, hand blown glass bottle base that appears to date to the late 1800s, and three Western Cartridge Company bullet casings with the head stamp “WCC / 44”. The bottle base was found on the *mauka* side of the trail roughly 5 meters northwest of Feature D, and the bullet casings were observed 1 to 2 meters north of Feature D (see Figure 245). Detailed descriptions of all four of the features of Site 10187 follow below.

Feature A

Feature A is a cairn located in the southeastern portion of Site 10187, 2 meters *mauka* of the existing Māmalahoa Trail (SIHP Site 2) alignment (see Figure 245). This roughly circular cairn with a flat top surface is constructed of approximately fifty *pāhoehoe* slabs and cobbles neatly stacked on a level *pāhoehoe* bedrock ground surface (Figure 246). It measures 0.75 meters by 0.95 meters and stands roughly 50 centimeters tall. Feature A is interpreted as a Historic survey marker that was erected in 1902 at the southeastern corner of the planned intersection of the Kalaoa-‘O‘oma Homestead road and the realigned *makai* Government Road (see Figure 241).

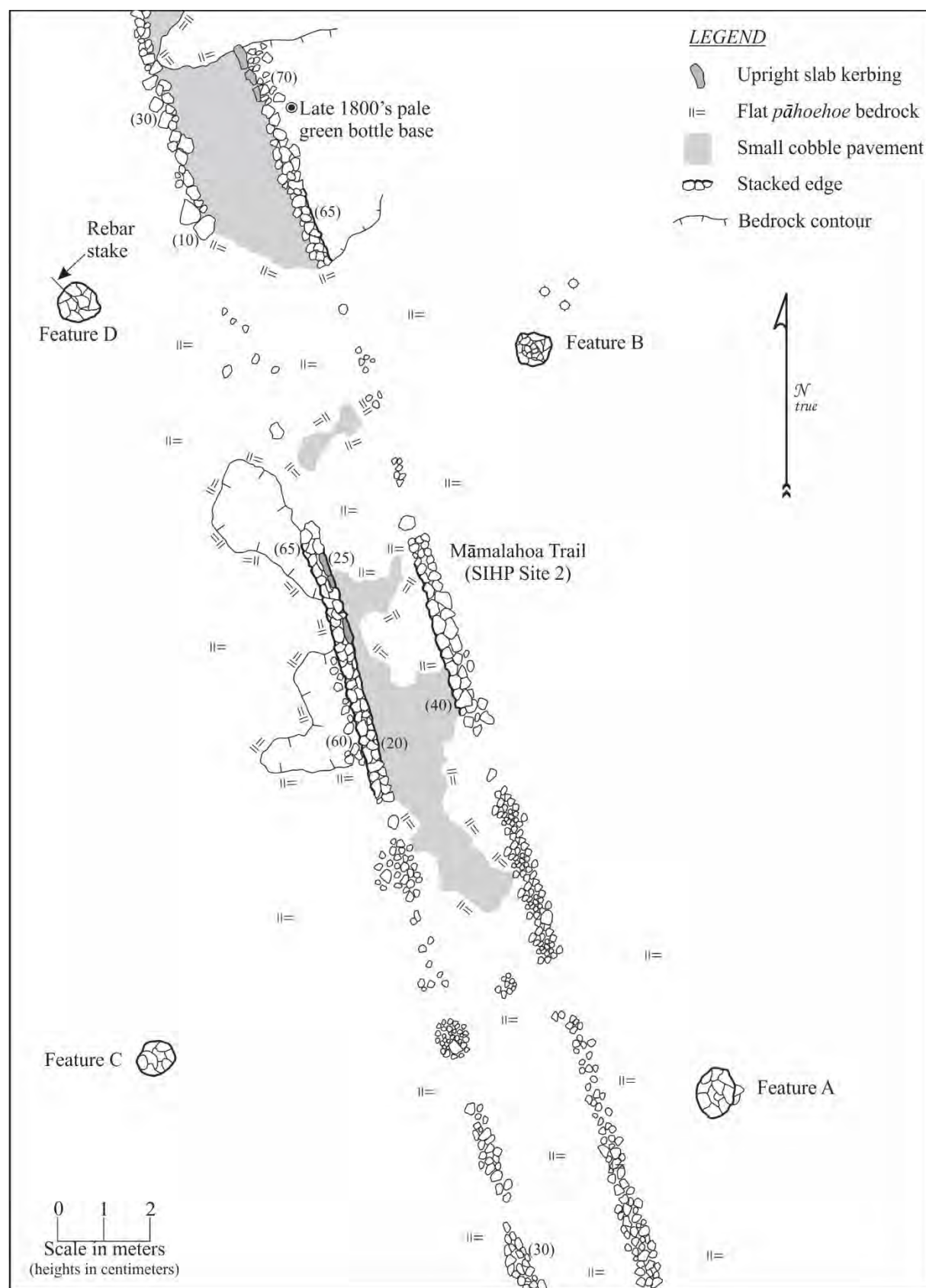


Figure 245. SIHP Site 10187 plan view.



Figure 246. SIHP Site 10187 Feature A, view to the north.

Feature B

Feature B is a cairn located in the northeastern portion of Site 10187, 3 meters *mauka* of the existing Māmalahoa Trail (SIHP Site 2) alignment (see Figure 245). This roughly circular cairn with a sloped top surface is constructed of approximately fifty flat *pāhoehoe* slabs and cobbles neatly stacked, but slightly collapsed, on a level *pāhoehoe* bedrock ground surface (Figure 247). It measures 0.9 meters by 0.95 meters and stands roughly 45 centimeters tall. Feature B is interpreted as a Historic survey marker that was erected in 1902 at the northeastern corner of the planned intersection of the Kalaoa-‘O‘oma Homestead road and the realigned *makai* Government Road (see Figure 241).

Feature C

Feature C is a cairn located in the southwestern portion of Site 10187, 2.5 meters *makai* of the existing Māmalahoa Trail (SIHP Site 2) alignment (see Figure 245). This roughly circular cairn with a flat top surface and sloped sides is constructed of approximately fifty *pāhoehoe* slabs neatly stacked on a level *pāhoehoe* bedrock ground surface (Figure 248). It measures 0.85 meters by 0.95 meters and stands roughly 75 centimeters tall. Feature C is interpreted as a Historic survey marker that was erected in 1902 at the southwestern corner of the planned intersection of the Kalaoa-‘O‘oma Homestead road and the realigned *makai* Government Road (see Figure 241).

Feature D

Feature D is a cairn located in the northwestern portion of Site 10187, 2.5 meters *makai* of the existing Māmalahoa Trail (SIHP Site 2) alignment (see Figure 245). This roughly circular cairn with a flat top surface and sloped sides is constructed of approximately fifty *pāhoehoe* slabs neatly stacked on a level *pāhoehoe* bedrock ground surface (Figure 249). It measures 0.7 meters by 0.8 meters and stands roughly 55 centimeters tall. A rusted length of rebar currently protrudes from the cairn. Feature D is interpreted as a Historic survey marker that was erected in 1902 at the northwestern corner of the planned intersection of the Kalaoa-‘O‘oma Homestead road and the realigned *makai* Government Road (see Figure 241).

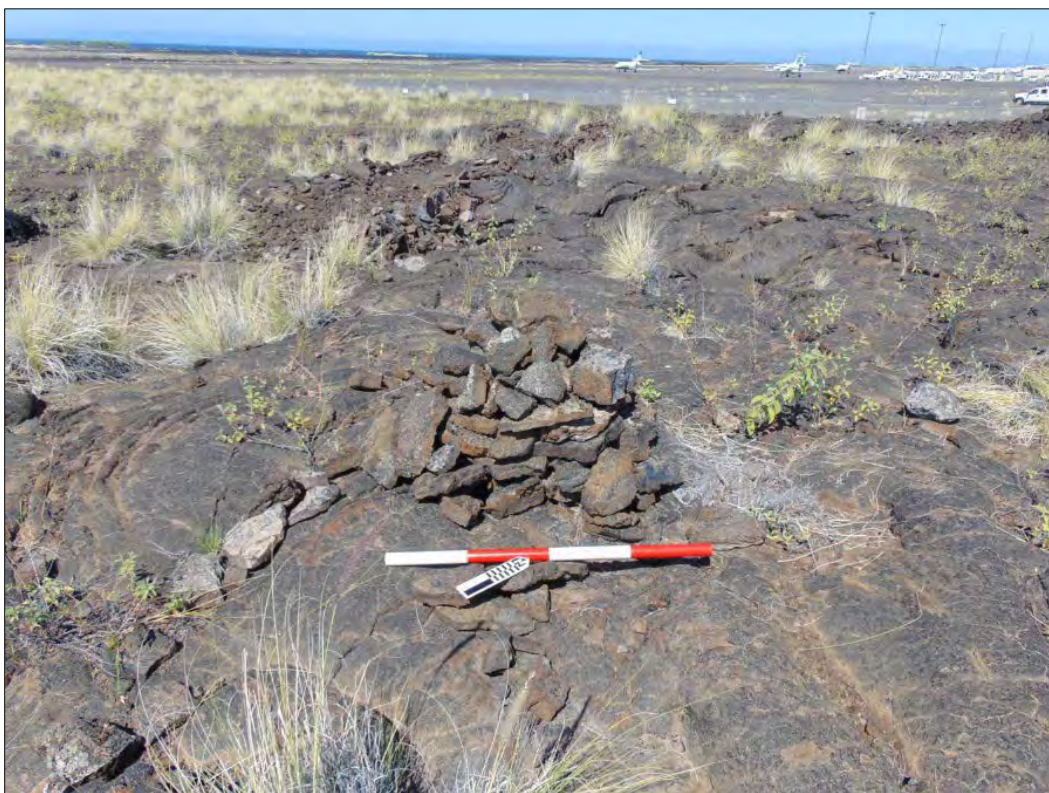


Figure 247. SIHP Site 10187 Feature B, view to the northwest.

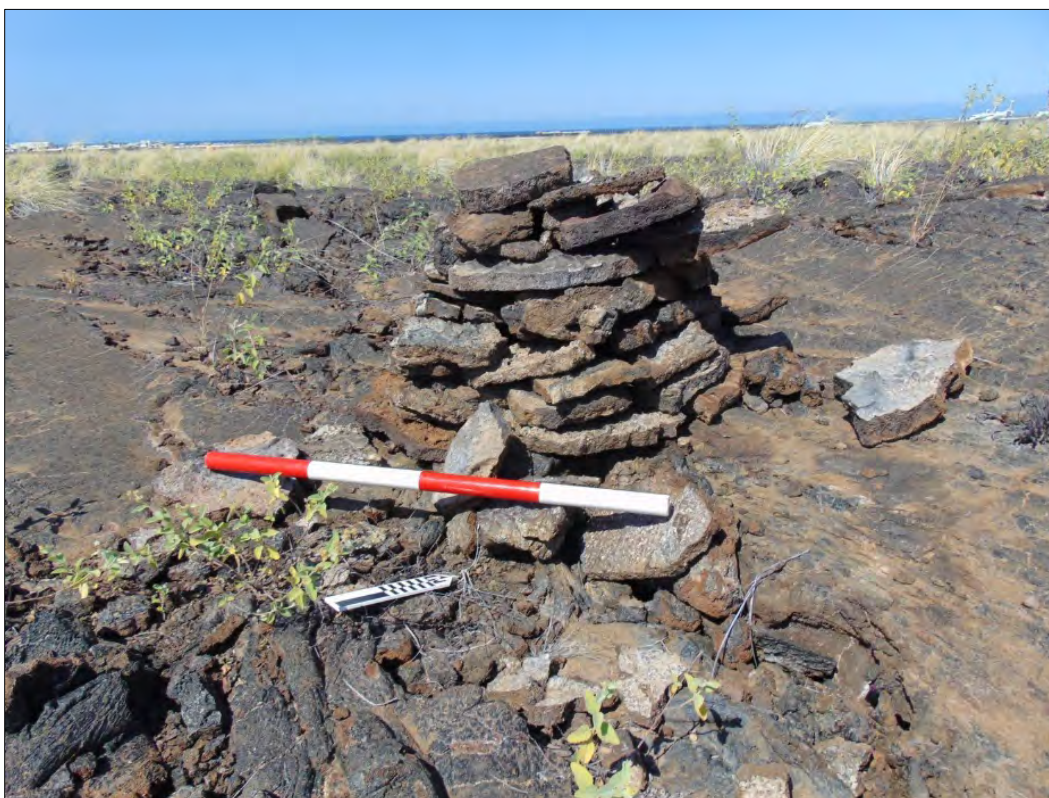


Figure 248. SIHP Site 10187 Feature C, view to the northwest.



Figure 249. SIHP Site 10187 Feature D, view to the north.

SIHP Site 10188

Site 10189 consists of two cairns (Features A and B) previously recorded by Barrera (1985a) as “two stone mounds” (see Appendix A). The site is situated on a level *pāhoehoe* bedrock surface along the western boundary of the current study area (at its southern end), 32 meters west of Site 30350 and approximately 10 meters north of the raised edge of an ‘*a*’ flow (see Figure 240). The cairns are situated 17.4 meters from one another (Figure 250) along either edge of the surveyed location of the Kalaoa-‘O‘oma Homestead road at a planned change in direction (see Figure 241). The road was laid out by surveyors in 1902, but was never built (see Figure 241). Both features of Site 10188 are interpreted as Historic survey markers, and are described in detail below.

Feature A

Feature A is situated at the north end of Site 10188, approximately 14.5 meters north of Feature B (see Figure 250). The cairn is circular in shape and constructed of neatly stacked *pāhoehoe* cobbles and slabs (Figure 251). It measures 1.2 meters in diameter and stands up to 87 centimeters tall. Two coral fragments are present on the top of the cairn. A collapsed blister with excavated cobbles is located 1.1 meters east of Feature A, and it is likely the source of cobbles and slabs used to construct the feature.

Feature B

Feature B is a cairn located at the south end of Site 10188, approximately 14.5 meters south of Feature A, and 10 meters north of the raised edge of an ‘*a*’ flow (see Figure 250). The cairn is circular in shape and constructed of neatly stacked *pāhoehoe* cobbles and slabs (Figure 252). It measures 1.2 meters long by 1.3 meters wide and stands up to 75 centimeters tall. A collapsed blister and small area of excavated *pāhoehoe* are located in the level bedrock surface between Feature A and Feature B, and given the presence of easily accessible material, it is likely that some of the slabs used to construct Feature B were taken from these areas.

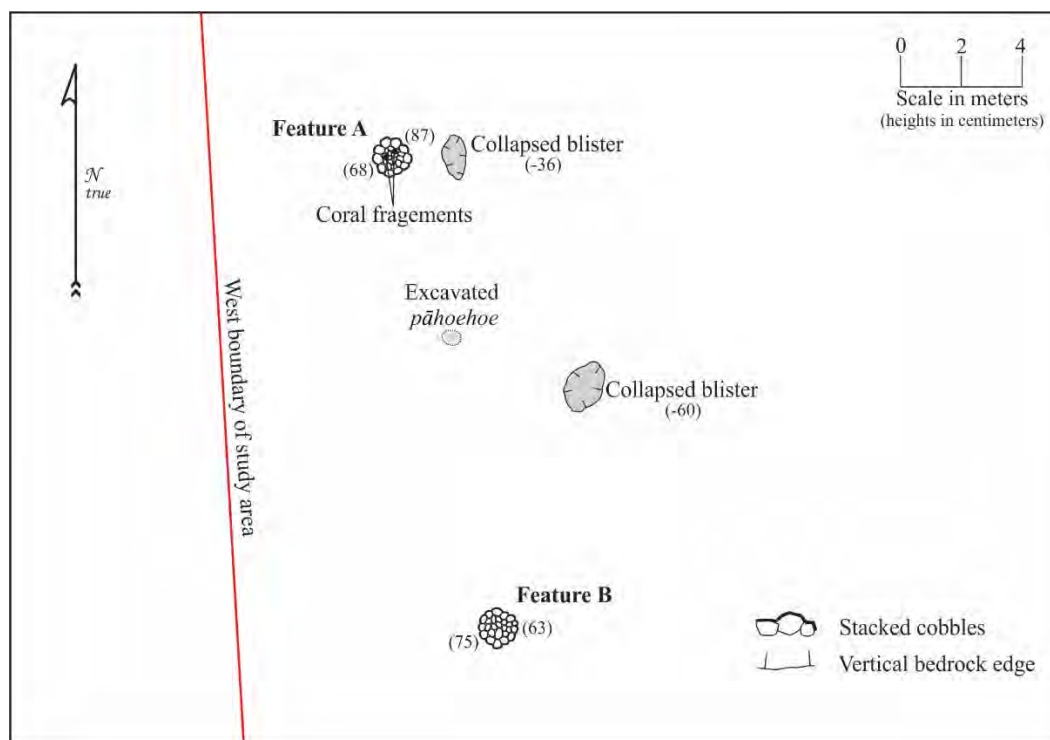


Figure 250. SIHP Site 10188 plan view.



Figure 251. SIHP Site 10188 Feature A, view to the north.



Figure 252. SIHP Site 10188 Feature B, view to the north with Feature A in the background.

SIHP Site 10189

Site 10189 is a cairn located in the southwestern portion of the current study area roughly 16 meters southwest of Site 30352 and 20 meters east of a bulldozed area along the western boundary of the study area adjacent to the Moana Tech, LLC facility (see Figures 178 and 240). This site was previously recorded by Barrera (1985a) as a “stone mound”, and interpreted as a probable “survey boundary marker” (see Appendix A). The roughly circular cairn is constructed of approximately seventy-five *pāhoehoe* cobbles and slabs neatly stacked on a level *pāhoehoe* bedrock surface (Figure 253). It measures 1 meter in diameter and stands up to 70 centimeters tall. Given the size and shape of Site 10189, the cairn is interpreted as a Historic survey marker. It is likely that this survey marker, like several other similar cairns within the study area, was erected by surveyors laying out the Kalaoa-‘O‘oma Homestead lots in 1902 (see Figure 241). The specific purpose of marking this particular location, however, is unknown. Site 10189 may be associated with the nearby Site 30352 cairns that mark both edges of the surveyed route of the planned realignment of the *makai* Government Road (SIHP Site 2).

SIHP Site 29274

Site 29274 consists of two similarly constructed rock cairns (Features A and B) located on level *pāhoehoe* bedrock in the northeast-central portion of the study area (see Figure 240). These cairns were previously recorded by Rechtman and Clark (2012), and were re-examined during the current fieldwork. As no change was observed at the site the 2012 description of Site 29274 is reproduced here:

... Measured from center of cairn to center of cairn, Features A and B are 15 meters apart. Feature A [Figure 254] consists of about 50 small to medium sized angular *pāhoehoe* cobbles, measures 90 centimeters x 75 centimeters in outline, and rises 50 centimeters above the ground surface. Feature B [Figure 255], situated to the southwest of Feature A, is 135 centimeters x 90 centimeters in outline and 58 centimeters tall. It is made up of roughly 60 small to medium sized angular *pāhoehoe* cobbles. When comparing the location of these rock piles to the alignment of a proposed but never constructed grant increment road shown on Hawai‘i Register Map 2123 dated May 1902, the two cairns fall almost exactly on both sides of the road right at a surveyed change in direction [see Figure 241]. It seems an appropriate interpretation that these cairns represent survey markers placed during the 1902 Hawai‘i Territory Survey fieldwork for the proposed Kalaoa-‘O‘oma Homesteads to mark a change in direction of a proposed but never constructed roadway. [Rechtman and Clark 2012:74]

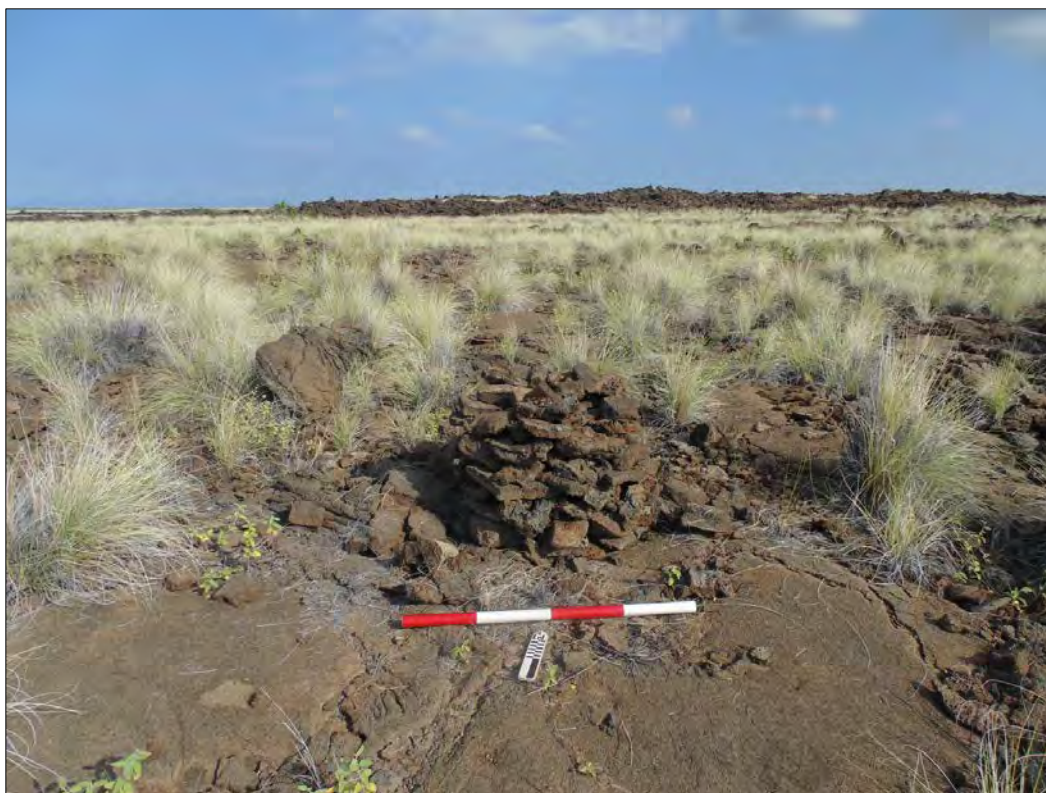


Figure 253. SIHP Site 10189, view to the north.

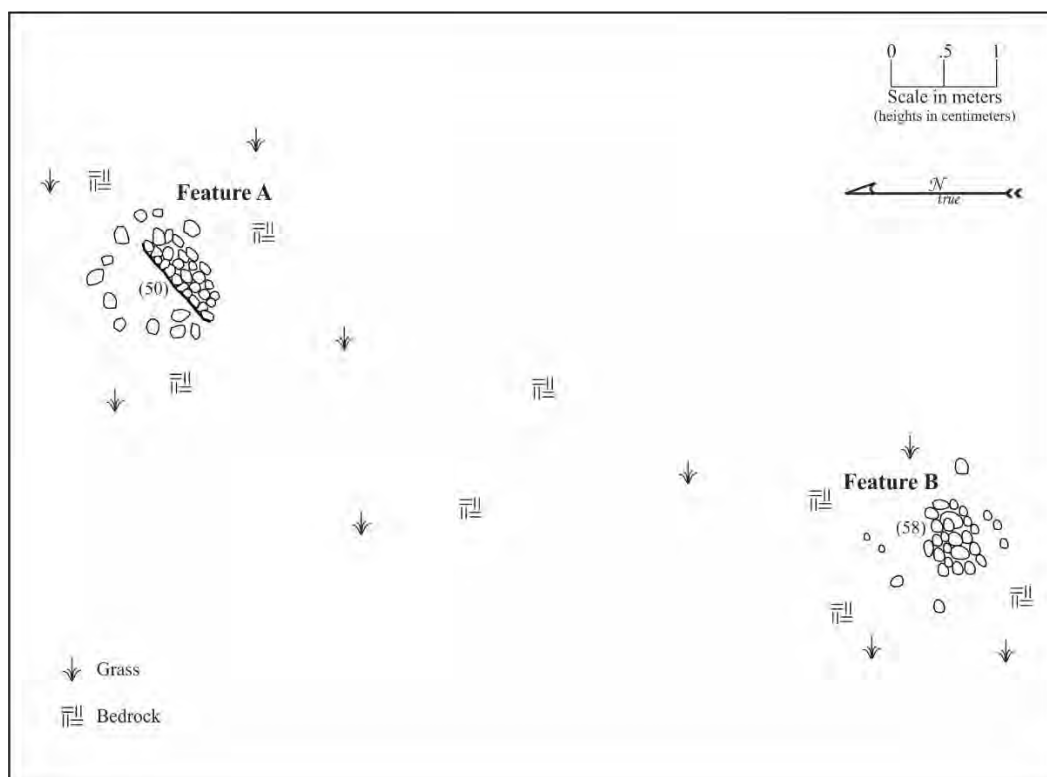


Figure 254. SIHP Site 29274 plan view.



Figure 255. SIHP Site 29274 Feature A, view to the southeast.



Figure 256. SIHP Site 29274 Feature B, view to the southeast.

SIHP Site 30348

Site 30348 is a cairn located in the east-central portion of the study area near the Parcel 072/073 boundary (see Figure 240). It is situated on a southwest sloping elevated *pāhoehoe* landform below Queen Ka‘ahumanu Highway. The cairn measures 0.9 meter in diameter and stands up to 40 centimeters tall (Figure 257). It is constructed of roughly fifty medium cobbles and slabs stacked in a circular formation. Slabs used in the construction of Site 30348 were appear to have been taken from a nearby *pāhoehoe* surface. An unfired bullet with the head stamp “Super-X 308 WIN” was noted adjacent to the north edge of the cairn. Given the size and shape of Site 30348, the cairn is interpreted as a Historic survey marker. The location of the cairn suggests that it was erected to mark a surveyed change in direction along the south side of the Kalaoa-‘O‘oma Homestead road laid out by surveyors in 1902, but never built (see Figure 241).



Figure 257. SIHP Site 30348, view to the west.

SIHP Site 30349

Site 30349 is a cairn located in the east-central portion of the study area approximately 44 meters southeast of Site 10162. The cairn is situated on an exposed *pāhoehoe* bedrock ground surface surrounded by fountain grass. It is roughly circular with sloped sides and a flat top surface, and is constructed of approximately fifty neatly stacked large cobbles and slabs (Figure 258). A wooden lathe reading “Arch Site 3” is stuck in bedrock immediately north of the site. Given the size and shape of Site 30349, the cairn is interpreted as a Historic survey marker. It is probable that this survey marker, like several other similar cairns within the study area, was erected by surveyors laying out the Kalaoa-‘O‘oma Homestead lots in 1902. The specific purpose of marking this particular location, however, is unknown. It may be that Site 30349, given its plotted location (see Figure 241), marks the boundary between Lots 6A and 7A of the homesteads at the southern edge of the planned Kalaoa-‘O‘oma Homestead road that was never built.

SIHP Site 30350

Site 30350 consists of two cairns (Features A and B) situated on a level *pāhoehoe* bedrock surface, in the northwest portion of the project area between Sites 10187 and 10188 (see Figure 241). The site occupies a 16 meter by 12 meter area overall. The location of the cairns suggests that they were erected to mark the north and south edges of the never built Kalaoa-‘O‘oma Homestead road laid out by surveyors in 1902. Their location does not occur at a change of direction in the road, but does correspond to the “25000 W” line of latitude shown on the 1902 map prepared by the surveyors S.M. Kanakanui and G.F. Wright (see Figure 241). Detailed descriptions of Features A and B follow below.



Figure 258. SIHP Site 30349, view to the west.

Feature A

Feature A consists of a small cairn located at the north end of Site 30350, 15 meters northwest of Feature B, along the northern edge of the planned Kalaoa-‘O‘oma Homestead road (see Figures 240 and 241). The cairn measures 0.7 meters long by 0.6 meters wide and stands up to 25 centimeters tall (Figure 259). It is constructed of fifteen medium slabs on a level *pāhoehoe* surface.

Feature B

Feature B is a collapsed cairn located at the south end of Site 30350, 15 meters southeast of Feature A, along the southern edge of the planned Kalaoa-‘O‘oma Homestead road (see Figures 240 and 241). The cairn, which may have formerly been quite large, is now completely collapsed and consists of a pile of approximately 100 small slabs piled on a level *pāhoehoe* bedrock ground surface (Figure 260). In its current condition Feature B measures 1.2 meters in diameter and stands up to 40 centimeters tall. The pile has a circular form and is tallest in the middle, suggesting that the cairn may have once been a stacked in a manner similar to the features of the nearby Sites 10187 and 10188.

SIHP Site 30351

SIHP Site 30351 consists of two cairns (Feature A and Feature B) located on a level *pāhoehoe* bedrock surface in the northwestern portion of the project area 60 meters east of the Māmalahoa Trail (SIHP Site 2) at Site 10187 (see Figure 240). The site measures roughly 15 meters long by 8 meters wide overall (Figure 261). The location of the cairns suggests that they were erected to mark the north and south edges of the never built Kalaoa-‘O‘oma Homestead road laid out by surveyors in 1902 (see Figure 241). More detailed descriptions of Features A and B follow below.

Feature A

Feature A is a collapsed cairn located at the south end of Site 30351, 2.5 meters south of Feature B (see Figure 261), along the southern edge of the planned Kalaoa-‘O‘oma Homestead road (see Figures 240 and 241). The cairn, which may have formerly been quite large, is now completely collapsed and consists of a pile of *pāhoehoe* slabs on a level *pāhoehoe* bedrock surface and sloping south into a natural bedrock depression (Figure 262). The pile of slabs measures 2.5 meter long by 2 meters wide and has heights along its edges ranging from 60 centimeters (along northwest edge) to 33 centimeters (along the southeast edge). The area between Features A and B consists of scattered cobbles on level bedrock. It is likely that the natural bedrock depression at Feature A is the source of the material used to build both cairns at Site 30351, and consequently some of the slabs at Feature A may be naturally occurring, and not part of the former cairn.

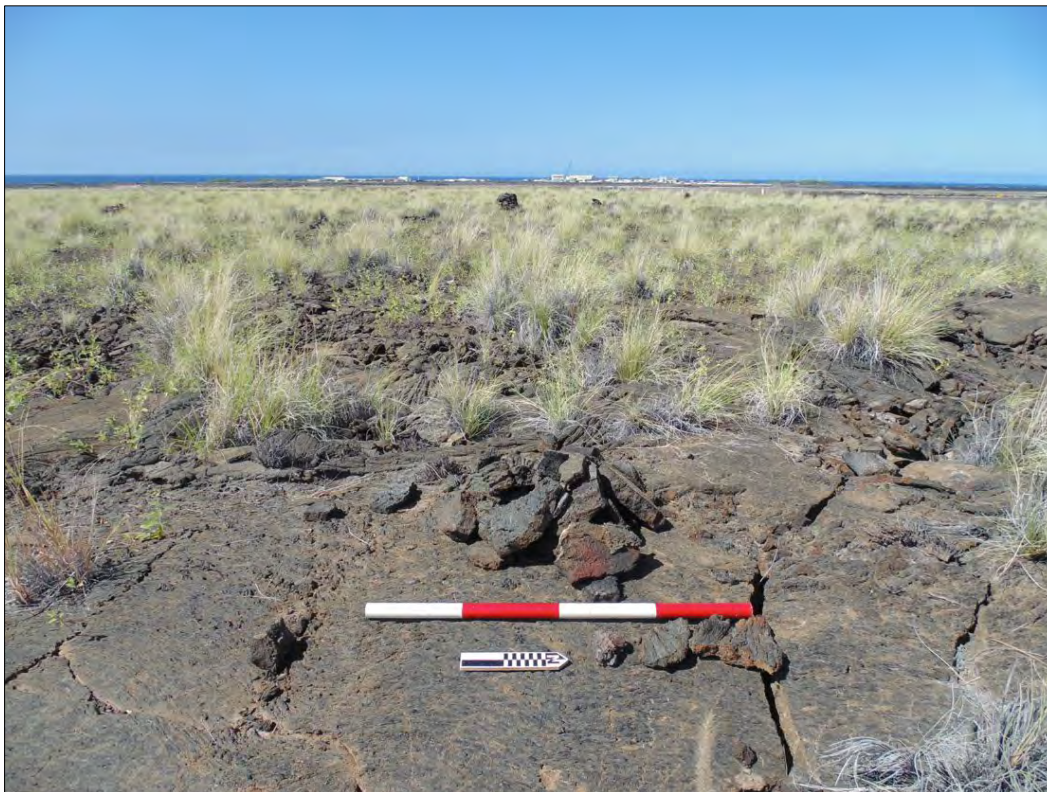


Figure 259. SIHP Site 30350 Feature A, view to the west with Site 10188 Feature A visible in the background.

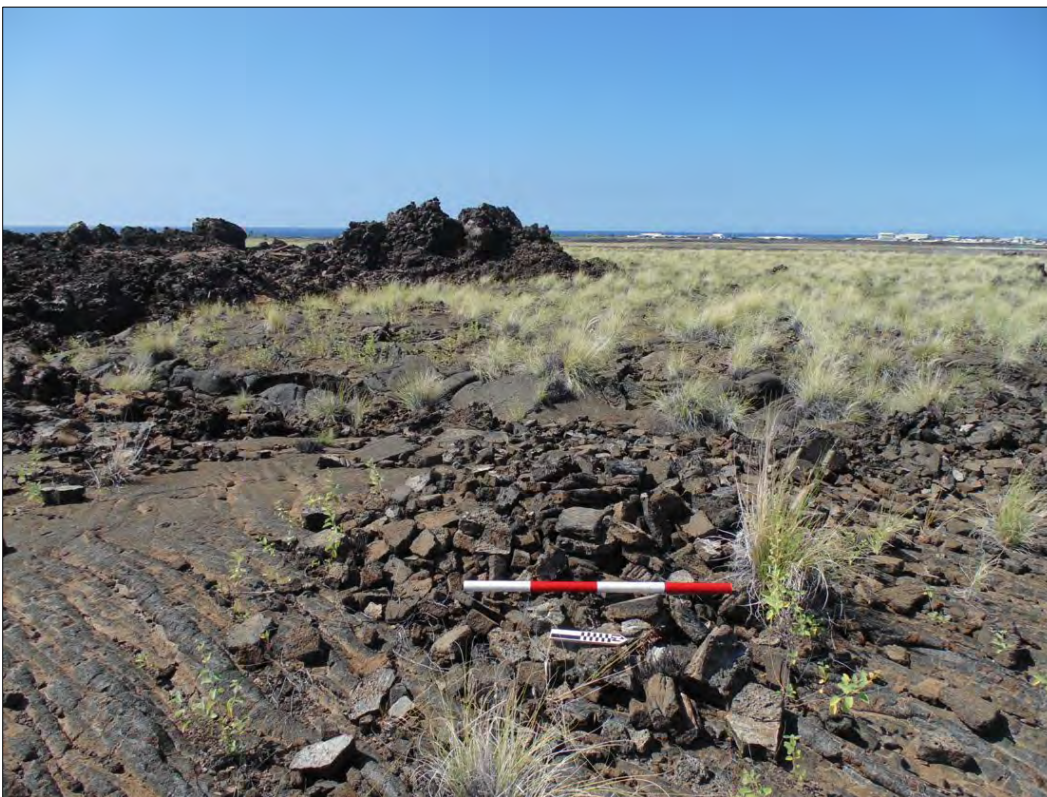


Figure 260. SIHP Site 30350 Feature B, collapsed cairn, view to the west.

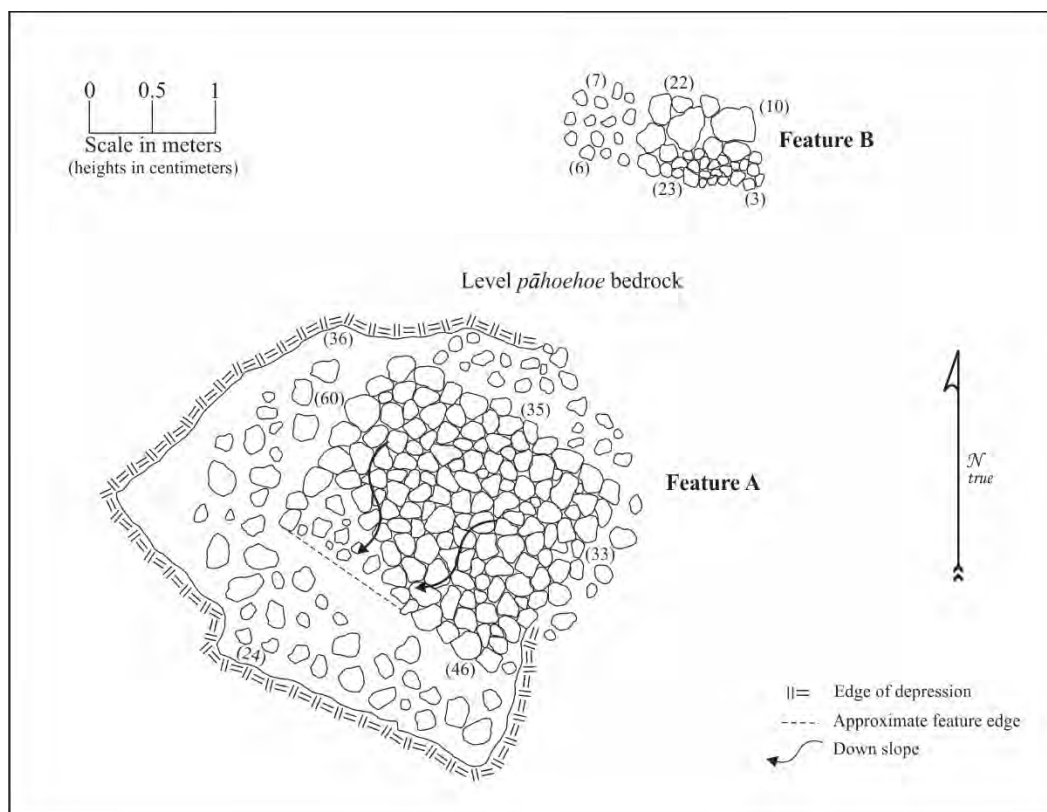


Figure 261. SIHP Site 30351 plan view.

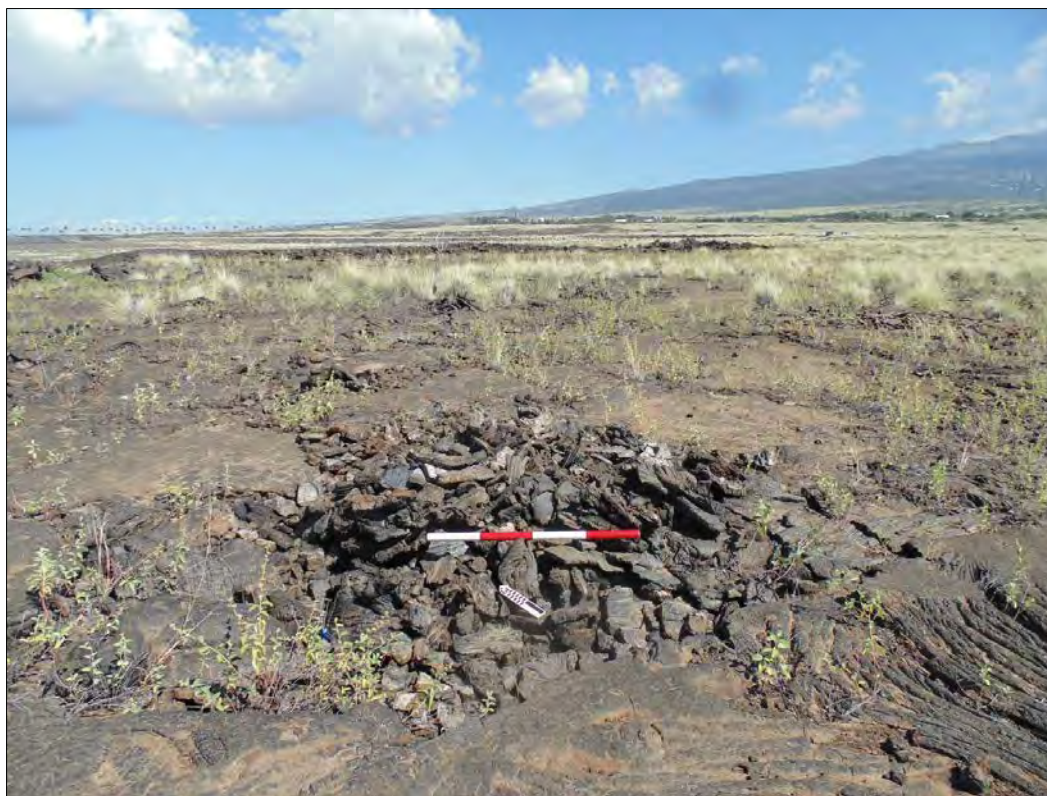


Figure 262. SIHP Site 30351 Feature A, view to the northeast.

Feature B

Feature B consists of a small cairn located at the north end of Site 30350, 2.5 meters north of Feature A (see Figure 261), near the northern edge of the planned Kalaoa-‘O‘oma Homestead road (see Figures 240 and 241). The cairn is constructed of ten small to large slabs that likely came from the bedrock depression at Feature A on a level *pāhoehoe* surface. It measures 1 meters long by 0.8 meters wide and stands up to 30 centimeters tall (Figure 263). This cairn may have been formerly stacked, but now is collapsed and the slabs are somewhat scattered.

