RC-0223

Archaeological Data Recovery at Ten Sites on TMKs:3-7-5-10:85 and 3-7-5-17:06

Waiʻaha Ahupuaʻa
North Kona District
Island of Hawaiʻi

PREPARED BY:

Robert B. Rechtman, Ph.D.
and
Johannes H. N. Loubser, Ph.D.

PREPARED FOR:

U of N BENCORP
75-165 Hualalai Road
Kailua-Kona, HI 96740

October 2007

RECHTMAN CONSULTING
HC 1 Box 4149 • Kea'au, Hawai'i 96749
phone: (808) 966-7636 • (808) 966-6235
toll free fax: (800)406-2665 • e-mail: brechtman@aol.com

Archaeological Data Recovery at Ten Sites on TMKs:3-7-5-10:85 and and 3-7-5-17:06

Waiʻaha Ahupuaʻa
North Kona District
Island of Hawaiʻi

RECHTMAN CONSULTING

Contents

Figures

Tables

INTRODUCTION

At the request of Ken Holzhei of U of N BENCORP, Rechtman Consulting, LLC has prepared this data recovery report for ten archaeological sites located on TMKs:3-7-5-10:85 and 3-7-5-17:06 in Waiʻaha Ahupuaʻa, North Kona District, Island of Hawaiʻi (Figure 1). The preparation of this Archaeological Data Recovery Report follows the successful completion of an Archaeological Inventory Survey (Clark and Rechtman 2003) of the property, in which ten sites were recommended for data recovery investigation. This Archaeological Data Recovery Report is based on the strategies set forth in the Data Recovery Plan (Rechtman 2004) for the mitigation of these ten sites from any possible impacts resulting from development of the property.

The current study area is bounded to the east by land (part of the same TMK parcel) that was reportedly (Corbin and Rosendahl 2002) given historic preservation clearance by a DLNR-SHPD representative (Mr. Marc Smith); to the north by a stone wall along the Waiʻaha 1st/Puaʻa 3rd boundary; to the south by a stone wall in Waiʻaha 2nd Ahupuaʻa just south of the Waiʻaha 1st boundary along the edge of TMK: 3-7-5-17:6 and by an existing residential development where the wall no longer stands; and to the west by a stone wall along the *mauka* edge Kuakini Highway (Figure 2). During the *Māhele,* the majority of Waiʻaha 1st was awarded to the American Board of Commissioners for Foreign Missions (LCAw. 387). There were no *kuleana* awards made within the project area. Waiʻaha is generally considered to have been a place of high-status residences and ceremonial complexes, and Queen Emma lived in the *ahupuaʻa* in her later years.

Terrain in the project area is gently undulating and elevation ranges from 100 to 240 feet above sea level. Two soils characterize the project area, Waiʻaha extremely stony silt loam and Punaluʻu extremely rocky peat (Sato et al. 1973). Both are well-drained, thin organic soils over bedrock. The underlying bedrock is *pāhoehoe* within the western third of the project area transitioning to *ʻaʻā* in the eastern two-thirds; the flows date to more than 5,000 years BP (Wolfe and Morris 1996).

Two historically introduced species, *kiawe* (*Prosopis pallida*) and *koa haole* (*Leucaena glauca*) dominate the vegetation within the project area. A variety of grasses, vines, weeds, and shrubs are also present. Prior impacts within the project area can be described as substantial. Mechanical earth moving is evident as a graded road (no longer in use) corresponding to a waterline easement running *mauka/makai* through the property.

A total of twenty-five previously unrecorded sites and one previously recorded site were discovered during the Archaeological Inventory Survey (Clark and Rechtman 2003) (Figure 3). The ten sites recommended for data recovery are listed in Table 1. For descriptions of the other sites see Clark and Rechtman (2003).

Table 1. Data recovery sites on TMK: 3-7-5-10:85.

SIHP No.	*Function*	*Temporal Association*
23670	Permanent habitation	Precontact
23671	Temporary habitation	Precontact
23672	Permanent habitation	Precontact
23673	Permanent habitation	Precontact
23674	Temporary habitation	Precontact
23675	Permanent habitation	Precontact
23676	Temporary habitation	Precontact
23677	Temporary habitation	Precontact
23678	Temporary habitation	Precontact
23686	Agricultural	Precontact

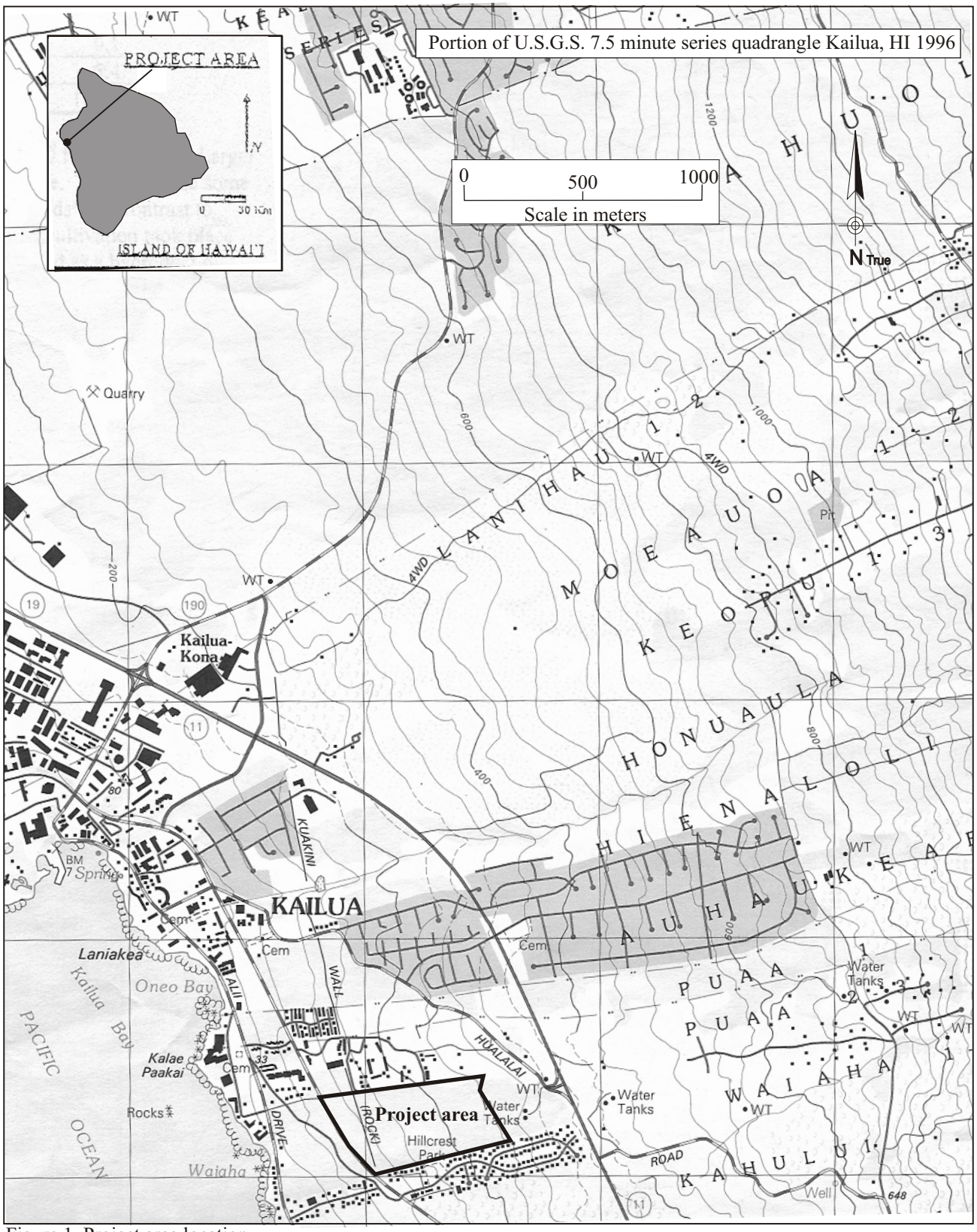


Figure 1. Project area location.

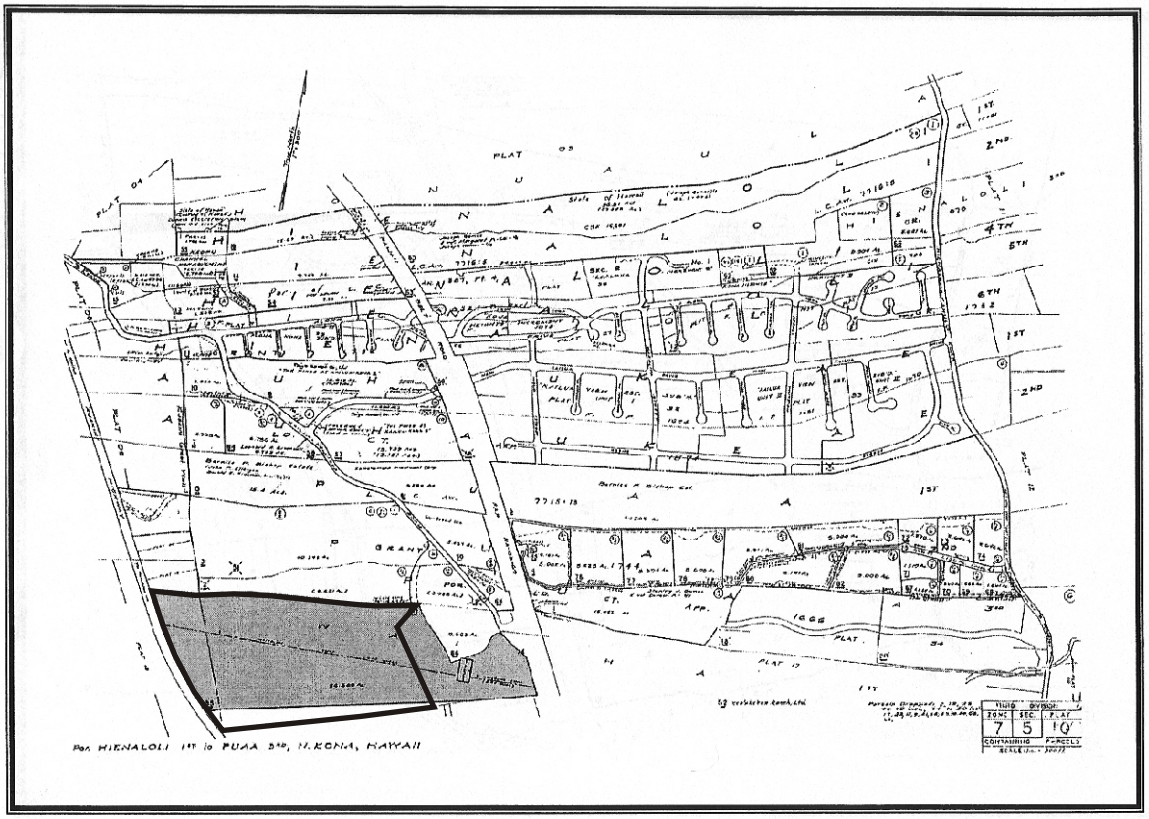


Figure 2. Tax Map Keys:3-7-5-10 and 17 showing current project area (parcels 85 and 06).

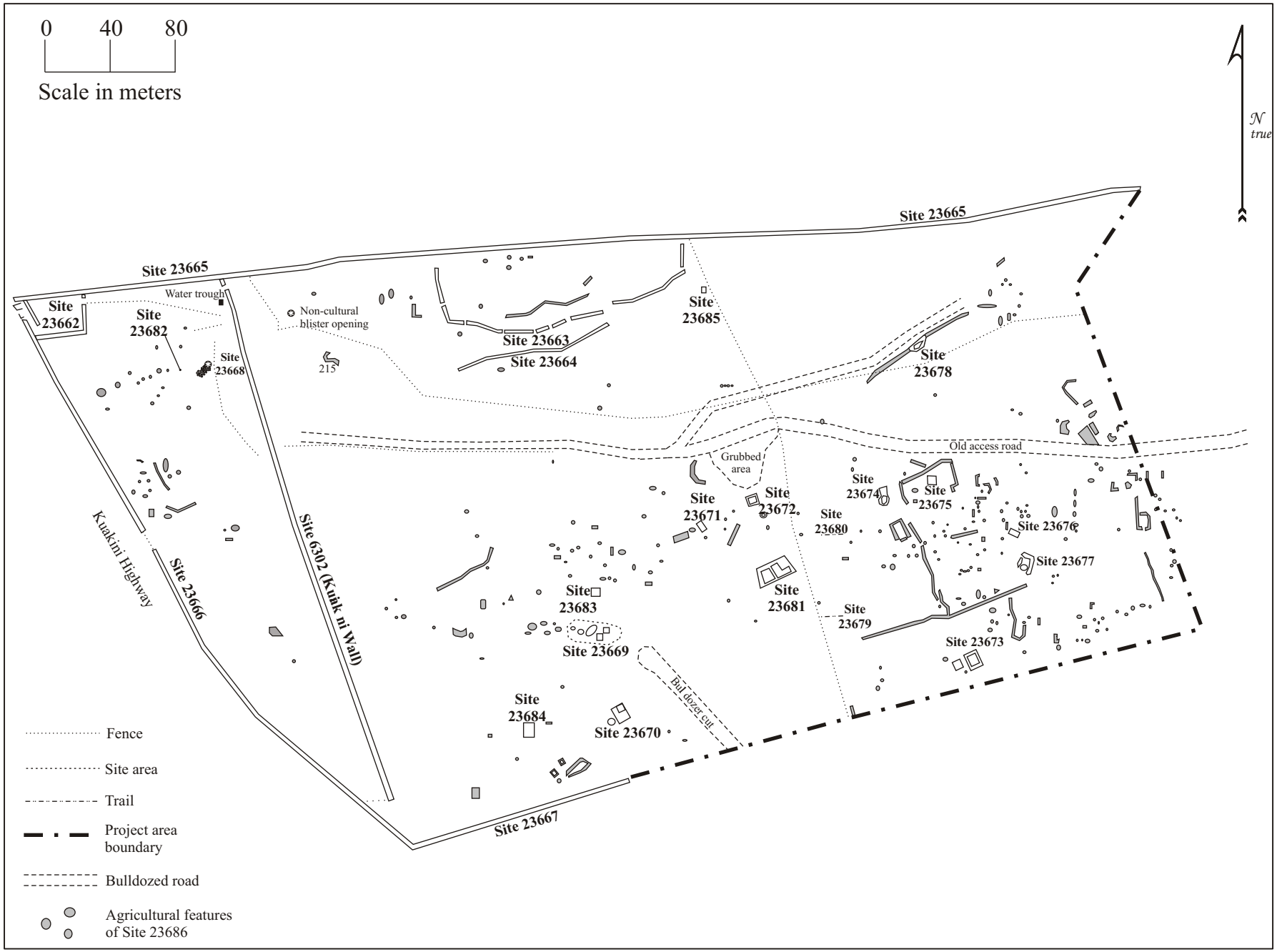


Figure 3. Project area plan view showing site locations.

PHYSICAL AND CULTURAL SETTING

The west-central coast of the island of Hawai‘i includes the western slopes of the dormant Hualālai volcano. The Kona coast is for the most part covered with barren Hualālai lava flows broken only occasionally by fertile patches of land. The successive lava flows contain numerous tubes and blisters. The abundance of volcanic rock provided readily available building material for house platforms, temples, fences, agricultural terraces, and Historic Period stock enclosures. The many crevices and caves created by the numerous lava flows afforded convenient locales for habitation, refuge, storage, refuse disposal, and burial.

Mean annual rainfall in the region ranges between 75 and 125 centimeters. Because it seldom rains on the leeward coast, West Hawai‘i is characterized by a paucity of stream drainages and a tendency to aridity; any surface water is quickly absorbed in the porous bedrock. In the early nineteenth century Ellis (1916:45-46) observed this water shortage, finding on his journey through the area that the populous Kailua was destitute of fresh water, except what was found in pools, or small streams, normally at higher elevations. Native Hawaiian people, however, had no problem drinking from the brackish springs on the coast (Cheever 1851:110).

Remnants of early house platforms that have been found near the Kaloko coast in North Kona radiocarbon dated to between AD 920 and 1290 (Cordy 2000:132). This area is known for its large brackish ponds and flowing drainage around their edges. In Lanihau Ahupua‘a immediately north of the project parcel midden deposits below stone platforms yielded charcoal fragments that were dated to between AD 1055 and 1270. A lava tube shelter to the south of the project parcel, near Kahalu‘u Bay, yielded a roughly contemporary date of AD 1000-1280 (ibid. 132-133). These sites are considered to represent temporary habitations of pioneers utilizing the nearby coastal resources. Charcoal dates from walled upland fields suggest that cultivation of the Kona uplands started between AD 1000 and 1200 (ibid. 133). Considered together, these roughly contemporary dates suggest the small pioneering communities that exploited coastal resources also cultivated the uplands.

Most of the Hawaiians living on the west coast chose to settle in small villages near the shore or clustered around bays where canoes could be launched or landed. Fish and marine resources were nearby and plentiful. The moister uplands could be reached by trails several miles long (Holland 1971:32). Upland forests contained a smaller number of people, in temporary villages, who hunted birds, harvested timber and bark, and logged sandalwood (ibid. 35). The seaward slope eventually became a mixed agricultural zone, with breadfruit planted on the lower slopes and large sweet potato and dry land taro plantations established in the higher elevations that received more rain (ibid. 33). With the decline of the breadfruit plantations, small fields of crops were planted in those areas and enclosed with low stonewalls concealed by sugarcane. Plantains and bananas were sometimes planted in the lower reaches of the rain forest (ibid. 34). Fish and other marine resources from the coast, plus crops and wild plants harvested from the higher slopes, supplied all the food, shelter, and clothing for the people on the west coast of Hawai‘i.

The study parcel is in the *kula* zone, a belt that stretches between sea level and the 150 meter elevation contour. This belt is associated with traditional habitation and the cultivation of sweet potatoes, paper mulberry, and gourds. Agricultural features, notably clearing mounds, planting mounds, planting depressions, modified outcrops, and planting terraces, are common within the *kula* zone (e.g., Hammatt and Clark 1980, Schilt 1984).

Traditional dwellings were concentrated within a roughly 200 meter wide belt along the shoreline, although some were also scattered throughout the agricultural portion of the *kula* zone. In addition to permanent houses, shoreline buildings were constructed for canoe storage, ceremonies and burials, and fishing related activities. A *heiau* related to fishing, known as Hekelinui, was recorded along the shoreline at the union of the two Kahului *ahupua‘a*, not far south of the current study area (Reinecke 1930, Site 62). Bryan (1915:50), among other scholars, observed that *heiau* shrines were usually located near the shore and were particularly dense in the region between Kailua and Kealakekua. A prominent *heiau* near the project area is ‘Ahu‘ena, adjacent to Kamehameha’s royal residence at Kailua.

The west coast's warm, dry climate and fertility made it a favorite residential area of Hawai‘i’s royalty. Important chiefly centers were located within the shoreline portion of the *kula* zone. Several large and densely populated royal centers were located along the shoreline between Kailua and Honaunau (Cordy 1995, Tomonari-Tuggle 1993). A variety of non-residential features are present in the *kula* zone near royal centers, including small agricultural plots, and burials. Wherever the ruling chief had his home, a large group of houses for members of the royal entourage and commoner laborers could also be found.

By the 1400s, dual seats of power existed on the windward and leeward coasts of Hawai‘i Island. The "Kona" chiefs governed Kohala, Kona, and Ka‘ū, while the "I" chiefs controlled Hamakua, Hilo, and Puna (Cordy 2000:205-207). The first chief to permanently unite the island of Hawai‘i was ‘Umi-a-Liloa, whose father had been an *ad hoc* ruler of the island with his court located in Waipi‘o Valley, Hamakua. ‘Umi subsequently moved the seat of power from the windward to the leeward side of the island at Kona. According to royal genealogies all this most likely took place sometime during the early 1400s to the early 1600s. Royal oral traditions imply that the period from 1500 to the mid-1700s consisted of continual attempts to wrest power from ‘Umi’s descendants. These cycles of conquest and re-conquest finally ended with Kamehameha’s unification of the Hawaiian Islands in the early Western contact period. The earlier chiefdoms were incorporated into the six districts of Kamehameha’s kingdom. Despite the further subdivision of Hilo, Kohala, and Kona into northern and southern portions, the original district boundaries of Hawai‘i Island still exist today, probably due to their separation according to natural physical barriers.

The town of Kailua, Kona, has long been the residence of Hawaiian chiefs. Kailua is also the site of Kamakahonu, the parcel of land containing King Kamehameha's principal residence and court during the last years of his life. Following Kamehameha’s death, his successor Liholiho overthrew the *kapu* system. Following the breaking of the *kapu* system and related traditional Hawaiian beliefs, the older places of worship, such as the *heiau*, lost their former significance. Many such places were dismantled, and the stones were used for other projects, such as the building the Kuakini Wall, which runs through the western third of the project parcel (see Figure 3).

Nineteenth century habitation features built on stone platforms were present in the *kula* zone of the project area (Hammatt and Meeker 1979, Schilt 1984). The Historic Period marked a shift from separate single-function structures (i.e., separate male sleeping quarters, female sleeping quarters, and cooking structures) to single structures with multiple rooms (i.e., male rooms, female rooms, and kitchens under one roof) (Ladefoged 1991). Burials associated with Historic Period structures made from mortar and corrugated tin are present in the lower portions of the *kula* zone. Burials also occurred within residential platforms during the Historic Period (O’Hare and Wolforth 1998).

In 1823 Ellis (1916:47) observed small gardens among the barren rocks of Kailua on which numerous but scattered houses were built “wherever soil could be found sufficient to nourish the sweet potato, the water melon, or even a few plants of tobacco.” The project area is actually within the coastal portion of the so-called Kona Field System (Cordy 1995, Newman 1970, Schilt 1984) of North Kona. These fields extend north at least to Kaū Ahupua‘a and south to Honaunau, west to the coastline and east to the forested slopes of Hualālai (Cordy 1995). A significant portion of the fields is designated in the Hawai‘i Inventory of Historic Places as SIHP Site 50-10-37-6601 and has been determined eligible for inclusion in the National Register of Historic Places.

Long stone-and-earth field boundaries characterize the Kona Field System. This complex of agricultural fields has never been completely mapped or properly delineated, however. Moreover, Historic Period construction and land-alteration activities have obliterated and obscured large portions of this walled complex. Long walls that mainly run parallel with the slope, called *kuaiwi*, or backbone, typically define former agricultural fields within this field complex. Shorter walls intersect the *kuaiwi* walls in places, giving the field complex an overall grid-like appearance of narrow and elongated rectangles, typically perpendicular to the coast (Soehren and Newman 1968:5). Bearing in mind that the *kuaiwi* walls follow the slope they were very likely not intended to retain soil or water. Instead, they were more likely constructed to delineate plot boundaries and to receive rocks from cleared fields (Kirch 1985:228). Among the *kuaiwi* walls are also preserved stone mounds, terraces, enclosures, and a variety of habitation features (ibid. 230).

Judging from available radiocarbon dates, the most intensive phase of agricultural wall building occurred in the seventeenth to eighteenth centuries.

The emergence of a Euro-American style of land ownership accompanied religious and demographic changes between 1790 and 1840. The Great *Māhele* of 1848 defined the land interests of King Kamehameha III, the high-ranking chiefs, and low-ranking chiefs. The Land Commission awarded land to chiefs given the understanding that the traditional boundaries would prevail until such boundaries could be surveyed. Commoners received land known as *kuleana*.

During the Territorial Period (1900–1959) population declined and settlements diminished along the Kona coast. Coastal populations were concentrated in the small villages of Kailua and Keauhou. These contained residences with gardens and animal pens that were scattered along the shoreline. Upland habitation was associated with cultivation and ranching activities. As cattle pastures expanded into the lower elevations (in the vicinity of the current project area), more walls were built in the *kula* zone.

PREVIOUS WORK AND RESEARCH QUESTIONS

Summary of Previous Work

A total of eleven sites (25 features) were closely investigated during the Archaeological Inventory Survey (Clark and Rechtman 2003) (Table 2). Of the eleven sites (25 features) investigated, nine sites (15 features) were interpreted as habitation and one site (10 features) was interpreted as agricultural. Seven test units were excavated within the habitation features, whereas ten test units were excavated within the agricultural features. Two charcoal samples obtained from habitation features were submitted for radiocarbon assaying. The calibrated dates ranged between the sixteenth and twentieth centuries.

Table 2. Archaeological Inventory Survey sites, features, test units, and dates.

Site #	*Feature letter*	*TU #*	*Form of habitation feature*	*C-14 calibrated date range (AD)*
23670	A	-	Lower two-tiered platform	-
23670	B	12	Upper two-tiered platform	-
23670	C	-	Small platform	-
23671	A	-	Platform	-
23672	A	11	Rectangular enclosure	-
23672	B	13	Rounded enclosure	1510-1950
23673	A	17	Platform	-
23673	B	-	Enclosure	-
23674	A	-	Platform	-
23674	B	-	Circular enclosure	-
23675	A	20	Enclosed platform depression	-
23676	A	18	Platform	-
23677	A	16	Small platform in enclosure	1660-1950
23677	B	-	Rough enclosure	-
23678	A	-	Oval enclosure	-
n=9	n=15	n=7		n=2
Site #	***Feature #***	***TU #***	***Form of agricultural feature***	***C-14 calibrated date range (AD)***
23686	187	1	Mound	-
23686	189	2	Mound	-
23686	262	15	Mound	-
23686	266	19	Mound	-
23686	271	21	Mound	-

Continued on next page

Table 2. Continued.

Site #	*Feature #*	*TU #*	*Form of agricultural feature*	*C-14 calibrated date range (AD)*
23686	183	4	Modified outcrop	-
23686	201	5	Modified outcrop	-
23686	204	6	Modified outcrop	-
23686	239	8	Modified outcrop	-
23686	297	22	Modified outcrop	-
n=1	n=10	n=10		n=0

The following six functional categories have been tentatively assigned to features based on their size and items recovered (Table 3): permanent habitation (n=7), temporary habitation (n=7), unknown agricultural (n=6), agricultural clearing (n=3), planting area (n=1), and storage and/or trash facility (n=1).

Table 3. Archaeological Inventory Survey feature size, inferred function, and items.

Site	*Feature*	*Area m²*	*Function*	*Items recovered*
23670	A	55.8	Permanent habitation	*Cypraea* sp.
23670	B	10.2	Permanent habitation	-
23670	C	11.4	Permanent habitation	-
23671	A	26.2	Temporary habitation	-
23672	A	114.8	Permanent habitation	cow
23672	B	8.8	Storage/trash	shark, shell, *kukui* nutshell, charcoal, rodent, basalt, volcanic glass
23673	A	26.5	Permanent habitation	fish, *Cypraea* sp., coral, Echinoidea, *kukui* nutshell, charcoal, rodent, volcanic glass
23673	B	74.8	Permanent habitation	coral
23674	A	17.2	Temporary habitation	-
23674	B	18.1	Temporary habitation	-
23675	A	33.1	Permanent habitation	*Cypraea* sp., pig, charcoal, basalt
23676	A	18.0	Temporary habitation	fish, *Cypraea* sp. lure, shell, Echinoidea, pig, rodent, *kukui* nutshell, volcanic glass
23677	A	7.3	Temporary habitation	fish, shell, Echinoidea, coral, small mammal, charcoal, volcanic glass
23677	B	6.3	Temporary habitation	-
23678	A	20.0	Temporary habitation	-
23686	187	3.0	?	coral
23686	189	1.5	?	coral
23686	262	5.8	?	-
23686	266	2.9	?	-
23686	271	7.3	?	coral
23686	183	35.5	Planting area	-
23686	201	23.6	Agricultural clearing	-
23686	204	9.2	?	-
23686	239	10.0	Agricultural clearing	-
23686	297	18.0	Agricultural clearing	-

Research Objectives and Analytical Approaches

The primary research objective of this data recovery project is to assess a general hypothesis related to the timing and nature of Precontact land use within the project area, and the concomitant implications for the prehistory within the *kula* zone of Kona. This hypothesis is developed based on general information contained in the large corpus of reports prepared over the past thirty years for the Kona region, as well as the specific results of the inventory survey conducted on the property (Clark and Rechtman 2003).

Secondary research questions, related to the primary hypothesis, are also discussed, along with analytical approaches for assessing all of the research objectives.

Primary Hypothesis and Archaeological Implications

The sequence of Precontact land use within the study area (and the *kula* of Kona in general) is as follows: The first use was for short term habitation and associated opportunistic agriculture, followed by formal agriculture and associated recurrent habitation, then the end of the sequence is marked by more consistent habitation with associated household gardens and animal pens.

The archaeological implications of this hypothesis are many. Those sites that were interpreted as "permanent habitations" in the inventory study (Clark and Rechtman 2003) should postdate the sites interpreted as "temporary habitations," and exhibit the largest investment in construction and contain the widest range of artifact types and the greatest diversity of faunal remains. The temporary habitations should fall into two temporal categories, the earlier being less substantial in construction and contain the fewest artifacts and the least diverse faunal collection, reflective of short term use; the later being more substantial in construction and possessing a wider range of artifacts and a greater diversity of faunal remains, reflective of recurrent use. The recurrent use habitation sites are expected to temporally correlate with the majority of the agricultural features of Site 23686. The permanent habitations should spatially and temporally correlate with enclosure features used either for agriculture or animal husbandry.

A key analytical component for assessing the hypothesis and its implications is comparative analyses of recovered artifact assemblages and faunal collections from the habitation features, and correlating this information with the metric characteristics of the sites. Radiocarbon age determinations are also vital in establishing the contemporaneity of defined recurrent use habitation sites and the formal agricultural features (i.e., *kuaiwi* and terraces). Fifteen charcoal samples from both habitation and agricultural contexts were submitted for radiocarbon analysis. Together with the existing two radiocarbon dates from the test units, the total of radiocarbon assays from the project is seventeen.

An avenue of investigation specific to multi-component habitation sites is an assessment of the functional variability between features. Ethno-historic models suggest that habitation sites (Cordy 1981), and the "planter's homestead" (Handy and Handy 1972:290) contained several functionally different structures (i.e. common house, men's eating house, woman's eating house, sleeping houses, cooking house, etc.). This "idealized" living complex is termed *kauhale*. While this residential pattern may not have been strictly or universally adhered to, the underlying cultural rules are likely to have been practiced in varying degrees at most residential complexes. Therefore, there should be recognizable formal and material content differences between the different types of structures. This can be studied at the sites recorded in the study area. All of the features at these sites will be subject to subsurface investigation. An inter-feature comparative analysis of the recovered material and correlation with the features' formal attributes is used to identify potential functional differences between the site's features. Functional interpretations can then be proposed for the individual features based on the ethno-historic information.

Handy and Handy's (1991:290-300) account of a *kauhale* is based primarily on work that they conducted with Pukui in the district of Ka'ū in southern Hawai'i. For reasons of *kapu*, structures with different uses and/or occupied by people of different gender and/or rank were kept spatially separate. Within most household complexes sleeping was in common but males and females ate and worked separately. The following structures normally occurred within a *kauhale*: common house, men's house, women's *tapa* manufacturing structures, women's menstrual huts, a storage shed for crops and implements, and cooking sheds that were separated along gender lines. Apparently only a few households ever exhibited the full complement of structures, although sleeping and cook houses were probably present within most household complexes. What follows is an overview of the more ubiquitous structures and excavated items that can be expected to be associated with each.

The main structure within the household complex was the common house, or *hale noa*, in which all the family members slept at night. It was normally the largest building within a family compound and the most weatherproof. Its frame consisted of end posts upon which rested the ridgepole. There were also four corner

posts with side posts between them. Prior to thatching, the house frame looked like a great cage. In drier areas a low stone wall often formed the outside perimeter support of the thatched rafters. The house sometimes stood on a stone platform of varying size and thickness. This platform at times extended beyond the front of the house to provide a roof-less porch, or *lanai*. A single waist high doorway was usually placed in the center of the front wall. During dedication rituals for a new house, fish were placed under the threshold to keep away evil influences from outside. Hogs, dogs, and chicken were also consumed and discarded during this ritual consecration. Women did not eat pork or dog (e.g., Handy and Handy 1991:292). The sleeping area was normally against the back wall. It was raised slightly and covered with pebbles, dried vines, and leaf mats. It was in the mat-covered space between the sleeping area and the door where women sat weaving mats and where children played on rainy days. Light in the evening was from candles made of the oily *kukui* nuts. Bearing in mind that no food was supposed to be consumed within the *hale noa*, with the exception of the initial house dedication feast, excavated food residues should ideally be a reflection of what was consumed primarily during this feast. Pork and dog bones would be residues left by men, whereas everybody would have consumed shell fish, and *kukui* nutshell fragments most likely would have come from candles or as a delicacy during the dedication feast. Areas covered with mats might appear as voids, whereas food items could expect to accumulate near the wall, particularly in corners, and near the doorway.

In the vicinity of the main sleeping house was the men's house, or *hale mua*. Interestingly, the term *mua* also refers to the fore part, or bow, of a canoe, showing the pervasiveness of a seafaring mindset in Hawaiian culture. At least in historic times the men's house was smaller than the sleeping house. Within the *hale mua* men kept and worked on their tools, including adzes and files for making tools and weapons. No women were allowed within the men's quarters. Against the narrow back wall of the *hale mua* was the shrine of the family ancestor spirits, or *'aumakua*. This shrine often included an altar, or *kuahu*, that comprised a framework of poles supporting a shelf on which was an image of the family ancestor. Shrines could also simply be an upright stone. At the time of the main meal, once a day, the family head placed the slightly narcotic *'awa* liquid on the altar while praying to the family ancestors. On special occasions, such as prior to heavy work or fighting, the men would sleep in the *hale mua*, for intercourse with women was *kapu* at such times. Near the men's house was the oven, or *imu*, where the men cooked their food. Considered overall then, material traces of a *hale mua* would include fragments of basalt adzes, pumice abraders, bone and shell fishing and cultivation gear. Food residues within *hale mua* can be expected to be denser than those from the sleeping house, including pig and dog bones. Upright stones and/or special food residues and coral at one end of the structure could be remnants associated with a shrine.

Cooking areas, as indicated by pits or stone-lined hearths, seemingly occurred on different sides of the house dwelling, or close to the spatially separate activity areas of men and women. Women did their bark cloth, or *tapa*, making in the *hale ku'a*, where strips of bark were processed and stored. These were often raised stone platforms without a roof, the implements being stored inside cupboard-like hollows within the platforms. The structures were apparently somewhat separate from the main house complex as it was *kapu* for men to touch the tools of *tapa* processing. Instruments that are associated with bark cloth processing include wooden beaters that are sometimes preserved within their storage spaces in the drier areas of Hawai'i. The menstrual hut, or *hale pe'a*, was even more remote than the *tapa* processing locales, to ensure that "impure" women during their menses did not come into contact with men. Women who were not menstruating took food to the secluded menstruating women. Remains associated with *kapa* production locales and menstrual huts are expected to be limited and restricted to certain spots, and would include beaters, abraders, and certain shellfish.

Close to the cultivated fields, a farmer would have had a stout storage shed, or *hale papa'a*. This shed served as a storehouse for crops, a place to keep digging sticks, and cuttings of taro, sweet potato, and sugar cane for replanting. Cultivators also used this shed as a shelter during bad weather. Due to the perishable nature of cultivation-related tools and foodstuffs, storage sheds are not expected to contain many items, unless a fire has carbonized and preserved some of the plants and implements from decay.

It is worth noting that according to Handy and Handy, point features on the landscape, such as fresh water sources or protected bays, typically facilitated inter-*kauhale* clustering and intra-*kauhale* nucleation. In the *kula* zone of the project area where such naturally occurring nodes were ostensibly absent, *kauhale*

would likely have been dispersed, often with some distance separating neighboring *kauhale* (Handy and Handy 1991:284). Also, a *kauhale* associated with dispersed agricultural activities can be expected to lack the more clearly discernable internal structured relationship between different features found within those *kauhale* that were centered on bays, for example.

Secondary Research Objectives

Refining the nature of habitation sites

Refined assessments of site and feature function have been problematic at best in Hawaiian archaeology. This is particularly so when attempting to assess the nature of presumed habitation features. Nearly thirty years ago a rigid dichotomy of habitation sites types (permanent/temporary) was formally established along with the criteria for distinguishing between temporary versus permanent habitations (Cordy 1978), then later revised (Cordy 1981). The model that resulted is based on a set of co-varying surface observable attributes: form, size; substantiveness of construction; internal features (single versus multiple fire hearths); associated structures; and geographic context. Although criticized (Kirch 1983, 1985) and elaborated on (Clark 1987), the basic elements of Cordy's model have remained in use over years of testing (literally hundreds of studies have used the key variables for interpreting temporary and permanent habitation sites), and codified in the recently signed Administrative Rules (HAR 13§13-275) that govern the historic preservation review process.

Using the criteria of form, size, internal features, and associated structures contained in the Cordy model, three of the sites that are the focus of this data recovery study would be interpreted as permanent habitations; however, the geographic context and substantiveness of construction are not what is expected for a permanent habitation. Further, the qualitatively assessed amount of habitation debris (recovered from testing and seen on the surface) does not seem to be enough for permanent habitation; thus all of these sites are presently interpreted as temporary. It is the criteria for making this interpretation (and thus the utility of the continued use of the orthodox version of the Cordy model) that will be addressed in the data recovery investigation.

One criterion used by Clark (1987) for assessing permanence of habitation sites, which was not a consideration of Cordy's model, was that of abundance and diversity of accumulated habitation debris. Clark did not provide a measurable distinguishing threshold, however, quantity and diversity of habitation debris can be a qualitative measure (an impression). As stated elsewhere (Rechtman 2002), and in the process of being demonstrated (based on data recovery investigations at several sites in both South Kona, and North Kona), that if further developed, some measure of the quantity and diversity of faunal material present within a site can be a powerful tool in assessing permanence of habitation. When a site is excavated, volumetric data can be generated with respect to the quantity of habitation debris. These measures can then be statistically analyzed to identify patterning, which can then be tested against the normative criteria contained in Cordy's model. Likewise, the diversity of species present in the faunal collection can be used as a measure of habitation permanence. This is based on the logical assumption that faunal assemblages from temporary habitations will be less diverse than those from permanent habitations. A diversity index can be generated based on number of species present given a particular volume of excavated sample. Both of these measures might also ultimately prove useful, in conjunction with an examination of other formal feature attributes and recovered artifactual material, in assessing the status of the site residents, through comparisons of inter- and intra-site variability and distribution analyses. It is recognized that environmental conditions and site taphonomy can greatly effect preservation of material remains, and thus their accurate reflection of past behaviors.

Refining the age estimate and functional interpretation of agricultural features

As the subsurface examination of mounds and modified outcrops during the inventory survey (Clark and Rechtman 2003) yielded very little information, the focus of data recovery at SIHP Site 23686 included the other four recorded features types; *kuaiwi*, terraces, enclosures, and pavement.

Cross-sections through three *kuaiwi* (Features 17, 82, and 291) and through the rock facings of six terraces (Features 81, 185, 212, 247, 254, and 286) were excavated by hand in an attempt to document

potential successive build episodes, the relationship between the rock feature and the underlying soil, and to recover charcoal samples for radiocarbon analysis.

Three enclosures (Features 251, 293, and 294) were also excavated. As a result of the inventory survey (Clark and Rechtman 2003) these sites were interpreted to be associated with agricultural activities as opposed to having served as animal pens or habitations. This interpretation will be tested through data recovery, as will the identification and characterization of any soil deposits. The stratigraphy of the soil deposits will be recorded and soil and radiocarbon samples collected for laboratory analyses.

Three pavements were recorded during the inventory survey (Clark and Rechtman 2003), all in the *mauka* third of the study area. This feature type represents only about one percent of the feature types recorded at SIHP Site 23686. Rechtman et al. (2001) formally defined this specialized agricultural feature type as a stone surfaced area, level with the surrounding ground surface on at least one side. Pavements are generally constructed against or into sloping terrain, and are then filled with stones to create a relatively flat surface. Pavements come in many shapes (including square, rectangular, and irregular) and sizes. The outside edges of a pavement may be piled or stacked (piled edges are sloped, while stacked edges are generally vertical). Small (cobble to gravel size) stones are generally used as the fill material. In the absence of excavation data, pavements were functionally described as specialized features associated with agricultural activity (possibly for staging and processing agricultural products). It is also possible that pavements served as locations of temporary habitation, or were used simply for sleeping (a use defined here as distinct from habitation).

All three of the recorded pavements (Features 250, 282, and 289) were excavated. The analytical criteria used to interpret the pavements as plant processing activity features was a combination of an abundance of volcanic glass flakes, and a paucity of faunal remains. The characteristics that distinguished the pavement features as loci of habitation were the presence of faunal remains and the identification of a hearth or hearths (hearth features would not be expected to occur within the pavements if they were used for plant processing or drying). If these features were used simply for sleeping then very little or no surface or subsurface cultural material would be present. Based on architectural and artifact similarities with excavated pavements/platforms elsewhere on the island, it could be that some of the more elaborately paved structures represent *heiau*, or shrines.

DATA RECOVERY METHODS

Excavation Units

This section presents a site-by-site accounting (in table form) of the data recovery excavation units and a description the excavation techniques. Table 4 lists the hypothesized habitation sites and the number and configuration of the excavation units. Table 5 lists the excavated features and the unit configuration at the agricultural Site SIHP 23686.

Table 4. Excavation sample size per habitation site and feature.

SIHP No.	*Total m^2*	*Unit Number and Configuration*
23670 Feature A	8	EU-31 (2 x 2m), EU-32 (2 x 2m)
23670 Feature B	2	TU-12 (1 x 1m), EU-34 (1 x 1m)
23670 Feature C	1	EU-33 (1 x 1m)
23671	4	EU-4 (2 x 2m)
23672 Feature A	6	TU-11 (1 x 1m), EU-2 (1 x 1m), EU-3 (2 x 2m)
23672 Feature B	3	TU-13 (1 x 1m), EU-1b (2 x 1m)
23673 Feature A	5	TU-17 (1 x 1m), EU-27 (1 x 2m), EU-28 (1 x 2m)
23673 Feature B	4	EU-29 (2 x 2m), EU-30 (2 x 2m)

Continued on next page

Table 4. Continued.

SIHP No.	*Total m^2*	*Unit Number and Configuration*
23674	5	EU-6 (2 x 2m), EU-7 (1 x 1m)
23675	7	TU-20 (1 x 1m), EU-9 (2 x 1m), and EU-10 (2 x 2m)
23676	5	TU-18 (1 x 1 m), EU-21 (2 x 2m)
23677 Feature A	2	TU-16 (1 x 1m), EU-22 (1 x 1m)
23677 Feature B	4	EU-23 (2 x 1m), EU-24 (2 x 1m)
23678	4	EU-14 (2 x 1m), EU-15 (2 x 1m)

Table 5. Features of SIHP Site 23686 subject to data recovery excavation.

Feature Type	*Feature No.*	*Unit Number and Configuration*
Mound	187	TU-1 (1 x 1m)
Mound	189	TU-2 (1 x 1m)
Mound	262	TU-15 (1 x 1m)
Mound	266	TU-19 (1 x 1m)
Mound	271	TU-21 (1 x 1m)
Modified outcrop	183	TU-4 (1 x 1m)
Modified outcrop	201	TU-5 (1 x 1m)
Modified outcrop	204	TU-6 (1 x 1m)
Modified outcrop	239	TU-8 (1 x 1m)
Modified outcrop	297	TU-22 (1 x 1m)
Kuaiwi	17	EU-37 (2 x 1m)
Kuaiwi	82	EU-26 (2 x 1m)
Kuaiwi	291	EU-13 (2 x 1m)
Terrace	81	EU-25 (2 x 1m)
Terrace	185	EU-1a (2 x 1m)
Terrace	212	EU-38 (2 x 1m)
Terrace	247	EU-5 (2 x 1m)
Terrace	254	EU-12 (2 x 1m)
Terrace	286	EU-16 (2 x 1m)
Enclosure	251	EU-8 (2 x 2m)
Enclosure	293	EU-36 (2 x 1m)
Enclosure	294	EU-37 (2 x 1m)
Pavement	250	EU-11 (2 x 2m)
Pavement	282	EU-17 (2 x 1m), EU-18 (2x2m)
Pavement	289	EU-19 (2 x 2m), EU-20 (2 x 2m)

Prior to sub-surface testing, all sites were adequately cleared of vegetation and photographed. Also, scaled plan views were drawn, or updated from the inventory survey (Clark and Rechtman 2003) for each site and feature to show the placement of the excavation units. All excavation units were dug by hand following natural stratigraphic layers divided into 10-centimeter arbitrary levels. The arbitrary levels were measured relative to an elevation datum corresponding to the highest corner of the excavation unit. All excavated matrix were passed through quarter inch mesh screening and cultural material were collected and segregated by level. Level Record Forms were completed for each excavated level. Subsurface features encountered during excavation were fully documented before further excavation of the unit. Excavation was continued down to bedrock. Upon completion of the excavation unit, a Unit Summary Form was completed, photographs were taken, a stratigraphic profile was drawn, and the unit was backfilled.

Cultural Material Analyses

All recovered cultural material was processed in the Rechtman Consulting, LLC laboratory facility. Items were cleaned, weighed, counted, described, and entered into a master project catalog (Appendix A). Where appropriate, artifacts were drawn, photographed, and subjected to further detailed analysis. Faunal remains were tabulated and identified to the lowest taxonomic level possible. Where applicable, the Number of

Identified Specimens (NISP) and the Minimum Number of Individuals (MNI) were determined. Based on evidence from test excavations (Clark and Rechtman 2003) these sites are poor candidates for pollen and flotation (macrobotanical) analyses. Charcoal and other organic samples were prepared for possible radiocarbon analysis.

Radiocarbon Samples

The radiocarbon samples collected during fieldwork were prioritized based on size, provenience, and integrity of association. Priority was given to large single-piece samples recovered in situ from a clear stratigraphic context. All samples were cataloged and initially cleaned and weighed in the Rechtman Consulting, LLC laboratory facility. Following this process, selected samples were sent to Beta Analytic Inc for analysis (Appendix B). Conventional radiocarbon analysis coupled with a calculation of stable isotope ratios (C^{13}/C^{12}) were used for all samples.

Curation of Recovered Archaeological Material

All items recovered during data recovery are temporarily stored at the Rechtman Consulting, LLC curation facility for a period of no more than one year following submission of the final data recovery report, during which time arrangements will be made for permanent curation in consultation with the landowner and DLNR-SHPD. It is the responsibility of the landowner to secure permanent curation in an acceptable facility; included in this responsibility are the costs associated with long-term curation.

DESCRIPTION OF EXCAVATION RESULTS

Introduction

The following description considers together the results from the test units and from the excavation units. The results are presented generally in the sequence of the SIHP Site numbers and feature numbers. The description of the results include site and feature location, size, shape, make-up, stratigraphy, identification and number of recovered items by layer and level, and radiocarbon assays where charcoal samples were analyzed by Beta Analytic. Whereas the items recovered are merely listed in table format within this descriptive section, the identification, weight, distribution, and likely exploitation zones of items are discussed afterwards within the synthesis section.

SIHP Site 23670

Site 23670 is a stone platform complex located in the western half of the project area approximately 30 meters north of the eastern end of Site 23667 (see Figure 3). Site 23670 consists of a two-tiered platform (Features A and B) with a second smaller platform (Feature C) located two meters to the east (Figure 4). Both platforms are constructed of *ʻaʻā* with large cobbles stacked around the outside edges and small cobbles paving the surface. A single *Cypraea* shell fragment was found on ground surface near the south edge of Feature A.

Feature A

Feature A is the lower platform of the two-tiered platform (see Figure 4). This roughly rectangular platform measures 9.0 meters long by 6.2 meters wide. The feature is constructed on bedrock with the outside edges stacked 70 centimeters (two courses) high. The paved surface of Feature A is relatively level and in good condition, although some collapse has occurred along the south and west edges (Figure 5). Two excavation units (EU-31 and EU-32) were placed on the Feature A platform. EU-31 (2 x 2m) was placed near the eastern corner of Feature A, while EU-32 (2 x 2m) was placed near the center of the same feature.

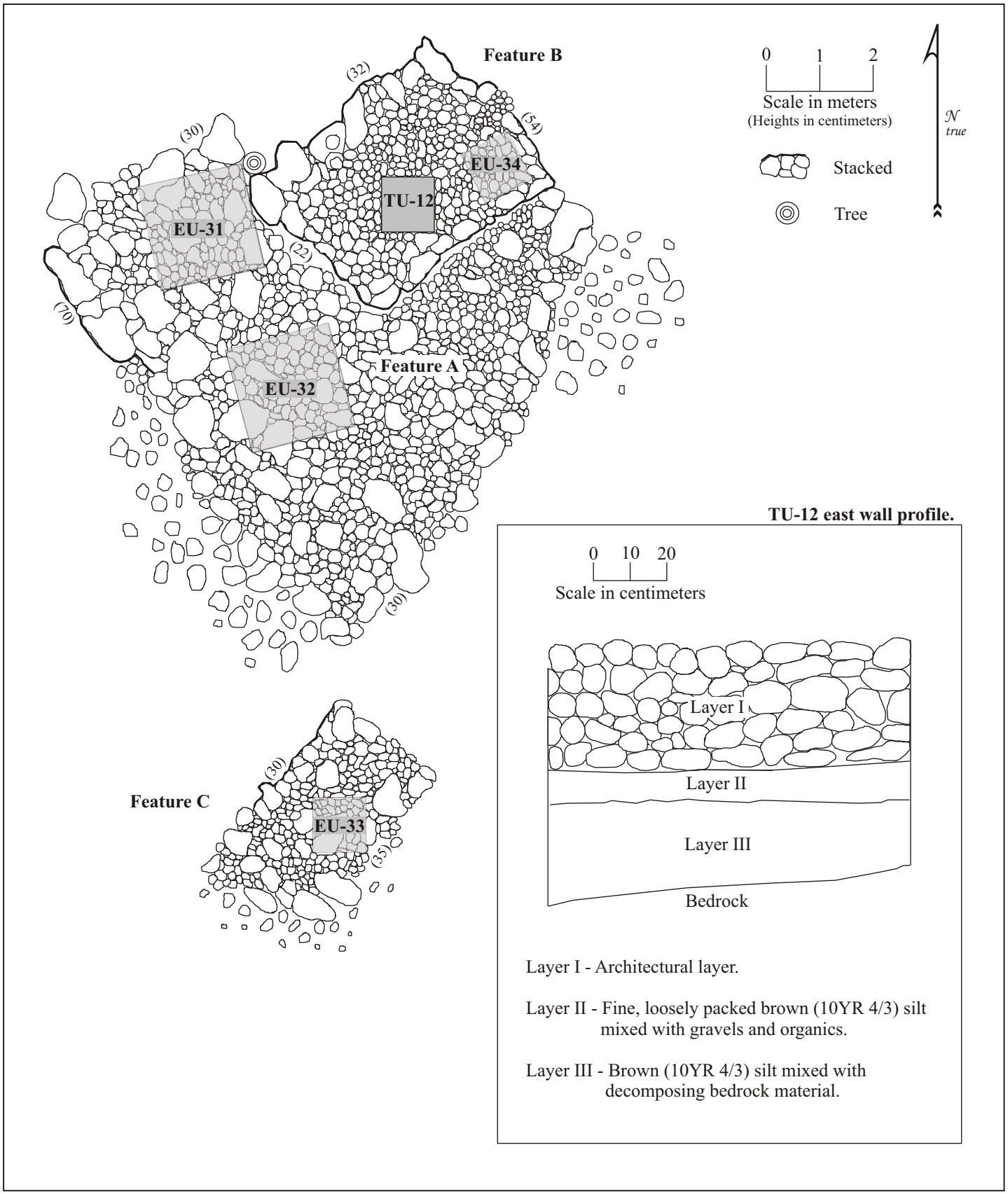


Figure 4. SIHP Site 23670 Features A-C plan view and TU-12 east wall profile.

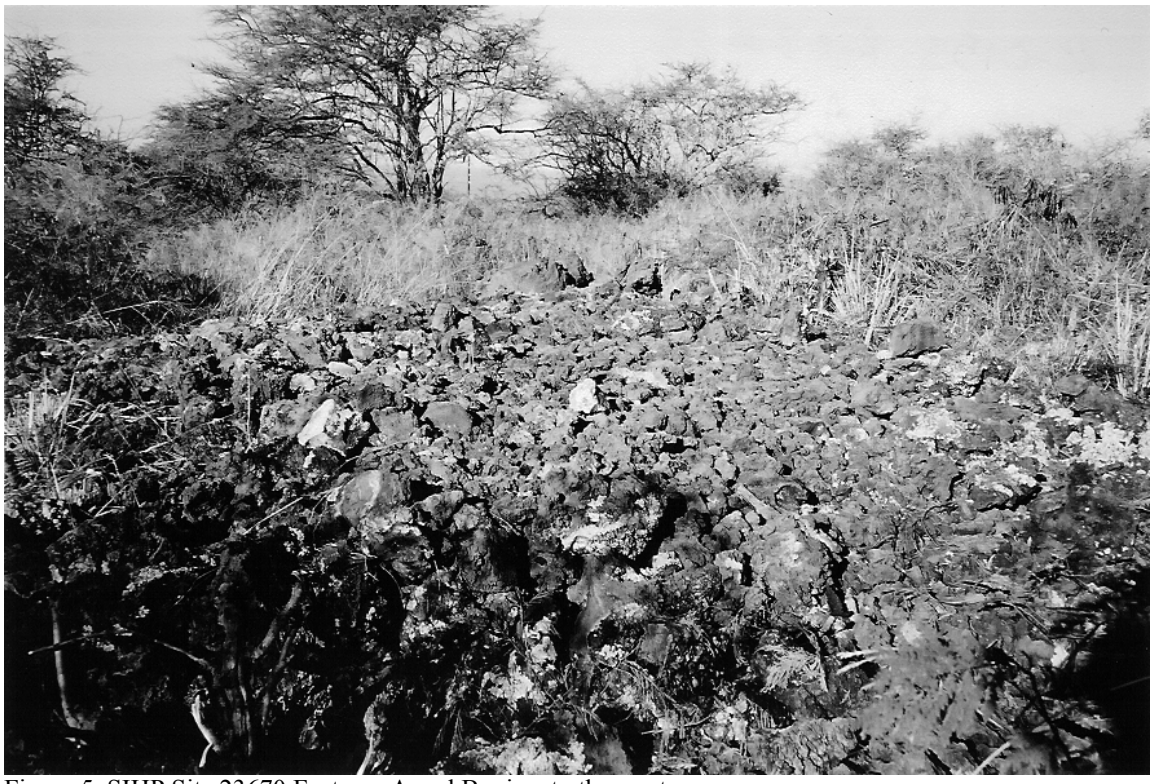


Figure 5. SIHP Site 23670 Features A and B, view to the west.

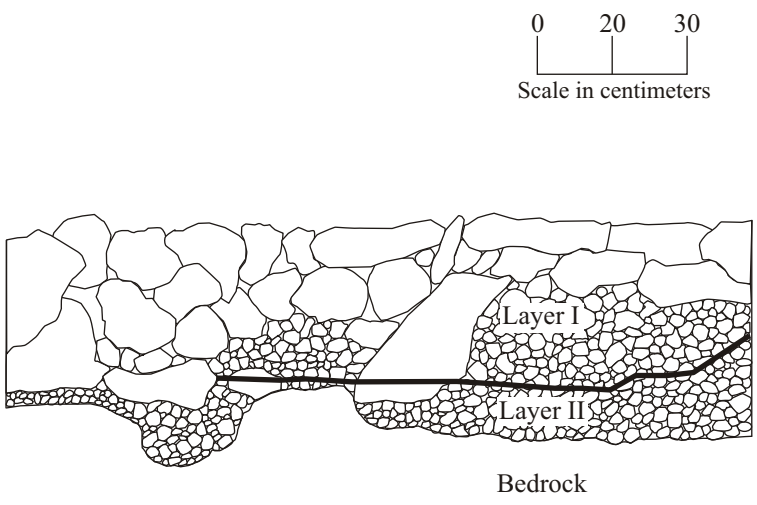
EU-31 revealed the following stratigraphic profile (Figures 6 and 7):

Layer I (0-30cmbs)..... architectural layer with small to large *ʻaʻā* cobbles and boulders.

Layer II (30-50cmbs) ..... pebble and cobble layer with dark yellowish brown (10YR 4/4) silt in northeastern corner and very dark grayish brown (10YR 3/2) silt in southeastern corner on undulating bedrock.

Items recovered from EU-31 include *Cypraea* sp., Echinoidea, *kukui* nutshell, and charcoal (Table 6). Historic Period items, all recovered from Layer I, include a glass fragment, iron fragments, and two brass button parts. The brass button parts (Acc# 516 and 517) appear to go together (both came from the same provenience and each weigh 0.8 grams). The size and shape of the buttons differ slightly, however. Brass button part Acc# 516 is a flat round disk with a diameter of 23.5 millimeters and thickness of 0.3 millimeters. Brass button part Acc# 517 (Figure 8) is a slightly convex disk with one hole in the middle and incised with a crown and "warranted fast shank." This brass button is slightly oval (31.3 millimeters long by 20.9 millimeters wide) and is comparatively thick (1.9 millimeters).

Figure 6. SIHP Site 23670 Feature A EU-31 showing Layer I and upright boulders, view to the south.



Layer I - Architectural layer.

Layer II - Predominantly pebble and cobble layer with dark yellowish brown (10YR 4/4) silt in northeastern corner and very dark grayish brown (10YR 3/2) silt in southeastern corner.

Figure 7. SIHP Site 23670 Feature A EU-31 west wall profile.

Figure 8. SIHP Site 23670 brass button part recovered from EU-31 (Acc#. 517).

Table 6. Recovered items from SIHP Site 23670, Feature A, EU-31.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
512	I	1	Marine shell	*Cypraea* sp.	3	1	3.3
515	I	1	Echinoderm	Echinoidea	7	-	0.6
511	I	1	Organic	*Kukui* nutshell	14	-	6.8
510	I	1	Organic	Charcoal	-	-	0.4
513	I	1	Metal	Iron fragments	4	-	0.9
516	I	1	Metal	Brass button part	1	-	0.8
517	I	1	Metal	Brass button inscribed	1	-	0.8
514	I	1	Glass	Brown bottle fragment	1	-	0.4
				Layer I, Level 1 Total:	31	1	14.0
519	II	1	Echinoderm	Echinoidea	2	-	0.1
520	II	1	Organic	*Kukui* nutshell	7	-	2.1
518	II	1	Organic	Charcoal	-	-	0.2
				Layer II, Level 1	9	-	2.4
				EU-31 Total:	40	1	16.4

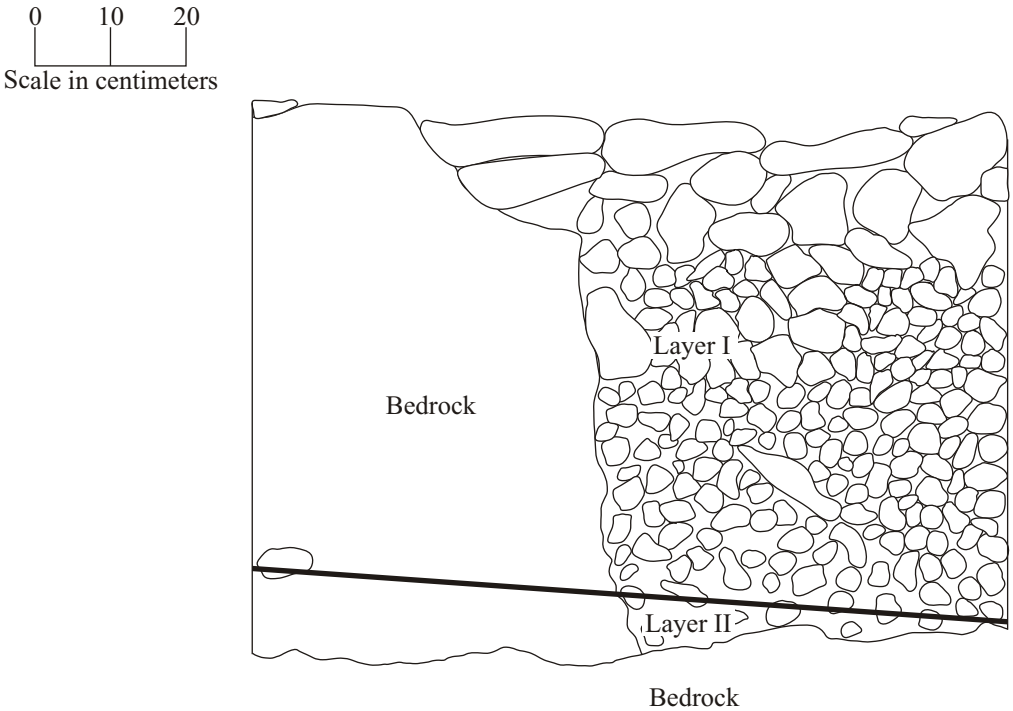
EU-32 contained the following stratigraphic profile (Figures 9 and 10):

Layer I (0-60cmbs)..... architectural layer with *ʻaʻā* cobbles.

Layer II (60-70cmbs) ..... pebble and cobble layer with brown (10YR 3/3) silt in southeastern corner.

Items recovered from EU-32 include *kukui* nutshell fragments and brown bottle glass (Table 7).

Figure 9. SIHP Site 23670 Feature A EU-32 base of excavation, view to the west.



Layer I - Architectural layer.

Layer II - Predominantly pebble and cobble layer with brown (10YR 3/3) silt in southeastern corner.

Figure 10. SIHP Site 23670 Feature A EU-32 north wall profile.

Table 7. Recovered items from SIHP Site 3670, Feature A, EU-32.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
522	I	1	Organic	*Kukui* nutshell	2	-	0.5
521	I	1	Glass	Bottle/brown	1	-	0.7
				EU-32 Total:	3	0	1.2

Feature B

Feature B, the upper platform of the two-tiered platform (see Figure 4), is situated on the northeast corner of Feature A. Feature B is rectangular in shape measuring 3.4 meters long by 3.0 meters wide. The stacked edges rise as much as 30 centimeters (2 courses) above the surface of Feature A and 54 centimeters above the bedrock ground surface. Test Unit 12 (TU-12) was excavated near the central portion of Feature B, whereas Excavation Unit 34 (EU-34) was excavated near the eastern corner of Feature B.

Excavation of TU-12 (1 x 1m) revealed the following stratigraphic profile (see Figure 4):

Layer I (0-35cmbs)..... architectural layer with small to large *ʻaʻā* cobbles and boulders.
Layer II (35-45cmbs) ..... fine loosely packed brown (10YR 4/3) silt mixed with gravels and organics.
Layer III (45-70cmbs)..... brown (10YR 4/3) silt mixed with decomposing bedrock on bedrock.

No cultural material was recovered from TU-12.

The surface of Feature B on which EU-34 was placed had a pavement of pebbles and cobbles. The surface sloped to the south, probably due to collapsed stacking on this side of Feature B. EU-34 (1 x 1m) revealed the following stratigraphic profile (Figures 11 and 12):

Layer I (0-60cmbs)..... architectural layer with large and small *ʻaʻā* cobbles and pebbles.
Layer II (60-80cmbs) ..... loose *ʻaʻā* on uneven bedrock.

The only item recovered within EU-34 is 0.4 grams of charcoal (Acc# 523) in Layer II.

Figure 11. SIHP Site 23670 Feature B EU-34 base of excavation, view to the east.

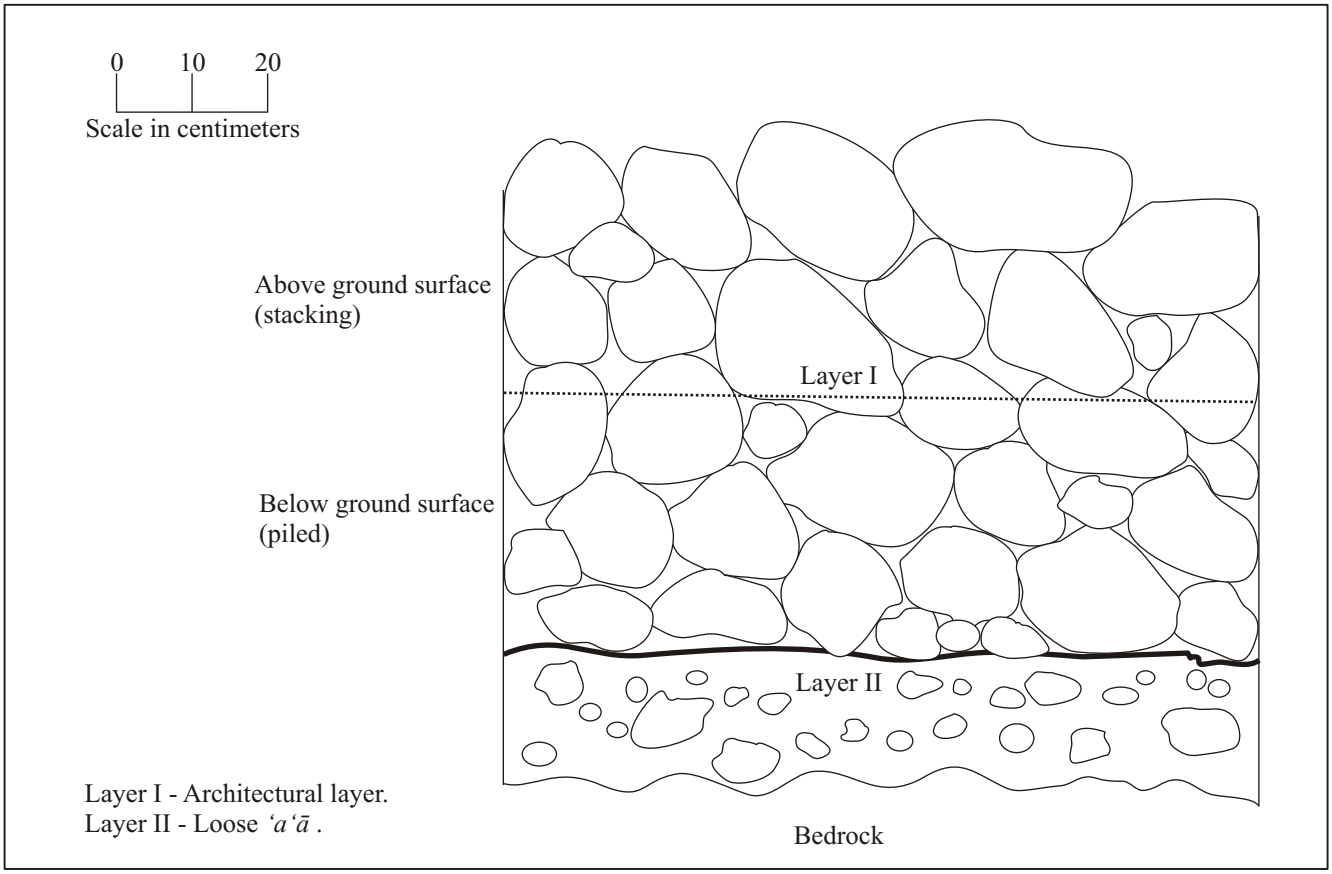


Figure 12. SIHP Site 23670 Feature B EU-34 east wall profile.

Feature C
Feature C is a small rectangular platform located 1.5 meters south of Feature A's southwestern corner (see Figure 4). Feature C measures 3.8 meters long by 2.5 to 3.1 meters wide (including some collapsed cobbles that are scattered along the southeast side of the feature) with stacked sides standing up to 35 centimeters (1 to 2 courses) above the surrounding bedrock ground surface. Feature C is in relatively good condition, although portions of its southwestern edge have collapsed. No habitation debris was observed in the vicinity of this feature. EU-33 was placed on the southeastern side of the rough *ʻaʻā* pavement, within a slight depression.

Excavation of EU-33 (1 x 1m) contained the following stratigraphic profile (Figures 13 and 14):

Layer I (0-50cmbs)..... architectural layer with large and small *ʻaʻā* cobbles and pebbles.
Layer II (50-60cmbs) ..... brown (10YR 4/3) silt and clay mixed with organics and decomposing *ʻaʻā* bedrock.

No cultural material was recovered from EU-33.

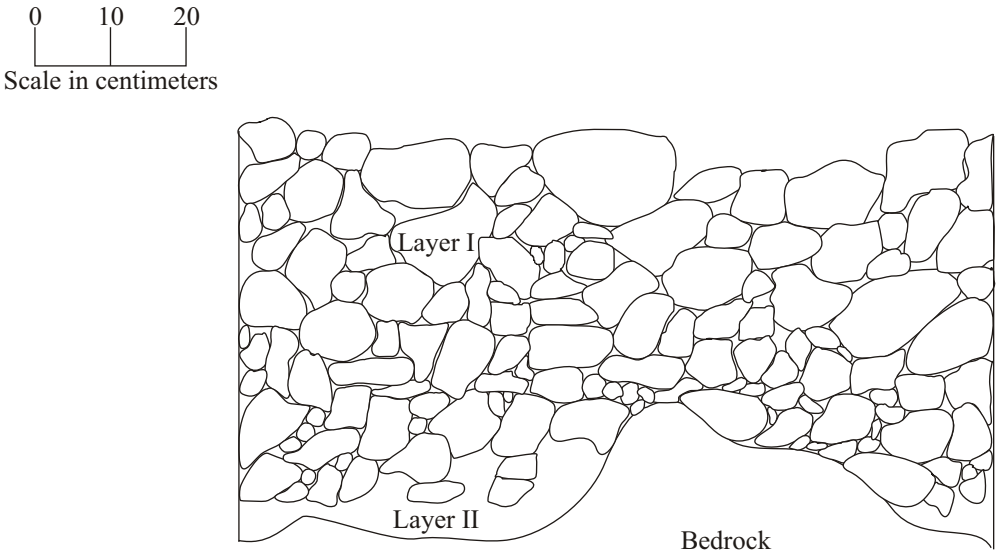
SIHP Site 23671

Site 23671 is a platform remnant located in the central portion of the project area (see Figure 3). The platform (Figure 15), constructed of *ʻaʻā* cobbles, is largely collapsed although some stacking remained along the western edge. Current platform dimensions are 6.9 meters (north/south) by 3.8 meters (east/west) including the rubble scatter that surrounds the feature. The stacked western edge of the site is 90 centimeters above the surrounding bedrock surface. The surface of the platform is relatively level and paved primarily with small *ʻaʻā* cobbles, although some larger cobbles are present. Site 23671 seems to have been heavily disturbed by ranching activities in the area. No habitation debris was observed on ground surface at this site. During data recovery EU-4 was placed immediately south of the feature's center (Figure 16).

Excavation of EU-4 (2 x 2m) revealed the following stratigraphic profile (Figures 17 and 18):

Layer I, Level 1 (0-40cmbs).....architectural layer with *ʻaʻā* boulders and cobbles.
Layer I, Level 2 (40-65cmbs) *ʻaʻā* cobbles with dark grayish brown (10YR 3/2) silt.
Layer II, Level 1 (65-90cmbs) ..... *ʻaʻā* cobbles with brown (10YR 4/3) silt.
Layer II, Level 2 (90-100cmbs) ..... *ʻaʻā* cobbles with brown (10YR 4/3) silt.
Layer II, Level 3 (100-110cmbs) ....exfoliating bedrock with *ʻaʻā* cobbles and dark yellowish brown (10YR 3/4) silt and rootlets.

Figure 13. SIHP Site 23670 Feature C EU-33 base of excavation, view to the south.



Layer I - Architectural layer.

Layer II - Brown (10YR 4/3) silt and clay mixed with organics and decomposing *ʻaʻā* bedrock.

Figure 14. SIHP Site 23670 Feature C EU-33 south wall profile.

Figure 15. SIHP Site 23671, view to the north.

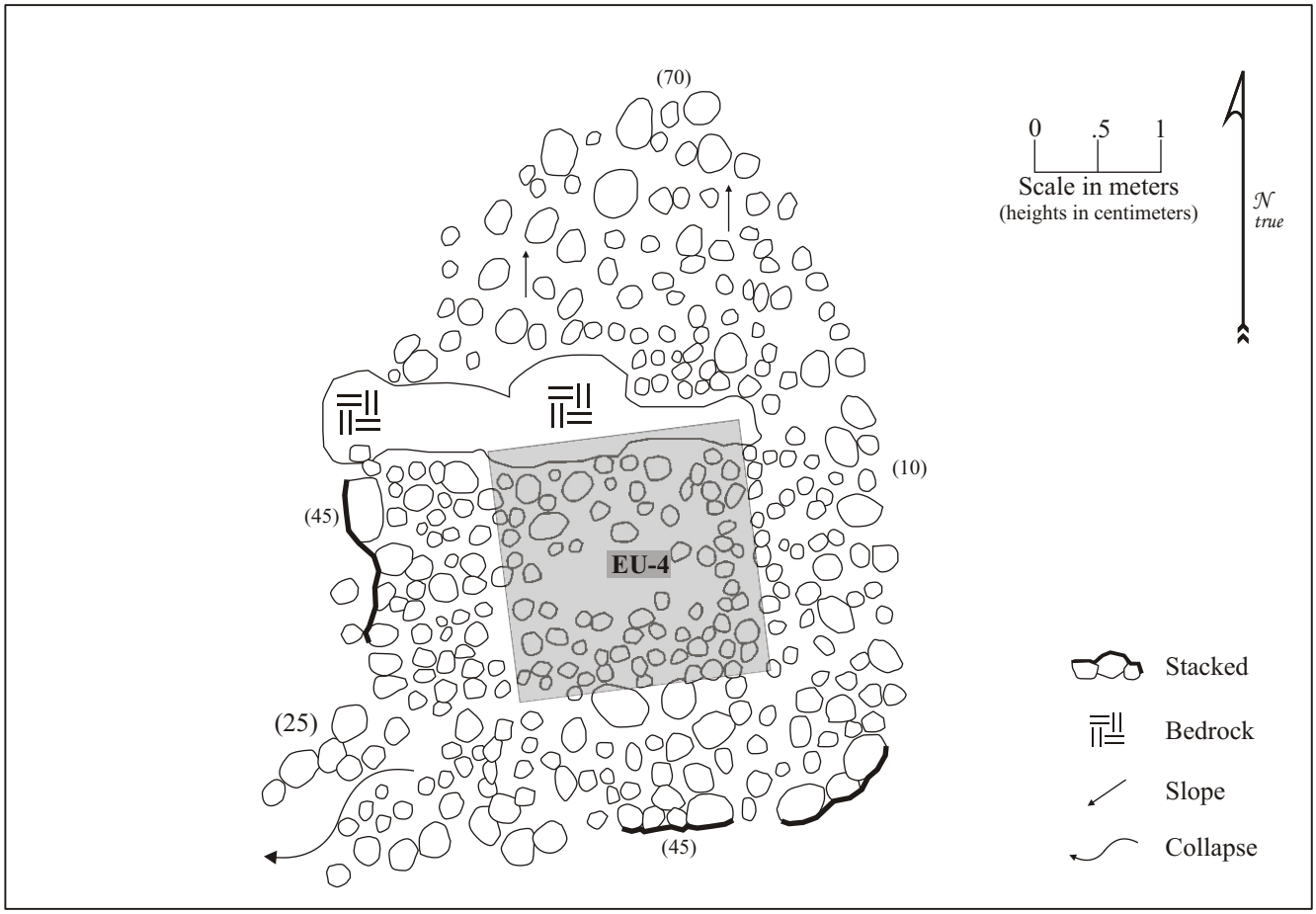
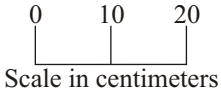
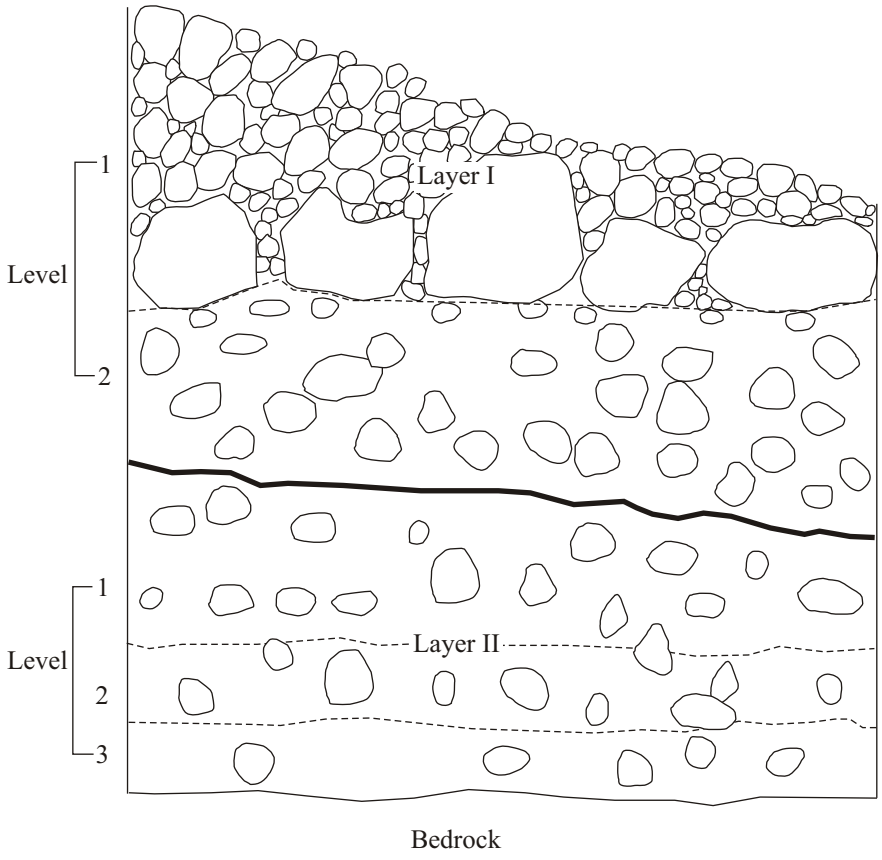


Figure 16. SIHP Site 23671 plan view.

Figure 17. SIHP Site 23671 EU-4 base of excavation, view to the east.





Layer I, Level 1- Architectural layer with *ʻaʻā* boulders and cobbles.

Layer I, Level 2- *ʻAʻā* cobbles with dark grayish brown (10YR 3/2) silt.

Layer II, Level 1- *ʻAʻā* cobbles with brown (10YR 4/3) silt.

Layer II, Level 2- *ʻAʻā* cobbles with brown (10YR 4/3) silt.

Layer II, Level 3- Exfoliating bedrock with *ʻaʻā* cobbles and dark yellowish brown (10YR 3/4) silt.

Figure 18. SIHP Site 23671 EU-4 south wall profile.

Items recovered from EU-4 include *Cypraea* sp. shell, *Drupa* sp., *Morula* sp., *Isognomon* sp., *Nerita* sp., branch coral, Echinoidea, *Turbo* sp., *Brachidontes* sp., *Conus* sp., unidentifiable shell, rodent, charcoal, a basalt flake, and volcanic glass flakes (Table 8). A volcanic glass flake (Acc# 187) that shows signs of working on one edge is 17.9 millimeters long, 14.2 millimeters wide, and 3.3 millimeters thick. No obvious changes or trends in species or artifact types recovered from different layers could be detected.

Table 8. Recovered items from SIHP Site 23671, EU-4.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
7	I	1	Marine shell	*Cypraea* sp.	3	2	6.8
8	I	1	Coral	Waterworn	2	-	3.2
9	I	1	Echinoderm	Echinoidea	1	-	0.4
				Layer I, Level 1 Total:	6	2	10.4
12	I	2	Marine shell	*Cypraea* sp.	17	4	14.6
16	I	2	Marine shell	*Drupa* sp.	1	1	0.7
14	I	2	Marine shell	*Morula* sp.	3	3	2.7
18	I	2	Marine shell	*Isognomon* sp.	14	4	1.6
17	I	2	Marine shell	*Nerita* sp.	1	1	0.4
21	I	2	Marine shell	*Turbo* sp.	1	1	0.5
19	I	2	Marine shell	*Brachiodontes* sp.	50	10	3.4
15	I	2	Marine shell	*Conus* sp.	1	1	1.5
22	I	2	Marine shell	Unidentified	3	-	0.4
20	I	2	Echinoderm	Echinoidea	167	-	13.5
13	I	2	Mammal bone	Unidentified rodent	1	-	0.3
11	I	2	Basalt	Flake	1	-	5.7
10	I	2	Organic	Charcoal	-	-	1.6
				Layer I, Level 2 Total:	260	25	46.9
27	II	1	Marine shell	*Cypraea* sp.	24	4	18.0
25	II	1	Marine shell	*Isognomon* sp.	80	30	4.2
26	II	1	Marine shell	*Brachidontes* sp.	58	14	3.8
187	II	1	Volcanic glass	Flake worked	1	-	1.0
24	II	1	Volcanic glass	Flake	1	-	0.5
23	II	1	Organic	Charcoal	-	-	0.5
				Layer II, Level 1 Total:	164	48	28.0
29	II	2	Marine shell	*Cypraea* sp.	1	1	2.4
32	II	2	Marine shell	*Drupa* sp.	5	2	4.1
31	II	2	Marine shell	*Conus* sp.	1	1	2.2
30	II	2	Coral	Waterworn	1	-	0.6
28	II	2	Echinoderm	Echinoidea	208	-	14.2
				Layer II, Level 2 Total:	216	4	23.5
				EU-4 Total:	646	79	108.8

Charcoal collected from Layer I, Level 2 in EU-4 was submitted for radiocarbon assaying. The sample (Beta-212756) intercepts the tree-ring calibration curve at AD 1490 and has a 2-sigma standard deviation calibrated date range of AD 1440 to 1640.

SIHP SITE 23672

Site 23672 is centrally located within the project area (see Figure 3). The site consists of a large rectangular enclosure (Feature A) with a small rectangular enclosure (Feature B) located six meters to its south (Figure 19). Bulldozing activity along the old central access road came close to impacting the north edge of Feature A and may have covered a third feature near its northwest corner. Two test units (TU-11 and TU-13), one in each feature, were excavated at Site 23672. Two additional excavation units (EU-2 and EU-3) were completed in Feature A.

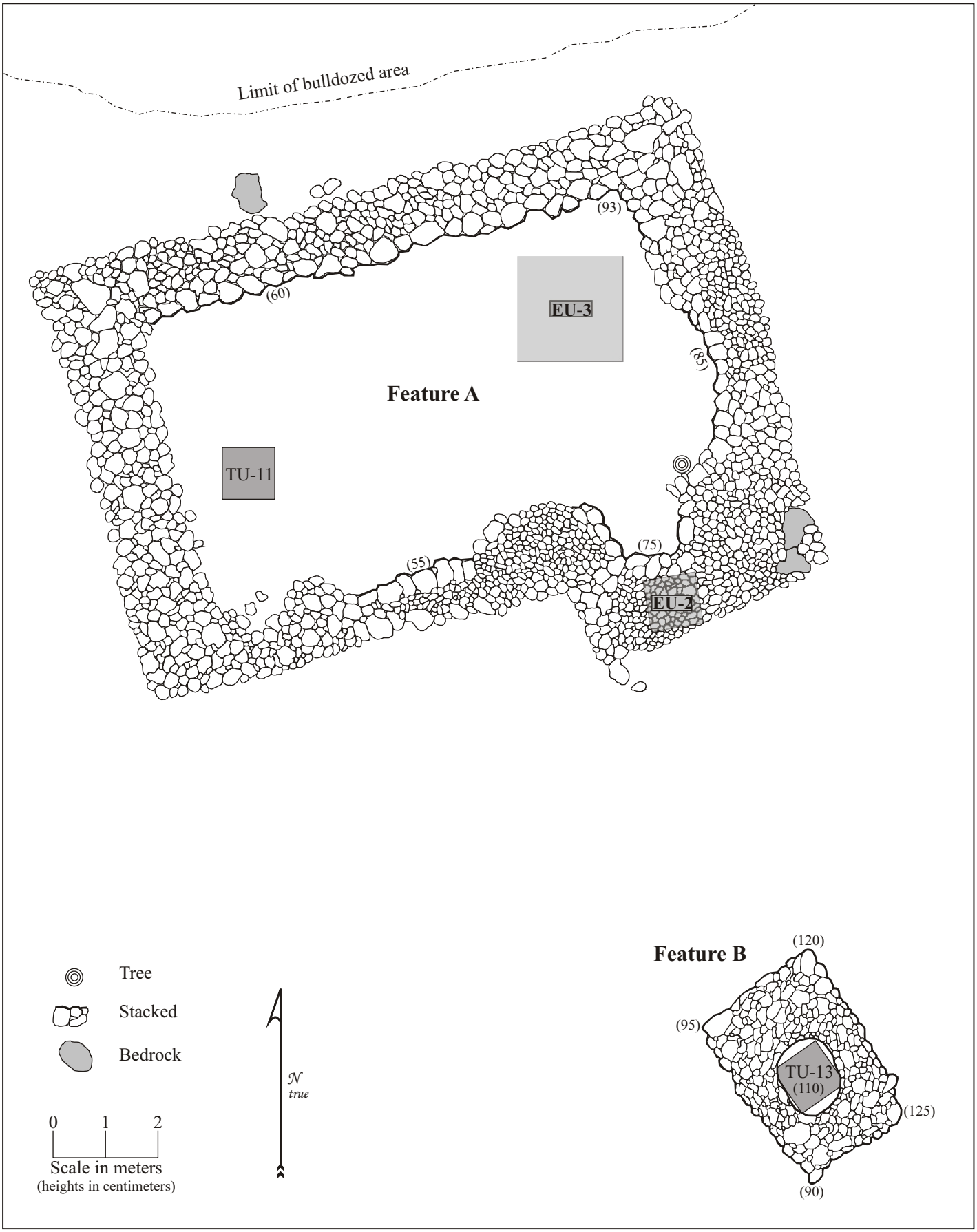


Figure 19. SIHP Site 23672 Features A and B plan view.

Feature A

Feature A is a large low-lying enclosure located at the north end of Site 23672 (see Figure 19). The enclosure (Figure 20), constructed of piled and stacked *ʻaʻā* cobbles, measures 13.5 meters long by 8.5 meters wide. The interior area of the enclosure (10.1 meters by 6.0 meters) has been cleared of cobbles leaving a leveled soil floor. The cleared cobbles were used to create the enclosure's walls, which stand between 60 and 90 centimeters in height along the interior edges and gradually transition into ground surface along the exterior edges.

Figure 20. SIHP Site 23672 Feature A, view to the northeast (location of EU-3).

TU-11 was excavated in the soil floor along the western interior wall of Feature A (see Figure 19). Excavation of TU-11 (1 x 1m) revealed the following stratigraphic profile (Figures 21 and 22):

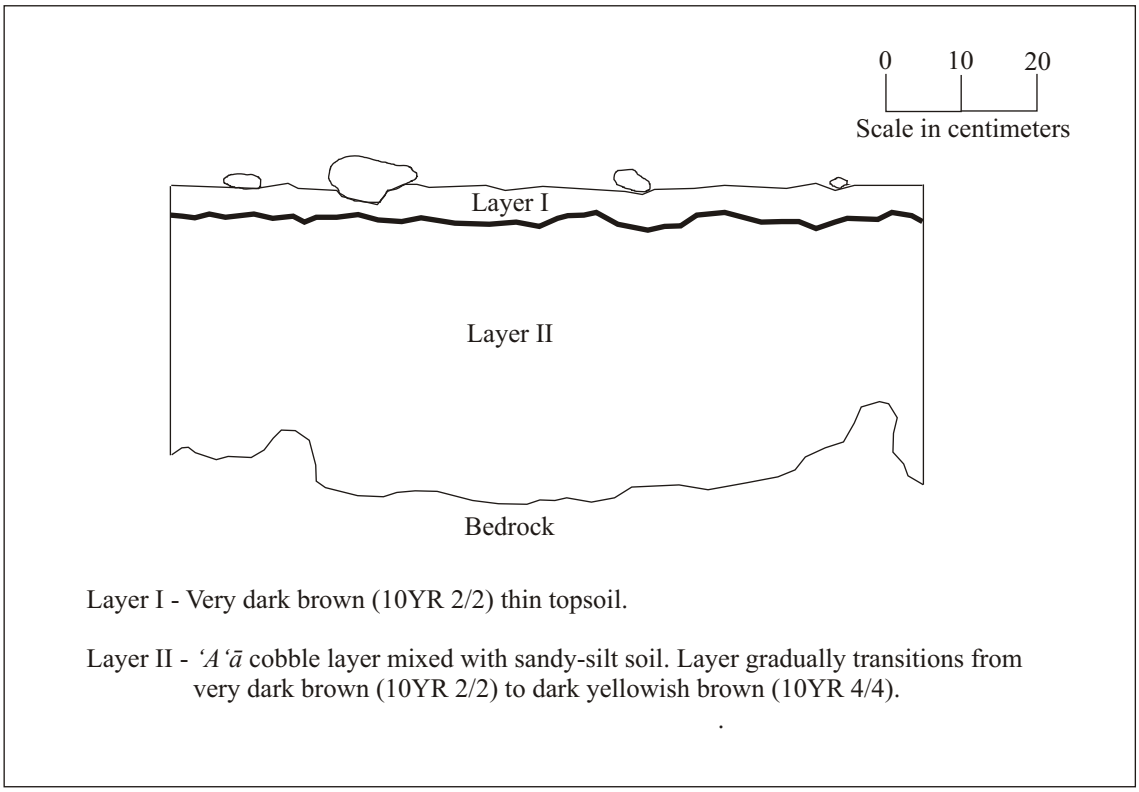
Layer I (0-4cmbs)..... very dark brown (10YR 2/2) thin topsoil mixed with grass roots and organics.

Layer II (4-42cmbs) ..... *ʻaʻā* cobbles mixed fairly evenly with a sandy-silt soil gradually transitioning from very dark brown (10YR 2/2) to dark yellowish brown (10YR 4/4) and mixed with decomposing bedrock with increasing depth until bedrock.

Sixteen cow bone fragments were recovered from Layer I and the top of Layer II. These bones showed no sign of human processing and are most likely not related to the feature, but rather to the cow pasture within which the feature resides.

An excavation unit (EU-2) was placed in the southeastern corner of Feature A, within the constructed wall south of the interior. The surface of the unit was fairly level, with medium-sized *ʻaʻā* boulders and cobbles on the northern half and smaller *aʻā* cobbles and pebbles on the southern side. A possible constructed posthole occurred in the southeastern quadrant of EU-2.

Figure 21. SIHP Site 23672 Feature A TU-11 base of excavation, view to the north.



Layer I - Very dark brown (10YR 2/2) thin topsoil.

Layer II - *ʻAʻā* cobble layer mixed with sandy-silt soil. Layer gradually transitions from very dark brown (10YR 2/2) to dark yellowish brown (10YR 4/4).

Figure 22. SIHP Site 23672 Feature A TU-11 north wall profile.

Excavation of EU-2 (1 x 1m) revealed the following stratigraphic profile (Figures 23 and 24):

Layer I (0-10cmbs)..... *a'ā* boulders and cobbles with very dark brown (10YR 2/2) silt.
Layer II (4-42cmbs) ..... fewer and smaller *'a'ā* cobbles and pebbles with very dark brown (10YR 2/2) silt on uneven bedrock.

EU-2 yielded a *Cypraea* sp. shell fragment and a volcanic glass flake (Table 9).

Table 9. Recovered items from SIHP Site 3672, Feature A, EU-2.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
1	I	1	Marine shell	*Cypraea* sp.	1	1	1.8
2	II	1	Volcanic glass	Flake	1	-	2.8
				EU-2 Total:	2	1	4.6

EU-3 was placed on the interior surface near the northeastern corner of the Feature A enclosure of Site 23672 (see Figure 19). Excavation of EU-3 (2 x 2m) revealed the following stratigraphic profile (Figures 25 and 26):

Layer I, Level 1 (0-25cmbs).....very dark brown (10YR 2/2) silt with gravelly inclusions.
Layer I, Level 2 (25-30cmbs).....very dark yellowish brown (10YR 4/4) silt on *'a'ā* bedrock.

EU-3 yielded waterworn coral fragments, bone fragments of a rodent, volcanic glass flakes, and charcoal fragments (Table 10).

Table 10. Recovered items from SIHP Site 23672, Feature A, EU-3.

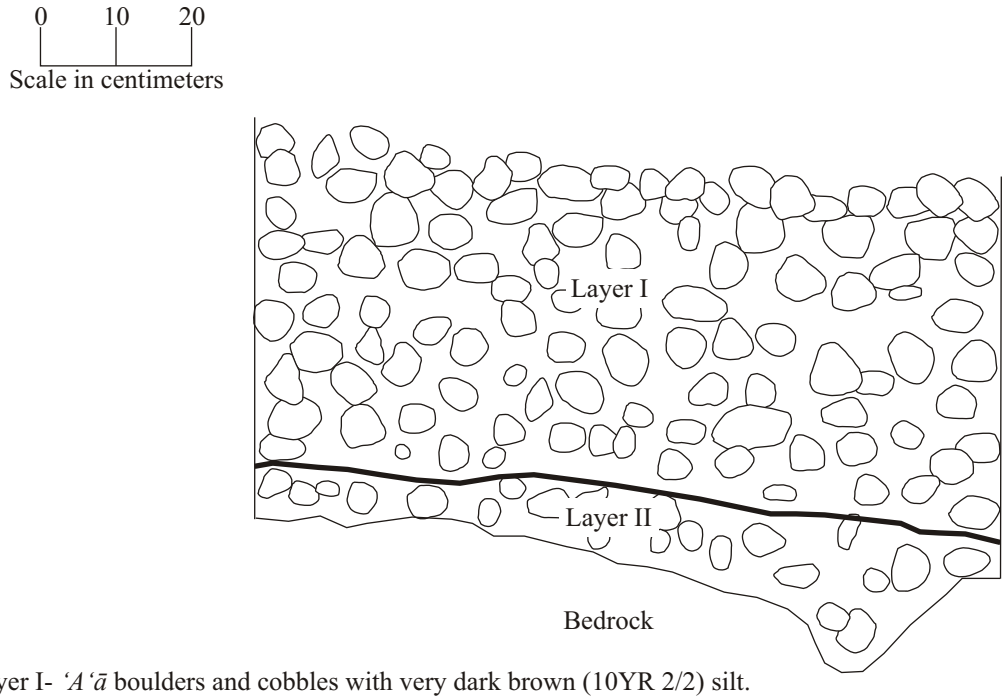
ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
4	I	1	Coral	Waterworn	3	-	2.1
3	I	1	Mammal bone	Unidentified rodent	6	1	2.0
				Layer I, Level 1 Total:	9	1	4.1
5	I	2	Volcanic glass	Flake	2	-	0.6
6	I	2	Organic	Charcoal	-	-	0.4
				Layer I, Level 2 Total:	2	-	1.0
				EU-3 Total:	11	1	5.1

Feature B

Feature B is a small roughly rectangular enclosure with rounded corners located six meters south of Feature A (see Figure 19). The enclosure is constructed on an *'a'ā* bedrock outcrop of stacked *'a'ā* cobbles standing 6 to 8 courses (1.0–1.3 meters) high (Figure 27). It measures 3.5 meters long by 2.5 meters wide along its exterior edges and has a roughly circular centrally located interior space 1.2 meters in diameter and 1.1 meters deep containing a soil floor. A rubber hose fragment, a modern beer can, decaying organics, and several cobbles were resting on ground surface within the enclosure. Feature B is not large enough to have been used for habitation purposes. The entire soil floor of Feature B was removed as a single 1 x 1 meter test unit (TU-13). Excavation of TU-13 revealed the following two distinct soil horizons resting on bedrock (Figure 28):

Layer I (0-22cmbs)..... very dark grayish brown (10YR 3/2) fine silt mixed with many small *'a'ā* pebbles, roots and decaying organic material (bedrock in the northeastern corner just below ground surface)
Layer II (22-42cmbs) ..... dark brown (10YR 3/3) fine silt mixed with decomposing bedrock on bedrock.

Figure 23. SIHP Site 23672 Feature A EU-2 base of excavation, view to the south/southeast.



Layer I- *ʻAʻā* boulders and cobbles with very dark brown (10YR 2/2) silt.

Layer II- Small amount of *ʻaʻā* cobbles and pebbles with very dark brown (10YR 2/2) silt.

Figure 24. SIHP Site 23672 Feature A EU-2 south wall profile.

Figure 25. SIHP Site 23672 Feature A EU-3 base of excavation, view to the east.

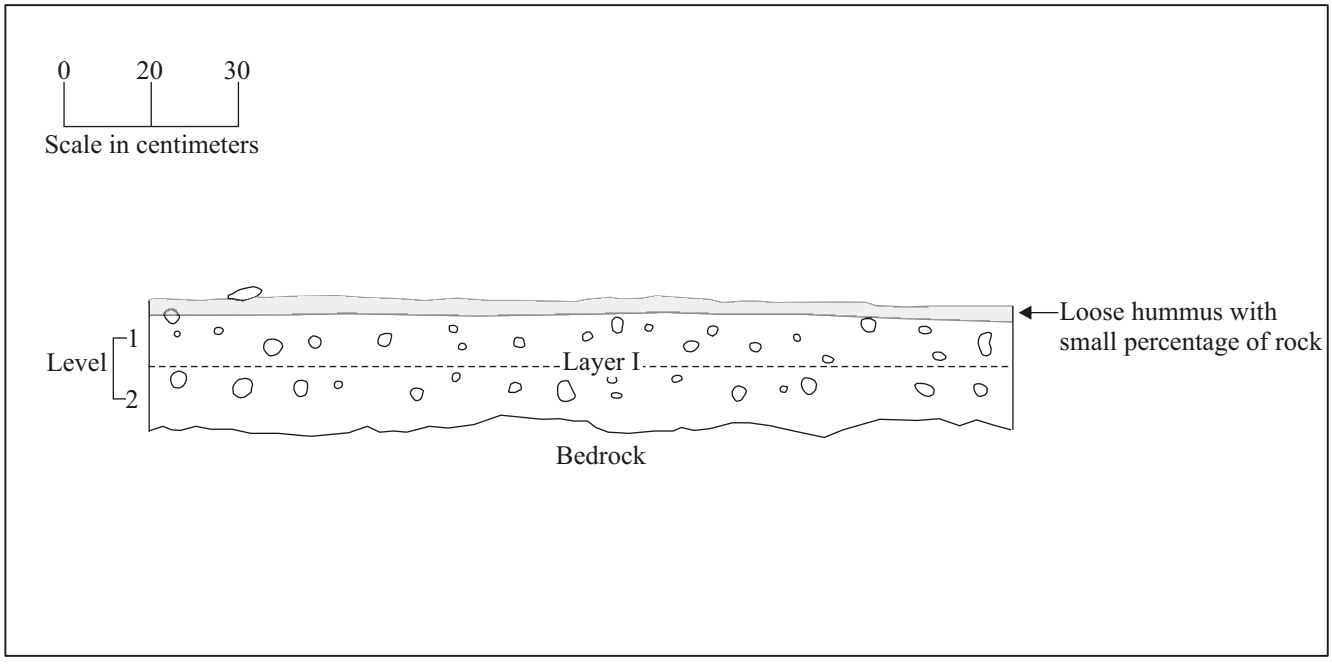


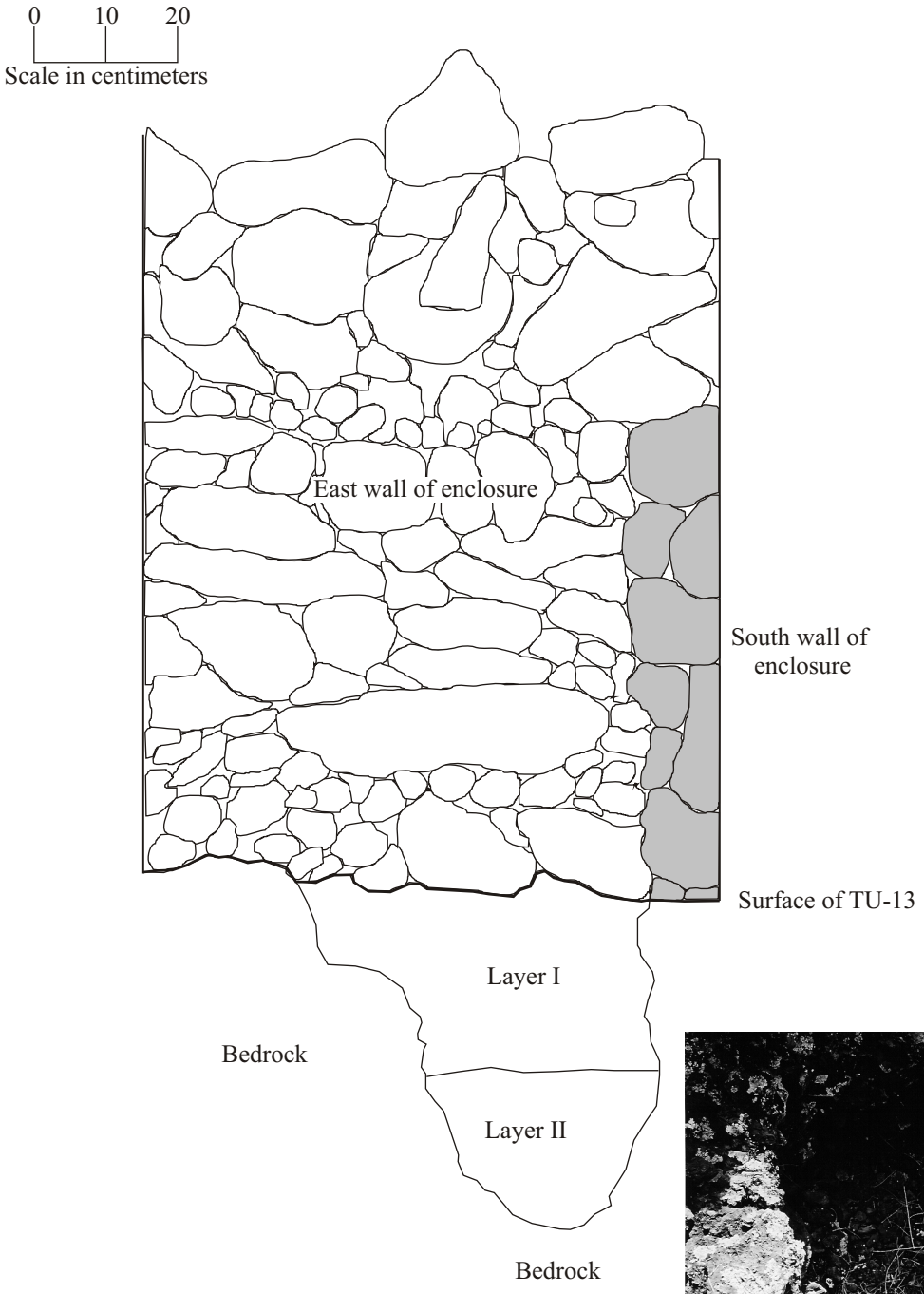
Figure 26. SIHP Site 23672 Feature A EU-3 east wall profile.

TU-13 yielded shark teeth, *Drupa* sp. fragments, *Nerita* sp. fragments, a rodent bone, *kuku*i nutshell fragments, charcoal fragments, volcanic glass flakes and shatter, and waterworn basalt (Table 11). No trends of recovered species or artifact types by increasing depth were apparent, apart from a recovery peak between 10 and 20 centimeters deep.

Table 11. Recovered items from SIHP Site 23672, Feature B, TU-13 Layer I.

ACC #	*Depth (cm)*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
4	0-10	Volcanic glass	Flake	4	-	1.5
5	0-10	Organic	*Kukui* nutshell	2	1	3.0
6	10-20	Basalt	Waterworn	1	-	45.1
7	10-20	Volcanic glass	Shatter	44	-	17.5
8	10-20	Mammal bone	Rodent	1	1	0.1
9	10-20	Fish bone	Shark (teeth)	2	1	0.2
10	10-20	Marine shell	*Drupa* sp.	1	1	0.1
11	10-20	Marine shell	*Nerita* sp.	1	1	0.2
12	10-20	Organic	Charcoal	-	-	1.8
			TU-13 Total:	65	5	69.5

Figure 27. SIHP Site 23672 Feature B exterior, view to the north.



Layer I - Very dark grayish brown (10YR 3/2) very fine silt.

Layer II - Dark brown (10YR 3/3) fine silt mixed with decomposing bedrock.

Figure 28. SIHP Site 23672 Feature B TU-13 east wall profile and photograph of base of excavation.

A charcoal sample (1.8 grams) was collected from Layer I during the screening of Level 2, 10-20 centimeters below the surface of TU-13. The carbon sample from this layer was sent to Beta Analytic, Inc. for radiocarbon age determination (Beta-175916). The sample produced a conventional radiocarbon age of 210±70 years before present, or a 2 sigma calibrated range of AD 1510 to 1950 with an intercept of AD 1660 (Clark and Rechtman 2003).

EU-1b was placed in the north section of Feature B, measuring 2 meters from west to east and 1 meter from south to north. Excavation of EU-1b revealed the following stratigraphic profile (Figures 29 and 30):

Layer I (0-80cmbs)..... very dark brown (10YR 3/3) silt mixed with *ʻaʻā* cobbles.
Layer II (80-110cmbs)..... very dark brown (10YR 3/3) fine silt mixed with *ʻaʻā* pebbles on bedrock.

No cultural material was recovered from EU-1b.

SIHP Site 23673

Site 23673 consists of a platform (Feature A) and an enclosure (Feature B) located in the eastern half of the project area along the southern property boundary (see Figure 3). The permanent habitation interpretation is primarily based on size (Cordy 1991; 1995). The features are constructed of *ʻaʻā* cobbles and boulders in an area of exposed bedrock and thin soil. Feature A is located 6.7 meters west of Feature B (Figure 31). Modern debris was observed on the surface of the site including a paint can lid and several golf balls.

Feature A

Feature A is a platform measuring 6.8 meters long by 3.9 meters wide (see Figure 31). It is constructed of large cobbles and boulders stacked along the exterior edges (Figure 32) and small cobbles paving the roughly level platform surface. The western edge of the feature rises 90 centimeters above ground surface, while the eastern edge rises 40 to 70 centimeters above ground surface. The exterior edges of Feature A are collapsed in several locations. The following three excavations were conducted on the Feature A platform surface: TU-17 (1 x 1m); EU-27 (1 x 2m); and EU-28 (1 x 2m).

TU-17 was excavated in the approximate center of Feature A and revealed the following stratigraphic profile (see Figure 31):

Layer I (0-65cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles.
Layer II (65-73cmbs) ..... very dark grayish brown (10YR 3/2) medium grained coarse silt rich with organics.
Layer III (73-86cmbs)..... dark gray (10YR 4/1) medium grained coarse silt mixed with ash and *ʻaʻā* gravels
Layer IV (86-88cmbs)..... dark brown (10YR 3/3) fine silt mixed with gravels.
Layer V (88-90cmbs) ..... culturally sterile dark brown (7.5YR 3/4) fine silt mixed with decaying bedrock on bedrock.

Items recovered from TU-17 include fish, *Cypraea* sp., *Drupa* sp., *Cellana* sp., *Nerita* sp., branch coral, Echinoidea, *Conus* sp., rodent, *kukui* nutshell, unidentifiable plant seed, and volcanic glass flakes (Table 12). Apart from a species and artifact type peak in Layer III, no definite trends or change in items could be detected from one layer to the next.

Figure 29. SIHP Site 23672 Feature B EU-1b base of excavation, view to the south.

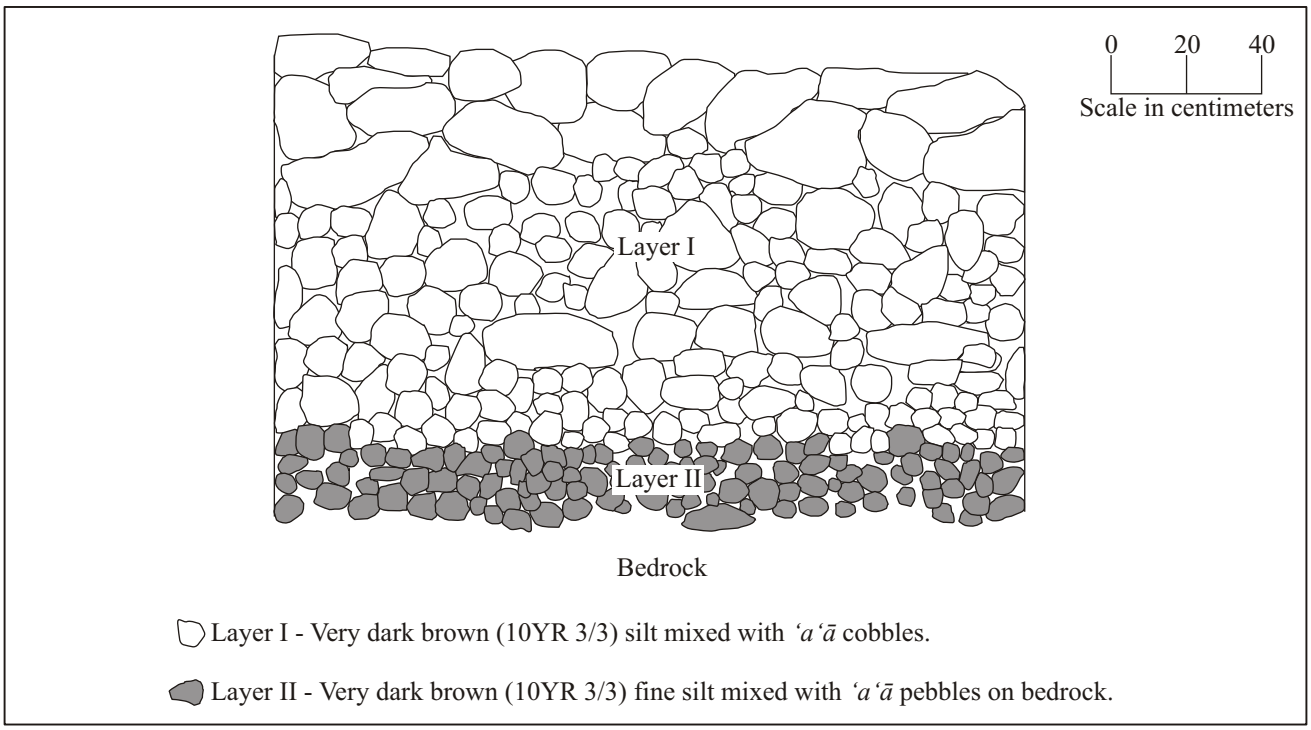


Figure 30. SIHP Site 23672 Feature B EU-1b south wall profile.

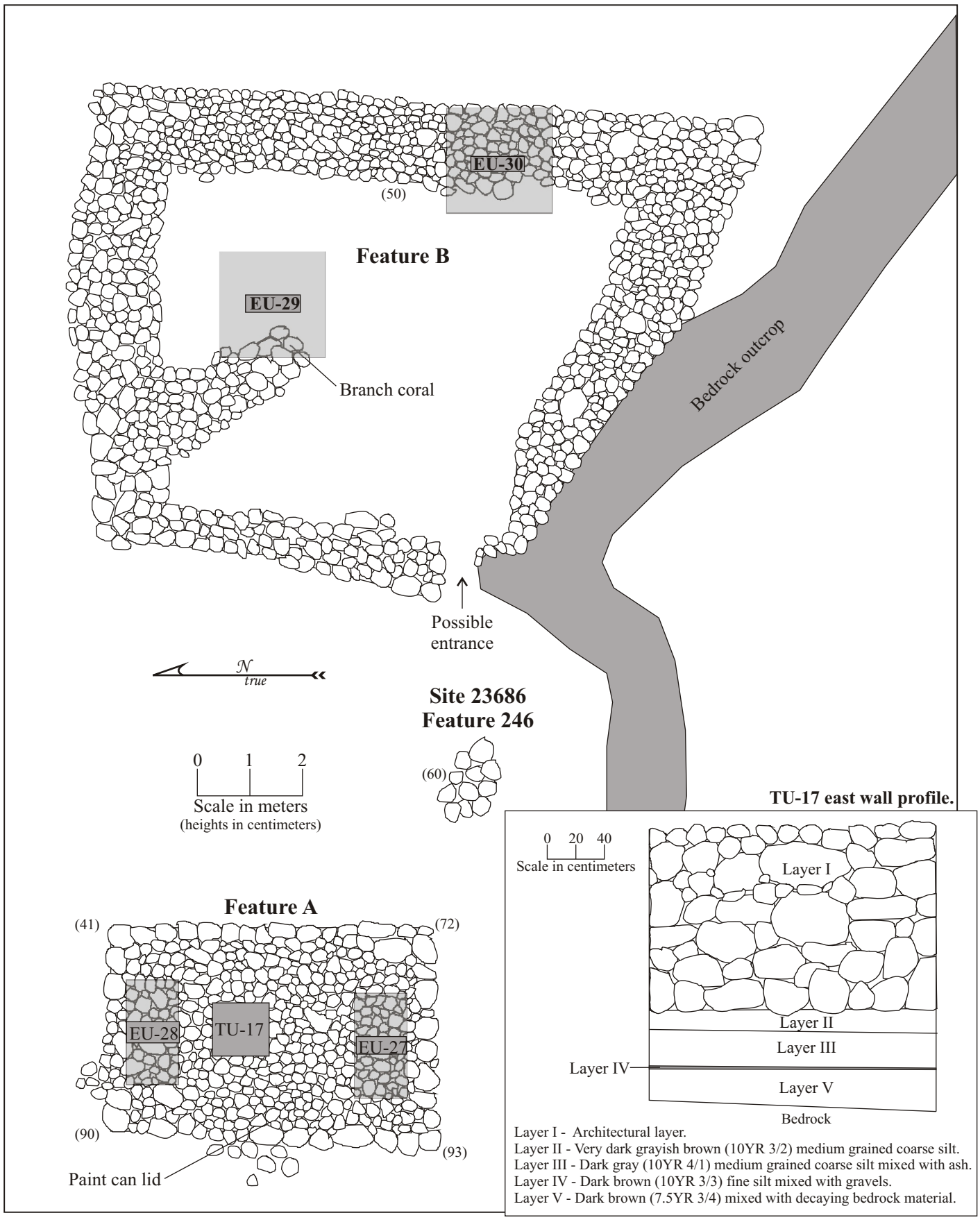


Figure 31. SIHP Site 23673 plan view and TU-17 east wall profile.

Figure 32. SIHP Site 23673 Feature A, view to the north.

Table 12. Recovered items from SIHP Site 23673, Feature A, TU-17.

ACC #	*Layer*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
58	I	Coral	Branch	1	1	28.7
59	I	Organic	*Kukui* nutshell	1	1	6.3
60	I	Echinoderm	Echinoidea	7	1	0.1
61	I	Marine shell	*Cypraea* sp.	1	1	2.0
62	I	Mammal bone	Rodent	1	1	0.1
			Layer I Total:	11	5	37.2
63	II	Coral	Branch	1	1	0.4
64	II	Organic	*Kukui* nutshell	6	1	1.6
65	II	Echinoderm	Echinoidea	4	1	1.0
66	II	Marine shell	*Cypraea* sp.	5	2	5.3
67	II	Fish bone	Unidentified	1	1	0.6
68	II	Mammal bone	Rodent	1	1	0.1
69	II	Volcanic glass	Flakes	15	-	11.2
			Layer II Total:	33	7	20.2
70	III	Organic	Seed	1	1	0.1
71	III	Echinoderm	Echinoidea	109	1	9.1
72	III	Marine shell	*Cypraea* sp.	6	3	6.6
73	III	Marine shell	*Drupa* sp.	3	1	0.7
74	III	Marine shell	*Nerita* sp.	2	2	0.4
75	III	Marine shell	*Cellana* sp.	3	1	0.5
76	III	Organic	*Kukui* nutshell	6	1	0.4
77	III	Fish bone	Unidentified	4	1	3.6
78	III	Volcanic glass	Flake	24	-	12.1

Continued on next page

Table 12. Continued.