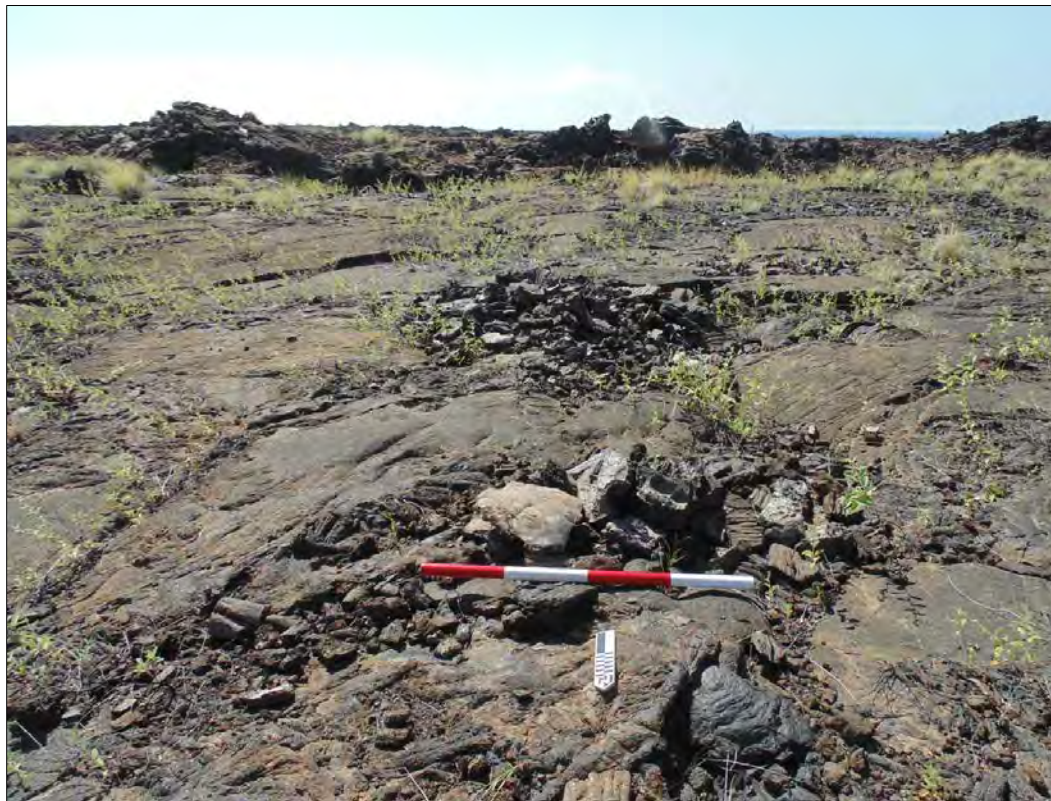


Figure 263. SIHP Site 30351 Feature A, view to the south with Feature A in the background.

SIHP Site 30352

Site 30352 consists of two cairns (Features A and B) located in the southwestern portion of the study area, approximately 17 meters northwest of Site 10190 and 16 meters northeast of Site 10189 (see Figures 178 and 240). The two cairns are constructed within an 8 meter by 4 meter area on a level *pāhoehoe* bedrock surface between a bedrock depression and a fractured bedrock outcrop (Figure 264). In addition to Site 10190, five other rock rings (SIHP Sites 30321 to 30325) are present in the immediate vicinity of Site 30352. Both cairns are constructed of large *pāhoehoe* slabs intentionally leaned upright against one another. Given the location of Site 30352, the cairns are interpreted as a Historic survey markers. These markers occur along the eastern and western edges of the surveyed route of the planned realignment of the *makai* Government Road (SIHP Site 2) at the approximate location of boundary between Lots 4A and 4B of the Kalaoa-‘O‘oma Homesteads (see Figure 241). Although the Government Road was never realigned into this area, it is likely that the Feature A and B cairns were erected by surveyors laying out the Kalaoa-‘O‘oma Homestead lots in 1902 (see Figure 241). More detailed descriptions of Features A and B follow below.

Feature A

Feature A of Site 30352 is a collection of upright slabs (a cairn) located 6.4 meters west of Feature B and 16.4 meters northeast of Site 10189 along the west edge of the planned realignment of the *makai* Government Road (see Figures 241 and 264). This feature is situated along the upper southeast edge of a natural bedrock depression. It measures 1.1 meters long by 0.8 meters wide and is constructed of five large *pāhoehoe* slabs set on edge with a few small cobbles used as supports at the base (Figure 265). Feature A stands up to 96 centimeters tall and the upright slabs lean against each other to support the structure of the feature.

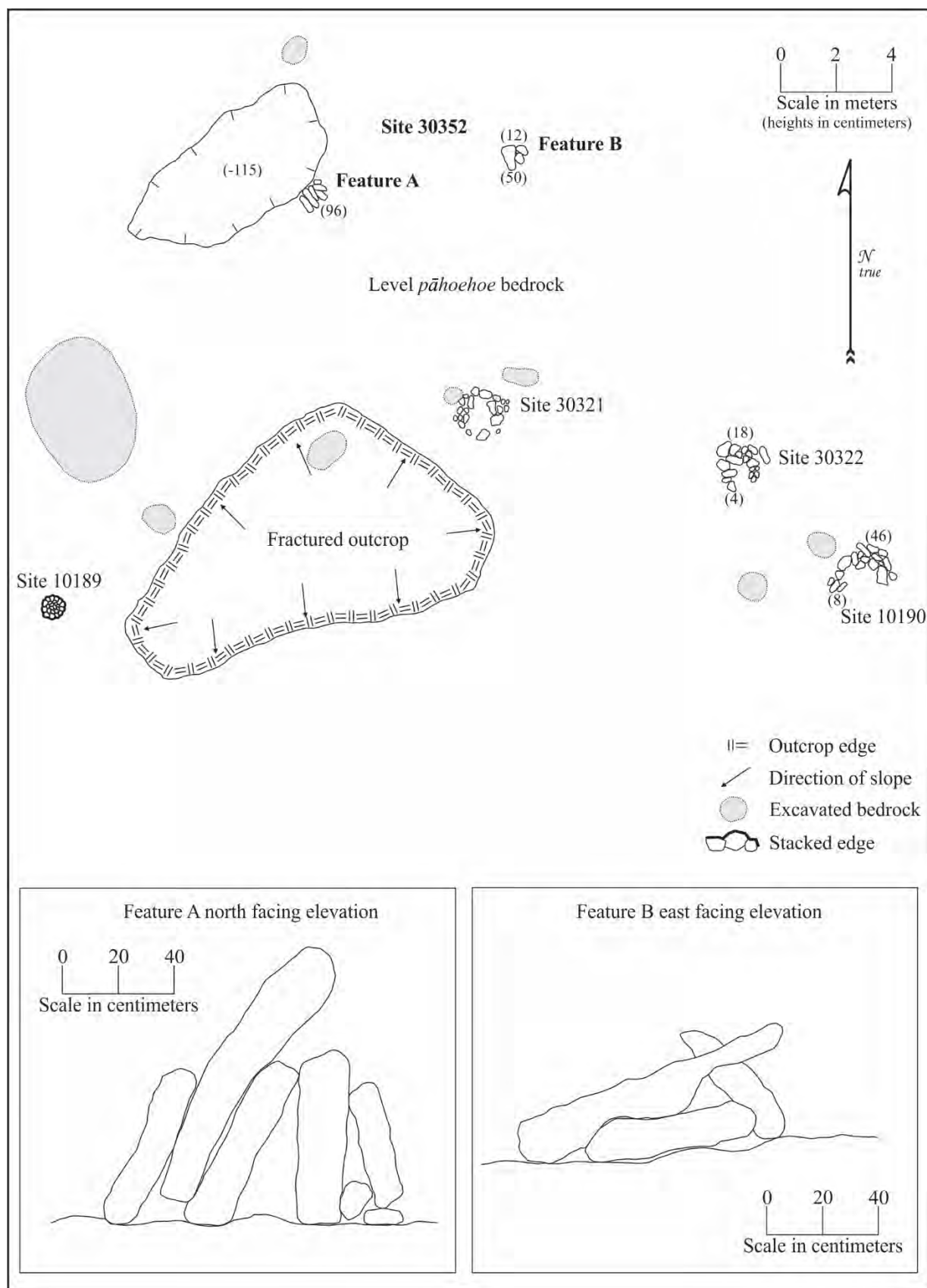


Figure 264. SIHP Site 30352 plan view and feature elevations.

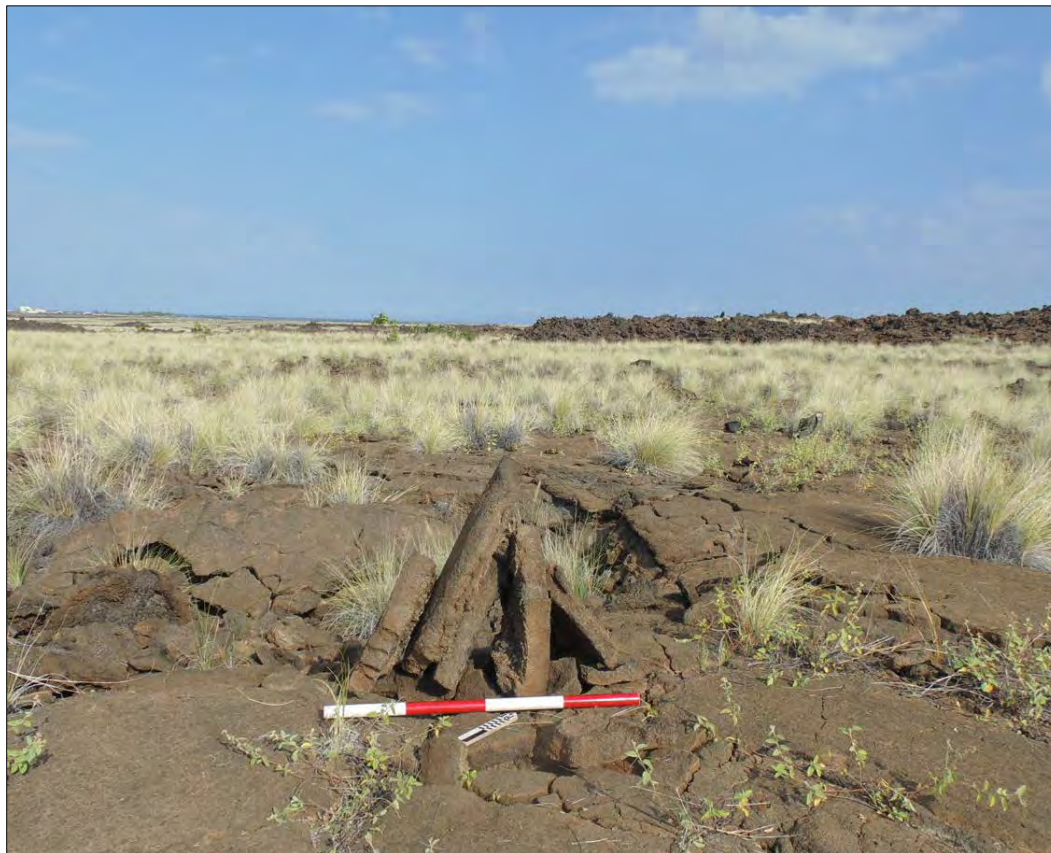


Figure 265. SIHP Site 30352 Feature A, view to the northwest.

Feature B

Feature B of Site 30352 is a collection of *pāhoehoe* cobbles and slabs (a cairn) located 6.4 meters east of Feature A along the east edge of the planned realignment of the *makai* Government Road (see Figures 241 and 264). The cairn is situated on a level *pāhoehoe* bedrock surface near the west edge of a slightly raised flow edge. It measures 0.85 meters long by 0.6 meters wide and is constructed of six loosely piled *pāhoehoe* slabs and cobbles, standing up to 50 centimeters tall (Figure 266). The arrangement of the cobbles and slabs suggest that they may have formerly been propped upright, but have fallen over.

SIHP Site 30353

Site 30353 is a cairn located in the northern portion of the project area 4 meters west of the *makai* entrance to the Site 30319 lava tube and 20 meters south of the Site 30315 trail route (see Figure 240). The cairn is situated on the western edge of a fractured *pāhoehoe* bedrock surface. It measures 0.7 meters long by 0.6 meters wide and stands up to 15 centimeters tall. The cairn is constructed with a single large slab and six smaller slabs scattered around the southern edge of the larger slab (Figure 267). It is likely that the smaller slabs were formerly stacked on top of the large slab, but have collapsed. This site is interpreted as an unspecified marker.

SIHP Site 30354

Site 30354 is a cairn located in the northern portion of the project area, approximately 28 meters northeast of the *mauka* entrance to the Site 30319 lava tube and 42 meters northeast of the Site 30315 trail (see Figure 240). The cairn is situated on a fairly level exposed *pāhoehoe* bedrock surface surrounded by fountain grass. It is constructed of two slabs, which were taken from a nearby outcropping of naturally eroding *pāhoehoe* and placed on top of another (Figure 268). The cairn measures 0.5 meters long by 0.3 meters wide and stands up to 12 centimeters tall. This site is interpreted as an unspecified marker.

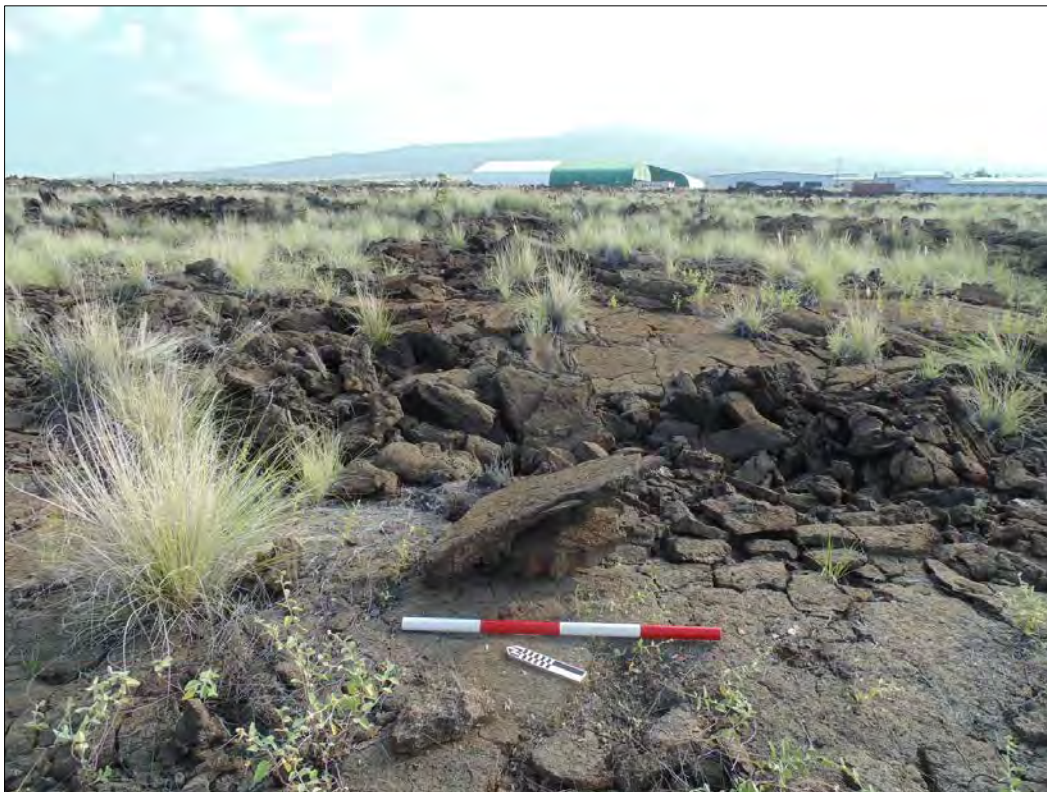


Figure 266. SIHP Site 30352 Feature B, view to the northeast.



Figure 267. SIHP Site 30353, view to the east with the Site 30319 lava tube entrance visible in the background.

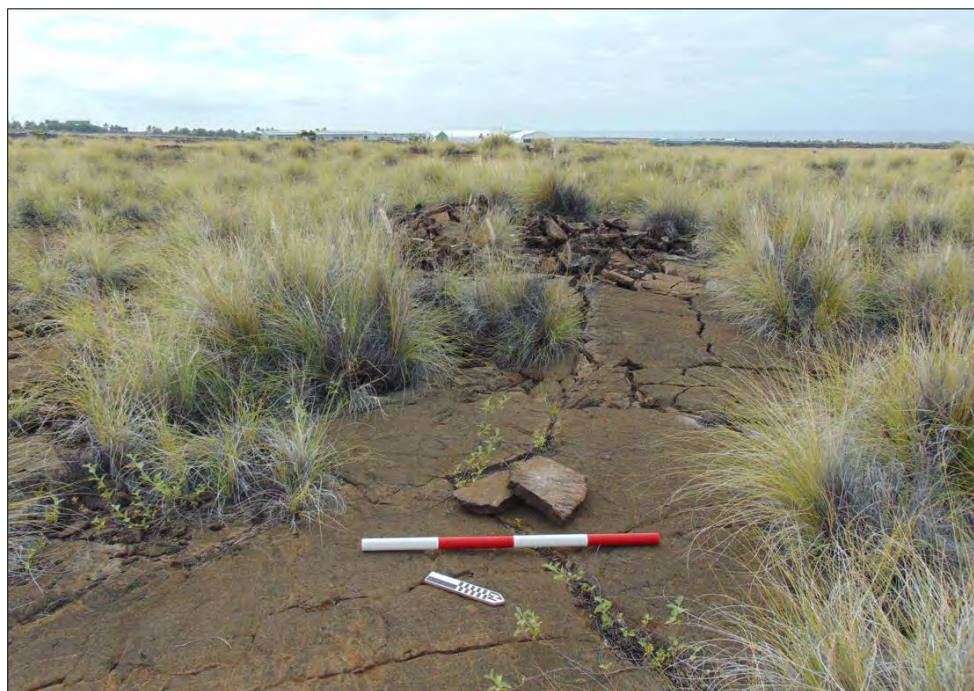


Figure 268. SIHP Site 30354, view to the southwest with the eroding bedrock outcrop that is the source of the *pāhoehoe* slabs visible in the background.

SIHP Site 30355

Site 30355 is a complex of four cairns (Features A to D) located in the northeastern portion of the study area to the east of the Site 30319 lava tube and the north of the Site 30315 trail alignment (see Figure 240). The cairns are all similar constructions (stacks of thin *pāhoehoe* slabs) that do not appear to be particularly ancient, but seem to mark an infrequently used path that follows a narrow *pāhoehoe* channel between two fingers of an ‘a‘a flow for a distance of roughly 70 meters. The cairns when followed from the east (the direction of Queen Ka‘ahumanu Highway) to the west lead to the Site 30319 lava tube at the Site 30315 trail (Figure 269). More detailed descriptions of Features A to D of Site 30355 follow below.

Feature A

Feature A is a cairn, constructed of four thin *pāhoehoe* slabs stacked on top each other, situated on a *pāhoehoe* surface along the east edge of a narrow finger of cobbly *pāhoehoe* and ‘a‘ā at the eastern end of Site 30355 (see Figure 269). The cairn measures 0.4 meters long by 0.3 meters wide and stands up to 15 centimeters tall (Figure 270).

Feature B

Feature B is a cairn consisting of three *pāhoehoe* slabs situated on a *pāhoehoe* surface 10 meters northwest of Feature A on the opposite side of the narrow finger of cobbly *pāhoehoe* and ‘a‘ā (see Figure 269). The cairn measures 0.5 meters long by 0.4 meters wide and stands up to 15 centimeters tall. Two of the slabs used in its construction are stacked one on top of the other; the third slab is resting on bedrock just south of the other two (Figure 271).

Feature C

Feature C is a cairn, constructed of four thin *pāhoehoe* slabs stacked on top each other, situated on a *pāhoehoe* surface 24 meters southwest of Feature B (see Figure 269). The cairn measures 0.35 meters long by 0.3 meters wide and stands up to 18 centimeters tall (Figure 272).

Feature D

Feature D is a cairn, constructed of six thin *pāhoehoe* slabs stacked on top each other, situated on a fracturing *pāhoehoe* bedrock ground surface along the southern edge of the Site 30319 lava tube sink 42 meters southwest of Feature C near Feature M along the Site 30315 trail route (see Figure 269). The cairn measures 0.2 meters long by 0.2 meters wide and stands up to 30 centimeters tall (Figure 273). This cairn is visible from the *mauka* entrance to Site 30319, and appears to users of the Site 30355 path in the direction of the lava tube. No additional cairns of this type were identified to the southwest of Feature A.

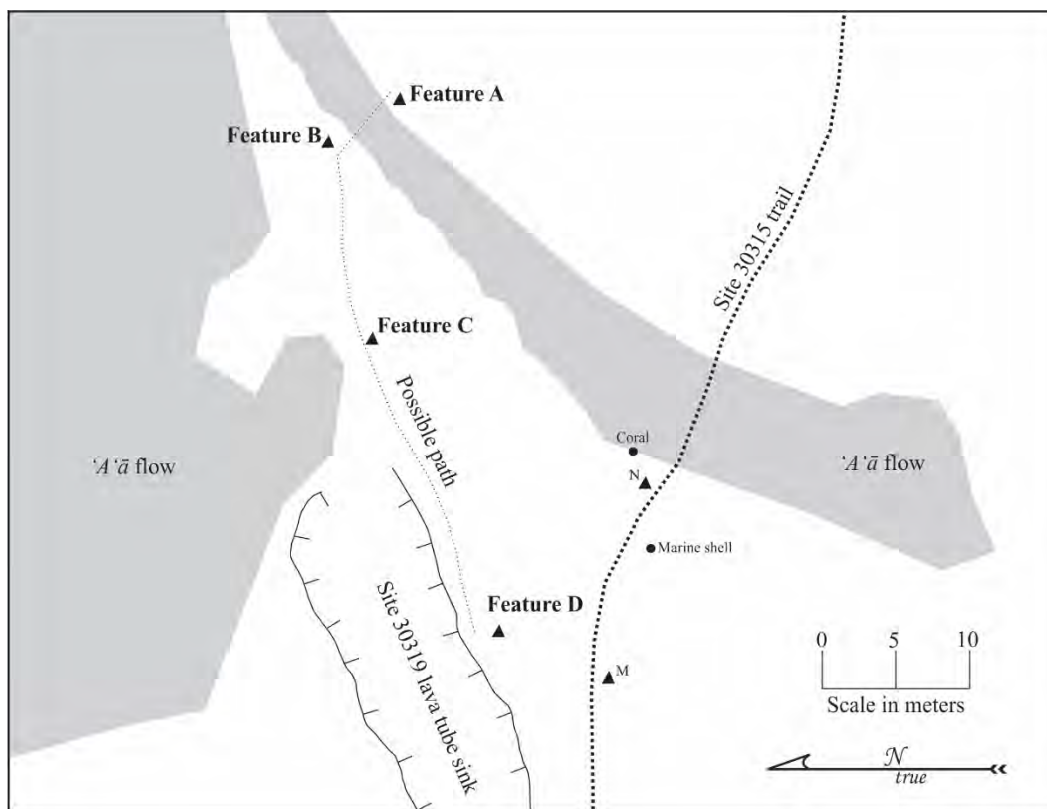


Figure 269. SIHP Site 30355 plan view.

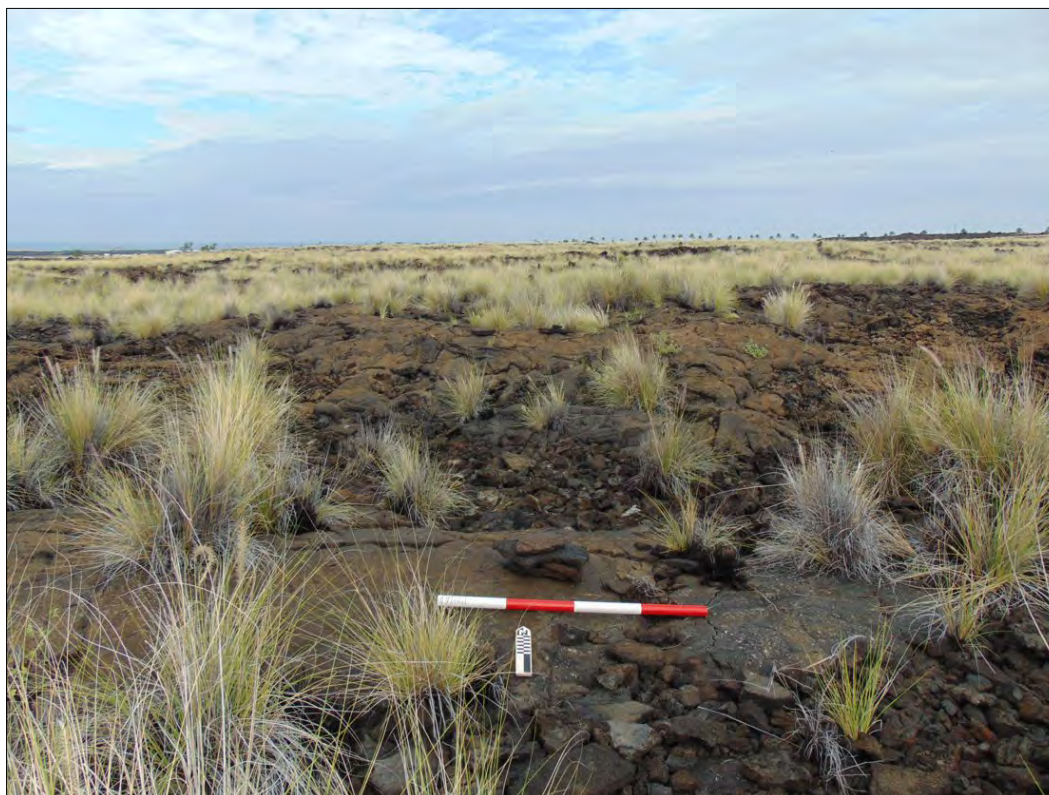


Figure 270. SIHP Site 30355 Feature A, view to the north with Feature B visible in the background.

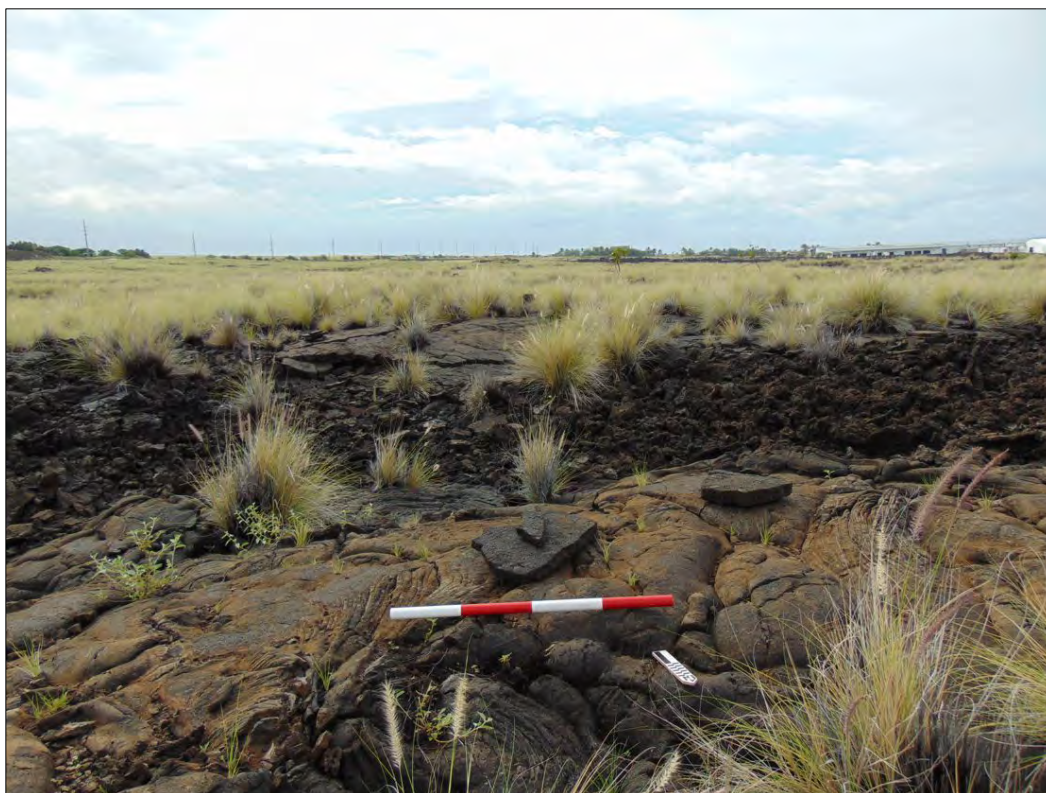


Figure 271. SIHP Site 30355 Feature B, view to the south with Feature A visible in the background.

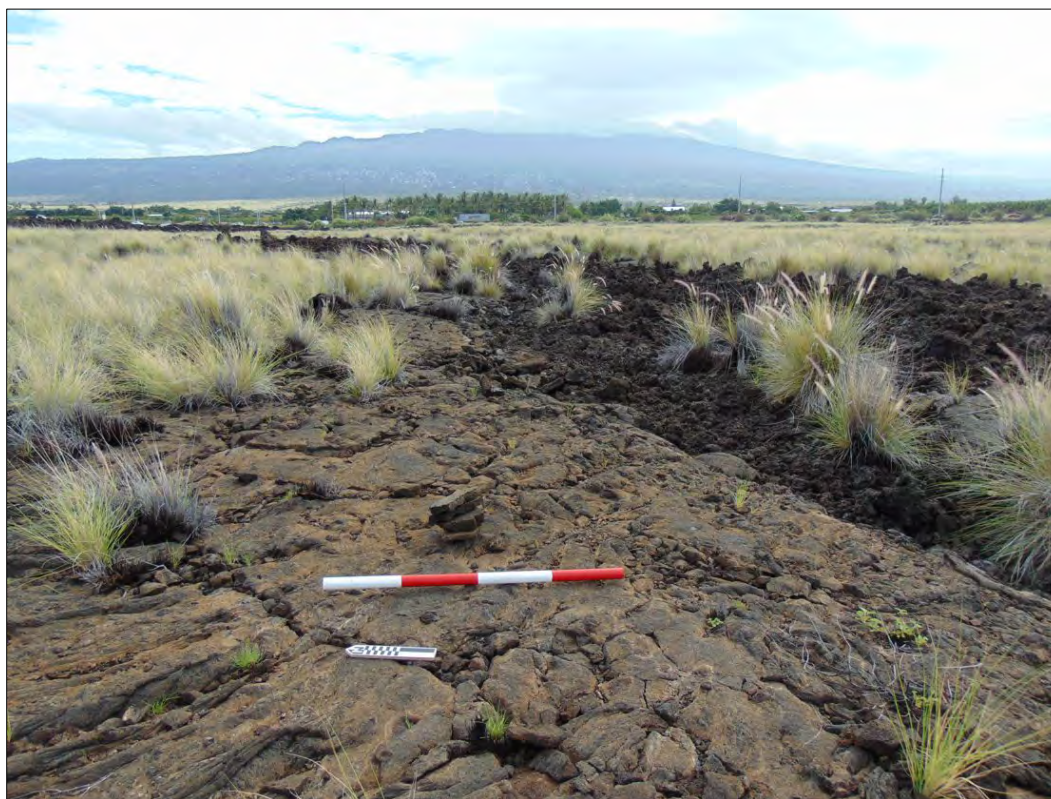


Figure 272. SIHP Site 30355 Feature C, view to the east.

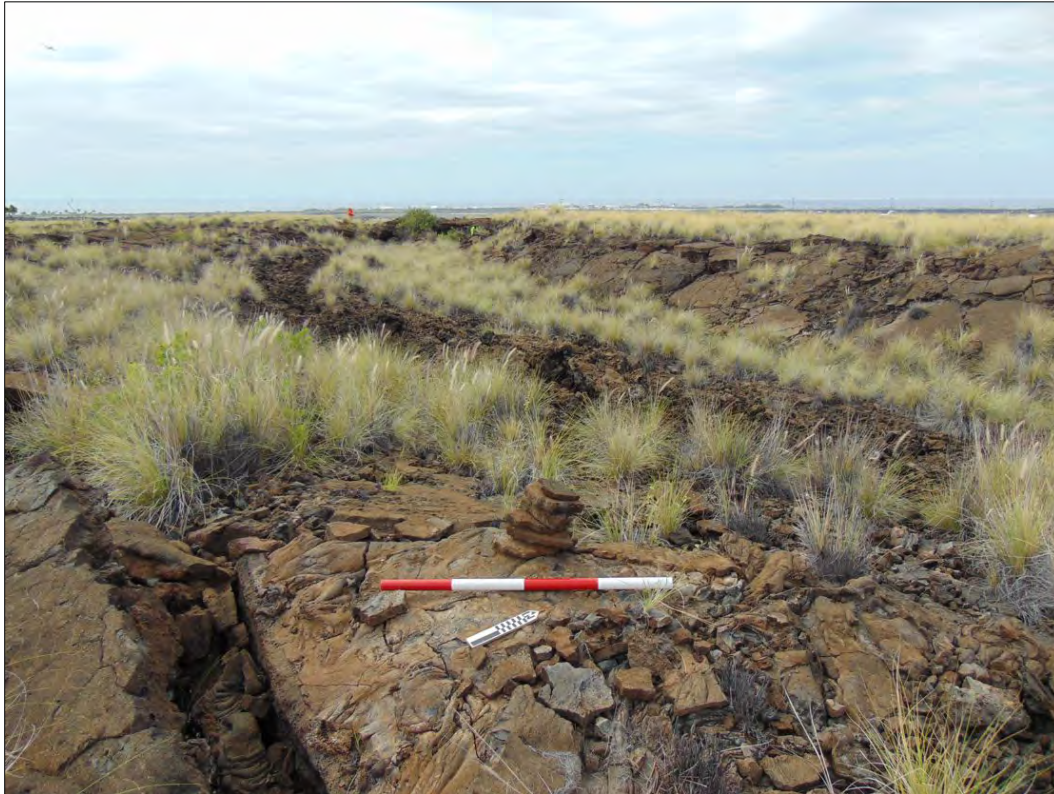


Figure 273. SIHP Site 30355 Feature D, view to the northwest with the Site 30319 sink and *mauka* entrance visible in the background.

SIHP Site 30356

Site 30356 is a cairn located in the northern portion of the project area, approximately 17 meters south of the entrance to the Site 30317 lava tube (see Figure 240). The cairn, which consists of a large *pāhoehoe* slab propped upright by a small boulder and a large cobble, is situated on a *pāhoehoe* ground surface within a narrow bedrock crack. The cairn is constructed with the upright slab leaning against an upright boulder stuck in the bedrock crack, with the cobble used to support the boulder base (in the *pāhoehoe* crack). The front (top surface) of the upright slab faces north (Figure 274), with the support stones behind it to the south (Figure 275). All of the material used to build the cairn is available in the immediate vicinity of the site. Site 30356 is interpreted as an unspecified marker.

SIHP Site 30357

Site 30357 is a cairn located in the northern portion of the project area approximately 16 meters southwest of Feature M of Site 30315 (see Figure 240). The cairn, which is situated on a level *pāhoehoe* bedrock surface, is comprised of four large cobbles and six small cobbles that were likely once piled on top of each other, but are currently collapsed (Figure 276). The collapsed cairn measures 1 meter long by 0.8 meter wide and stands up to 20 centimeters tall. Site 30357 is interpreted as an unspecified marker.

SIHP Site 30358

Site 30358 consists of two cairns (Features A and B) located in the northeast portion of the project area, 60 meters northeast of Site 30355 (see Figure 240). The site, which occupies a 26 meter by 6 meter area, is situated within a narrow *pāhoehoe* lava channel between two fingers of an ‘*a‘ā* lava flow (Figure 277). The features are grouped based on proximity and their shared location within the narrow channel of *pāhoehoe*. It may be that this site marks a southeastern continuation of the infrequently used path represented by Site 30355, or a branch of the Site 29273 trail, but this is purely impressionistic, as no positive connection between these any of these sites was identified in the field. The narrow *pāhoehoe* channel that contains Site 30355 is the easiest route of travel northeast/southwest across this portion of the study area. Features A and B of Site 30355 are described in more detail below.

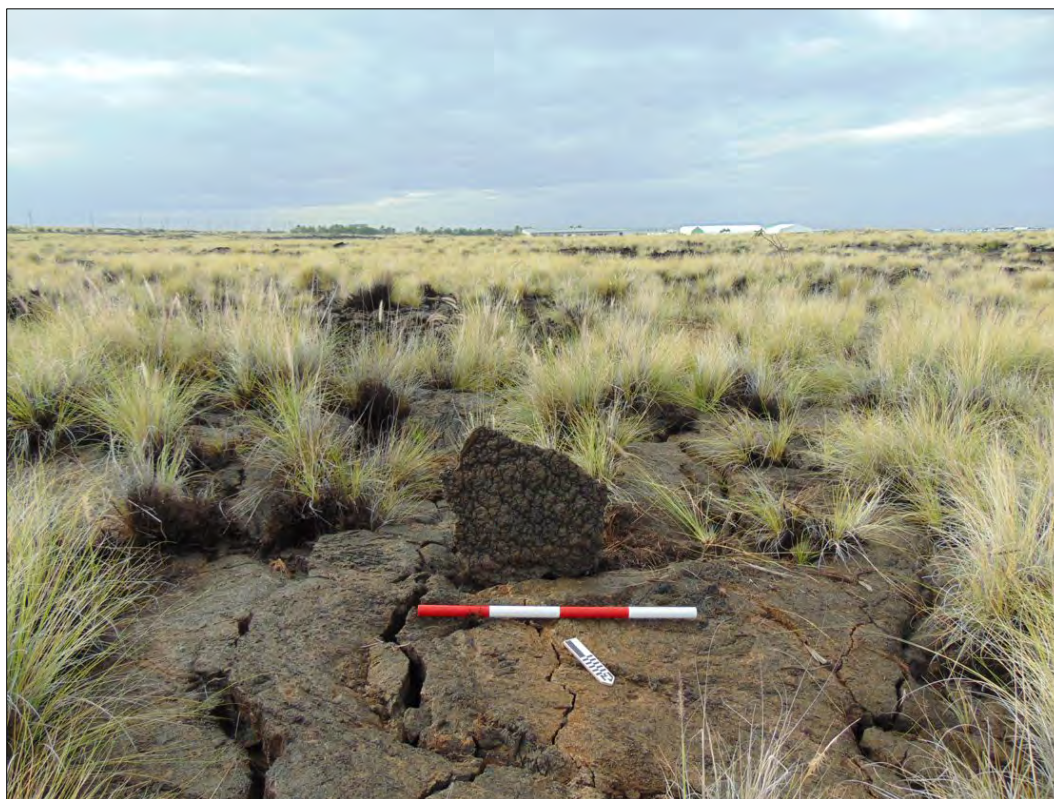


Figure 274. SIHP Site 30356, view to the south showing the face of the upright slab.

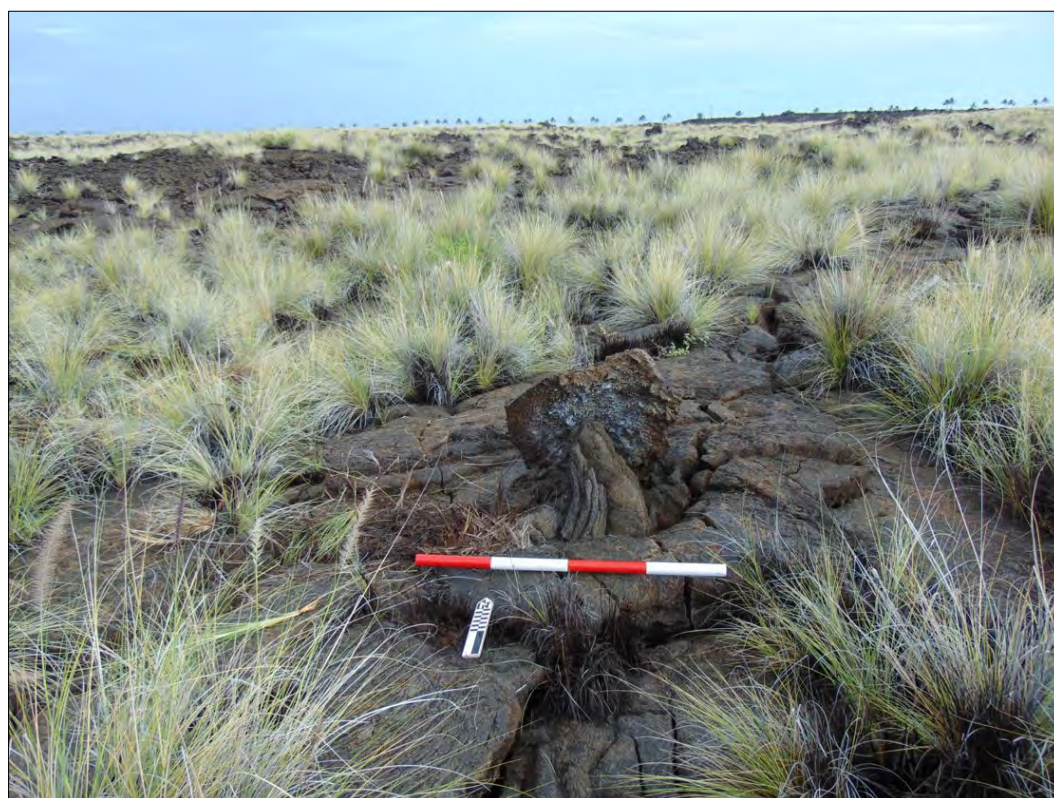


Figure 275. SIHP Site 30356, view to the north showing the stones used to support the upright slab.