ACC #	Layer	Material	Species/type	Count	MNI	Weight (g)
81	III	Basalt	Flake	1	-	0.1
			Layer III Total:	159	11	33.6
82	IV	Echinoderm	Echinoidea	13	1	0.8
83	IV	Volcanic glass	Flake	2	-	0.3
84	IV	Marine shell	*Cypraea* sp.	4	1	2.7
85	IV	Marine shell	*Conus* sp.	1	1	2.1
86	IV	Marine shell	*Drupa* sp.	1	1	0.3
			Layer IV Total:	21	4	6.2
			TU-17 Total:	224	27	97.2

EU-27 (aligned east-west) was excavated in the southern third of the Feature A platform and revealed the following stratigraphic profile (see Figures 33 and 34):

Layer I (0-120cmbs)..... architectural layer with small *ʻaʻā* cobbles on the surface transitioning to larger ones with depth.

Layer II (120-135cmbs) ... very dark grayish brown (10YR 3/2) medium grained silt with a gray (10YR 4/2) silt pocket in northeastern corner (both on undulating decomposed bedrock).

Items recovered from EU-27 include *Cypraea* sp., *Isognomon* sp., branch coral, Echinoidea, *Fimbria* sp., unidentifiable shell, *kukui* nutshell, charcoal, volcanic glass flakes and shatter, and waterworn basalt (Table 13). No definite stratigraphic trends in recovered items could be detected, except for the Layer II spike.

Table 13. Recovered items from SIHP Site 23673, Feature A, EU-27.

ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
419	I	1	Marine shell	*Cypraea* sp.	1	1	3.8
420	I	1	Marine shell	*Fimbria* sp.	2	1	2.6
421	I	1	Coral	Branch	4	-	59.0
422	I	1	Coral	Unidentified	-	-	54.2
417	I	1	Basalt	Waterworn pebble	1	-	51.4
416	I	1	Volcanic glass	Flake	1	-	0.7
418	I	1	Organic	*Kukui* nutshell	3	-	5.1
415	I	1	Organic	Charcoal	-	-	0.2
				Layer I, Level 1	12	2	177
425	II	1	Marine shell	*Isognomon* sp.	2	1	0.2
426	II	1	Echinoderm	Echinoidea	2	-	0.1
424	II	1	Volcanic glass	Flake	1	-	0.1
570	II	1	Volcanic glass	Shatter	1	-	13.5
423	II	1	Organic	*Kukui* nutshell/burnt	8	-	1.2
				Layer II, Level 1	14	1	15
430	II	2	Marine shell	Unidentified	3	-	0.7
431	II	2	Coral	Unidentified	1	-	0.1
432	II	2	Echinoderm	Echinoidea	6	-	0.7
429	II	2	Volcanic glass	Flake	9	-	2.6
571	II	2	Volcanic glass	Shatter	7	-	21.5
428	II	2	Organic	*Kukui* nutshell	7	-	0.9
427	II	2	Organic	Charcoal	-	-	0.2
				Layer II, Level 2	33	0	27
434	II	3	Marine shell	*Cypraea* sp.	1	1	0.1
433	II	3	Volcanic glass	Flake	2	-	0.8
				Layer II, Level 3	3	1	0.9
				EU-27 Total:	62	4	220

Figure 33. SIHP Site 23673 Feature A EU-27 base of excavation, view to the north.

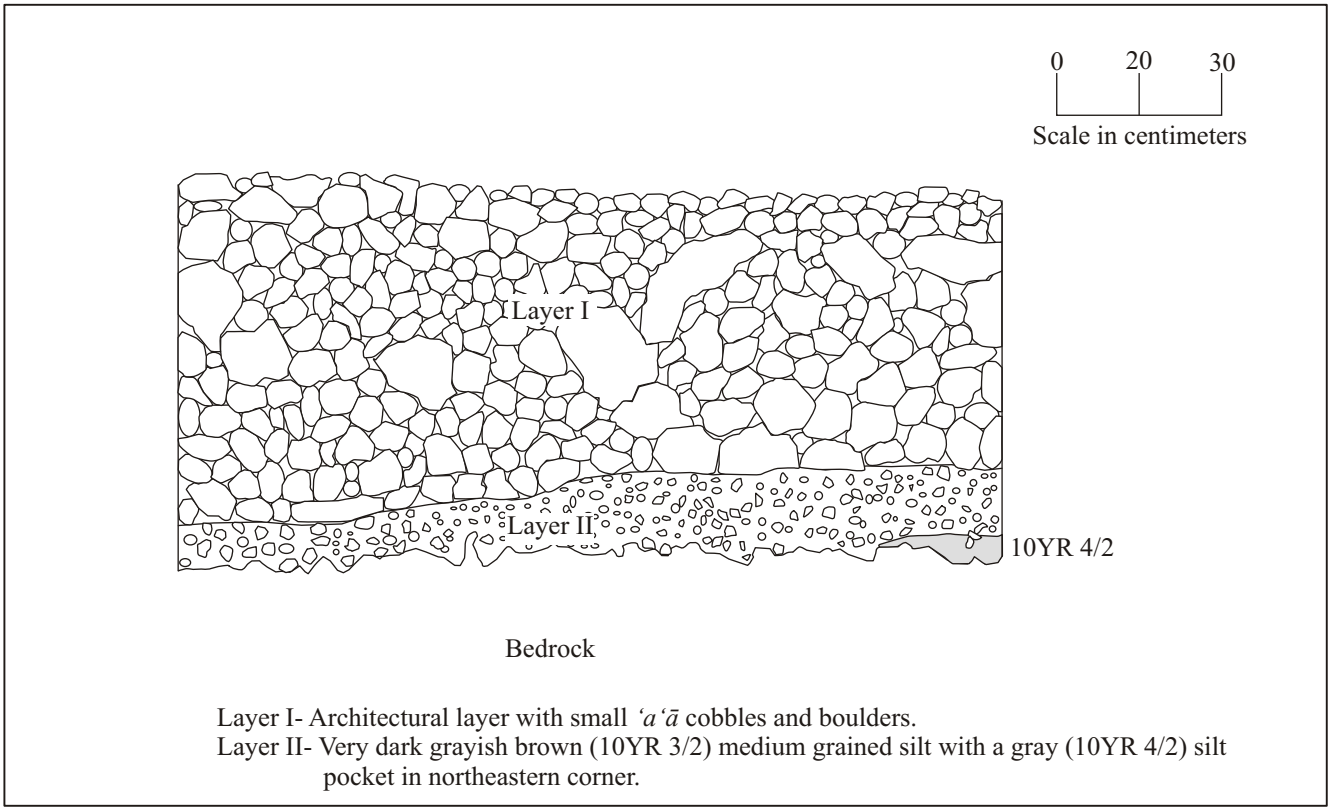


Figure 34. SIHP Site 23673 Feature A EU-27 north wall profile.

EU-28 (aligned east-west) was excavated in the northern third of the Feature A platform and revealed the following stratigraphic profile (see Figures 35 and 36):

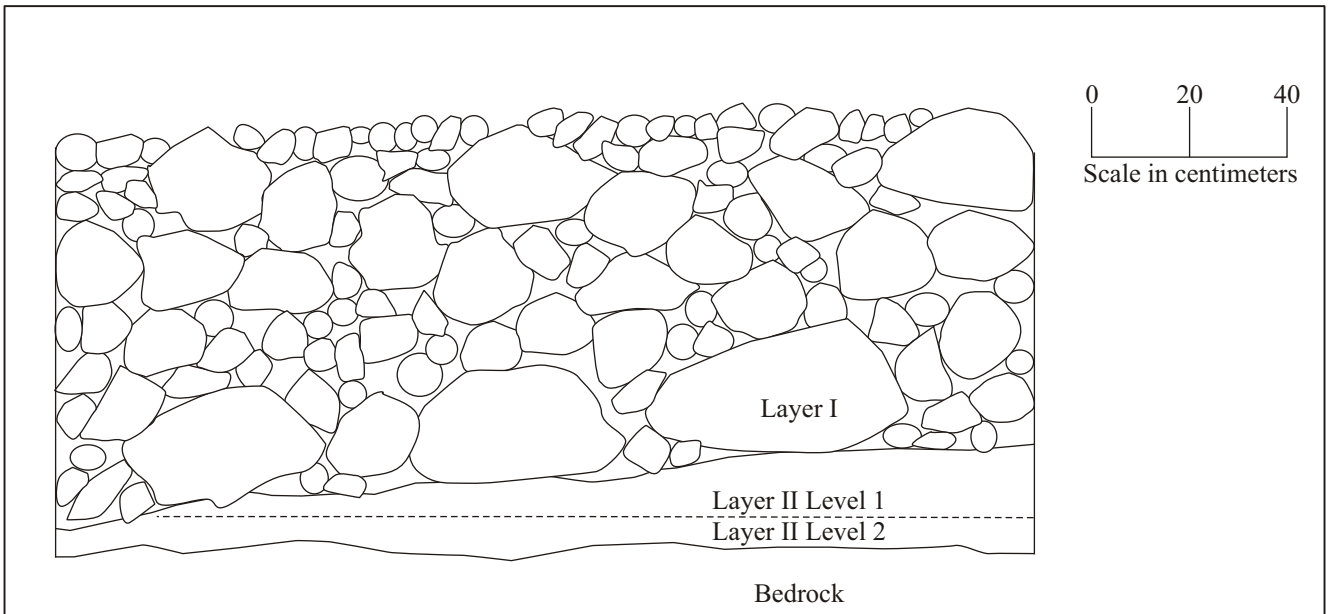
Layer I (0-90cmbs)..... architectural layer with small *ʻaʻā* cobbles on surface transitioning to larger ones with depth.
Layer II (90-98cmbs) ..... thin band (i.e., 2cm thick) of dark brown (10YR 3/3) silt on dark grayish brown (10YR 3/2) loose silt.

Items recovered from EU-28 include fish, *Cypraea* sp., *Drupa* sp., coral, Echinoidea, *Mitra* sp., *Terebra* sp., unidentifiable shell, probable rodent, *kukui* nutshell, charcoal, basalt flake, and volcanic glass flakes and shatter (Table 14). A coral abrader (Acc# 439) from Layer I is cone-shaped with a pointed tip that has six abraded facets (Figure 37). The abrader is 19.15 millimeters long, 18.6 millimeters wide, and 7.9 millimeters thick. A worked coral fragment (Acc# 450) from Level 2 in Layer II has a tabular shape with six flattened surfaces (Figure 38). One of the sides is slanted so that the two edges come to a point. On the opposite side of this beveled edge is a crescent-shaped depression, roughly the size of a small finger. The worked piece of coral is 19.5 millimeters long, 18.6 millimeters wide, and 7.9 millimeters thick. An echinoderm abrader (Acc# 565) from Level 2 in Layer II has one side abraded from its mid-section to its proximal side where it attached to the main body (Figure 39). This abrader is 51.4 millimeters long, 9.6 millimeters wide, and 9.65 millimeters thick.

Table 14. Recovered items from SIHP Site 23673, Feature A, EU-28.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
436	I		Marine shell	*Cypraea* sp.	1	1	2.2
437	I		Marine shell	Unidentified	1	-	3.8
439	I		Coral	Abrader	1	-	17.3
438	I		Coral	Unidentified	25	-	88.4
572	I		Basalt	Flake	1	-	6.0
435	I		Volcanic glass	Flake	6	-	6.3
573	I		Volcanic glass	Shatter	1	-	6.6
				Layer I Total:	36	1	131
441	II	1	Fish bone	Unidentified	1	-	1.0
442	II	1	Marine shell	*Cypraea* sp.	2	2	15.9
443	II	1	Marine shell	*Drupa* sp.	1	1	0.9
445	II	1	Coral	Unidentified	5	-	41.2
446	II	1	Coral	Unidentified	1	-	0.6
447	II	1	Echinoderm	Echinoidea	5	-	0.2
440	II	1	Volcanic glass	Flake	7	-	4.8
444	II	1	Organic	*Kukui* nutshell	6	-	0.4
				Layer II, Level 1 Total:	28	3	65
452	II	2	Marine shell	*Cypraea* sp.	1	1	1.4
454	II	2	Marine shell	*Mitra* sp.	1	1	0.1
453	II	2	Marine shell	*Terebra* sp.	1	1	0.1
455	II	2	Marine shell	Unidentified	1	-	0.1
450	II	2	Coral	Worked	1	-	0.5
456	II	2	Coral	Unidentified	3		0.8
457	II	2	Echinoderm	Echinoidea	5	-	0.1
565	II	2	Echinoderm	Echinoidea abrader	1	-	1.6
451	II	2	Small mammal	Jaw and teeth	2	1	0.4
449	II	2	Volcanic glass	Flakes	10	-	6.0
448	II	2	Organic	Charcoal	-	-	0.3
				Layer II, Level 2 Total:	26	4	11
				EU-28 Total:	90	8	207

Figure 35. SIHP Site 23673 Feature A EU-28 base of excavation, view to the west.



Layer I- Architectural layer with small *ʻaʻā* cobbles on surface transitioning to larger ones with depth.

Layer II- Dark brown (10YR 3/3) silt on dark grayish brown (10YR 3/2) loose silt.

Figure 36. SIHP Site 23673 Feature A EU-28 north wall profile.

Figure 37. SIHP Site 23673 coral abrader from EU-28 (Acc#. 439).

Figure 38. SIHP Site 23673 worked coral fragment from EU-28 (Acc#. 450).

Figure 39. SIHP Site 23673 Echinoidea abrader from EU-28 (Acc#. 565).

Generally the same species and artifact types occur in both Layers I and II (Table 14), so no definite evidence exists that different depths represent different components or different activities.

Feature B

Feature B is a walled-enclosure located 6.7 meters east of Feature A (see Figure 31). The enclosure (Figure 40) is roughly square measuring 8.7 meters by 8.6 meters along its exterior edges. The enclosure walls, which are constructed of stacked (but largely collapsed) *ʻaʻā* cobbles, measure up to 1.2 meters wide and stand 50 centimeters high. The south edge of the feature abuts a raised linear *ʻaʻā* bedrock outcrop running northwest/southeast. There is a 1.0 meter wide opening (entrance?) accessing the enclosure's southwestern corner. A 3.0-meter long internal dividing wall runs southeast from Feature B's interior north wall. This internal wall, which may have partitioned off separate use areas within the enclosure, stands up to 70 centimeters high and 1.2 meters wide. A branch coral fragment was found on the surface of the wall's south end. No other cultural debris was observed at Feature B. The following two excavation units were conducted within Feature B: EU-29 (2 x 2m) and EU-30 (2 x 2m).

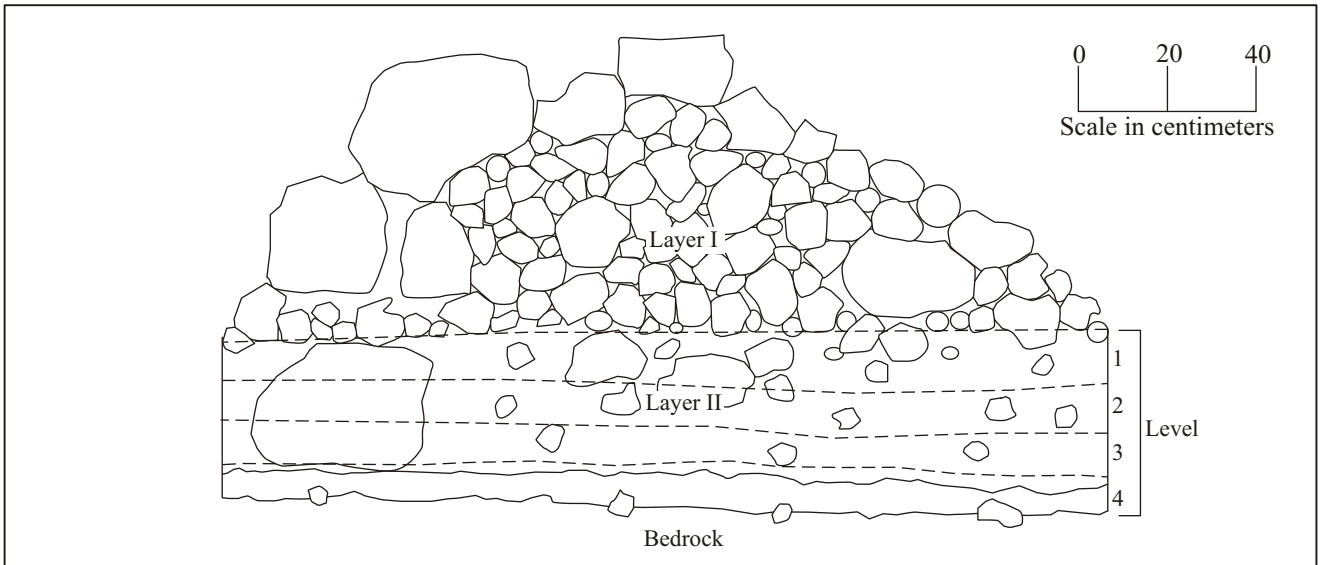
Figure 40. SIHP Site 23673 Feature B, view to the east.

EU-29 was placed in the northeastern portion of the Feature B enclosure, touching the southern tip of an internal partition wall, and revealed the following stratigraphic profile (Figures 41 and 42):

Layer I (0-60cmbs)..... architectural layer with small to large *ʻaʻā* cobbles, fire cracked rock, and branch coral.
Layer II, Level 1 (60-70cmbs)..... small *ʻaʻā* cobbles with dark brown (10YR 3/3) silt.
Layer II, Level 2 (70-80cmbs)..... small *ʻaʻā* cobbles with very dark gray brown (10YR 3/1) silt.
Layer II, Level 3 (89-90cmbs)..... small *ʻaʻā* cobbles with very dark gray brown (10YR 3/1) silt.
Layer II, Level 4 (90-100cmbs)... small *ʻaʻā* cobbles with very dark brown (7.5YR 2.5/2) silt on weathered *ʻaʻā* bedrock.

Items recovered from EU-29 include *Thunnus thynnus*, unidentifiable fish, *Trochus* sp., *Cypraea* sp., *Drupa* sp., *Isognomon* sp., *Nerita* sp., *Thais* sp., coral, Echinoidea, *Conus* sp., unidentifiable shell, pig, small mammal, charcoal, and volcanic glass flakes (Table 15). A Historic Period .177 caliber lead pellet (Acc# 479) from Level 3 in Layer II testifies to some kind of intrusion into earlier layers. This pellet is 6.6 millimeters long, 5.6 millimeters wide, and 5.75 millimeters thick. An echinoderm abrader fragment (Acc# 482) came from the same provenience as the lead pellet. Only one side of the spine bears signs of abrasion. The spine fragment is 10.8 millimeters long, 6.10 millimeters wide, and 5.9 millimeters thick. Layer I yielded no items. Recovered items peaked in Level 3 of Layer II.

Figure 41. SIHP Site 23673 Feature B EU-29 base of excavation, view to the west.



Layer I- Architectural layer with small to large *ʻaʻā* cobbles.

Layer II, Level 1- Small *ʻaʻā* cobbles with dark brown (10YR 3/3) silt.

Layer II, Level 2- Small *ʻaʻā* cobbles with very dark gray brown (10YR 3/1) silt.

Layer II, Level 3- Small *ʻaʻā* cobbles with very dark gray brown (10YR 3/1) silt.

Layer II, Level 4- Small *ʻaʻā* cobbles with very dark brown (7.5YR 2.5/2) silt on weathered *ʻaʻā* bedrock.

Figure 42. SIHP Site 23673 Feature B EU-29 west wall profile.

Table 15. Recovered items from SIHP Site 23673, Feature B, EU-29.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
460	II	1	Fish bone	*Thunnus thynnus*	2	1	0.8
462	II	1	Marine shell	*Cypraea* sp.	9	2	7.8
463	II	1	Marine shell	*Nerita* sp.	1	1	0.2
464	II	1	Marine shell	Unidentified	2	-	0.4
465	II	1	Coral	Unidentified	1	-	27.4
466	II	1	Coral	Unidentified	2	-	3.1
467	II	1	Echinoderm	Echinoidea	9	-	0.6
461	II	1	Mammal bone	Unidentified	1	-	0.1
459	II	1	Volcanic glass	Flake	1	-	0.2
458	II	1	Organic	Charcoal	-	-	1.1
				Layer II, Level 1 Total:	28	4	42
470	II	2	Marine shell	*Cypraea* sp.	29	2	25.0
471	II	2	Marine shell	*Conus* sp.	2	1	0.6
473	II	2	Coral	Unidentified	3	-	3.6
472	II	2	Echinoderm	Echinoidea	22	-	2.0
469	II	2	Volcanic glass	Flake	4	-	2.0
468	II	2	Organic	Charcoal	-	-	1.2
				Layer II, Level 2 Total:	60	3	34
480	II	3	Fish bone	Unidentified	1	-	0.1
485	II	3	Marine shell	Unidentified	18	-	4.5
475	II	3	Marine shell	*Cypraea* sp.	36	7	36.5
487	II	3	Marine shell	*Drupa* sp.	2	2	0.6
476	II	3	Marine shell	*Isognomon* sp.	6	1	1.2
478	II	3	Marine shell	*Nerita* sp.	1	1	0.1
486	II	3	Marine shell	*Thais* sp.	1	1	0.5
483	II	3	Marine shell	*Conus* sp.	5	2	3.0
484	II	3	Coral	Unidentified	10	-	33.9
482	II	3	Echinoderm	Echinoidea abrader frag	1	-	0.2
488	II	3	Echinoderm	Echinoidea	208	-	25.8
477	II	3	Mammal bone	Unidentified	3	-	0.6
481	II	3	Volcanic glass	Flake	2	-	1.8
474	II	3	Organic	Charcoal	21	-	2.0
479	II	3	Metal	Lead .166 cal Pellet	1	-	0.9
				Layer II, Level 3 Total:	316	14	112
494	II	4	Marine shell	*Trochus* sp.	1	1	0.3
491	II	4	Marine shell	*Cypraea* sp.	12	3	10.2
490	II	4	Echinoderm	Echinoidea	42	-	4.9
492	II	4	Mammal bone	*Sus* sp. vertebrae	1	1	2.2
489	II	4	Organic	Charcoal	47	-	5.5
493	II	4	Organic	Unidentified nut	1	-	0.6
				Layer II, Level 4 Total:	104	5	24
				EU-29 Total:	508	26	211

Charcoal collected from Layer II, Level 3 in EU-29 of Feature B in SIHP Site 23673 was submitted for radiocarbon assaying. The sample (Beta-212769) intercepts the tree-ring calibration curve at AD 1530, 1550, and 1630 and has a 2-sigma standard deviation calibrated date range of AD 1460 to 1660. Charcoal collected from Layer II, Level 4 in EU-29 of Feature B in SIHP Site 23673 was also submitted for radiocarbon assaying. The sample (Beta-212768) intercepts the tree-ring calibration curve at AD 1440 and has a 2-sigma standard deviation calibrated date range of AD 1320 to 1640. A calibrated weighted average of the two "linked" raw assays intercepts the tree-ring calibration curve at AD 1500, with a calibrated standard deviation that ranges between AD 1470 and 1630.

EU-30 was placed on the eastern wall of the Feature B enclosure and revealed the following stratigraphic profile (Figures 43 and 44):

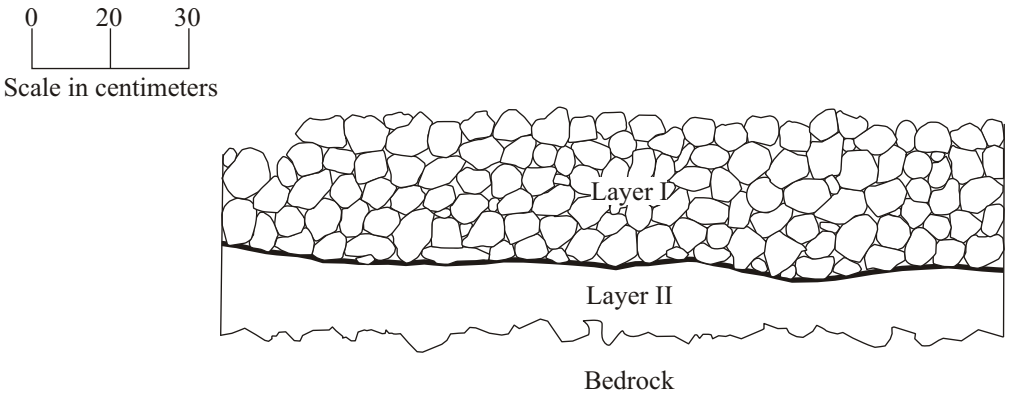
Layer I (0-30cmbs)..... architectural layer with small to large *ʻaʻā* cobbles.
Layer II Level 1 (30-50cmbs) ..... dark brown (10YR 3/2) silt with *ʻaʻā* cobbles and very dark brown (7.5YR 5/2) silt resting on weathered *ʻaʻā* bedrock.

EU-30 yielded *Thunnus thynnus*, *Drupa* sp., coral, Echinoidea, *Canis* sp., *Rattus* sp., mammal, and *kukui* nutshell remains (Table 16). A machine cut mammal bone rib fragment (Acc# 566) from Level 1 of Layer II suggests some form of post-depositional intrusion. The rib is 118.3 millimeters long, 12.85 millimeters wide, and 11.05 millimeters thick. No trends or changes in species or artifact types could be discerned for the layers within EU-30; species and artifact types are fairly evenly distributed in all excavated layers, except for the comparatively sparse bottom Level 3 of Layer II.

Table 16. Recovered items from SIHP Site 23673, Feature B, EU-30.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
495	I	1	Fish bone	*Thunnus thynnus*	13	1	4.7
496	I	1	Mammal bone	*Canis* sp.	1	1	0.2
				Layer I, Level 1 Total:	14	2	4.9
497	II	1	Fish bone	*Thunnus thynnus*	8	1	4.1
499	II	1	Coral	Unidentified	2	-	7.8
498	II	1	Mammal bone	Unidentified	6	-	4.7
566	II	1	Mammal bone	Machine cut rib	3	-	13.2
500	II	1	Organic	*Kukui* nutshell	2	-	2.1
				Layer II, Level 1 Total:	21	1	31.9
501	II	2	Fish bone	*Thunnus thynnus*	3	1	0.2
503	II	2	Echinoderm	Echinoidea	2	-	0.1
504	II	2	Coral	Unidentified	3	-	0.7
502	II	2	Mammal bone	*Rattus* sp.	1	1	0.1
505	II	2	Organic	*Kukui* nutshell	2	-	0.2
				Layer II, Level 2 Total:	11	2	1.3
506	II	3	Fish bone	*Thunnus thynnus*	2	1	0.1
509	II	3	Shell	*Drupa* sp.	1	1	1.9
508	II	3	Coral	Unidentified	1	-	0.2
507	II	3	Organic	*Kukui* nutshell	1	-	1.9
				Layer II, Level 3 Total:	5	2	4.1
				EU-30 Total:	51	7	42.2

Figure 43. SIHP Site 23673 Feature B EU-30 base of excavation, view to the east.



Layer I - Architectural layer.

Layer II Level 1 - Dark brown (10YR 3/2) silt with *ʻaʻā* cobbles and very dark brown (7.5YR 5/2) silt.

Figure 44. SIHP Site 23673 Feature B EU-30 east wall profile.

SIHP Site 23674

Site 23674 consists of a linked platform and enclosed circle feature that is located in the east-central portion of the project area (see Figure 3). Site 23674 consists of a rough rectangular platform (5.2 meters by 3.3 meters) with a circular enclosure (4.8 meters in diameter) protruding from its south edge (Figures 45 and 46). The site is constructed of stacked and piled *ʻaʻā* cobbles, and the partially leveled surface of the platform is roughly paved with small *ʻaʻā* cobbles (see Figure 45). The platform stands up to 66 centimeters above ground surface along its stacked southern edge and is slightly terraced to the north standing up to 46 centimeters above ground surface along its northern edge. The enclosure walls measures as wide as 1.9 meters and stand up to 66 centimeters high along their interior edge. The central area of the enclosure consists of leveled soil covered by dense vegetation. The following two excavations were conducted at Site 23674: EU-6 (2 x 2m) and EU-7 (1 x 1m).

EU-6 was placed on the central portion of the platform, and revealed the following stratigraphic profile (Figures 47 and 48):

Layer I (0-70cmbs) ..... architectural layer with *ʻaʻā* pebble paving on top of small to large cobbles and a few boulders.
Layer II Level 1 (70-90cmbs)..... dark brown (10YR 3/3) silt and *ʻaʻā* gravel.
Layer II Level 2 (90-100cmbs)..... very dark brown (10YR 2/2) and dark yellowish brown (10YR ¾) sandy silt with *ʻaʻā* gravel.
Layer II Level 3 (100-110cmbs)..... dark yellowish brown (10YR ¾) sandy silt and decomposed bedrock on sloping bedrock.

EU-6 yielded fish, *Trochus* sp., *Drupa* sp., *Cellana* sp., *Nerita* sp., coral, Echinoidea, crustacean, *Conus* sp., unidentifiable shell, bird, dog, rodent, mammal, *kukui* nutshell, charcoal, basalt flakes, and volcanic glass flakes and shatter (Table 17). No significant shifts or trends are apparent when the recovered items from different depths are compared. Species and artifact types peak in Layer I, drop off in Levels 1 and 2 of Layer II only to rise slightly again in the bottom Level 3 of Layer II.

Table 17. Recovered items from SIHP Site 23674, EU-6.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
56	I	1	Fish bone	*Scarus* sp. teeth	4	1	0.6
49	I	1	Marine shell	*Cypraea* sp.	59	10	50.4
50	I	1	Marine shell	*Drupa* sp.	11	5	6.4
52	I	1	Marine shell	*Cellana* sp.	1	1	0.8
51	I	1	Marine shell	*Conus* sp.	6	2	0.7
53	I	1	Marine shell	Unidentified	3	-	2.0
61	I	1	Coral	Waterworn	12	-	24.4
55	I	1	Bird bone	Unidentified	5	-	1.0
54	I	1	Mammal bone	*Canis* sp.	2	1	2.0
58	I	1	Basalt	Flake	2	-	2.8
57	I	1	Volcanic glass	Flake	23	-	15.0
564	I	1	Volcanic glass	Shatter	7	-	12.1
60	I	1	Organic	*Kukui* nutshell	1	-	0.4
62	I	1	Organic	Charcoal	-	-	0.2
				Layer I, Level 1 Total:	136	20	118.8

Continued on next page

Table 17. Continued.

ACC#	Layer	Level	Material	Species/type	Count	MNI	eight (g)
69	II	1	Fish Bone	Unidentified jaw	1	-	0.4
63	II	1	Marine shell	*Cypraea* sp.	18	2	10.4
64	II	1	Marine shell	*Drupa* sp.	9	3	2.9
65	II	1	Marine shell	*Conus* sp.	3	2	1.2
66	II	1	Marine shell	Unidentified	3	-	0.6
72	II	1	Coral	Waterworn	1	-	2.9
67	II	1	Echinoderm	Echinoidea	7	-	6.6
68	II	1	Mammal bone	Unidentified	1	-	0.1
70	II	1	Volcanic glass	Flake	73	-	26.1
71	II	1	Organic	*Kukui* nutshell	3	-	0.8
73	II	1	Organic	Charcoal	-	-	0.3
				Layer II, Level 1 Total:	119	5	52.3
80	II	2	Fish bone	Unidentified vertebrae	1	-	0.8
74	II	2	Marine shell	*Cypraea* sp.	16	2	7.6
75	II	2	Marine shell	*Drupa* sp.	7	3	4.5
76	II	2	Marine shell	*Conus* sp.	3	2	5.2
77	II	2	Marine shell	Unidentified	4	-	0.7
78	II	2	Echinoderm	Echinoidea	2	-	0.4
79	II	2	Bird bone	Unidentified	2	-	1.8
81	II	2	Mammal bone	Unidentified rodent	1	-	0.2
82	II	2	Volcanic glass	Flake	30	-	22.8
83	II	2	Organic	*Kukui* nutshell	2	-	0.2
84	II	2	Organic	Charcoal	-	-	0.2
				Layer II, Level 2 Total:	68	7	44.4
85	II	3	Marine shell	*Cypraea* sp.	25	3	10.6
86	II	3	Marine shell	*Drupa* sp	8	1	2.2
88	II	3	Marine shell	*Nerita* sp.	1	1	0.4
87	II	3	Marine shell	*Conus* sp.	6	2	4.0
89	II	3	Marine shell	Unidentified	5	-	1.5
90	II	3	Echinoderm	Echinoidea	6	-	0.5
91	II	3	Crustacean	UID claw fragment	1	-	0.2
92	II	3	Mammal bone	Rodent	10	1	0.5
93	II	3	Volcanic glass	Flake	48	-	14.3
94	II	3	Organic	Charcoal	-	-	0.5
				Layer II, Level 3 Total:	110	8	34.7
				EU-6 Total:	433	40	250.2

EU-7 was placed on the ground surface within the circular enclosure, and revealed the following stratigraphic profile (Figures 49 and 50):

Layer I (0-10cmbs) ..... dark brown (10YR 3/3) silt with small *ʻaʻā* pebbles on weathered bedrock.

No cultural material was recovered from EU-7.

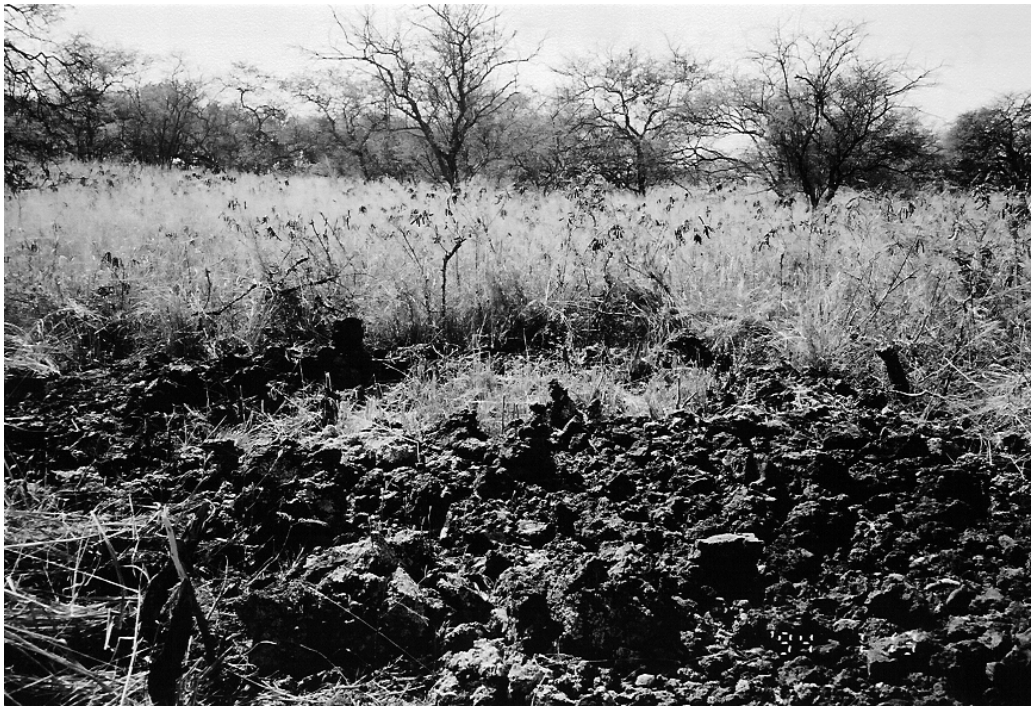


Figure 45. SIHP Site 23674, view to the south.

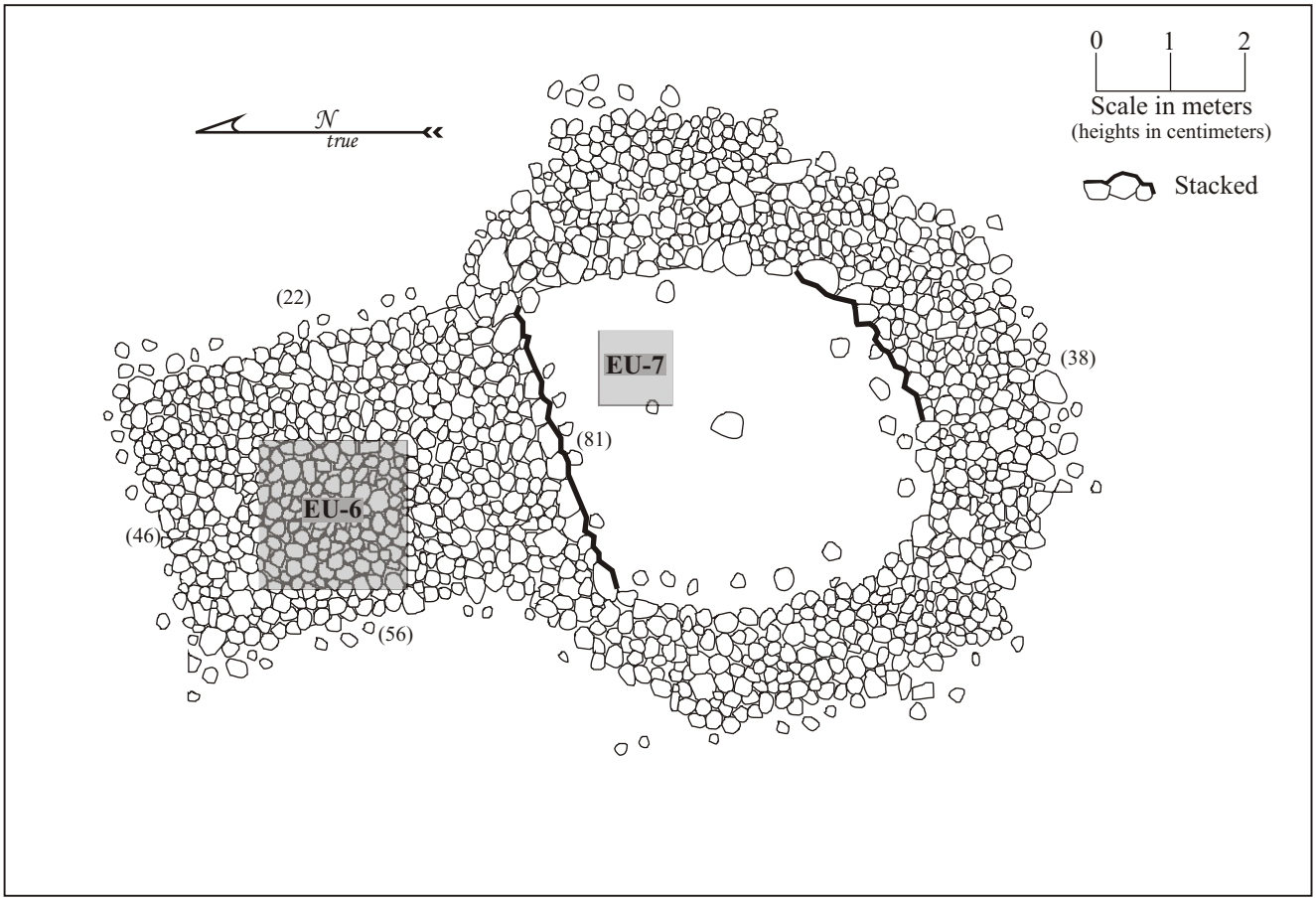
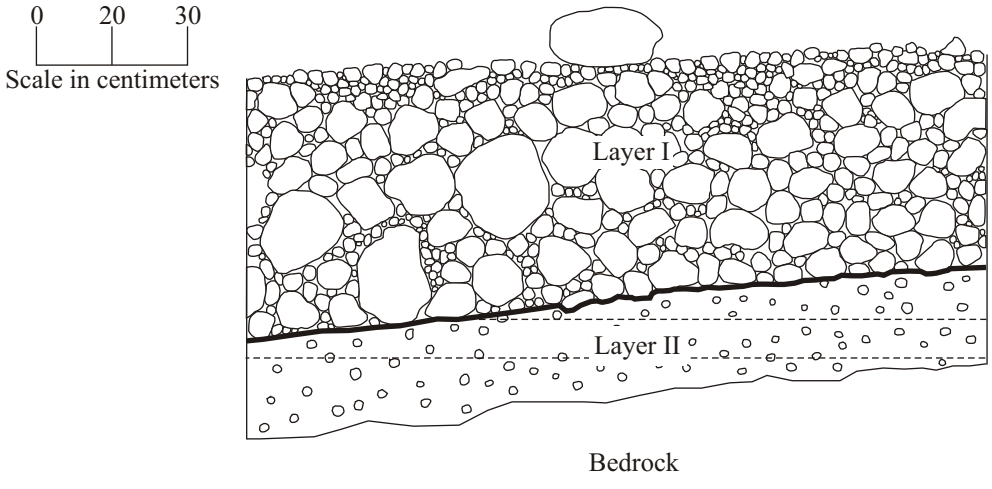


Figure 46. SIHP Site 23674 plan view.

Figure 47. SIHP Site 23674 EU-6 base of excavation, view to the north.



Layer I - Architectural layer.
Layer II Level 1 - Dark brown (10YR 3/3) silt and *ʻaʻā* gravel.
Layer II Level 2 - Very dark brown (10YR 2/2) and dark yellowish brown (10YR 3/4) sandy silt with *ʻaʻā* gravel.
Layer II Level 3 - Dark yellowish brown (10YR 3/4) sandy silt.

Figure 48. SIHP Site 23674 EU-6 north wall profile.

Figure 49. SIHP Site 23674 EU-7 base of excavation, view to the north.

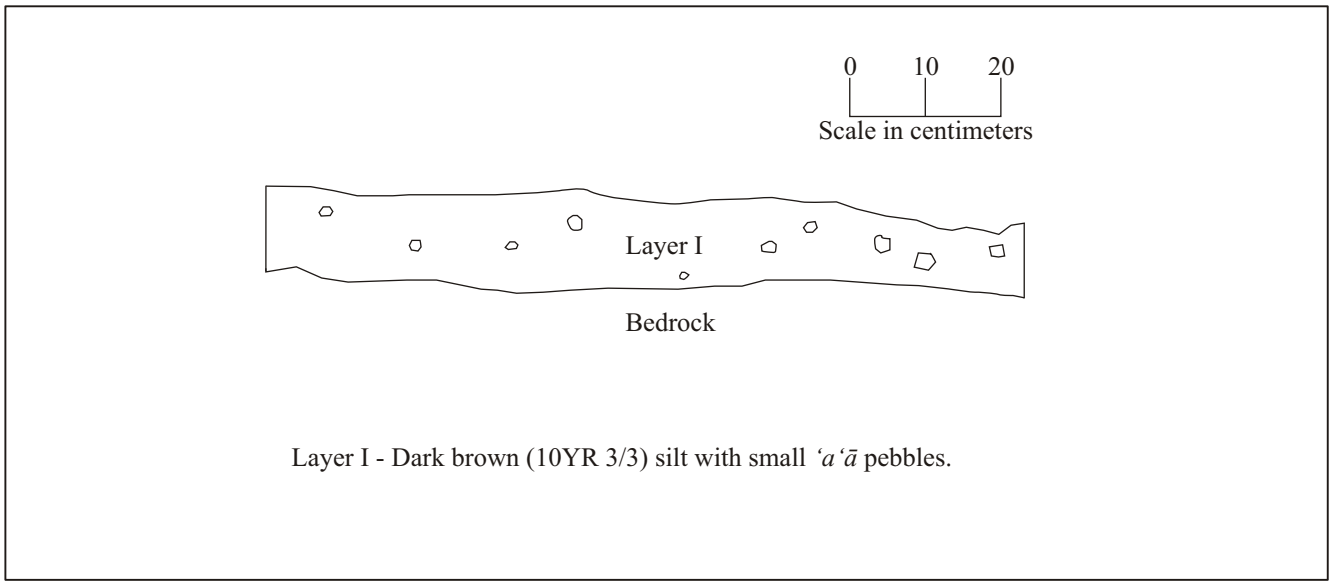


Figure 50. SIHP Site 23674 EU-7 north wall profile.

SIHP SITE 23675

Site 23675 is a partly walled platform located in the east-central portion of the project area (see Figure 3). The platform is constructed of partially stacked, but now mostly collapsed, small to large sized *ʻaʻa* cobbles. The southern edge of the platform has no wall. The platform measures 5.8 meters long by 5.7 meters wide and stands up to 80 centimeters above ground surface (Figure 51). The platform's surface is roughly paved with small sized cobbles. The platform's surface also contains two waterworn pebbles and two small circular depressions. The western depression measures 1.2 meters in diameter and 55 centimeters deep, while the eastern depression measures 1.2 meters in diameter and 50 centimeters deep; both depressions may be the result of tree-tip-ups at the site. The following three excavations were conducted at Site 23675: TU-20 (1 x 1m), EU-9 (2 x 1m aligned west-east), and EU-10 (2 x 2m).

TU-20 was excavated on top of the eastern depression (see Figure 51) and revealed the following stratigraphic profile (Figure 52):

Layer I (0-95cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles mixed with organics.
Layer II(95-113cmbs) ..... dark yellowish brown (10YR 4/4) sandy silt mixed with some organics and containing approximately 70% gravel content transitioning to a dark brown (10YR 3/3) silt containing a high concentration of gravels and decomposing bedrock.

TU-20 yielded *Cypraea* sp., *Sus* sp., charcoal, and basalt remains (Table 18). The basalt included a ground stone fragment and a waterworn piece. Layer II clearly yielded more species and types than Layer I.

Table 18. Recovered items from SIHP Site 23675, TU-20.

ACC #	*Layer*	*Depth (cmbs)*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
116	I	0-95	Organic	Charcoal	-	-	0.6
117	II	95-105	Marine shell	*Cypraea* sp.	1	1	1.3
118	II	95-105	Basalt	Waterworn	1	-	71.4
119	II	95-105	Basalt	Groundstone fragment	1	-	116.7
120	II	95-105	Mammal bone	*Sus* sp.	21	1	9.6
				TU-20 Total:	24	2	199.6

EU-9 was excavated on the western depression and revealed the following stratigraphic profile (Figure 53):

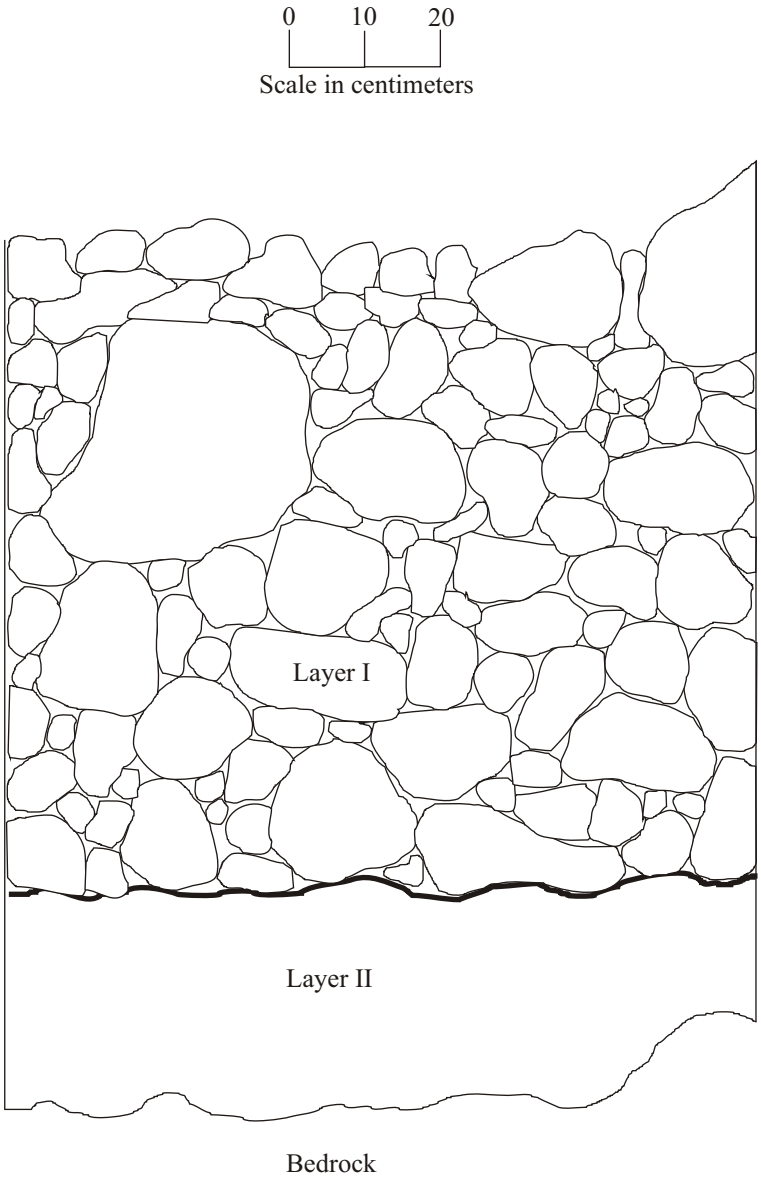
Layer I (0-70cmbs) .....architectural layer with loosely stacked *ʻaʻā* cobbles mixed with dark brown (10YR 3/3) silt.
Layer II Level 1 (70-80cmbs).....dark brown (10YR 3/3) silt mixed with *ʻaʻā* cobbles.
Layer II Level 2 (80-90cmbs).....dark brown (10YR 3/3) silt mixed with *ʻaʻā* cobbles and weathered bedrock fragments within a pocket on western side of unit on uneven bedrock.

EU-9 yielded *Cypraea* sp. shell fragments and charcoal (Table 19).

Table 19. Recovered items from SIHP Site 23675, EU-9.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
97	II	1	Marine shell	*Cypraea* sp.	3	2	2.6
96	II	1	Organic	Charcoal	-	-	0.4
				EU-9 Total:	3	2	3.0

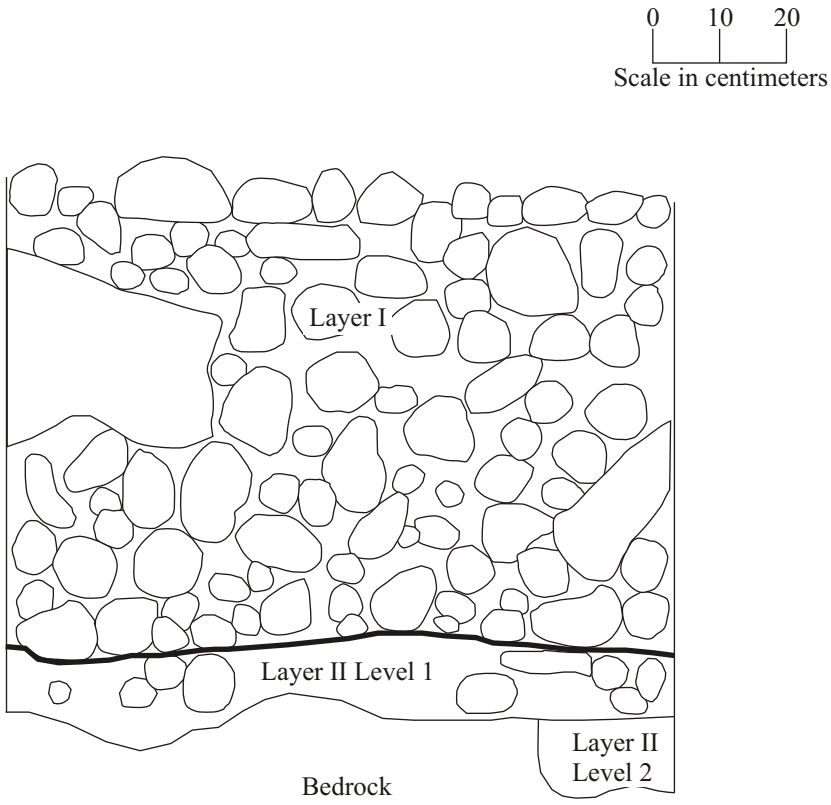
Figure 51. SIHP Site 23675 plan view.



Layer I- Architectural layer consisting of small to large sized *ʻaʻā* cobbles mixed with organics.

Layer II- Dark yellowish brown (10YR 4/4) sandy silt mixed with some organics and approximately 70 percent gravel content.

Figure 52. SIHP Site 23675 TU-20 north wall profile.



Layer I - Architectural layer with loosely stacked *ʻaʻā* cobbles mixed with dark brown (10YR 3/3) silt.

Layer II Level 1 - Dark brown (10YR 3/3) silt mixed with *ʻaʻā* cobbles.

Layer II Level 2 - Dark brown (10YR 3/3) silt mixed with *ʻaʻā* cobbles and weathered bedrock fragments within pocket on western side of unit.

Figure 53. SIHP Site 23675 EU-9 north wall profile.

EU-10 was placed on the south-central portion of the paved surface. The surface of the pavement within the confines of EU-10 slopes slightly to the southwest. The following layers were observed within EU-10 (Figures 54 and 55):

Layer I (0-70cmbs) .....architectural layer with small to large *ʻaʻā* cobbles (many of which are waterworn).
Layer II Level 1 (70-80cmbs).....black (10YR 2/1) and very dark brown (10YR 2/2) mottled silt mixed with *ʻaʻā* cobbles.
Layer II Level 2 (80-90cmbs).....black (10YR 2/1) and very dark brown (10YR 2/2) mottled silt mixed with *ʻaʻā* cobbles.
Layer II Level 3 (90-100cmbs) black (10YR 2/1) silt with weathered bedrock on undulating bedrock.

EU-10 yielded fish, *Cypraea* sp., *Drupa* sp., *Cellana* sp., *Nerita* sp., coral, Echinoidea, unidentifiable shell, pig, dog, small mammal, *kukui* nutshell, charcoal, basalt flakes, and volcanic glass flakes (Table 20). A coral abrader (Acc# 109) was recovered from Level 1 of Layer 2 (Figure 56). This irregular-shaped tab has two flat abraded surface, one of which is cut along the abrasion edge. The abrader measures 20.7 millimeters long, 15 millimeters wide, and 7.45 millimeters thick. A worked bone fragment (Acc# 059) was recovered from Level 2 of Layer II within EU-10 (Figure 57). This fragment has three surfaces that appear modified. The fragment is 12.15 millimeters long, 9.25 millimeters wide, and 3.9 millimeters thick. No stratigraphic changes or trends concerning recovered items are apparent within EU-10. The architectural Layer I yielded less species and types than the underlying Layer II, however.

Table 20. Recovered items from SIHP Site 23675, EU-10.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
101	I		Marine shell	*Cypraea* sp.	4	1	6.7
102	I		Marine shell	*Nerita* sp.	1	1	0.8
103	I		Coral	Unidentified	20	-	209.5
104	I		Coral	Waterworn	1	-	6.3
100	I		Mammal bone	*Sus* sp.	1	1	1.5
99	I		Volcanic glass	Flake	1	-	1.5
98	I		Organic	Charcoal in situ	-	-	2.3
				Layer I Total:	28	3	228.6
112	II	1	Marine shell	*Cypraea* sp.	26	5	21.8
114	II	1	Marine shell	*Drupa* sp.	3	1	2.3
110	II	1	Marine shell	*Cellana* sp.	2	1	1.3
115	II	1	Marine shell	*Cellana* sp.	1	1	1.1
111	II	1	Marine shell	*Nerita* sp.	7	6	2.3
116	II	1	Marine shell	Unidentified	2	-	0.4
109	II	1	Coral	Abrader	1	-	1.0
117	II	1	Coral	Unidentified	54	-	69.5
118	II	1	Coral	Waterworn	3	-	16.0
119	II	1	Coral	Unidentified	4	-	4.2
113	II	1	Echinoderm	Echinoidea	5	-	0.5
108	II	1	Mammal bone	*Sus* sp.	2	1	1.1
107	II	1	Volcanic glass	Flake	3	-	4.1
106	II	1	Organic	*Kukui* nutshell	2	-	0.5
105	II	1	Organic	Charcoal	-	-	2.0
				Layer II, Level 1 Total:	115	15	128.1
124	II	2	Fish bone	*Scarus* sp.	2	1	0.7
126	II	2	Marine shell	*Cypraea* sp.	33	6	21.0
127	II	2	Marine shell	*Drupa* sp.	1	1	0.4
123	II	2	Marine shell	*Nerita* sp.	19	16	4.2
128	II	2	Coral	Unidentified	12	-	22.5

Continued on next page

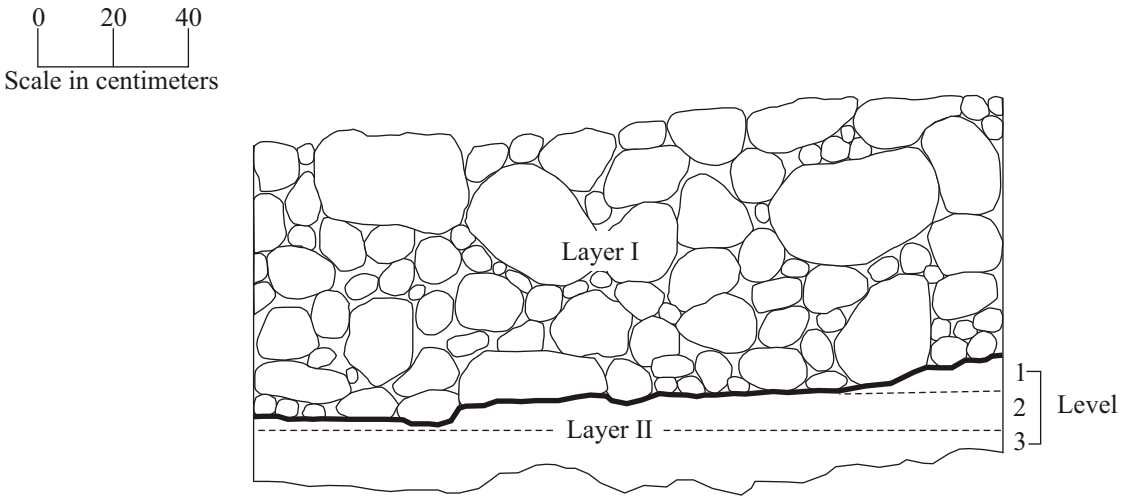
Table 20. Continued.

ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
129	II	2	Coral	Waterworn	1	-	0.4
125	II	2	Echinoderm	Echinoidea	4	-	0.8
122	II	2	Small mammal	Unidentified	9	-	0.8
59	II	2	Small mammal	Unidentified/worked	1	-	0.2
121	II	2	Volcanic glass	Flake	6	-	9.5
120	II	2	Organic	Charcoal	-	-	2.0
				Layer II, Level 2 Total:	88	24	62.5
135	II	3	Fish bone	Unidentified	1	-	0.1
137	II	3	Marine shell	*Cypraea* sp.	23	2	13.2
141	II	3	Marine shell	*Drupa* sp.	1	1	0.4
136	II	3	Marine shell	*Nerita* sp.	18	15	3.9
138	II	3	Coral	Unidentified	2	-	1.3
139	II	3	Coral	Waterworn	1	-	9.4
140	II	3	Coral	Unidentified	8	-	6.7
133	II	3	Mammal bone	*Sus* sp.	5	1	1.7
134	II	3	Mammal bone	*Canis sp.* tooth	2	1	0.9
131	II	3	Basalt	Flake	6	-	2.2
132	II	3	Volcanic glass	Flake	9	-	5.2
130	II	3	Organic	Charcoal	-	-	4.6
				Layer II, Level 3 Total:	76	20	49.6
				EU-10 Total:	307	62	468.8

In situ charcoal collected from Layer I in EU-10 of SIHP Site 23675 was submitted for radiocarbon assaying. The sample (Beta-212758) intercepts the tree-ring calibration curve at AD 1680, 1740, 1810, 1930, and 1950 and has a 2-sigma standard deviation calibrated date range of AD 1660 to 1950. Charcoal collected from Layer II, Level 3 in EU-10 of SIHP Site 23675 was also submitted for radiocarbon assaying. The sample (Beta-212759) also intercepts the tree-ring calibration curve at AD 1680, 1740, 1810, 1930, and 1950 and has a 2-sigma standard deviation calibrated date range of AD 1660 to 1950. A calibrated weighted average of the two "linked" raw assays intercepts the tree-ring calibration curve at AD 1690, 1740, 1800, 1930, and 1950, with a calibrated standard deviation that ranges between AD 1670 and 1950.

Figure 56. SIHP Site 23675 coral abrader recovered from EU-10 (Acc#. 109).

Figure 54. SIHP Site 23675 EU-10 base of excavation, view to the north.



Layer I - Architectural layer.
Layer II Level 1 - Black (10YR 2/1) and very dark brown (10YR 2/2) mottled silt mixed with *ʻaʻā* cobbles.
Layer II Level 2 - Black (10YR 2/1) and very dark brown (10YR 2/2) mottled silt mixed with *ʻaʻā* cobbles.
Layer II Level 3 - Black (10YR 2/1) silt with weathered bedrock.

Figure 55. SIHP Site 23675 EU-10 north wall profile.

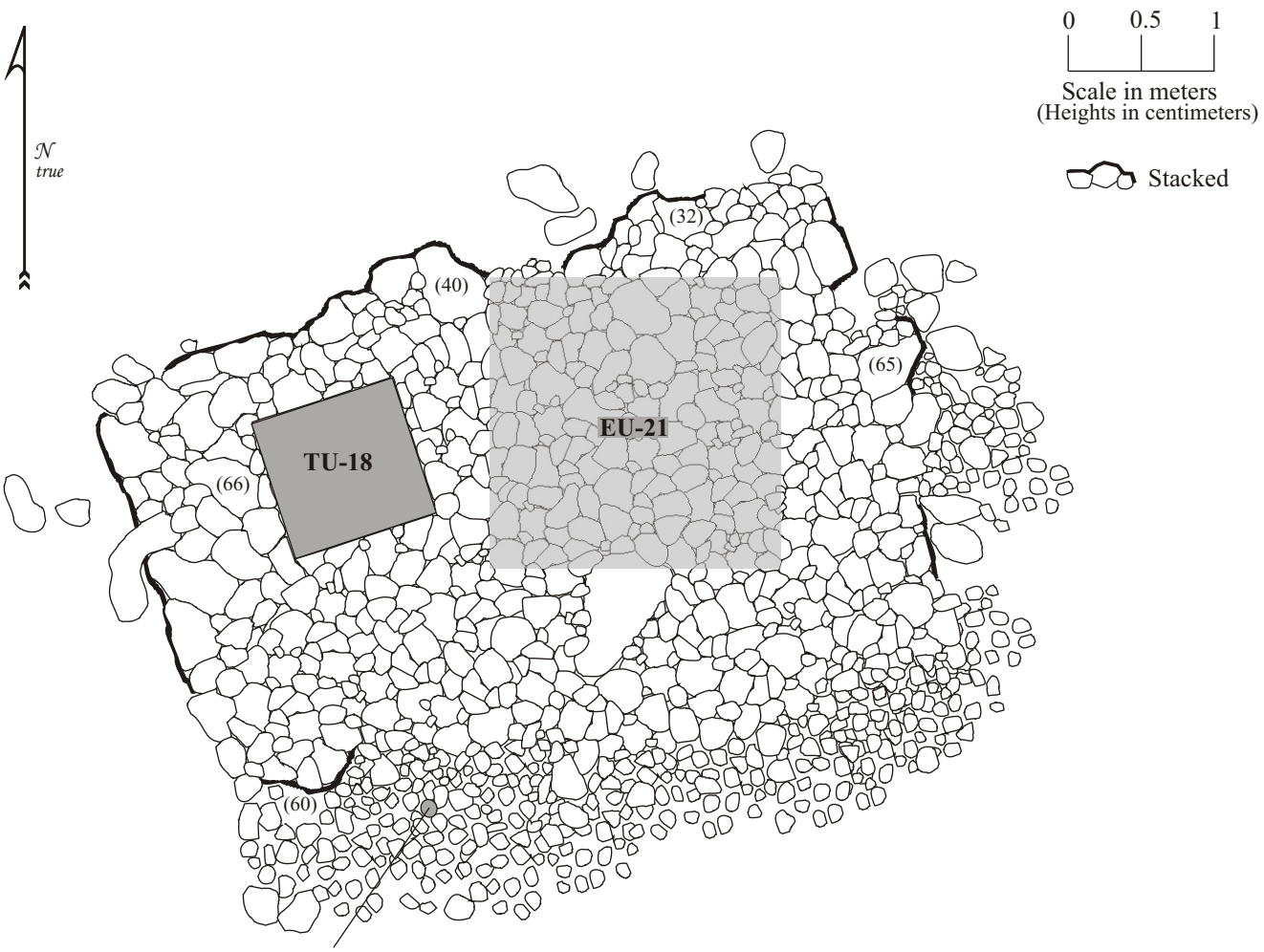

Figure 57. SIHP Site 23675 worked bone fragment from EU-10 (Acc#. 059).

SIHP Site 23676

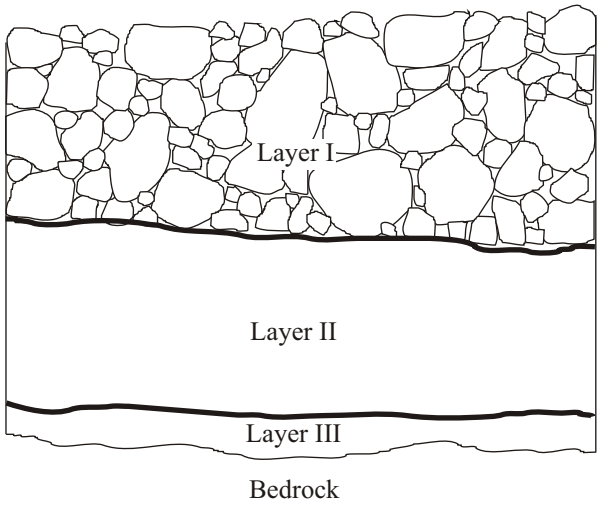
Site 23676 is a platform located in the east-central portion of the project area (see Figure 3). The platform (5.3 meters long by 3.4 meters wide) is constructed with partially stacked - mostly collapsed - large *ʻaʻā* cobbles forming its exterior edges (Figures 58 and 59). The platform is roughly paved with small *ʻaʻā* cobbles and pebbles creating a somewhat level surface. Site 23676 stands up to 70 centimeters above the surrounding ground surface and its southeastern edge dissipates into a bedrock outcrop. A waterworn coral fragment was observed on the platform's southern corner. The following two excavations were conducted on the Site 23878 platform: TU-18 (1 x 1 m) and EU-21 (2 x 2m). TU-18 was excavated into the northwest portion of Site 23676 and revealed the following stratigraphic profile (see Figure 59):

Layer I (0-40cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles mixed with organic debris.
Layer II (40-71cmbs) ..... very dark brown (10YR 2/2) sandy silt with approximately 45 percent *ʻaʻā* gravel content.
Layer III (71-73cmbs)..... dark brown (7.5YR 3/4) fine silt mixed with gravels and decomposing bedrock on bedrock.


Figure 58. SIHP Site 23676, view to the southwest.



TU-18 west wall profile.



0 10 20
Scale in centimeters

Layer I - Architectural layer consisting of small to large sized *ʻaʻā* cobbles mixed with organic debris.

Layer II - Very dark brown (10YR 2/2) sandy silt with approximately 45 percent *ʻaʻā* gravel content.

Layer III - Dark brown (7.5YR 3/4) fine silt mixed with gravels and decomposing bedrock.

Figure 59. SIHP Site 23676 plan view and TU-18 west wall profile.

TU-18 yielded fish, *Cypraea* sp., a *he'e* lure (Acc# 90 and Figure 60), *Cellana* sp., *Nerita* sp., *Strombina* sp., Echinoidea, *Conus* sp., unidentifiable shell, pig, rodent, unidentifiable small mammal, charcoal, and volcanic glass flakes (Table 21). No stratigraphic changes or trends in species or artifact types are apparent within TU-18, even though the species and types from Layer II clearly outnumber those from Layer I.

Figure 60. SIHP Site 23676 *he'e* lure recovered from TU-18.

Table 21. Recovered items from SIHP Site 23676, TU-18.

ACC #	*Layer*	*Depth (cmbs)*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
87	I	0-40	Marine shell	*Cypraea* sp.	9	3	9.4
88	I	0-40	Marine shell	*Cellana* sp.	1	1	0.1
89	I	0-40	Marine shell	Unidentified	1	1	1.0
90	I	0-40	Marine shell	*He'e* lure	1	1	32.0
91	I	0-40	Organic	*Kukui* nutshell	5	-	4.5
92	I	0-40	Fish bone	Unidentified	1	1	0.1
93	I	0-40	Mammal bone	*Sus* sp.	1	2	1.4
79	I	0-40	Mammal bone	Rodent	3		0.3
94	I	0-40	Volcanic glass	Flake	2	-	2.6
				Layer I Total:	24	9	51.4
95	II	40-50	Organic	Charcoal	-	-	0.5
96	II	40-50	Organic	*Kukui* nutshell	10	-	2.3
97	II	40-50	Echinoderm	Echinoidea	25	1	1.6
98	II	40-50	Marine shell	*Conus* sp.	1	1	0.2
99	II	40-50	Marine shell	*Cypraea* sp.	39	14	22.3
100	II	40-50	Marine shell	*Drupa* sp.	1	1	0.1
101	II	40-50	Marine shell	*Nerita* sp.	1	1	0.2
102	II	40-50	Marine shell	*Cellana* sp.	3	1	0.4
103	II	40-50	Marine shell	*Strombina* sp.	1	1	0.3
104	II	40-50	Marine shell	Unidentified	17	-	0.3

Continued on next page

Table 21. Continued

ACC #	*Layer*	*Depth (cmbs)*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
105	II	40-50	Bone	Small mammal	4	2	0.8
106	II	40-50	Volcanic glass	Flake	8	-	6.4
107	II	40-50	Organic	*Kukui* nutshell	1	1	0.1
108	II	50-60	Echinoderm	Echinoidea	25	1	1.9
109	II	50-60	Marine shell	*Nerita*	1	1	0.1
110	II	50-60	Organic	Charcoal	-	-	0.2
111	II	50-60	Marine shell	*Cypraea*	12	3	10.9
112	II	50-60	Volcanic glass	Flakes	2	-	0.9
113	II	60-71	Echinoderm	Echinoidea	11	1	0.9
114	II	60-71	Marine shell	*Cypraea*	6	1	2.1
115	II	60-71	Volcanic glass	Flakes	2	-	1.1
				Layer II Total:	170	30	53.6
				TU-18 Total:	194	39	105.0

EU-21 was excavated on the northwest portion of Site 23676 and revealed the following stratigraphic profile (Figure 61):

Layer I (0-30cmbs).....architectural layer with large *ʻaʻā* cobbles on the surface transitioning to smaller cobbles with depth particularly in the southeastern quadrant.

Layer II, Levels 1-4 (30-70cmbs).....dark brown (10YR 3/3) silt mottled with dark yellowish brown (10YR 3/4) silt and *ʻaʻā* cobbles.

Recovered items from EU-21 include shark, *Serpuloris* sp, *Cypraea* sp., *Drupa* sp., *Morula* sp., *Cellana* sp., *Chama* sp., *Nerita* sp., coral, Echinoidea, *Nassarius* sp., *Fimbria* sp., *Conus* sp., unidentifiable shell, bird, *Sus* sp., *Canis* sp., *Rattus* sp., unidentifiable mammal, *kukui* nutshell, charcoal, and volcanic glass flakes (Table 22). A bone awl fragment (Acc# 337) from Level 2 of Layer II has a chipped point. This awl fragment is 12.4 millimeters long, 8.9 millimeters wide, and 5.4 millimeters thick. A second bone awl (Acc# 352) came from Level 3 in Layer II (Figure 62). This awl is 46.4 millimeters long, 11 millimeters wide, and 7.1 millimeters thick. Items recovered from EU-21 display an unusually high variety and abundance in all the excavated layers. However, no significant change in species or types of items from one layer to the next is apparent within the unit. Species and artifact types peak in Level 1 of Layer II and then increasingly drop off towards bedrock.

Figure 62. SIHP Site 23676 bone awl recovered from EU-21 (Acc# 352).

Table 22. Recovered items from SIHP Site 23676, EU-21.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
310	I		Marine shell	*Serpuloris variabilis*	2	-	2.9
304	I		Marine shell	*Cypraea* sp.	73	4	68.0
302	I		Marine shell	*Drupa* sp.	2	1	6.6
302	I		Marine shell	*Morula* sp.	1	1	0.6
301	I		Marine shell	*Cellana* sp.	2	1	0.8
306	I		Marine shell	*Conus* sp.	2	1	0.2
305	I		Marine shell	Unidentified	44	-	0.2
312	I		Coral	Unidentified	14	-	15.0
313	I		Coral	Unidentified	2	-	9.1
311	I		Echinoderm	Echinoidea	5	-	0.4
309	I		Mammal bone	*Sus* sp.	6	1	2.0
307	I		Mammal bone	*Canis* sp. tooth	1	1	0.4
308	I		Small mammal	*Rattus* sp.	1	1	0.1
300	I		Volcanic glass	Flake	12	-	20.0
299	I		Organic	*Kukui* nutshell	4	-	0.8
298	I		Organic	Charcoal	-	-	3.0
				Layer I Total:	171	11	130.1

Continued on next page

Table 22. Continued.

ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
318	II	1	Fish	Shark tooth burnt	1	1	0.4
325	II	1	Marine shell	*Serpuloris variabilis*	1	1	0.3
319	II	1	Marine shell	*Cypraea* sp.	81	6	33.7
324	II	1	Marine shell	*Drupa* sp.	5	2	9.9
323	II	1	Marine shell	*Morula* sp.	2	2	1.4
321	II	1	Marine shell	*Cellana* sp.	7	1	3.2
327	II	1	Marine shell	*Chama* sp.	1	1	4.0
320	II	1	Marine shell	*Nerita* sp.	5	4	1.0
326	II	1	Marine shell	*Nassarius* sp.	2	2	1.6
322	II	1	Marine shell	*Conus* sp.	7	2	1.9
328	II	1	Marine shell	Unidentified	26	-	3.2
329	II	1	Coral	Unidentified	1	-	16.9
330	II	1	Coral	Unidentified	22	-	119.2
331	II	1	Echinoderm	Echinoidea	10	-	1.2
317	II	1	Mammal bone	*Sus* sp.	18	1	3.4
316	II	1	Volcanic glass	Flake	17	-	10.8
315	II	1	Organic	*Kukui* nutshell	10	-	4.3
314	II	1	Organic	Charcoal	-	-	2.4
				Layer II, Level 1 Total:	216	23	218.8
343	II	2	Marine shell	*Cypraea* sp.	52	7	29.2
341	II	2	Marine shell	*Drupa* sp.	3	1	3.7
340	II	2	Marine shell	*Morula* sp.	3	3	1.8
338	II	2	Marine shell	*Cellana* sp.	1	1	0.1
342	II	2	Marine shell	*Nassarius* sp.	6	5	2.8
339	II	2	Marine shell	*Conus* sp.	2	1	2.0
344	II	2	Marine shell	Unidentified	22	-	3.2
345	II	2	Coral	Waterworn	1	-	0.6
346	II	2	Coral	Unidentified	10	-	5.9
347	II	2	Echinoderm	Echinoidea	20	-	0.9
337	II	2	Mammal bone	Unidentified/awl	1	-	0.4
336	II	2	Mammal bone	*Sus* sp. burnt	5	1	3.4
335	II	2	Small mammal	*Rattus* sp. jaw	1	1	0.1
334	II	2	Volcanic glass	Flake	11	-	5.4
333	II	2	Organic	*Kukui* nutshell	19	-	3.1
332	II	2	Organic	Charcoal	-	-	3.3
				Layer II, Level 2 Total:	157	20	65.9
358	II	3	Marine shell	*Cypraea* sp.	37	6	23.1
353	II	3	Marine shell	*Drupa* sp.	1	1	4.0
355	II	3	Marine shell	*Nerita* sp.	2	2	0.5
356	II	3	Marine shell	*Nassarius* sp.	3	3	1.4
357	II	3	Marine shell	*Fimbria* sp.	1	1	0.3
354	II	3	Marine shell	*Conus* sp.	1	1	0.3
359	II	3	Marine shell	Unidentified	13	-	1.5
360	II	3	Coral	Unidentified	3	-	0.8
361	II	3	Echinoderm	Echinoidea	15	-	1.5
350	II	3	Mammal bone	*Canis* sp. teeth/burnt	2	1	0.5
352	II	3	Mammal bone	Unidentified/awl	1	-	2.8
351	II	3	Mammal bone	Unidentified/burnt	4	-	1.0
349	II	3	Volcanic glass	Flake	8	-	3.9
348	II	3	Organic	Charcoal	-	-	1.6
				Layer II, Level 3 Total:	91	15	43.2

Continued on next page

Table 22. Continued.

ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
374	II	4	Fish bone	Shark tooth	1	1	0.1
372	II	4	Marine shell	*Serpuloris variabilis*	1	1	0.9
367	II	4	Marine shell	*Cypraea* sp.	5	2	6.2
369	II	4	Marine shell	*Drupa* sp.	1	1	2.6
368	II	4	Marine shell	*Morula* sp.	1	1	0.5
371	II	4	Marine shell	*Nassarius* sp.	2	2	0.8
370	II	4	Marine shell	*Conus* sp.	2	1	0.5
373	II	4	Marine shell	Unidentified	2	-	0.1
375	II	4	Coral	Unidentified	1	-	0.2
376	II	4	Coral	Unidentified	1	-	0.3
377	II	4	Echinoderm	Echinoidea	3	-	0.2
366	II	4	Bird bone	Unidentified bird	2	-	0.2
365	II	4	Mammal bone	*Canis* sp. tooth	1	1	0.8
364	II	4	Med. mammal	Unidentified/cut	1	-	0.4
363	II	4	Volcanic glass	Flake	2	-	0.5
362	II	4	Organic	Charcoal	-	-	0.1
				Layer II, Level 4 Total:	26	10	14.4
				EU-20 Total:	661	79	472.4

Charcoal collected from Layer II Level 2 in EU-21 of SIHP Site 23676 was submitted for radiocarbon assaying. The sample (Beta-212765) intercepts the tree-ring calibration curve at AD 1520, 1590, and 1620 and has a 2-sigma standard deviation calibrated date range of AD 1440 to 1660. Charcoal collected from Layer I in EU-21 of SIHP Site 23676 was also submitted for radiocarbon assaying. The sample (Beta-212763) intercepts the tree-ring calibration curve at AD 1460 and has a 2-sigma standard deviation calibrated date range of AD 1420 to 1640. Charcoal collected from Layer II Level 1 in EU-21 of SIHP Site 23676 yielded a radiocarbon assay (Beta-212764) that intercepts the tree-ring calibration curve at AD 1460 and has a 2-sigma standard deviation calibrated date range of AD 1410 to 1650. A calibrated weighted average of the three "linked" raw assays intercepts the tree-ring calibration curve at AD 1470, with a calibrated standard deviation that ranges between AD 1450 and 1620.

SIHP Site 23677

Site 23677 is located in the east-central portion of the project area (see Figure 3). It consists of a small square platform remnant (Feature A) constructed in the southwest corner of a rough enclosures (Feature B) (Figures 63 and 64). The features are constructed of *ʻaʻā* cobbles and boulders formerly stacked, but now largely collapsed. The interior of the enclosure consists of thin soil covered by dense vegetation. A waterworn cobble, a piece of coral, and *Cypraea* sp. shell fragments were observed on ground surface within the site. A 1 x 1 meter test unit (TU-16) was excavated in the center of Feature A. A second 1 x 1 meter excavation unit (EU-22) was located immediately northeast of TU-16, near the eastern edge of the Feature B platform. Two abutting excavation units (EU-23 and EU-24) were placed across the southeastern corner of Feature B. Each excavation unit was 2 x 1 meters. Considering that Excavation Units 23 and 24 were abutting, combined these units comprised a trench that was four meters long by one meter wide. This trench covered the entire width of the corner section of the Feature B enclosing wall.

Feature A

Feature A is a small platform remnant (2.9 meters long by 2.5 meters wide) located in the northwest corner of the enclosure area (Feature B). The platform is constructed with large *ʻaʻā* cobbles stacked around the outside edges (90 centimeters high) and small cobbles paving its roughly level surface. Much of Feature A has collapsed leaving a rubble scatter around the entire feature. A piece of waterworn coral was found on the platform's surface.

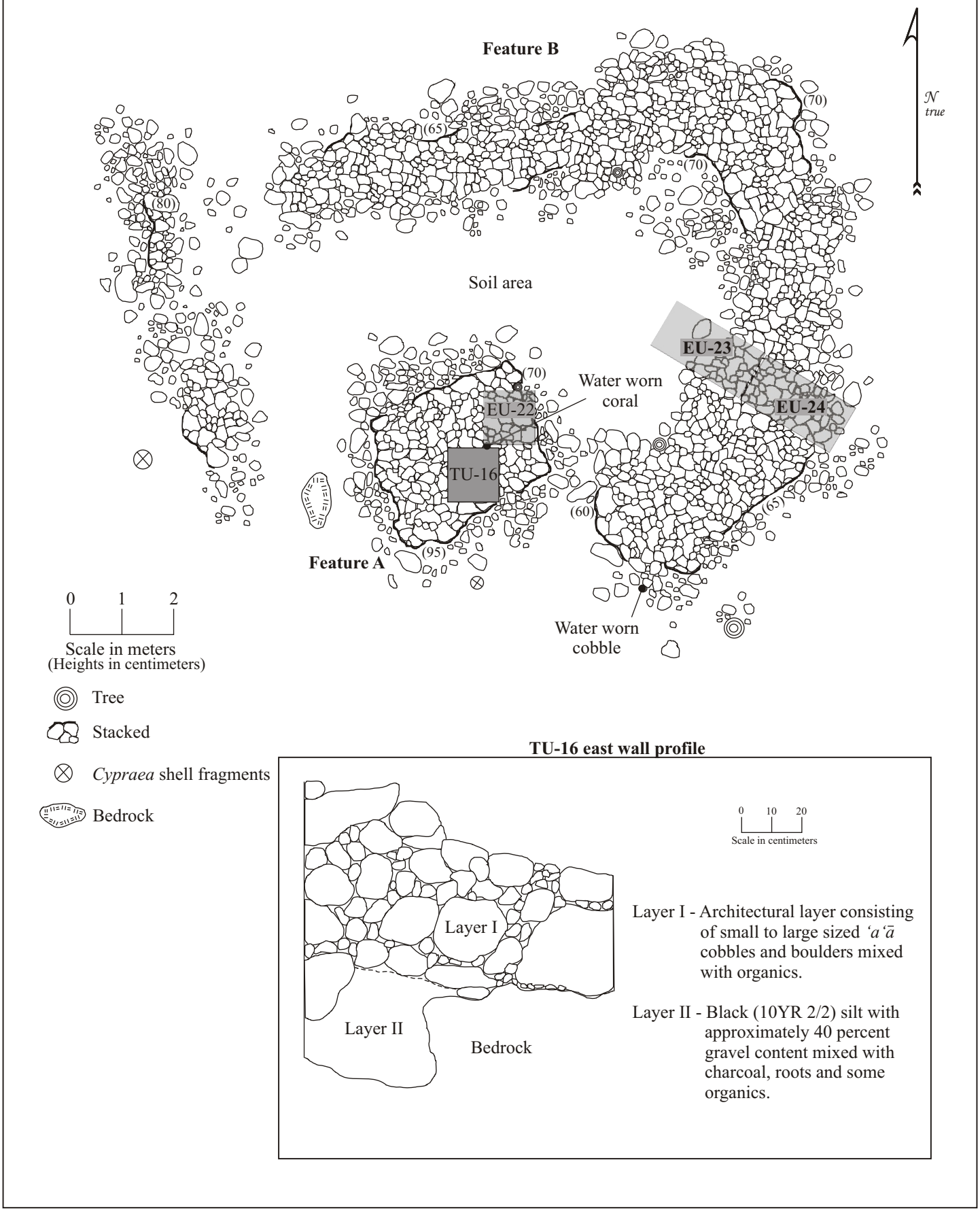


Figure 63. SIHP Site 23677 plan view and TU-16 profile.


Figure 64. SIHP Site 23677, view to the southwest.

TU-16 was excavated in the south-central area of Feature A (see Figure 63) and revealed the following stratigraphic profile:

Layer I (0-65cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles and boulders mixed with organics.
Layer II (65-95cmbs) ..... black (10YR 2/2) silt with approximately 40% gravel content mixed with roots and some organics (charcoal staining?) on bedrock.

Items recovered from TU-16 include fish, *Cypraea* sp., *Drupa* sp., *Cellana* sp., *Nerita* sp., coral, Echinoidea, *Cantharus* sp., *Conus* sp., *Venus* sp., unidentifiable shell, mammal, charcoal, and volcanic glass flakes and shatter (Table 23). Other than Layer II yielding far more and a greater variety of items than Level I, no meaningful changes could be detected between the layers.

Table 23. Recovered items from SIHP Site 23677, Feature A, TU-16.

ACC #	*Layer*	*Depth(cmbs)*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
26	I	0-65	Organic	Charcoal	-	-	0.4
27	I	0-65	Echinoderm	Echinoidea	2	1	0.3
28	I	0-65	Marine shell	*Cypraea* sp.	3	2	5.0
29	I	0-65	Marine shell	*Conus* sp.	1	1	0.7
30	I	0-65	Marine shell	*Drupa* sp.	1	1	3.5
31	I	0-65	Marine shell	*Nerita* sp.	1	1	0.2
				Layer I Total:	8	6	10.1
32	II	65-75	Organic	Charcoal	-	-	2.2
34	II	65-75	Echinoderm	Echinoidea	28	1	3.6
35	II	65-75	Marine shell	*Nerita* sp.	5	5	1.7
36	II	65-75	Marine shell	Unidentified	1	1	0.1
37	II	65-75	Coral	Waterworn	8	-	4.1
38	II	65-75	Marine shell	*Drupa* sp.	2	1	0.6
39	II	65-75	Marine shell	*Cantharus* sp.	1	1	0.1

Continued on next page

Table 23. Continued

ACC #	*Layer*	*Depth(cmbs)*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
40	II	65-75	Marine shell	*Cypraea* sp.	30	4	14.7
41	II	65-75	Marine shell	*Cellana* sp.	1	1	0.1
42	II	65-75	Marine shell	*Venus* sp.	1	1	0.1
43	II	65-75	Fish bone	Unidentified	1	1	0.2
44	II	65-75	Bone	Small mammal	1	1	2.4
45	II	65-75	Volcanic glass	Flakes	2	-	0.5
46	II	75-85	Organic	Charcoal	-	-	1.3
47	II	75-85	Echinoderm	Echinoidea	16	1	1.6
48	II	75-85	Marine shell	*Cypraea* sp.	5	1	1.1
49	II	75-85	Marine shell	*Nerita* sp.	1	1	0.1
50	II	75-85	Marine shell	*Cellana* sp.	1	1	0.1
51	II	75-85	Bone	Small mammal	1	1	1.0
52	II	75-85	Volcanic glass	Debitage	1	-	0.3
53	II	75-85	Organic	Charcoal	-	-	0. 9
54	II	75-85	Echinoderm	Echinoidea	2	1	0.3
55	II	75-85	Marine shell	*Cypraea* sp.	3	1	2.7
56	II	75-85	Marine shell	*Nerita* sp.	1	1	0.1
57	II	75-85	Marine shell	*Venus* sp.	1	1	0.3
				Layer II Total:	113	26	39.3
				TU-16 Total:	121	32	49.4

A charcoal sample from Layer II was sent to Beta Analytic, Inc. for AMS radiocarbon analysis (Beta-175917). The resulting conventional radiocarbon age is 160±40 BP, with a 2-sigma range of AD 1660 to 1950 (Clark and Rechtman 2003).

EU-22 was excavated near the northeast-central edge of Feature A (see Figure 63) and revealed the following stratigraphic profile (Figures 65 and 66):

Layer I (0-20cmbs).....architectural layer with angular *ʻaʻā* cobbles.
Layer II, Levels 1-3 (20-80cmbs)....dark brown (10YR 3/3) silt with approximately 70% *ʻaʻā* cobbles.
Layer III, Level 1-3 (80-130cmbs)..black (10YR 2/1) silt with approximately 70% *ʻaʻā* cobbles.

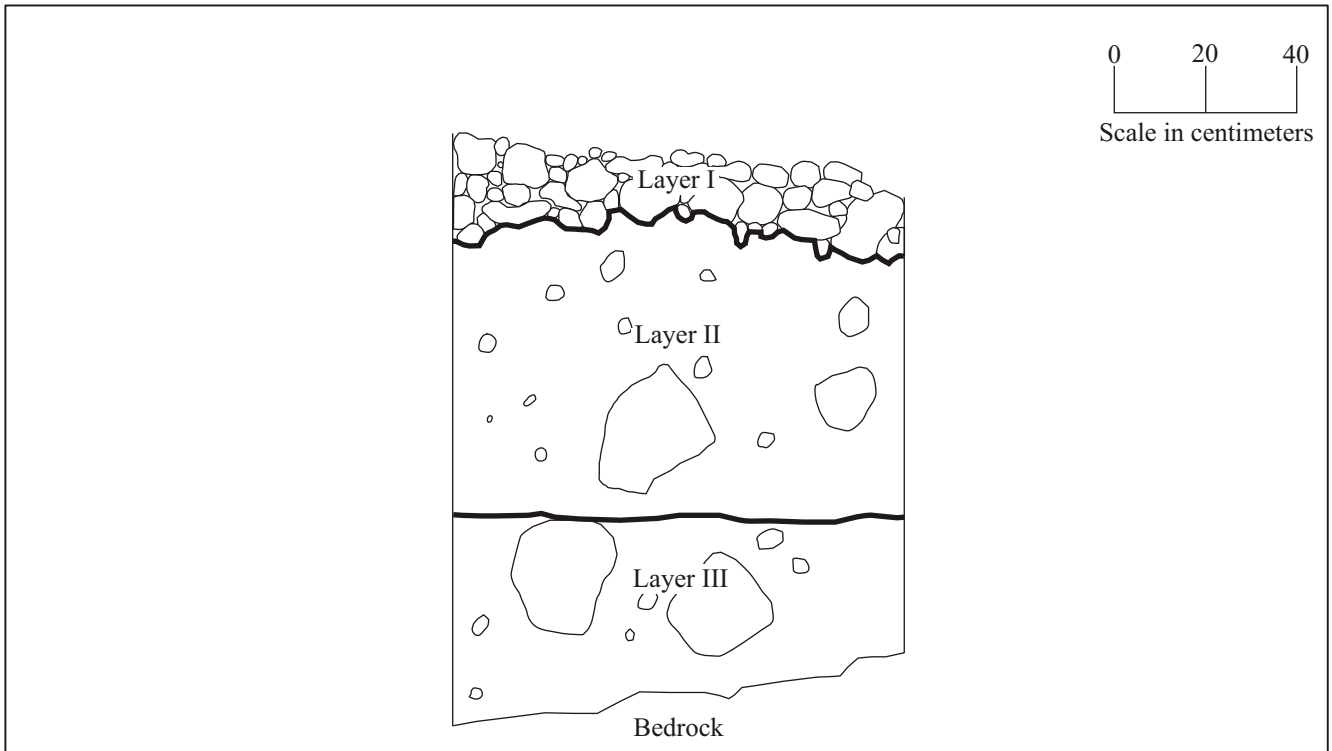
Items recovered from EU-22 include *Cypraea* sp., *Drupa* sp., *Chama* sp., *Nerita* sp., coral, Echinoidea, *Conus* sp., unidentifiable shell, rodent, unidentifiable mammal, *kukui* nutshell, charcoal, and volcanic glass flake (Table 24). No items were recovered in the architectural Layer I, while items peaked in Level 2 of Layer III. Volcanic glass flakes were limited to Layer III. Other than these stratigraphic differences, no significant trends for species by depth are apparent within EU-22.

Charcoal collected from Layer II Level 1 in EU-22, SIHP Site 23677 was submitted for radiocarbon assaying. The sample (Beta-212766) intercepts the tree-ring calibration curve at AD 1950 and has a 2-sigma standard deviation calibrated date range of AD 1680 to 1960. Charcoal collected from Layer III Level 3 in EU-22 was also submitted for radiocarbon assaying. The sample (Beta-212767) intercepts the tree-ring calibration curve at AD 1680/1740/1800/1930/1950 and has a 2-sigma standard deviation calibrated date range of AD 1660 to 1950. Charcoal collected from Layer I in TU-16 of SIHP Site 23677 yielded a radiocarbon assay that intercepts the tree-ring calibration curve at AD 1680/1740/1800/1930/1950 and has a 2-sigma standard deviation calibrated date range of AD 1660 to 1950. A calibrated weighted average of the three "linked" raw assays intercepts the tree-ring calibration curve at AD 1690/1730/1810/1920/1950, with a calibrated standard deviation that ranges between AD 1690 and 1950.

Table 24. Recovered items from SIHP Site 23677, Feature A, EU-22.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
380	II	1	Marine shell	*Cypraea* sp.	2	1	2.8
381	II	1	Coral	Unidentified	15	-	3.1
379	II	1	Small mammal	*Rattus* sp.	1	1	0.2
378	II	1	Organic	Charcoal	-	-	1.0
				Layer II, Level 1 Total:	18	2	7.1
383	II	2	Marine shell	*Cypraea* sp.	1	1	1.2
382	II	2	Marine shell	*Conus* sp.	2	1	0.7
384	II	2	Coral	Unidentified	1	-	5.1
385	II	2	Coral	Unidentified	2	-	3.7
386	II	2	Echinoderm	Echinoidea	1	-	0.1
387	II	3	Marine shell	*Cypraea* sp.	4	3	5.2
388	II	3	Marine shell	*Drupa* sp.	1	1	1.1
389	II	3	Coral	Unidentified	1	-	0.6
				Layer II, Level 2 Total:	13	6	17.7
392	III	1	Marine shell	*Cypraea* sp.	4	1	5.8
394	III	1	Marine shell	*Nerita* sp.	2	2	0.5
393	III	1	Marine shell	*Conus* sp.	3	1	1.1
395	III	1	Coral	Unidentified	1	-	0.1
396	III	1	Echinoderm	Echinoidea	2	-	0.3
391	III	1	Volcanic glass	Flake	1	-	0.4
390	III	1	Organic	Charcoal	-	-	0.2
				Layer III, Level 1 Total:	13	4	8.4
402	III	2	Marine shell	*Cypraea* sp.	35	5	26.4
405	III	2	Marine shell	*Drupa* sp.	1	1	0.1
404	III	2	Marine shell	*Nerita* sp.	7	5	1.4
403	III	2	Marine shell	*Conus* sp.	3	1	1.0
406	III	2	Marine shell	Unidentified	9	-	2.2
407	III	2	Coral	Unidentified	4	-	3.9
408	III	2	Echinoderm	Echinoidea	45	-	4.6
401	III	2	Mammal bone	Unidentified/burnt	2	-	0.9
400	III	2	Volcanic glass	Flake	3	-	2.8
399	III	2	Organic	*Kukui* nutshell	1	-	0.2
397	III	2	Organic	Charcoal	6	-	0.4
398	III	2	Organic	Charcoal in situ	14	-	0.2
				Layer III, Level 2 Total:	130	12	44.1
411	III	3	Marine shell	*Cypraea* sp.	6	1	9.2
413	III	3	Marine shell	*Drupa* sp.	1	1	0.3
414	III	3	Marine shell	*Pseudochama* sp.	2	1	0.3
412	III	3	Marine shell	*Nerita* sp.	1	1	0.4
410	III	3	Volcanic glass	Flake	1	-	1.2
409	III	3	Organic	Charcoal	37	-	1.5
				Layer III, Level 3 Total:	48	4	12.9
				EU-22 Total:	222	28	90.2

Figure 65. SIHP Site 27677 Feature A EU-22 base of excavation, view to the west.



Layer I - Architectural layer with angular *ʻaʻā* cobbles.

Layer II, Levels 1-3 - Dark brown (10YR 3/3) silt with approximately 70% *ʻaʻā* cobbles.

Layer III, Level 1-3 - Black (10YR 2/1) silt with approximately 70% *ʻaʻā* cobbles.

Figure 66. SIHP Site 27677 Feature A EU-22 west wall profile.

Feature B

Feature B is a rough wall partially enclosing Feature A to the north, east, and south. The wall which was formerly stacked, but is now mostly collapsed, measures up to 2.5 meters wide 70 centimeters high, and encompasses an area approximately 13.2 meters long by 9.5 meters wide. This *ʻaʻā* cobble wall is absent in the site's southwest corner near Feature A, and only a faint trace of the western wall remains intact. The central area enclosed by the wall consists primarily of thin soil.

EU-23 and EU-24 were placed back-on-back across the southeastern corner of the Feature B wall and revealed the following stratigraphic profile (Figures 67, 68, and 69):

Layer I (0-40cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles and boulders with an upright in the center of the wall.
Layer II (65-95cmbs) ..... dark brown (10YR 3/3) loose silt with approximately 90% small *ʻaʻā* cobbles and pebbles on weathered bedrock.

No items were recovered from EU-23, which fell on the northwestern half of the wall. *Cypraea* sp. and cone shell fragments were recovered from Level 2 of Layer II (Table 25).

Table 25. Recovered items from SIHP Site 23677, EU-24.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
562	II	2	Marine shell	*Cypraea* sp.	1	1	5.2
563	II	2	Marine shell	*Conus* sp.	1	1	0.3
				EU-24 Total:	2	2	5.5

SIHP Site 23678

Site 23678 is an enclosure in the northeast quadrant of the project area (see Figure 3) constructed within the center of a *kuaiwi* remnant (Site 23686 Feature 291) (Figure 70). The oval shaped enclosure (12.5 meters long by 5.5 meters wide) is constructed of partially stacked (mostly collapsed) *ʻaʻā* cobbles and boulders (Figure 71). In several locations the tops of the walls, which stand up to 60 centimeters above ground surface and measure 1.0 meter wide, and are topped with smooth *pāhoehoe* cobbles. The interior of the enclosure area (7.7 meters long by 2.6 meters wide) consists primarily of thin soil (at least 8 centimeters thick) covered by dense vegetation. An engineered opening (1.0 meter wide) located in the center of the north wall allows access to the enclosure. A *Cypraea* shell fragment and a small piece of coral were found on ground surface within Site 23678. Judging by the continuous construction, it appears that the enclosure was built prior to, or at the same time as, the *kuaiwi* (Site 23686 Feature 291), which extends in both directions from the enclosure's east and west ends.

EU-14 (2 x 1m aligned west-east) was placed within the oval-shaped enclosure, east of the possible northern entrance (see Figure 70) and revealed EU-14 revealed the following stratigraphic profile (Figure 72):

Layer I, Levels 1-2 (0-20cmbs)..... dark brown (10YR 3/3) silt with 40% small *aʻā* cobbles and pebbles.
Layer I, Level 3 (20-30cmbs)..... dark yellowish brown (10YR 3/4) silt on undulating and decomposing bedrock.

EU-14 yielded items that include *Cypraea* sp., *Drupa* sp., *Cellana* sp., *Isognomon* sp., coral, Echinoidea, *Conus* sp., *Venus* sp., unidentifiable shell, charcoal, fire cracked basalt, a basalt adze fragment, basalt flake, waterworn basalt, and volcanic glass flakes and shatter (Table 26). Most of the recovered items came from Levels 1 and 2. The fine-grained basalt adze fragment (Acc# 223) from Level 3 of Layer I has one polished face (Figure 73). This fragment is 13.05 millimeters long, 9.9 millimeters wide, and 1.55 millimeters thick. Other than these differences, no significant change in species or artifact types is apparent.

Figure 67. EU-23 base of excavation, view to the northeast.

Figure 68. EU-24 base of excavation, view to the northeast.

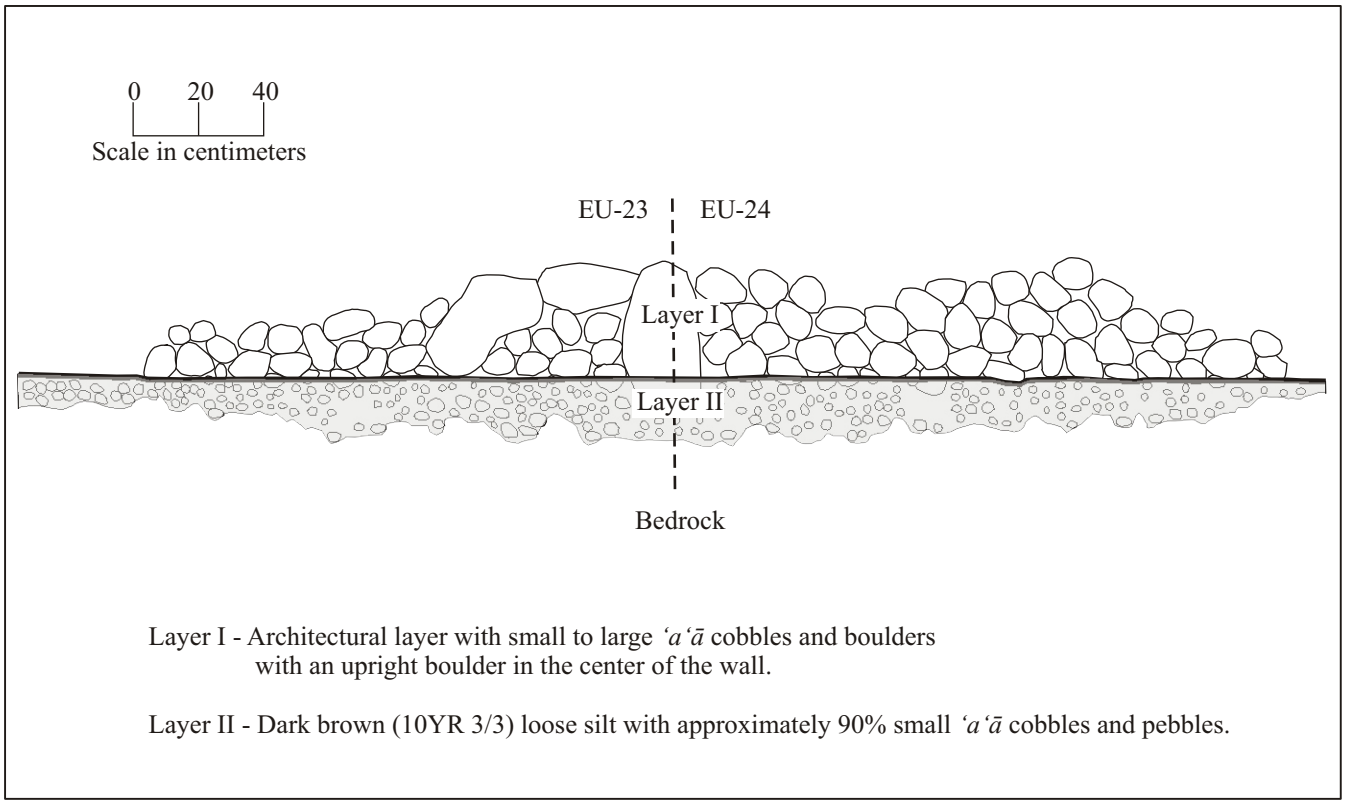


Figure 69. SIHP Site 23677 Feature B EU-23 and 24 northeast wall profile.

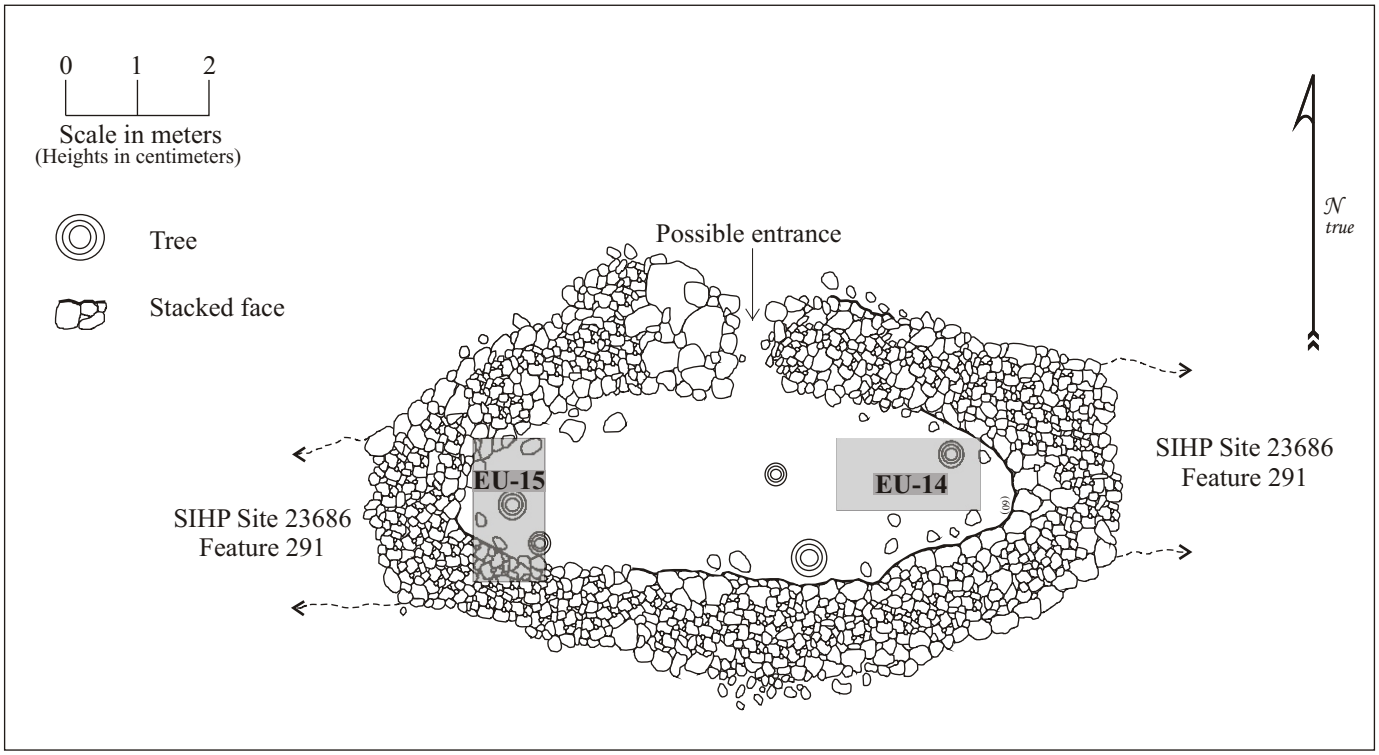
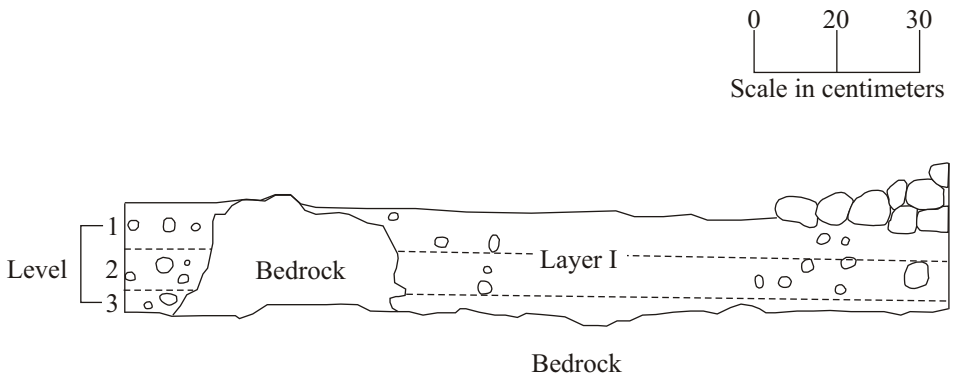


Figure 70. SIHP Site 23678 plan view.

Figure 71. SIHP Site 23678, view to the east .



Layer I, Levels 1-2 - Dark brown (10YR 3/3) silt with 40% small *ʻaʻā* cobbles and pebbles.

Layer I, Level 3 - Dark yellowish brown (10YR 3/4) silt on undulating and decomposing bedrock.

Figure 72. SIHP Site 23678 EU-14 north wall profile.

Figure 73. SIHP Site 23678 EU-14 basalt adze fragment (Acc.# 223).

Table 26. Recovered items from SIHP Site 23678, EU-14.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
204	I	1	Marine shell	*Cypraea* sp.	37	4	29.1
203	I	1	Marine shell	*Cellana* sp.	1	1	0.1
567	I	1	Marine shell	*Cellana* sp.	1	1	0.5
202	I	1	Marine shell	*Conus* sp.	6	-	2.8
568	I	1	Marine shell	*Conus* sp.	1	1	1.0
569	I	1	Marine shell	Unidentified bivalve	3	-	1.9
205	I	1	Marine shell	Unidentified	4	-	0.7
206	I	1	Coral	Unidentified	12	-	12.2
207	I	1	Coral	Unidentified	19	-	22.2
208	I	1	Coral	Waterworn	11	-	6.5
200	I	1	Basalt	Flake	1	-	0.7
199	I	1	Basalt	Fire cracked	1	-	54.2
201	I	1	Volcanic glass	Flake	9	-	4.7
198	I	1	Organic	Charcoal	-	-	0.2
				Layer I, Level 1 Total:	106	7	136.8
217	I	2	Marine shell	*Cypraea* sp.	30	3	17.5
215	I	2	Marine shell	*Drupa* sp	5	-	2.3
216	I	2	Marine shell	*Isognomon* sp.	2	1	0.1
214	I	2	Marine shell	*Conus* sp.	7	3	3.8
219	I	2	Marine shell	Unidentified	20	-	6.0
220	I	2	Coral	Unidentified	22	-	2.0
221	I	2	Coral	Unidentified	30	-	30.5
222	I	2	Coral	Waterworn	3	-	0.6
218	I	2	Echinoderm	Echinoidea	11	-	0.9
213	I	2	Basalt	Waterworn pebble	1	-	0.5
212	I	2	Volcanic glass	Flake	18	-	7.5
211	I	2	Volcanic glass	Shatter	1	-	2.5
209	I	2	Organic	Charcoal	-	-	1.0
210	I	2	Organic	Wood	1	-	0.1
				Layer I, Level 2 Total:	151	7	75.3
224	I	3	Marine shell	*Cypraea* sp.	7	1	4.0
226	I	3	Marine shell	Unidentified	6	-	2.0
227	I	3	Coral	Unidentified	2	-	0.4
228	I	3	Coral	Unidentified	5	-	2.8
225	I	3	Echinoderm	Echinoidea	1	-	0.1
223	I	3	Basalt	Adze fragment	1	-	0.2
				Layer I, Level 3 Total:	22	1	9.5
				EU-14 Total:	279	15	221.6

Charcoal collected from Level 2 in Layer I of EU-14, SIHP Site 23678 was submitted for radiocarbon assaying. The sample (Beta-212762) intercepts the tree-ring calibration curve at AD 1660 and has a 2-sigma standard deviation calibrated date range of AD 1640 to 1950.

EU-15 (2 x 1m aligned south-north) was placed partly within the oval-shaped enclosure and partly on the enclosing wall, southwest of the possible northern entrance (see Figure 70). EU-15 revealed the following stratigraphic profile (Figures 74 and 75):

Layer I (0-30cmbs).....architectural layer with small to large sized *ʻaʻā* cobbles and boulders with an upright in the center of the wall.
Layer II, Levels 1-4 (30-60cmbs)....dark brown (10YR 3/3) silt with *ʻaʻā* cobbles and pebbles.
Layer III (60-70cmbs) .....dark yellowish brown (10 YR3/4) silt on weathered and uneven *ʻaʻā* bedrock.

EU-15 yielded fish, *Cypraea* sp., *Drupa* sp., *Morula* sp., *Cellana* sp., *Isognomon* sp., *Nerita* sp., *Strombina* sp., coral, Echinoidea, *Conus* sp., *Venus* sp., unidentifiable shell, bird, charcoal, basalt flakes, waterworn basalt, and volcanic glass flakes and shatter (Table 27). Species and artifact types peak in Level 2 of Layer II and then drops off to bedrock. Other than these shifts in numbers, no meaningful stratigraphic trends for recovered items are apparent. EU-15 is unusual in terms of the density of recovered items.

Table 27. Recovered items from SIHP Site 23678, EU-15.

ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
229	I	1	Marine shell	*Cypraea* sp.	2	1	2.9
230	I	1	Coral	Branch	2	-	67.0
231	I	1	Coral	Unidentified	3	-	12.2
232	I	1	Coral	Unidentified	15	-	66.4
				Layer I, Level 1 Total:	22	1	148.5
235	II	1	Fish bone	Unidentified	1	-	0.1
238	II	1	Marine shell	*Cypraea* sp.	16	2	12.0
237	II	1	Marine shell	*Drupa* sp.	2	1	0.5
241	II	1	Marine shell	*Drupa* sp.	2	1	0.6
239	II	1	Marine shell	*Morula* sp.	2	2	0.3
236	II	1	Marine shell	*Conus* sp.	7	3	3.5
240	II	1	Marine shell	Unidentified	15	-	4.3
242	II	1	Coral	Unidentified	16	-	12.2
243	II	1	Coral	Unidentified	42	-	43.9
244	II	1	Echinoderm	Echinoidea	5	-	0.3
234	II	1	Basalt	Waterworn pebble	1	-	2.3
233	II	1	Volcanic glass	Flake	1	-	0.8
				Layer II, Level 1 Total:	110	9	80.8
250	II	2	Marine shell	*Cypraea* sp.	58	4	36.5
252	II	2	Marine shell	*Drupa* sp	3	1	0.9
253	II	2	Marine shell	*Morula* sp.	2	1	0.7
255	II	2	Marine shell	*Cellana* sp.	1	1	0.1
254	II	2	Marine shell	*Isognomon* sp.	2	1	0.3
257	II	2	Marine shell	*Strombus* sp.	2	2	0.6
251	II	2	Marine shell	*Conus* sp.	20	3	9.4
256	II	2	Marine shell	Unidentified bivalve	3	-	1.4
258	II	2	Marine shell	Unidentified	59	-	19.7
260	II	2	Coral	Unidentified	32	-	13.2
261	II	2	Coral	Unidentified	72	-	75.3
259	II	2	Echinoderm	Echinoidea	44	-	2.6
249	II	2	Bird bone	Unidentified	1	-	0.1
246	II	2	Basalt	Flake	4	-	2.8
247	II	2	Volcanic glass	Flake	10	-	7.7
248	II	2	Volcanic glass	Shatter	1	-	1.8
245	II	2	Organic	Charcoal	-	-	0.3
				Layer II, Level 2 Total:	314	13	173.4

Continued on next page

Table 27. Continued.

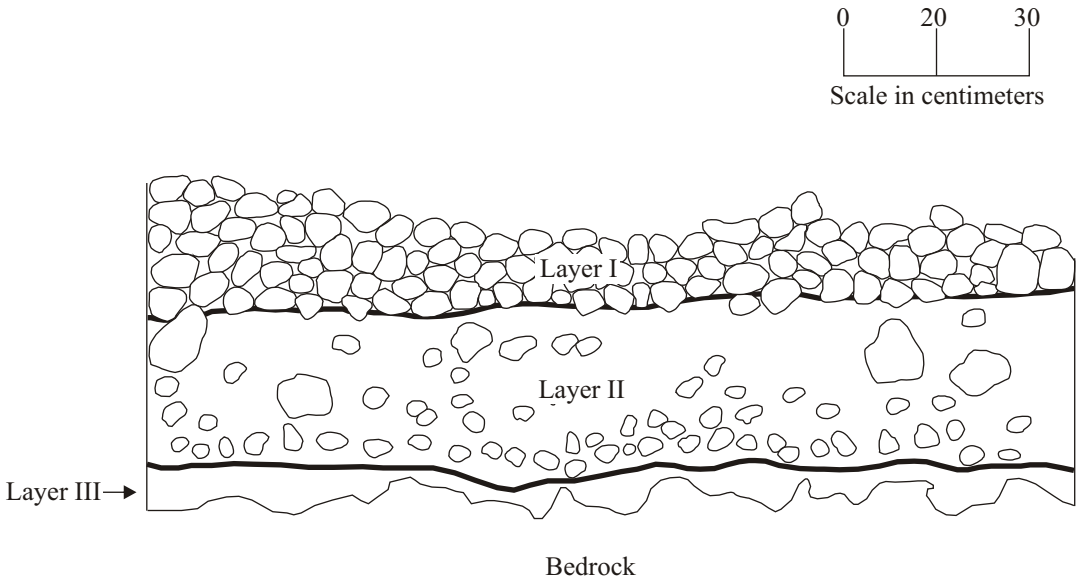
ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
266	II	3	Marine shell	*Cypraea* sp.	16	2	13.5
264	II	3	Marine shell	*Drupa* sp	5	2	2.6
265	II	3	Marine shell	*Nerita* sp.	1	1	0.1
263	II	3	Marine shell	*Conus* sp.	17	3	8.2
267	II	3	Marine shell	Unidentified bivalve	3	-	1.7
268	II	3	Marine shell	Unidentified	18	-	8.0
270	II	3	Coral	Unidentified	12	-	3.7
271	II	3	Coral	Unidentified	30	-	30.0
272	II	3	Coral	Waterworn	3	-	1.2
269	II	3	Echinoderm	Echinoidea	24	-	1.1
262	II	3	Volcanic glass	Flake	1	-	0.8
				Layer II, Level 3 Total:	130	8	70.9
274	II	4	Marine shell	*Cypraea* sp.	4	1	2.8
275	II	4	Marine shell	*Conus* sp.	2	1	1.2
277	II	4	Marine shell	Unidentified bivalve	1	-	0.6
276	II	4	Marine shell	Unidentified	5	-	1.2
279	II	4	Coral	Unidentified	3	-	2.0
280	II	4	Coral	Unidentified	8	-	6.2
281	II	4	Coral	Waterworn pebble	1	-	0.1
278	II	4	Echinoderm	Echinoidea	4	-	0.9
273	II	4	Basalt	Waterworn pebble	1	-	0.5
				Layer II, Level 4 Total:	29	2	15.5
				EU-15 Total:	605	33	489.1

SIHP SITE 23686

Site 23686 consists of the entire archaeological agricultural landscape contained within the project area. The site encompasses 297 distinct agricultural features including 199 mounds (67.0%), 59 modified outcrops (19.6%), 22 terraces (7.4%), 7 enclosures (2.4%), 7 *kuaiwi* (2.4%), and 3 pavements (1.0%). See Clark and Rechtman (2003) for a discussion of feature type definitions. These features stretch over the entire landscape but, by far, the greatest numbers are concentrated in the southeast quadrant of the project area (see Figure 3). This area may have received less Historic Period use, which would point to a higher number of preserved features in this area, rather than increased Precontact use of this portion of the project area. Features in the *makai* third to one half of the project area are constructed primarily of *pāhoehoe* while the *mauka* features are constructed primarily of *ʻaʻā*, as dictated by the readily available source materials. A complete listing of the features at Site 23686 is shown in Table 7, and the locations of the features are shown on Figure 76.

During the Inventory Survey (Clark and Rechtman 2003) ten test units were excavated within five mounds (Features 187, 189, 262, 266, and 271) and five modified outcrops (Features 183, 201, 204, 239, and 297) at various elevations within Site 23686. No cultural material was recovered from any of these test units; and no terraces, enclosures, *kuaiwi*, or pavements were tested during the inventory survey. During data recovery seventeen excavation units were excavated within fifteen features (2 excavation units were placed within each of Features 282 and 289). The fifteen excavated features include two square enclosures (Features 293 and 294), one rectangular enclosure (Feature 251), two rectangular pavements (Features 250 and 282), one irregular pavement (Feature 289), five linear terraces (Features 81, 185, 212, 247 and 254), one irregular terrace (Feature 286), and three linear *kuaiwi* (Features 17, 82, and 291).

Figure 74. SIHP Site 23678 EU-15 base of excavation, view to the north.



Layer I - Architectural layer with small to large sized *ʻaʻā* cobbles and boulders.

Layer II, Levels 1-4 - Dark brown (10YR 3/3) silt with *ʻaʻā* cobbles and pebbles.

Layer III - Dark yellowish brown (10 YR3/4).

Figure 75. SIHP Site 23678 EU-15 west wall profile.

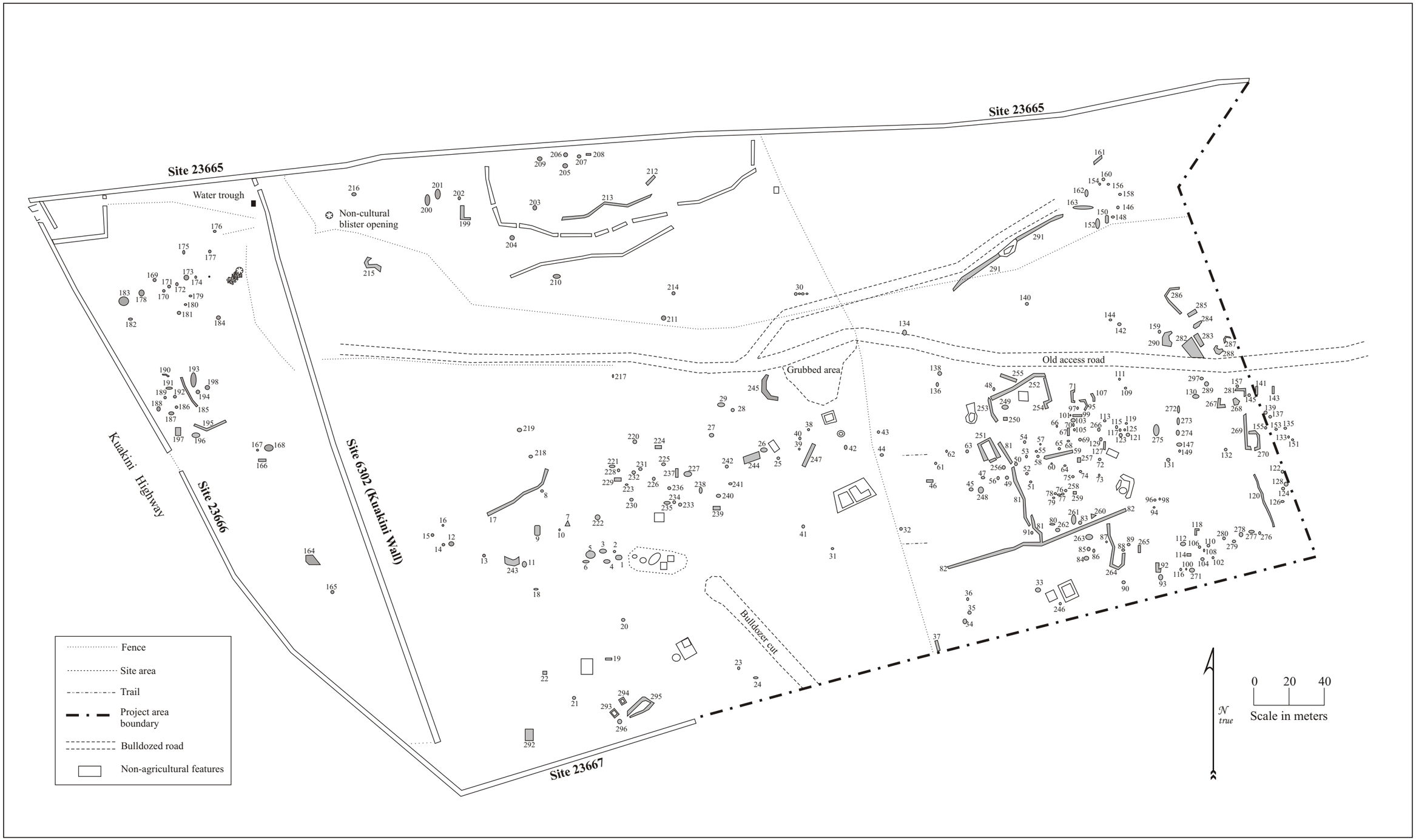


Figure 76. SIHP Site 23686 plan view.

Table 28. SIHP Site 23686 agricultural features.

Feature #	*Feature type*	*Attribute**	*Length (m)*	*Width (m)*	*Height (m)*	*Shape*
1	Mound	S/P	5.2	2.9	0.8	Irregular
2	Mound	S	2.8	2.7	0.8	Oval
3	Modified outcrop	S	4.3	2.2	1.8	Irregular
4	Modified outcrop	P	4.6	2.9	1.1	Linear
5	Modified outcrop	P	5.8	4.2	0.6	Irregular
6	Mound	P	5.0	2.1	0.4	Linear
7	Modified outcrop	P	4.4	3.6	0.6	Triangular
8	Mound	P	2.8	2.8	0.5	Circular
9	Modified outcrop	S	5.2	2.9	0.8	Irregular
10	Mound	P	2.0	1.5	0.5	Oval
11	Mound	P	3.9	1.8	0.8	Linear
12	Mound	P	3.7	2.1	0.7	Linear
13	Mound	P	3.8	2.7	0.9	Linear
14	Mound	P	2.7	2.7	0.7	Circular
15	Mound	P	3.5	3.0	1.0	Oval
16	Mound	P	2.3	2.3	0.8	Circular
17	*Kuaiwi*	P	38.7	2.0	0.8	Linear
18	Mound	P	2.7	2.4	0.7	Circular
19	Mound	P	2.1	0.9	0.9	Linear
20	Mound	P	3.1	1.9	0.9	Oval
21	Mound	P	2.7	1.6	1.0	Irregular
22	Mound	P	3.2	2.9	0.5	Rectangular
23	Mound	P	3.3	0.9	0.9	Linear
24	Mound	P	3.8	3.0	0.9	Irregular
25	Mound	P	3.1	2.5	0.5	Irregular
26	Modified outcrop	P	4.5	3.5	0.7	Irregular
27	Mound	P	2.1	2.1	0.7	Circular
28	Mound	P	3.5	2.0	0.4	Irregular
29	Mound	P	4.1	3.5	0.9	Oval
30	Mound	P	10.7	2.7	0.4	Linear
31	Mound	P/S	2.1	1.9	0.7	Irregular
32	Mound	P	1.8	1.6	0.6	Irregular
33	Mound	P	4.0	3.6	0.8	Oval
34	Mound	P	2.2	2.2	1.0	Circular
35	Enclosure	P	3.0	2.5	0.4	Oval
36	Modified outcrop	P/S	2.1	1.4	1.1	Irregular
37	Terrace	P	4.8	3.1	0.9	Linear
38	Mound	P	2.0	1.7	0.5	Oval
39	Mound	P	1.8	1.4	0.5	Oval
40	Mound	P	2.8	2.1	0.7	Oval
41	Mound	P	1.4	1.4	0.4	Circular
42	Mound	S	2.1	1.8	0.8	Irregular
43	Mound	P	1.9	1.8	0.5	Circular
44	Mound	P	2.3	2.0	0.5	Oval
45	Mound	P	2.3	1.5	0.5	Oval
46	Mound	P	3.2	1.0	0.4	Linear
47	Mound	P	2.5	1.9	0.6	Oval
48	Mound	P	2.6	2.0	0.4	Oval
49	Mound	P	2.3	1.9	0.5	Oval
50	Mound	P	3.2	2.1	0.5	Irregular
51	Mound	P	2.7	1.8	0.5	Irregular
52	Mound	P	1.3	1.3	0.6	Circular

***S=Stacked; P=Piled.**

continued on next page.

Table 28. Continued.

Feature #	*Feature type*	*Attribute**	*Length (m)*	*Width (m)*	*Height (m)*	*Shape*
53	Mound	P	4.4	2.9	0.6	Oval
54	Mound	P	1.8	1.3	0.4	Irregular
55	Mound	P	1.9	1.3	0.4	Rectangular
56	Mound	P	2.5	1.7	0.7	Oval
57	Mound	P	2.5	1.6	0.7	Linear
58	Mound	P	4.5	3.2	0.7	Irregular
59	*Kuaiwi*	P	18.6	1.1	0.4	Linear
60	Mound	P	1.4	1.4	0.6	Linear
61	Mound	P	3.3	1.5	0.7	Linear
62	Mound	P	2.1	2.1	0.3	Circular
63	Mound	P	1.7	1.0	0.5	Irregular
64	Mound	P	3.3	1.9	0.3	Oval
65	Mound	P	2.1	1.5	0.2	Oval
66	Mound	P	1.7	2.1	0.3	Circular
67	Mound	P	3.5	0.8	0.4	Linear
68	Mound	P	1.8	1.0	0.5	Circular
69	Mound	P	2.7	2.7	0.6	Circular
70	Mound	P	2.2	1.2	0.4	Oval
71	Mound	P	4.8	3.3	0.4	Irregular
72	Mound	P	1.9	1.5	0.8	Oval
73	Mound	P	1.9	1.9	0.4	Circular
74	Mound	P	1.7	1.7	0.3	Circular
75	Mound	P	2.1	1.4	0.6	Oval
76	Mound	P	1.3	1.3	0.5	Circular
77	Mound	P	1.9	1.2	0.3	Oval
78	Mound	P	1.8	1.1	0.5	Oval
79	Mound	P	1.4	1.4	0.4	Circular
80	Mound	P	3.2	1.4	0.7	Linear
81	Terrace	S	60.0	1.0	0.5	Linear
82	*Kuaiwi*	S	108.0	2.1	0.7	Linear
83	Mound	S	1.8	1.3	0.5	Circular
84	Mound	S	3.4	2.1	0.8	Rectangular
85	Mound	P	3.1	2.2	0.8	Oval
86	Mound	P	3.0	1.7	0.5	Oval
87	Mound	S	1.8	1.1	0.4	Rectangular
88	Mound	P	2.1	1.1	0.4	Oval
89	Mound	P	1.5	1.5	0.5	Circular
90	Mound	P	3.4	1.7	0.6	Linear
91	Mound	P	1.9	1.9	0.6	Circular
92	Mound	P	5.6	2.1	0.7	Linear
93	Mound	P	3.4	1.9	0.4	Rectangular
94	Mound	P	1.9	1.9	0.7	Circular
95	Mound	P	6.4	1.8	1.4	Crescent
96	Mound	P	2.6	1.2	0.7	Irregular
97	Mound	P	1.9	1.4	0.5	Oval
98	Mound	P	2.0	1.2	0.4	Rectangular
99	Mound	P	4.0	1.4	0.4	Linear
100	Mound	P	11.9	1.9	0.5	Circular
101	Mound	P	2.0	2.0	0.5	Circular
102	Mound	P	1.4	1.4	0.4	Circular
103	Mound	P	3.4	1.7	0.5	Irregular
104	Mound	P	1.6	1.1	0.4	Oval

***S=Stacked; P=Piled.**

continued on next page.

Table 28. Continued.

Feature #	*Feature type*	*Attribute**	*Length (m)*	*Width (m)*	*Height (m)*	*Shape*
105	Mound	P	2.4	2.4	0.4	Circular
106	Mound	P	1.7	1.7	0.4	Circular
107	Terrace	P	5.2	2.4	0.3	Linear
108	Mound	P	1.7	1.5	0.5	Irregular
109	Mound	P	1.7	1.2	0.5	Oval
110	Mound	P	1.6	1.6	0.5	Circular
111	Mound	P	1.8	1.2	0.5	Oval
112	Modified outcrop	P	3.6	2.3	0.8	Linear
113	Mound	P	2.8	1.8	0.6	Linear
114	Mound	P	2.2	1.5	0.3	Rectangular
115	Mound	P	2.1	2.0	0.5	Irregular
116	Mound	P	2.3	1.4	0.5	Oval
117	Mound	P	2.4	1.2	0.3	Oval
118	Terrace	P	7.0	0.7	0.6	L-shaped
119	Mound	P	2.8	1.9	0.4	Oval
120	Terrace	S	29.0	1.0	0.6	Linear
121	Mound	P	2.7	1.3	0.4	Oval
122	Mound	S	2.8	1.7	0.6	Oval
123	Mound	P	2.3	1.2	0.5	Linear
124	Mound	P	2.3	1.3	0.4	Oval
125	Mound	P	2.0	1.4	0.5	Oval
126	Mound	S	2.6	1.6	0.7	Rectangular
127	Mound	P	5.2	1.2	0.4	Linear
128	Mound	P	3.2	2.2	0.6	Oval
129	Mound	P	3.5	3.2	1.0	Oval
130	Modified outcrop	S	4.7	2.8	0.3	Linear
131	Mound	S	3.4	2.3	0.5	Triangular
132	Mound	P	1.8	1.3	0.8	Oval
133	Modified outcrop	P	2.2	2.0	0.7	Irregular
134	Mound	P	1.9	1.3	0.4	Oval
135	Modified outcrop	P	1.8	1.1	0.6	Irregular
136	Mound	P	2.3	1.9	0.6	Irregular
137	Modified outcrop	P	2.8	2.0	0.8	Rectangular
138	Mound	P	1.3	1.3	0.3	Circular
139	Modified outcrop	P	1.5	1.1	0.7	Oval
140	Mound	S	2.3	1.8	0.7	Irregular
141	Terrace	P	4.7	2.5	1.0	Rectangular
142	Mound	S	1.3	0.9	0.9	Oval
143	Terrace	P	3.6	1.8	0.8	Rectangular
144	Mound	P	2.6	2.1	0.8	Oval
145	Modified outcrop	P	1.8	2.1	0.7	Oval
146	Mound	P	2.6	2.2	0.6	Oval
147	Mound	P	3.7	1.6	0.5	Linear
148	Mound	P	2.3	1.2	0.6	Oval
149	Mound	P	2.0	2.0	0.7	Circular
150	Mound	P	4.4	2.5	0.6	Linear
151	Mound	P	1.4	1.4	0.3	Circular
152	Mound	P	4.9	3.2	0.7	Linear
153	Mound	P	1.4	0.8	0.3	Oval
154	Mound	P	3.6	2.3	0.7	Linear
155	Mound	P	1.5	1.0	0.4	Triangular
156	Mound	P	3.2	2.1	0.6	Oval

***S=Stacked; P=Piled.**

continued on next page.

Table 28. Continued.

Feature #	*Feature type*	*Attribute**	*Length (m)*	*Width (m)*	*Height (m)*	*Shape*
157	Mound	P	1.8	1.5	0.5	Circular
158	Mound	S	2.5	1.6	0.7	Oval
159	Mound	P	1.5	1.2	0.7	Oval
160	Mound	S	1.8	1.3	0.6	Irregular
161	Modified outcrop	S/P	6.0	3.0	1.4	Rectangular
162	Mound	P	1.3	1.3	0.6	Circular
163	Modified outcrop	P	12.2	1.1	1.1	Irregular
164	Modified outcrop	P	5.8	4.8	1.9	Rectangular
165	Mound	P	1.8	1.8	0.4	Irregular
166	Mound	P	3.2	1.7	0.8	Linear
167	Mound	P	1.3	1.3	0.4	Circular
168	Mound	S/P	5.7	3.9	0.9	Oval
169	Mound	P	2.2	1.6	0.7	Oval
170	Mound	P	1.3	1.3	0.5	Circular
171	Mound	P	2.2	1.7	0.8	Irregular
172	Mound	P	2.3	1.8	0.5	Oval
173	Mound	P	3.0	2.2	0.9	Oval
174	Mound	P	1.8	1.8	0.3	Circular
175	Modified outcrop	P	2.3	2.1	1.0	Irregular
176	Mound	P	1.1	1.0	0.5	Circular
177	Modified outcrop	P	2.9	2.6	0.6	Crescent
178	Mound	P	2.6	2.1	0.5	Irregular
179	Modified outcrop	P	1.4	2.3	0.4	Irregular
180	Mound	P	1.8	1.8	0.6	Circular
181	Mound	P	2.8	1.7	0.8	Irregular
182	Mound	P	2.2	2.2	0.5	Circular
183	Modified outcrop	S	6.7	5.3	0.8	Irregular
184	Mound	P	2.0	2.0	0.4	Circular
185	Terrace	P	17.0	0.6	0.9	Linear
186	Mound	S/P	2.6	1.4	0.9	Oval
187	Mound	S/P	3.0	1.7	0.8	Rectangular
188	Modified outcrop	P	3.5	2.7	1.0	Irregular
189	Mound	P	2.4	2.2	0.7	Irregular
190	Modified outcrop	S/P	3.9	2.3	0.9	Linear
191	Modified outcrop	P	4.4	2.1	0.8	Linear
192	Modified outcrop	S	2.5	1.8	0.8	Oval
193	Modified outcrop	P	9.2	3.1	1.1	Irregular
194	Mound	P	3.0	2.1	0.6	Oval
195	*Kuaiwi*	S/P	16.0	1.0	0.5	Linear
196	Modified outcrop	P	5.2	2.8	0.8	Linear
197	Mound	S/P	6.0	2.3	1.1	Rectangular
198	Modified outcrop	P	3.1	2.7	0.6	Irregular
199	Modified outcrop	P	6.5	4.8	0.7	L-shaped
200	Terrace	P	7.2	2.1	0.8	Crescent
201	Modified outcrop	S/P	6.2	3.8	0.7	Oval
202	Mound	P	2.1	2.1	0.6	Circular
203	Mound	P	3.4	2.8	0.8	Circular
204	Modified outcrop	S/P	3.4	2.7	0.7	Irregular
205	Modified outcrop	P	3.0	2.3	0.6	Irregular
206	Mound	S	2.3	2.3	0.6	Circular
207	Mound	S	3.2	3.2	0.8	Irregular
208	Modified outcrop	P	2.7	0.9	0.4	Linear

***S=Stacked; P=Piled.**

continued on next page.

Table 28. Continued.

Feature #	*Feature type*	*Attribute**	*Length (m)*	*Width (m)*	*Height (m)*	*Shape*
209	Modified outcrop	P	3.7	2.6	0.6	Oval
210	Modified outcrop	P	5.2	3.4	0.9	Irregular
211	Mound	P	3.6	2.8	0.8	Irregular
212	Terrace	P	5.2	1.4	0.5	Linear
213	*Kuaiwi*	P	50.2	1.8	0.7	Linear
214	Mound	S/P	2.6	2.1	0.9	Oval
215	Modified outcrop	S/P	10.3	3.9	1.7	Irregular
216	Mound	P	2.7	2.4	0.2	Circular
217	Modified outcrop	S	1.6	0.4	0.4	Linear
218	Modified outcrop	P	2.0	1.8	0.7	Oval
219	Modified outcrop	P	3.0	1.8	1.0	Irregular
220	Modified outcrop	S	1.8	1.0	1.5	Crescent
221	Mound	S/P	3.5	1.9	1.1	Irregular
222	Mound	P	3.6	2.7	1.0	Rectangular
223	Mound	P	2.5	2.0	0.8	Irregular
224	Mound	S/P	3.3	1.9	0.9	Rectangular
225	Mound	P	1.4	1.4	0.7	Circular
226	Mound	P	2.0	2.0	0.6	Circular
227	Mound	P	4.1	3.7	0.8	Irregular
228	Mound	P	2.3	2.1	1.0	Oval
229	Mound	S/P	4.3	2.0	0.9	Rectangular
230	Modified outcrop	P	3.4	2.3	0.9	Oval
231	Modified outcrop	P	2.3	2.0	0.7	Irregular
232	Modified outcrop	P	1.9	1.7	0.9	Oval
233	Mound	P	2.3	1.7	0.8	Irregular
234	Mound	S/P	2.0	1.7	1.0	Irregular
235	Modified outcrop	S/P	3.9	1.9	1.0	Irregular
236	Modified outcrop	S/P	2.1	1.6	1.1	Irregular
237	Terrace	S/P	6.0	4.0	2.1	Rectangular
238	Modified outcrop	P	3.4	2.8	1.0	L-shaped
239	Modified outcrop	S/P	4.0	2.5	0.7	Rectangular
240	Mound	P	2.5	2.1	0.8	Circular
241	Mound	P	4.4	3.1	1.0	Irregular
242	Modified outcrop	S/P	3.4	2.2	0.8	Irregular
243	Terrace	S/P	11.8	7.9	0.9	Crescent
244	Terrace	S/P	9.0	5.6	0.7	Linear
245	Modified outcrop	S/P	13.9	7.8	1.7	Irregular
246	Mound	S/P	2.2	1.0	0.6	Irregular
247	Terrace	S/P	11.0	2.6	0.9	Linear
248	Modified outcrop	P	3.5	1.9	0.7	Irregular
249	Mound	P	4.1	2.3	0.6	Oval
250	Pavement	P	2.5	1.8	0.5	Rectangular
251	Enclosure	P	12.5	11.5	0.6	Rectangular
252	*Kuaiwi*	P	38.0	2.3	0.8	Linear
253	Terrace	S/P	15.0	2.5	0.7	Linear
254	Terrace	S/P	20.0	2.7	0.8	Linear
255	Mound	P	9.5	2.8	0.8	Linear
256	Mound	P	1.5	1.4	0.5	Circular
257	Mound	S/P	2.9	2.1	0.6	Rectangular
258	Mound	P	1.2	1.0	0.5	Oval
259	Mound	P	2.8	1.2	0.6	Rectangular
260	Mound	S	3.3	2.3	1.2	Triangular

***S=Stacked; P=Piled.**

continued on next page.

Table 28. Continued.

Feature #	*Feature type*	*Attribute**	*Length (m)*	*Width (m)*	*Height (m)*	*Shape*
261	Mound	S	5.1	3.0	1.2	Oval
262	Mound	S	3.4	1.7	1.2	Irregular
263	Mound	S/P	4.2	2.2	1.4	Oval
264	Terrace	S/P	36.0	2.1	0.7	Linear
265	Terrace	P	5.2	1.4	0.4	Linear
266	Mound	S	2.4	1.2	0.7	Rectangular
267	Terrace	S/P	5.0	5.0	1.0	L-shaped
268	Modified outcrop	P	3.1	2.1	0.9	Irregular
269	Terrace	S/P	22.5	1.8	0.8	Linear
270	Enclosure	S/P	11.0	9.5	0.9	U-shaped
271	Mound	S	2.4	1.2	0.7	Rectangular
272	Modified outcrop	P	4.6	4.5	0.7	Oval
273	Modified outcrop	P	5.5	3.0	1.1	Irregular
274	Mound	P	4.0	2.5	1.0	Oval
275	Modified outcrop	S/P	5.0	4.5	1.2	Oval
276	Mound	P	2.7	1.4	0.8	Linear
277	Mound	S/P	5.0	2.7	0.9	Oval
278	Mound	P	3.2	2.4	0.9	Oval
279	Enclosure	S/P	3.5	2.6	0.7	Oval
280	Mound	P	2.2	2.2	0.6	Circular
281	Modified outcrop	P	6.4	4.3	1.0	L-shaped
282	Pavement	P	12.5	8.5	0.2	Rectangular
283	Mound	P	7.4	1.7	0.8	Linear
284	Mound	P	4.5	2.9	0.7	Irregular
285	Mound	S/P	5.0	1.3	0.8	Linear
286	Terrace	P	16.0	1.8	0.6	Irregular
287	Modified outcrop	S/P	3.5	1.7	0.9	Irregular
288	Modified outcrop	P	3.0	1.1	0.8	Crescent
289	Pavement	P	9.0	5.5	0.2	Irregular
290	Terrace	S/P	11.0	6.5	0.8	Crescent
291	*Kuaiwi*	P	78.0	3.5	0.3	Linear
292	Modified outcrop	P	5.6	4.7	0.9	Rectangular
293	Enclosure	P	1.9	1.9	0.5	Square
294	Enclosure	P	2.2	2.2	0.6	Square
295	Enclosure	P	5.5	3.4	0.5	U-shaped
296	Mound	P	2.3	1.3	0.7	Oval
297	Modified outcrop	S/P	4.5	4.0	0.7	Oval

***S=Stacked; P=Piled.**

Five mounds (Features 187, 189, 262, 266, 271), ones that appeared to have the most time invested in their construction, underwent subsurface testing in the form of 1 x 1 meter test units.

Feature 187

Feature 187 is a partially stacked rectangular shaped *pāhoehoe* cobble mound located in the extreme western end of Site 23686 (see Figure 76). The mound rests on exposed bedrock. Its edges are mostly stacked, but have collapsed in small sections (Figure 77). Feature 187 measures 3.0 meters long by 1.7 meters wide and 80 centimeters tall. Its surface slopes slightly to the north following the natural bedrock contours.


Figure 77. SIHP Site 23686 Feature 187, view to the southeast.

A 1 x 1 meter test unit (TU-1) was excavated into the north-central portion of Feature 187 (Figure 78) and revealed a single architectural layer (Layer I) resting on bedrock. Layer I consisted of small to medium sized *pāhoehoe* cobbles mixed with some organics. This layer rested directly on bedrock and at the base of the layer a single piece of water rounded coral was discovered. Along the unit's northern edge, a small amount of brown (10YR 4/3) sandy silt (less than 1 centimeter thick) had accumulated subsequent to the feature's construction. No cultural material (with the exception of the coral fragment) was recovered from TU-1 and the excavation terminated at bedrock (Figure 79).

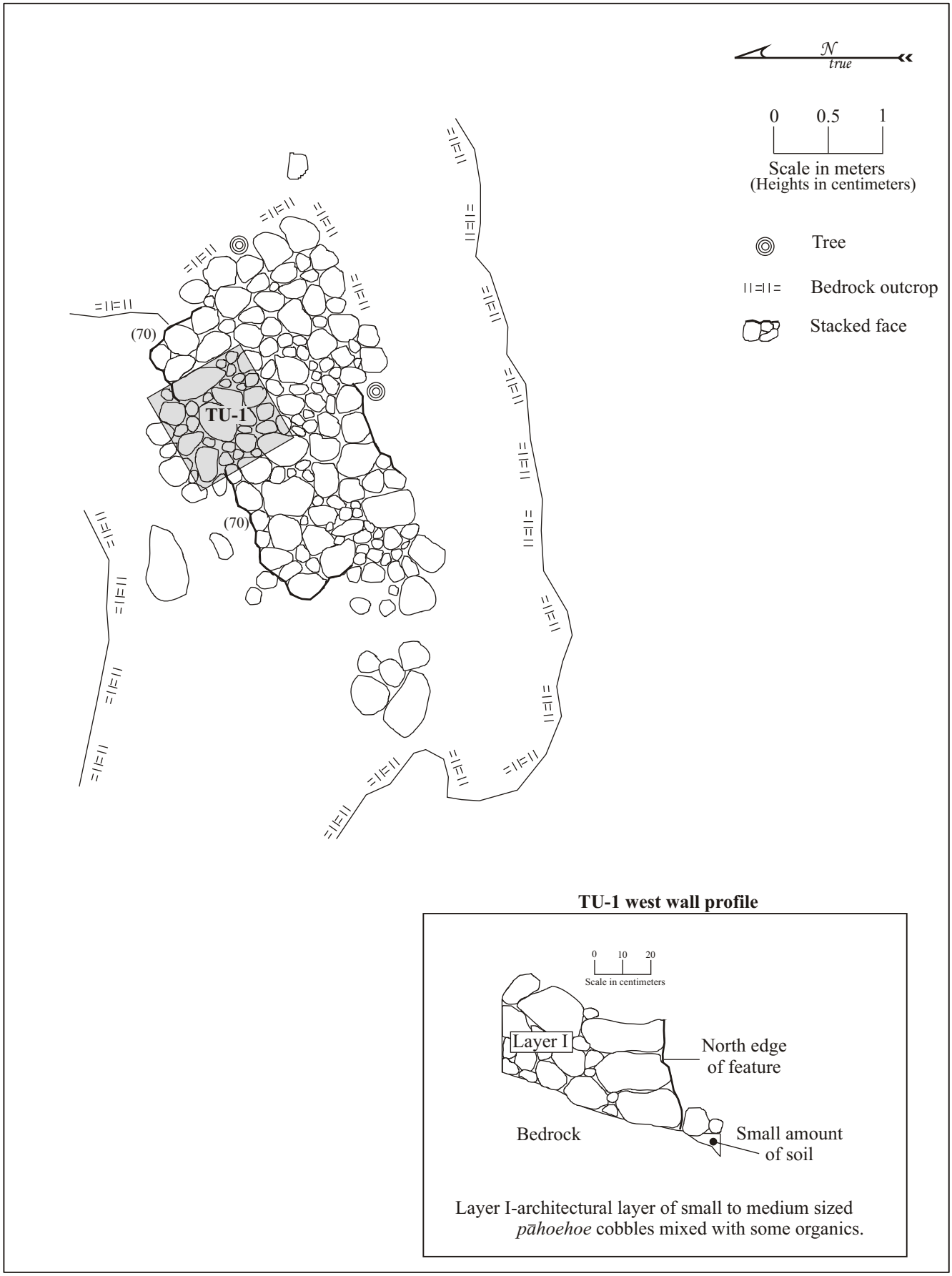


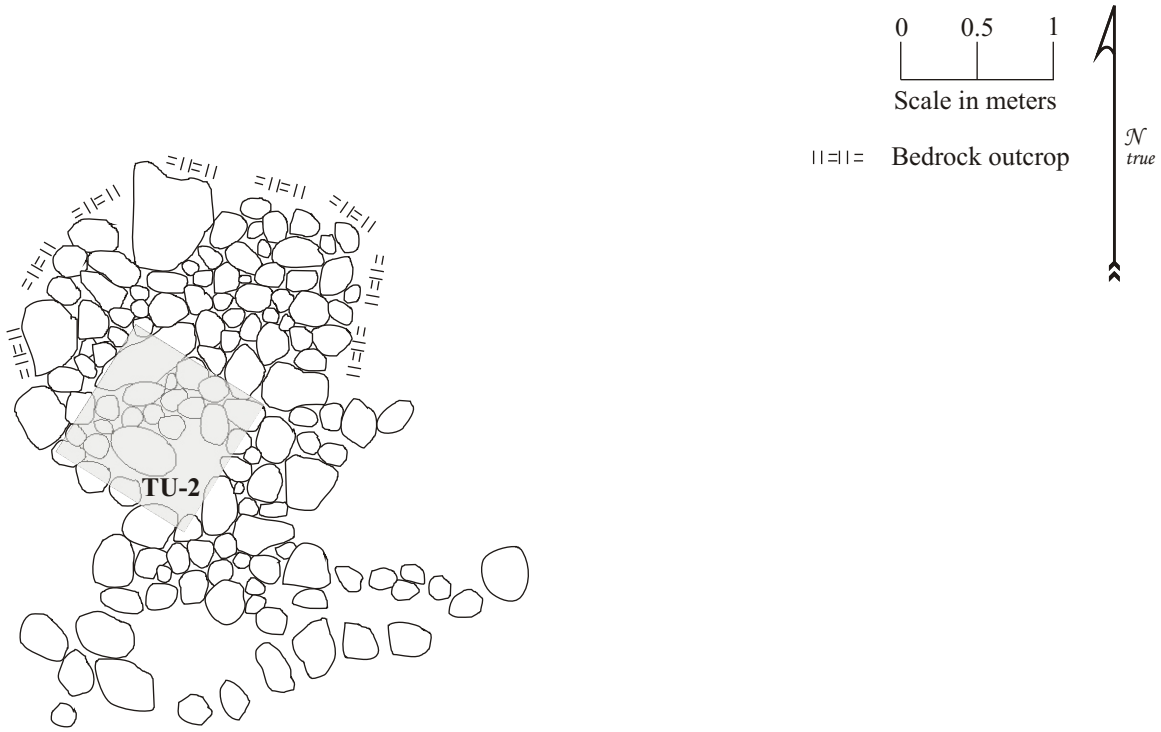
Figure 78. SIHP Site 23686 Feature 187 plan view and TU-1 profile.


Figure 79. SIHP Site 23686 Feature 187 TU-1 base of excavation, view to the southwest.

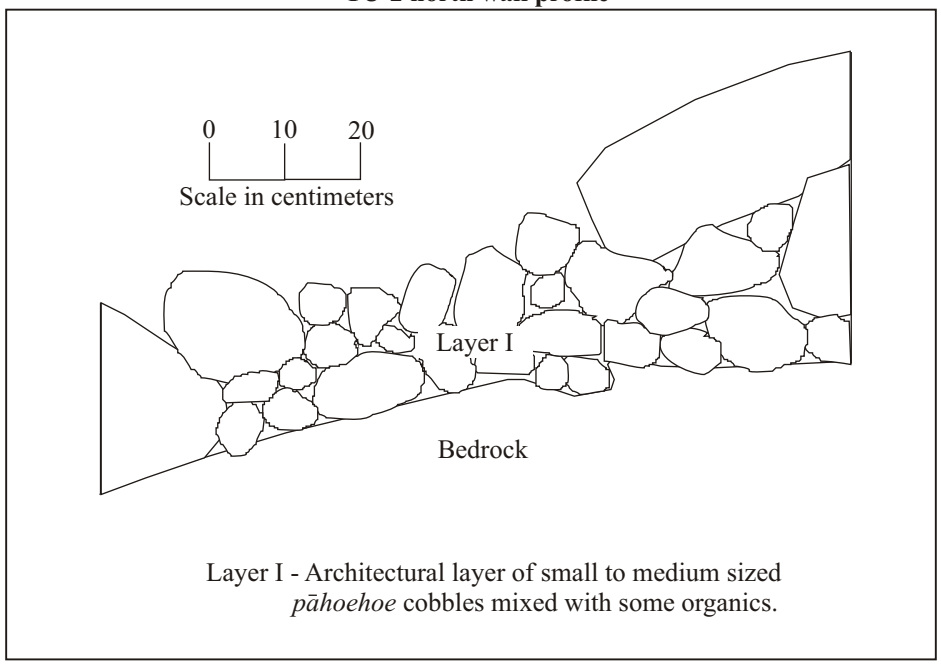
Feature 189

Feature 189 is a piled irregular shaped *pāhoehoe* cobble mound located in the extreme western end of the project area (see Figure 76). The mound rests on exposed bedrock and may have been formerly stacked around its edges, but is now largely collapsed (Figures 80 and 81). In its current condition Feature 189 measures 2.4 meters long by 2.2 meters wide and 70 centimeters tall. A small rounded piece of coral was found resting on the feature's southwest corner.


Figure 80. SIHP Site 23686 Feature 189, view to the northeast.



TU-2 north wall profile



Layer I - Architectural layer of small to medium sized *pāhoehoe* cobbles mixed with some organics.

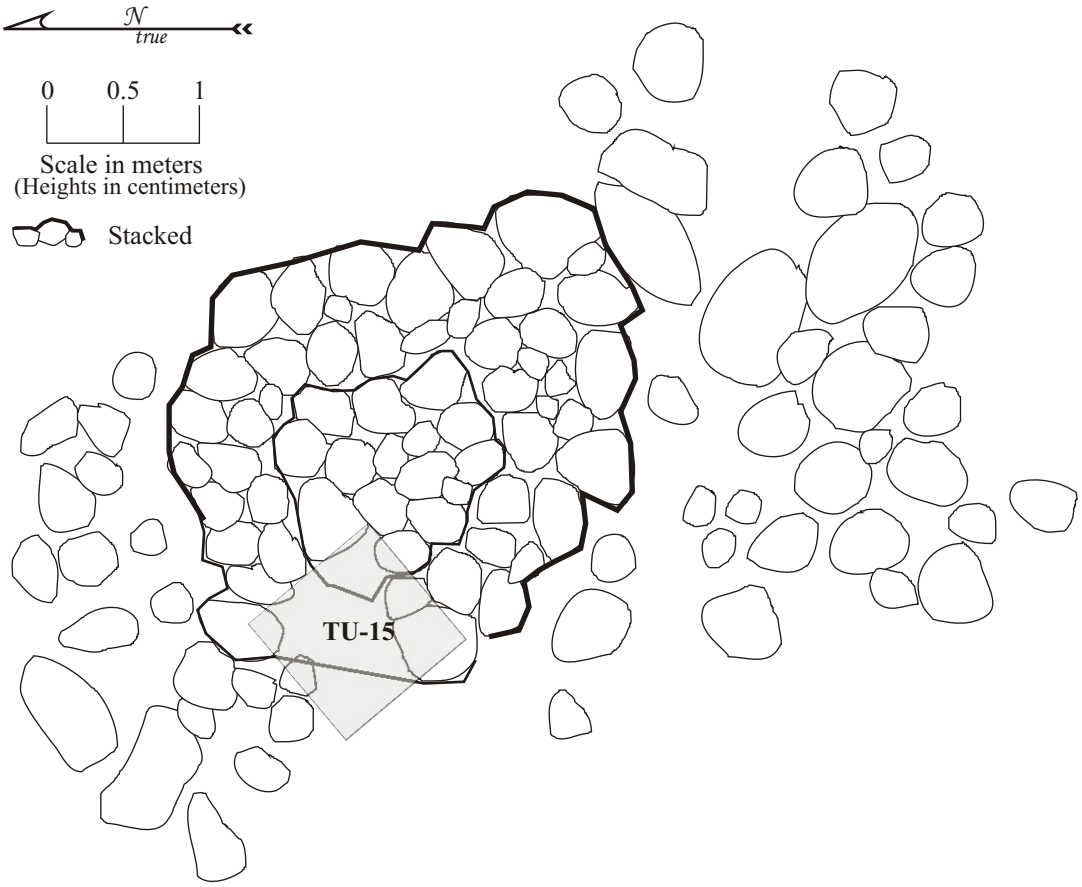
Figure 81. SIHP Site 23686 Feature 189 plan view and TU-2 profile.

A 1 x 1 meter test unit (TU-2) was excavated into the central portion of Feature 189 (see Figure 81). Excavation of TU-2 revealed a single architectural layer (Layer I) resting on bedrock. Layer I consisted of small to medium sized *pāhoehoe* cobbles mixed with some organics. This layer rested directly on bedrock. However, along its southwestern edge, in a bedrock depression, a small amount of brown (7.5YR 3/4) fine silt (less than 1 centimeter thick) had accumulated subsequent to the feature's construction. No cultural material of any kind was recovered from TU-2 and the excavation terminated at bedrock (Figure 82).

Figure 82. SIHP Site 23686 Feature 189 TU-2 base of excavation, view to the northeast.

Feature 262

Feature 262 is an irregular shaped mound constructed of stacked *ʻaʻā* cobbles located in the southeast quadrant of the project area along the north side of Feature 82, a *kuaiwi* (see Figure 76). The mound measures 3.4 meter long by 1.7 meters wide and up to 1.25 meters tall (Figure 83). It has a squared north side and a slightly rounded south side with a rounded top surface (Figure 84). Feature 262 rests on a soil ground surface covered by dense vegetation.



TU-15 east wall profile

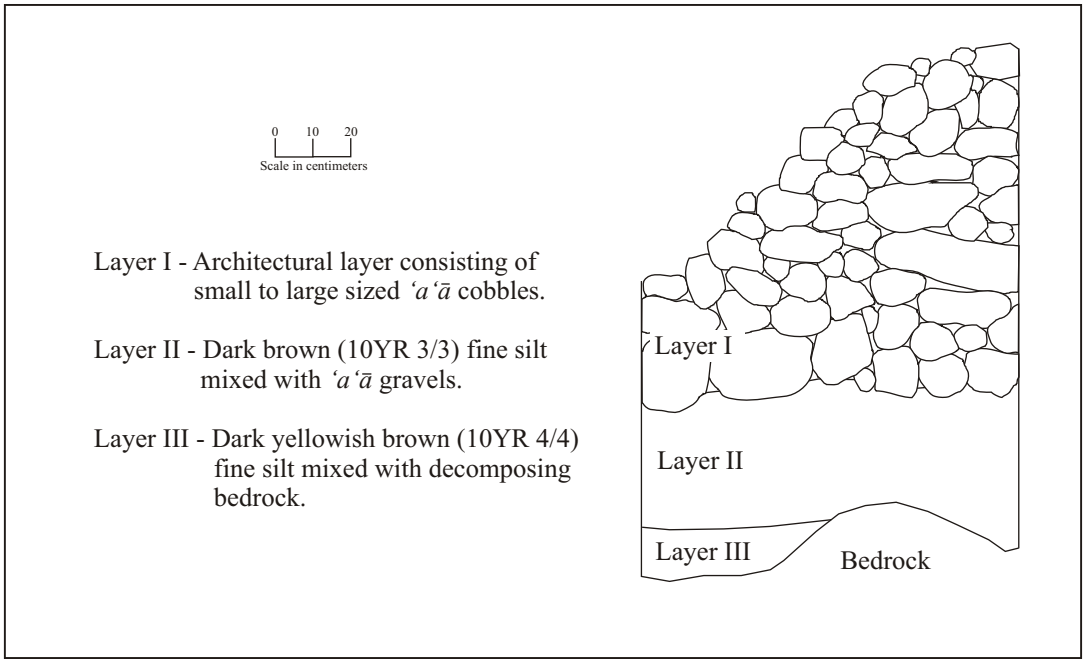


Figure 83. SIHP Site 23686 Feature 262 plan view and TU-15 profile.


Figure 84. SIHP Site 23686 Feature 262, view to the east.

A 1 x 1 meter Test Unit (TU-15) was excavated in the northwest corner of Feature 262 (see Figure 83) and revealed the following stratigraphic profile (which contained no cultural items):

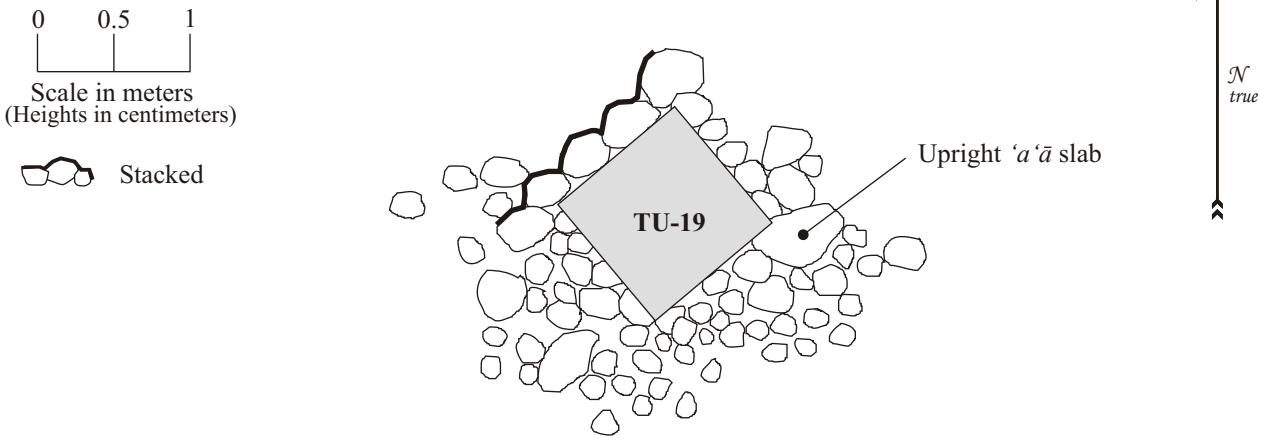
Layer I (0-92cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles stacked along the exterior edges of the feature and piled within the interior.
Layer II (92-141cmbs) ..... dark brown (10YR 3/3) fine silt mixed with *ʻaʻā* gravels on bedrock in the southern portion of TU-15.
Layer III (141-147cmbs).. dark yellowish brown (10YR 4/4) fine silt mixed with decomposing bedrock on bedrock.

Feature 266

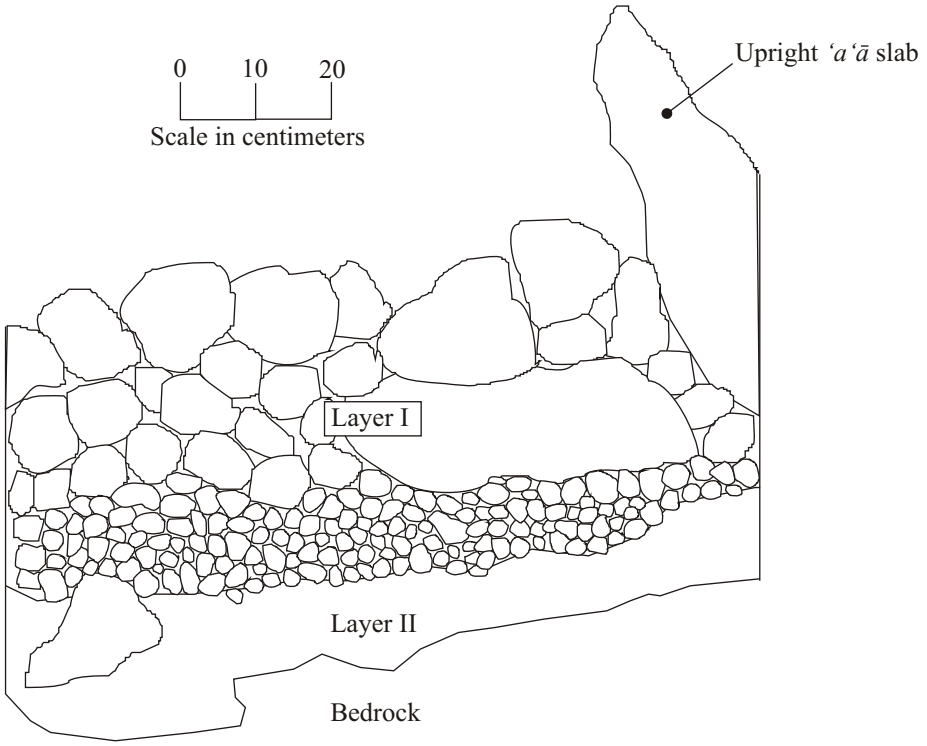
Feature 266 is a stacked *ʻaʻā* cobble mound located in the southeast quadrant of the project area amongst a number of less formal mounds (see Figure 76). This mound, which is roughly rectangular in shape, measures 2.4 meters long by 1.2 meters wide and stands up to 70 centimeters above the surrounding soil ground surface (Figures 85 and 86). The west end of the feature is neatly stacked and an upright *ʻaʻā* slab (70 centimeters long) is located at the eastern end of the feature.

A 1 x 1 meter test unit (TU-19) was excavated within the center of Feature 266 (see Figure 85 and 87) and revealed the following stratigraphic profile (which contained no cultural items):

Layer I (0-48cmbs)..... architectural layer with large sized *ʻaʻā* cobbles on top and smaller ones beneath mixed with organics (Figure 41).
Layer II (48-67cmbs) ..... dark grayish brown (10YR 3/2) silt with approximately 50% gravel on undulating bedrock.



TU-19 southeast wall profile.



Layer I - Architectural layer consisting of small to large sized *ʻaʻā* cobbles mixed with organics.

Layer II - Dark grayish brown (10YR 3/2) silt containing approximately 50% gravel.

Figure 85. SIHP Site 23686 Feature 266 plan view and TU-19 profile.


Figure 86. SIHP Site 23686 Feature 266, view to the east.


Figure 87. SIHP Site 23686 Feature 266 TU-19 base of excavation, view to the northeast.

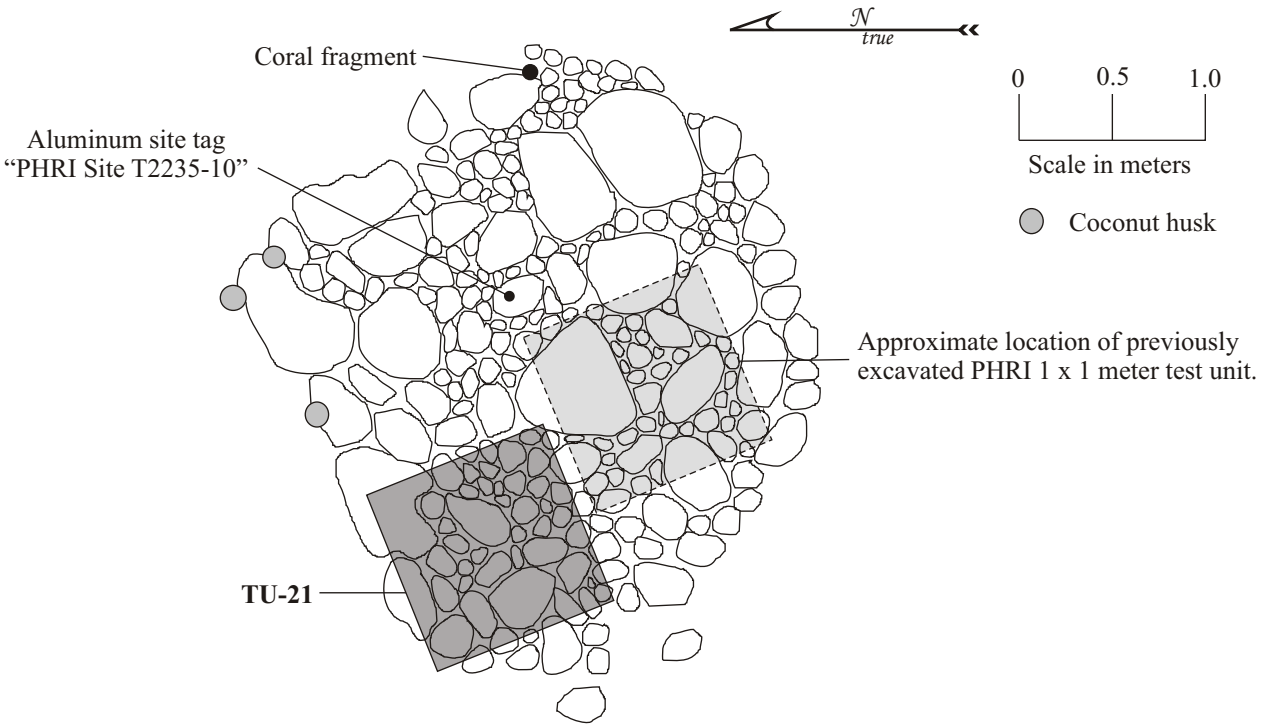
Feature 271

Feature 271 is a stacked *ʻaʻā* cobble mound located in the southeast quadrant of the project area along the southern property boundary amongst a number of less formal mounds (see Figure 76). The mound, which is roughly rectangular in shape, measures 2.9 meters long by 2.5 meters wide and stands up to 90 centimeters above the surrounding soil ground surface (Figures 88 and 89). An aluminum site tag with the inscription "PHRI Site T2235-10" was found on the surface of the feature and there was evidence that a 1 meter by 1

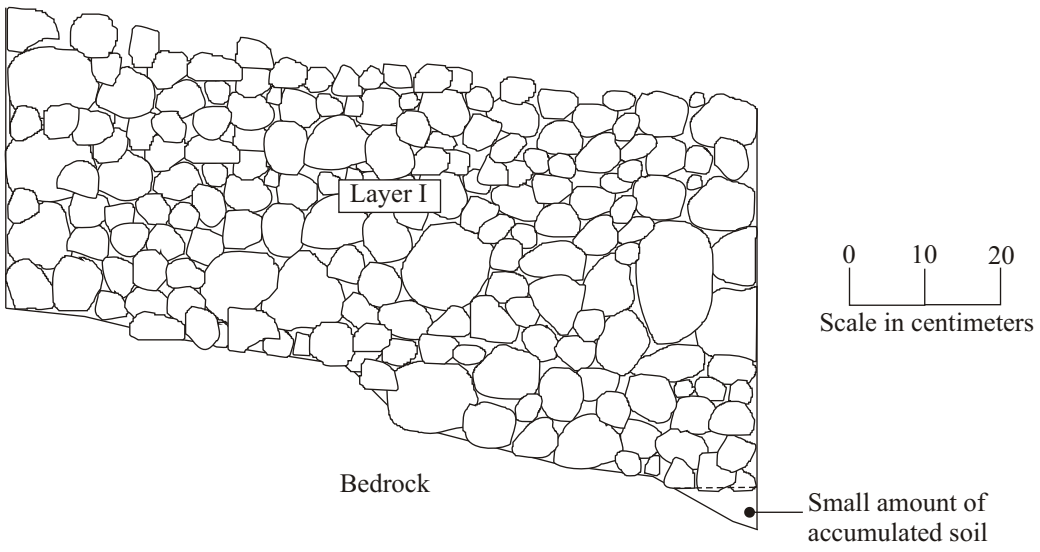
meter test unit had been previously excavated at Feature 271. A fragment of water-rounded coral was discovered along the eastern edge of the mound and three coconut husks were resting on its northeast corner.

Figure 89. SIHP Site 23686 Feature 271, view to the southeast.

A 1 x 1 meter test unit (TU-21) was excavated in the northeast corner of Feature 271 adjacent to the north edge of the previously excavated PHRI test unit (Figure 88). Excavation of TU-21 revealed a single architectural layer (Layer I) resting on bedrock. Layer I consisted of small to large sized *ʻaʻā* cobbles mixed with organics 61 centimeters thick resting on bedrock. A small amount of soil (approximately 2 centimeters thick) had accumulated in the southwest corner of the unit on top of the bedrock subsequent to the construction of the feature. Excavation of TU-21 terminated at bedrock 61 centimeters below the feature's surface and no cultural material was recovered from Feature 271.



TU-21 south wall profiles



Layer I - Architectural layer consisting of small to large sized *ʻaʻā* cobbles mixed with organics.

Figure 88. SIHP Site 23686 Feature 271 plan view and TU-21 profile.

Five modified outcrops (Features 183, 201, 204, 239, and 297), ones that appeared to have the most time invested in their construction, underwent subsurface testing in the form of 1 meter by 1 meter test units. The results are presented below.