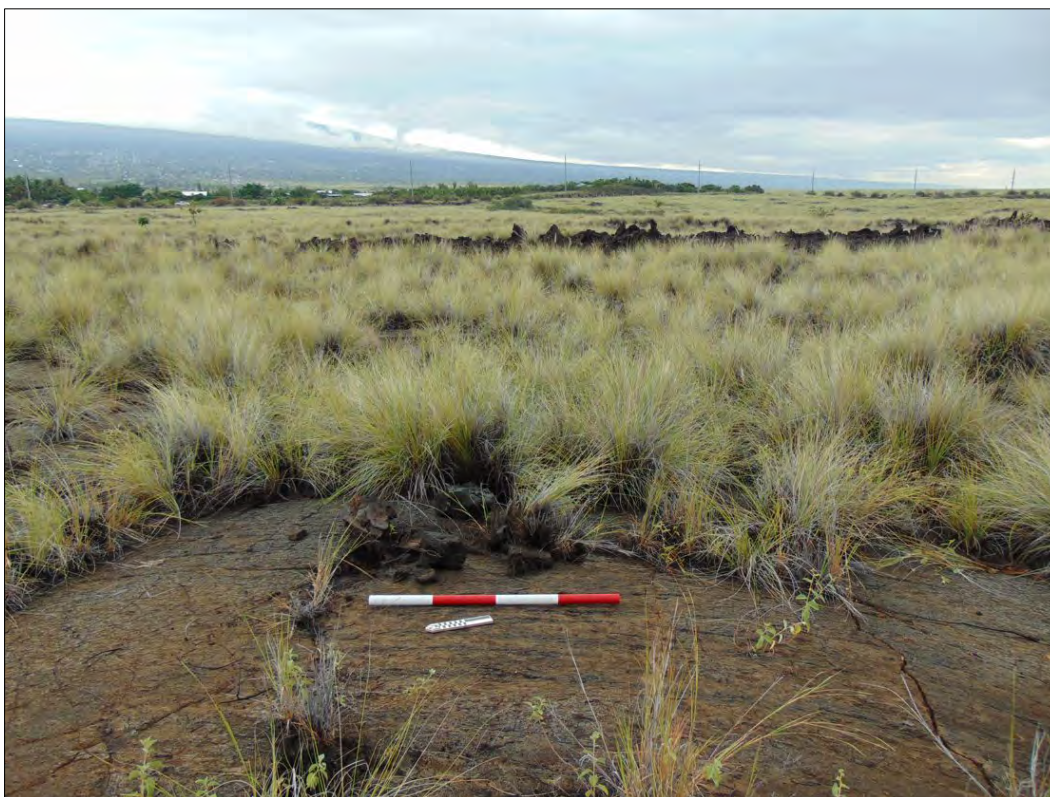


Figure 276. SIHP Site 30357, collapsed cairn, view to the southeast.

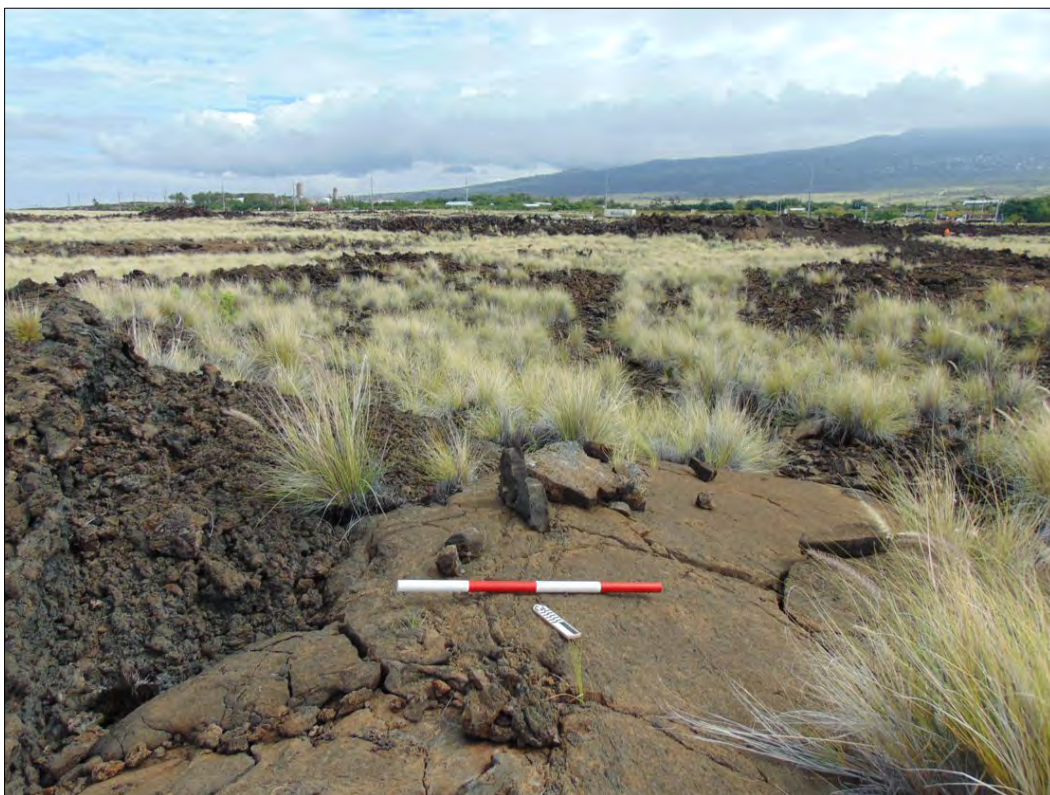


Figure 277. SIHP Site 30358, view to the northeast of the narrow *pāhoehoe* (grass-filled) lava channel from Feature A (foreground).

Feature A

Feature A is a collapsed cairn located at the southwestern end of Site 30358, approximately 24 meters southwest of Feature B (see Figure 240). The cairn consists of twelve small cobbles and slabs, two upright triangular-shaped slabs, and a boulder on an elevated surface of smooth *pāhoehoe* (Figure 278). The cobbles are loosely arranged at the west end of the narrow *pāhoehoe* channel in a manner that suggest that they may have been formerly stacked on top of one another. The material used to construct Feature A was taken from the edge of the outcrop nearby the cairn.

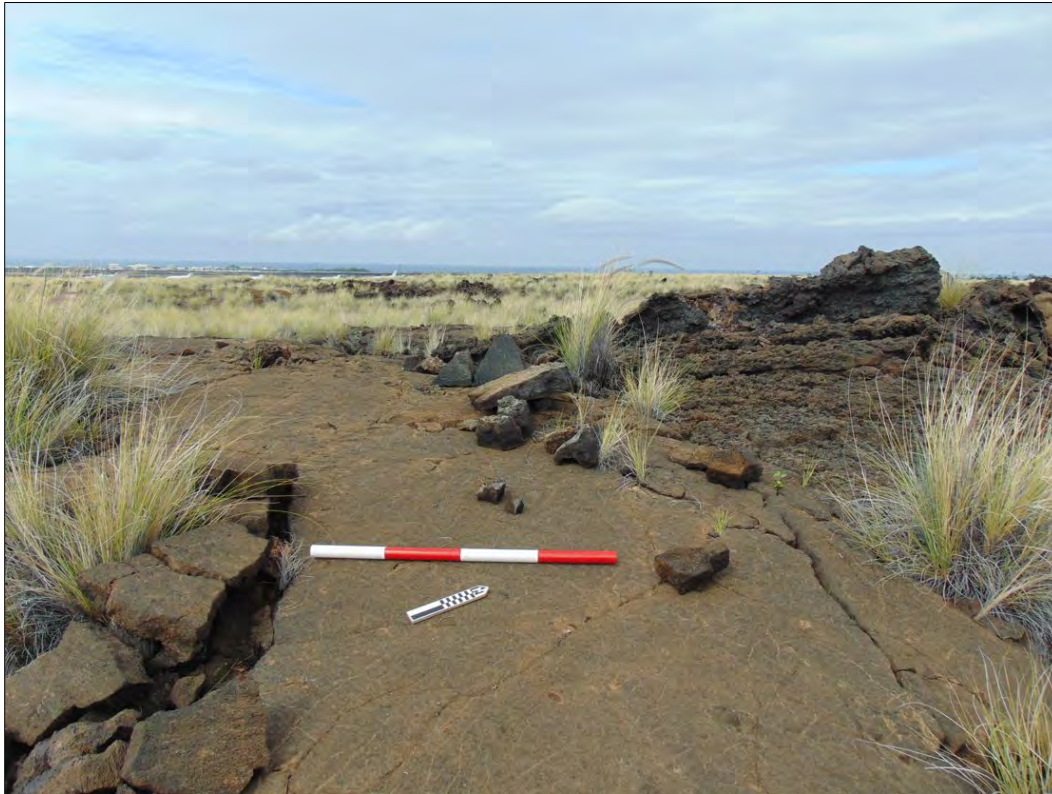


Figure 278. SIHP Site 30358 Feature A, view to the northwest.

Feature B

Feature B is a cairn located at the northeastern end of Site 30355, approximately 24 meters northeast of Feature A (see Figure 240). The cairn is constructed of five *pāhoehoe* slabs placed one on top of another within the narrow *pāhoehoe* channel (Figure 279). The slabs used in its construction are readily available (naturally occurring) within the narrow *pāhoehoe* channel, and the feature, except for being stacked, blends in with the surrounding terrain. Feature B measures 0.5 meters long by 0.5 meters wide and stands up to 25 centimeters tall.

SIHP Site 30359

Site 30359 is a cairn located in the northeast portion of the study area on a slightly elevated *pāhoehoe* formation within the boundaries of Site 30373 and approximately 50 meters west of the southern termination of Site 29273 (see Figure 240). The cairn measures 0.6 meters long by 0.7 meters wide and stands up to 35 centimeters tall. It is constructed of six slabs (two large) stacked one on top of another (Figure 280). The stacking is somewhat precarious and does not appear particularly ancient. It is likely that the slabs used to build the cairn were removed from a nearby *pāhoehoe* excavation at Site 30373 (X-44), located 0.6 meters to the west. The specific reason for marking this location is not clear however, and Site 30359 is therefore interpreted as an unspecified marker.

SIHP Site 30360

Site 30360 consists of two similar cairns (Features A and B) located in the northeast portion of the project area, approximately 25 meters southeast of Site 30358 Feature B (see Figure 240). The site occupies a roughly 12 meter by 4 meter area on a fractured *pāhoehoe* bedrock surface near a section of 'a'ā flow. Both cairns are interpreted as an unspecified markers, and are described in more detail below.

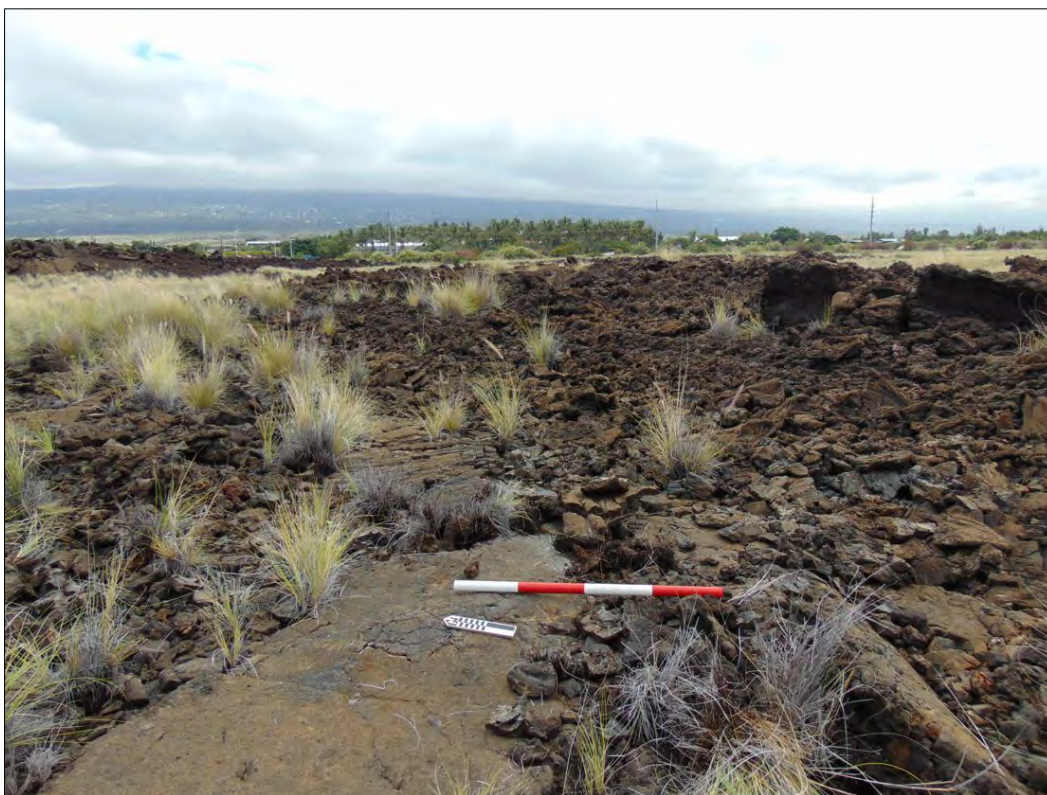


Figure 279. SIHP Site 30358 Feature B, view to the northeast.

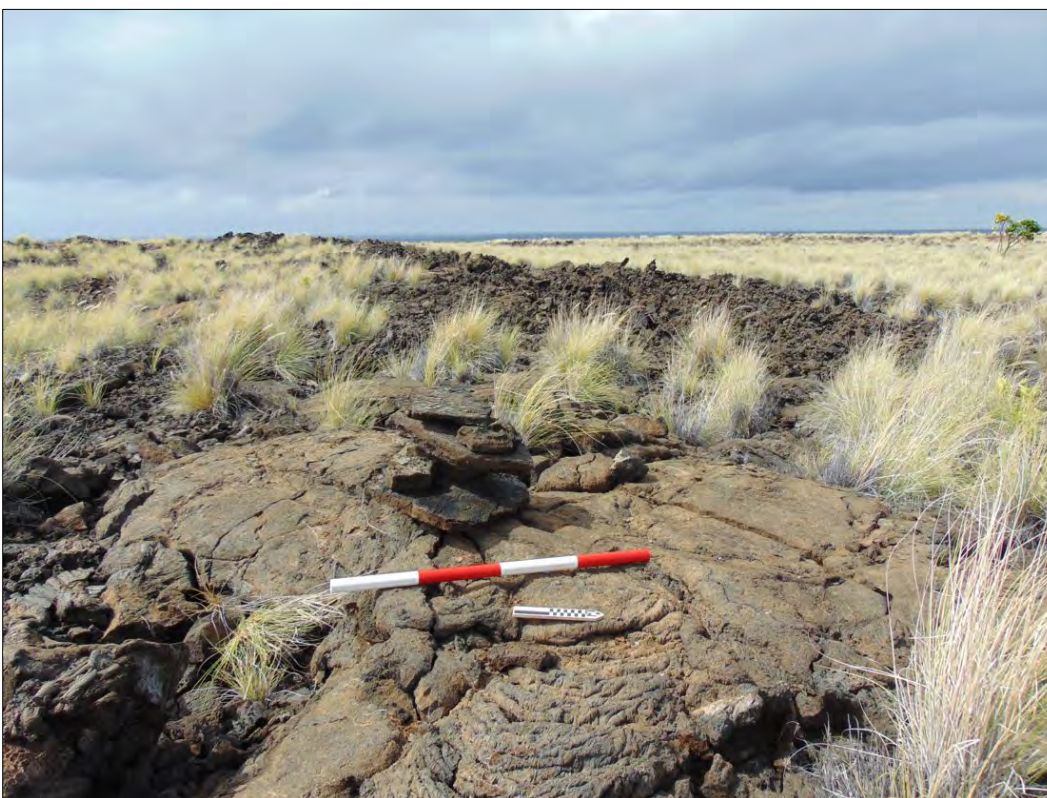


Figure 280. SIHP Site 30359, view to the west.

Feature A

Feature A is a cairn located at the southeastern extent of Site 30360, roughly 12 meters southeast of Feature B (see Figure 240). The cairn is constructed of three large *pāhoehoe* slabs, two of which are stacked, with a third that appears to have toppled to the west (Figure 281). Including the fallen slab, Feature A measures 1.5 meters long by 0.8 meters wide and stands up to 45 centimeters tall.

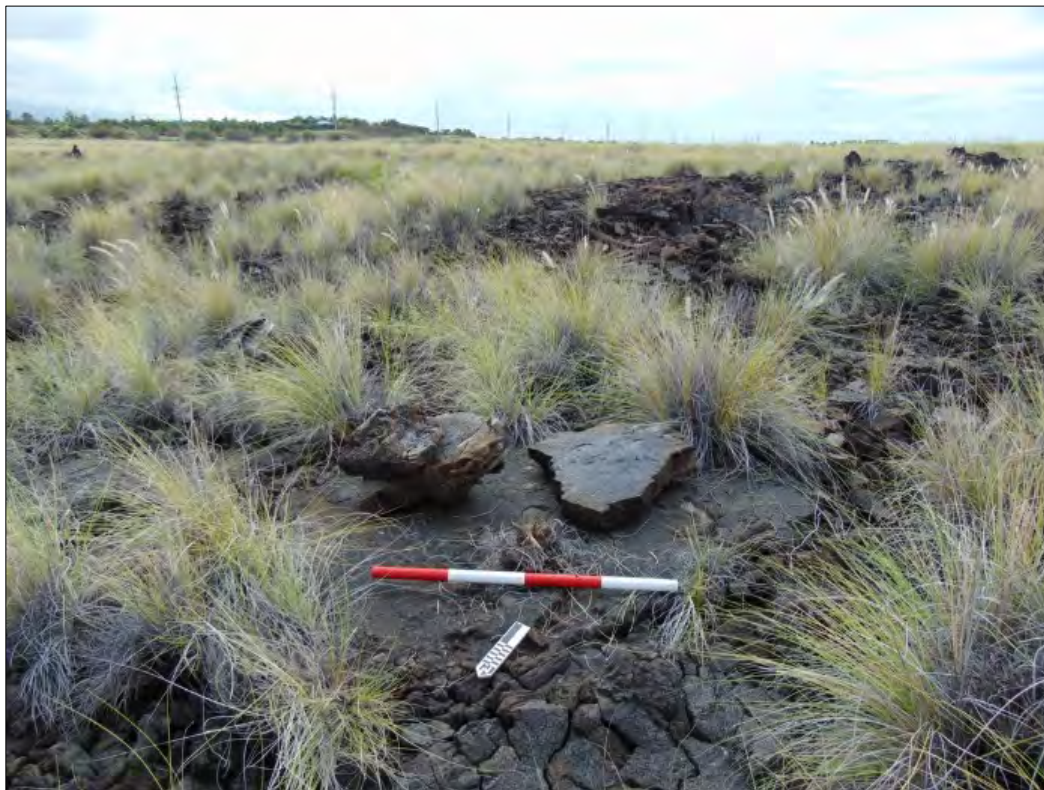


Figure 281. SIHP Site 30360 Feature A, view to the south.

Feature B

Feature B is a cairn located at the northwestern extent of Site 30360, roughly 12 meters northwest of Feature A (see Figure 240). The cairn is constructed of five large *pāhoehoe* slabs stacked on top of each other, with some additional smaller slabs on the surrounding bedrock (Figure 282). Feature A measures 0.5 meters by 0.4 meters and stands up to 30 centimeters tall.

SIHP Site 30361

Site 30361 is a cairn located in the central portion of the project area, approximately 24 meters northeast of Site 10162 (see Figure 240). The cairn is situated at the peak of a prominent outcrop of the h1y-1 lava flow that is surrounded by the younger h2-2 lava flow. The cairn is constructed with one large *pāhoehoe* block forming the base for two smaller cobbles placed on top of it (Figure 283). The resulting construction measures 0.3 meters long by 0.2 meters wide and stands up to 45 centimeters tall. It appears that this cairn was fairly recently built, and it may mark the route of a bulldozer cut that passes through the bedrock outcrop near this location. Alternatively, Site 30361 forms a straight line with two other nearby cairns (Sites 10162 and 30362; Site 10162 is interpreted as a Historic survey marker), and could also mark a survey point itself.

SIHP Site 30362

Site 30362 is a cairn located in the central portion of the project area, approximately 24 meters northeast of Site 30361 (see Figure 240). The cairn is situated along the east slope of a prominent *pāhoehoe* outcrop of the h1y-1 lava flow that is surrounded by the younger h2-2 lava flow. It is constructed with two slabs and one small cobble, which appear to have been formerly stacked, but are now collapsed (Figure 284). In its current condition Site 30362 measures 0.7 meters long by 0.6 meters wide and stands up to 15 centimeters tall. Site 30362 is interpreted as an unspecified marker (see discussion of Site 30361 above).

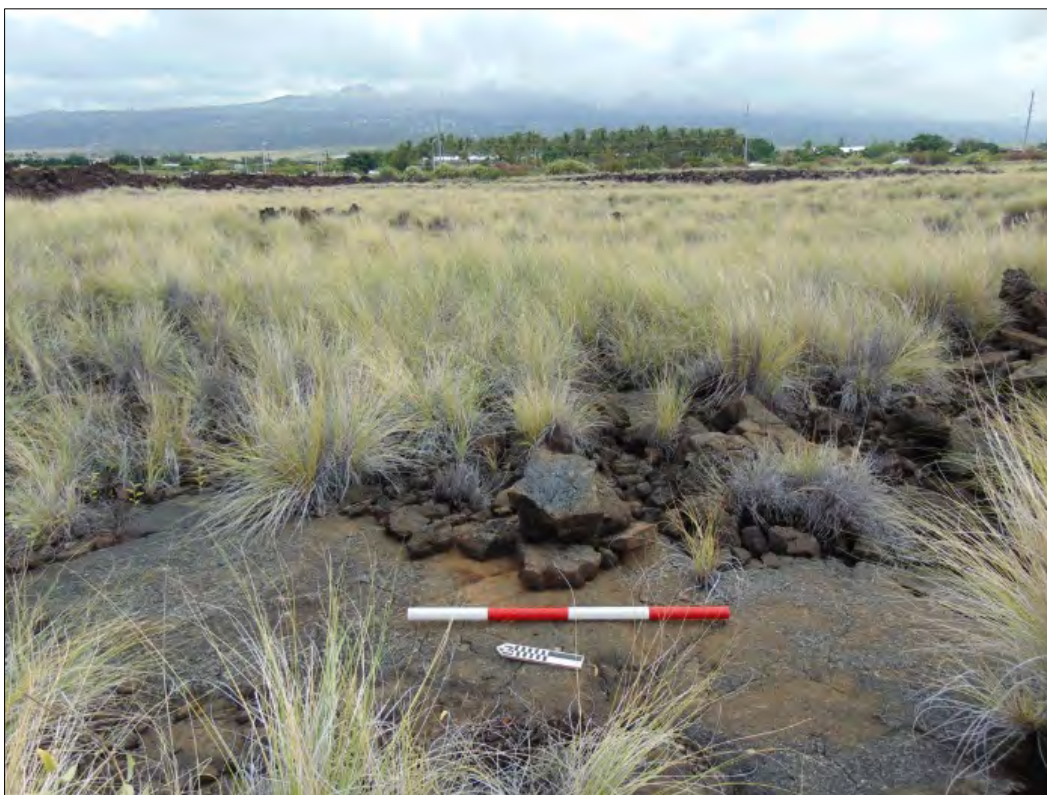


Figure 282. SIHP Site 30360 Feature B, view to the east.

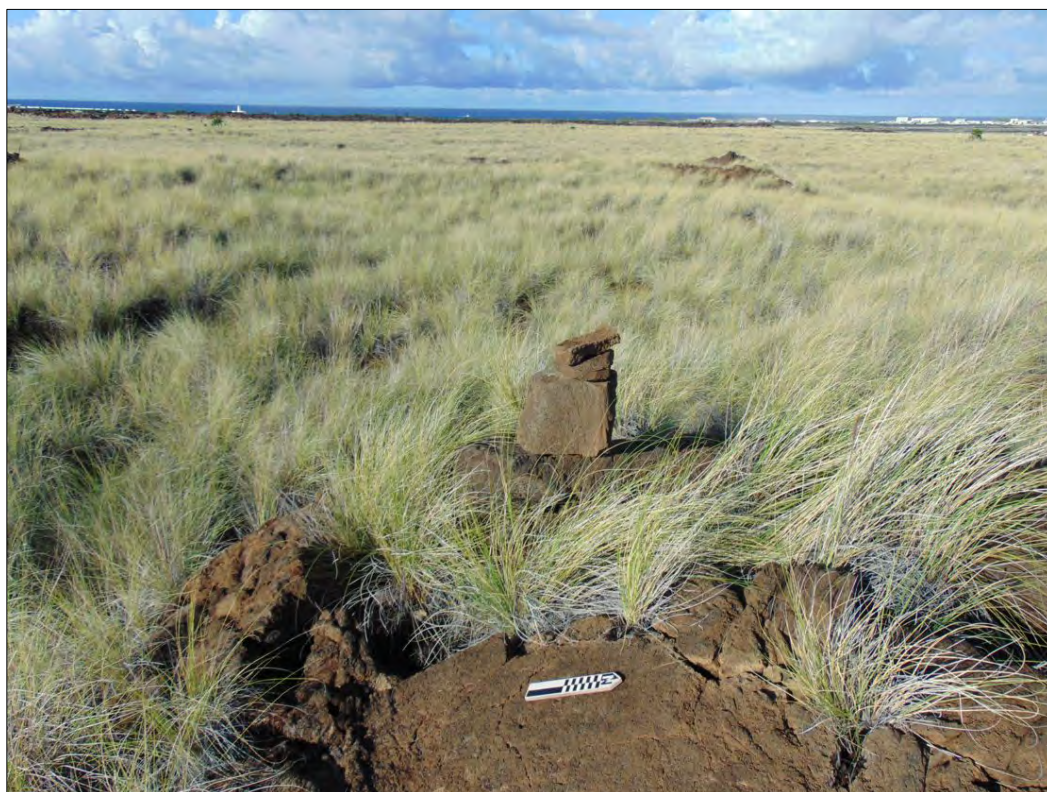


Figure 283. SIHP Site 30361, view to the west.

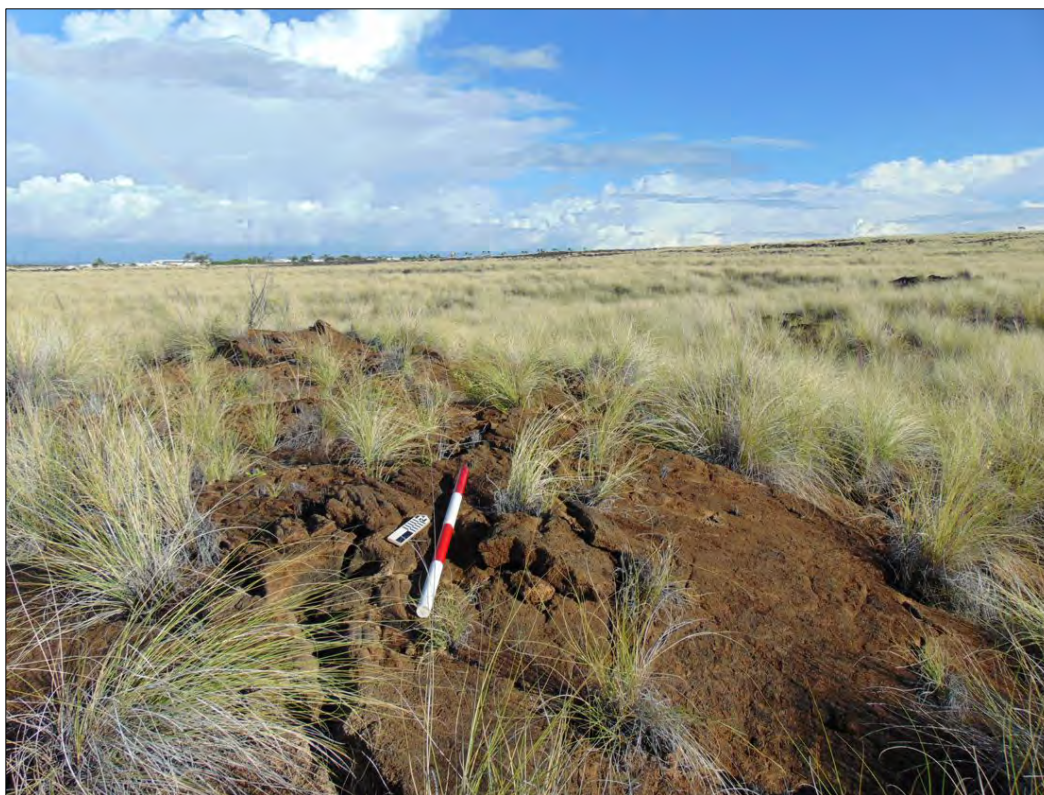


Figure 284. SIHP Site 30362, view to the west.

SIHP Site 30363

Site 30363 is a cairn located in the eastern portion of the project area approximately 30 meters northwest of Site 29274 (see Figure 240). The cairn is situated on a level *pāhoehoe* bedrock ground surface, and is surrounded by a dense growth of fountain grass. It is constructed of thirty medium to large cobbles piled on top of each other in a mounded fashion (Figure 285). Site 30363 measures 1 meter long by 0.9 meters wide, and is interpreted as an unspecified marker, as the specific reason for marking this location is unclear.

SIHP Site 30364

Site 30364 is a cairn located in the northern portion of the project area approximately 30 meters south of the Site 30315 trail at the location of Features L and K (see Figure 240). The cairn, which is constructed of five slabs and one small cobble stacked on top of one another (Figure 286), is situated on top of the northern edge of a naturally uplifted outcrop of slabby *pāhoehoe* lava. It measures 0.4 meters by 0.3 meters by 25 centimeters tall, and is constructed of the same slabby *pāhoehoe* material that it sits on. Site 30364, given its location, seems to serve as a visual marker meant to identify this particular outcrop of slabby *pāhoehoe*. However, although the cairn has been placed in an elevated location, it blends with the natural outcrop and is not visible from afar.

SIHP Site 30365

Site 30365 consists of three small cairns (Features A, B, and C) located in the southwest portion of the project area, *makai* of the Māmalahoa Trail (SIHP Site 2) and north of the Site 29272 trail (see Figure 240). The cairns, which are all of similar construction, are situated within a 24 meter long by 16 meter wide area of exposed *pāhoehoe* bedrock along the southern edge of a large bedrock depression. The material used to construct the cairns may have come from some of the nearby excavations of Site 30372 or from the large depression. It is not clear what the cairns are marking. They do not appear particularly ancient, and may be associated with the use of the nearby Site 29272 trail (see description above), or may serve some other completely unrelated purpose. For this reason Site 30365 is interpreted as a complex of unspecified markers. Features A, B, and C are described individually, in more detail, below.



Figure 285. SIHP Site 30363, view to the northeast.

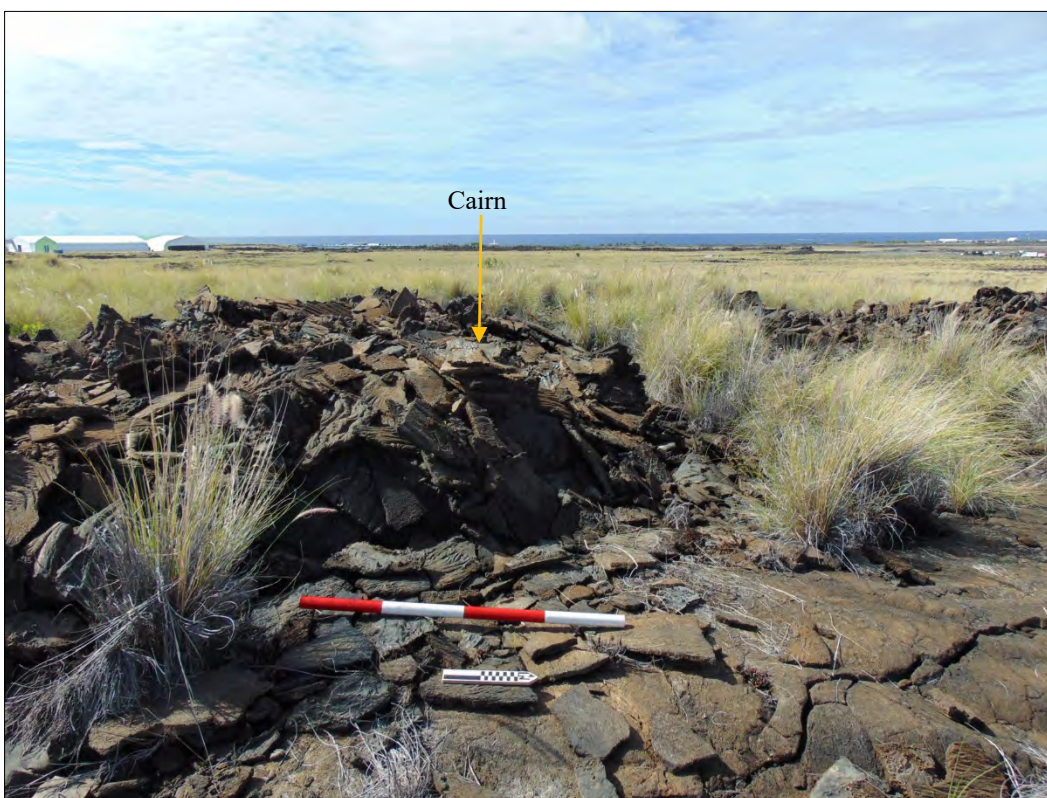


Figure 286. SIHP Site 30364, cairn on top of an outcrop of slabby *pāhoehoe*, view to the west.

Feature A

Feature A is a cairn located at the eastern end of Site 30365, 10 meters west of the Māmalahoa Trail (SIHP Site 2) and 25 meters north of the Site 29272 trail (see Figure 240). The cairn is constructed of five cobbles and three *pāhoehoe* slabs piled/loosely stacked on a level bedrock surface (Figure 287). The cairn measures 0.6 meters by 0.6 meters and stands up to 30 centimeters tall. An aluminum foil pan, riddled with bullet holes, that appears to have been used for target practice was noted 1.5 meters to the west of Feature A.

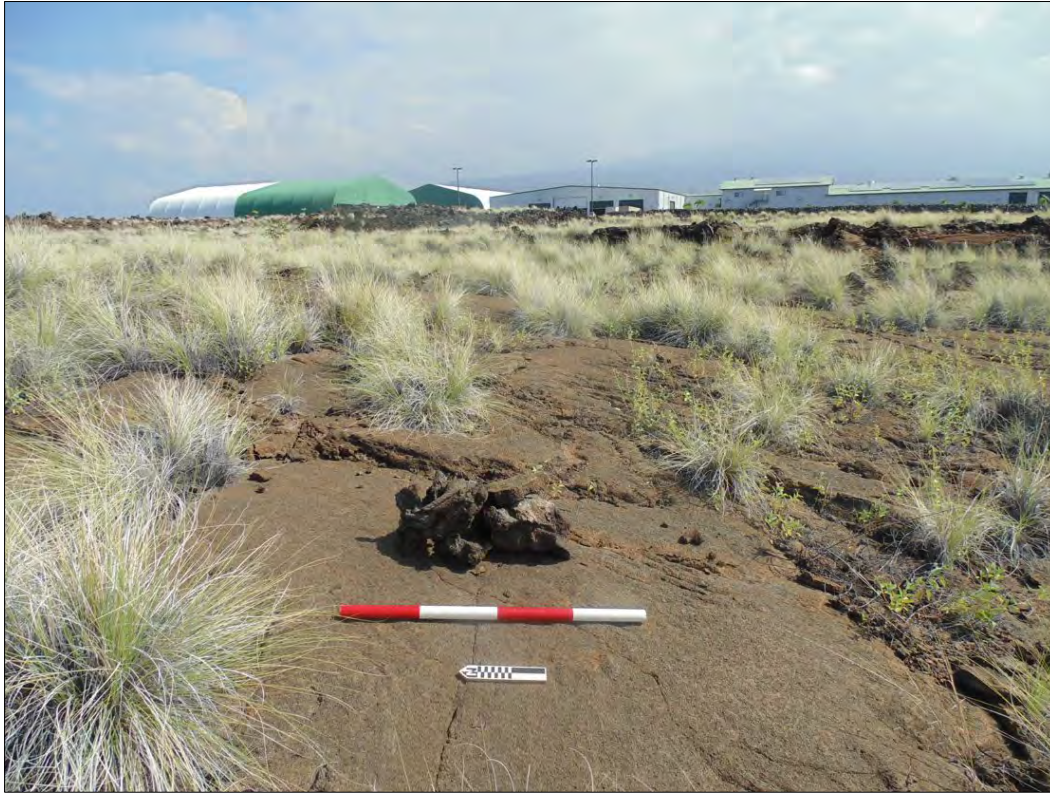


Figure 287. SIHP Site 30365 Feature A, view to the east.

Feature B

Feature B is a cairn located in the central portion of Site 30365, 10 meters southwest of Feature A (see Figure 240). The cairn is constructed of ten, loosely stacked/collapsed *pāhoehoe* slabs, with four additional slabs placed next to one another in two spots on exposed *pāhoehoe* bedrock surface to the west (Figure 288). It is likely that the slabs used in the construction of Feature B were taken from a nearby Site 30372 *pāhoehoe* excavation (X-201).

Feature C

Feature C is a cairn located at the west end of Site 30365, approximately 16 meters west of Feature B (see Figure 240). The cairn is situated along the south edge of the natural depression on a level *pāhoehoe* bedrock surface. It is constructed of two slabs and one cobble stacked one on top of another (Figure 289). The cairn measures 0.35 meters long by 0.3 meters wide and stands up to 30 centimeters tall.

SIHP Site 30366

Site 30366 consists of a cairn located in the southwestern portion of the project area, approximately 36 meters west of the northern termination Pā'o Street *makai* of the Koyo USA Corporation bottling facility (see Figure 240). The cairn is constructed of six thin slabs of *pāhoehoe* placed into two stacks, and a single cobble collapsed downslope to the west, on a slightly west sloping *pāhoehoe* bedrock outcrop (Figure 290). Site 30366 does not appear particularly ancient, but it is unclear what the cairn is marking, and the site is therefore interpreted as an unspecified marker.

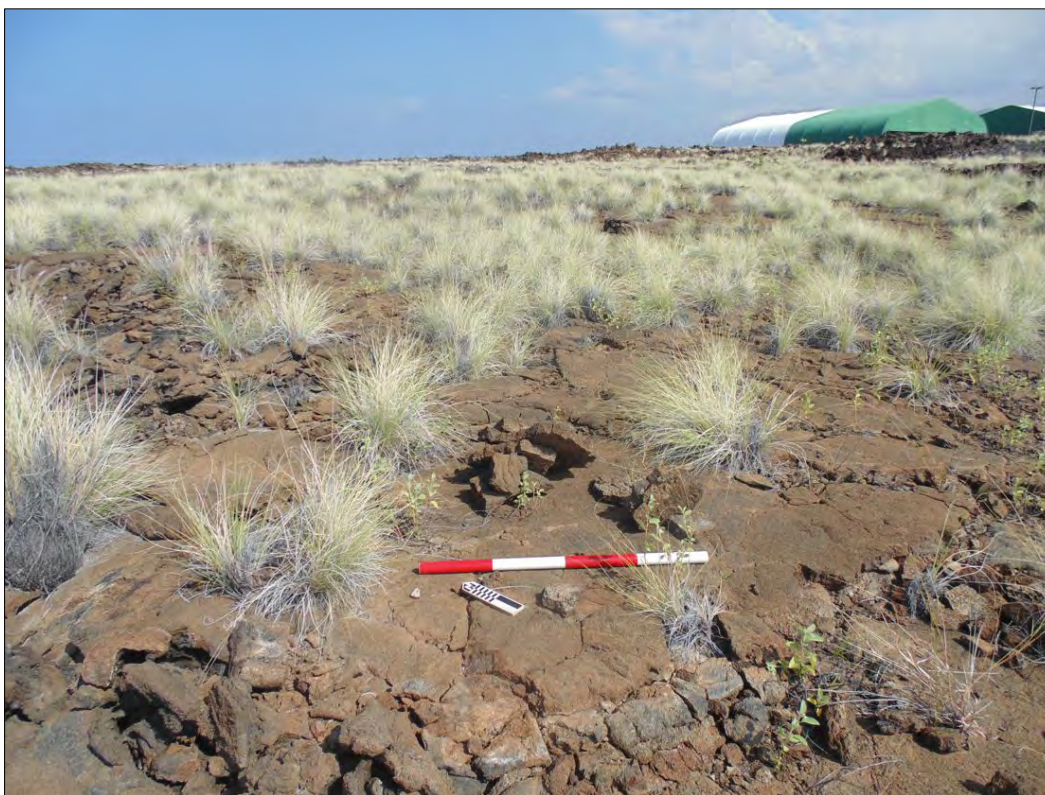


Figure 288. SIHP Site 30365 Feature B, view to the northeast with Feature A visible in the background.

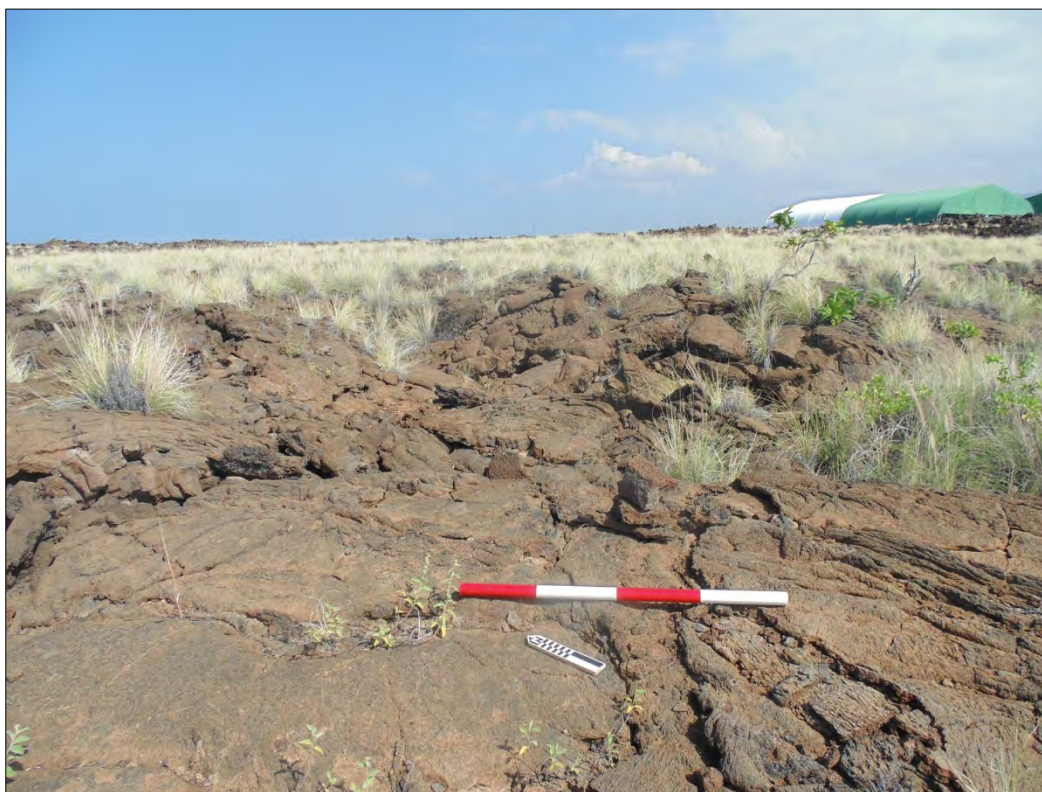


Figure 289. SIHP Site 30365 Feature C, view to the northeast.

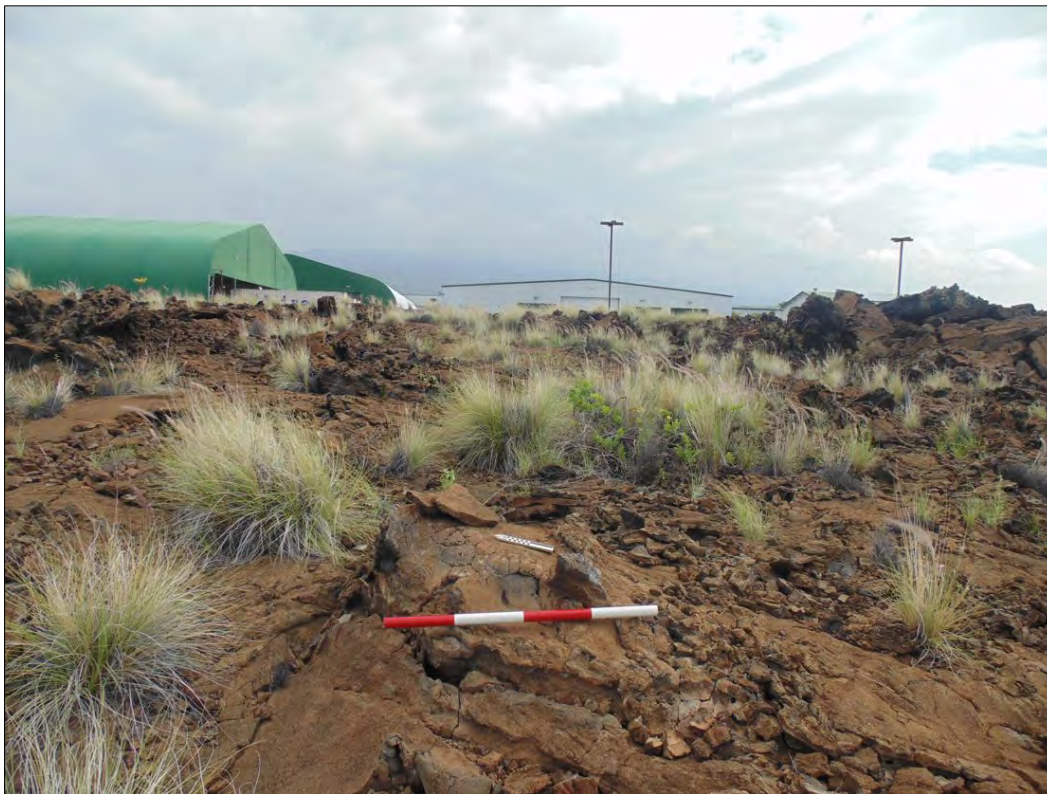


Figure 290. SIHP Site 30366, view to the east.

SIHP Site 30367

Site 30367 is located in the southwest portion of the project area, approximately 10 meters *mauka* of the Māmalahoa Trail (SIHP Site 2) alignment (see Figure 240). The cairn is constructed of six piled cobbles on a *pāhoehoe* bedrock surface near the pronounced southern edge of a ‘*a*’*ā* flow (Figure 291). It measures 0.8 meters long by 0.6 meters wide and stands up to 25 centimeters tall. It is not clear what the cairn is intended to mark; Site 30367 is therefore interpreted as an unspecified marker.

SIHP Site 30368

Site 30368 is a tall stacked cairn located in the eastern portion of the current study area (see Figure 240), roughly 45 meters west of the Queen Ka‘ahumanu Highway right-of-way (Figure 292). The cairn is constructed of approximately fifty small to large cobbles stacked in a tall conical pile that measures 0.7 meters in diameter and stands up to 85 centimeters tall. Site 30368 is situated on a level *pāhoehoe* bedrock surface near a transition to ‘*a*’*ā* (Figure 293), and several *pāhoehoe* excavations of Site 30375 are found in its immediate vicinity.

Given its distinct formal traits and the precarious arrangement of stones, it is likely that this cairn is a modern construction, perhaps associated with the Site 30375 excavations in the area. One possible explanation for the presence of this cairn at this location, based on its associations, is that Site 30368 was constructed as a marker, visible from Queen Ka‘ahumanu Highway (the section of the highway to Keāhole Airport opened in ca. 1969), that was intended to identify the location of lava that would provide stones suitable for building a particular rock wall (see discussion of *pāhoehoe* excavations below). Of course other explanations are also equally plausible, but regardless, Site 30368 seems to be a modern construction.

SIHP Site 30369

Site 30369 consists of two cairns (Features A and B) located in the southeastern portion of the study area, approximately 30-80 meters north of the Site 29272 trail (see Figure 240). The cairns are situated on a somewhat rough *pāhoehoe* bedrock surface that is surrounded by ‘*a*’*ā*, in the area to the north of the southernmost excavations of Site 30375. The features are spaced roughly 50 meters from one another, but are similar in construction. As it is not clear what these cairns are marking (they are likely modern), Site 30369 is interpreted as a complex of unspecified markers. Features A and B of Site 30369 are described in more detail below.

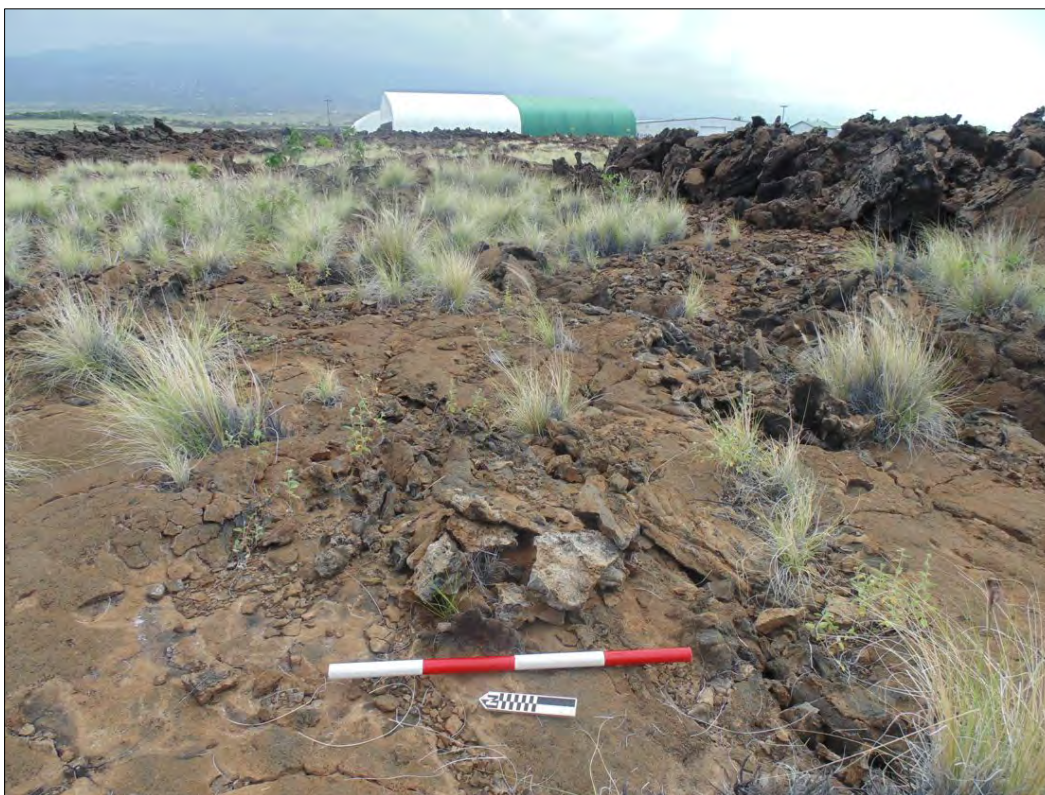


Figure 291. SIHP Site 30367, view to the east.

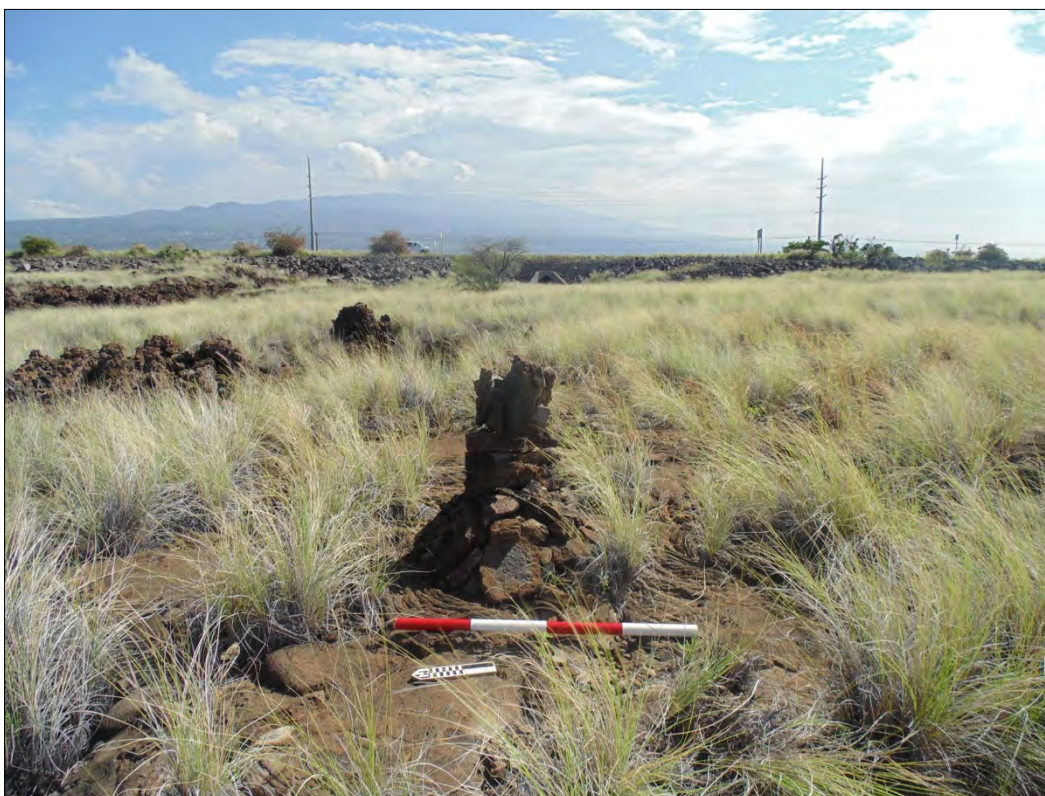


Figure 292. SIHP Site 30368, view to the east with Queen Ka'ahumanu Highway visible in the background.

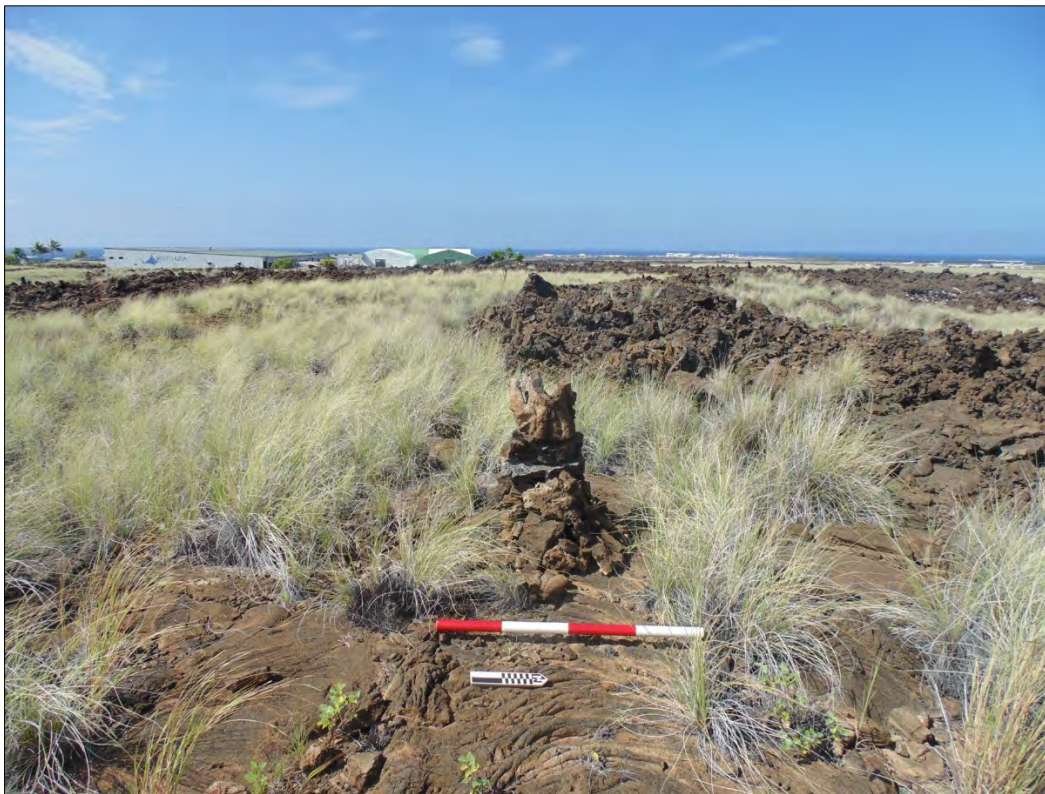


Figure 293. SIHP Site 30368, view to the west.

Feature A

Feature A is a cairn located at the southern end of Site 30369 approximately 48 meters south/southeast of Feature B (see Figure 240). The cairn is constructed of three *pāhoehoe* slabs stacked one on top of another, with a fourth supporting the base slab to the south (Figure 294). Feature A measures 0.4 meters in diameter and stands up to 30 centimeters tall.

Feature B

Feature B is a cairn located at the northern end of Site 30369 approximately 48 meters north/northwest of Feature A (see Figure 240). The cairn is constructed of four thin *pāhoehoe* slabs stacked one on top of another (Figure 295). Feature B measures 0.5 meters long by 0.28 meters wide and stands up to 20 centimeters tall.

SIHP Site 30370

Site 30370 consists of two cairns (Features A and B) located in the southeastern portion of the study area, approximately 8 meters south of the Site 29272 trail and 16 meters northwest of the northern termination of Kahilihili Street (see Figure 240). The cairns are situated roughly 9 meters from one another on a *pāhoehoe* bedrock surface near several outcroppings of 'a 'ā; bulldozing associated with the construction of Kahilihili Street has occurred in the vicinity of both cairns. As it is not clear what these cairns are marking (they are likely modern), Site 30370 is interpreted as a complex of unspecified markers. Features A and B of Site 30370 are described in more detail below.

Feature A

Feature A is a cairn located at the northern end of Site 30370 approximately 9 meters north/northeast of Feature B (see Figure 240). The cairn consists of five slabs stacked in two adjacent piles on a level *pāhoehoe* surface (Figure 296). Together the piles measure 0.6 meters long by 0.3 meter wide and they stand up to 30 centimeters tall. A vertical bedrock drop-off occurs 0.65 meters north of the cairn.

Feature B

Feature B is a cairn located at the southern end of Site 30370 approximately 9 meters south/southeast of Feature B (see Figure 240). The cairn is constructed of 5 slabs stacked one on top of another on a *pāhoehoe* bedrock surface (Figure 297). Feature B measures 0.4 meters long by 0.3 meters wide and stands up to 35 centimeters tall.

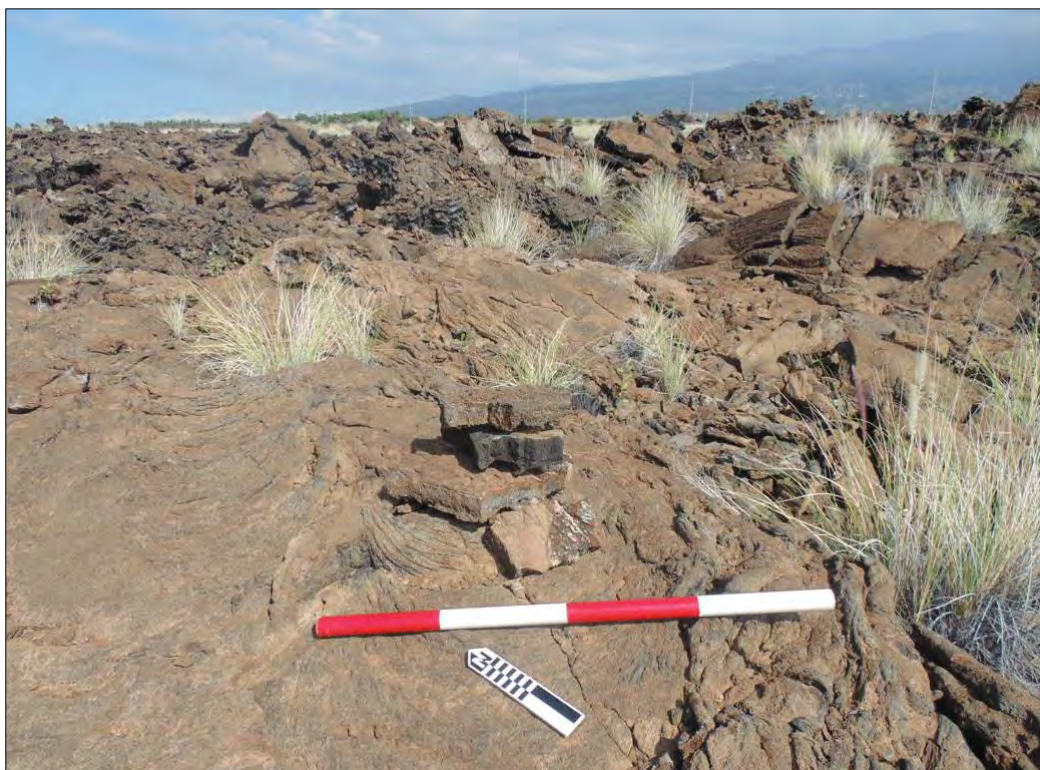


Figure 294. SIHP Site 30369 Feature A, view to the northeast.



Figure 295. SIHP Site 30369 Feature B, view to the northeast.

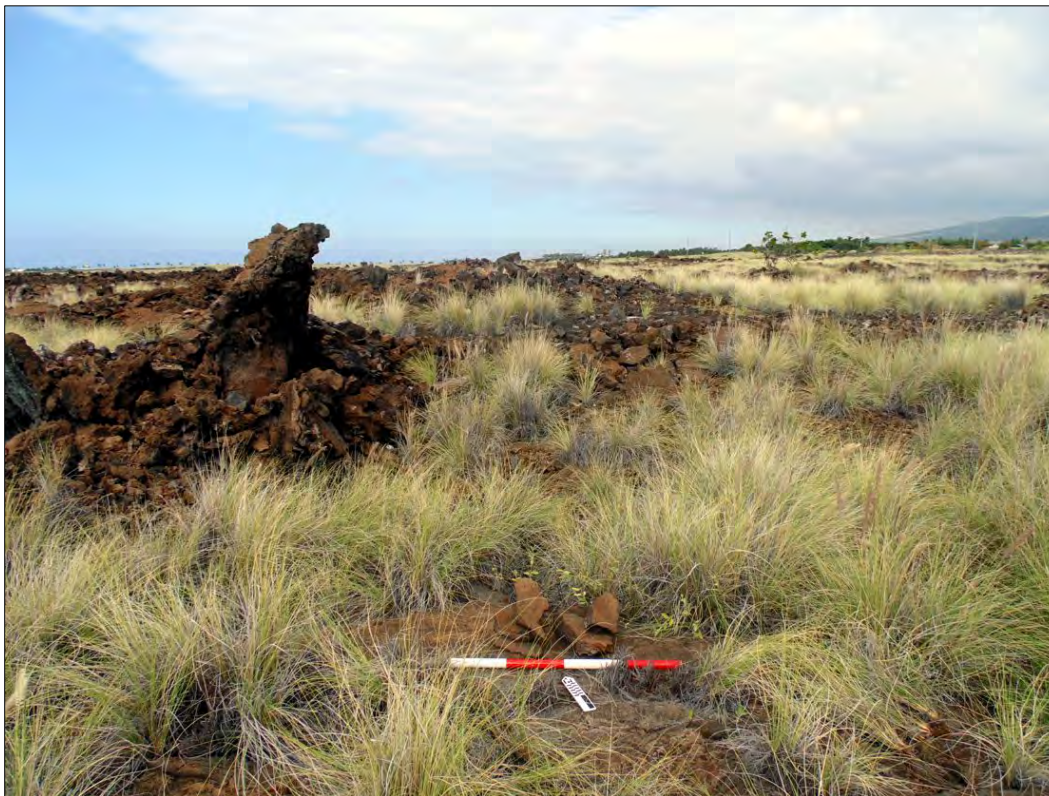


Figure 296. SIHP Site 30370 Feature A, view to the west.



Figure 297. SIHP Site 30370 Feature B, view to the west.

***Pāhoehoe* Excavations**

Five *pāhoehoe* excavation sites containing a total of 255 individual *pāhoehoe* excavation features were recorded within the current study area (Table 11 and Figure 298). *Pāhoehoe* excavations are small blisters, voids, cracks, or vertical edges found within *pāhoehoe* lava flows (typically where gas pockets existed between the layers of lava) from which the surface layer has been removed (excavated). The removal of rocks from the surface exposes the spaces between the surface and the underlying flow and creates an artificial pit in the *pāhoehoe* bedrock that is typically no more than 0.2 to 0.6 meters deep. The excavated material is either left at the excavation, adjacent to or within the excavated area, or is absent from the excavation and has been removed elsewhere. The possible functions of *pāhoehoe* excavations have been long debated in Hawaiian archaeological literature (see Nakamura et al. 1998). While there may be other additional interpretations, four potential functional interpretations for *pāhoehoe* excavations (extracted from Barrera 1971; Carter 1986; Ladefoged et al. 1987; Moore and Bevacqua 1972) are offered here: 1) that these sites are locations of quarrying activity for the acquisition of basalt cobbles and slabs for construction, 2) that these sites represent assaying and/or quarrying activities for the procurement of vesicular basalt as raw material for making abraders, 3) that these sites are planting pit for the cultivation of sweet potato, and 4) that these sites were created as byproducts of collecting eggs and fledgling birds that may have used shallow lava blisters for nesting.

Table 11. *Pāhoehoe* excavation sites identified within the current study area.

<i>SIHP Site #*</i>	<i>Site type</i>	<i>Site function</i>	<i>Age</i>
30371	<i>Pāhoehoe</i> excavation complex	Assay/Quarry/Unknown	Precontact/Historic
30372	<i>Pāhoehoe</i> excavation complex	Quarry/Unknown	Historic
30373	<i>Pāhoehoe</i> excavation complex	Quarry/Unknown	Unknown/Modern
30374	<i>Pāhoehoe</i> excavation complex	Assay/Unknown	Unknown
30375	<i>Pāhoehoe</i> excavation complex	Quarry/Unknown	Unknown/Modern

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

It is likely that as a feature class *pāhoehoe* excavations reflect all of these activities, and it would be a combination of the disposition of the removed material and the environmental context in which the sites are found that would inform functional interpretation. Regardless of specific function, it seems clear that the recorded *pāhoehoe* excavation features are loci of resource extraction activities. The primary and secondary functions listed in Table 11 for the excavation sites are discussed in further detail below with the individual site descriptions. In general it appears that the forty-five *pāhoehoe* excavation features recorded in the northern portion of the study area as Site 30371 (see Figure 298) are associated with the Precontact to early Historic use of the Site 30315 trail and the Sites 30316, 30318, and 30319 lava tubes. Most of these excavations still have the removed material present within and adjacent to the excavated areas, suggesting that Interpretations 1 and 3 are most likely, but Interpretations 2 and 4 cannot be wholly discounted for this site. The material removed from the 184 *pāhoehoe* excavation features recorded in the southwestern portion of the study area as Site 30372 (see Figure 298) is mostly absent from the site, suggesting that Interpretation 2 is most likely. The association of these excavations with the Māmalahoa Trail (SIHP Site 2) suggests that they were areas used to quarry material for the construction of that Historic roadway. The functions listed for the three remaining sites (SIHP Sites 30373, 30374, and 30375) should be considered tentative, as the age of all three is unknown, and the excavations in these areas, near easily accessed portions of the study area, could in fact be modern.

In addition to the recorded *pāhoehoe* excavation sites, the top surface of lava has been nearly completely stripped away from a roughly 200 meter square area in the northeastern portion of Parcels 072 and 073 adjacent to the Queen Ka‘ahumanu right-of-way (see Figure 298). The lack of weathering on the excavated bedrock surfaces within this area (Figure 299) suggests that the quarrying activity associated with the removal of material from this location occurred during the Modern Period. Given the differential weathering, and the nearly complete removal of the entire bedrock surface within this area, it is likely that the rock at this location was collected by contractors sometime after the construction of Queen Ka‘ahumanu Highway (post ca. 1970) and used to build rock walls in the Kailua area. The broken tip of a metal ‘ō‘ō bar associated with these excavations (Figure 300), attests to the modern quarrying activity that occurred here.

Each *pāhoehoe* excavation identified within the current study area was assigned a numerical designation as it was recorded (X-1, X-2, X-3, etc.), and these numbers were retained for the feature designations, even after the excavations were grouped into the sites listed above. Fifty-three (20%) of the *pāhoehoe* excavations, mostly at Site 30371, were recorded in detail and photographed with a meter stick and north arrow for scale and orientation. Each of the *pāhoehoe* excavation sites is described in detail below. Significance evaluations and treatment recommendations for these sites are presented at the conclusion of this report.

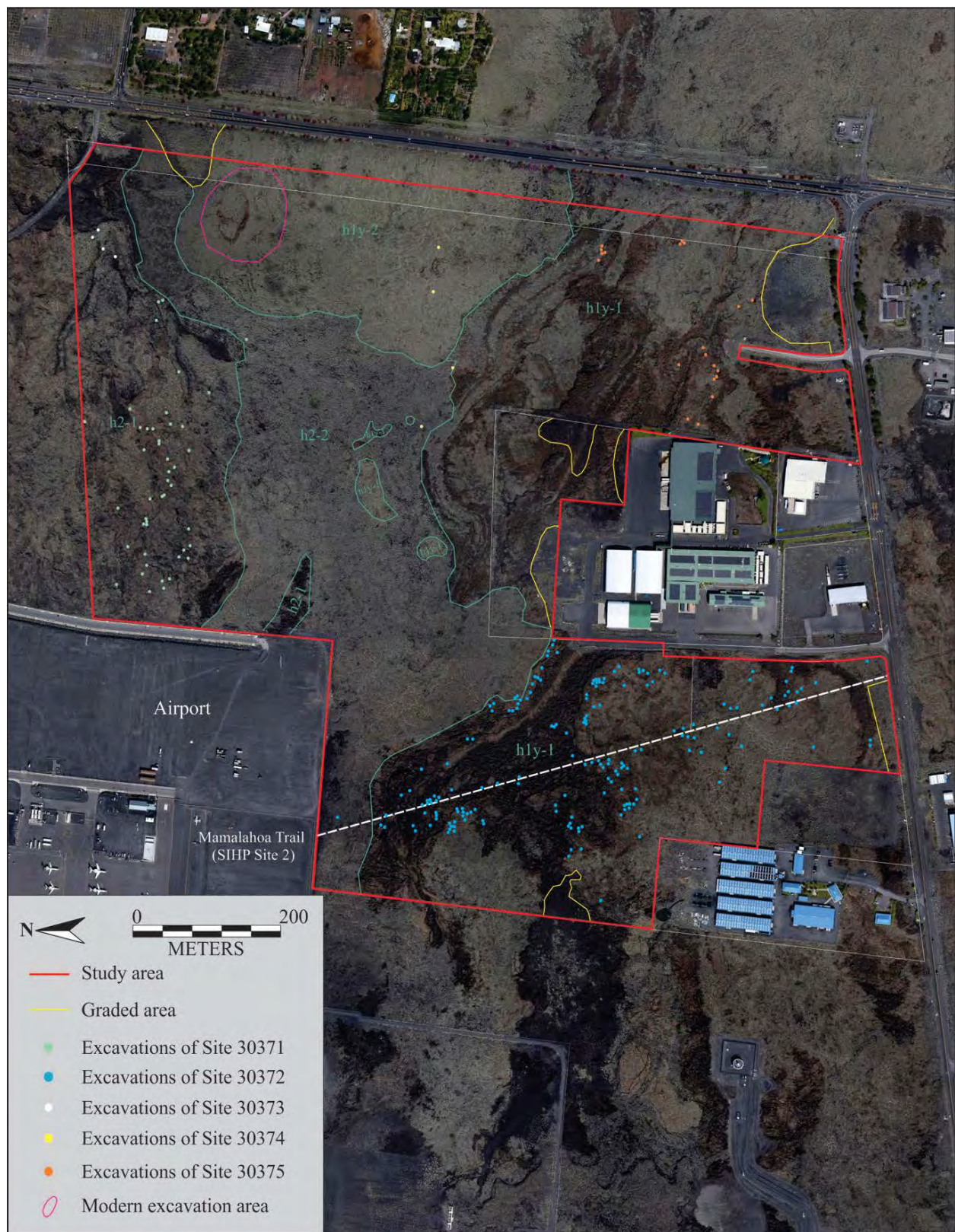


Figure 298. *Pāhoehoe* excavation sites and features recorded within the current study area.



Figure 299. Recently excavated bedrock surface in the northeastern portion of the study area, view to the southwest.



Figure 300. Broken tip of a metal 'ō'ō bar associated with the recent rock removal, view to the south.

SIHP Site 30371

Site 30371 is a complex comprised of forty-five *pāhoehoe* excavations (X-1 to X-43, X-45, and X-46; Table 12) located in the northern portion of the current study (see Figure 298). The excavations at Site 30371 occur within an area that measures roughly 450 meters (east/west) by 300 meters (north/south) primarily within *pāhoehoe* sections of the h2-1 lava flow (only X-46 occurs on the adjacent h2-2 lava flow) along the route of the Site 30315 trail and nearby the Site 30316, 30318, and 30319 lava tubes (Figure 301). The *pāhoehoe* excavations vary in size from a low of 0.2 square meters to a high of 27 square meters, with depths of excavation that vary from 3.5 centimeters to 70 centimeters below the surrounding bedrock surface (the average depth of the excavations is 38 centimeters).

At most of the individual *pāhoehoe* excavations of Site 30371, the excavated material remains within the excavated area or scattered on bedrock around the edges, suggesting that the primary purpose for the excavations was assaying the underlying bedrock voids, either for vesicular basalt or for eggs and fledgling birds (see discussion above). Fine grained, smooth, vesicular basalt formed the surface of the underlying lava within four of the excavations (X-9, X-10, X-16, X-17, and X-18), and a few small slabs of *pāhoehoe* material that appeared suitable for abrader use, although not actually abraded, were noted amongst the discarded material near a few of the excavations (primarily in the vicinity of the Site 30316 and Site 30318 lava tubes). No direct evidence of nesting birds was observed at any of the excavations, but bird bone was noted within the nearby Site 30318 lava tube (see above).

At four of the excavations (X-9, X-17, X-18, and X-37) of Site 30371 most of the excavated material appeared to have been removed and taken elsewhere, suggesting a basalt quarrying component to the site as well. Cobble and slab material removed from five of the excavations (X-10, X-11, X-16, X-21, and X-37), based on proximity, appears to have been used to construct cairns along the route of the Site 30315 trail. At all but X-11, however, the material used in the construction of the adjacent cairn is not enough to explain the overall amount of material removed from the entire excavation area. In addition to the cairns along the Site 30315 trail route, material taken from X-15 appears to have been used to build the Site 10160 Historic survey marker. Also at six of the *pāhoehoe* excavations of Site 30371 (X-2, X-8, X-20, X-23, X-34, and X-43) the larger cobbles removed from the excavated area appear to have arranged in rough linear alignments; it is not clear if these cobble arrangements were intentionally created, or were simply a byproduct of the manner in which the excavation occurred.

Soil is virtually non-existent within the excavations at Site 30371 (or anywhere on the bedrock surfaces in the vicinity of the site), indicating that the possibility of sweet potato cultivation is extremely unlikely. However, thin soil deposits were observed at two of the excavations (X-36 and X-45), suggesting that while an agricultural function is not likely, it cannot be fully discredited. A *noni* tree currently growing out of the X-45 blister could perhaps indicate that selective planting, tending, or harvesting of naturally occurring plant species well adapted to the arid environment was occurring within the general site area.

While cultural material related to the use of the Site 30315 trail and the Sites 30316, 30318, and 30319 lava tubes, including water-rounded coral chunks, water-worn cobbles, marine shell, a basalt adze fragment, bottle glass, and horse shoes (see Site 30315 trail description above), is present on the ground surface within the general boundaries of Site 30371, only one item of cultural debris (a water-worn cobble at X-10) was found directly associated with one of the excavations. The water-worn cobble found within X-10, although small, exhibits signs of bashing, and may have been used to remove some of the material from that excavation or other nearby excavations (Figure 302). A larger water-worn cobble with evidence of use as a bashing stone was found stashed within a small blister along the route of the Site 30315 trail between X-37 and X-38 (Figure 303; see Site 30315 trail description above). Other methods of dislodging stones from the excavated areas at Site 30371 likely included the use of digging sticks (‘ō‘ō) and removal by hand.

Given of the formal attributes of the *pāhoehoe* excavations recorded in this portion of the study area, and their various associations with the Site 30315 trail, the Site 10160 Historic survey marker, and the Sites 30316, 30318, and 30319 lava tubes, Site 30371 is interpreted as an area where the assay of *pāhoehoe* bedrock features (i.e. blisters, voids, and cracks) occurred in the past. This assay, which was generally limited to the pulling apart (excavation) of the various *pāhoehoe* features, could have occurred during either the Precontact or Historic Period, but likely occurred during both. The excavation, given that most of the rock material was left at the site, was likely focused primarily on the collection of resources such as vesicular basalt or possibly eggs and fledgling birds, but some of the excavations were also the source of basalt construction materials quarried from the site and taken elsewhere, and the possibility of opportunistic horticulture in excavations where soil exists, cannot be fully discounted. A description and photograph of each of the *pāhoehoe* excavations recorded as Site 30371 is presented below in Table 12.

5. Fieldwork

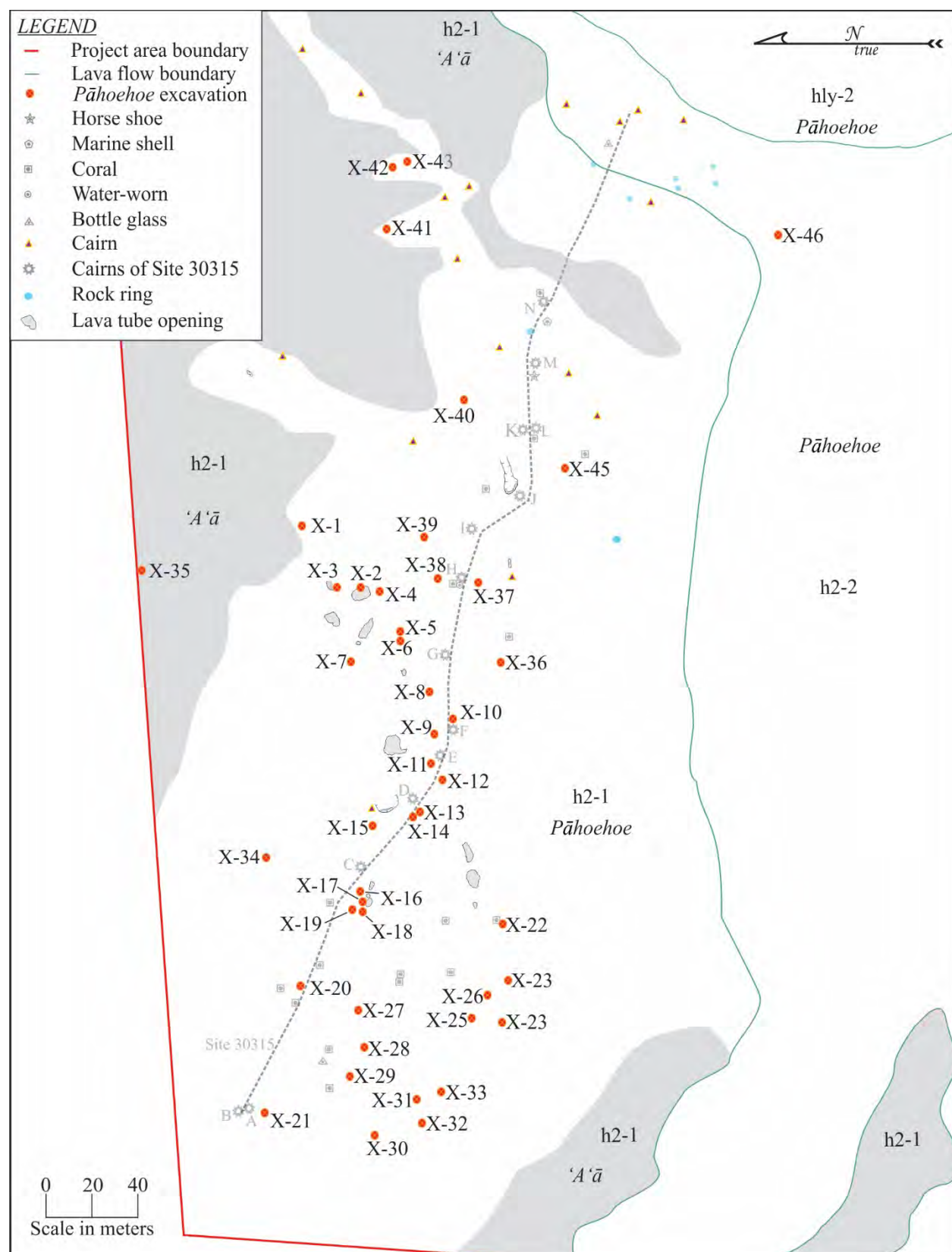


Figure 301. SIHP Site 30371 plan view.



Figure 302. SIHP Site 30371, water-worn basher within X-10, view to the north.



Figure 303. SIHP Site 30371, water-worn basher found within a small blister along the route of the Site 30315 trail between X-37 and X-38, close-up view.

Table 12. Features of SIHP Site 30371.