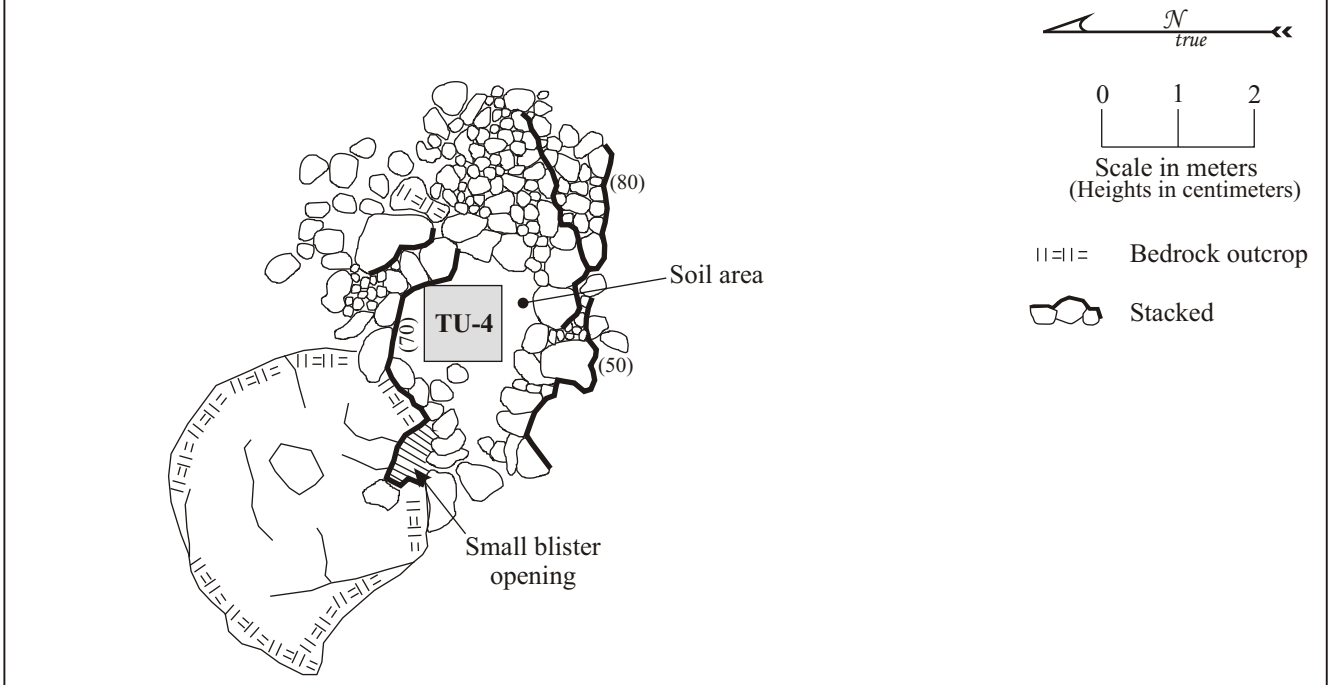
Feature 183

Feature 183 is a modified *pāhoehoe* outcrop located in the extreme northwestern portion of the project area (see Figure 76). The feature measures 6.7 meters long by 5.3 meters wide and stands up to 80 centimeters above the surrounding ground surface (Figure 90). It consists of *pāhoehoe* cobbles and boulders stacked along the southeast edge of a bedrock outcrop stretching to the west (Figure 91). The central portion of the feature, on top of the outcrop, consists of a soil area (2 meters in diameter) cleared of cobbles possibly used for planting. Along the west edge of the soil area is a small blister opening that measures 48 centimeters from floor to ceiling and 60 centimeters deep. No cobble modification was evident around the blister. The feature is most likely constructed from the remains of a larger collapsed blister.

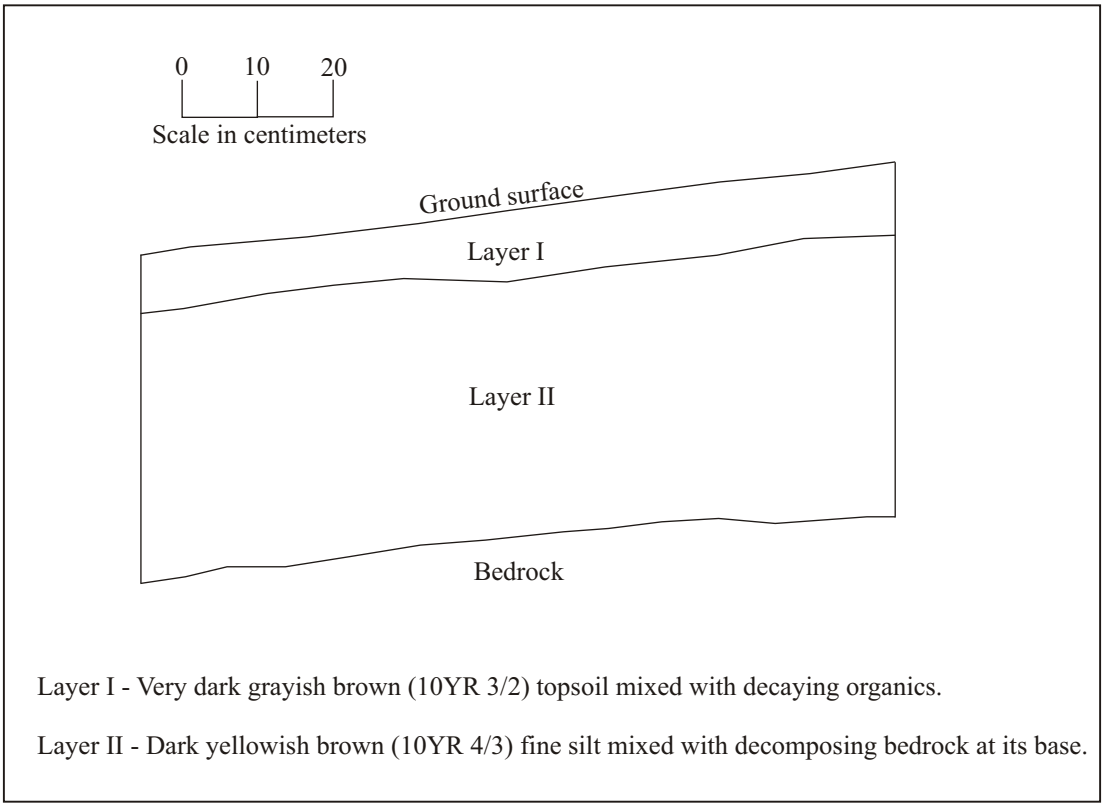
Figure 90. SIHP Site 23686 Feature 183, view to the northwest.

A 1 x 1 meter test unit (TU-4) was excavated in the cleared soil area at the center of Feature 183 (see Figure 91) and revealed the following stratigraphic profile (which contained no cultural items, but could have been used as a planting area (Clark and Rechtman 2003)):

Layer I (0-10cmbs)..... very dark grayish brown (10YR 3/2) topsoil mixed with decaying organics and grass roots.
Layer II (10-45cmbs) ..... dark yellowish brown (10YR 4/3) fine silt mixed with decomposing bedrock at the base of the layer.



TU-4 east wall profile



Layer I - Very dark grayish brown (10YR 3/2) topsoil mixed with decaying organics.

Layer II - Dark yellowish brown (10YR 4/3) fine silt mixed with decomposing bedrock at its base.

Figure 91. SIHP Site 23686 Feature 183 plan view and TU-4 profile.

Feature 201

Feature 201 is a modified *pāhoehoe* outcrop located in the northwestern quadrant of the project area along the northern property boundary (see Figure 76). The feature consists of formerly stacked *pāhoehoe* cobbles and boulders, now partially collapsed, supported by a bedrock outcrop to the east (Figure 92). Feature 201 is roughly oval in shape and measures 6.2 meters long by 3.8 meters wide and stands up to 70 centimeters high along its western edge (Figure 93). The surface of the feature is roughly leveled and paved with small *pāhoehoe* cobbles.

Figure 92. SIHP Site 23686 Feature 201, view to the east.

A 1 x 1 meter test unit (TU-5) was excavated in the central portion of Feature 201 (see Figure 93) and revealed the following stratigraphic profile (which contained no cultural items, but could have been a by-product of agricultural clearing nearby (Clark and Rechtman 2003):

Layer I (0-25/40cmbs) ..... architectural layer with small to large sized *pāhoehoe* cobbles.

Layer II (25/40-35/50cmbs)..... dark brown (10YR 3/3) silt mixed with organics only within bedrock low spots.

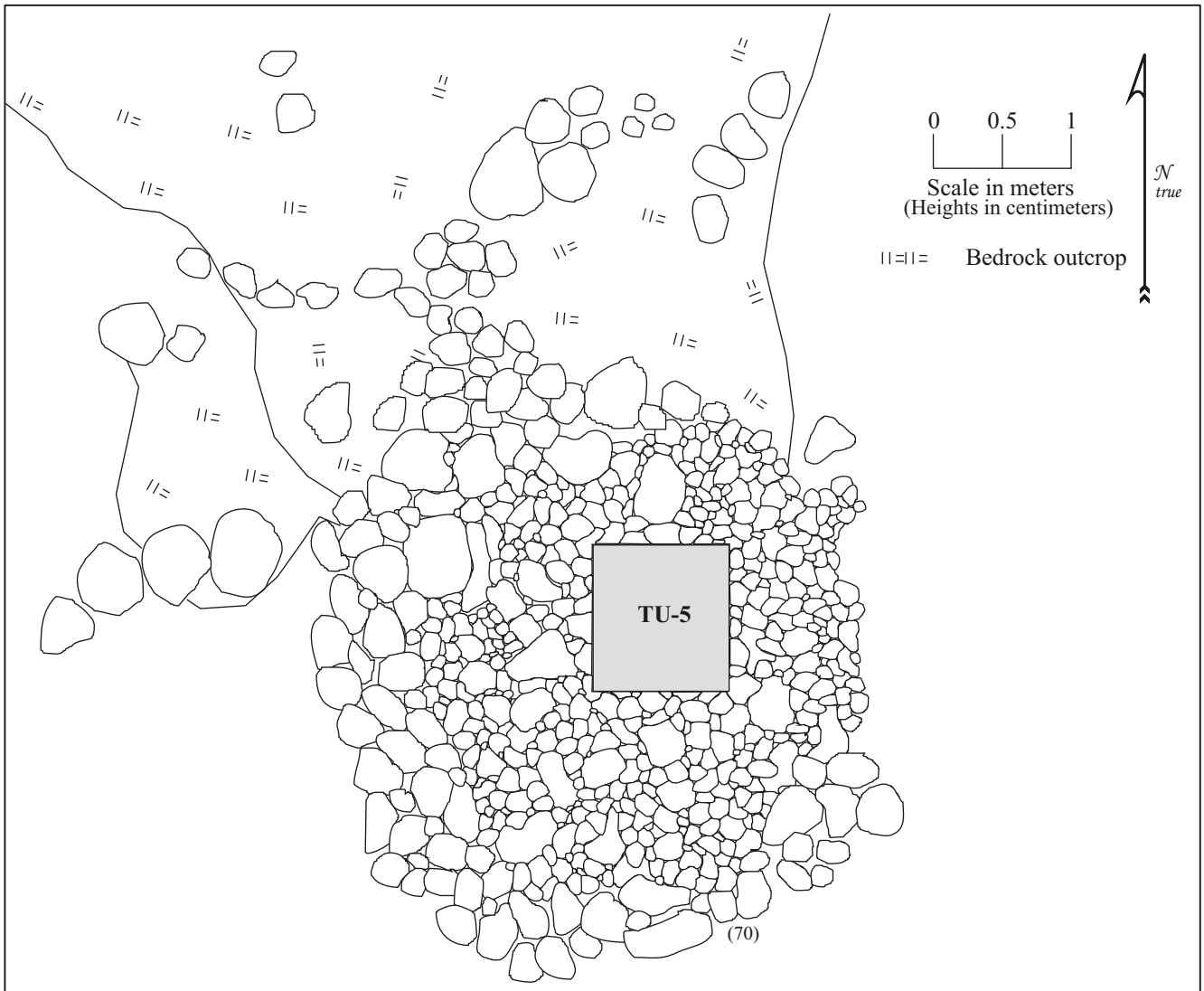
Feature 204

Feature 204 is a modified *pāhoehoe* outcrop located in the northwestern quadrant of the project area (see Figure 76). The feature has an irregular shape and may have been formerly stacked, but is now mostly collapsed (Figures 94 and 95). Some remnant *pāhoehoe* cobble stacking still remains along its southwestern edge and the northeastern edge abuts the bedrock outcrop. The surface of the feature, which has evidence of protruding bedrock, is roughly leveled and paved with small *pāhoehoe* cobbles (see Figure 95). A waterworn cobble was found on the feature's surface adjacent to the bedrock outcrop. Feature 204 measures 3.4 meters long by 2.7 meters wide and stands 70 centimeters high along its western edge.

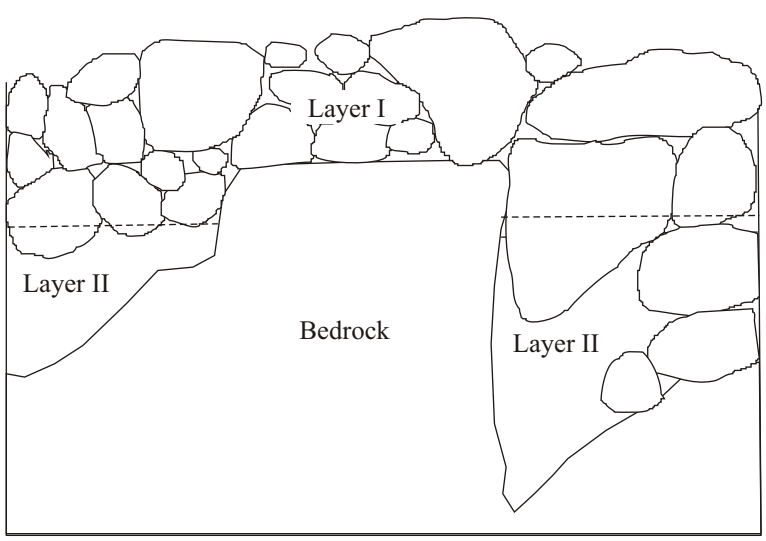
A 1 x 1 meter test unit (TU-6) was excavated in the west-central portion of Feature 204 (see Figure 94) and revealed the following two layers (which contained no cultural items):

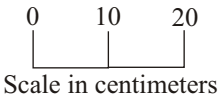
Layer I (0-18cmbs)..... small to large sized *pāhoehoe* cobbles mixed with organics on bedrock and bedrock pockets.

Layer II (18-25cmbs) ..... low-lying bedrock pockets with dark brown (10YR 3/3) silt mixed with organics on bedrock.



TU-5 west wall profile

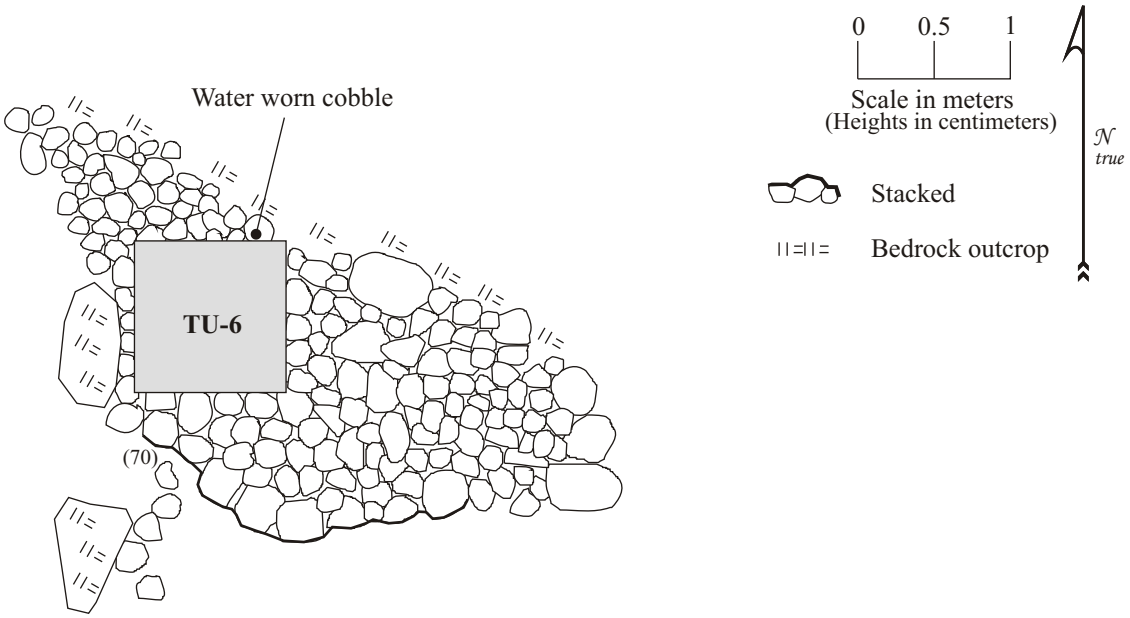




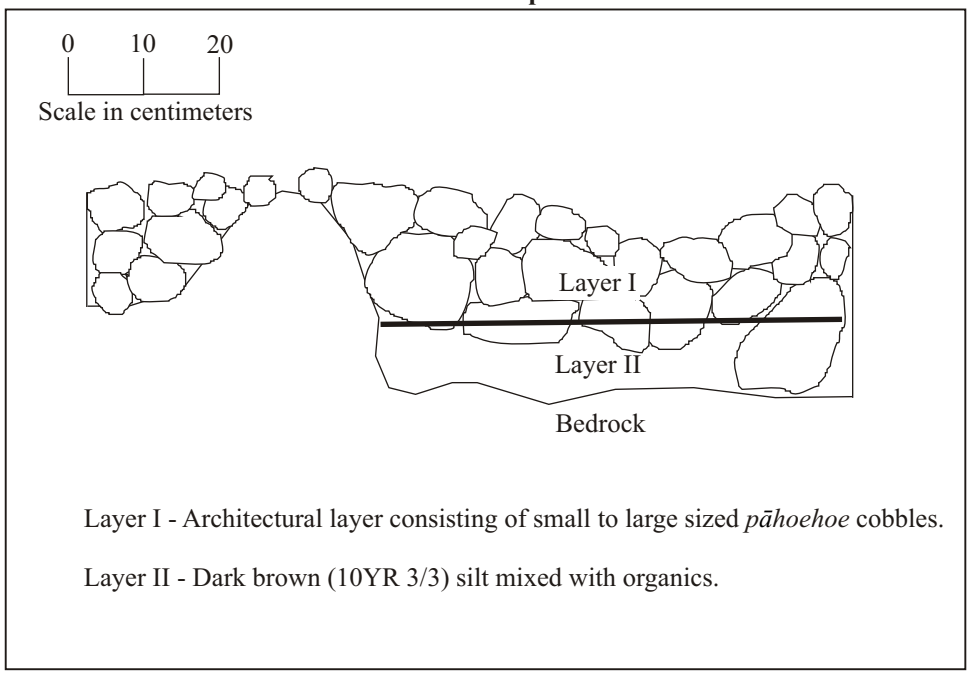
Layer I - Architectural layer consisting of small to large sized *pāhoehoe* cobbles.

Layer II - Dark brown (10YR 3/3) silt mixed with organics.

Figure 93. SIHP Site 23686 Feature 201 plan view and TU-5 profile.



TU-6 west wall profile



Layer I - Architectural layer consisting of small to large sized *pāhoehoe* cobbles.

Layer II - Dark brown (10YR 3/3) silt mixed with organics.

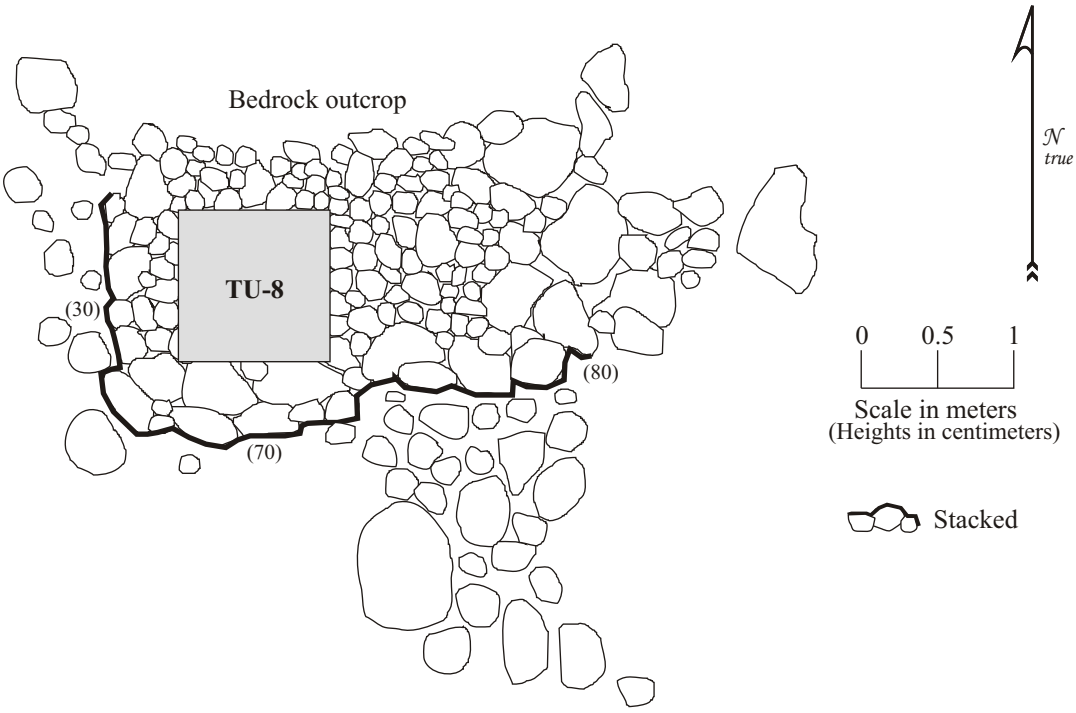
Figure 94. SIHP Site 23686 Feature 204 plan view and TU-6 profile.


Figure 95. SIHP Site 23686 Feature 204, view to the west.

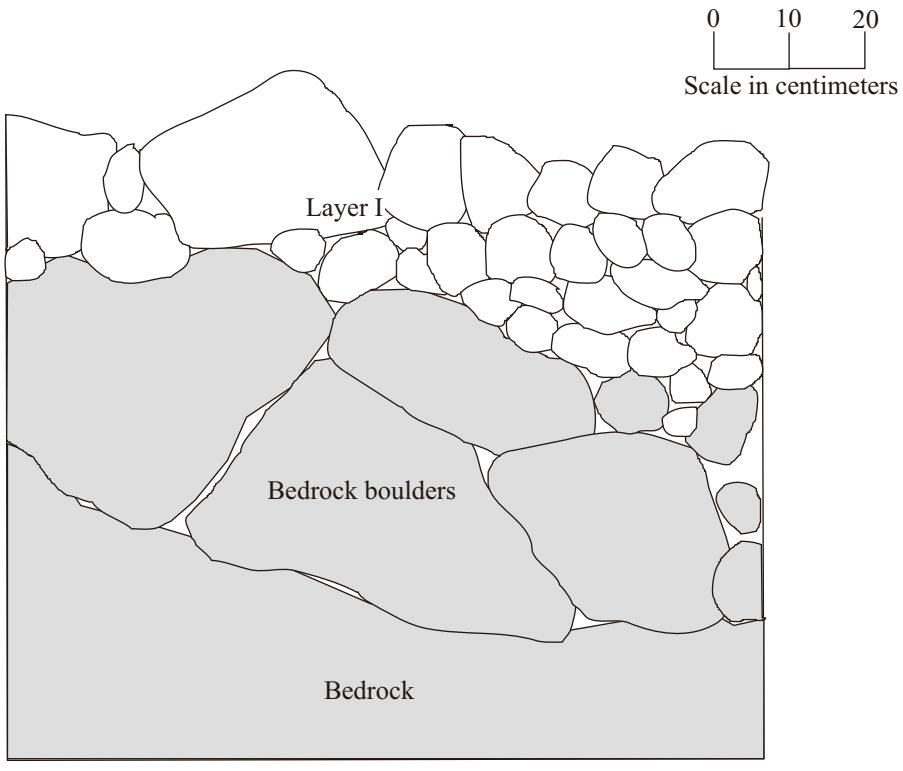
Feature 239

Feature 239 is a modified *ʻaʻā* outcrop centrally located within the project area amongst a number of other agricultural features (see Figure 76). The feature, which is roughly rectangular, measures 4.0 meters long by 2.5 meters wide and stands up to 70 centimeters high along its southern edge (Figure 96). The southern and western edges consist of stacked *ʻaʻā* cobbles and boulders (Figure 97). The eastern edge is completely collapsed and the bedrock outcrop supports the northern edge of the feature. The surface of Feature 239 is roughly paved and leveled with small *ʻaʻā* cobbles.


Figure 96. SIHP Site 23686 Feature 239, view to the north.



TU-8 south wall profile



Layer I - Architectural layer consisting of small to large sized *ʻaʻā* cobbles mixed with organics.

Figure 97. SIHP Site 23686 Feature 239 plan view and TU-8 profile.

A 1 x 1 meter test unit (TU-8) was excavated in the west-central portion of Feature 239 (see Figure 97). Excavation of TU-8 revealed a single architectural layer (Layer I) resting on bedrock. Layer I consisted of small to large sized *ʻaʻā* cobbles mixed with organics 55 centimeters thick resting on bedrock and mixed with fractured bedrock boulders. A small amount of soil (approximately 1 to 2 centimeters thick) had accumulated at the base of the unit within low-lying bedrock areas subsequent to the construction of the feature. Excavation of TU-8 terminated at bedrock 55 centimeters below the feature's surface (Figure 98). No cultural material was recovered from Feature 239, and Clark and Rechtman (2003) suggested that this feature may be a by-product of agricultural clearing in the area.

Figure 98. SIHP Site 23686 Feature 239 TU-8 base of excavation, view to the south.

Feature 297

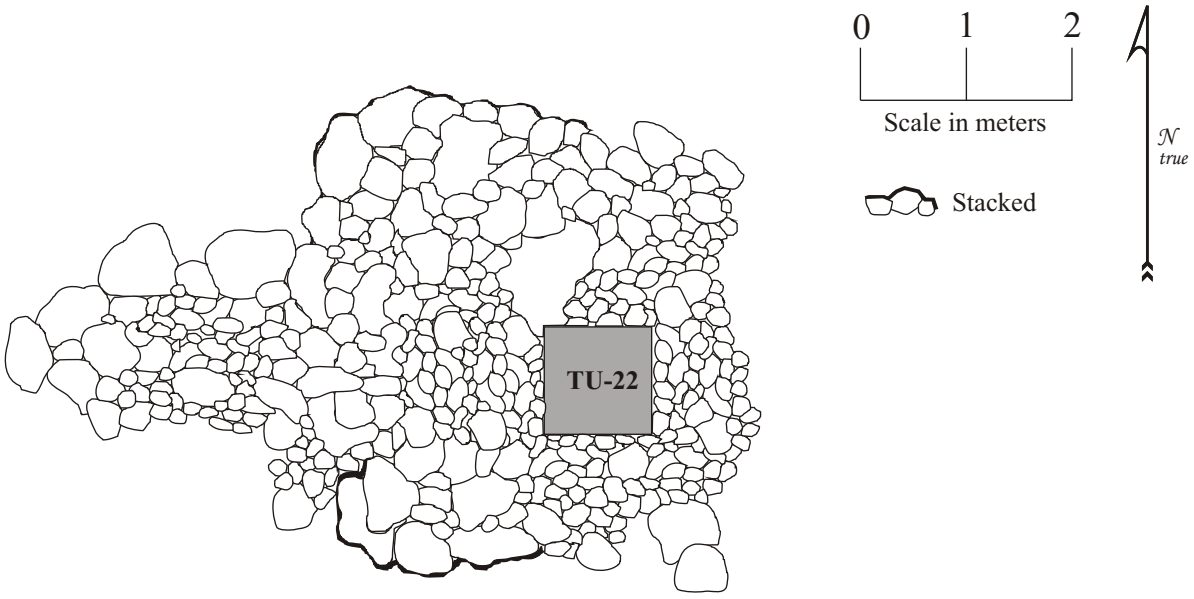
Feature 297 is a modified *ʻaʻā* outcrop located at the extreme eastern end of the project area along the southern edge of the old access road (see Figure 76). Feature 297 was formerly constructed of stacked *ʻaʻā* cobbles, but is now collapsed in several sections (Figures 99 and 100). The feature, which is roughly oval in shape, measures 4.5 meters long by 4.0 meters wide and stands up to 70 centimeters above ground surface in its southwestern corner. The southern and northern edges of the feature are stacked. The western edge is nearly completely collapsed and a bedrock outcrop supports the eastern edge of the feature. The surface of Feature 297 is roughly paved and leveled with small sized *ʻaʻā* cobbles. Overall, the feature has a very formal appearance.

A 1 x 1 meter test unit (TU-22) was excavated in the east central portion of Feature 297 (see Figure 99) and revealed the following stratigraphic profile:

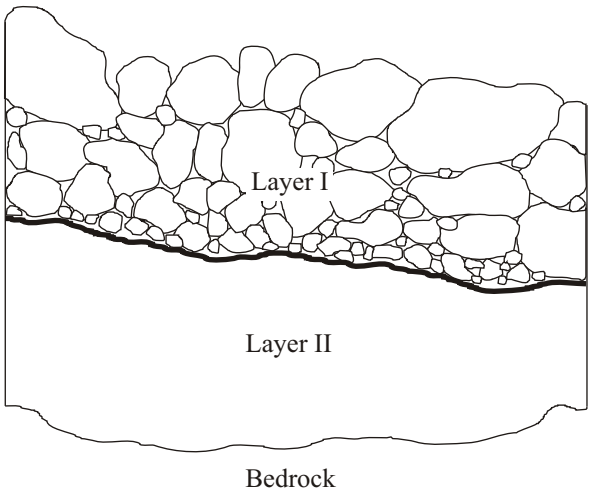
Layer I (0-33cmbs)..... architectural layer with small to large sized *ʻaʻā* cobbles mixed with organics

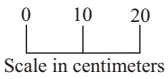
Layer II (33-63cmbs) ..... dark brown (10YR 3/3) very fine sandy silt mixed with decaying organics, the lower portions grading into dark yellowish brown soil (10YR 4/4) mixed with decomposing bedrock on bedrock.

No cultural material of any kind was recovered from TU-22, and Clark and Rechtman (2003) suggested that Feature 297 may be the by-product of agricultural clearing in the area.



TU-22 north wall profile





Layer I - Architectural layer consisting of small to large sized *ʻaʻā* cobbles mixed with organics.

Layer II - Dark brown (10YR 3/3) very fine sandy silt. Upper portions were mixed with decaying organics while the lower portions gradually transitioned into dark yellowish brown (10YR 4/4) soil mixed with decomposing bedrock.

Figure 99. SIHP Site 23686 Feature 297 plan view and TU-22 profile.

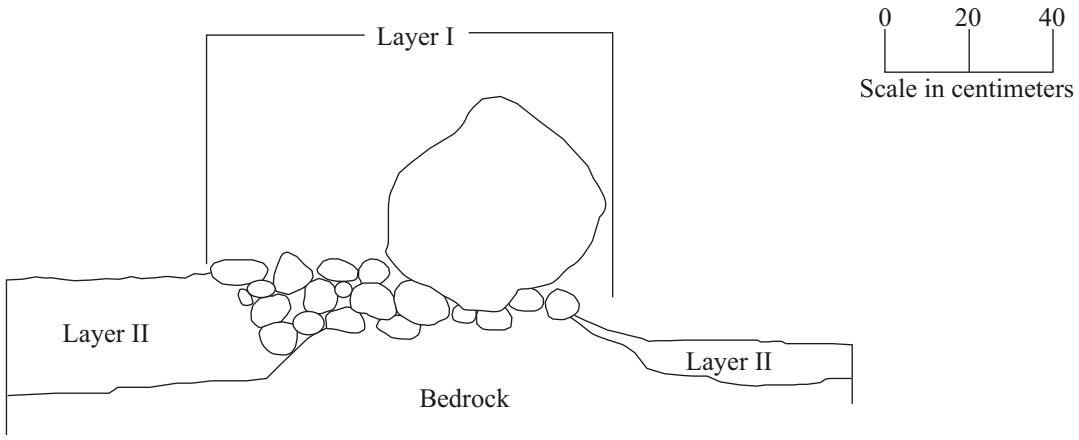

Figure 100. SIHP Site 23686 Feature 297, view to the north.

Feature 185

Feature 185 is a linear terrace constructed of piled *pāhoehoe* near the western end of the project area not far from the Kuakini Highway (see Figure 76). The southeast to northwest aligned feature is 17 meters long, 60 centimeters wide, and 90 centimeters high. Small to medium boulders align the *makai* edge of the wall whereas small cobbles make-up the *mauka* side of the wall. Soil accumulation occurred after construction of the wall, particularly on the northeastern side. The wall rested directly on *pāhoehoe* bedrock.

A 2 x 1 meter excavation unit (EU-1a), aligned southwest-northeast, was placed two meters from the northern edge of the terrace wall and revealed the following stratigraphic profile (Figure 101). No cultural items were recovered:

Layer I with boulders on wall (0-50cmbs)	architectural layer with medium to small *pāhoehoe* boulders and cobbles on *pāhoehoe* bedrock.
Layer II northeast/*mauka* of wall (0-40cmbs)	very dark brown (7.5YR 2.5/3) silt mixed with 10 percent rock.
Layer II northeast/*makai* of wall (0-20cmbs)	very dark brown (7.5YR 2.5/3) silt mixed with 10 percent rock.



Layer I - Architectural layer consisting of medium to small *pāhoehoe* boulders and cobbles on bedrock.

Layer II (northeast/*mauka* of wall) - Very dark brown (7.5YR 2.5/3) silt mixed with 10% rock.

Layer II (northeast/*makai* of wall) - Very dark brown (7.5YR 2.5/3) silt mixed with 10% rock.

Figure 101. SIHP Site 23686 Feature 185 EU-1a south wall profile.

Feature 247

Feature 247 is a linear terrace constructed of small *ʻaʻā* cobbles near the center of the project area (see Figure 76). The southwest to northeast aligned feature is 11 meters long, 2.6 meters wide, and 90 centimeters high. The wall consists of piled stone with an outer stacked edge.

A 2 x 1 meter excavation unit (EU-5) aligned west to east, was placed within the wall *mauka* of the *makai* stacked wall edge. EU-5 revealed the following stratigraphic profile (Figures 102 and 103):

Layer I (0-40cmbs)..... architectural layer with piled *ʻaʻā* cobbles and stacked *ʻaʻā* cobble facing on the west.
Layer II (40-80cmbs) ..... very dark grayish brown (10YR 3/2) fine silt grading into reddish brown (5YR 4/4) silt immediately above weathered and undulating *ʻaʻā* bedrock (95cm deep pocket within *ʻaʻā* bedrock in northwest corner).

Recovered items from EU-5 include *Cypraea* sp., *Drupa* sp., *Cellana* sp., coral, *kukui* nutshell, charcoal, basalt flakes, and a volcanic glass flake (Table 29). A corroded iron horseshoe nail (Acc# 034) from Level 1 of Layer I is probably intrusive. This nail is 36 millimeters long, 7.4 millimeters wide and 3 millimeters thick. Other than the nail the vertical distribution of species and artifact types appears fairly constant within the unit.

Table 29. Recovered items from SIHP Site 23686, Feature 247, EU-5.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
33	Surface		Marine shell	*Cypraea* sp.	1	1	23.4
36	I	1	Marine shell	*Cypraea* sp.	3	1	4.3
38	I	1	Marine shell	*Cellana* sp.	1	1	0.7
35	I	1	Coral	Unidentified	10	-	9.7
37	I	1	Organic	*Kukui* nutshell	4	-	2.6
34	I	1	Metal	Iron horseshoe nail	1	-	2.1
				Layer I, Level 1 Total:	19	2	19.4
42	II	1	Marine shell	*Cypraea* sp.	2	1	1.1
41	II	1	Coral	Unidentified	3	-	1.2
40	II	1	Volcanic glass	Flake	1	-	1.4
39	II	1	Organic	*Kukui* nutshell	5	-	2.2
				Layer II, Level 1 Total:	11	1	5.9
45	II	2	Marine shell	*Cypraea* sp.	7	2	9.0
47	II	2	Marine shell	*Drupa* sp.	1	1	2.8
44	II	2	Basalt	Flake	1	-	4.2
48	II	2	Basalt	Flake	8	-	6.7
46	II	2	Organic	*Kukui* nutshell	7	-	2.2
43	II	2	Organic	Charcoal	-	-	3.3
				Layer II, Level 2 Total:	24	3	28.2
				EU-5 Total:	55	7	76.9

Charcoal collected from Layer II Level 2 of EU-5, Feature 247, was submitted for radiocarbon assaying. The sample (Beta-212757) intercepts the tree-ring calibration curve at AD 1530, 1560, and 1630 and has a 2-sigma standard deviation calibrated date range of AD 1460 to 1660.

Figure 102. SIHP Site 23686 Feature 247 EU-5 base of excavation.

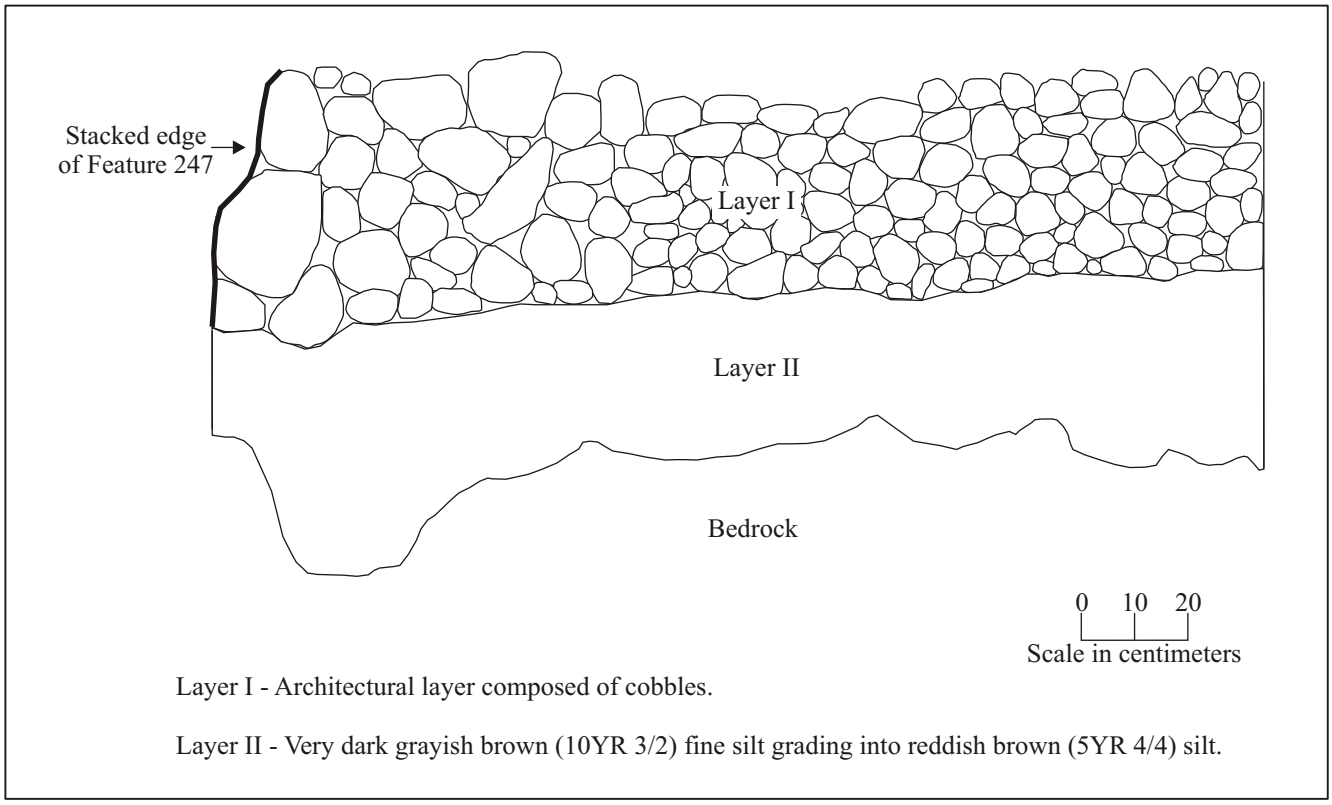


Figure 103. SIHP Site 23686 Feature 247 EU-5 north wall profile.

Feature 251

Feature 251 is a rectangular enclosure constructed of *ʻaʻā* cobbles within the southeastern quadrant of the project area (see Figure 76). The southeast to northwest aligned walled-enclosure is 12.5 meters long by 11.5 meters wide, and the wall is 60 centimeters high.

A 2 x 2 meter excavation unit (EU-8) was placed within the enclosure, two meters east of the western wall and four meters south of the northern wall, and revealed the following stratigraphic profile (Figures 104 and 105):

Layer I (0-25cmbs)..... 20cm thick dark brown (10YR 3/3) sandy silt with 25% cobbles on 5cm thick dark yellowish brown (10YR 3/4) silt mixed with decomposing *ʻaʻā* bedrock.

Seventeen fragments, or 34.5 grams, of bovine bone and teeth fragments came from Layer I Level 1 of EU-8 (Acc# 95). The fragments probably represent the remains of a single cow.

Feature 250

Feature 250 is a rectangular pavement constructed of *ʻaʻā* cobbles within the southeastern quadrant of the project area (see Figure 76). The east to west aligned platform is 2.5 meters long, 1.8 meters wide, and 50 centimeters high.

A 2 x 2 meter excavation unit (EU-11) was placed on the central portion of the platform surface, and revealed the following stratigraphy (Figure 106):

Layer I Level 1 (0-65cmbs).....architectural layer with piled *ʻaʻā* cobbles, diminishing in size with increasing depth.
Layer II Level 1 (65-90cmbs).....dark brown (10YR 3/3) silt with 85% cobbles.
Layer II, Level 2 (90-100cmbs).....dark brown (10YR 3/3) silt with 85% cobbles on weathered bedrock.

Recovered items from EU-11 include fish, *Cypraea* sp., *Drupa* sp., *Cellana* sp., coral, *Sus* sp., *kukui* nutshell, charcoal, and volcanic glass flakes (Table 30). Overall species and artifact type density increases with increasing depth within EU-11. Apart from this stratigraphic trend there is no evidence for shifting diet or activities between the different layers.

Figure 104. SIHP Site 23686 Feature 251 EU-8 base of excavation, view to the west/southwest.

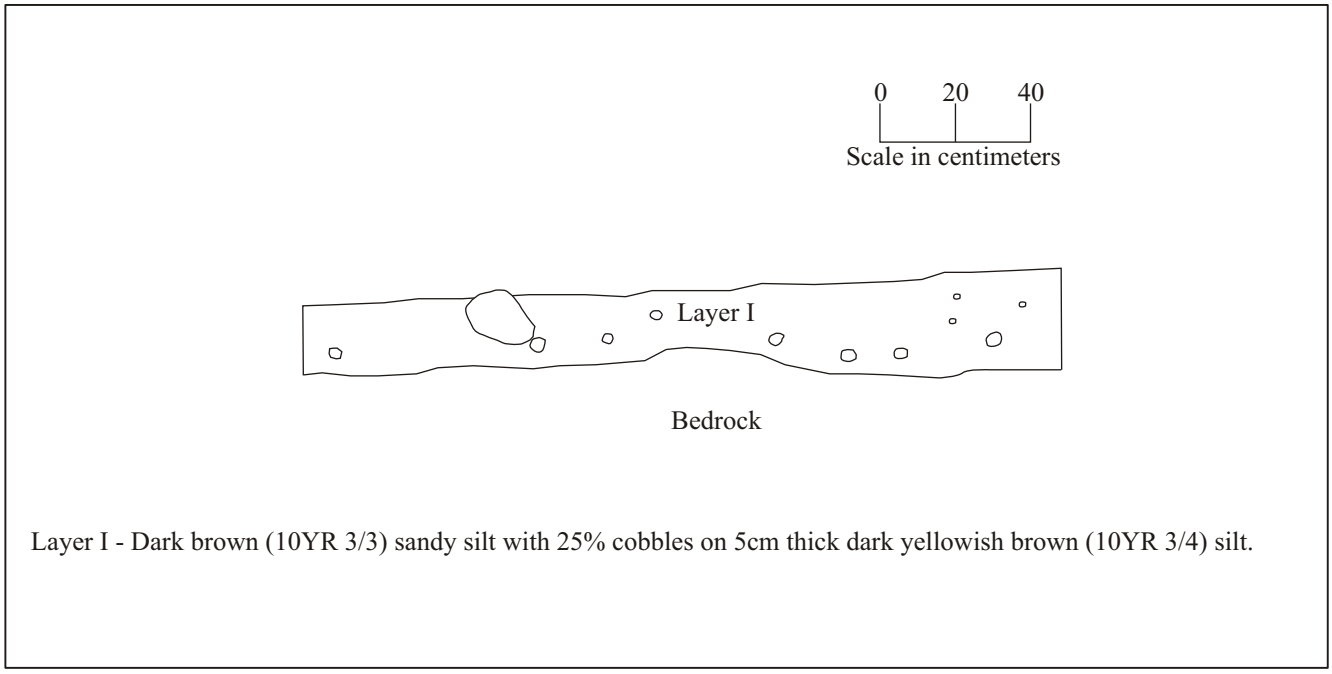
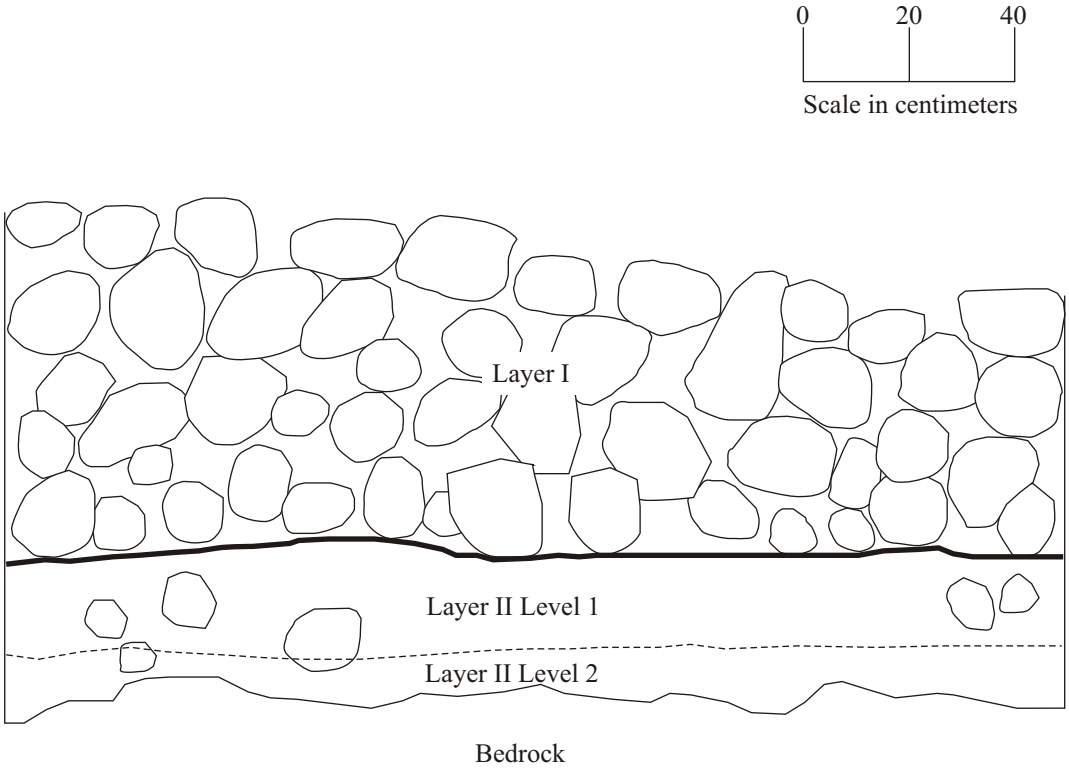


Figure 105. SIHP Site 23686 Feature 251 EU-8 north wall profile.



Layer I Level 1 - Architectural layer with piled *ʻaʻā* cobbles, diminishing in size with increasing depth.

Layer II Level 1 - Dark brown (10YR 3/3) silt with 85% cobbles.

Figure 106. SIHP Site 23686 Feature 250 EU-11 north wall profile.

Table 30. Recovered items from SIHP Site 23686, Feature 250, EU-11.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
142	I	1	Marine shell	*Drupa* sp	1	1	20.5
143	I	1	Marine shell	*Cellana* sp.	1	1	59.1
				Layer 1, Level 1 Total:	2	2	79.6
147	II	1	Fish bone	*Scarus* sp. pharyngeal plate	1	1	0.6
148	II	1	Marine shell	*Drupa* sp.	1	1	2.2
149	II	1	Coral	Unidentified	1	-	0.4
146	II	1	Mammal	*Canis* sp. tooth	1	1	1.0
145	II	1	Volcanic glass	Flake	2	-	1.8
144	II	1	Organic	*Kukui* nutshell	3	-	1.0
				Layer II, Level 1 Total:	9	3	7.0
153	II	2	Fish bone	Unidentified	1	-	0.1
154	II	2	Marine shell	*Cypraea* sp.	4	1	1.3
155	II	2	Marine shell	*Drupa* sp.	3	1	3.5
156	II	2	Coral	Unidentified	10	-	7.2
157	II	2	Coral	Unidentified	1	-	0.3
152	II	2	Volcanic glass	Flake	5	-	3.2
151	II	2	Organic	*Kukui* nutshell	2	-	0.9
150	II	2	Organic	Charcoal	-	-	0.5
				Layer II, Level 2 Total:	26	2	17.0
				EU-11 Total:	37	7	103.6

Charcoal collected from Layer II Level 2 of EU-11, Feature 250, was submitted for radiocarbon assaying. The sample (Beta-212760) intercepts the tree-ring calibration curve at AD 1650 and has a 2-sigma standard deviation calibrated date range of AD 1520 to 1950.

Feature 254

Feature 254 is a linear terrace wall constructed of *ʻaʻā* cobbles within the southeastern quadrant of the project area (see Figure 71). The southeast to northwest aligned wall is 20 meters long, 2.7 meters wide, and 80 centimeters high. The wall is loosely stacked along its edges with a slightly mounded interior surface of piled cobbles.

A 2 x 1 meter excavation unit (EU-12) was placed perpendicularly across the terrace wall in a northeastern alignment and revealed the following stratigraphic profile (Figures 107 and 108):

Layer I, Level 1 (0-60cmbs).....architectural layer with small piled *ʻaʻā* cobbles and larger stacked *ʻaʻā* cobbles along outer edges.
Layer II, Level 1 (60-70cmbs).....dark yellowish brown (10YR 3/4) silt with cobbles.
Layer II, Level 2 (70-80cmbs).....dark yellowish brown (10YR 3/4) and dark brown (10YR 3/3) mottled silt with medium-sized cobbles.
Layer II, Level 3 (80-90cmbs).....very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) mottled silt with cobbles.
Layer II, Level 4 (90-100cmbs).....dark brown (10YR 3/3) silt with less cobbles on undulating *ʻaʻā* bedrock.

Recovered items from EU-12 included *Cypraea* sp., coral, unidentifiable shell, *Sus* sp., and charcoal (Table 31). All the recovered items came from Layer II; the architectural layer and the bottom-most silt layer being sterile.

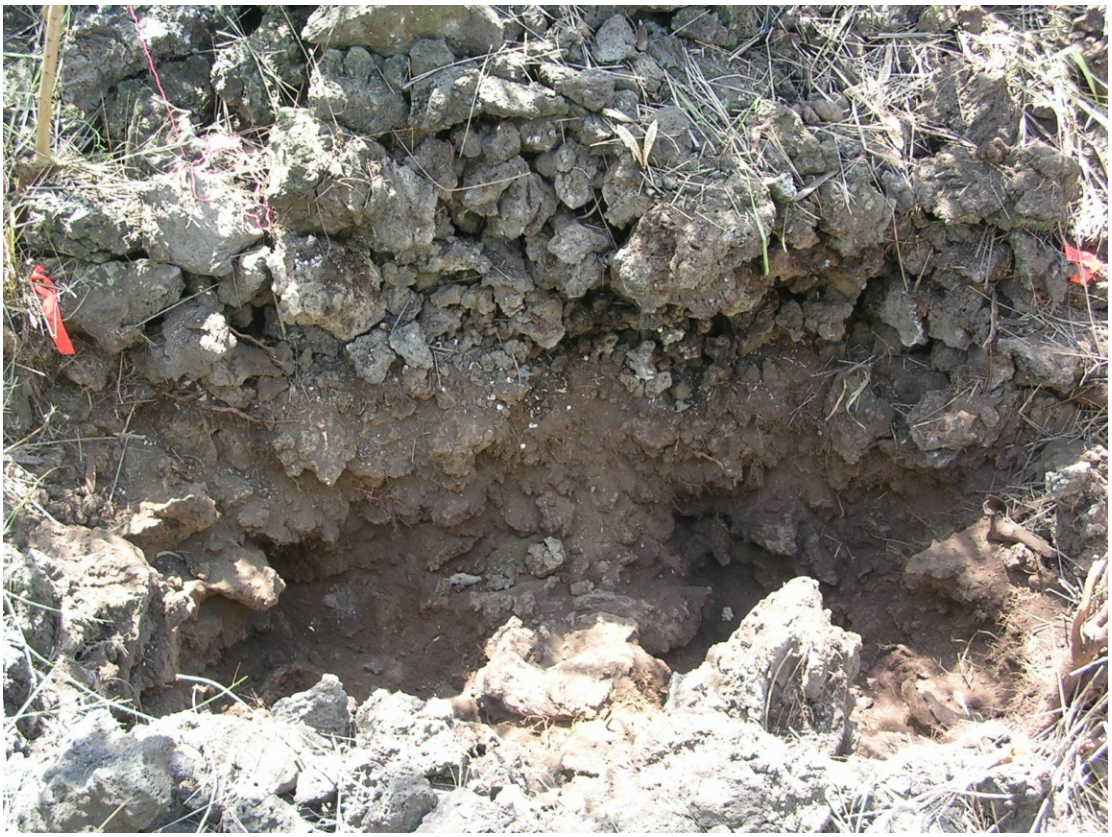
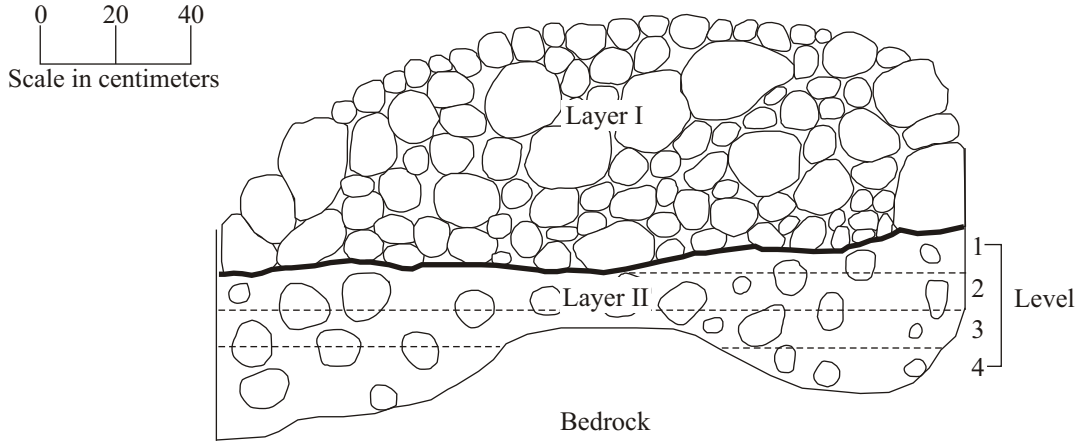


Figure 107. SIHP Site 23686 Feature 254 EU-12 base of excavation, view to the southeast.



Layer I, Level 1 - Architectural layer with small piled *ʻaʻā* cobbles and larger stacked *ʻaʻā* cobbles along outer edges.

Layer II, Level 1 - Dark yellowish brown (10YR 3/4) silt with cobbles.

Layer II, Level 2 - Dark yellowish brown (10YR 3/4) and dark brown (10YR 3/3) mottled silt with medium-sized cobbles.

Layer II, Level 3 - Very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) mottled silt with cobbles.

Layer II, Level 4 - Dark brown (10YR 3/3) silt with a small amount of cobbles.

Figure 108. SIHP Site 23686 Feature 254 EU-12 northwest wall profile.

Table 31. Recovered items from SIHP Site 23686, Feature 254, EU-12.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
159	II	1	Marine shell	*Cypraea* sp.	1	1	0.7
158	II	1	Organic	Charcoal	-	-	0.2
				Layer II, Level 1 Total:	1	1	0.9
163	II	2	Marine shell	Unidentified	1	-	0.2
162	II	2	Coral	Unidentified	4	-	1.5
161	II	2	Mammal bone	*Sus* sp. vertebrae	1	1	1.1
160	II	2	Organic	Charcoal	-	-	0.5
				Layer II, Level 2 Total:	6	1	3.3
164	II	3	Organic	Charcoal	-	-	0.3
				Layer II, Level 3 Total:	0	0	0.3
				EU-12 Total:	7	2	4.5

Charcoal collected from Layer II Level 2 of EU-12, Feature 254, was submitted for radiocarbon assaying. The sample (Beta-212761) intercepts the tree-ring calibration curve at AD 1650 and has a 2-sigma standard deviation calibrated date range of AD 1520 to 1950.