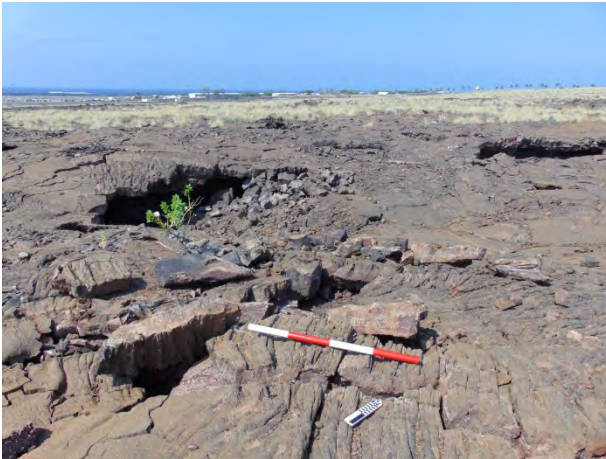
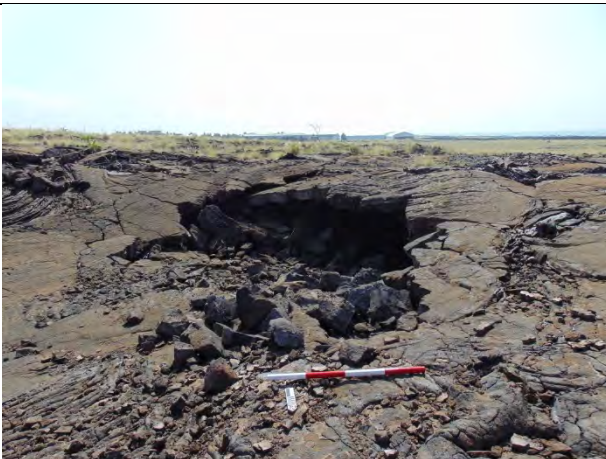
<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-1	1.4 x 0.5 x 0.4	Approximately 10 large cobbles and 30 small cobbles excavated from a small crack within a barren <i>pāhoehoe</i> flow near several lava tube entrances. Cobbles deposited on the bedrock slope to the east of the excavation and also left within the excavated crack.	
			View to north.
X-2	1.9 x 1.5 x 0.3	Approximately 25 large cobbles excavated from an L-shaped crack within a barren <i>pāhoehoe</i> lava flow. A non-cultural lava tube entrance is located to the northwest of the excavation, and some small cracks in the general vicinity have also been slightly excavated. Excavated cobbles are present along the northern edge of the excavation forming a rough linear alignment that extends east to west.	
			View to northwest
X-3	1.1 x 0.9 x 0.4	A roughly square shaped excavation located at the north edge of a non-cultural lava tube opening within a barren <i>pāhoehoe</i> lava flow. Roughly 20 large cobbles have been excavated and piled to the east and south of the excavation to the northwest of the lava tube opening.	
			View to south.

Table 12 continued on next page.

Table 12. Continued.

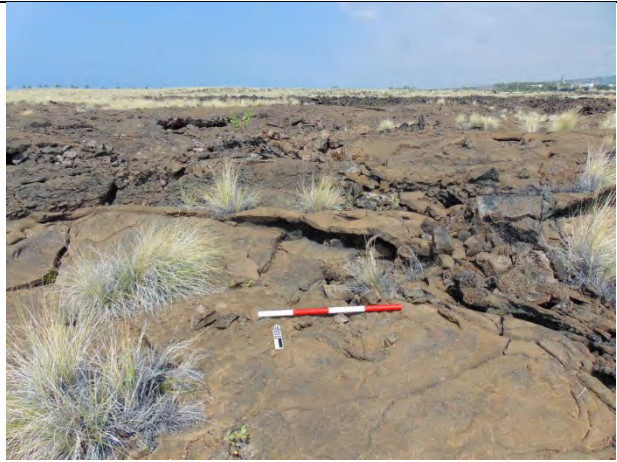

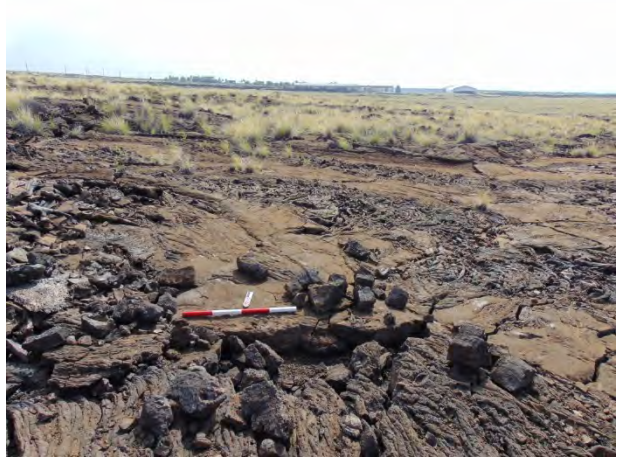
Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-4	1.3 x 1.1 x 0.4	Approximately 25 large cobbles excavated from a shallow lava blister/crack within a barren <i>pāhoehoe</i> lava flow near a non-cultural lava tube entrance. Some of the excavated material is piled to the east of the excavation, the rest was left within the blister/crack.	 <p>View to the north.</p>
X-5	1.3 x 1.0 x 0.4	Roughly 20 large cobbles and 20 small cobbles excavated from a thin, top layer of <i>pāhoehoe</i> lava revealing a void underneath. The excavation is located in a barren <i>pāhoehoe</i> lava flow near to several lava tube entrances east of X-6. Excavated material was left along the south and southwestern edges of the excavation, as well as within it.	 <p>View to the south.</p>
X-6	1.9 x 0.9 x 0.3	Approximately 20 large cobbles excavated from a thin top layer of <i>pāhoehoe</i> and placed on the eastern, western, and southern edges of the excavation, with some material left within it as well. The excavation is located on a barren <i>pāhoehoe</i> lava flow west of X-5.	 <p>View to south.</p>

Table 12 continued on next page.

Table 12. Continued.

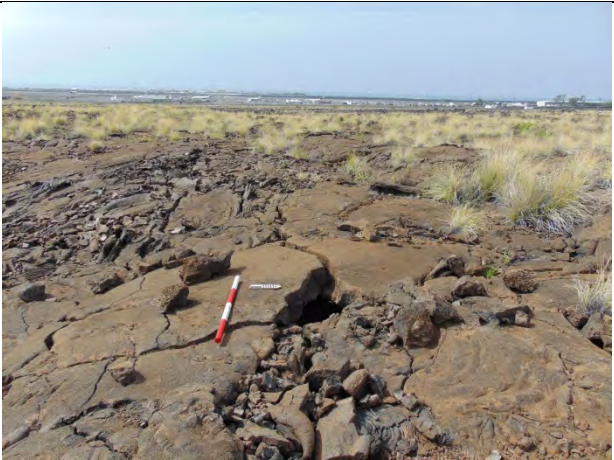
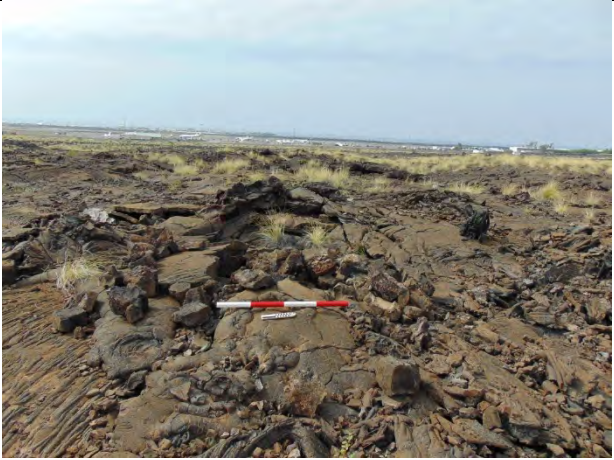

Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-7	0.8 x 0.5 x 0.6	Roughly 10 large cobbles excavated from a crack in the <i>pāhoehoe</i> revealing a hollow space beneath. The excavation is located within a barren <i>pāhoehoe</i> lava flow and near an entrance to the Site 30316 lava tube. Excavated cobbles were left along the northeastern and southern edges of the excavation.	 <p>View to west.</p>
X-8	2.0 x 1.2 x 0.4	Approximately 15 large cobbles excavated from the barren <i>pāhoehoe</i> lava flow near an entrance to the Site 30316 lava tube. Some of the excavated material has been placed along the southern edge of the excavation forming a rough alignment extending in an east/west line near the Site 30315 trail. The rest of the excavated material is scattered on bedrock to the east and north.	 <p>View to west.</p>
X-9	3.0 x 1.3 x 0.15	Thin slabs removed from the surface of a shallow <i>pāhoehoe</i> void near an entrance to the Site 30316 lava tube and the Site 30315 trail. Most of the excavated material has been removed from the area, but roughly 20 small slabs remain on the <i>pāhoehoe</i> surface to the north, south, and within the excavation. The floor of the excavation consists of smooth <i>pāhoehoe</i> .	 <p>View to the northwest.</p>

Table 12 continued on next page.

Table 12. Continued.

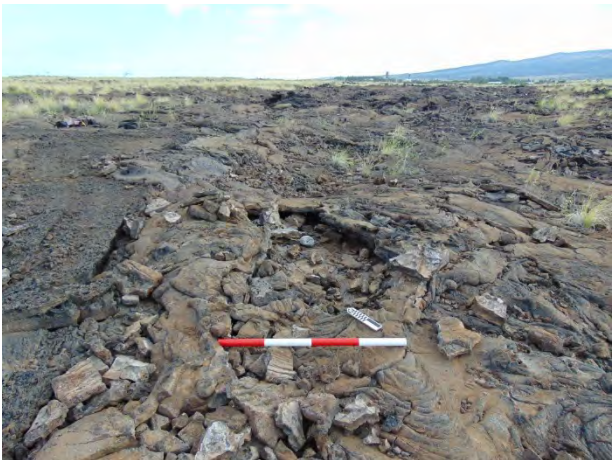
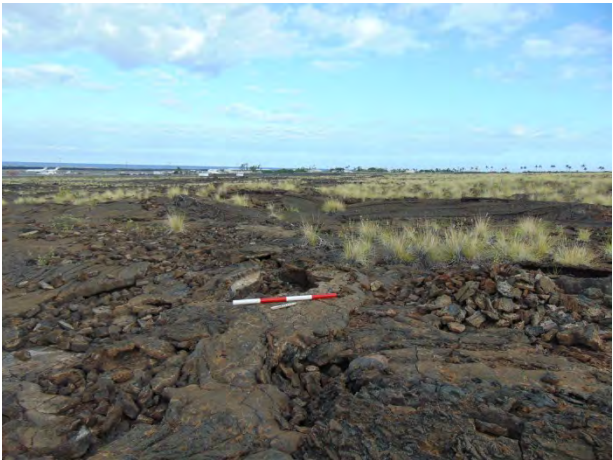
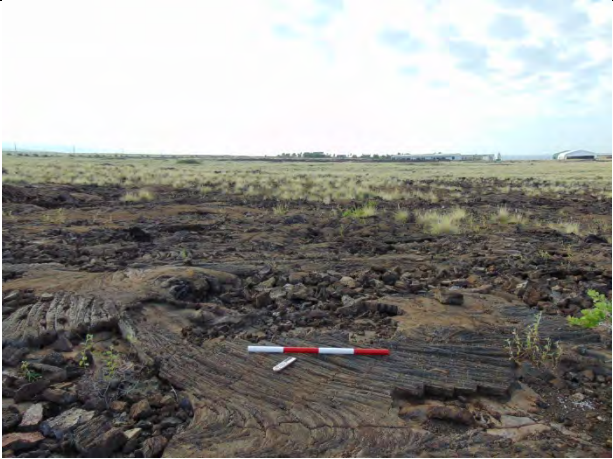
<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-10	2.0 x 0.8 x 0.3	Approximately 30 small cobbles and slabs excavated from the ceiling of a shallow void within the <i>pāhoehoe</i> flow revealing a smooth <i>pāhoehoe</i> surface within. Five of the slabs were used to build the Feature F cairn along the route of the Site 30315 trail to the southeast of the excavation. Most of the excavated material has been loosely piled to the northwest of the excavated void or left within. A water-worn cobble is present at X-10.	 <p>View to northeast.</p>
X-11	5.7 x 3.2 x 0.4	Approximately 200 small to large cobbles and slabs have been excavated from the top surface of the <i>pāhoehoe</i> over a wide area. Most of the cobbles removed from X-11 have been piled to the northeast of the excavation forming the Feature E cairn along the route of the Site 30315 trail. The rest of the material is scattered on bedrock to the west with material from X-12, or still within the excavation.	 <p>View to the northwest.</p>
X-12	4.0 x 3.0 x 0.3	U-shaped excavation located within a section of ropey <i>pāhoehoe</i> flow immediately west of X-11, near the Site 30315 trail route. Approximately 200 small to large cobbles and slabs have been excavated from this area. Most of the material remains within the excavation or is scattered downslope on the bedrock surface to the northwest.	 <p>View to the southeast.</p>

Table 12 continued on next page.

Table 12. Continued.

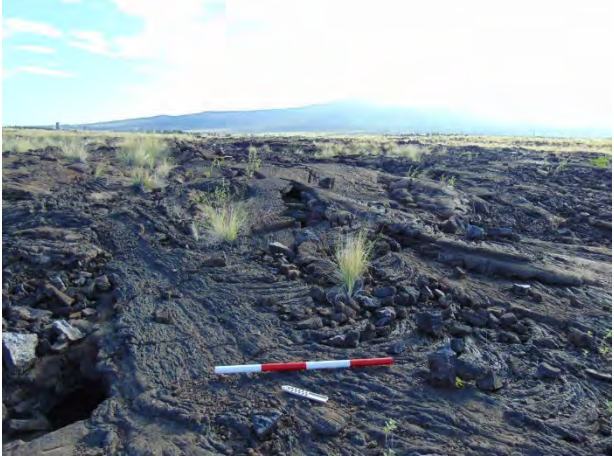
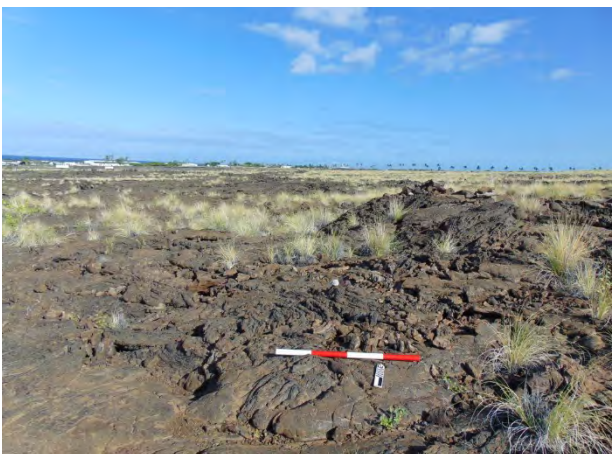

Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-13	5.0 x 4.0 x 0.6	Five small voids in close proximity to one another on a southwest facing flow aspect near an entrance to the Site 30316 lava tube along the southern edge of the Site 30315 trail near that have been excavated. Approximately 40 large cobbles have been removed from these voids and are scattered either <i>makai</i> of the excavation area or left within the deeper voids.	
			View to the northeast.
X-14	4.5 x 4.0 x 0.15	Approximately 10 large cobbles and 50 small cobbles and slabs excavated from a wide area along a west sloping flow aspect northwest of X-13; west of the Feature D cairn along the route of the Site 30315 trail and a Site 30316 lava tube entrance. Most of the material is small and deposited either <i>makai</i> of the excavation or within it. A water rounded coral fragment is present west of the excavation along the route of the trail.	
			View to the north.
X-15	4.7 x 2.6 x 0.4	Roughly 10 small boulders and 20 large cobbles excavated from a small, but deep void and left scattered <i>makai</i> of the excavation. Additional material excavated from this area appears to have been used to construct the nearby Site 10160 Historic survey marker, situated along the southwestern edge of an entrance to the Site 30316 lava tube.	
			View to the northeast.

Table 12 continued on next page.

Table 12. Continued.

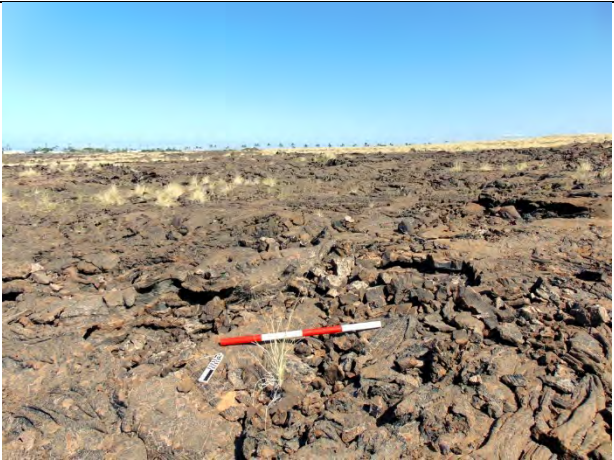
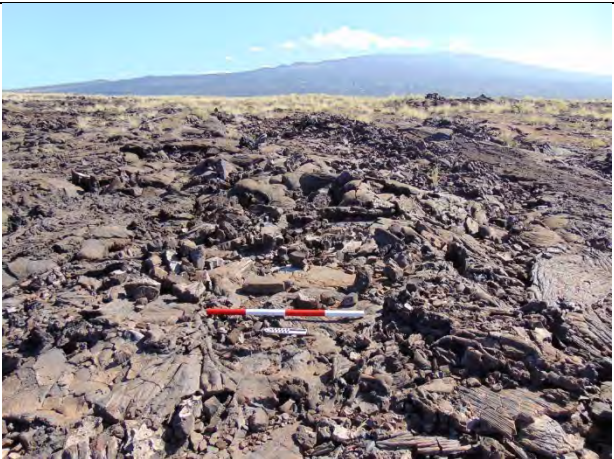

Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-16	3.0 x 1.0 x 0.2	Top layer of <i>pāhoehoe</i> removed from a roughly U-shaped excavation and broken into approximately 50 small to large cobbles and slabs that are scattered in and around the excavated area near the Site 30318 lava tube south of the Site 30315 trail. The exposed floor of the excavation consists of smooth <i>pāhoehoe</i> lava. Some of the excavated material may have been used to construct Feature C of Site 30315.	 <p>View to the north.</p>
X-17	2.2 x 1.1 x 0.2	The top layer of <i>pāhoehoe</i> lava excavated exposing a smooth <i>pāhoehoe</i> floor near the Site 30318 lava tube west of X-16. Approximately 30 cobbles remain scattered in and around the excavation, but it appears that some of the excavated material has been removed from the excavation area and taken elsewhere.	 <p>View to the east.</p>
X-18	2.0 x 1.2 x 0.15	Area from which the top surface of <i>pāhoehoe</i> has been removed adjacent to the Site 30318 lava tube entrance. Some 30 small to large cobbles and slabs were left in and around the excavation, but it appears that the rest of the excavated material may have been removed and taken elsewhere. The floor of the excavation consists of smooth <i>pāhoehoe</i> lava.	 <p>View to the west.</p>

Table 12 continued on next page.

Table 12. Continued.

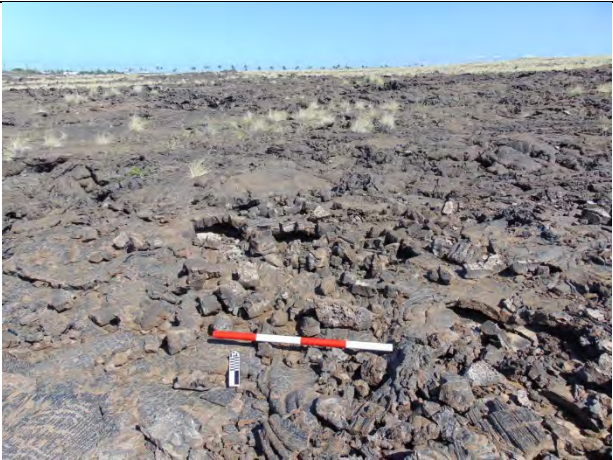
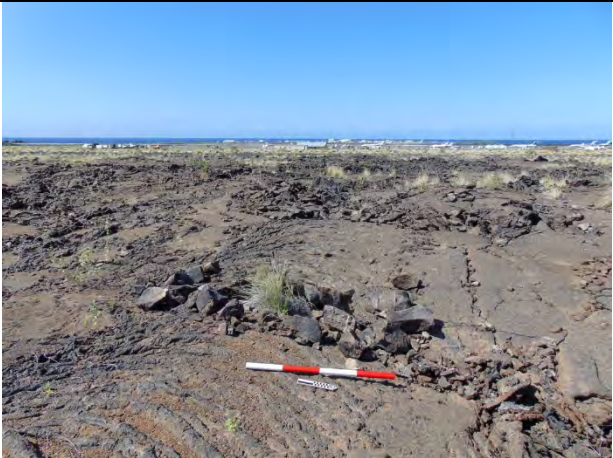
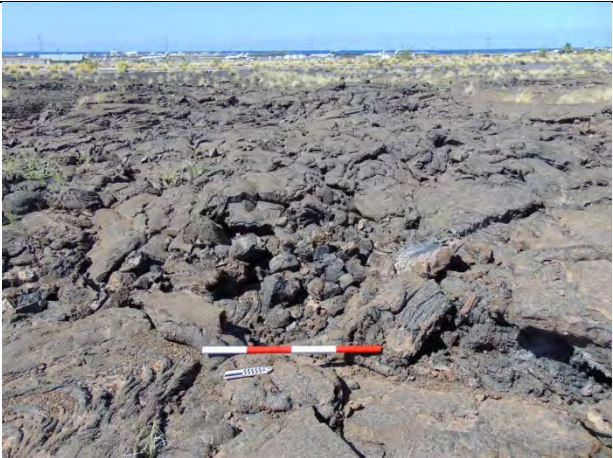
Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-19	2.4 x 1.2 x 0.2	The excavation is located on a barren <i>pāhoehoe</i> lava flow next to the Site 30318 lava tube and X-18. The top layer of <i>pāhoehoe</i> lava was removed from this area exposing a smooth <i>pāhoehoe</i> surface beneath. Approximately 30 small to large cobbles remain scattered around the edges of the excavation, but some of the material may have been removed and taken elsewhere.	 View to the north.
X-20	1.5 x 0.5 x 0.5	Roughly 20 large cobbles were removed from a crack where areas of east and west sloping <i>pāhoehoe</i> flow aspects meet along the northern edge of the Site 30315 trail. The excavated material has been placed in a rough line to the east of the excavation that wraps the northern and southern edges.	 View to the southwest.
X-21	1.4 x 1.2 x 0.5	Excavated area along a west facing bedrock contour south of Feature A of Site 30315. In this area small to large cobbles have been broken from the <i>pāhoehoe</i> edge and placed in a loose pile to the west of the excavated area. Approximately 30 cobbles remain at the excavation area, but some of the excavated material may have been used to build the nearby Feature A cairn.	 View to the west.

Table 12 continued on next page.

Table 12. Continued.

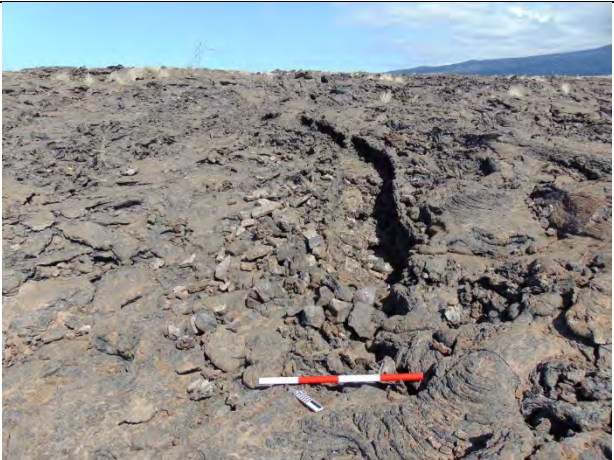
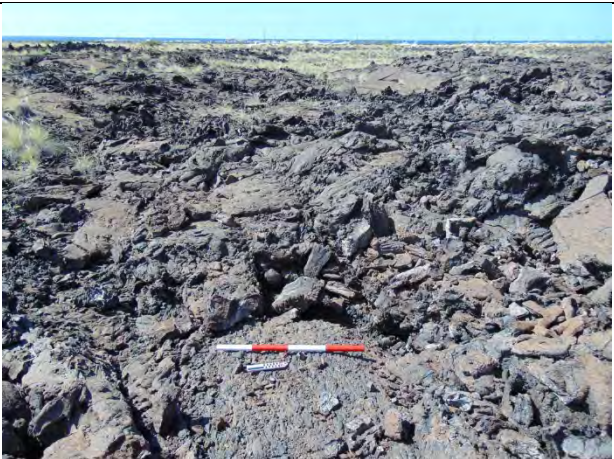
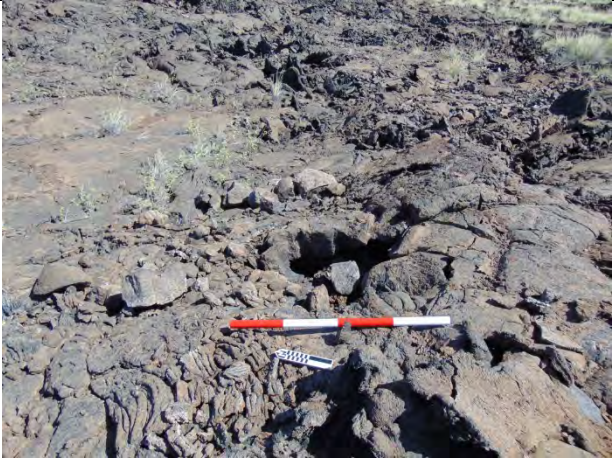
<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-22	3.7 x 0.9 x 0.5	Excavated area at the southwestern end of a narrow, serpentine, flow channel located near the <i>makai</i> entrances to the Site 30316 lava tube. Approximately 50 small slabs have been removed from the southwest end of the channel in this area and placed along its northwestern edge. A water rounded coral fragment is also present within the flow channel to the northeast of the excavated area.	 View to the northeast.
X-23	1.8 x 1.0 x 0.4	Excavated area along the base of a south facing contour within the lava flow. Approximately 40 small to large cobbles and 5 small boulders have been excavated from the top layer of <i>pāhoehoe</i> lava in this area. The boulders are present in a rough line to the west of the excavation and the cobbles are piled on bedrock to the north.	 View to the west.
X-24	1.2 x 1.2 x 0.3	A roughly square shaped excavation located near the top of a north facing flow aspect from which the surface layer of <i>pāhoehoe</i> has been removed. Approximately 20 large cobbles taken from the excavation are scattered on the bedrock surface down slope to the north of the excavated area.	 View to the northeast.

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Table 12. Continued.

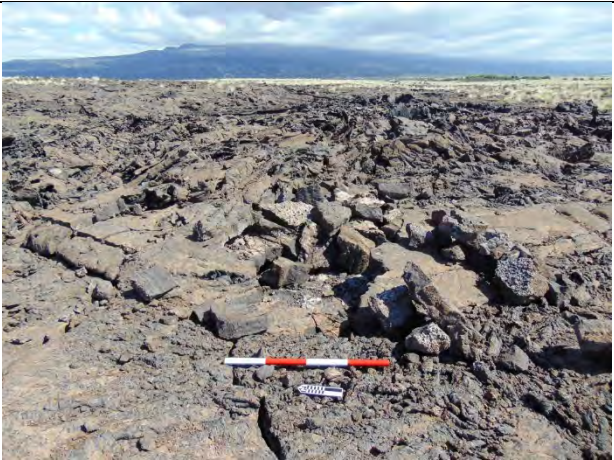
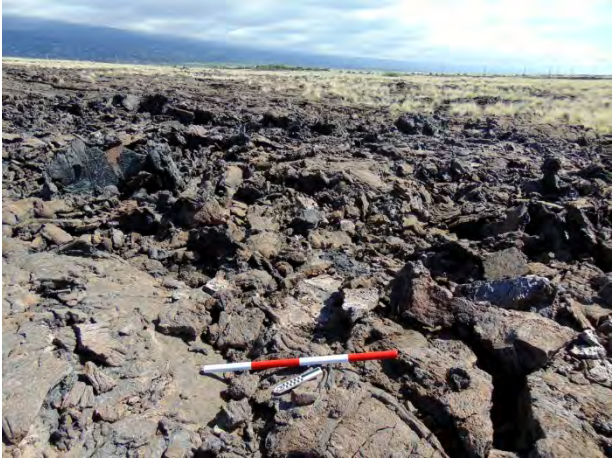

Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-25	2.0 x 1.5 x 0.45	Approximately 10 small boulders and 10 large cobbles have been removed from the thick upper layer of <i>pāhoehoe</i> in this area exposing a void in the bedrock beneath. The excavated material is scattered on the bedrock surface primarily to the south and east of the excavation.	 <p>View to the east.</p>
X-26	1.9 x 0.7 x 0.1	Approximately 10 small slabs have removed from the thin upper layer of the lava flow <i>mauka</i> of X-25. Most of the slabs are placed upside down on the bedrock to the south of the excavated area, but a few were placed right side up to the north of the excavated area. The surface exposed within the excavation consists of both smooth and ropey <i>pāhoehoe</i> .	 <p>View to the southeast.</p>
X-27	6.0 x 4.5 x 0.5	Six small blister/voids excavated nearby one another within an area of smooth <i>pāhoehoe</i> to the south of the Site 30315 trail. All of the excavations occur on top of the same hollow void beneath the surface crust. Roughly 20 large cobbles have been removed from 3 of the excavations at the northern edge of the large void and placed on the bedrock nearby. The slabs excavated at the other three locations were left within the excavations.	 <p>View to the north.</p>

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Table 12. Continued.

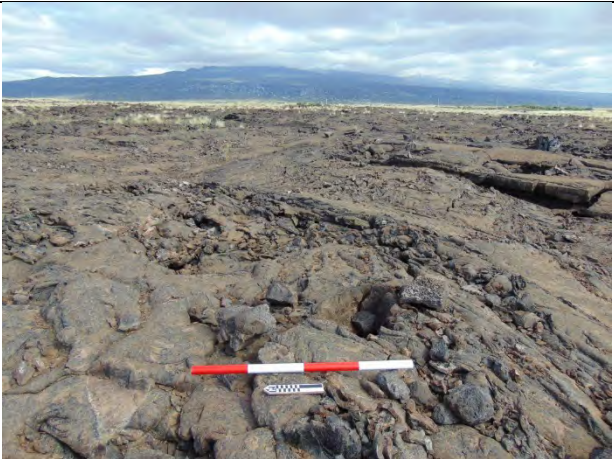

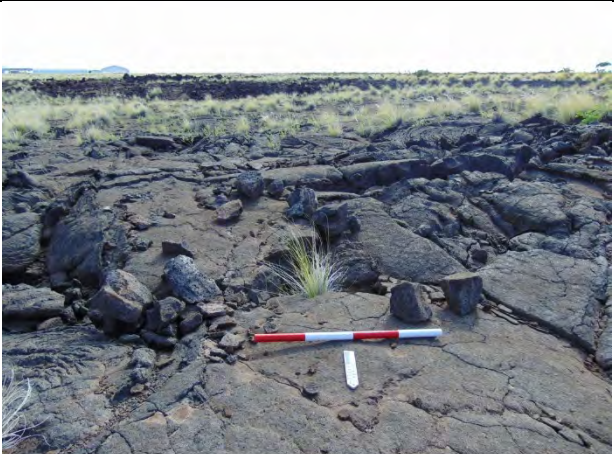
Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-28	0.5 x 0.4 x 0.3	A very small excavated area with the barren <i>pāhoehoe</i> lava flow to the west of X-27. From this excavation roughly 10 large cobbles have been removed and placed on the bedrock surface nearby.	 <p>View to the east.</p>
X-29	0.5 x 0.4 x 0.2	Approximately 20 small slabs removed from a low north facing flow contour on a barren <i>pāhoehoe</i> lava flow to the west of X-28. The excavated slabs are piled on the lava bedrock surface adjacent to the north edge of the excavation.	 <p>View to the southeast.</p>
X-30	0.8 x 0.7 x 0.4	Approximately 10 large cobbles pulled out from a top layer of smooth <i>pāhoehoe</i> lava revealing a void/crack beneath. The excavated material lies scattered on the bedrock near the corners of the excavation.	 <p>View to the south.</p>

Table 12 continued on next page.

Table 12. Continued.

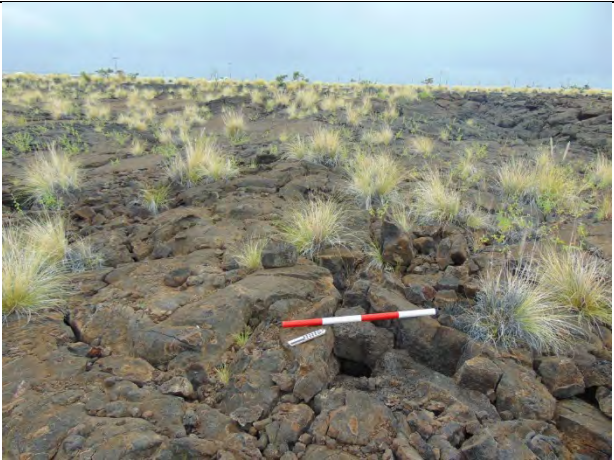
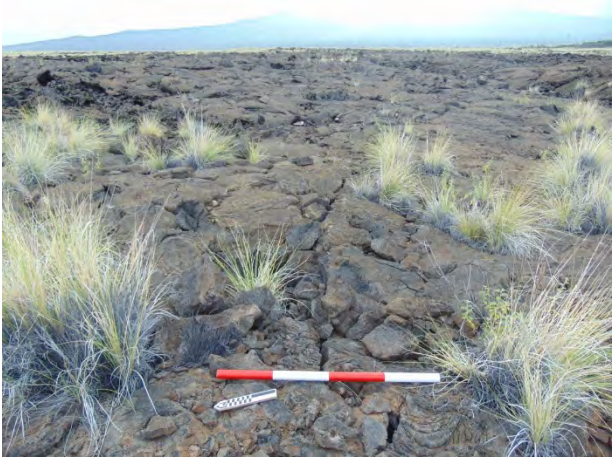
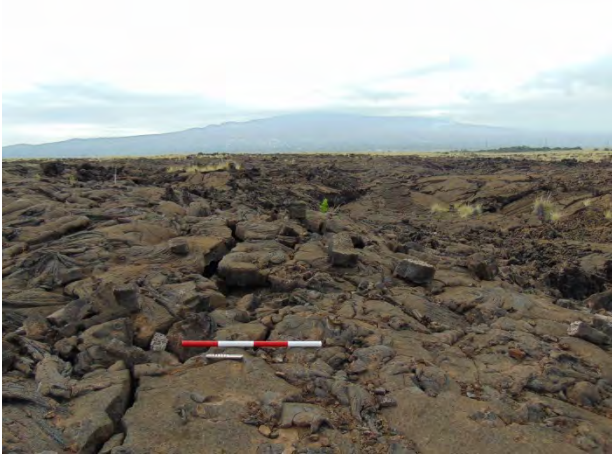
<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-31	2.0 x 0.9 x 0.5	Excavation of the surface lava within the barren <i>pāhoehoe</i> lava flow to the east of X-32. From this area 2 small boulders and approximately 15 medium to large cobbles have been removed revealing a void at the western end of the excavation. The excavated material is scattered on the bedrock to the north of the excavation.	 <p>View to the northwest.</p>
X-32	0.9 x 0.8 x 0.45	Excavation of the surface lava within the barren <i>pāhoehoe</i> lava flow to the west of X-31. From this small area roughly 10 large cobbles have been removed. The excavated material is scattered on the bedrock to the southwest of the excavation.	 <p>View to the southeast.</p>
X-33	3.9 x 2.9 x 0.3	Excavation of two areas within a natural bedrock crack on a south facing flow contour south of X-31. These adjacent excavation areas reveal small voids beneath the top layer of <i>pāhoehoe</i> within the crack. The excavated material consists of 4 small boulders and roughly 20 large cobbles that are scattered on bedrock in the immediate vicinity of the excavation.	 <p>View to the east.</p>

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Table 12. Continued.

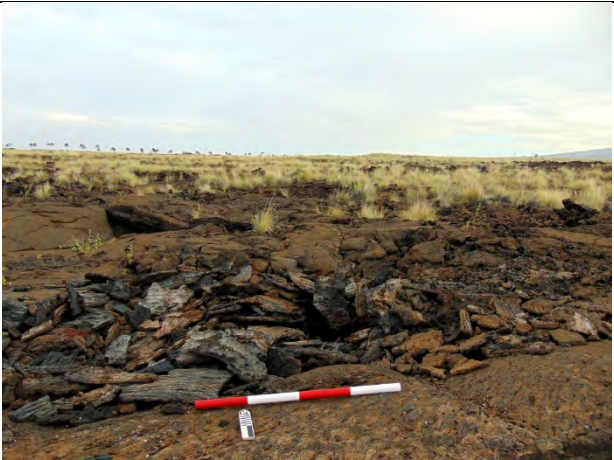

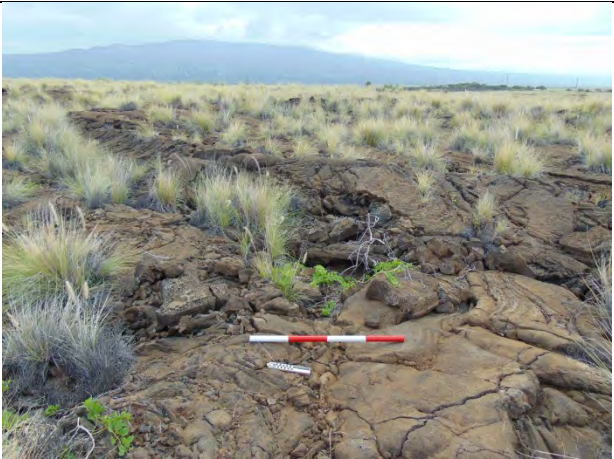
Feat.	Dimensions (m) (Length x Width x Depth)	Description	Photograph
X-34	0.9 x 0.9 x 0.7	Approximately 20 slabs removed from a distinctive flow channel within the barren <i>pāhoehoe</i> lava flow north of the Site 30315 trail. The excavated material has been removed from the center of a natural collection of broken up slabs of thin <i>pāhoehoe</i> within the lava channel. The removed material, which consists of roughly 20 small slabs, has been placed in a small pile to the west of the excavation.	 <p>View to the east.</p>
X-35	0.9 x 0.6 x 0.6	Excavation of a north facing contour of a barren <i>pāhoehoe</i> lava flow adjacent to the northern boundary of the study area. The excavated material consists of 10 large cobbles and roughly 25 medium cobbles that have been removed from a vertical flow edge, exposing a shallow, low ceilinged void to the south. The excavated material is deposited primarily to the northeast of the excavation.	 <p>View to the west.</p>
X-36	2.1 x 1.2 x 0.3	Excavation of a southeastern facing contour of the barren <i>pāhoehoe</i> lava flow to the south of the Site 30315 trail. The top layer of <i>pāhoehoe</i> has been removed from this area exposing a small void beneath. The floor of the excavation contains some soil, and the removed material was left within and scattered around the excavated area.	 <p>View to the northeast.</p>

Table 12 continued on next page.

Table 12. Continued.

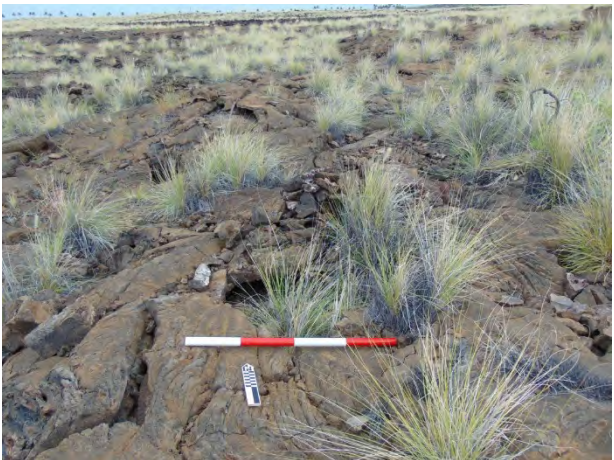
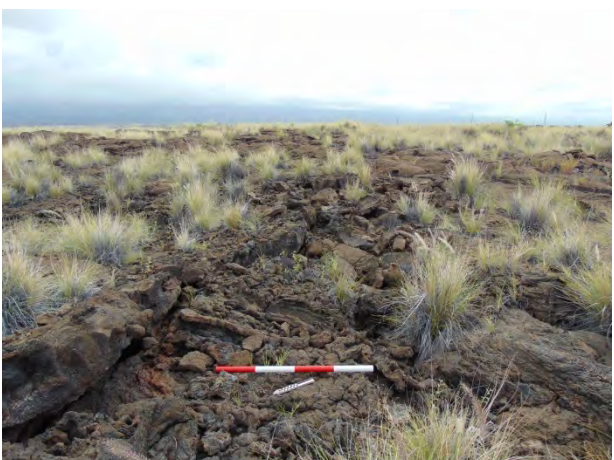

<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-37	1.4 x 1.2 x 0.5	Excavation along the southern edge of the Site 30315 trail near the Site 30319 lava tube. From this area approximately 30 surface cobbles and slabs have been excavated and used in the construction of the adjacent Feature H cairn marking the trail route. Roughly 10 cobbles are still present within the excavation, and 5 more are scattered downslope to the west. Some of the excavated material may have also been removed and taken elsewhere.	 <p>View to the north.</p>
X-38	3.7 x 2.6 x 0.5	Approximately 50 large cobbles and slabs removed from a vertical southwest facing flow edge to the north of X-37 and the Site 30315 trail, revealing a shallow void/crack beneath. The excavated cobbles are scattered on bedrock surrounding the flow edge. A small blister near trail and X-38 contains a water-worn bashing stone that may have been used to break up the <i>pāhoehoe</i> .	 <p>View to the southeast.</p>
X-39	1.1 x 0.7 x 0.6	Approximately 5 small boulders and 10 large cobbles removed from the edge of an east facing flow contour, revealing a small void within that extends to the west. Excavated material is scattered on the bedrock surface to the southwest of the excavation.	 <p>View to the northwest.</p>

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Table 12. Continued.

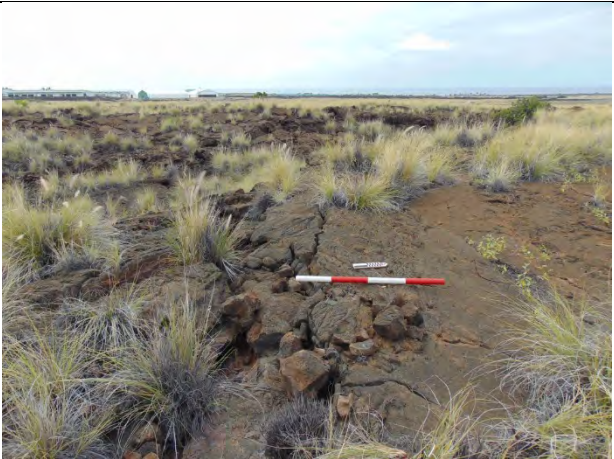
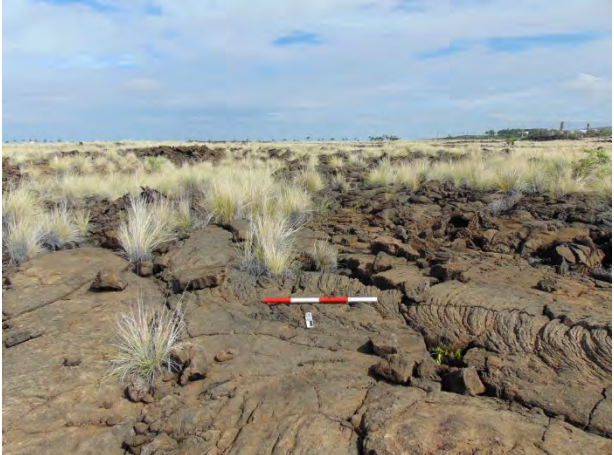
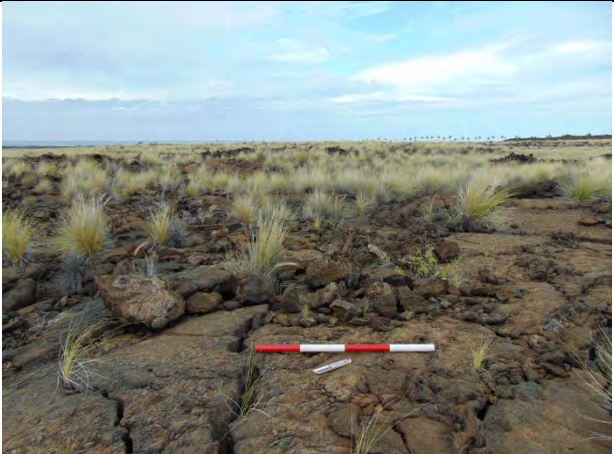


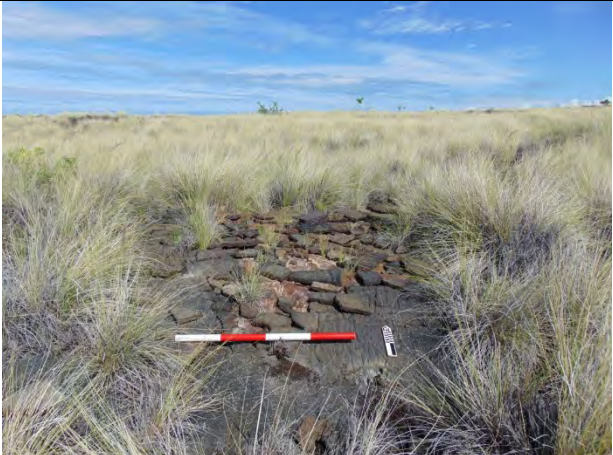
<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-40	0.8 x 0.6 x 0.4	Approximately 10 large cobbles excavated from a crack along the north edge of a lava channel that extends <i>makai</i> to the Site 30319 lava tube entrance. The excavated material is scattered on the bedrock surface surrounding the excavation.	 <p>View to the west.</p>
X-41	2.2 x 0.9 x 0.2	Approximately 30 large cobbles excavated from a crack within an area of ropey <i>pāhoehoe</i> lava, exposing a slight void beneath. The excavated cobbles are scattered on the surrounding bedrock surface.	 <p>View to the north.</p>
X-42	1.6 x 0.9 x 0.4	Excavation of 3 large boulders and roughly 25 large cobbles removed from a crack in an area of exposed <i>pāhoehoe</i> bedrock on top of a small rise, revealing a small void within. The majority of the material has been deposited to the east of the excavation.	 <p>View to the northwest.</p>

Table 12 continued on next page.

Table 12. Continued.

<i>Feat.</i>	<i>Dimensions (m)</i> <i>(Length x Width x Depth)</i>	<i>Description</i>	<i>Photograph</i>
X-43	0.8 x 0.5 x 0.6	Approximately 10 large cobbles and 30 small cobbles excavated from a crack revealing a small subsurface void beneath. The excavated material is deposited in a line to the west of the opening, and in a pile to the east of the excavation.	 <p>View to the northeast.</p>
X-45	1.3 x 0.8 x 0.6	Approximately 20 large cobbles and small boulders have been removed from a small blister opening within a <i>pāhoehoe</i> ridge south of the Site 30319 lava tube, exposing a shallow blister beneath. Material is piled to the east and west. A naturally collapsed large boulder within the blister makes access to the interior impossible. A <i>noni</i> tree is currently growing out of X-45 suggesting that it contains some soil within.	 <p>View to the north.</p>
X-46	2.8 x 2.4 x 0.3	Approximately 30 thin <i>pāhoehoe</i> slabs broken-up/removed from the very thin (c.3cm thick) upper crust of the h2-2 lava flow, revealing a red ropery <i>pāhoehoe</i> surface beneath. The slabs have been disturbed over a wide area, but most of the material has been left in place.	 <p>View to the north.</p>

End of Table 12.

SIHP Site 30372

Site 30372 is an excavation area consisting of 184 distinct *pāhoehoe* excavations (X-47 to 231) that are located in the southwestern portion of the current study area (see Figure 298). The excavations, which occur along both sides of the Māmalahoa Trail (the 1847 Government Road; SIHP Site 2) within an area measuring roughly 700 meters (north/south) by 350 meters (east/west), are found only on *pāhoehoe* sections of the h1y-1 lava flow (Figure 304). At these excavations, unlike the excavations recorded at Site 30371, most of the excavated material has been removed and taken elsewhere. Given the proximity of the excavations to the *makai* Government Road, Site 30372 is interpreted as the source of material quarried for the construction of the Historic roadway. Work on the Government Road began in ca. 1847, and was funded in part by Government appropriations, and through the labor, or financial contributions (tax), of area residents and prisoners working off penalties. In general, in lieu of paying a tax, adult residents of a given *ahupua'a*, under the supervision of the area's road supervisor, devoted a portion of their time to maintaining the Government Roads across that *ahupua'a*. In the case of the *makai* Government Road across the current study area, it is likely to have been built by tax paying residents of Kalaoa and 'O'oma *ahupua'a* during the middle part of the nineteenth century, indicating that the excavations at Site 30372 are mostly Historic Period quarry features. These features were not recorded in detail, but a general description of their distribution (see Figure 304) and photographs of selected features are presented below. No cultural debris was associated with any of the features of Site 30372.

The Government Road within the current study area consists of a roughly 2 meter wide, level path that is lined along both edges with *pāhoehoe* block kerbing (see description above). This Historic roadway, designed not only for pedestrian traffic, but for horse, donkey, and cart traffic as well, crosses several types of lava surfaces (smooth *pāhoehoe*, slabby *pāhoehoe*, and 'a'ā), but maintains a level road bed that extends in a straight line. Where it crosses the 'a'ā and slabby *pāhoehoe* surfaces of the h1y-1 lava flow, which are extremely difficult to walk on without modification, its path is built up (bridged) across low areas and excavated through high spots. All of this construction requires a fair amount of material, most of which appears to be *pāhoehoe*. When examining the excavations of Site 30372, the manner in which this *pāhoehoe* material was collected and brought to the road becomes clear. The excavations occur in three general settings: 1) along the edge of the roadway where it crosses the mixed 'a'ā and slabby *pāhoehoe* h1y-1 lava flow; 2) along the north edge of the mixed 'a'ā and slabby *pāhoehoe* (h1y-1) lava flow where it transitions back to smooth *pāhoehoe* just before it meets the younger h2-2 lava flow; and 3) on the h1y-1 *pāhoehoe* surfaces to the south of the mixed 'a'ā and slabby *pāhoehoe* flow (see Figure 304). In general, the smooth *pāhoehoe* lava surfaces along the edges of the mixed 'a'ā and slabby *pāhoehoe* flow seem to be the most sought after (easiest to remove) lava, but opportunistic excavation of *pāhoehoe* areas nearby the roadway, within the mixed 'a'ā and slabby *pāhoehoe* flow and on the smooth *pāhoehoe* surface south of the mixed flow, also occur.

Sixty-four of the excavations (X-48 to X-102, X-113 to X-116, X-138, and X-209 to X-212) occur along the edge of the roadway where it crosses the mixed 'a'ā and slabby *pāhoehoe* flow (see Figure 304). These excavations are found within small sections of smooth *pāhoehoe* that are surrounded by jagged 'a'ā and slabby *pāhoehoe* (Figure 305). Most occur nearby the roadway, and the rock material could have been fairly easily collected by following *pāhoehoe* channels from the road through the rough terrain. However, some of the excavated areas situated further away, near the southern edge of the mixed flow, particularly those at X-92 to X-101 and X-113 to X-116, may have been more easily collected from the southern edge of the flow and then brought across the smooth *pāhoehoe* on that side to the construction area. The X-95 to X-101 grouping (Figure 306) was mapped with Site 30328 (see Figure 97), a semi-circular rock ring located near those excavations (see description above).

Twenty-three of the *pāhoehoe* excavations (X-47, X-206 to X-208, and X-213 to X-231) occur along the north edge of the h1y-1 lava flow where the mixed lava transitions to smooth *pāhoehoe* (see Figure 304). All but one of these excavations occur in an area roughly 80-150 meters east of the Government Road (across the mixed flow), but excavated material along this flow edge was likely collected in a cart and brought across the smooth, flat surface of the h2-2 flow to the road for construction use, as that route is much easier to traverse. X-47 actually occurs on the h2-2 lava flow, but it is nearby the trail route, and is the only excavation found on that younger lava flow.

The remaining ninety-seven excavations (X-103 to X-112, X-117 to X-137, and X-139 to X-205) occur to the south of the mixed 'a'ā and slabby *pāhoehoe* flow (see Figure 302). More specifically, sixty-one excavations occur on the south facing slope where the mixed flow transitions to smooth *pāhoehoe* (X-103 to X-112, X-117 to X-137, X-139 to X-165, and X-189 to X-192; Figure 307), twenty-three occur within smooth *pāhoehoe* near the roadway and the intersection of the Site 29272 trail/road (X-166 to 174, X-185 to X-187, and X-193 to X-203; Figure 308), and thirteen occur along the edge of a small outcropping of 'a'ā near the southern boundary of the study area (X-175 to 184, X-188, X-204, X-205; Figure 309). The material excavated from these areas was likely transported across the smooth *pāhoehoe* of the h1y-1 flow to the road construction area.

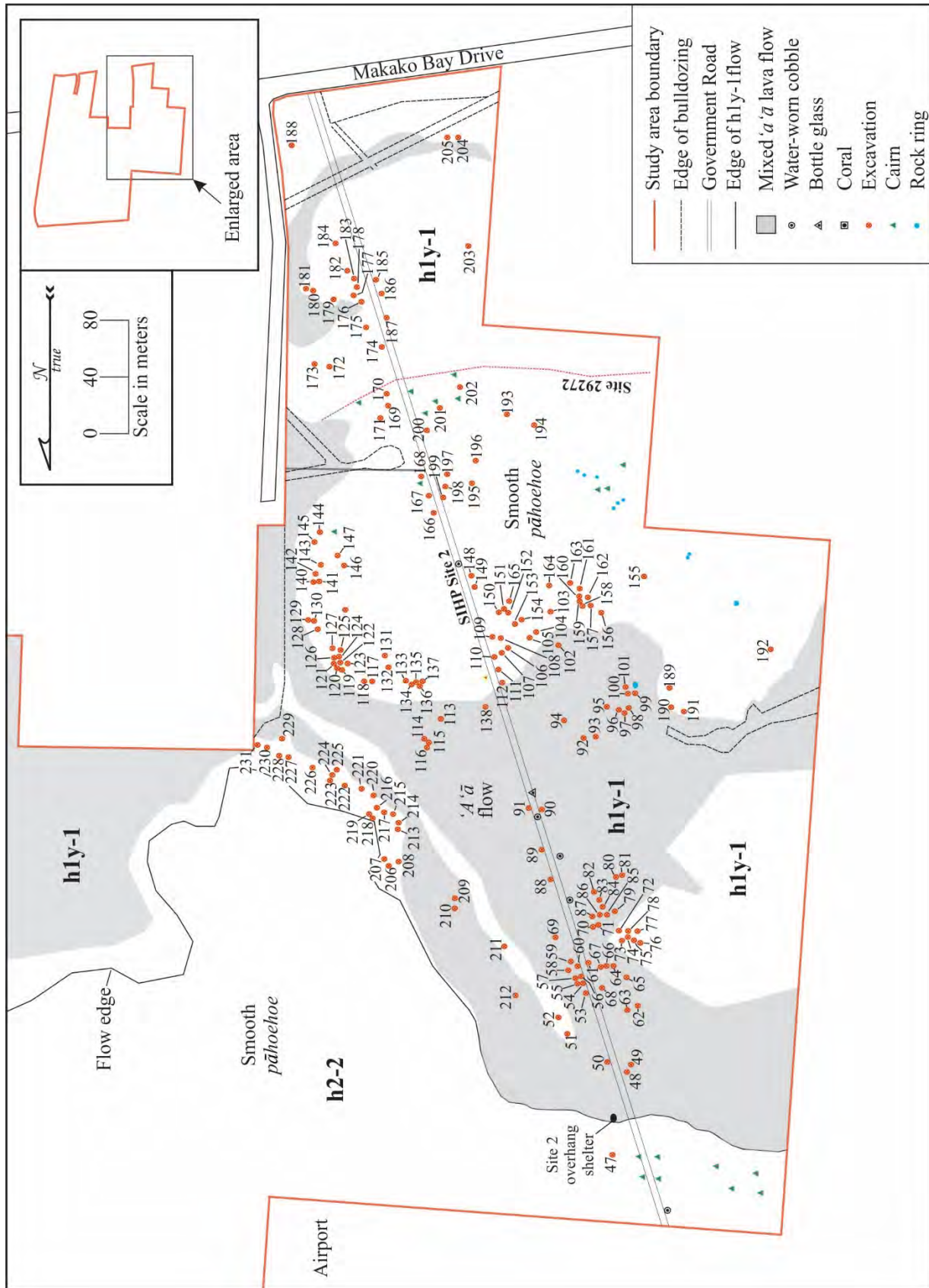


Figure 304. SIHP Site 30372 plan view.

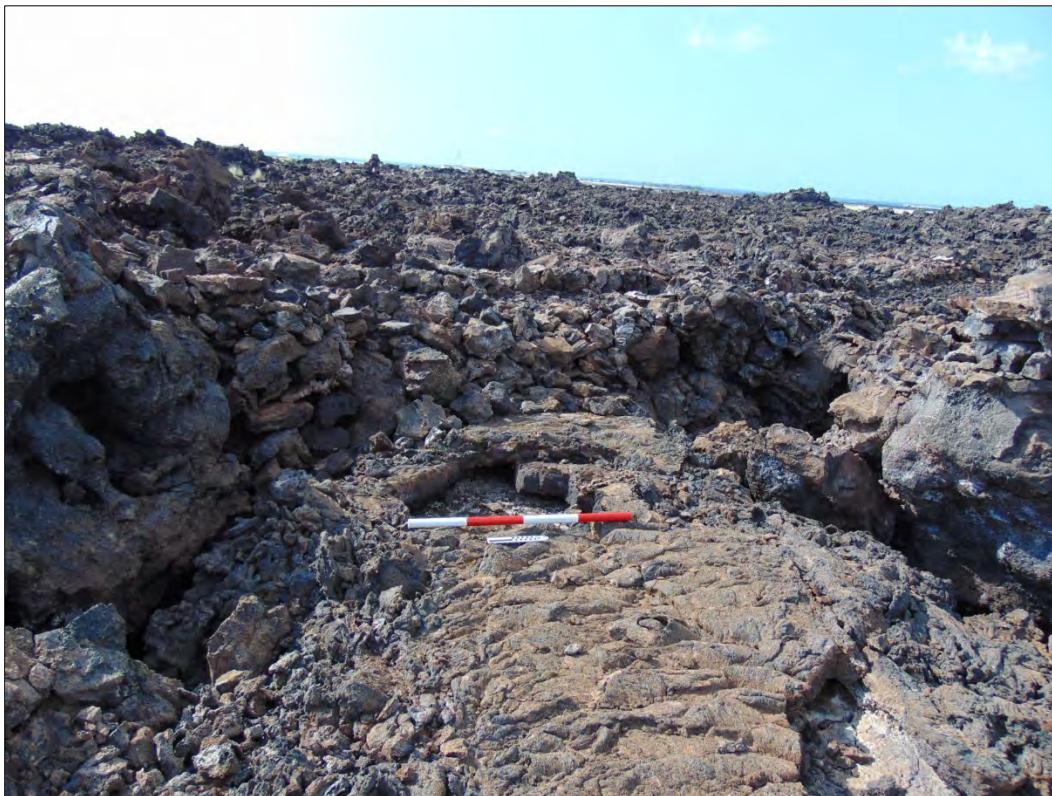


Figure 305. SIHP Site 30372, excavation (X-88) along the eastern edge of the Māmalahoa Trail (SIHP Site 2), view to the west.

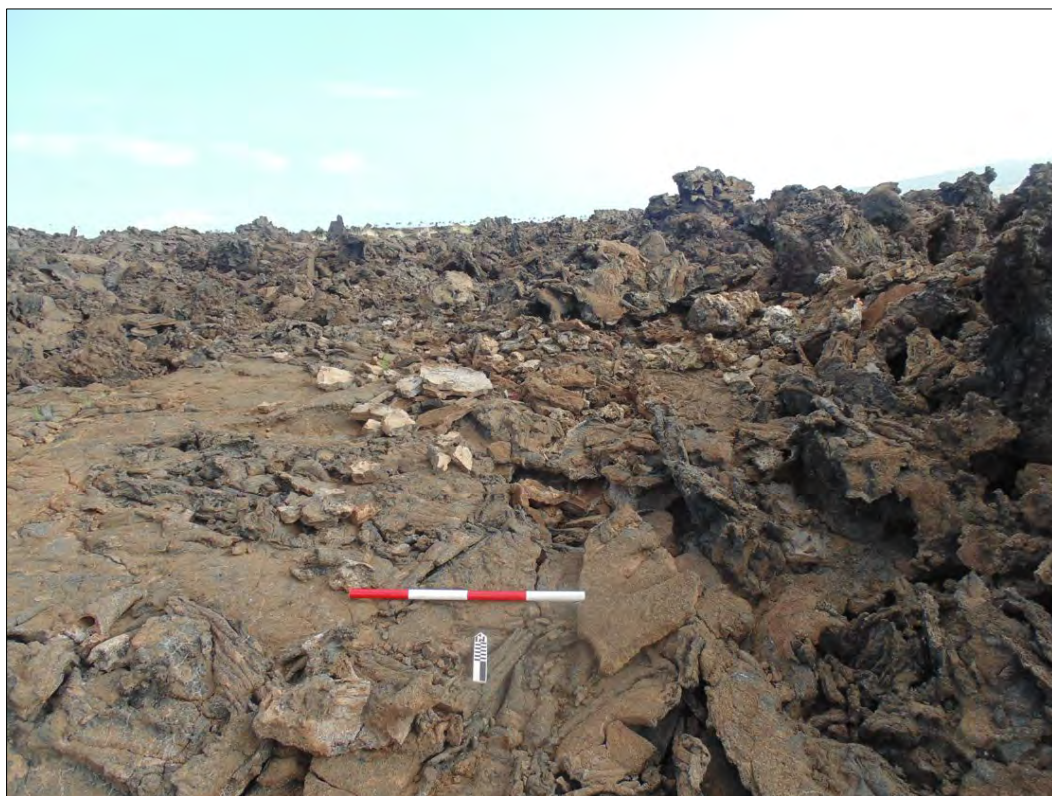


Figure 306. SIHP Site 30372, excavation (X-95) within the mixed h1y-1 lava flow near its southern edge, view to the north.



Figure 307. SIHP Site 30372, excavation (X-190) on the *pāhoehoe* slope just off the southern edge of the mixed h1y-1 lava flow, view to the southeast.

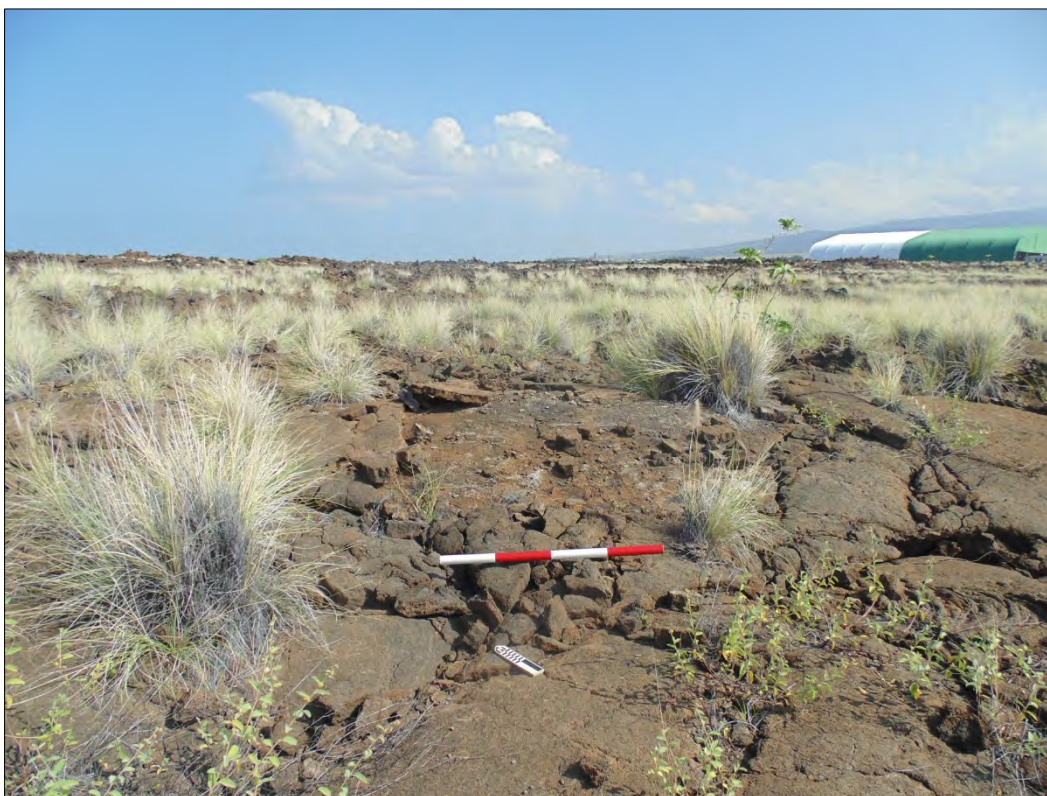


Figure 308. SIHP Site 30372, excavation (X-194) on the smooth *pāhoehoe* near the Māmalahoa Trail (SIHP Site 2 and the Site 29272 trail, view to the west.

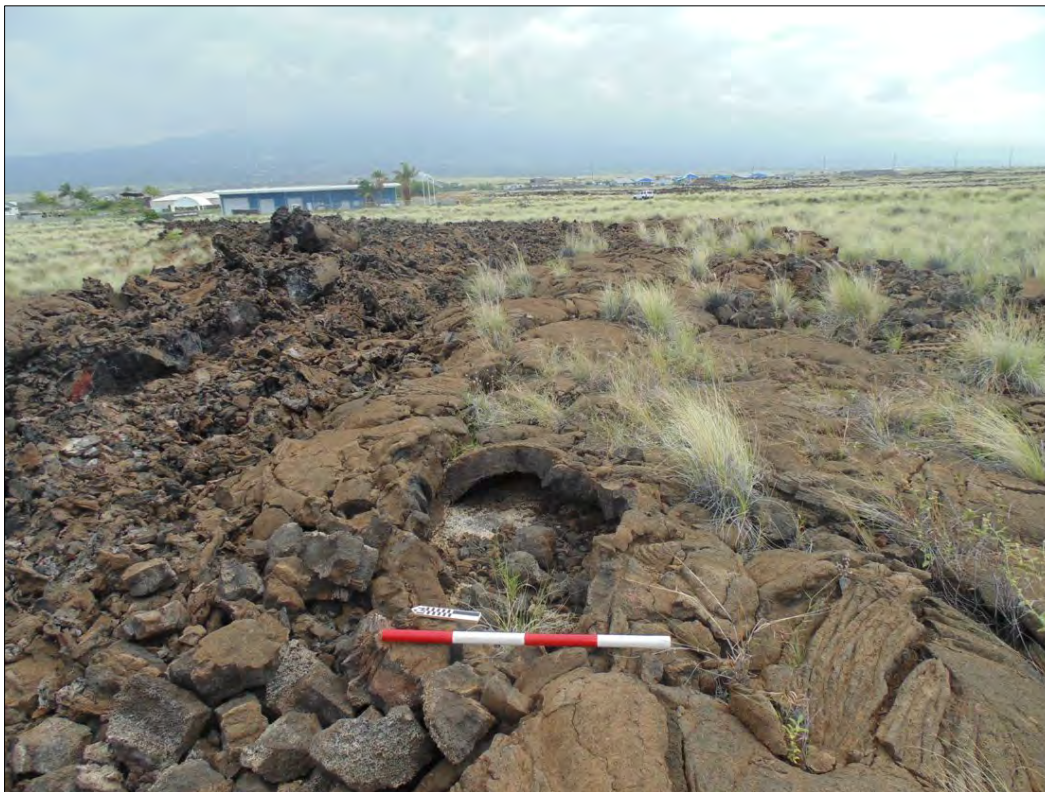


Figure 309. SIHP Site 30372, excavation (X-204) near a small outcropping of ‘a‘ā near the southern boundary of the study area, view to the east.

SIHP Site 30373

Site 30373 is a complex of four *pāhoehoe* excavations (X-44 and X-255 to X-257) located in the northeastern portion of the study area (see Figure 298). The excavations are situated within an area of mixed *pāhoehoe* and ‘a‘ā, roughly 20 meters south of the northern study area boundary and 40 meters northwest of the Site 29273 trail (Figure 310). The site occupies an area that measures roughly 50 meters (east/west) by 40 meters (north/south). The excavations all occur within *pāhoehoe* bedrock surfaces, and roughly 25 large cobbles and slabs have been excavated from each. Most of the cobbles are scattered on the bedrock near the excavated surfaces, but some of the material may have been removed. Some of the slabs taken from X-44 were used to construct the nearby Site 30359 cairn (Figure 311). Neither the cairn, nor the excavations at Site 30373 appear particularly old. This portion of the project area is easily accessed from Queen Ka‘ahumanu Highway (a secondary road to the airport passes nearby the northern boundary of the study area), and lots of modern disturbance (bulldozing, etc.) has occurred just *mauka* of the site. Several *pāhoehoe* excavations nearby the disturbance are clearly modern creations (the turned over rocks have not weathered), but the four excavations of Site 30373 were of indeterminate age, and were therefore recorded as an archaeological site.

SIHP Site 30374

Site 30374 is a complex of four *pāhoehoe* excavations (X-232 to 235) located in the east/central portion of the current study area (see Figure 298). The *mauka* end of the site (X-234) is located approximately 85 meters west of the Queen Ka‘ahumanu right-of-way, and other three features stretch in a line to the west for roughly 270 meters (Figure 312). All four features are similar excavations consisting of a few cobbles removed from openings to small blisters or voids within the h1y-1 and h1y-2 lava flows. X-234 and X-235 (Figures 313 and 314) are situated on the relatively steep slope of the h1y-2 lava flow, 65 meters apart from one another. X-233 (Figure 315) is situated on the h1y-1 lava flow at the base of the h1y-2 lava flow slope, 110 meters southwest of X-235. X-232 (Figure 316) is situated within a small *kīpuka* of the h1y-1 lava flow surrounded by the h2-2 lava flow, 94 meters northwest of X-233. None of the blisters are accessible, but all were thoroughly examined. No cultural material was present within or nearby any of the excavations of Site 30374. Given the relative locations of the features, however, it appears as though an individual may have walked this route at an indeterminate point in the past, assaying the voids in the bedrock for an unknown purpose (perhaps for eggs or fledgling birds; see discussion of *pāhoehoe* excavations above).

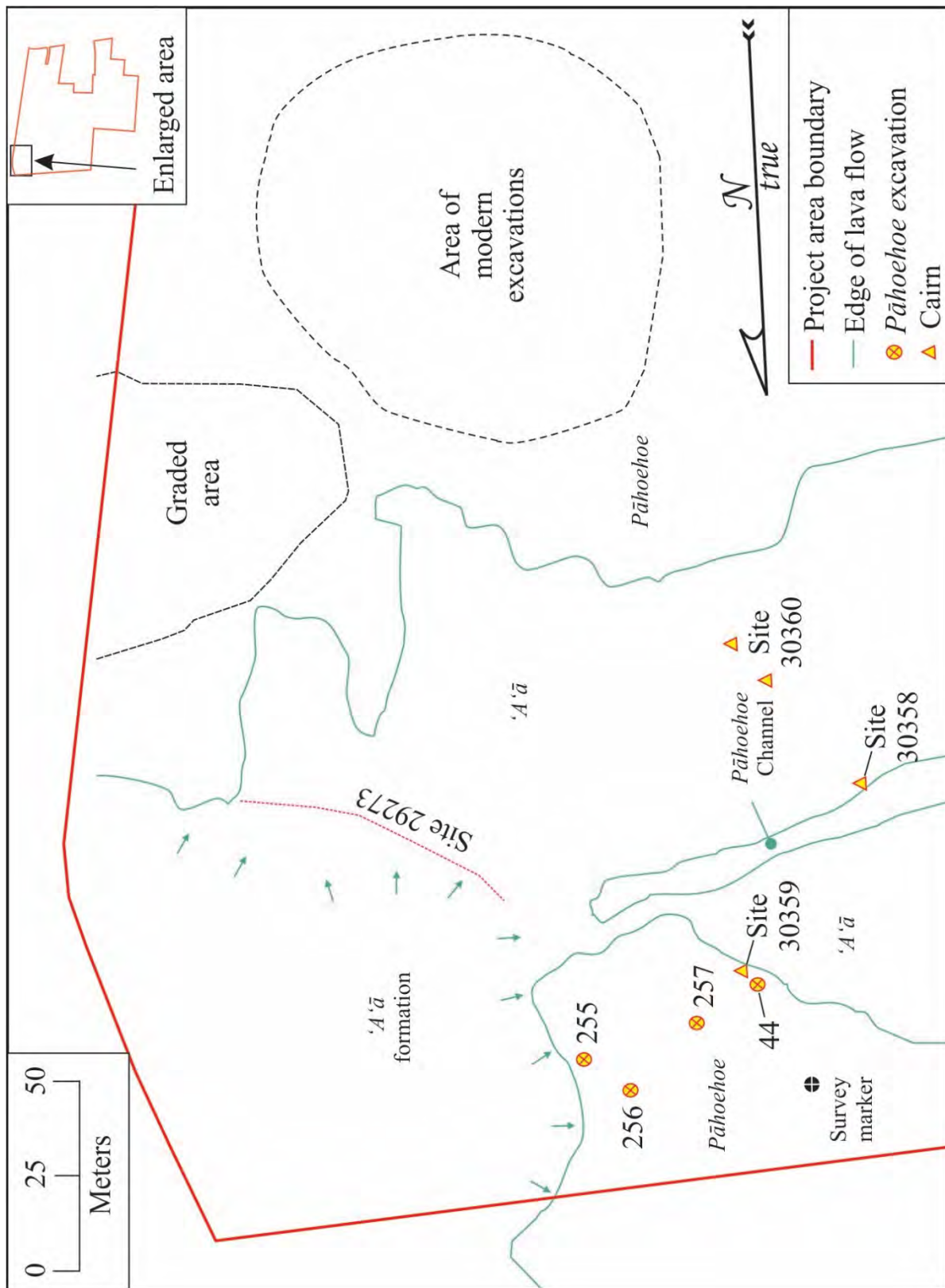


Figure 310. SIHP Site 30373 plan view.

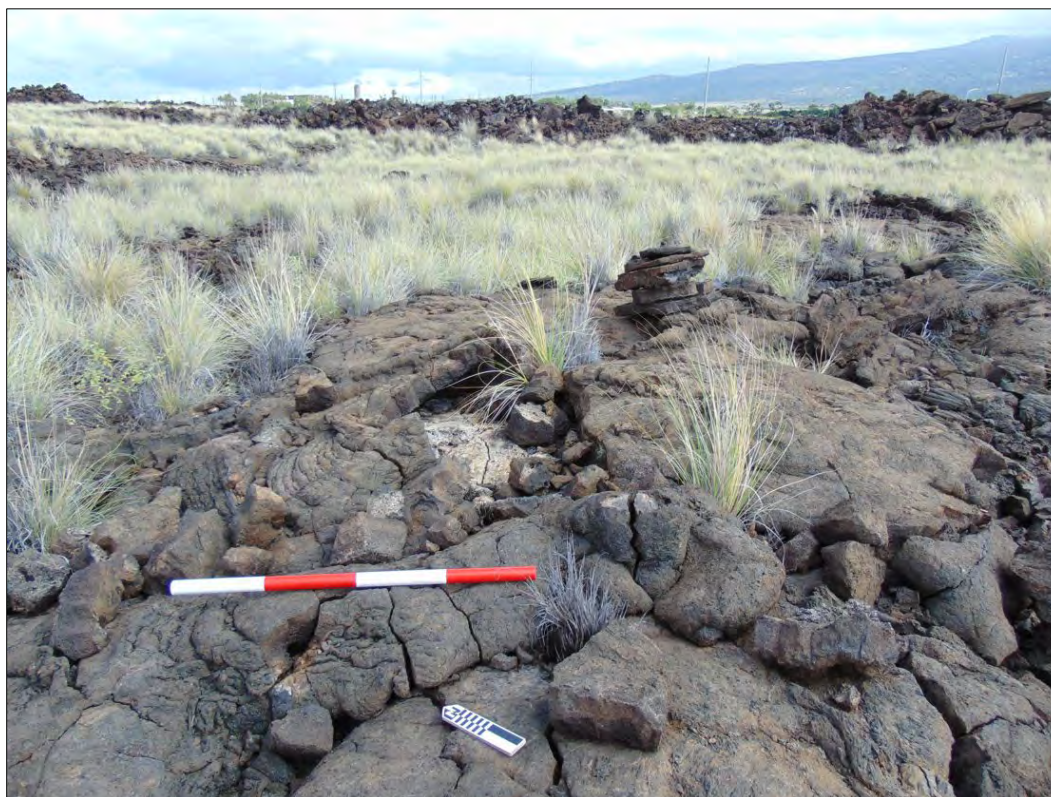


Figure 311. SIHP Site 30373, *pāhoehoe* excavation (X-44), view to the northeast with the Site 30359 cairn in the background.

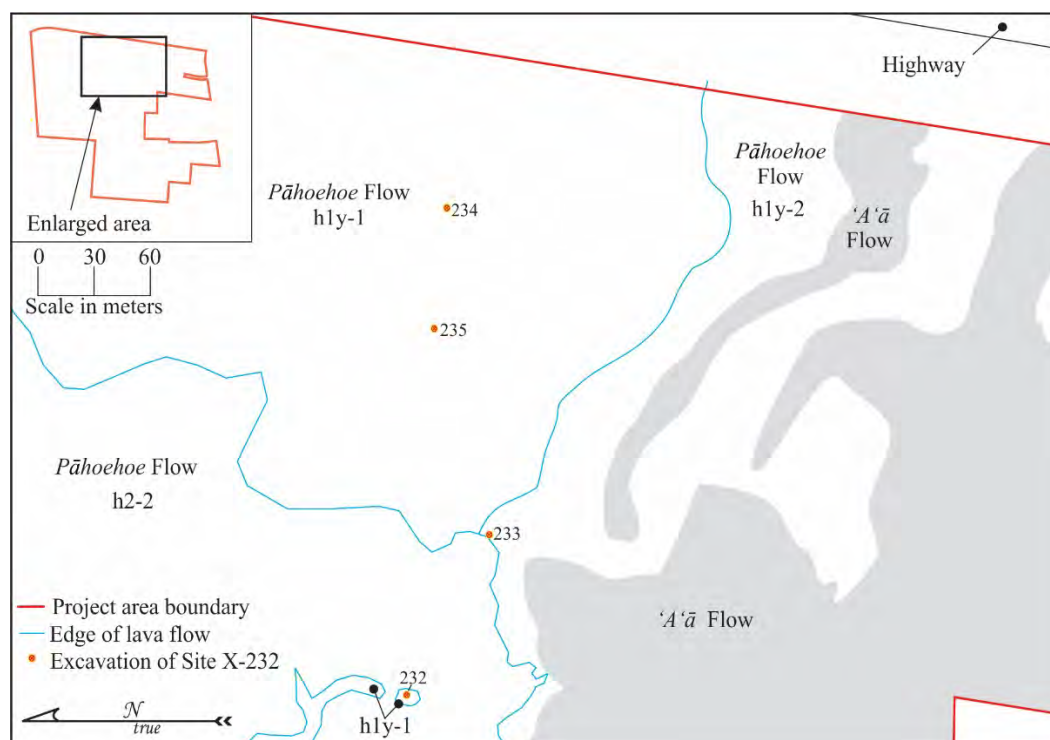


Figure 312. SIHP Site 30374 plan view.



Figure 313. SIHP Site 30374, *pāhoehoe* excavation (X-234), view to the southwest.

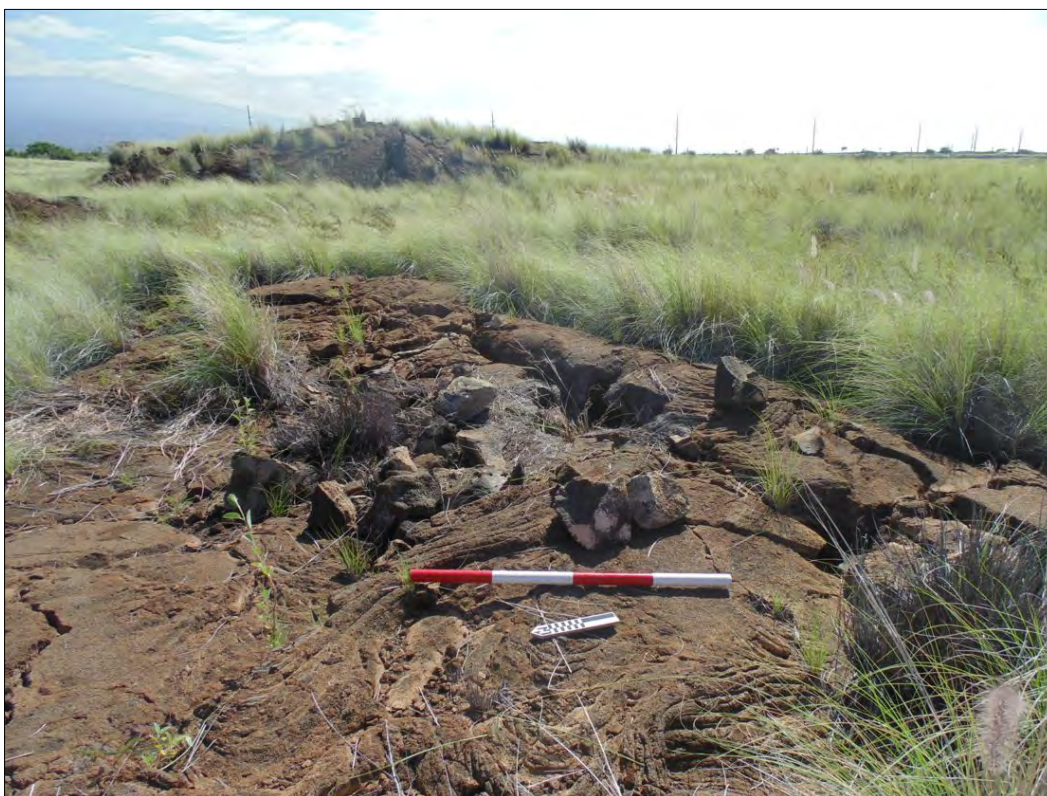


Figure 314. SIHP Site 30374, *pāhoehoe* excavation (X-235), view to the southeast.