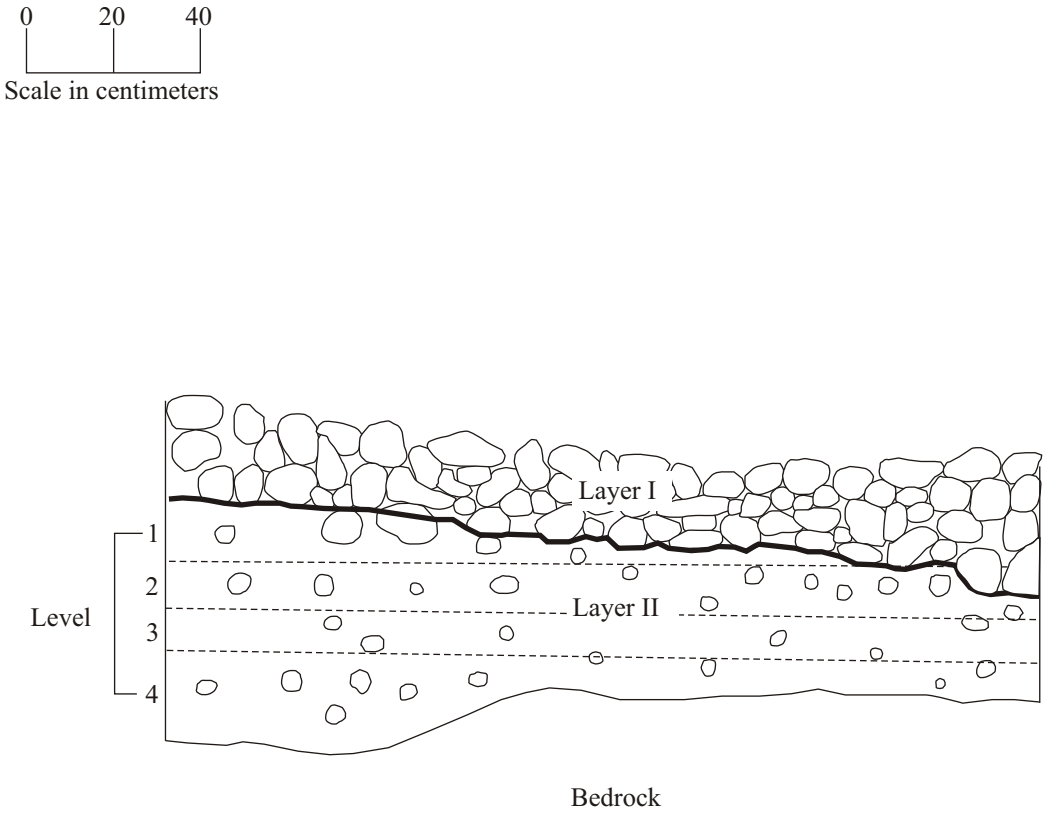
Feature 291

Feature 291 is a linear *kuaiwi* constructed of *ʻaʻā* cobbles within the northeastern quadrant of the project area (see Figure 76). The southwest to northeast aligned wall is 78 meters long, 3.5 meters wide, and 30 centimeters high. The wall is comprised of loosely piled small to medium cobbles.

A 2 x 1 meter excavation unit (EU-13) was placed from north to south across the wall near its northeastern tip and revealed the following profile (Figure 109):

Layer I (0-30cmbs).....architectural layer with small to medium piled *ʻaʻā* cobbles.
Layer II, Level 1 (30-40cmbs).....dark brown (10YR 3/3) silt with cobbles.
Layer II, Level 2 (40-50cmbs).....brown (10YR 4/3) silt with 40% cobbles.
Layer II, Level 3 (50-60cmbs).....brown (10YR 4/3) silt with smaller cobbles.
Layer II, Level 4 (60-80cmbs).....brown (10YR 4/3) silt with 80% smaller cobbles on undulating *ʻaʻā* bedrock.

Items recovered from EU-13 include *Cypraea* sp., *Drupa* sp., *Morula* sp., *Isognomon* sp., coral, Echinoidea, *Conus* sp., unidentifiable shell, volcanic glass flake, and waterworn basalt pebbles (Table 32). Layer II yielded more items than the architectural Layer I. However, no dietary or activity shifts are evident.



Layer I - Architectural layer with small to medium piled *ʻaʻā* cobbles.

Layer II, Level 1 - Dark brown (10YR 3/3) silt with cobbles.

Layer II, Level 2 - Brown (10YR 4/3) silt with 40% cobbles.

Layer II, Level 3 - Brown (10YR 4/3) silt with smaller cobbles.

Layer II, Level 4 - Brown (10YR 4/3) silt with 80% small cobbles.

Figure 109. SIHP Site 23678 EU-13 west wall profile.

Table 32. Recovered items from SIHP Site 23686, Feature 291, EU-13.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
165	I	1	Marine shell	*Cypraea* sp.	7	2	15.3
166	I	1	Marine shell	*Drupa* sp	1	1	1.2
167	I	1	Marine shell	*Conus* sp.	1	1	2.1
170	I	1	Marine shell	*Conus* sp.	1	1	0.0
168	I	1	Coral	Unidentified	1	-	2.8
169	I	1	Coral	Unidentified	12	-	67.5
				Layer I, Level 1 Total:	23	5	88.9
172	II	1	Marine shell	*Cypraea* sp.	7	1	5.3
173	II	1	Marine shell	*Drupa* sp.	3	1	1.1
174	II	1	Marine shell	*Conus* sp.	6	2	2.4
175	II	1	Marine shell	Unidentified	1	-	0.2
176	II	1	Coral	Unidentified	20	-	7.7
177	II	1	Coral	Unidentified	1	-	1.5
178	II	1	Coral	Waterworn	2	-	1.1
171	II	1	Basalt	Waterworn pebble	2	-	3.7
				Layer II, Level 1 Total:	42	4	23.0
180	II	2	Marine shell	*Cypraea* sp.	11	1	5.2
184	II	2	Marine shell	*Drupa* sp	1	1	1.5
185	II	2	Marine shell	*Morula* sp.	1	1	1.0
183	II	2	Marine shell	*Isognomon* sp.	1	1	0.1
182	II	2	Marine shell	*Conus* sp.	4	1	1.5
186	II	2	Marine shell	Unidentified	5	-	1.6
188	II	2	Coral	Unidentified	2	-	1.5
189	II	2	Coral	Waterworn	2	-	0.4
190	II	2	Coral	Unidentified	5	-	3.3
181	II	2	Echinoderm	Echinoidea	1	-	0.3
179	II	2	Volcanic glass	Flake	1	-	0.9
				Layer II, Level 2 Total:	34	5	17.2
191	II	3	Marine shell	*Cypraea* sp.	10	2	6.1
194	II	3	Marine shell	*Drupa* sp.	1	1	0.4
192	II	3	Marine shell	*Conus* sp.	8	2	3.9
195	II	3	Marine shell	Unidentified	12	-	1.1
196	II	3	Coral	Unidentified	5	-	1.7
197	II	3	Coral	Waterworn	6	-	2.5
193	II	3	Echinoderm	Echinoidea	3	-	0.5
				Layer II, Level 3 Total:	45	5	16.2
				EU-13 Total:	144	19	145.3

Feature 286

Feature 286 is an irregularly shaped terrace wall constructed of *ʻaʻā* cobbles within the east-central portion of the project area (see Figure 76). The roughly L-shaped wall extends for approximately ten meters from the southeast to the northwest where it turns into a generally northeasterly facing arc-shape for another six meters. The average width of the wall is 1.8 meters and its height is 60 centimeters. The wall consists of piled large cobbles and small boulders.

A 2 x 1 meter excavation unit (EU-16) was placed from east to west across the wall near its eastward turn and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figure 110):

Layer I (0-50cmbs)..... architectural layer with piled large to small *ʻaʻā* cobbles and a few boulders.
Layer II (50-80cmbs) ..... dark brown (10YR 3/3) silt grading into dark yellowish brown (10YR 3/4) silt immediately above weathered and undulating *ʻaʻā* bedrock.

Feature 282

Feature 282 is a rectangular pavement constructed of *ʻaʻā* cobbles within the east-central portion of the project area (see Figure 76). The southeast to northwest aligned platform is 12.5 meters long, 8.5 meters wide, and 20 centimeters above ground surface. Two excavation units (i.e., EU-17 and EU-18) were placed on the Feature 282 pavement.

A 2 x 1 meter excavation unit (EU-17) was placed in the northwestern portion of the pavement and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 111 and 112):

Layer I (0-25cmbs)..... architectural layer with piled small to large *ʻaʻā* cobbles (smaller pebbles formed a 10cm thick pavement).
Layer II (25-50cmbs) ..... brown (10YR 4/3) silt with 80% rock above weathered *ʻaʻā* bedrock.

A 2 x 2 meter excavation unit (EU-18) was placed near the northwestern corner of the pavement and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 113 and 114):

Layer I (0-25cmbs)..... architectural layer with piled small to large *ʻaʻā* cobbles.
Layer II (25-45cmbs) ..... brown (10YR 4/3) silt with 80% rock above weathered *ʻaʻā* bedrock.

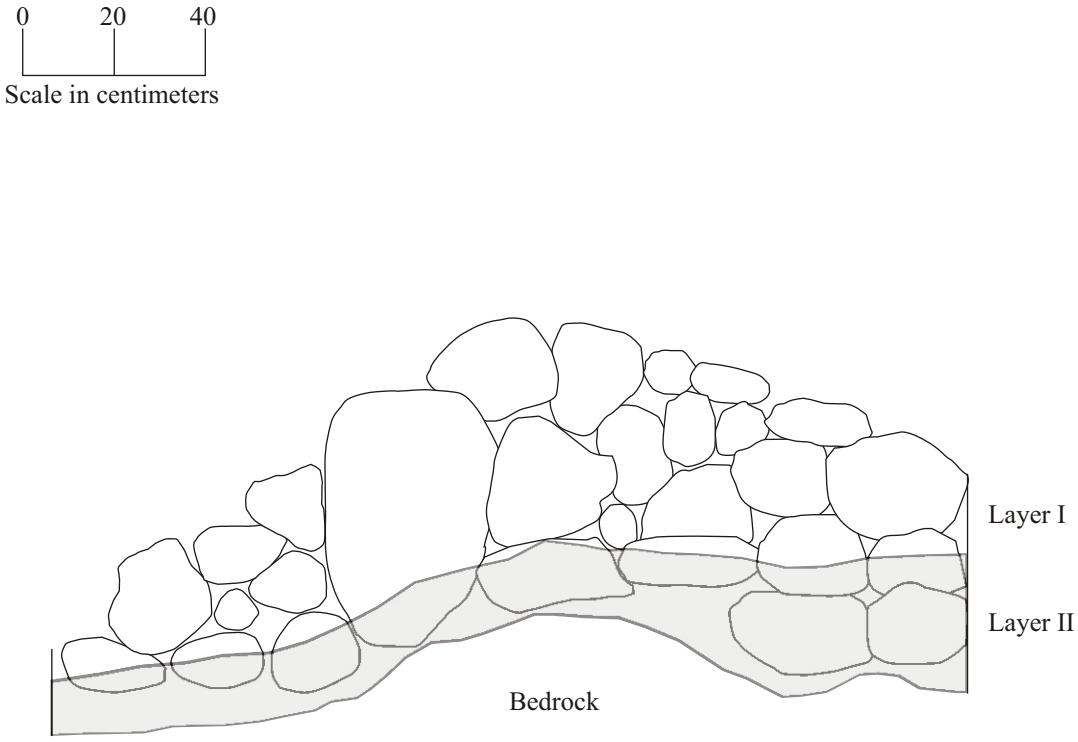
Feature 289

Feature 289 is an irregularly-shaped pavement constructed of *ʻaʻā* cobbles within the east-central portion of the project area (see Figure 76). The west to east aligned platform is nine meters long, 5.5 meters wide, and 20 centimeters above the surrounding ground surface. Two excavation units (i.e., EU-19 and EU-20) were placed on the Feature 289 pavement.

A 2 x 2 meter excavation unit (EU-19) was placed near the southwestern portion of the pavement and revealed the following stratigraphic profile (Figure 115):

Layer I (0-45cmbs).....architectural layer with piled small to large *ʻaʻā* cobbles and a few small boulders.
Layer II, Level 1 (45-55cmbs).....dark brown (10YR 3/3) silt with *ʻaʻā* cobbles from architectural layer.
Layer II, Level 2 (55-65cmbs).....dark brown (10YR 3/3) silt with 20% *ʻaʻā* gravels.
Layer II, Level 3 (65-80cmbs).....dark brown (10YR 3/3) silt with crumbly *ʻaʻā* cobble fragments from underlying undulating bedrock.

Items recovered from EU-19 include *Cypraea* sp., *Morula* sp., *Isognonom* sp., coral, and *Conus* sp. (Table 33). All the items came from Layer II below the architectural layer.

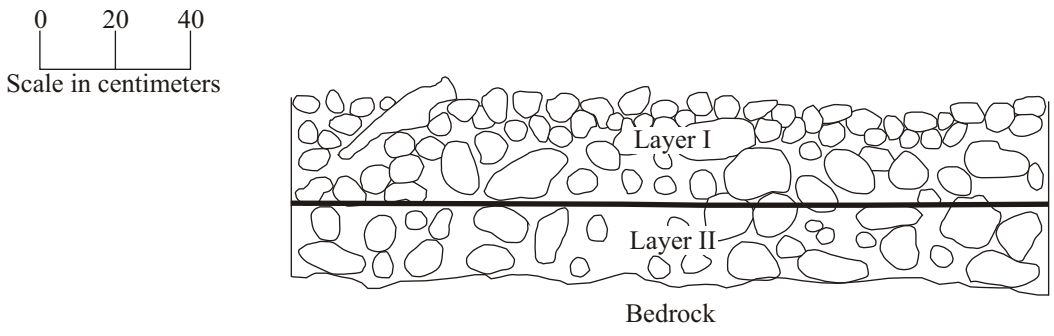


Layer I - Architectural layer with piled large to small *ʻaʻā* cobbles and a few boulders.

Layer II - Dark brown (10YR 3/3) silt grading into dark yellowish brown (10YR 3/4) silt.

Figure 110. SIHP Site 23686 Feature 286 EU-16 north wall profile.

Figure 111. SIHP Site 23686 Feature 282 EU-17 base of excavation, view to the east.



Layer I - Architectural layer with piled small to large *ʻaʻā* cobbles (smaller pebbles formed a 10cm thick pavement).

Layer II - Brown (10YR 4/3) silt with 80% rock above.

Figure 112. SIHP Site 23686 Feature 282 EU-17 east wall profile.

Figure 113. SIHP Site 23686 Feature 282 EU-18 base of excavation, view to the east.

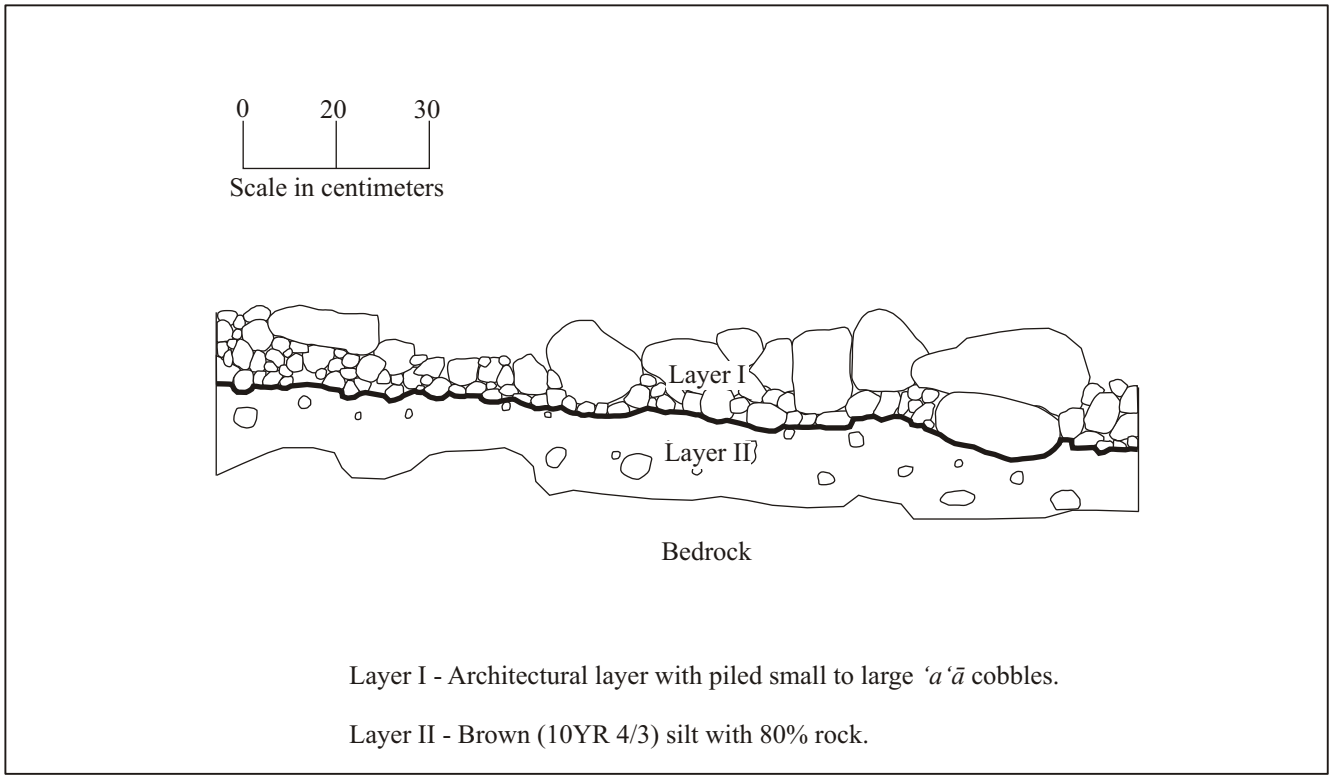
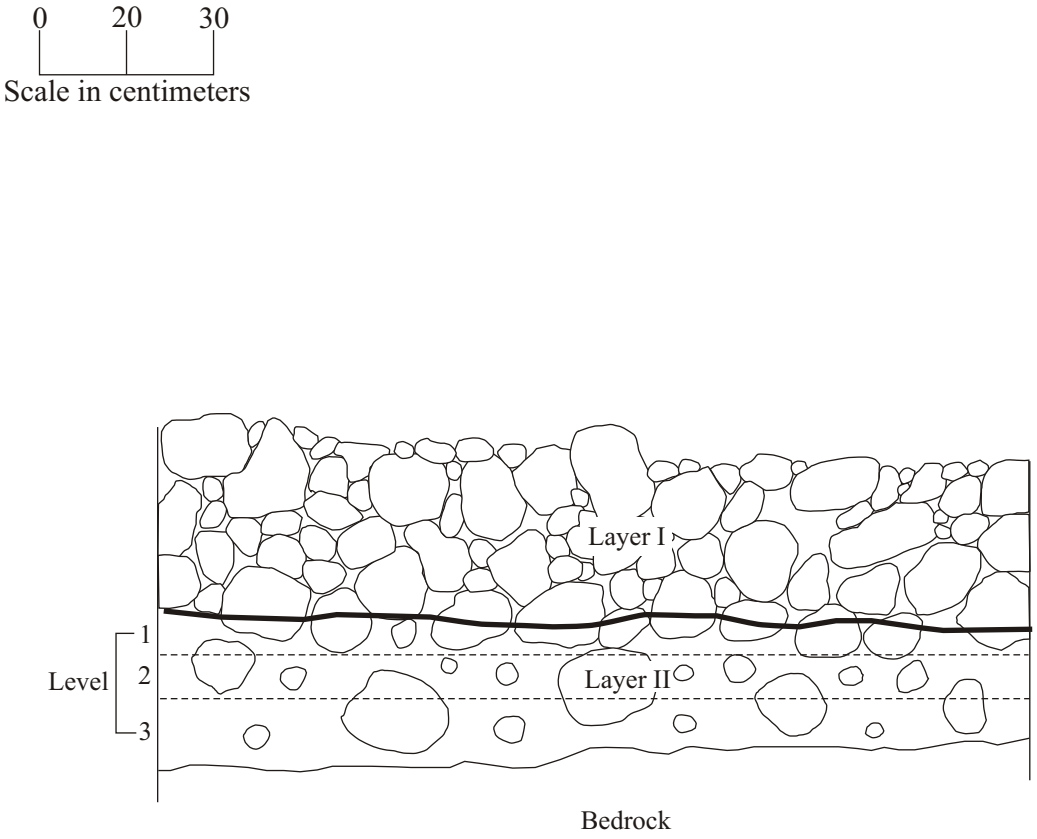


Figure 114. SIHP Site 23686 Feature 282 EU-18 east wall profile.



Layer I - Architectural layer with piled small to large *ʻaʻā* cobbles and a few small boulders .

Layer II, Level 1 - Dark brown (10YR 3/3) silt with *ʻaʻā* cobbles from architectural layer.

Layer II, Level 2 - Dark brown (10YR 3/3) silt with 20% *ʻaʻā* gravels.

Layer II, Level 3 - Dark brown (10YR 3/3) silt with crumbly *ʻaʻā* cobble fragments.

Figure 115. SIHP Site 23686 Feature 289 EU-19 north wall profile.

Table 33. Recovered items from SIHP Site 23686, Feature 289, EU-19.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
282	II	1	Marine shell	*Cypraea* sp.	10	2	7.6
284	II	1	Marine shell	*Isognomon* sp.	2	1	0.4
283	II	1	Marine shell	*Conus* sp.	1	1	0.2
285	II	1	Coral	Unidentified	1	-	0.3
				Layer II, Level 1 Total:	14	4	8.5
286	II	2	Marine shell	*Cypraea* sp.	1	1	0.7
				Layer II, Level 2 Total:	1	1	0.7
287	II	3	Marine shell	*Cypraea* sp.	3	1	1.0
288	II	3	Marine shell	*Morula* sp.	1	1	0.7
				Layer II Level 3Total:	4	2	1.7
				EU-19 Total:	19	7	10.9

A 2 x 2 meter excavation unit (EU-20) was placed near the central portion of the pavement (immediately east of and abutting EU-19) and revealed the following stratigraphic profile (Figures 116 and 117):

Layer I (0-30cmbs).....architectural layer with piled small to large *ʻaʻā* cobbles and a few small boulders.
Layer II, Level 1 (30-40cmbs).....brown (10YR 4/3) silt with 60% *ʻaʻā* cobbles from architectural layer.
Layer II, Level 2 (40-50cmbs).....brown (10YR 4/3) silt with 60% *ʻaʻā* gravels.
Layer II, Level 3 (50-60cmbs).....brown (10YR 4/3) silt with crumbly *ʻaʻā* cobble fragments from underlying bedrock.

Items recovered from EU-20 include *Cypraea* sp., *Cymatium* sp., *Conus* sp., coral, and a volcanic glass flake (Table 34). The architectural layer yielded more remains than the underlying Layer II.

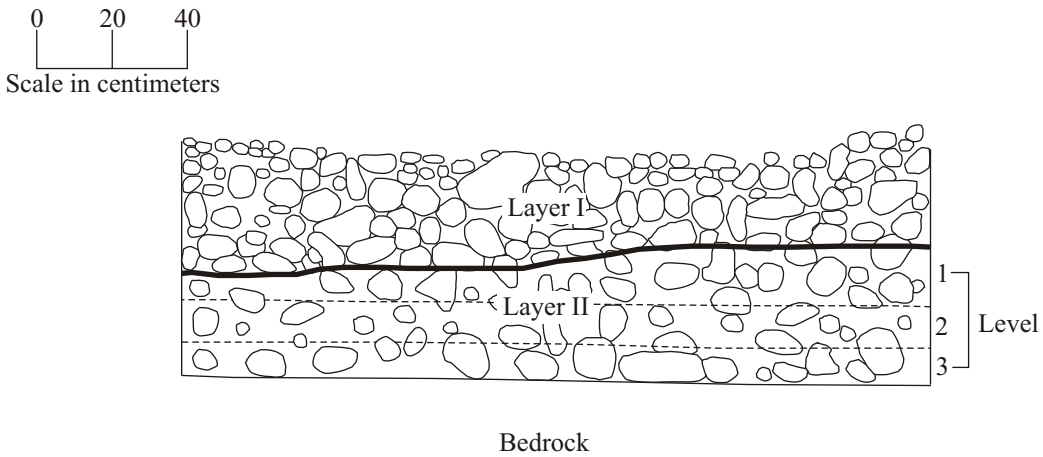
Table 34. Recovered items from SIHP Site 23686, Feature 289, EU-20.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
289	I	1	Marine shell	*Cypraea* sp.	2	1	5.6
292	I	1	Marine shell	*Cypraea* sp.	14	2	7.8
294	I	1	Marine shell	*Cymatium* sp.	1	1	3.1
293	I	1	Marine shell	*Conus* sp.	2	1	2.9
290	I	1	Coral	Unidentified	1	-	17.2
291	I	1	Volcanic glass	Flake	1	-	0.5
				Layer I, Level 1 Total:	21	5	37.1
295	II	2	Marine shell	*Cypraea* sp.	4	1	1.6
296	II	2	Marine shell	*Conus* sp.	2	1	1.5
297	II	2	Coral	Unidentified	1	-	2.5
				Layer II, Level 2 Total:	7	2	5.6
				EU-20 Total:	28	7	42.7

Feature 81

Feature 81 is a linear terrace constructed of *ʻaʻā* cobbles within the southeastern quadrant of the project area (see Figure 76). The southeast to northwest aligned wall is 60 meters long, one meter wide, and 50 centimeters above the surrounding ground surface.

Figure 116. SIHP Site 23686 Feature 289 EU-20 base of excavation, view to the east.



Layer I - Architectural layer with piled small to large *ʻaʻā* cobbles and a few small boulders.
Layer II, Level 1 - Brown (10YR 4/3) silt with 60% *ʻaʻā* cobbles from architectural layer.
Layer II, Level 2 - Brown (10YR 4/3) silt with 60% *ʻaʻā* gravels.
Layer II, Level 3 - Brown (10YR 4/3) silt with crumbly *ʻaʻā* cobble fragments from underlying bedrock.

Figure 117. SIHP Site 23686 Feature 289 EU-20 south wall profile.

A 2 x 1 m excavation unit (EU-25), aligned southeast-northwest, was placed in the *makai* portion of the terrace wall. EU-25 revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 118 and 119):

Layer I (0-30cmbs).....architectural layer with piled small to large *ʻaʻā* cobbles.
Layer II, Level 1 (30-40cmbs).....dark brown (10YR 3/3) silt with 60% *ʻaʻā* cobbles.
Layer II, Level 2 (40-50cmbs).....brown (10YR 4/3) silt with 80% *ʻaʻā* gravels on bedrock.

Feature 82

Feature 82 is a linear *kuaiwi* constructed of *ʻaʻā* cobbles within the southeastern quadrant of the project area (see Figure 76). The southwest to northeast aligned wall is 108 meters long, 2.1 meters wide, and 70 centimeters high. The wall is composed of loosely piled small to medium cobbles and exhibits a considerable degree of post-constructional disturbance.

A 2 x 1 meter excavation unit (EU-26) was placed from east to west across the wall near its right-angled intersection with the Feature 81 wall and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 120 and 121):

Layer I (0-15cmbs)..... architectural layer with small to large piled *ʻaʻā* cobbles.
Layer II (15-28cmbs) ..... dark brown (10YR 3/3) and dark yellowish brown (10YR 3/4) mottled silt with small cobbles on crumbly *ʻaʻā* bedrock.

Feature 17

Feature 17 is a linear *kuaiwi* constructed of *ʻaʻā* cobbles close to the southwestern quadrant of the project area (see Figure 76). The southwest to northeast aligned wall is 38.7 meters long, two meters wide, and 80 centimeters high. The wall consists of loosely piled small to medium cobbles.

A 2 x 1 meter excavation unit (EU-35) was placed from southeast to northwest across the wall and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 122 and 123):

Layer I (0-60cmbs)..... architectural layer with small to large piled *ʻaʻā* cobbles.
Layer II (60-65cmbs) ..... dark yellowish brown (10YR 3/4) silt with organic debris on uneven *ʻaʻā* bedrock.

Feature 293

Feature 293 is a square enclosure constructed of *ʻaʻā* cobbles towards the southwestern portion of the project area (see Figure 76). The enclosure wall is 1.9 meters long by 1.9 meters thick and 50 centimeters above ground surface. Extensive modern-day activities in and around the feature have impacted the configuration and height of the enclosure wall as well as introduced recent items to the deposits, such as glass, plastic and metal containers, automobile parts, clothing, and fish remains.

A 2 x 1 meter excavation unit (EU-36) aligned south to north, was placed in the central portion of the enclosed space covered by inwardly collapsed wall remnants. EU-36 revealed the following stratigraphic profile with evidence of disturbance (Figures 124 and 125):

Layer I (0-40cmbs).....architectural layer with piled small to large *ʻaʻā* cobbles, *ʻiliʻili* pebbles, coral, and marine shell.
Layer II Level 1 (40-60cmbs) .....dark brown (10YR 3/3) silt with 30% *ʻaʻā* gravel.
Layer II Level 2 (60-80cmbs) .....dark brown (10YR 3/3) and brown (10YR 4/3) mottled silt on undulating *ʻaʻā* bedrock.

Figure 118. SIHP Site 23686 Feature 81 EU-25 base of excavation, view to the northwest.

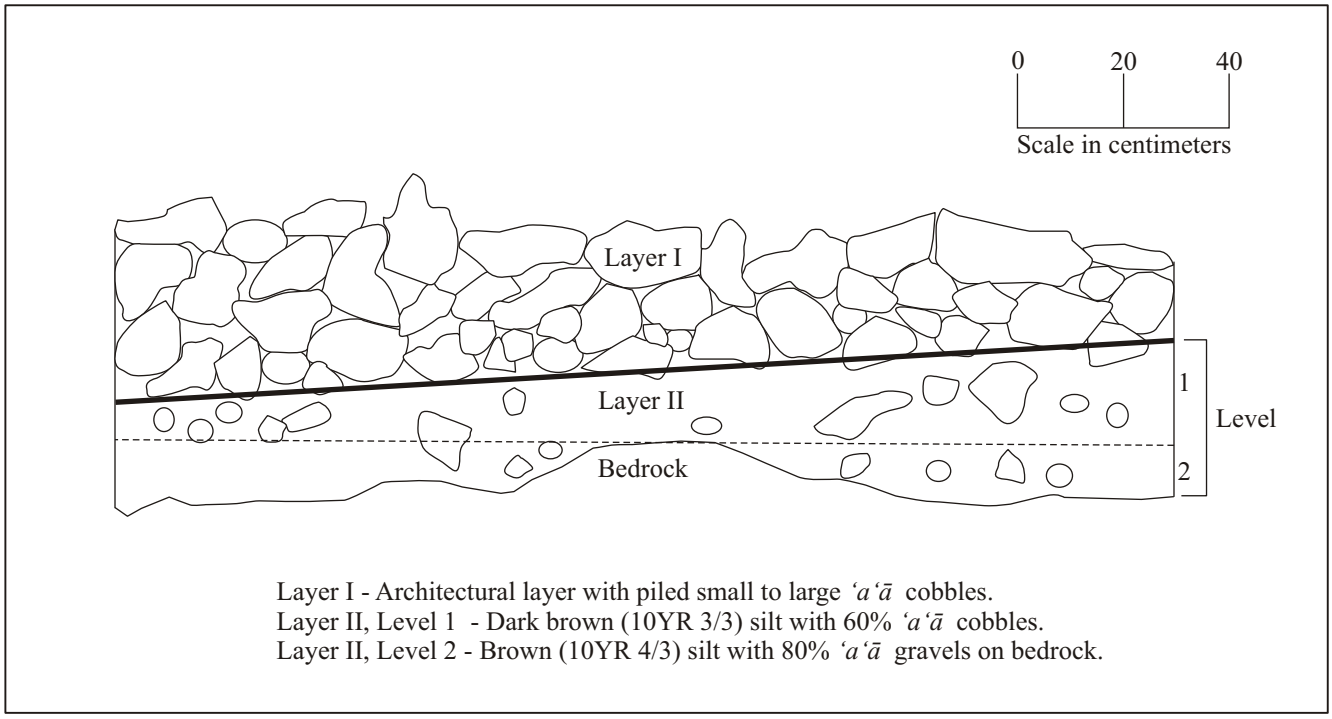
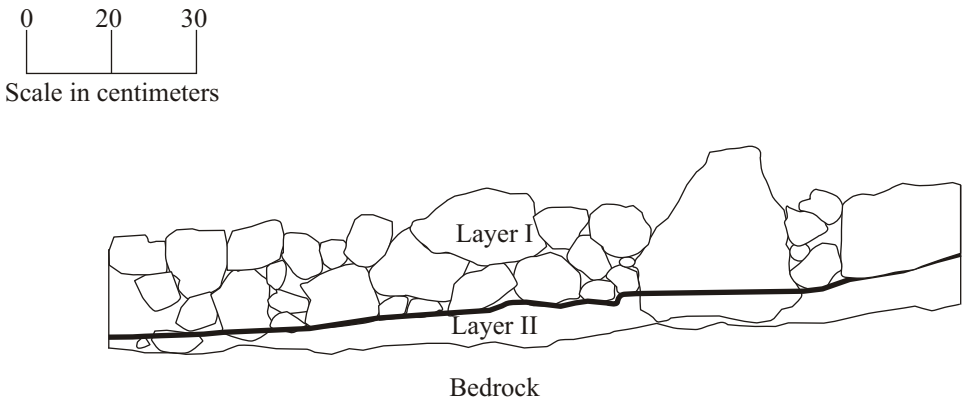


Figure 119. SIHP Site 23686 Feature 81 EU-25 northeast wall profile.

Figure 120. SIHP Site 23686 Feature 82 EU-26 base of excavation, view to the north.



Layer I - Architectural layer with small to large piled *ʻaʻā* cobbles.

Layer II - Dark brown (10YR 3/3) and dark yellowish brown (10YR 3/4) mottled silt with small cobbles.

Figure 121. SIHP Site 23686 Feature 82 EU-26 north wall profile.

Figure 122. SIHP Site 23686 Feature 17 EU-35 base of excavation, view to the east.

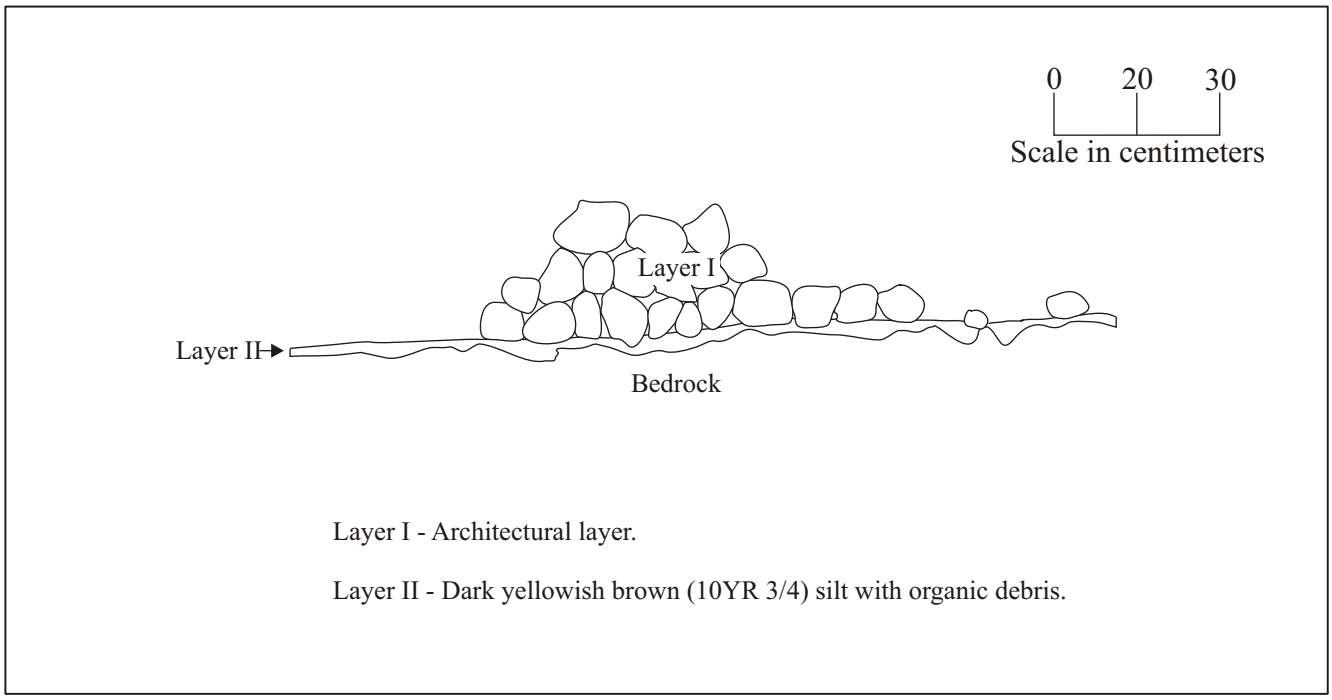
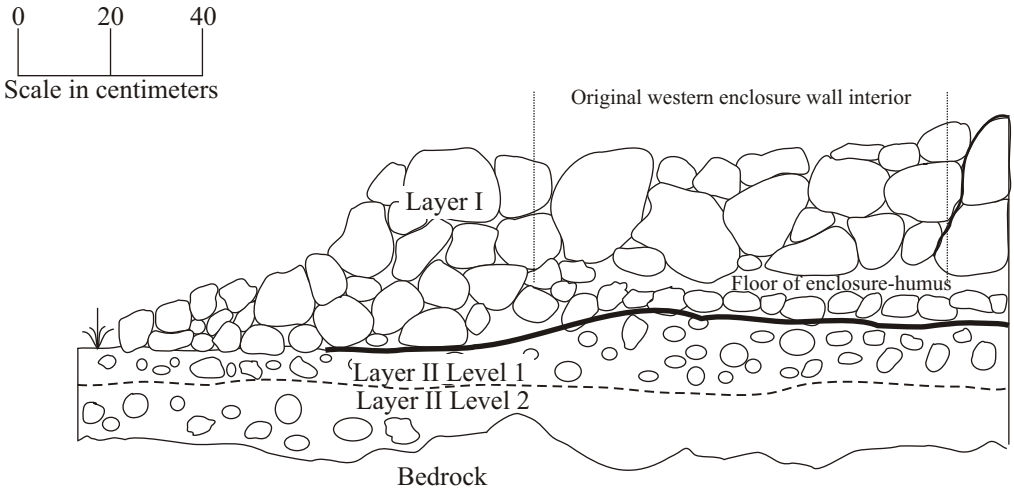


Figure 123. SIHP Site 23686 Feature 17 EU-35 northeast wall profile.

Figure 124. SIHP Site 23686 Feature 293 EU-36 base of excavation, view to the west.



Layer I - Architectural layer.

Layer II Level 1 - Dark brown (10YR 3/3) silt with 30 percent *ʻaʻā* gravel.

Layer II Level 2 - Dark brown (10YR 3/3) and brown (10YR 4/3) mottled silt near bedrock.

Figure 125. SIHP Site 23686 Feature 293 EU-36 west wall profile.

Items recovered from EU-36 include fish, *Cypraea* sp., coral, Echinoidea, *Sus* sp., *Rattus* sp., *kukui* nutshell, charcoal, a volcanic glass flake, and waterworn basalt (Table 35). Historic Period items include steel nuts, screws, nails, bottle glass, and a plastic container. A steel common nail (Acc # 530) from Level 1 in Layer II appears modern. It is 38.5 millimeters long, 6.3 millimeters wide, and 2.85 millimeters thick. A steel finish nail (Acc# 546) from Level 2 in Layer II also appears modern. This nail is 51 millimeters long, 4 millimeters wide, and 2.9 millimeters thick. And finally, a hexagonal steel nut (Acc# 532) from Level 1 in Layer II also appears modern. This nut is sheared and corroded on the inside. It is 13.7 millimeters long, 12.5 millimeters wide, and 8.9 millimeters thick. The recovery of Historic Period materials from the deepest levels within EU-36 indicate post-depositional disturbance.

Table 35. Recovered items from SIHP Site 23686, Feature 293, EU-36.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
526	I	1	Marine shell	*Cypraea* sp.	1	1	8.3
525	I	1	Coral	Unidentified	3	-	16.1
524	I	1	Basalt	Waterworn	1	-	5.5
				Layer I, Level 1 Total:	5	1	30
533	II	1	Fish bone	Unidentified	2	-	0.3
527	II	1	Basalt	Waterworn	22	-	47.1
535	II	1	Organic	*Kukui* nutshell	1	1	0.9
528	II	1	Organic	Charcoal	-	-	1.8
530	II	1	Metal	Steel nail	1	-	1.5
531	II	1	Metal	Iron fragments rusted	43	-	15.6
532	II	1	Metal	Steel nut	1	-	6.1
534	II	1	Glass	Brown bottle	3	-	4.8
536	II	1	Glass	Clear thin fragments	4	-	3.3
537	II	1	Glass	Clear thick fragments	2	-	0.7
538	II	1	Glass	Light green bottle	2	-	0.7
539	II	1	Glass	Clear fragments	2	-	1.1
529	II	1	Synthetic	Plastic container	9	-	4.9
				Layer II, Level 1 Total:	92	1	89
552	II	2	Fish bone	Unidentified vertebrae	1	-	1.8
553	II	2	Fish bone	Unidentified	1	-	0.2
545	II	2	Marine shell	*Cypraea* sp.	1	1	3.0
544	II	2	Coral	Unidentified	4	-	1.7
556	II	2	Echinoderm	Echinoidea	1	-	>0.1
541	II	2	Mammal bone	*Sus* sp. rib	2	1	6.4
551	II	2	Mammal bone	*Rattus* sp. jaw	1	1	0.1
542	II	2	Basalt	Waterworn	13	-	24.1
550	II	2	Volcanic glass	Flake	1	-	0.5
543	II	2	Organic	*Kukui* nutshell	1	-	0.9
561	II	2	Organic	Charcoal	4	-	0.2
540	II	2	Metal	Iron fragments rusted	57	-	33.4
546	II	2	Metal	Steel finish nails	3	-	5.6
555	II	2	Metal	Steel screw	1	-	3.8
547	II	2	Glass	Clear bottle fragments	8	-	10.5
548	II	2	Glass	Light green bottle	3	-	5.8
549	II	2	Glass	Brown bottle	6	-	2.5
554	II	2	Glass	Clear fragments	5	-	4.2
557	II	2	Glass	Clear fragment	1	-	2.7
558	II	2	Glass	Clear fragment	1	-	0.3
559	II	2	Synthetic	Plastic	4	-	0.9
560	II	2	Synthetic	Plastic	9	-	0.8
				Layer II, Level 2 Total:	128	3	109
				EU-36 Total:	225	5	228

Charcoal collected from Layer II Level 1 of EU-36, Feature 293, was submitted for radiocarbon assaying. The sample (Beta-212770) intercepts the tree-ring calibration curve at AD 1410 and has a 2-sigma standard deviation calibrated date range of AD 1290 to 1480.

Feature 294

Feature 294 is a square enclosure constructed of loosely piled *ʻaʻā* cobbles. The feature is located towards the southwestern portion of the project area (see Figure 76). The enclosure wall is two meters long by two meters thick and 60 centimeters above ground surface. Extensive modern-day activities in and around the feature have impacted the configuration and height of the enclosure wall as well as introduced recent items to the architectural layer, such as glass, plastic and metal containers, and automobile parts.

A 2 x 1 meter excavation unit (EU-37), aligned west to east, was placed across Feature 294, including the enclosed space and the surrounding wall. EU-37 revealed the following stratigraphic profile (apart from the modern items, the deposits yielded no cultural items) (Figures 126 and 127):

Layer I (0-40cmbs).....architectural layer with piled small to large *ʻaʻā* cobbles and a few small boulders.
Layer II (40-42cmbs) .....dark brown (10YR 3/3) silt on uneven *ʻaʻā* bedrock.

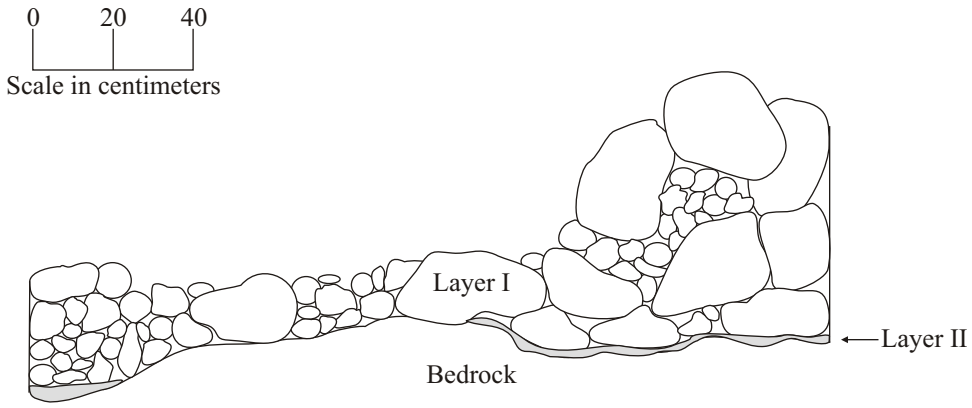
Feature 212

Feature 212 is a linear terrace constructed of very loosely piled *pāhoehoe* cobbles. The feature is located in the north-central portion of the project area (see Figure 76). The terrace wall is 5.2 meters long by 1.4 meters thick and 50 centimeters high. The orientation of the wall is southwest to northeast.

A 2 x 1 meter excavation unit (EU-38), aligned southeast to northwest, was placed perpendicularly across Feature 212. EU-38 revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 128 and 129):

Layer I (0-10cmbs).....architectural layer with loosely piled *pāhoehoe* cobbles.
Layer II (10-20cmbs) .....dark brown (10YR 3/3) silt on uneven *pāhoehoe* bedrock.

Figure 126. SIHP Site 23686 Feature 294 EU-37 base of excavation, view to the south.



Layer I - Architectural layer.

Layer II - Dark brown (10YR 3/3) silt.

Figure 127. SIHP Site 23686 Feature 294 EU-37 south wall profile.

Figure 128. SIHP Site23686 Feature 212 EU-38 base of excavation, view to the southwest.

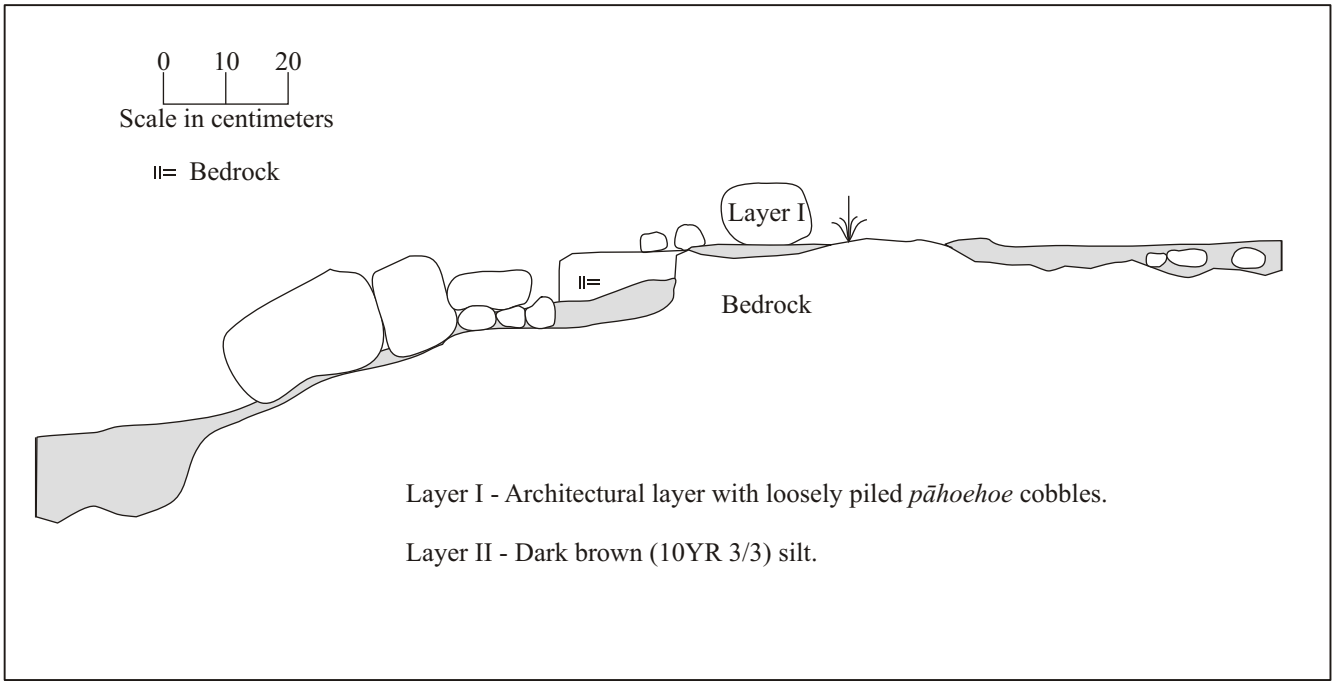


Figure 129. SIHP Site23686 Feature 212 EU-38 southwest wall profile.

SYNTHESIS OF EXCAVATION RESULTS

Introduction

The following synthesis considers together the results from the inventory survey and from the data recovery work. The synthesis is presented to evaluate the hypotheses outlined in the research objective. First, as afar as radiocarbon assays and cross-dating evidence allow, habitation and agricultural sites and features are ordered within a chronological framework. Secondly, the identity and function of roughly contemporaneous habitation and agricultural sites and features are interpreted in terms of architectural criteria and associated items. Once roughly contemporary sets of habitation and agricultural sites and features and associated items are compared and contrasted with sets from different periods, it would be possible to evaluate the primary hypothesis. The primary research question was to determine if short term habitation and associated opportunistic agriculture was indeed followed by recurrent habitation and associated formal agriculture and finally by more consistent habitation with associated household gardens and animal pens. Changes in resource exploitation through time are also considered as is an assessment of tentatively identified permanent and temporary habitation features, and agricultural features.

Site and Feature Chronology

Altogether, seventeen charcoal samples were submitted for radiocarbon assaying (Table 36). Of these, two were previously submitted samples from Test Units 13 and 16. Of the remaining fifteen, eleven came from suspected habitation features and four came from suspected agricultural features.

Table 36. Charcoal samples submitted for radiocarbon assaying, by laboratory number.

Beta-	RC-	Site	Feature	EU	Layer	Level	Measured BP	Standard Deviation	13C/12C	Conventional BP
175916	-	23672	B	TU-13	I	-	-	-	-	210
175917	-	23677	A	TU-16	I	-	-	40	-	160
212756	0223-10	23671	-	4	I	2	340	40	-23.1‰	370
212757	0223-43	23686	247	5	II	2	350	40	-26.9‰	320
212758	0223-98	23675	-	10	I	in situ	100	40	-21.7‰	150
212759	0223-130	23675	-	10	II	3	190	80	-26.2‰	170
212760	0223-150	23686	250	11	II	2	300	40	-27.4‰	260
212761	0223-160	23686	254	12	II	2	250	40	-24.4‰	260
212762	0223-209	23678	-	14	I	2	200	40	-24.1‰	210
212763	0223-298	23676	-	21	I	-	390	60	-23.4‰	410
212764	0223-314	23676	-	21	II	1	410	70	-25.4‰	410
212765	0223-332	23676	-	21	II	2	340	60	-25.1‰	340
212766	0223-378	23677	A	22	II	1	60	40	-24.1‰	70
212767	0223-409	23677	A	22	III	3	120	40	-22.6‰	160
212768	0223-474	23673	B	29	II	3	400	80	-22.5‰	440
212769	0223-498	23673	B	29	II	4	300	50	-24.4‰	310
212770	0223-528	23686	293	36	II	1	520	80	-23.5‰	540

Table 37 presents the calibrated dates sequentially, starting with the most recent ones and moving back in time. The two calibrated dates from EU-22 (i.e., Feature A of Site 23677) appear to match the stratigraphy in terms of chronological succession; charcoal from Layer II Level 1 is slightly younger than charcoal from Layer III Level 3. The two calibrated dates from EU-10 (i.e., Site 23675) are similarly compatible with stratigraphic depth; charcoal from Layer I is younger than charcoal from Layer II Level 3. However, the three radiocarbon dates from EU-21 (i.e., Site 23676) appear to be jumbled when viewed in their stratigraphic contexts; Layer II Level 1 is sandwiched between Layer I and Layer II Level 2 has yielded the earliest charcoal, whereas the charcoal from the deepest the three proveniences (i.e., Layer II Level 2) is the most recent. Two charcoal dates from EU-29 (i.e., Feature B of Site 23673) are also inverted; Layer II Level 3 contained older charcoal than the underlying Level 4. The calibrated standard

deviation ranges of the dates from each of these four excavation units (i.e., EU-10, EU-21, EU-22, and EU-29) overlap within the same unit, suggesting that the dates represent different estimates of a site's occupation. Of the four sites, the dates from Site 23676 and Site 23677 appear to have the tightest range (Figure 130). The ostensibly "inverted" dates could actually be the result of fluctuations in counting radioactive carbon instead of stratigraphic disturbance or post-depositional movement of charcoal. Indeed, "split dates" of the same charcoal sample are known to produce slightly different results, not unlike the overlapping but tight range of variation as exhibited by the three dates from EU-21 in Site 23676.

Table 37. Calibrated radiocarbon dates by increasing age.

Beta-	Site	Feature	EU	Layer	Level	Conventional AD	AD intercept(s)	2-σ calibration
212766	23677	A	22	II	1	1880	1950	1680-1960
212767	23677	A	22	III	3	1790	1680/1740/1800/1930/1950	1660-1950
175917	23677	A	TU-16	I		1790	1680/1740/1800/1930/1950	1660-1950
212762	23678	-	14	I	2	1740	1660	1640-1950
212758	23675	-	10	I	in situ	1800	1680/1740/1810/1930/1950	1660-1950
212759	23675	-	10	II	3	1780	1680/1770/1800/1940/1950	1520-1960
212760	23686	250	11	II	2	1690	1650	1520-1950
212761	23686	254	12	II	2	1690	1650	1520-1950
175916	23672	B	TU-13	I		1740	1660	1510-1950
212756	23671	-	4	I	2	1580	1490	1440-1640
212765	23676	-	21	II	2	1610	1520/1590/1620	1440-1660
212763	23676	-	21	I	-	1540	1460	1420-1640
212764	23676	-	21	II	1	1540	1460	1410-1650
212769	23673	B	29	II	4	1640	1530/1550/1630	1460-1660
212768	23673	B	29	II	3	1510	1440	1320-1640
212757	23686	247	5	II	2	1630	1530/1560/1630	1460-1660
212770	23686	293	36	II	1	1410	1410	1290-1480

A "best estimate" age of different radiocarbon dates from the same unit or the same feature can be derived from calculating a weighted average of the dates and then calibrate the weighted average against the tree-ring calibration curve (Table 38, Figure 131). Judging from roughly contemporary calibration intercepts (which, by the way, do not necessarily represent the most probable date) and from similarities in the calibrated standard deviation ranges, four phases, labeled A to D, appear to be represented. The breaks between the phases are somewhat arbitrary, especially considering overlaps in standard deviation ranges. Nonetheless, for comparative purposes and for the detection of possible habitation and agricultural trends through time, grouping together roughly contemporary sites and features can be useful.

Table 38. Single and weighted average calibrated radiocarbon dates by increasing age.

Site	Feature	Unit (x dates per unit)	Layer	Level	AD multiple date weighted average and single date calibration intercept(s)	AD calibrated 2-σ range	Phase
23677	A	EU-22 (x2) and TU-16	I-III	1-3	1690/1730/1810/1920/1950	1690-1950	D
23678	-	EU-14	I	2	1660	1640-1950	D
23675	-	EU-10 (x2)	I-II	3	1690/1740/1800/1930/1950	1670-1950	D
23686	250	EU-11	II	2	1650	1520-1950	C
23686	254	EU-12	II	2	1660	1510-1950	C
23672	B	TU-13	I		1660	1510-1950	C
23686	247	EU-5	II	2	1530/1560/1630	1460-1660	B
23671	-	EU-4	I	2	1490	1440-1640	B
23676	-	EU-21 (x3)	I-II	1-2	1470	1450-1620	B
23673	B	EU-29 (x2)	II	3-4	1500	1470-1630	B
23686	293	EU 36	II	1	1410	1290-1480	A

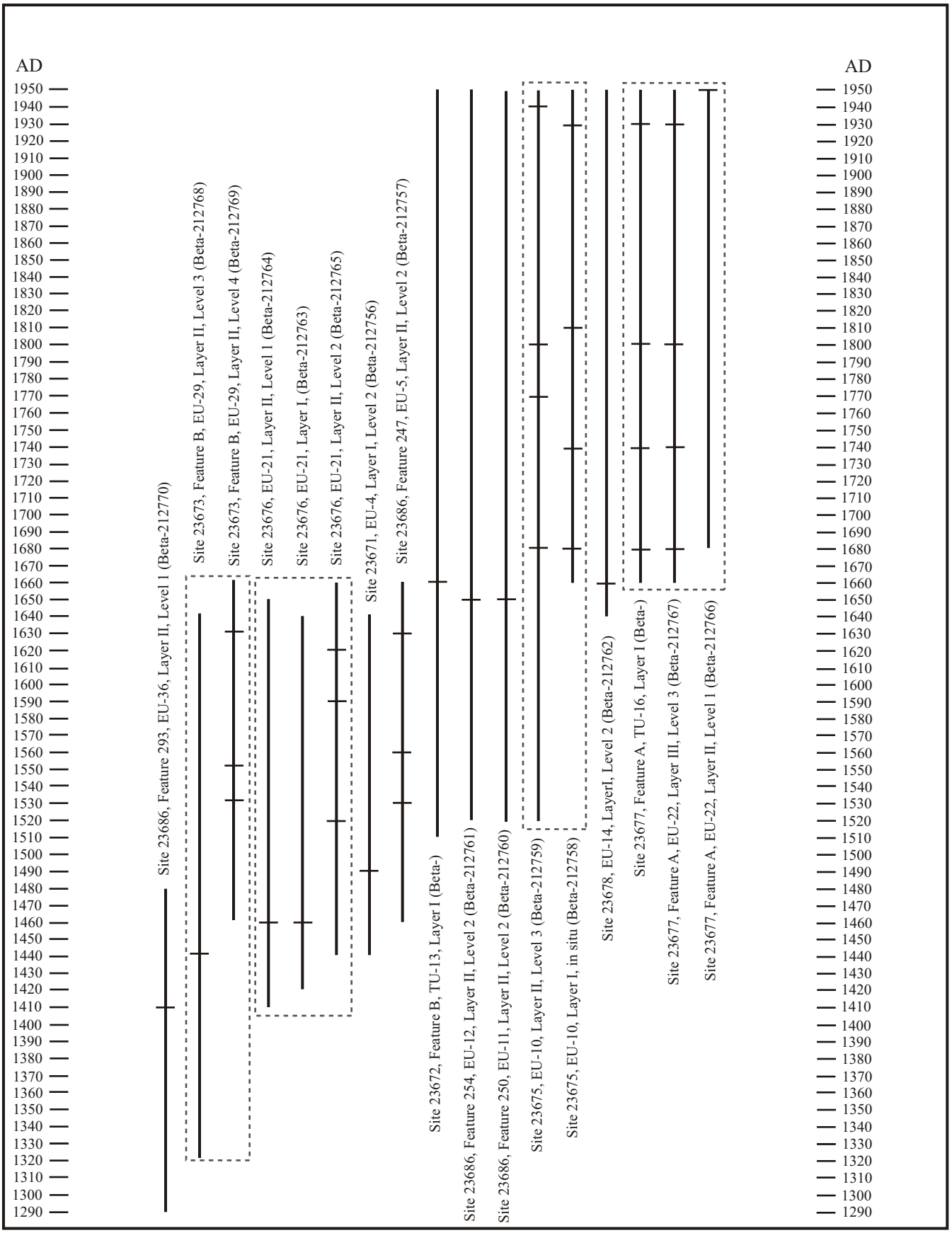


Figure 130. Diagrammatic representation of calibrated radiocarbon dates.