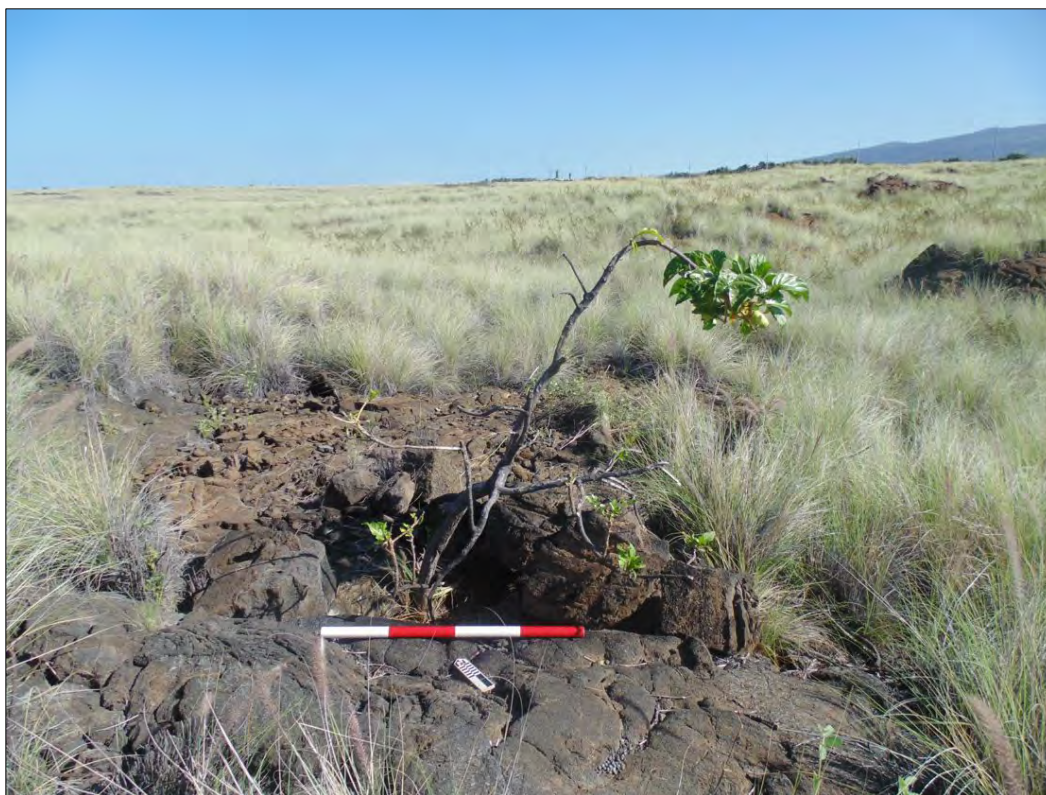


Figure 315. SIHP Site 30374, *pāhoehoe* excavation (X-233), view to the northeast.

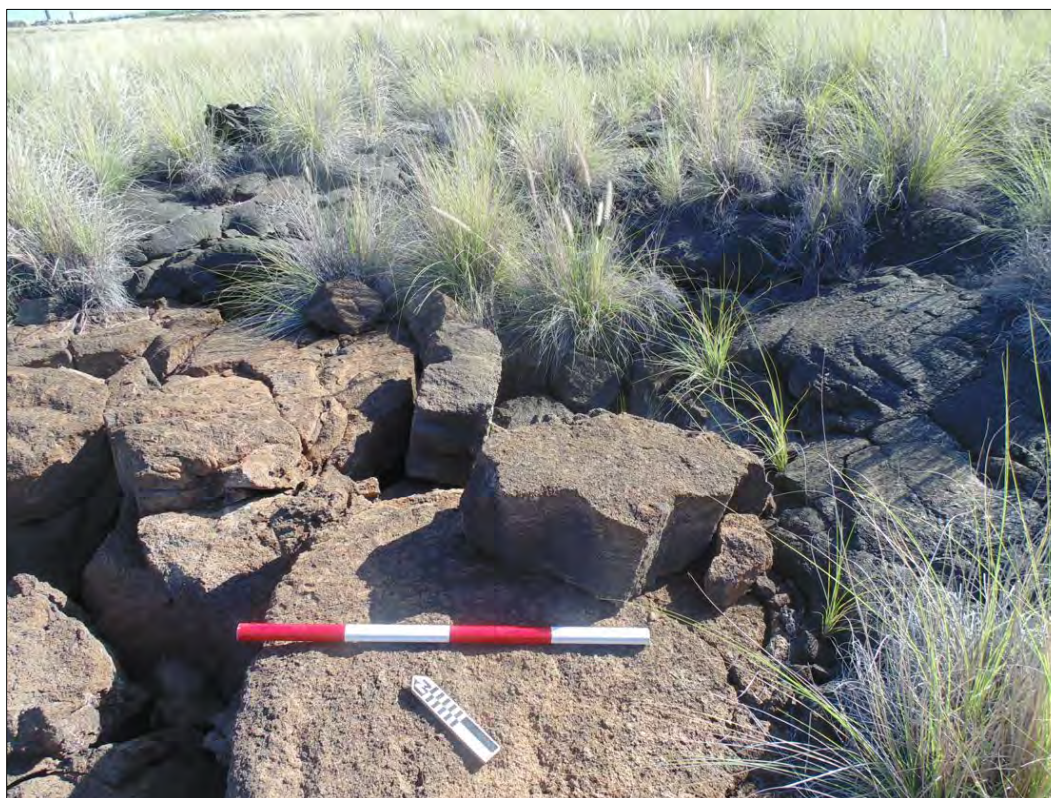


Figure 316. SIHP Site 30374, *pāhoehoe* excavation (X-232), view to the northeast.

SIHP Site 30375

Site 30375 is complex of twenty *pāhoehoe* excavations (X-236 to 255) located in the southeastern portion of the current study area (see Figure 298). The excavations are situated between the eastern study area boundary and the KOYO USA bottling plant, along both sides of the Site 29272 trail/road (Kauhini Road) within a mixed *pāhoehoe* and 'a'ā (h1y-1) flow (Figure 317). The northern termination of Kahilihili Street ends roughly 40 meters south of X-236 and a large bulldozed area is located immediately southeast, in the corner of the study area. The excavations occur within an area (Figure 318) the measures approximately 300 meters (east/west) by 225 meters (north/south). Eight of the excavations (X-236 to X-243) are situated at the eastern end of the site. These excavations occur in two distinct areas (Figures 319 and 320), and consist of a thin crust of *pāhoehoe* that has been pulled with some of the excavated material removed. The lack of weathering on the removed slabs and within the excavated areas, and the association of these excavations with modern beer bottles and the seemingly modern Site 30368 cairn (see description above), suggests that all eight of the excavations in this portion of Site 30375 may be modern creations as well.

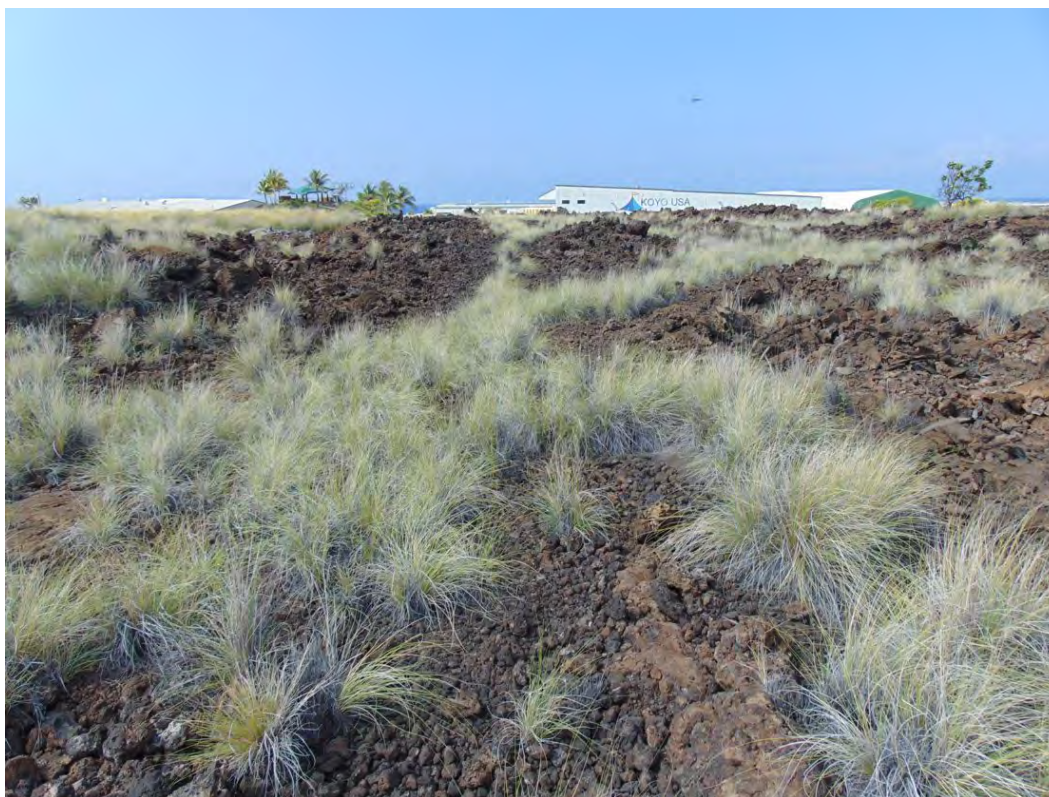


Figure 317. SIHP Site 30375, general site area, view to the west.

Two of the *pāhoehoe* excavations at Site 30375 (X-244 and X-255) occur within a smooth *pāhoehoe* bedrock area to the south of the Site 29272 trail (Figure 221). X-244 is a small excavation closer to the trail route from which a few cobbles have been removed and taken elsewhere, but X-255 is an unusual excavation that occur along a vertical bedrock edge just to the north (below) a graded, bulldozed area in the southeastern corner of the Parcel 073 (see Figure 318). This excavation feature measures 3 meters long by 2.5 meters wide and consists of approximately fifty small to large sub-angular cobbles that have been pulled from the area of an overhang in a vertical bedrock face and left loosely piled to the north (Figures 322 and 323). The pile is roughly semi-circular against the outcrop, and has interior heights ranging from 37 to 53 centimeters tall and exterior heights ranging from 23 to 50 centimeters tall. The slight bedrock overhang extends south beneath the outcrop edge for 1.2 meters and has a maximum height of up to 50 centimeters. No cultural material was observed at X-255, or beneath the overhang, and the reason for excavating this bedrock face is not clear.

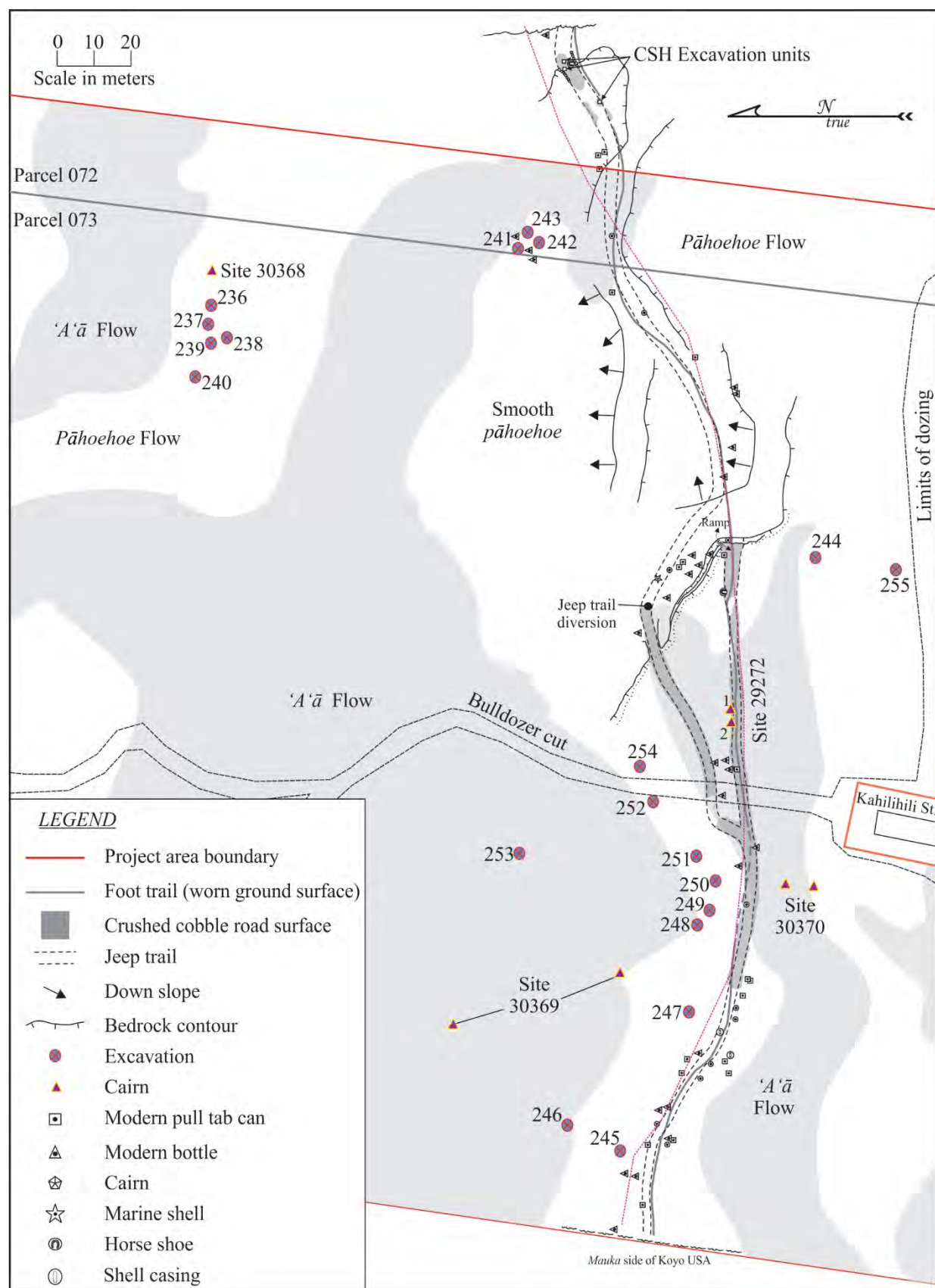


Figure 318. SIHP Site 30375 plan view.

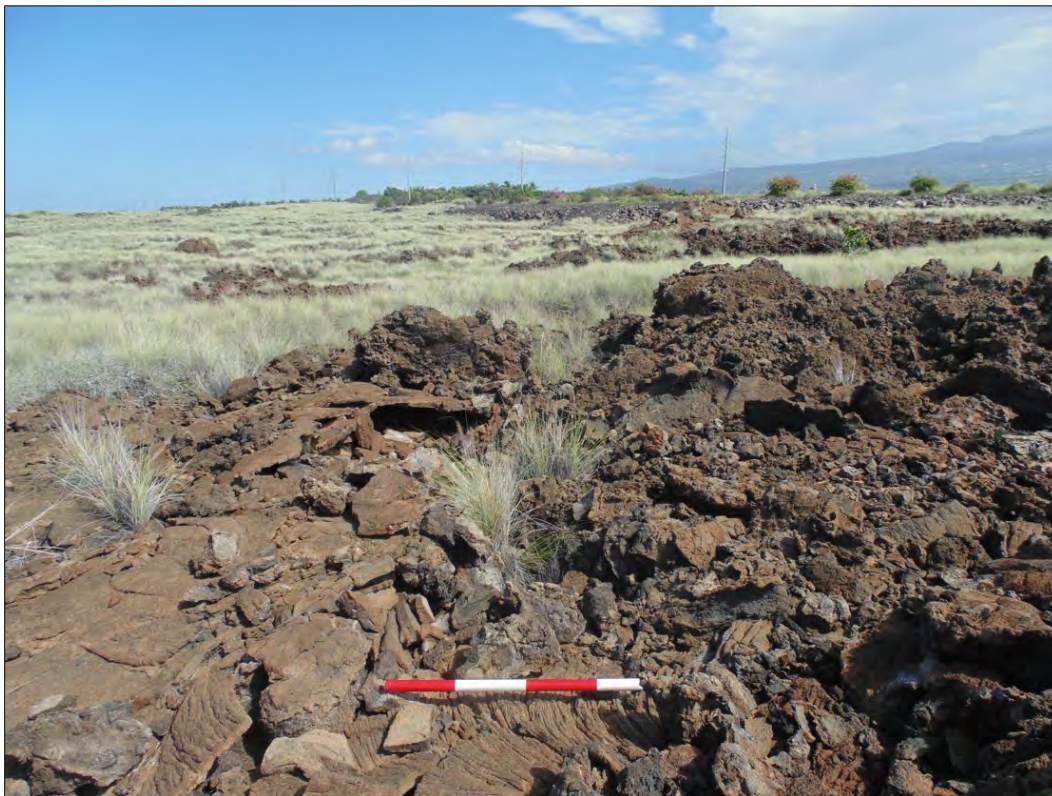


Figure 319. SIHP Site 30375, X-236 to X-240 general area, view to the north.

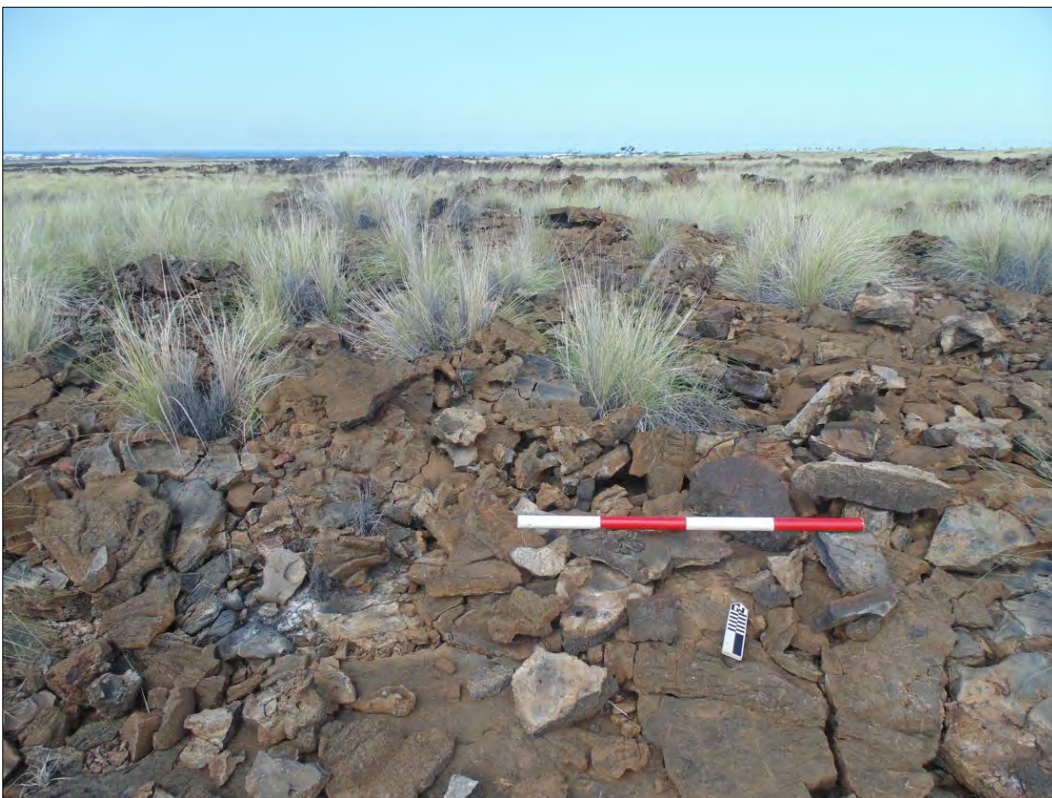


Figure 320. SIHP Site 30375, X-241 to X-243 general area, view to the north.

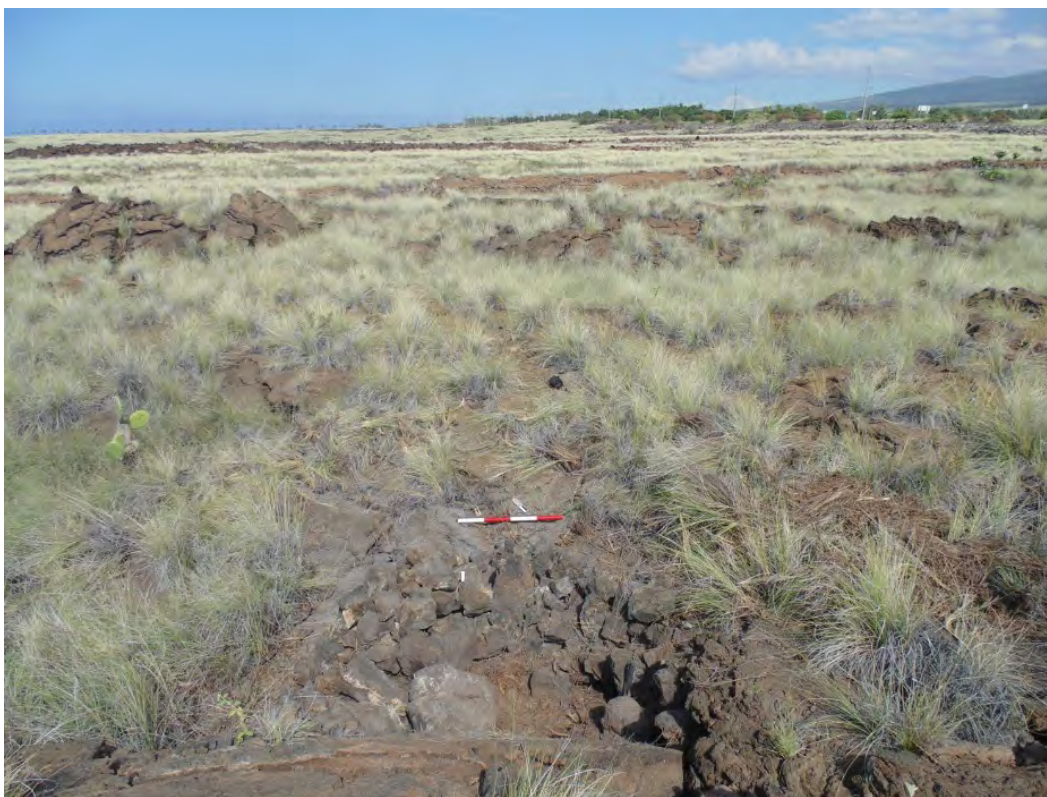


Figure 321. SIHP Site 30375, *pāhoehoe* excavations (X-244 and X-255) general area, view to the northeast with X-255 in the foreground.

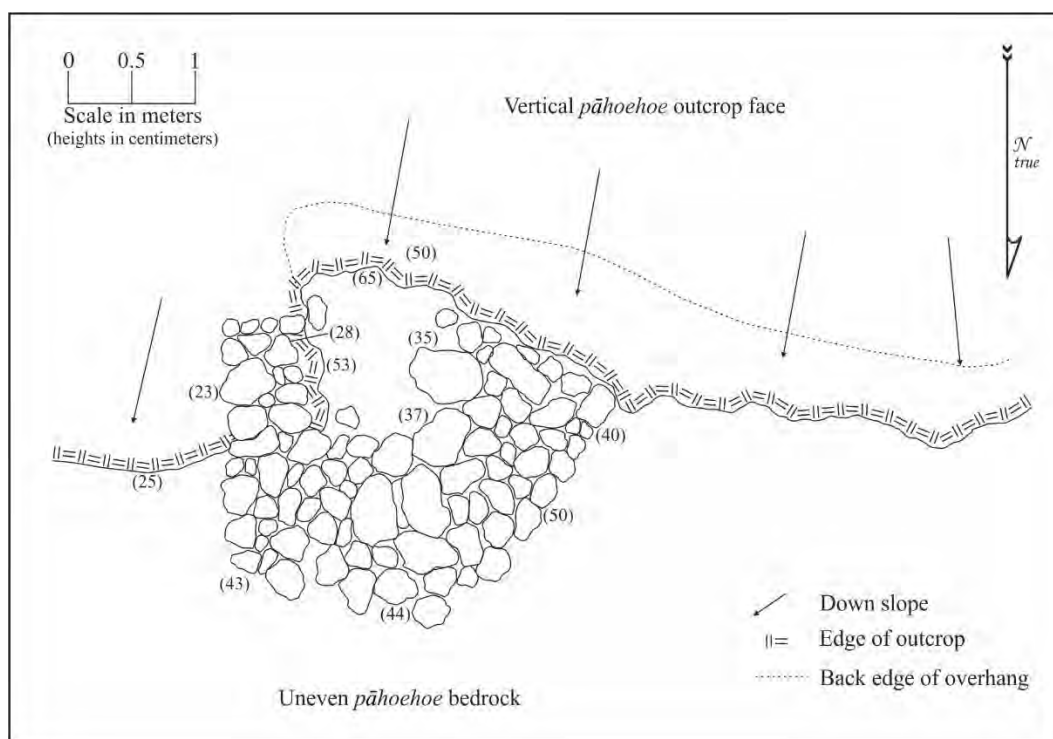


Figure 322. SIHP Site 30375 Feature X-255 plan view.



Figure 323. SIHP Site 30375 Feature X-255, view to the south.

The remaining ten *pāhoehoe* excavations at Site 30375 (X-245 to X-254) are all located along the western half of this portion of Site 29272, to the north edge of the trail/road route (see Figure 318). These excavations all occur within outcroppings of *pāhoehoe* in a mixed flow area, and most of the cobble and slab material removed from them has been taken elsewhere (Figures 324, 325, 326, and 327). The lack of weathering within the excavated areas and on the remaining excavated material, suggests that these excavations are also not particularly old. It seems likely that the *pāhoehoe* excavations at Site 30375 are associated with the use of the nearby Site 29272 trail/road, which was originally created and used as a foot path during the Precontact Period, was later used for horse and donkey travel during the Historic Period, and remained in use as a Jeep road until the late 1970s. The association with Kauhini Road (SIHP Site 29272) suggests that these excavations could have been created during any of the relative time periods, but the lack of weathering at most of them, and the associations with modern debris along the trail route and at X-241 to X-243, and the Site 30368 cairn near X-236 to X-240, combined with the absence of the excavated material at many of the features, indicates that most of the excavation features at Site 30375 are likely modern quarry areas. The excavations at Site 30375 could have been the source of construction material used in the creation of the Jeep road (see Site 29272 description above), or been the source of material for rock wall building in the general Kailua area.

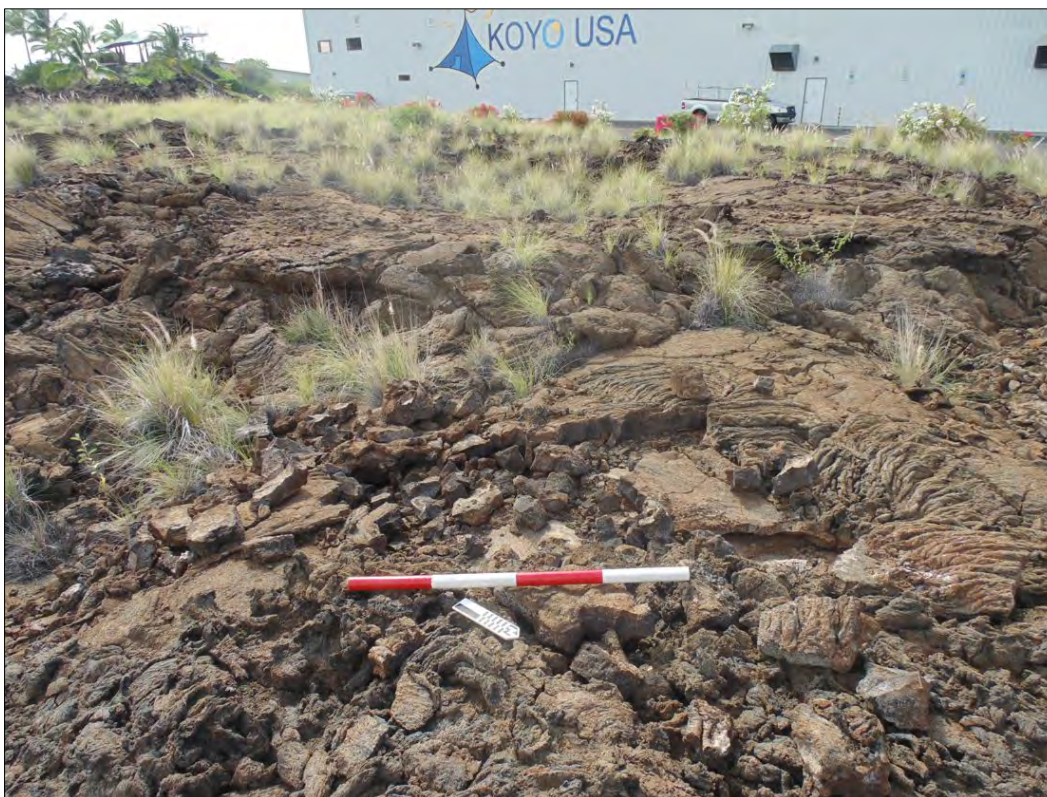


Figure 324. SIHP Site 30375, *pāhoehoe* excavation (X-245), view to the southwest.



Figure 325. SIHP Site 30375, *pāhoehoe* excavation (X-247), view to the southeast.



Figure 326. SIHP Site 30375, *pāhoehoe* excavation (X-248), view to the south.



Figure 327. SIHP Site 30375, *pāhoehoe* excavation (X-250), view to the southwest.

6. SIGNIFICANCE EVALUATION AND TREATMENT RECOMMENDATIONS

The above-described archaeological sites are assessed for their significance based on criteria established and promoted by the DLNR-SHPD and contained in the Hawai'i Administrative Rules 13§13-275-6. These significance evaluations should be considered as preliminary until DLNR-SHPD provides concurrence. For a resource to be considered significant it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

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

The significance and recommended treatment for all seventy-three sites documented sites is presented in Table 13 and discussed below.

Table 13. Site significance and treatment recommendations.

<i>SIHP Site #*</i>	<i>Site Type</i>	<i>Temporal Affiliation</i>	<i>Significance</i>	<i>Recommended Treatment</i>
2	Māmalahoa trail	Historic	a, c, d, e**	Preservation
10160	Survey marker	Historic	d	No further work
10161	Complex	Unknown/Historic	d	No further work
10162	Survey marker	Historic	d	No further work
10187	Survey markers	Historic	d	No further work
10188	Survey markers	Historic	d	No further work
10189	Survey marker	Historic	d	No further work
10190	Rock ring	Unknown	d	No further work
28813-F	Modified depression	Precontact	d, e**	Preservation
29272	Trail/roadway	Precontact/Historic/Modern	c, d, e**	Limited preservation
29273	Stepping-stone trail	Precontact	c, d**	Limited preservation
29274	Survey markers	Historic	d**	No further work
30315	Cairn marked trail	Precontact/Historic	d, e	Limited preservation
30316	Lava tube	Precontact/Historic	d, e	Preservation
30317	Lava tube	Precontact	d	No further work
30318	Lava tube	Precontact	d	No further work
30319	Lava tube	Precontact Historic	d, e	Preservation
30320	Lava blister	Precontact	d	No further work
30321	Rock ring	Unknown	d	No further work
30322	Rock ring	Unknown	d	No further work
30323	Rock ring	Unknown	d	No further work
30324	Rock ring	Unknown	d	No further work
30325	Rock ring	Unknown	d	No further work
30326	Rock rings	Unknown	d	No further work
30327	Rock ring	Unknown	d	No further work
30328	Rock ring	Unknown	d	No further work
30329	Rock ring	Unknown	d	No further work
30330	Rock ring	Unknown	d	No further work

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

**previously determined by DLNR-SHPD

Table 13 continued on next page.

Table 13. Continued.

<i>SIHP Site #*</i>	<i>Site Type</i>	<i>Temporal Affiliation</i>	<i>Significance</i>	<i>Recommended Treatment</i>
30331	Rock ring	Unknown	d	No further work
30332	Rock ring	Unknown	d	No further work
30333	Rock ring	Unknown	d	No further work
30334	Rock ring	Unknown	d	No further work
30335	Rock ring	Unknown	d	No further work
30336	Rock ring	Unknown	d	No further work
30337	Rock ring	Unknown	d	No further work
30338	Rock ring	Unknown	d	No further work
30339	Rock ring	Unknown	d	No further work
30340	Rock ring	Unknown	d	No further work
30341	Rock ring	Unknown	d	No further work
30342	Rock ring	Unknown	d	No further work
30343	Rock ring	Unknown	d	No further work
30344	Rock ring	Unknown	d	No further work
30345	Rock ring	Unknown	d	No further work
30346	Rock ring	Unknown	d	No further work
30347	Rock ring	Unknown	d	No further work
30348	Survey marker	Historic	d	No further work
30349	Survey marker	Historic	d	No further work
30350	Survey markers	Historic	d	No further work
30351	Survey markers	Historic	d	No further work
30352	Survey markers	Historic	d	No further work
30353	Cairn	Unknown	d	No further work
30354	Cairn	Unknown	d	No further work
30355	Cairn complex	Unknown	d	No further work
30356	Cairn	Unknown	d	No further work
30357	Cairn	Unknown	d	No further work
30358	Cairn complex	Unknown	d	No further work
30359	Cairn	Unknown	d	No further work
30360	Cairn complex	Unknown	d	No further work
30361	Cairn	Unknown	d	No further work
30362	Cairn	Unknown	d	No further work
30363	Cairn	Unknown	d	No further work
30364	Cairn	Unknown	d	No further work
30365	Cairn complex	Unknown	d	No further work
30366	Cairn	Unknown	d	No further work
30367	Cairn	Unknown	d	No further work
30368	Cairn	Unknown	d	No further work
30369	Cairn complex	Unknown	d	No further work
30370	Cairn complex	Unknown	d	No further work
30371	Excavation complex	Precontact/Historic	d	No further work
30372	Excavation complex	Historic	d	No further work
30373	Excavation complex	Unknown/Modern	d	No further work
30374	Excavation complex	Unknown	d	No further work
30375	Excavation complex	Unknown/Modern	d	No further work

*SIHP Site numbers are preceded by the State, Island, and USGS quad prefix 50-10-27-.

End of Table 13.

The significance of SIHP Sites 2, 28813, 29272, 29273, and 29274 has already been evaluated (Wolforth 1999; Monahan et al. 2012; Rechtman and Clark 2012) and DLNR-SHPD has approved those evaluations. SIHP Site 2 (the Māmalahoa Trail; 1847 Government Road) was determined significant under Criterion a, c, d, and e; SIHP Site 28813 was determined significant under Criterion d and e; SIHP Site 29272 (Kauhini Road) was determined to be significant under Criterion c, d, and e; SIHP Site 29273 was determined significant under Criterion c and d; and SIHP Site 29274 was determined significant under Criterion d only. All of the other sites recorded within the current study area are also

assessed as significant under Criterion d for information they have provided relative to the history and prehistory of the current study area. SIHP Sites 30315, 30316 and 30319, as a *mauka/makai* trail route, a lava tube containing an important traditional cultural artifact, and a lava tube with petroglyphs, respectively, are additionally assessed as significant under Criterion e for the important traditional cultural value they hold for native Hawaiian people.

The portions of SIHP Site 2 that traverse the NELHA property have been previously addressed in a preservation plan (Rechtman and Clark 2004). SIHP Site 28813 was previously recommended (Monahan et al. 2012) for partial preservation (Feature A) and partial data recovery (Features B-E); Feature F was not previously documented, but is also recommended for preservation. SIHP Sites 29272 and 29273 have previously been approved for limited preservation, and no further work is the approved treatment for SIHP Site 29274 (Rechtman and Clark 2012). Additionally, although not assessed for significance, Sites 10161, 10188, 10187, and 10191, were previously included in a data recovery effort conducted by Barrera (1989).

For the sixty-eight sites within the current study area that do not have previously approved treatments, two are recommended for preservation (SIHP Sites 30316 and 30319, both lava tubes), one is recommended for limited preservation (SIHP Site 30315, a *mauka/makai* trail), and the other sixty-five are recommended for no further work (see Table 13). A preservation plan addressing Sites 28813 Feature F, 29272, 29273, 30315, 30316, and 30319 should be prepared in accordance with HAR §13-277 and submitted to DLNR-SHPD for review and approval. It is further recommended that the preservation are for SIHP Site 28813 Feature F join with the preservation area created around Feature A within the adjoining highway corridor. It has been previously recommended for Site 29273 that the more intact eastern portion of the site that falls on the *mauka* edge and outside of the proposed road corridor be preserved, and for SIHP Site 29272 that NELHA work with the road design engineers to avoid as much of this site as is feasible and then develop a preservation plan for the portions of the site that will remain outside the roadway corridor after the proposed road construction has been completed (see Rechtman and Clark 2012). The same preservation strategy is recommended for Site 30315.

While not formally recommended for preservation, a number of other sites and features will be included in the preservation areas created for SIHP Sites 29272, 30315, 30316, and 30319, and within the previously established preservation easement for SIHP Site 2. Sites that are included within the already established SIHP Site 2 preservation easement include SIHP Sites 10187, 30367, and portions of 30372. Sites that will be included partially or wholly within the Site 30315, 30316, and 30319 preservation area include SIHP Sites 10160, 30318, 30329, 30353, and 30371. Additionally, portions of SIHP Sites 30372 and 30375 will be included in the preservation easement established for SIHP Site 29272. In compliance with HAR §12-277, a preservation plan should be prepared and submitted to DLNR-SHPD for review and approval that addresses all of these preservation commitments.

It is the further recommendation of this study that a qualified archaeological monitor be present during any ground-disturbing activities associated with development within the current study area, and that an archaeological monitoring plan compliant with HAR §13-279 be prepared prior to the commencement of such activities.

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APPENDIX A – Barrera (1985a) Site Descriptions

II. THE SITES

Site 2 [Mamalahoa Trail]

This is a Nineteenth Century kerb-stone lined footpath approximately 1.5 meters in width that runs through the project area [Figure 49].

SITE 10,156

This is a stone mound measuring about 1.2 by 1.2 meters and standing to a height of about 1.2 meters.



Figure 13. Site 10,156, looking west.

SITE 10,157

This is a stone mound measuring about 1 by 1 meter and standing to a height of about 60 centimeters.



Figure 14. Site 10,157, looking west-northwest.

SITE 10,158

Blocks of lava have been removed from the natural pahoehoe bedrock to form this feature, which is a cavity in the lava measuring about 1 by 1.2 meters, and about 1.5 meters deep. Its function is unknown.



Figure 15. Site 10,158, looking east.

SITE 10,159

This site consists of four crude C-shaped habitation shelters covering an area of about ten by 30 meters. The only midden material noted included the shell of a drupe [Drupa ricina] and fragments of coral.



Figure 16. Site 10,159, looking north-northeast.

SITE 10,160

This is a stone mound measuring about 1 by 1 meter and standing to a height of about 50 centimeters.



Figure 17. Site 10,160, looking west-northwest.

SITE 10,161

This site consists of one intact stone mound, several dismantled or collapsed stone mounds, and a deteriorated C-shaped habitation shelter. The site covers an area of about 50 by 100 meters.



Figure 18. Site 10,161, Mound, looking north.



Figure 19. Site 10,161, dismantled mound, looking west.

SITE 10,162

This is a stone mound measuring about 1 by 1 meter and standing to a height of about 75 centimeters.



Figure 20. Site 10,162, looking southwest.

SITE 10,187

This site consists of four stone mounds, two on each side of the Mamalahoa Trail, covering an area of about 15 by 20 meters.



Figure 49. Site 10,187, looking northwest.

SITE 10,188

This site consists of two stone mounds covering an area of about 3 by 20 meters.



Figure 50. Site 10,188, looking south.

SITE 10,189

This site is a stone mound measuring about 1 meter in diameter and standing to a height of 70 centimeters. It is probably a survey boundary marker.



Figure 51. Site 10,189, looking north.

SITE 10,190

This is a crude C-shaped habitation shelter measuring approximately 2 meters across, with a wall that measures about 60 centimeters wide and 40 centimeters high.



Figure 52. Site 10,190, looking north-northeast.

APPENDIX B – Barrera (1989) Site Descriptions

SITE 10161

This is a series of crude stone structures covering an area of 40 by 65 meters. No midden or artifacts were observed.

Feature A - This is an oval rock mound measuring 0.5 by 0.9 meter [0.35 square meters] and standing to a height of 0.35 meter.

Feature B - This is an oval rock mound measuring 1.15 by 1.2 meters [1.2 square meters] and standing to a height of 0.75 meter.

Feature C - This is a deteriorated C-shaped shelter measuring 1.7 by 1.8 meters [2.3 square meters] and standing to a height of 0.35 meter. Before its collapse, the wall probably measured about 40 centimeters in width.

Feature D - This is an oval rock mound measuring 1.8 by 2.25 meters [1.9 square meters] and standing to a height of 0.25 meter.

Feature E - This is an oval rock mound, possibly a collapsed shelter, measuring 1.5 by 1.6 meters [2 square meters] and standing to a height of 0.2 meter.

Feature F - This is possibly a collapsed C-shaped shelter that measures 2.4 by 2.5 meters [4.4 square meters] and stands to a height of 0.2 meter. Before its collapse, the wall probably measured about 60 centimeters in width.

Feature G - This is a collapsed C-shaped shelter measuring 1.75 by 1.85 meters [3 square meters] and standing to a height of 0.2 meter. Before its collapse the wall probably measured about 40 centimeters in width.

The site was probably a temporary habitation area during the prehistoric period.

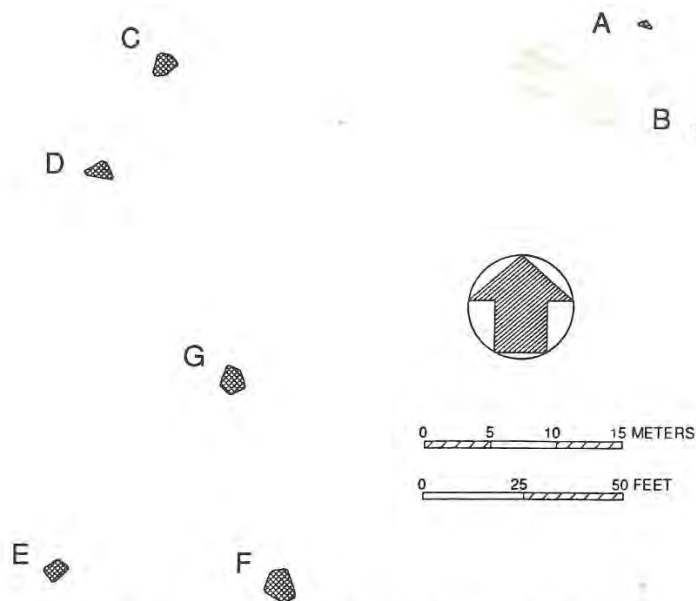


Figure 30. Plan of SITE 10161.

SITE 10187

This site consists of four stone mounds located in an area measuring 8 by 20 meters.- The fact that they are constructed of rocks of exactly the same type as was used in the construction of the kerbing of the adjacent Mamalahoa Trail [Site 2], and the fact that there are distinct gaps in that kerbing at this location, clearly indicate that the kerbing of the trail was the source of rocks for their construction. This roughly dates the site to the period after about the middle of the Nineteenth Century, but tells us nothing of their function, which remains unknown.

Feature A - This mound measures 0.75 by 0.95 meter and stands to a height of 0.5 meter.

Feature B - This mound measures 0.9 by 0.95 meter and stands to a height of 0.45 meter.

Feature C - This mound measures 0.85 by 0.95 meter and stands to a height of 0.75 meter.

Feature D - This mound measures 0.7 by 0.8 meter and stands to a height of 0.3 meter.

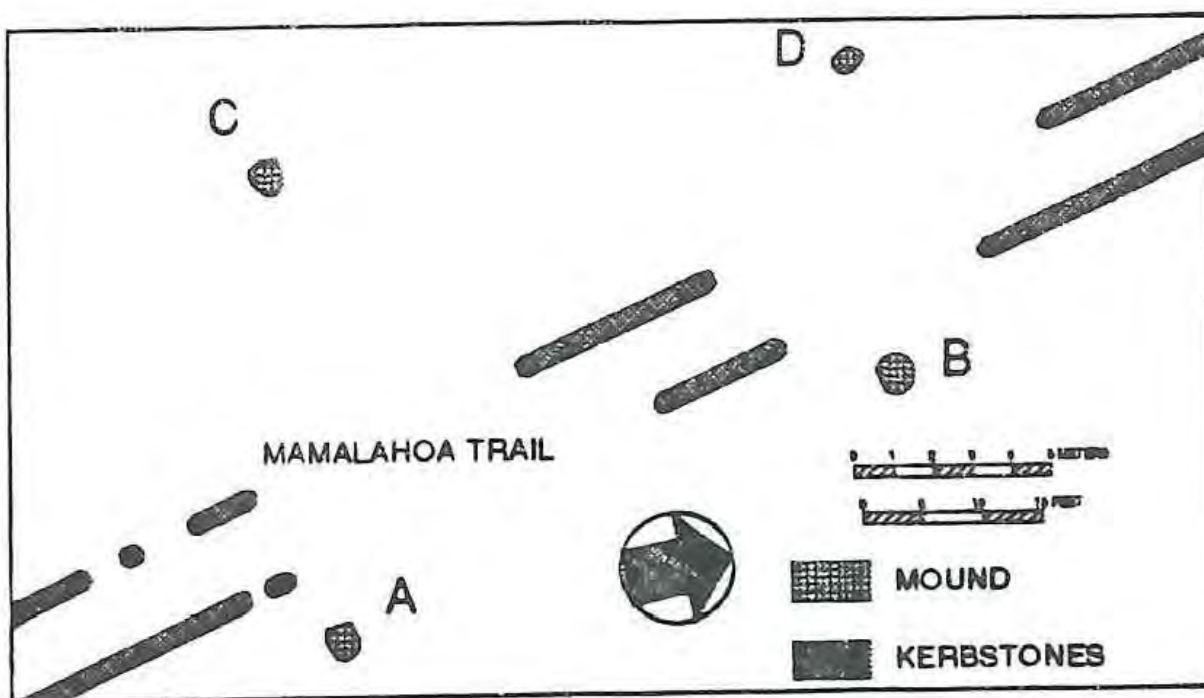


Figure 79. Plan of SITE 10187.

SITE 10188

This site consists of two stone mounds situated 16 meters apart. Their age and function are unknown.

Feature A - This mound measures 1.1 by 1.3 meters and stands to a height of 0.75 meter.

Feature B - This mound measures one by one meter and stands to a height of 0.85 meter.

SITE 10190

This is a crude C-shaped structure measuring 1.7 by 1.8 meters and standing to a height of 0.45 meter. The 0.6 meter wide wall covers an area of one square meter and encloses an area of one square meter. The entire feature covers an area of 2.1 square meters. It was probably a temporary shelter during the prehistoric period.

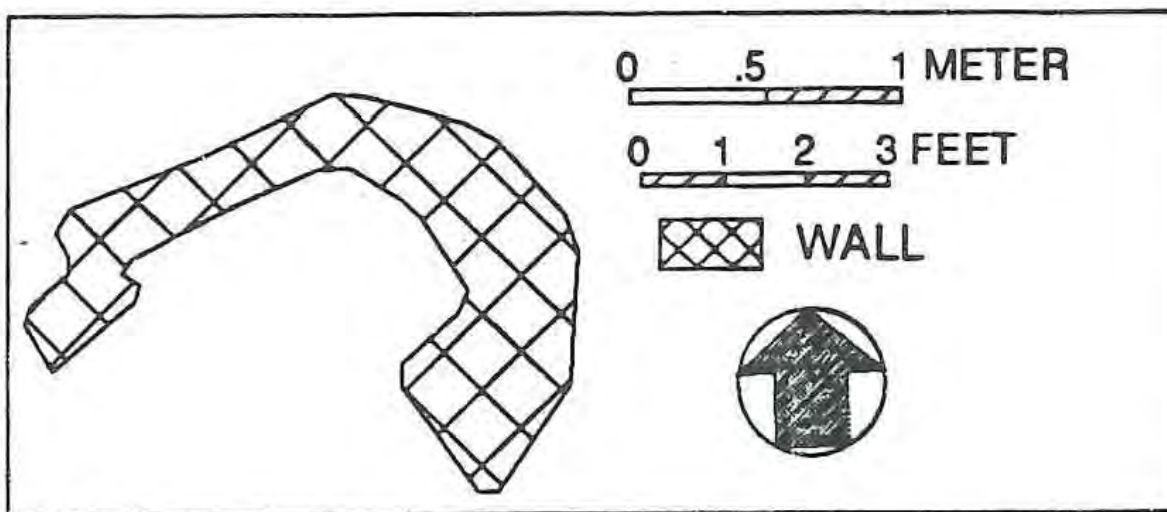


Figure 80. Plan of SITE 10190.

APPENDIX C – Monahan et al. (2012) Site Descriptions

5.2.67 SIHP # 50-10-27-29272

Temp. Site Designation: Coral Frags (Harp 2011)

Site Type: Level Area (Feature A) with *Mauka/Makai* Trail (Feature B)

No. of Features: 2

Functional Interpretation: Possible Resting Place (Fea. A) / Transportation (Fea. B)

Probable Age: Indeterminate

Overall Dimensions: 6.5 m E/W by 5.5 m N/S (level area)

Topography: Undulating *pāhoehoe* terrain sloping gently *makai*

Elevation: 114 ft (36 m) AMSL

Description:

SIHP # 50-10-27-29272 consists of a level area (Feature A) of somewhat rounded but “fresh” looking basalt cobbles and small boulders with some rounded coral pieces (mostly less than 5 cm in size) in a low area at the edge of a *pāhoehoe* outcrop (Figure 251, Figure 252). Pieces of shell (cowrie and ‘*opihi*’) are also present on the surface of the level area. Some 1970s-era bottles and beverage cans and other trash are scattered around the site area, as well as a single, rusted horseshoe. The western side of the feature has a clear but informal edge about 30 cm high. Grasses surround the site. The site location is depicted in Figure 25. This site was pointed out to CSH by Isaac Harp, and was inspected and assessed as part of the supplemental survey of the north segment of the current project area (Monahan and Wilkinson 2012).

While working with CSH archaeologists, Isaac Harp identified a relatively faint trail oriented *mauka* to *makai* leading into the site area from the west (Figure 253). CSH archaeologists were skeptical about this trail, which they considered to be relatively difficult to observe in the field; nonetheless, GPS coordinates for the trail were obtained in order to map its location (see Figure 25). It is important to note that, subsequent to CSH’s fieldwork with Isaac Harp, the SHPD informed CSH that a more formal section of this trail had been identified by another firm (Dr. Robert Rechtman) in an adjacent project area to the west. The site number obtained by Rechtman for this trail has been used for the current project area, but the report is still in draft form and is not available for citation at this time.

In order to explore the possible function and age of the site more fully, two test units were excavated within the main level area (Feature A). Test unit 1 (TU-1) was relatively shallow and was sterile (Figure 254). Test unit 2 (TU-2) contained a small amount of midden (Figure 255, Figure 256). A third excavation, test unit 3 (TU-3), was placed in a nearby area of the site thought to be possibly a “filled in” area by Isaac Harp (Figure 257). This test unit was sterile.

This site appears to be a constructed ramp to allow for travel across uneven terrain with a primary function of transportation. It may also have been used as a small resting place (the level area designated Feature A) associated with a *mauka/makai* trail (Feature B). The age of the site is currently indeterminate.

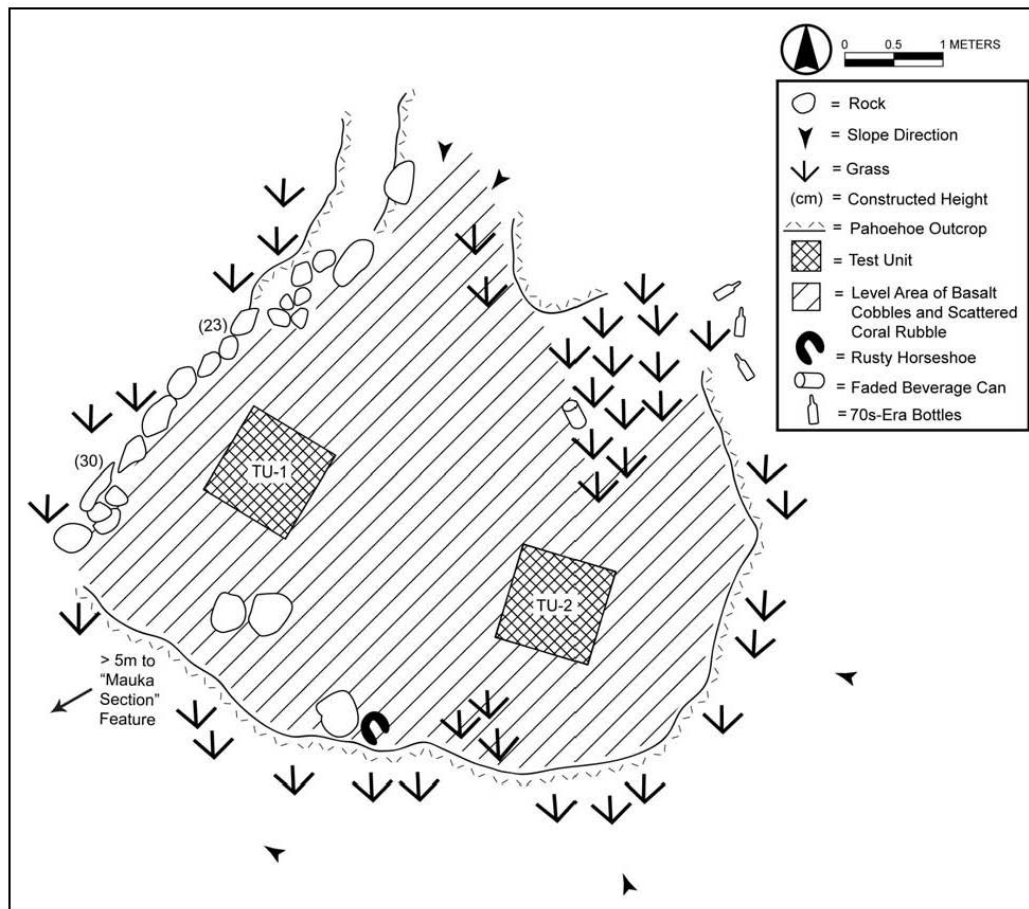


Figure 251. Plan view sketch map of SIHP # -29272 Feature A



Figure 252. Level area of cobbles with coral (SIHP # - 29272 Feature A);-, view to northwest

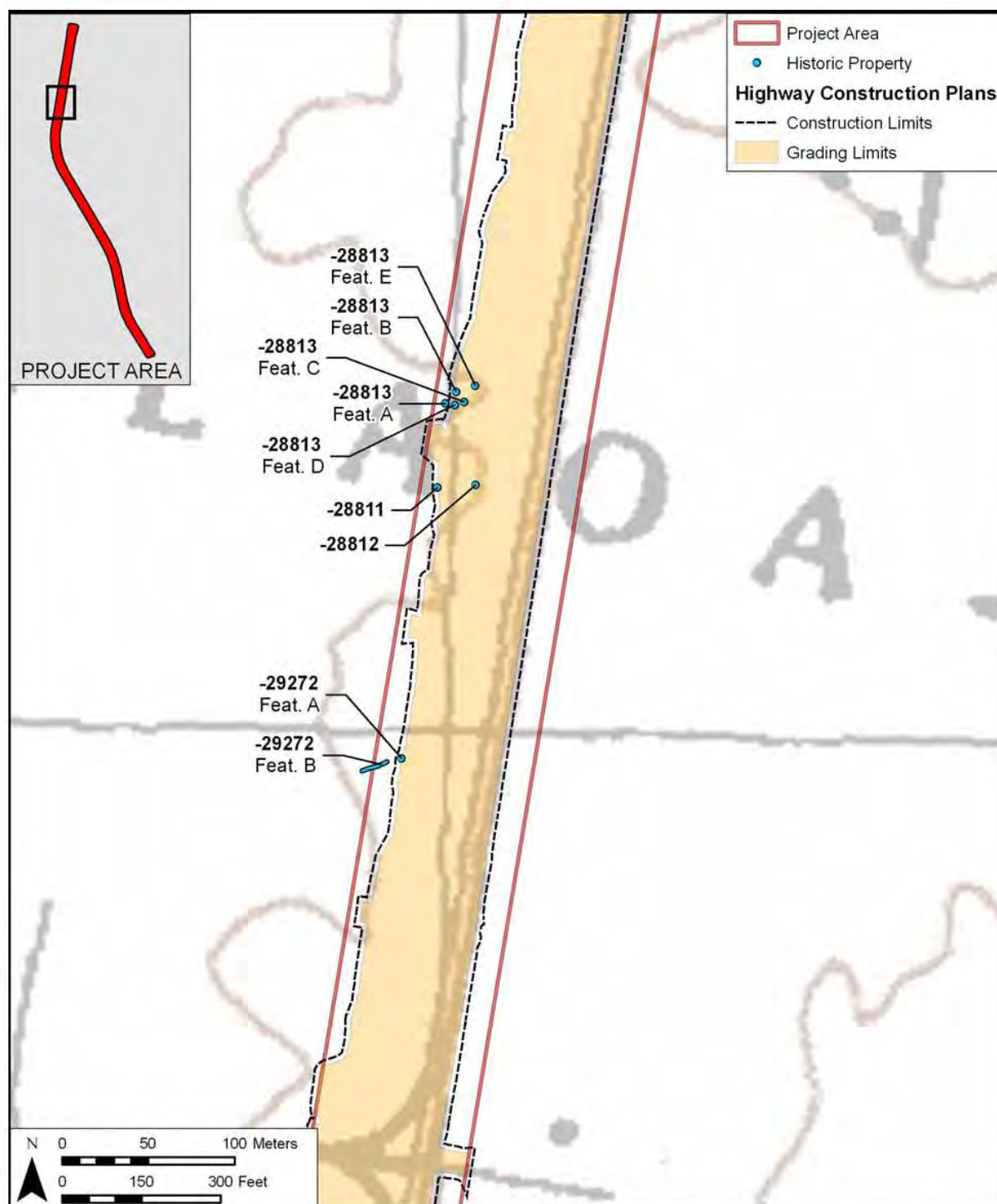


Figure 25. Portion of the 1996 U.S. Geological Survey 7.5 minute topographic map (Keāhole Point Quadrangle) showing Section 9 of the project area



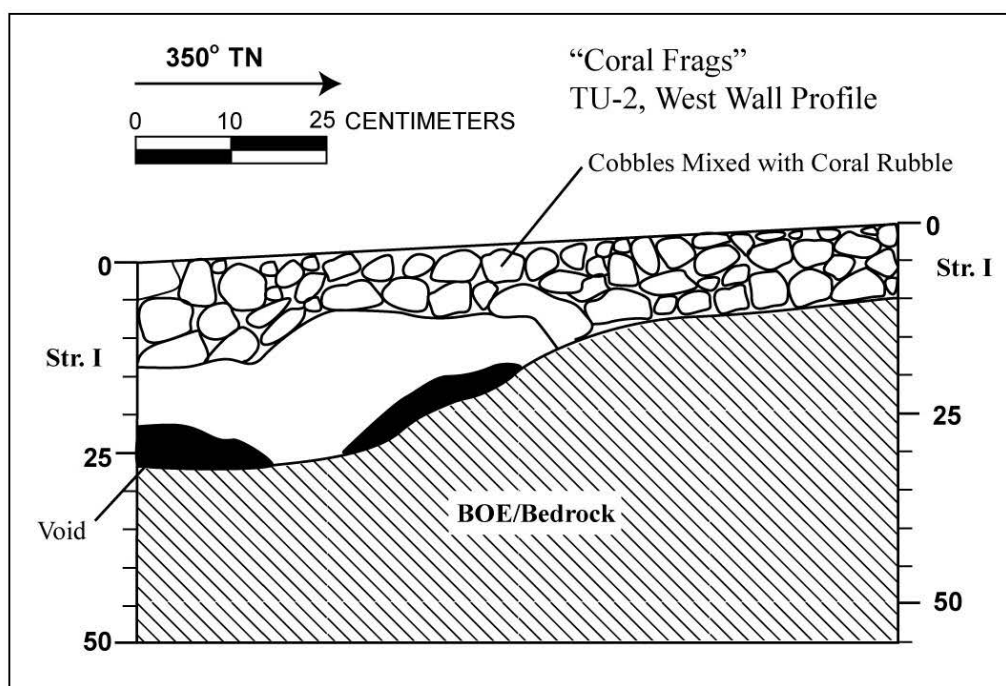
Figure 253. Section of trail (SIHP # -29272 Feature B) identified by Isaac Harp leading to Feature A, view to west



Figure 254. Post-excavation of TU-1 at SIHP # -29272 Feature A, view to east



Figure 255. Post-excavation of TU-2 at SIHP # -29272 Feature A, view to southeast



56. Stratigraphic profile of TU-2 (SIHP # -29272 Feature A)



Figure 257. Post-excavation of TU-3, view to east

5.2.68 SIHP # 50-10-27-28811**Temp. Site No.:** T-092110-10 (Monahan et al. 2011)**Site Type:** *Pāhoehoe* Excavation**No. of Features:** 1**Functional Interpretation:** Quarrying**Probable Age:** Prehistoric (Pre-Contact)**Overall Dimensions:** 3.0 m N/S by 4.2 m E/W**Topography:** Level *pāhoehoe* flow**Elevation:** 114 ft (35 m) AMSL**Description:**

SIHP # 50-10-27-28811 is a *pāhoehoe* excavation approximately 715 m south of the intersection of OTEC Road and the Queen Ka'ahumanu Highway (Figure 258, Figure 259, and see Figure 25). It consists of an area where an overlying, uplifted sheet of *pāhoehoe* has been quarried and removed, exposing a lower *pāhoehoe* surface. Quarry marks and scalloping were observed along the edges of the excavation. Most of the excavated material (medium boulder-sized *pāhoehoe* slabs) has been overturned and placed along the northern side of the excavation. The interior surface of the excavation consists of scattered *pāhoehoe* pebbles on solid *pāhoehoe* bedrock. The excavated area lacks soil deposition. The *pāhoehoe* excavation measures 3.0 m N/S by 4.0 m E/W with a maximum depth of 0.6 m below the adjacent ground surface. No artifacts or midden were observed in the area.

SIHP # -28811 is interpreted as a possible raw material quarrying locality likely dating from prehistoric (pre-Contact) times. The *pāhoehoe* excavation lacks sediment accumulation that would indicate potential agricultural use.



Figure 258. Photograph of SIHP # -28811, view to west

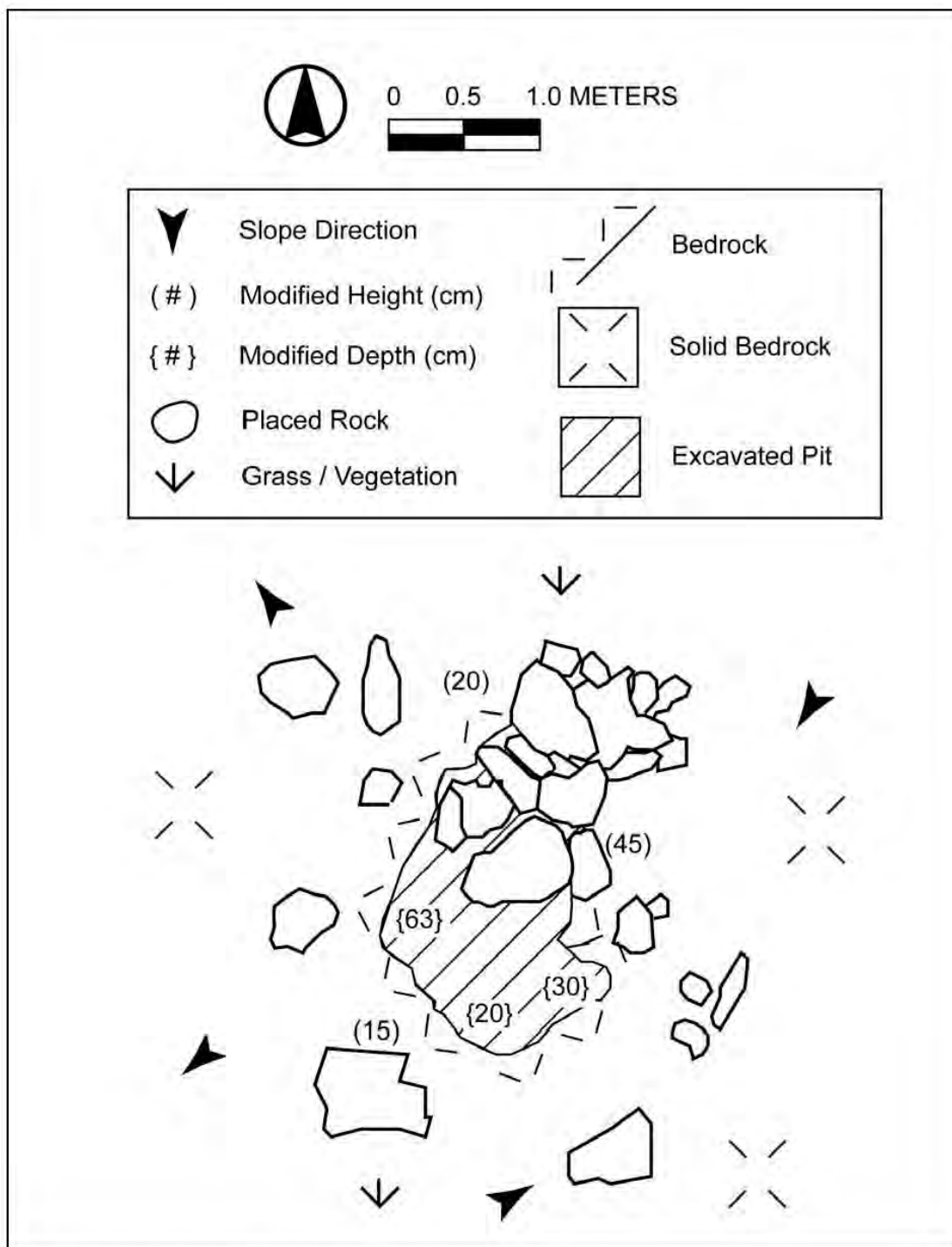


Figure 259. Plan view of SIHP # -28811

5.2.69 SIHP # 50-10-27-28812**Temp. Site No.:** T-092410-1 (Monahan et al. 2011)**Site Type:** Possible Filled Crevice**No. of Features:** 1**Functional Interpretation:** Indeterminate**Probable Age:** Indeterminate**Overall Dimensions:** 1.0 m N/S by 1.5 m E/W**Topography:** *Pāhoehoe* tumulus, level to moderately sloping**Elevation:** 124 ft (38 m) AMSL**Description:**

SIHP # 50-10-27-28812 is a possible filled crevice located approximately 390 m north of the intersection of OTEC Road and the Queen Ka‘ahumanu Highway (Figure 260, Figure 261, and see Figure 25). SIHP # -28812 consists of an area within a natural *pāhoehoe* crevice that appears to be filled with loosely-piled *pāhoehoe* boulders. The possible filled crevice is located near the center of a *pāhoehoe* tumulus and measures 1.0 m N/S by 1.5 m E/W. The possible filled crevice is identified by the presence of a small stand of *ti* plants located immediately north of and adjacent to the site. In general, the fill material within the crevice appears to be unmodified rubble or collapse, however, the presence of manually-introduced *ti* plants suggest that the area has been visited and possibly modified. No artifacts or midden were observed in the area.

The function of SIHP # 50-10-27-28812 is indeterminate. In general, the fill material within the crevice appears to be unmodified rubble or collapse; however, the presence of manually-introduced *ti* plants suggests the area has been visited and possibly modified.



Figure 260. Photograph of SIHP # -28812, view to west

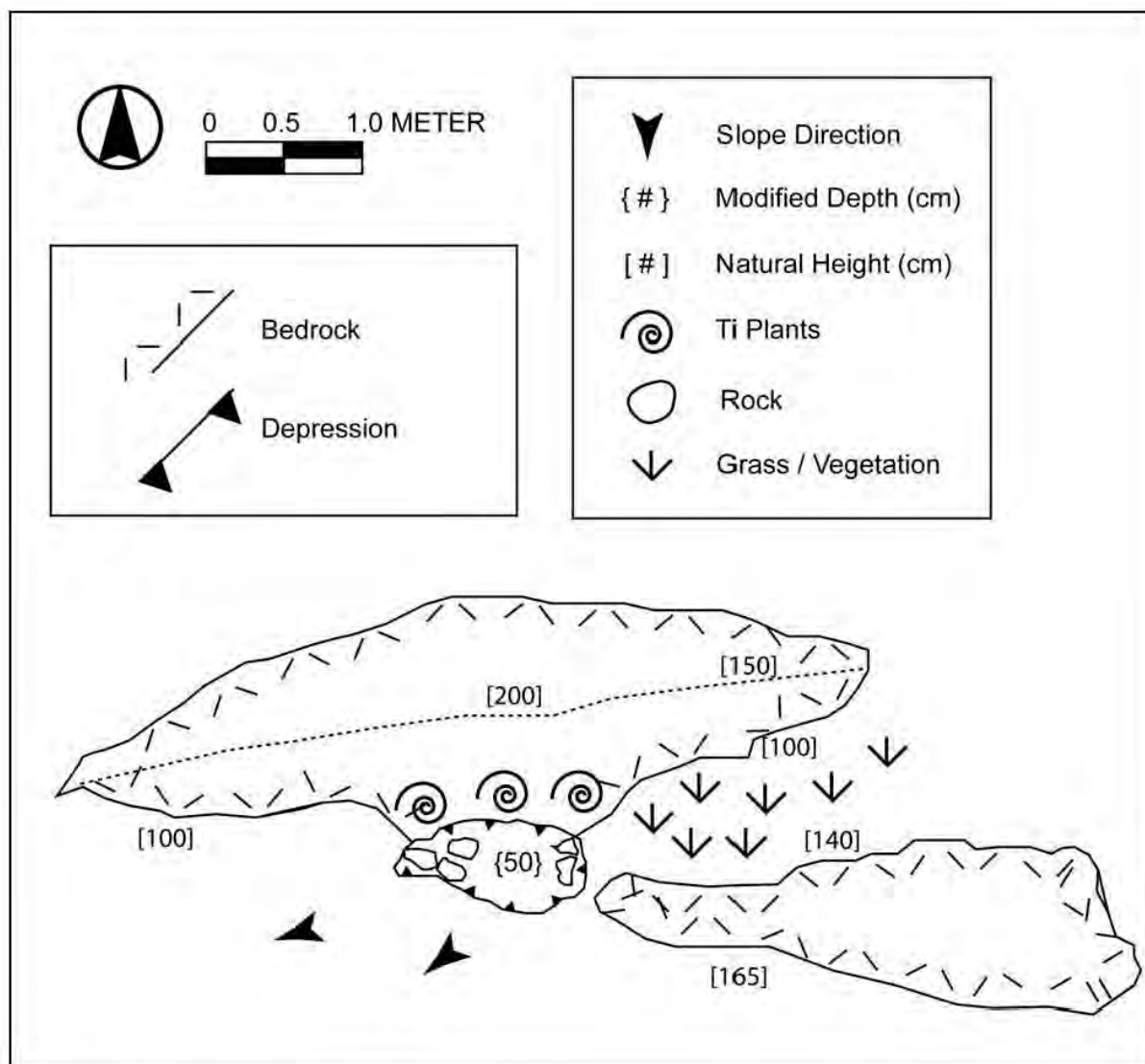


Figure 261. Plan view of SIHP # -28812

5.2.70 SIHP # 50-10-27-28813**Temp. Site No.:** T-092110-11 (Monahan et al. 2011)**Site Type:** Modified Lava Blisters**No. of Features:** 5**Functional Interpretation:** Agriculture**Probable Age:** Prehistoric (Pre-Contact)**Overall Dimensions:** 25 m NE/SW by 15 m NW/SE**Topography:** Level *pāhoehoe* flow**Elevation:** 112-116 ft (34-35 m) AMSL**Description:**

As originally documented in Monahan et al. (2011), **SIHP # 50-10-27-28813** was described as consisting of one modified lava blister approximately 437 m north of the intersection of OTEC Road and the Queen Ka‘ahumanu Highway (Figure 262 to Figure 265). The site location is depicted in Figure 25. The original site description by Monahan et al. (2011) was that it consisted of,

an oval-shaped collapsed lava blister with vertical sides that extend approximately 1.1 m below the surface. The lava blister measures 6.0 m N/S by 3.2 m E/W. The interior of the lava blister consists of a thick layer of sediment and organic debris that currently supports that growth of grasses. A wall, comprised of two to three courses of stack *pāhoehoe* cobbles and small boulders, has been constructed along the southeastern edge of the lava blister. The wall measures 2.8 m long by 0.4 m wide with a maximum height of 0.9 m. No artifacts or midden were observed in the area.

Based on these observations, SIHP # 50-10-27-28813 was interpreted as an agricultural locality likely dating from prehistoric (pre-Contact) times. The relatively thick soil-sedimentary layer within the interior of the lava blister was thought to have perhaps supported various dryland cultivars. Monahan et al. (2011) recommended data recovery (subsurface excavation) to test this hypothesis.

More recently, during the NHO survey work, several other nearby (heading *mauka*) features, broadly similar in overall structure to the one designated SIHP # -28813, were identified (note, these were designated by Harp 2011 as “Excblis 1,” “Shell,” and “Natural C-Shelter”). In order to address NHO concerns, these additional features were cleared of vegetation, inspected more carefully, evaluated for evidence of human modification or use, and documented (including making a scaled sketch map) (Figure 262). During the course of this follow-up documentation, a fourth possible additional feature—a pair of very small *pāhoehoe* pits—was also identified and similarly investigated. For the sake of simplicity and organization, standard feature designations have been given to the total of five (5) features, as follows: Feature A = the original SIHP # 28813, Feature B = “Excblis 1,” Feature C = “Shell,” Feature D = the pair of very small *pāhoehoe* pits, and Feature E = “Natural C-Shelter.”

These additional features and investigation results are described in more detail below. It was the professional opinion of CSH archaeologists that these additional features do not have any evidence of human modification (e.g., rock stacking or alignment) or use in the form of soil-

sedimentary deposits that may contain occupation debris. CSH made a preliminary conclusion that these additional features are natural, rather than archaeological. Isaac Harp has disagreed with this interpretation, and suggests more work can be done at these features to see if there is additional evidence of human occupation or use. Chris Monahan consulted with Mike Vitousek, in his capacity as SHPD archaeologist, who suggested CSH could conduct data recovery at these features to satisfy NHO concerns. See Section 5 (Project Effect and Mitigation Recommendations) for a discussion of this. There are also disagreements between CSH archaeologists and Isaac Harp as to the taxonomic identification of certain crab and shell fragments recovered from this site (see discussion at the end of this site description).

Feature A, the original SIHP # -28813, has already been described above. **Feature B (“Excblis 1”)** is a collapsed blister or small sink that measures approximately 2.5 m E/W by 3.25 m N/S and up to 1.25 m deep at the north end (Figure 266). Once cleared of grass, the feature was found to contain boulders resting on the floor/base around the interior perimeter with a minimal open area in the center. A significant amount of soil-sediment is present, likely due to the substantial grasses present. No overhangs are present that could accommodate a person, although quite a bit of shade would be provided (late or early in the day) by the depth of the feature alone. A crab chela (pincer part) was found in this feature. There was disagreement between CSH archaeologist Ollie Bautista and Isaac Harp as to the taxonomic identification of this crab (see discussion below).

Feature C (“Shell”) is similar to Feature B. This collapsed blister / sink measures up to 3.0 m (NE/SW) by 2.5 m E/W and up to 1.25 m deep at the south end (Figure 267). At this feature, a concentration of boulders covers the southeastern half of the pit floor, leaving the western and northern portions of the floor relatively open. The northern end has a shallow overhang. The sink contained a substantial amount of grass and, once cleared, a significant amount of soil-sediment was observed. A snail shell was found in this feature. CSH archaeologist Oliver Bautista believes it is an African snail. Isaac Harp disagreed (see discussion below).

Feature D (“very small *pāhoehoe* pits”) is south of the other features. It is a small natural pit in the *pāhoehoe* flow consisting of two holes separated by a section of *pāhoehoe* that was not collapsed (Figure 268). Collapsed stones are present on the pit floors of the holes. The northern pit is roughly 0.5 m by 0.5 m and up to 1.0 m deep, while the smaller, southern pit is about 0.5 m E/W by 0.3 m N/S and up to 0.70 m deep.

Feature E (“Natural C-Shelter”) is the *mauka*-most feature, and is a natural C-shape formed by the edge of a *pāhoehoe* outcrop (Figure 269). A clear, level area “fronts” the C-shape to the north, and is somewhat “enclosed” by another *pāhoehoe* outcrop / tumulus reaching a height of 1.6 m. The C-shape feature is approximately 4.0 m long E/W and the level “floor” is about 1.0 m wide N/S. The outcrop edge measures 1.0 – 1.3 m high. The feature was overgrown with grass. After clearing, a substantial soil-sedimentary deposit was observed. Some very shallow overhangs / crevices are present along the outcrop edge.

There is disagreement between CSH archaeologists and Isaac Harp about the taxonomic identification of the crab and shell fragments (Figure 270). These specimens should be analyzed by a recognized expert during the data recovery work.

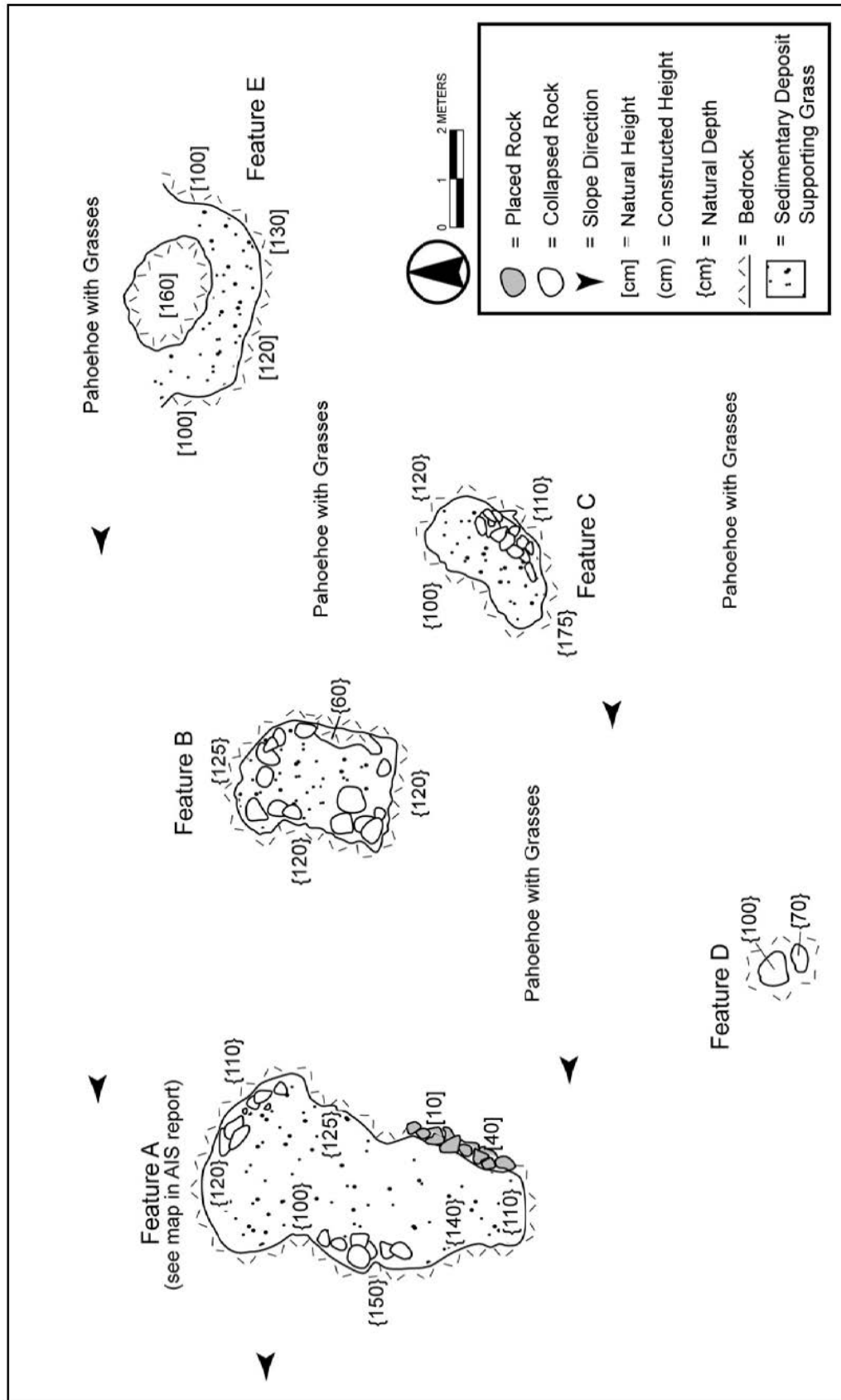


Figure 262. Plan view sketch map of SIHP # -28813



Figure 263. Photograph of SIHP # -28813 Feature A, view to north



Figure 264. Photograph of SIHP # -28813 Feature A, view to northwest

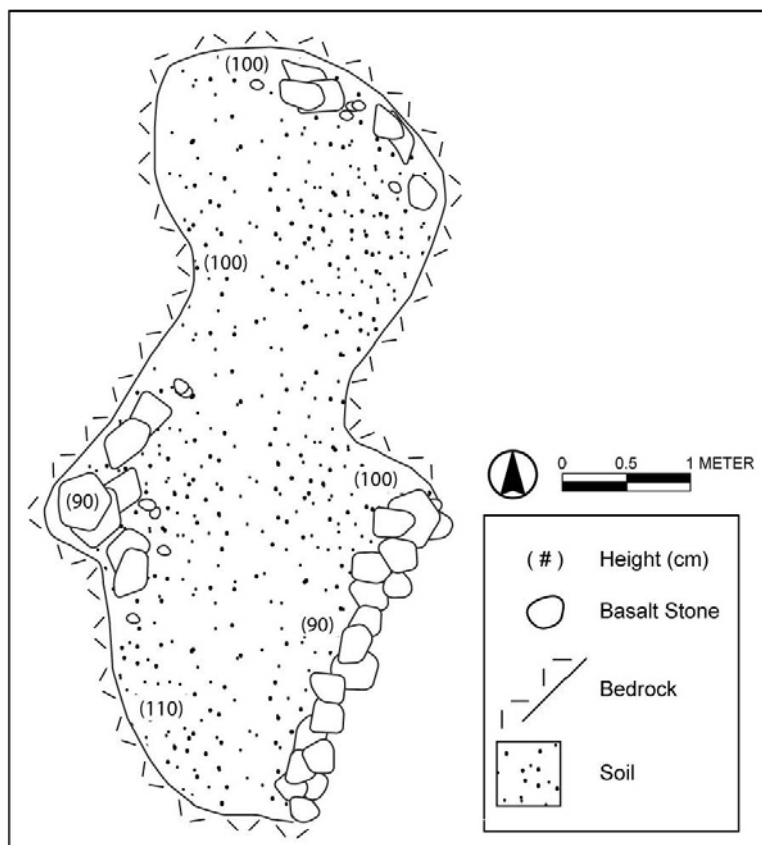


Figure 265. Plan view map of SIHP # -28813 Feature A



Figure 266. Photograph of SIHP # -28813 Feature B, view to northwest



Figure 267. Photograph of SIHP # -28813 Feature C, view to north



Figure 268. Photograph of SIHP # -28813 Feature D, view to north



Figure 269. Photograph of SIHP # -28813 Feature E, view to northeast