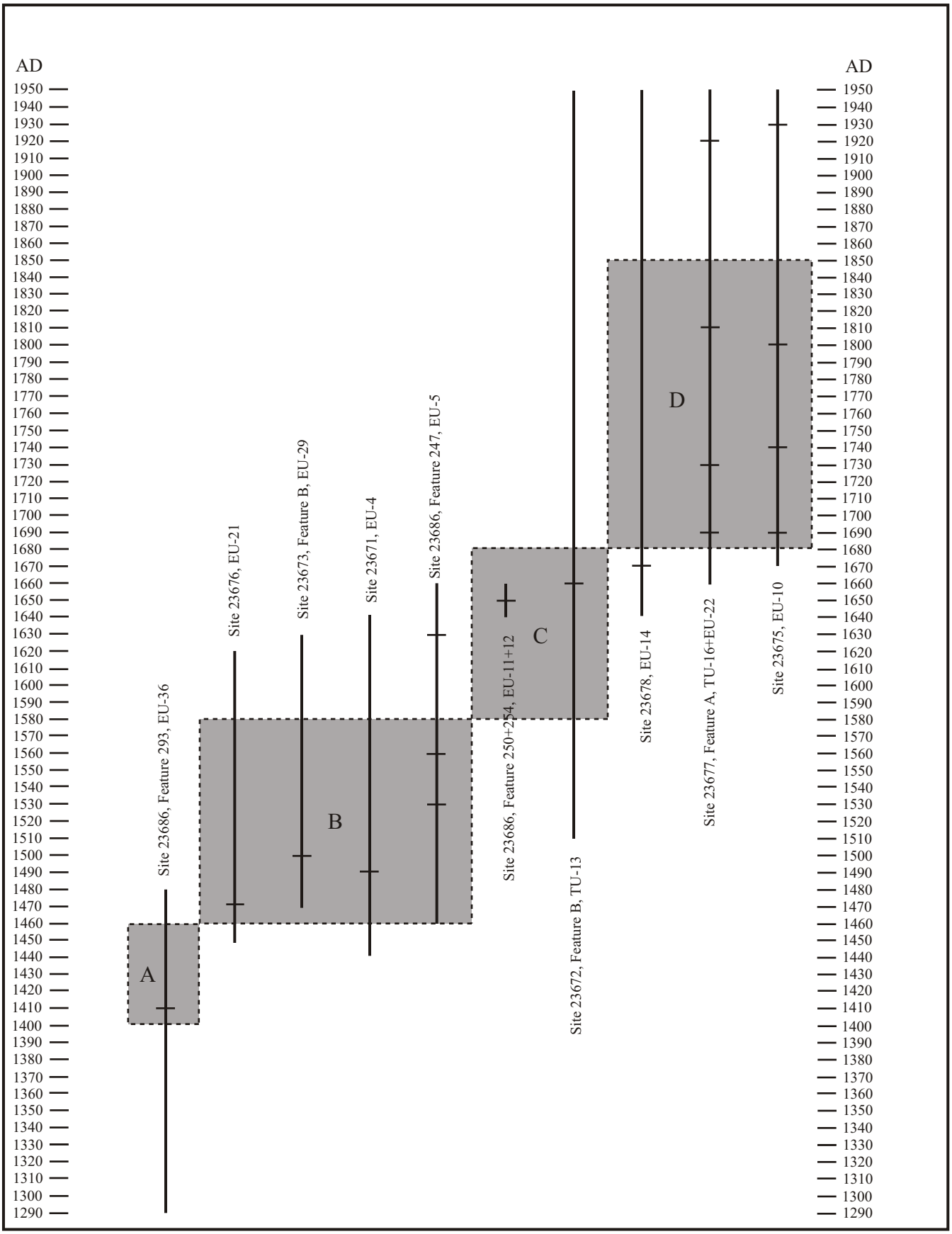


Figure 131. Diagrammatic representation of calibrated weighted averages with proposed phases.

Based on the information in Table 38 and Figure 129, the suggested phases probably span the following four somewhat arbitrary time periods: Phase A from AD 1400 to AD 1460, Phase B from AD 1460 to AD 1580, Phase C from AD 1580 to AD 1680, and Phase D from AD 1680 to AD 1850. The AD 1850 cut-off date is based on the probable AD 1830 to AD 1850 time range for the inscribed brass button from EU-31 in Feature A of Site 23670. Albeit overlapping and probably representing a gradual development, the phases are used as heuristic devices to help detect similarities and differences of site use and recovered items through time.

SITE AND FEATURE FUNCTION

Now that the time periods have been established in broad outline, roughly contemporary sites and features can be grouped by phase and then compared to sites and features from different phases. Doing this would help determine if the primary hypothesis is valid or if it needs modification. To re-iterate, this hypothesis states that: The first use was for short term habitation and associated opportunistic agriculture, followed by formal agriculture and associated recurrent habitation, then the end of the sequence is marked by more consistent habitation with associated household gardens and animal pens.

Starting with the earliest dated feature in the project area and then progressively moving towards the Historic Period, the following discussion synthesizes the field and laboratory results, first on a intra-site feature-by-feature basis and then on a inter-site settlement level. Undated features and sites are lumped with dated features and structures whenever possible, using criteria such as spatial proximity (i.e., closely juxtaposed sites are likely to be contemporary), architectural connectedness (e.g., a wall surrounding a platform), similarity and/or relatedness of recovered items, and related feature types as suggested in the ethnographic record (cf. primarily Handy and Handy 1972).

Phase A (ca. AD 1400-1460)

Two features associated with the earliest dated evidence of occupation within the project area are Feature 293 and the nearby Feature 294 of Site 23686. Both features, which are located near the southwestern corner of the project area (Figure 132), have been preliminary identified as being related to agricultural activities. Almost five meters of empty ground separate the features, both of which are square enclosures of roughly equal size (i.e., approximately 4 m^2). Both features also have been disturbed somewhat by modern-day activities and are covered in recent refuse, such as glass, plastic and metal containers, and automobile parts. The features also have a similar architectural layer comprised of *ʻaʻā* cobbles and small boulders, roughly 40 centimeters thick. Considering the generally similar size, shape, architectural attributes, and deposits from Features 293 and 294, it is proposed that the two are roughly contemporary (i.e., the charcoal date from Feature 293 is plausibly an indicator of Feature 294's antiquity).

In spite of these similarities between the two features some differences are also apparent. First, the thirty-centimeter thick dark brown (10YR3/3) silt layer within Feature 293 far exceeds the two-centimeter thick silt layer within Feature 294. Secondly, Feature 293 showed signs of once having had a pavement of *ʻiliʻili* pebbles, coral, and marine shell, which was absent within Feature 294. And finally, Feature 293 yielded ten different kinds of items, mostly from the silt layer, whereas Feature 294 yielded no items (Table 39). Overall then, Feature 293 appears to have been more elaborate and used more extensively than the nearby Feature 294. Whether these differences translate into significant chronological differences is not certain, although it is proposed here that the differences probably have more to do with different functions, intensity of use, and/or persistence of use than with time differences.

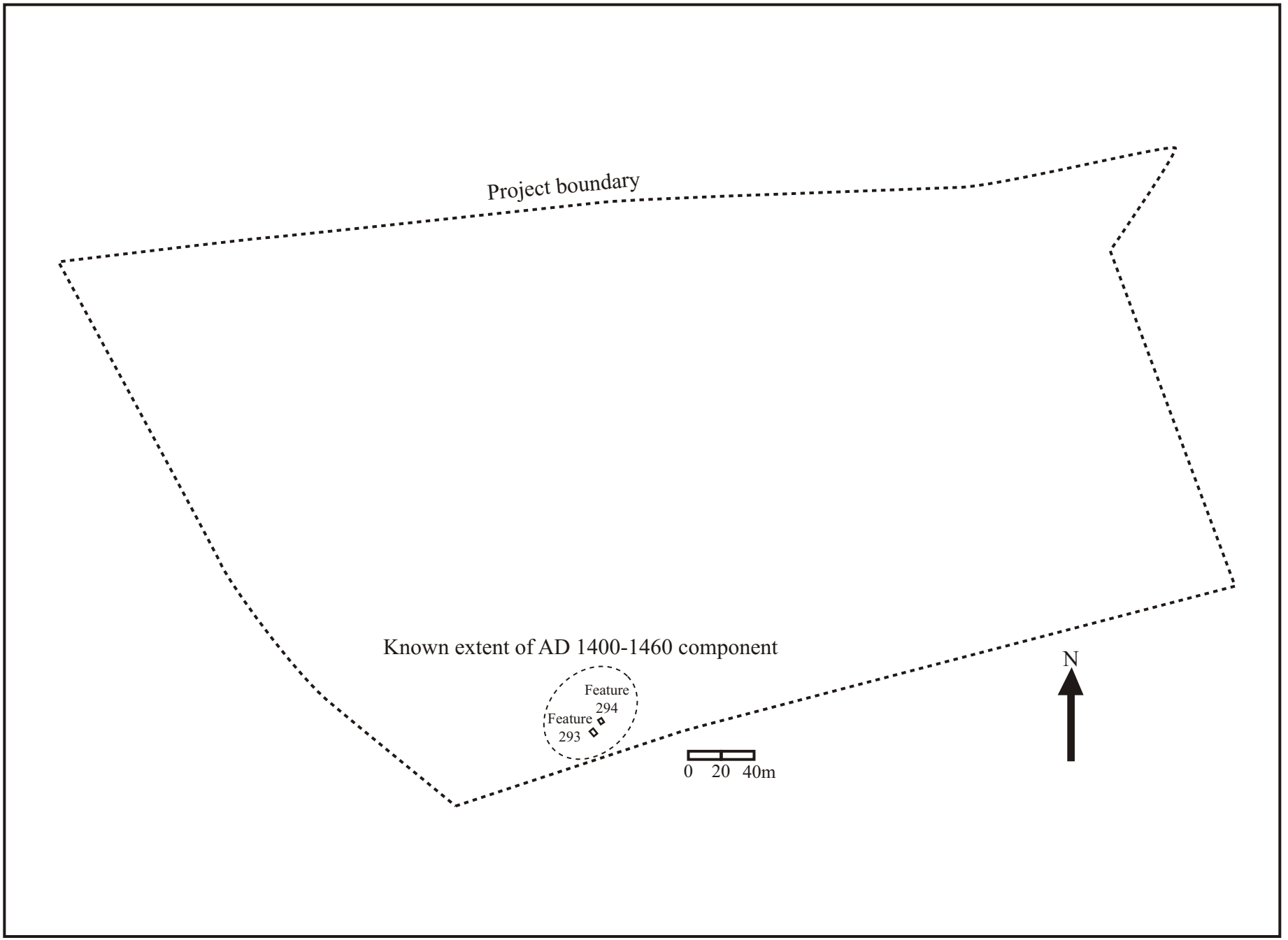


Figure 132. Probable extent of known Phase A features.

As can be seen in Table 39, items recovered from Feature 293 include fish, *Cypraea* sp., coral, Echinoidea, pig, rodent, *kukui* nutshell, wood charcoal, volcanic glass flakes, and waterworn basalt. These items indicate that resources from the ocean, rocky coast line, local area, and interior were utilized (no beach shells were recovered). The presence of pig remains suggests the possibility that males used the structure. Based on its small size and the comparatively low combined weight of recovered items per square meter (i.e., 58.2 g), the structure was most likely used on an intermittent or temporary basis. Being isolated in the *kula* zone during this relatively early period, suggests that Feature 293 was probably used by men cultivating fields away from the main habitation area. The nearby Feature 294 was probably used for a shorter period or as temporary sleeping quarters. Whatever the case might have been, the available radiocarbon and site functional evidence suggests that the initial fifteenth century AD occupation of the project area was restricted and temporary.

Table 39. Weight (grams) of recovered items from Phase A features.

Site	*Feature*	*Unit*	*Fish UID*	*Cypraea*	*Branch coral*	*Echinoidea*	*Pig*	*Rodent*	*Kukui* nuthsell	*Charcoal*	*Volcanic glass flake*	*Basalt waterworn*	*Total*
23686	293	E36	2.3	8.6	17.8	0.1	6.4	0.1	1.8	2	0.5	76.7	116.3
23686	294	E37	-	-	-	-	-	-	-	-	-	-	-

Phase B (ca. AD 1460-1580)

The five features that can be associated with the second oldest period of occupation within the project area are the following: (1.) the Site 23676 platform, (2.) the Feature B enclosure of Site 23673; (3.) the Feature A platform of Site 23673; (4.) the Site 23671 platform, and (5.) the Feature 247 terrace within Site 23686. Considering that Features B and A of are part of one Site 23673 and that Site 23671 and Feature 247 are neighbors (an approximately 15 m gap separates 23671 and 247) with virtually identical radiocarbon dates, the following three separate sites can be said to be presented during Phase B: (1.) Site 23676; (2.) Site 23673, and (3.) Site 23671/Feature 247. Viewed together, these three sites extend from the southeast to the northwest, more-or-less within the southeastern portion of the project area (Figure 133).

Based on the kinds and weight of items recovered, plus considerations of feature shape and size, the function of each feature can be inferred. First, the presence of certain animal species and artifacts are indicative of the highly gendered dietary and activity "preferences" in Hawaiian culture. Shark, tuna, chicken, pig, and dog remains particularly indicate male consumption, activities, and rituals. According to Malo (1951), prior to 1819 shark meat was *kapu* for Hawaiian women. The recovery of a burnt shark tooth from Site 23676 could be the remains of a meal or a discarded tool (see Table 40). Malo (1951) notes that tuna, or *'ahi*, was particularly favored by men of high status. The concentration of tuna remains within the Feature B enclosure of Site 23673 is suggestive that the feature was used by high status males. The recovery of pig and dog remains from the same Feature B underscores its male association. The recovery of pig, dog, and bird (chicken?) remains from Site 23676 (Table 40) is also significant in this regard; all three animal species were consumed as food by men or used as offerings to the family ancestor spirits in the *hale mua* (Handy and Handy 1972:24, 252, 256, 387). Even after the early nineteenth century abolition of the *kapu* against women eating pig and dog, these animals were still considered a favorite among men (ibid. 245). Moreover, according to Handy and Handy (1972:301) fishing and the making of fishing gear were essentially male activities. The *Cypraea* sp. shell lure from Site 23676 is an example of a composite fishing tool that took some time and skill to manufacture. The entire composite tool was lowered on a line from a canoe to the ocean floor, where the cowry lure attracted octopus (Kirch 1997:203-204). The recovery of fishing gear, albeit minimal, suggests that at least some of the men who cultivated the *kula* zone also fished in the ocean. Bone awls recovered from Sites 23676 and 23673 further suggest male-related activities in these two locales.

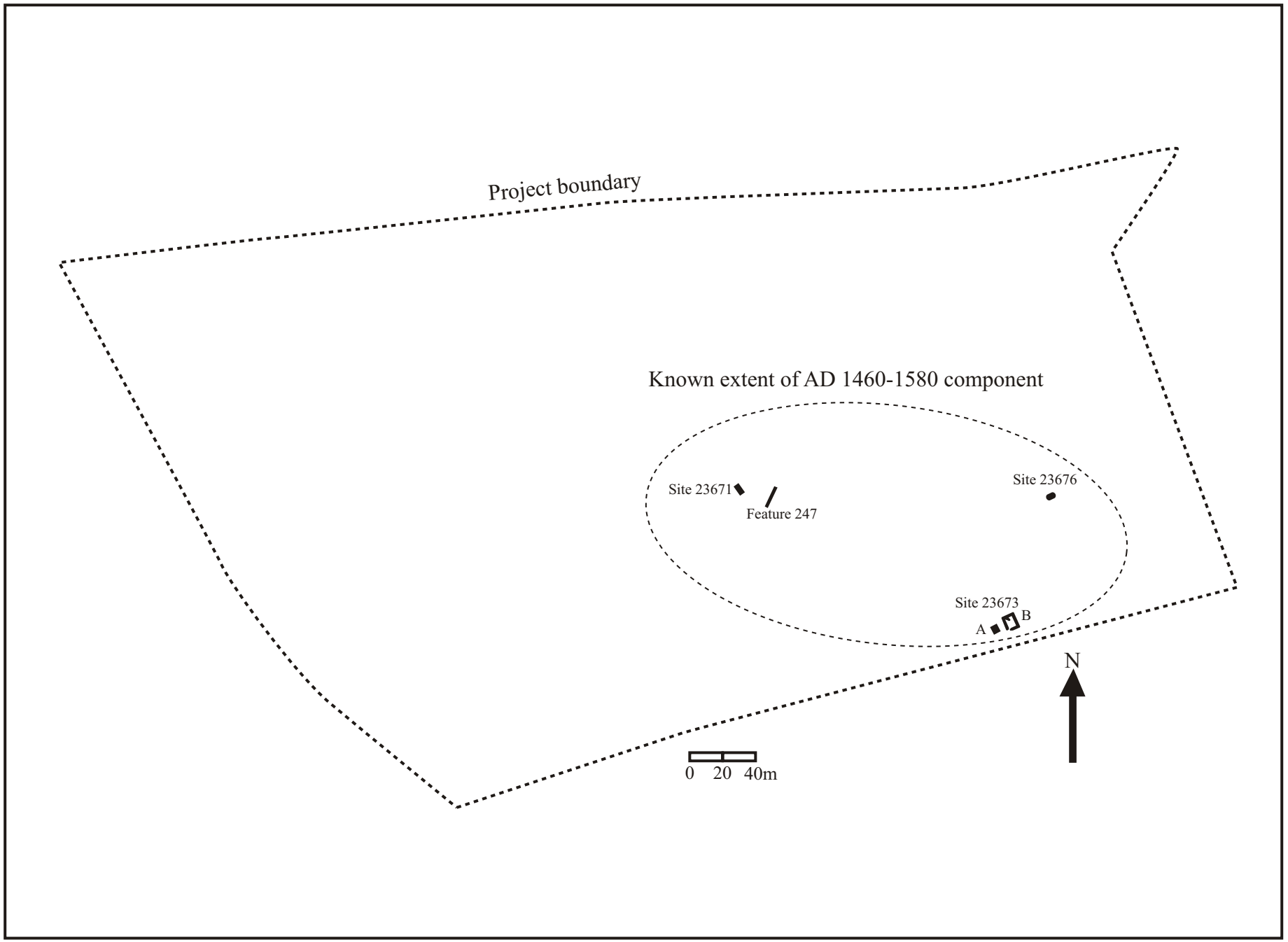


Figure 133. Probable extent of known Phase B sites and features.

Table 40. Weight (grams) of recovered fish, fishing gear, and land animals from Phase B features.*

Site	Feature	Unit	Tuna	Shark	Fish Scaridae	Fish UID	He'e lure	Avian bone	Pig	Dog	Rodent	Mammal bone	Medium mammal bone cut	Small mammal	Small mammal bone awl	Small mammal worked bone
23676	-	E21	-	0.5	-	-	-	0.2	8.8	1.7	0.2	1	0.4	-	3.2	-
23676	-	T18	-	-	0.1	-	32.0	-	1.4	-	0.3	-	-	0.8	-	-
23673	B	E29	0.8	-	-	0.1	-	-	2.2	-	-	-	-	-	0.7	-
23673	B	E30	9.1	-	-	-	-	-	-	0.2	0.1	-	-	4.7	-	13
23673	A	E27	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23673	A	E28	-	-	-	1	-	-	-	-	0.4	-	-	-	-	-
23673	A	T17	-	-	4.2	-	-	-	-	-	0.2	-	-	-	-	-
23671	-	E04	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-
23686	247	E05	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*male related items are shaded

Of note is the absence of male-related remains from Site 23671 and from the contemporary Feature 247 (Table 40), suggesting some other function for these two features which will be discussed below. Although the Feature A platform at Site 23673 also lacks male-related items, its proximity to the Feature B enclosure suggests that the platform and enclosure are related. Indeed, the high combined average weight of recovered items per square meter (i.e., 104 g) from the three Feature A units is higher than that for the average per square meter weight from the nearby two Feature B units (i.e., 40.2 g). The average mass of recovered items from the Feature A platform, however, is less than that from the Site 23676 platform (i.e., 115 g). The deposits within both platforms are dark in color, suggesting some kind of cooking residue. But perhaps more importantly, the Feature A and Site 23676 platforms have similar rectangular shapes, even though Feature A (i.e., 26.5 m^2) is somewhat bigger than Site 23676 (i.e., 18 m^2). Based on the similar architecture and deposits of the platforms at Feature A and Site 23676, it is suggested that they could have functioned primarily as cooking areas for male consumption, whereas Feature B of Site 23673 was actually a *hale mua* structure in which males consumed and discarded their food. The partition wall within this Feature B, together with a branch coral on the wall and tuna remains, suggests that it was a comparatively important structure in the project area, perhaps with a shrine-like area behind the partition. The absence of pig and dog remains at Feature A could be that these prestige animals were all taken to the nearby Feature B for consumption, whereas the more isolated location Site 23676 meant that the pigs and dogs cooked on site were also consumed and discarded on site. Sites 23676 and 23673 are contemporary in terms of the radiocarbon time-scale, so it is likely that they existed on the landscape at roughly the same time, perhaps serving different sections of the work force. Alternatively, Site 23676 could be slightly earlier than the more elaborate Site 23673. If this was indeed the scenario, then the addition of an enclosure next-to the platform at Site 22673 could signify the beginning of settling down in the project area.

The more-or-less simultaneous appearance of the Site 23671 platform and Feature 247 terrace wall roughly 180 meters northwest of Site 23673 is an additional sign of filling-in of the landscape. Albeit disturbed, the intact portions of the Site 23671 platform exhibits a level surface paved with small *ʻaʻā* cobbles. Although the size of this platform (i.e., 26.2 m^2) is somewhat small for a *hale noa* sleeping hut, it could indeed have served as the foundation of a somewhat temporary hut. The brown (10YR 4/3) deposits within the platform were slightly lighter than the very dark gray brown (10YR 3/2) silt within the *hale mua* features discussed above, suggesting less cooking activities inside the platform. But perhaps more importantly, the excavation unit within Site 23671 only yielded a total of 27.2 grams of items per square

meter. The nearby contemporary terrace wall midden yielded 37.4 grams. This comparatively low mass of items recovered suggests far less food preparation, consumption, and discard at this proposed *hale noa* locale than the *hale mua* area to the southeast and east.

Nonetheless, as can be seen in Tables 41 to 43, the shell and lithic items recovered from the proposed *hale noa* and associated wall midden broadly match those from the contemporary *hale mua*. A variety of shells from a rocky coastline, corals, Echinoidea, beach shells, *kukui* nutshell, wood charcoal fragments, volcanic glass flakes, and waterworn basalt came from all the features dating to Period B. These items indicate that resources from the ocean, rocky coastline, beach, local area, and interior were utilized.

Table 41. Weight (grams) of recovered rocky shore shell from Phase B features.

Site	*Feature*	*Unit*	*Serpulorbis sp.*	*Trochus sp.*	*Cypraea sp.*	*Drupa sp.*	*Morula sp.*	*Cellana sp.*	*Isognomon sp.*	*Chama sp.*	*Nerita sp.*	*Strombina sp.*	*Thais sp.*	
23676	-	E21	4.1	-	160.2	26.8	4.3	4.1	-	4.0	0.6	-	-	*hale mua* kitchen
23676	-	T18	-	-	44.7	0.1	-	0.5	-	-	0.3	0.3	-	
23673	B	E29	-	0.3	151.2	0.6	-	-	1.2	-	0.3	-	0.5	*hale mua*
23673	B	E30	-	-	-	1.9	-	-	-	-	-	-	-	
23673	-	E27	-	-	3.9		-	-	0.2	-	-	-	-	
23673	A	E28	-	-	19.5	0.9	-	-	-	-	-	-	-	*hale mua* kitchen
23673	A	T17	-	-	16.6	1.0	-	0.5	-	-	0.4	-	-	
23671	-	E04	-	-	41.8	4.8	2.7	-	5.8	-	0.4	-	-	*hale noa*
23686	247	E05	-	-	37.8	2.8	-	0.7	-	-	-	-	-	*hale noa* boundary

Table 42. Weight (grams) of recovered coral, Echinoidea, and beach shell from Phase B features.

Site	*Feature*	*Unit*	*Coral abrader*	*Branch coral*	*Echinoidea*	*Turbo*	*Nassarius*	*Brachidontes*	*Fimbria sp.*	*Conus*	*Mitra sp.*	*Terebra sp.*	*Shell UID*	
23676	-	E21	-	168.0	4.2	-	6.6	-	0.3	4.9	-	-	8.2	*hale mua* kitchen
23676	-	T18	-	-	4.4	-	-	-	-	0.2	-	-	1.3	
23673	B	E29	-	68	33.5	-	-	-	-	0.9	-	-	4.9	*hale mua*
23673	B	E30	-	8.7	0.1	-	-	-	-	-	-	-	-	
23673	A	E27	-	113.3	0.8	-	-	-	2.6	-	-	-	0.7	
23673	A	E28	17.8	131	1.9	-	-	-	-	-	0.1	0.05	3.9	*hale mua* kitchen
23673	A	T17	-	29.1	11.0	-	-	-	-	2.1	-	-	-	
23671	-	E04	-	3.8	28.1	0.5	-	7.2	-	3.7	-	-	0.4	*hale noa*
23686	247	E05	-	10.9	-	-	-	-	-	-	-	-	-	*hale noa* boundary

Table 43. Weight (grams) of recovered plants and lithics from Phase B features.

Site	*Feature*	*Unit*	*Kukui* nutshell	*Charcoal*	*Basalt flake*	*Volcanic glass flake*	*Volcanic shatter*	*Basalt waterworn*	
23676		E21	8.2	10.4	-	40.6	-	-	*hale mua* kitchen
23676		T18	6.9	0.7	-	11.0	-	-	
23673	B	E29	-	10.4	-	4	-	-	*hale mua*
23673	B	E30	4.2	-	-	-	-	-	
23673	A	E27	7.2	0.4	-	4.2	35	51.4	
23673	A	E28	0.4	0.3	5.7	1.5	12.6	-	*hale mua* kitchen
23673	A	T17	6.3	-	-	23.7	-	-	
23671		E04	-	2.1	7.2	-	-	-	*hale noa*
23686	247	E05	7	3.3	10.9	1.4	-	-	*hale noa* boundary

Based on the evidence then, the following two main categories of features were used during Phase B: (1.) *hale mua* male eating house (Feature B walled structure of Site 23673) and *hale mua* kitchen (Feature A platform of Site 23673 and platform at Site 23676); and (2.) *hale noa* sleeping house (platform at Site 23671) and the possibly related *hale noa* midden that accumulated within the nearby agricultural terrace (Feature 247 of Site 23686). Furthermore, the appearance of a terrace wall, albeit diagonal to later *kuaiwi* walls, shows that by the late fifteenth to early sixteenth centuries, agricultural land started to have short partitions, in this case seemingly some kind of a boundary wall between the *hale noa makai* and *hale mua mauka*.

Phase C (ca. AD 1580-1680)

The seven features that can be associated with the third phase of occupation within the project area are the following: (1.) the Feature 250 pavement within Site 23686; (2.) the Feature 254 terrace within Site 23686; (3.) possibly the Site 23674 articulated platform and circular enclosure; (4.) the Feature A enclosure of Site 23672; (5.) the smaller Feature B enclosure of Site 23672; (5.) possibly the Feature 289 pavement within Site 23686; and (6.) possibly the large Feature 282 pavement within Site 23686. Although Site 23674 has not been dated, its placement between the contemporary Features 250/254 *mauka* and Site 23672 *makai* suggests that Site 23674 belongs to the same period. The observation that Features 282 and 289 fall on the *mauka* end of the same line tentatively suggests that they too date to Phase C, although this is less certain.

Considering that 20 meters separates Features 250 and 254 that have virtually identical radiocarbon dates, these two features are treated as part of one site, labeled Feature 250/254. Also considering that six meters separate Features A and B of Site 237672, this site too is treated as one entity. The following five sites can then be said to be present during Phase C: (1.) Feature 250/254; (2.) Site 23674; (3.) Site 23672; (4.) Feature 289; and (5.) Feature 282. Viewed together, these five sites form a long line that stretches west to east along the east-central portion of the project area (Figure 134).

Based on the kinds and weight of items recovered and on considerations of feature shape and size, the function of each Phase C feature is interpreted. The recovery of pig and dog from Features 250/254 (Table 44) suggests that males cooked, consumed, and discarded food in these structures. However, the average weight per square meter of all the items recovered from Features 250/254 is comparatively light (i.e., 18 g). This suggests that the fairly small Feature 250 platform (i.e., 4.5 m^2) was only a temporary or short-term cooking and/or eating house, perhaps catering for men laboring in the fields. The contemporary south to north aligned Feature 254 terrace wall probably marked a boundary *mauka* of this small platform (reminiscent of the earlier Feature 247 terrace wall *mauka* of the Site 23671 *hale noa*).

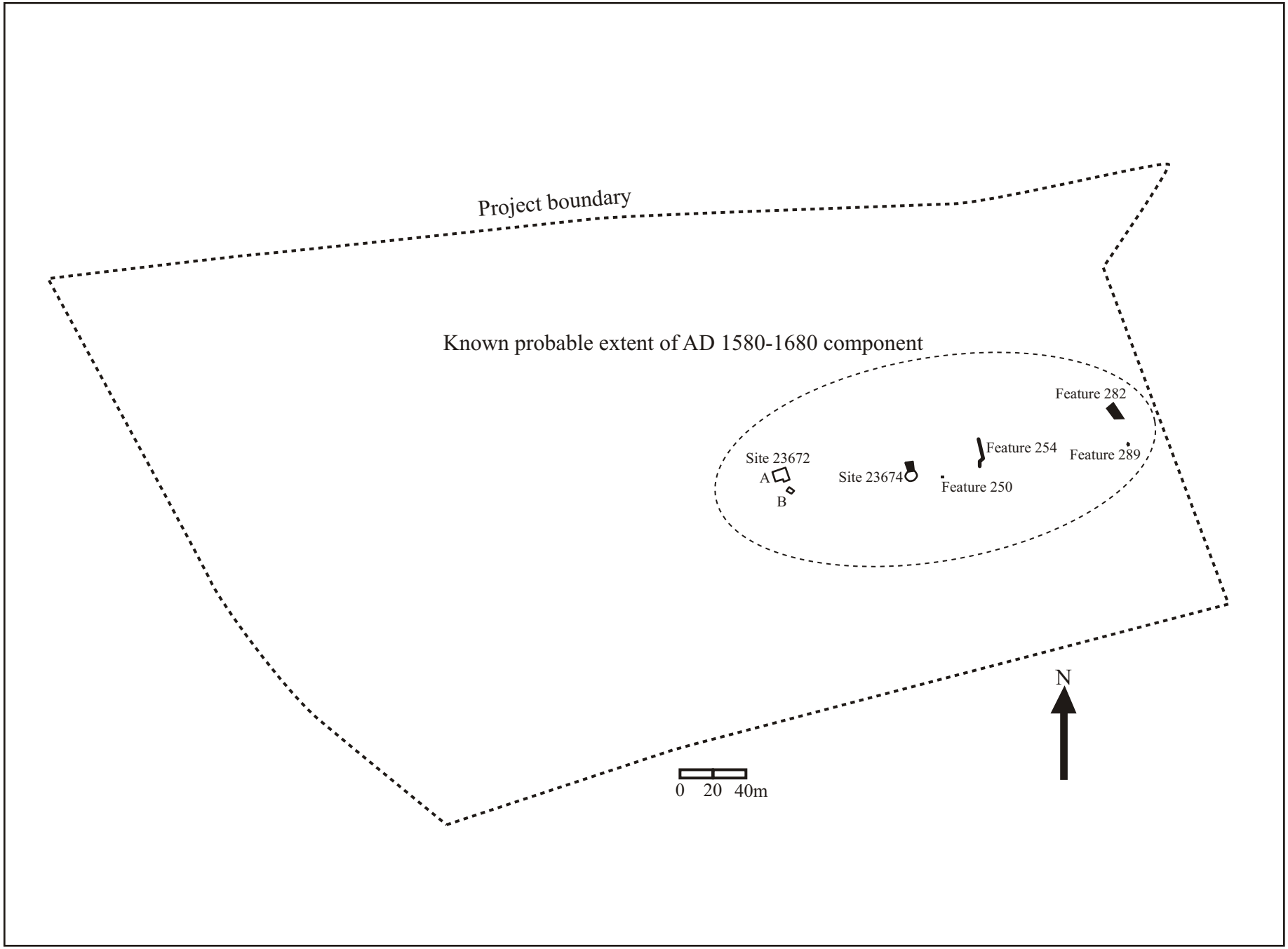


Figure 134. Probable extent of known and possible Phase C sites and features.

Roughly 15 meters *makai* from Feature 250 platform is the more substantial Site 23674 platform. The recovery of bird (chicken?) and dog from Site 23674 suggests that it too is associated with male eating. Judging from the size, weight, and variety of items, the Site 23674 platform seems to be a more substantial and permanent *hale mua* than Feature 250. The Site 23674 platform, which covers 17.2 m^2, has a wider variety of items than Feature 250 (i.e., 20 versus 10 different kinds of items). The items recovered from Site 23674 also weigh more (i.e., 62.3 g per square meter) and came from comparatively dark 10 YR3/2 grayish brown silt compared to the lighter 10 YR3/3 dark brown of Feature 250. The circular enclosure that is attached to the Site 23674 was sterile with lighter and thinner soil, however, suggesting that this space was kept clean.

The two shark teeth from Feature B of Site 23672 (Table 44) could also have been associated with male-related activities. It should be noted that once a day men cooked meals for women and children of their family in a temporary shed, called *hale 'aina*, near the common sleeping house, or *hale noa*. At times a substantial oven would have been built into the surface of the *hale 'aina* cooking shed (e.g., Handy and Handy 1972:302). It could indeed be that Feature B of Site 23672 with its 69.5 grams of items and very dark grayish brown (10YR 3/2) fine silt was such a cooking locale. The shark teeth found within could have been introduced while men were preparing food.

The nearby Feature A walled enclosure of Site 23672 is probably a *hale noa* where everybody slept. This identification is supported by the comparatively big size of the walled enclosure (i.e., 114.8 m^2), bearing in mind that a *hale noa* was normally the largest building around (Handy and Handy 1972:291). Also, the absence of male-related items, the low average weight of items recovered (i.e., 1.94 g per square meter), and the low variety of items identified (i.e., 5 different kinds of items) fit the specifications of a typical *hale noa*.

The likely functions of Features 282 and 289 near the extreme eastern boundary of the project area are less certain. The mere size and even surface of the rectangular Feature 282 platform (i.e., 106.3 m^2) suggests that it could have been a *heiau* platform. Together with its big size, rectangular shape, the paucity of associated items are attributes of *heiau* elsewhere in Hawai'i (e.g., Loubser and Rechtman 2007). A wide variety of *heiau* existed in Hawai'i, both in terms of architectural layout and function. *Heiau* vary from seemingly insignificant natural rock outcrops to elaborately constructed platforms. Moreover, like *hale mua*, *heiau* were placed at the approach toward a settlement, such as in front of a household cluster (Valeri 1985:174) or agricultural plots; people had to pass through these "gateways" to reach destinations beyond. It is worth noting that in relation to the *hale noa* dating to Phases B and C, the *hale mua* and proposed *heiau* were all on the *mauka* side. If these identifications are indeed correct, then the agricultural settlement within the project area was approached from the *mauka* side. The south to north orientation of the terrace walls dating to Phases B and C could also be significant in this regard, providing a "front" fence as people approached the nearby *hale noa* (i.e., the Feature 247 wall and Site 23671) and *hale mua* (i.e., Feature 254 and Site 23674) from the interior.

Feature 289 yielded a more restricted range of items than the other features with the exception of the nearby Feature 282 that yielded nothing (see Tables 44 and 45). Only shell and a volcanic glass flake were recovered from the small (i.e., 49.5 m^2) platform; the feature could have been a convenient stopping and snacking point on the way to agricultural plots.

Fish, shell, coral, urchin, crab, bird, mammal, terrestrial plants, and volcanic glass and basalt were found at most of the excavated Phase C locales (Tables 44 and 45). Shell from beach-like settings only came from the Site 23674 *hale mua* and Feature 289 platform. The recovered items indicate that resources from the ocean, rocky coast line, beach (at two locales), local area, and interior were utilized.

Table 44. Weight (grams) of recovered shark, land animals, plants, and lithics from Phase C features.*

Site	Feature	Unit	Shark	Avian bone	Pig	Dog	Rodent	Small mammal	Kukui nutshell	Charcoal	Basalt flake	Volcanic glass flake	Volcanic shatter	Basalt waterworn	
23686	250	E11	-	-	-	1.0	-	-	1.9	0.5	-	5.0	-	-	*hale mua*
23686	254	E12	-	-	1.1	-	-	-	-	1.0	-	-	-	-	*hale mua* boundary
23674	-	E06	-	1.9	-	2.0	0.7	0.1	1.4	1.2	2.8	78.2	12.1	-	*hale mua*
23674	-	E07	-	-	-	-	-	-	-	-	-	-	-	-	
23672	A	E03	-	-	-	-	2.0	-	-	0.4	-	0.6	-	-	*hale noa*
23672	A	E02	-	-	-	-	-	-	-	-	-	2.8	-	-	
23672	A	T11	-	-	-	-	-	-	-	-	-	-	-	-	
23672	B	T13	0.2	-	-	-	0.05	-	3.00	1.80	-	1.50	17.50	45.10	*hale noa* kitchen
23672	B	E1b	-	-	-	-	-	-	-	-	-	-	-	-	
23686	289	E19	-	-	-	-	-	-	-	-	-	-	-	-	agricultural platform
23686	289	E20	-	-	-	-	-	-	-	-	-	0.5	-	-	
23686	282	E17	-	-	-	-	-	-	-	-	-	-	-	-	*heiau*?
23686	282	E18	-	-	-	-	-	-	-	-	-	-	-	-	

*male related items are shaded

Table 45. Weight (grams) of recovered fish and shell from Phase C features.

Site	Feature	Unit	Fish Scaridae	Fish UID	Cypraea sp.	Drupa sp.	Morula sp.	Cellana sp.	Isognomon sp.	Cymatium sp.	Nerita sp.	Branch coral	Echinoidea	Crustacean	Brachidontes sp.	Conus sp.	Shell UID
23686	250	E11	0.6	0.1	1.3	26.2	-	59.1	-	-	-	7.9	-	-	-	-	-
23686	254	E12	-	-	0.7	-	-	-	-	-	-	1.5	-	-	-	-	0.2
23674	-	E06	0.6	1.2	79.0	16	-	0.8	-	-	0.4	27.3	7.5	0.2	-	11	4.8
23674	-	E07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23672	A	E03	-	-	-	-	-	-	-	-	-	2.1	-	-	-	-	-
23672	A	E02	-	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-
23672	A	T11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23672	B	T13	-	-	-	0.10	-	-	-	-	0.20	-	-	-	-	-	-
23672	B	E1b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23686	289	E19	-	-	9.3	-	0.7	-	0.4	-	-	0.3	-	-	-	0.2	-
23686	289	E20	-	-	15.0	-	-	-	-	3.1	-	19.7	-	-	4.4	-	-
23686	282	E17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23686	282	E18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Based on the evidence then, the following four main categories of features were used during Phase C: (1.) *hale mua* male eating houses (Site 23674 and Feature 250 of Site 23686) and an associated terrace wall (Feature 254 of Site 23686); (2.) a *hale noa* sleeping house (Feature A of Site 23672) and the possibly associated *hale noa* kitchen (Feature B of Site 23672); (3.) an agricultural platform (Feature 289); and (4.) a possible *heiau* platform. The Feature 254 terrace wall could be a partition between the *hale mua makai* and *heiau mauka*. The increase in the different kinds of features on the late sixteenth to mid- seventeenth century landscape suggests a settling in and increasingly permanent use of the area. However, as will be

discussed below, Phase C represents an overall drop in the mass and variety of resources exploited when compared to the earlier Phase B. Phase D, nonetheless, shows a dramatic increase over Phase C.

Phase D (ca. AD 1680-1850)

The nine excavated features that can be associated with the fourth phase of occupation within the project area are the following: (1.) the Site 23675 enclosed platform; (2.) the Site 23670A lower tier platform; (3.) the Site 23670B upper tier platform; (4.) the Site 23670C platform; the Site 23678 oval enclosure; (5.) the Site 23677A enclosure; (6.) the Site 23677B platform; (7.) (8.) the Feature 251 enclosure within Site 23686; and (9.) the Feature 23686 *kuaiwi*. Although the *kuaiwi* has not been dated directly, its age can be inferred from it being an extension of the late-seventeenth century Site 23678 oval enclosure.

Considering that Features A and B are two platforms arranged at different levels within the same "stepped" platform structure of Site 23670, they are really part of one feature. Moreover, considering that Feature C is a small rectangular platform some 1.5 meters south of Feature A, it too is an integral part of Site 23670. Knowing that the Feature A platform at Site 23677 is partly enclosed by the Feature B wall, these features are treated as part of the same occupation. Accordingly, the following six sites are present during Phase D: (1.) Site 23675; (2.) Site 23670; (3.) Site 23678; (4.) Site 23677; (5.) Feature 251; and (6.) Feature 291. Viewed together, these six sites stretch from south to north in the eastern half of the project area. Site 23670 appears as an outlier *makai* from this settlement line (Figure 135).

The function of each Phase D feature is interpreted based on the kinds and weight of items recovered and on considerations of feature shape and size. The recovery of pig and dog from Site 23675 (Table 46) suggests that males cooked, consumed, and discarded food in this structure. The average weight per square meter of all items recovered from Site 23675 is comparatively heavy (i.e., 112 g). This suggests that the comparatively big Site 23675 enclosure (i.e., 33.1 m^2) was a permanent eating house. Two depressions and a C-shaped rock alignment visible on the paved surface could be remnants of hearths. Also, black (10YR 2/1) silt from EU-10 suggests organic refuse generated by cooking. The comparatively robust Site 23675 being in the vicinity of the earlier but smaller male cooking structures at Feature 250 and Site 23674 suggests that the *hale mua* was a more permanent fixture on the landscape.

The tiered Site 23670A and B platform structure probably functioned as a *heiau*. The overall size (approximately 56 m^2) of Site 23670, its roughly rectangular shape, its fairly level but stepped surface, and general paucity of associated items are attributes of *heiau* elsewhere in Hawai'i (e.g., Loubser and Rechtman 2007). The nearby Feature C is aligned in a similar direction as Features A and B. This suggests that the small Feature C platform, albeit sterile, was somehow related to the Features A and B platform. In this regard then one can perhaps refer to Site 23670 as a complex.

Unlike the location of the proposed *heiau* from the earlier Phases B and C on the *mauka* end of the occupation, the Phase D *heiau* complex appears to be *makai* from the main settlement. If the identification of the Phase D *heiau* is correct, then the settlement would probably have been approached from the *makai* side. This suggests that the main approach to the agricultural settlement changed 180° during Phase D times.

The southwest to northeast aligned Feature 291 wall runs more-or-less perpendicular to the coast line. In this regard the wall is roughly parallel to nearby but longer *kuaiwi* in the project area. The appearance of a wall that runs perpendicular instead of parallel to the coast by the mid- to late seventeenth century suggests that new kinds of divisions emerged on the agricultural landscape of the project area; up slope-down slope boundary walls appeared alongside earlier terraced walls.

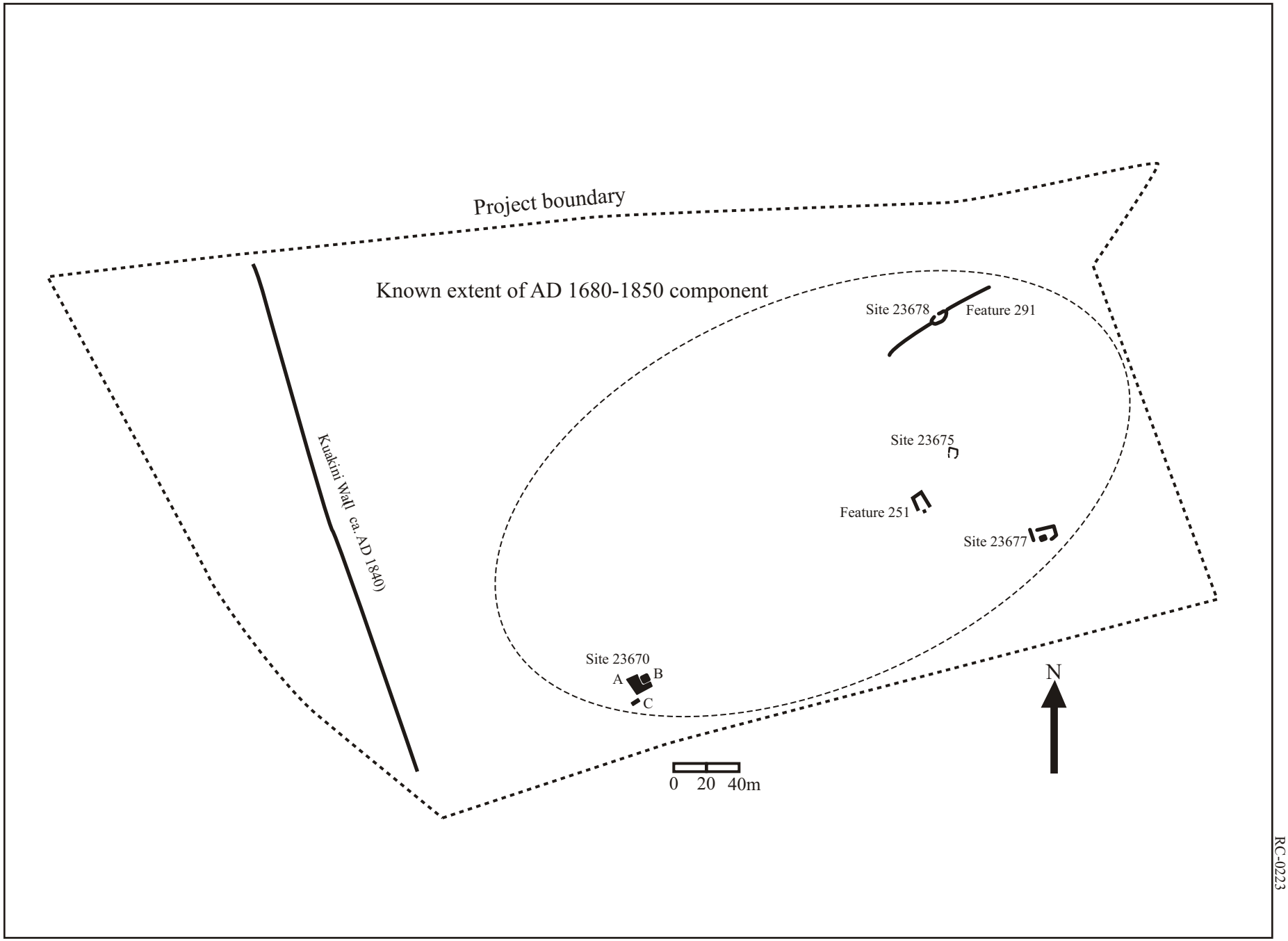


Figure 135. Probable extent of known Phase D sites and features.

Built within the Feature 291 wall is the oval-shaped Site 23678 (judging from how their walls abut, the undated Feature 291 is either contemporary or slightly later that the dated Site 23678). Judging from the medium-sized structure (55 m^2) and the absence of male-related items (Table 46), Site 23678 might very well have been a common sleeping house, or *hale noa*. However, the unusually high average weight of items recovered (i.e., 178 g per square meter) and high variety of items identified (i.e., 21 different kinds of items) exceed the specifications of a typical *hale noa*. Nonetheless, instead of suggesting a different function, an increase in the mass and variety of items deposited within could simply be the result of increased and more intensive use of the structure. A fragment of a basalt adze found within the Feature 23678 is the only one recovered from the project area. The recovery of fire cracked rock and dark brown (10YR 3/3) silt from Site 23678 suggests that cooking occurred within, an activity that typically generate an above average amount of refuse. Excess trash was also probably disposed within the nearby wall, roughly two meters to the northeast of the proposed *hale noa*. Whatever the function of Site 23678 might have been, the weight and variety of items from within and from nearby deposits strongly suggests increased and more intensified occupation.

On the opposite side of the Phase D occupation within the project area, at Site 23677 Features A and B, are the remains of what could be a second *hale noa*, As already mentioned, the Feature A platform being partly enclosed by the Feature B wall shows that these two features are part of the same structure. Whereas the wall yielded only a few shell remains and nothing else, the platform yielded 19 different kinds of items and an average weight of 69.2 grams per square meter of items. Recovered remains from the platform include fish, rocky shore shell, beach shell, mammals and plants from around the settlement, and volcanic glass from the interior. Together with these items, the presence of 10YR 2/1 black ashy silt within the platform suggests that cooking occurred on this platform. If so, then as in the case of Site 23678, Site 23677 had a cooking area within. The cooking areas being part of the proposed *hale noa* structures at Sites 23677 and 23678 of Phase D contrast with the earlier Phase C Site 23672 proposed *hale noa* where the cooking area was a spatially separate structure. The incorporation of the cooking areas within structures during the eighteenth century, whatever the function of the structures might have been, is a topic worth pursuing in future data recovery projects.

Fish, shell, coral, Echinoidea, bird, mammals, terrestrial plants, and volcanic glass and basalt were found at most of the excavated Phase D locales (Tables 46 and 49). The recovered items indicate that resources from the ocean, rocky coast line, beach, local area, and interior were utilized.

Not shown in Table 46 are the cattle bones recovered from within the rectangular Feature 251 enclosure. The size (143.8 m^2) of this enclosure, together with the absence of items apart from the cow carcass, strongly suggests that the enclosure served as a cattle pen. Cattle were first introduced to Hawai‘i in 1793 and by 1810 big herds roamed across the island. By 1812 the *kapu* against capturing feral cattle was lifted, marking the beginning of fully fledged ranching activities. Captured animals were taken to stone-walled paddocks where they were given food and water. By the 1830s, ranching was an important part of the Hawaiian economy and by the late 1800s cattle ranches had grown up in the Kona District (e.g., Kelly 1980). The presence of cattle bones within Feature 251 suggests that it could have been used as a paddock, most likely some time between 1812 and the 1850s. In this regard the Feature 251 probable stock pen probably post-dates the radiocarbon dated structures.

Table 46. Weight (grams) of recovered bone and plant from Phase D features.*

Site	Feature	Unit	Avian bone	Pig	Dog	Rodent	Small mammal	Mammal bone	Small mammal worked bone	Kukui nutshell	Charcoal	
23675	-	E10	-	4.3	0.9	-	0.8	-	0.2	0.5	10.9	
23675	-	T20	-	9.6	-	-	-	-	-	-	0.6	*Hale mua*
23675	-	E09	-	-	-	-	-	-	-	-	0.4	
23670	A	E31	-	-	-	-	-	-	-	8.9	0.6	
23670	A	E32	-	-	-	-	-	-	-	0.5	-	
23670	B	E34	-	-	-	-	-	-	-	-	-	*Heiau* platforms
23670	B	T12	-	-	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	-	-	
23678	-	E14	-	-	-	-	-	-	-	-	1.3	*Hale noa*
23678	-	E15	0.1	-	-	-	-	-	-	-	0.3	
23677	B	E24	-	-	-	-	-	-	-	-	-	*Hale noa*
23677	B	E23	-	-	-	-	-	-	-	-	-	
23677	A	E22	-	-	-	0.2	-	0.9	-	0.2	3.3	*Hale noa* kitchen
23677	A	T16	-	-	-	-	3.4	-	-	-	3.9	
23686	251	E08	-	-	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	-	-	-	-	-	-	-	*Kuaiwi* wall

*male related items are shaded

Table 47. Weight (grams) of recovered fish and shell from Phase D features.

Site	Feature	Unit	Fish Scaridae	Fish UID	Cypraea sp.	Drupa sp.	Morula sp.	Cellana sp.	Isognomon sp.	Chama sp.	Nerita sp.	
23675	-	E10	0.7	0.05	62.7	3.1	-	2.4	-	-	11.2	
23675	-	T20	-	-	1.3	-	-	-	-	-	-	*Hale mua*
23675	-	E09	-	-	2.6	-	-	-	-	-	-	
23670	A	E31	-	-	3.3	-	-	-	-	-	-	
23670	A	E32	-	-	-	-	-	-	-	-	-	
23670	B	E34	-	-	-	-	-	-	-	-	-	*Heiau* platforms
23670	B	T12	-	-	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	-	-	
23678	-	E14	-	-	50.6	2.3	-	0.6	0.1	-	-	*Hale noa*
23678	-	E15	-	0.05	67.7	4.6	1	0.1	0.3	-	0.1	
23677	B	E24	-	-	5.2	-	-	-	-	-	-	*Hale noa*
23677	B	E23	-	-	-	-	-	-	-	-	-	
23677	A	E22	-	-	50.6	1.5	-	-	-	0.3	2.3	*Hale noa* kitchen
23677	A	T16	0.2	-	23.5	4.1	-	0.2	-	-	2.1	
23686	251	E08	-	-	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	31.9	4.2	1	-	0.05	-	-	*Kuaiwi* wall

Table 48. Weight (grams) of recovered shell, coral, and Echinoidea from Phase D features.

Site	Feature	Unit	*Strombina* sp.	*Coral abrader*	*Branch coral*	*Echinoidea*	*Cantharus* sp.	*Conus* sp.	*Venus* sp.	*Shell UID*	
23675	-	E10	-	1	345.8	1.3	-	-	-	0.4	
23675	-	T20	-	-	-	-	-	-	-	-	*Hale mua*
23675	-	E09	-	-	-	-	-	-	-	-	
23670	A	E31	-	-	-	0.7	-	-	-	-	
23670	A	E32	-	-	-	-	-	-	-	-	
23670	B	E34	-	-	-	-	-	-	-	-	*Heiau* platforms
23670	B	T12	-	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	-	
23678	-	E14	-	-	77.2	0.95	-	7.6	1.9	8.7	*Hale noa*
23678	-	E15	0.6	-	333.4	4.9	-	22.3	3.7	33.2	
23677	B	E24	-	-	-	-	-	0.3	-	-	*Hale noa*
23677	B	E23	-	-	-	-	-	-	-	-	
23677	A	E22	-	-	16.5	5	-	1.9	-	2.2	*Hale noa* kitchen
23677	A	T16	-	-	4.1	5.8	0.1	0.7	0.1	0.1	
23686	251	E08	-	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	90	0.75	-	9.93	-	2.9	*Kuaiwi* wall

Table 49. Weight (grams) of recovered lithics from Phase D features.

Site	Feature	Unit	*Basalt fire cracked rock*	*Basalt adze fragment*	*Basalt flake*	*Volcanic glass flake*	*Volcanic shatter*	*Basalt grinder*	*Basalt waterworn*	
23675	-	E10	-	-	2.2	20.3	-	-	-	
23675	-	T20	-	-	-	-	-	116.7	71.4	*Hale mua*
23675	-	E09	-	-	-	-	-	-	-	
23670	A	E31	-	-	-	-	-	-	-	
23670	A	E32	-	-	-	-	-	-	-	
23670	B	E34	-	-	-	-	-	-	-	*Heiau* platforms
23670	B	T12	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	
23678	-	E14	54.2	0.2	0.7	12.2	2.5	-	0.5	*Hale noa*
23678	-	E15	-	-	2.8	9.3	1.8	-	2.8	
23677	B	E24	-	-	-	-	-	-	-	*Hale noa*
23677	B	E23	-	-	-	-	-	-	-	
23677	A	E22	-	-	-	4.4	-	-	-	*Hale noa* kitchen
23677	A	T16	-	-	-	0.5	0.3	-	-	
23686	251	E08	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	-	0.9	-	-	3.7	*Kuaiwi* wall

Based on the available evidence, the following five main categories of features were used during Phase D: (1.) a *hale mua* male eating house (Site 23675); (2.) two *hale noa* sleeping houses containing kitchens within (Sites 23678 and 23677); (3.) a *kuaiwi* (Feature 291) associated with the Site 23678 *hale noa*; (4.) a

possible *heiau* platform complex (Site 23670, Features A-C); and (5.) a likely cattle enclosure (Feature 251). Except for the *heiau* platform complex *makai* of the main site concentration, all the Phase D features were sandwiched between the Feature 291 *kuaiwi* to the north and the Feature 82 *kuaiwi* wall to the south. Considering that these *kuaiwi* walls followed the slope they were not soil retention or water-holding devices (e.g., Kirch 1985:228). Rather, these walls were intended to define boundaries between plots and/or homestead units, or *kauhale*. Generally speaking, the presence of *kuaiwi* walls on the landscape suggests that a permanent cropping system replaced a shifting system of rotating cultivation by the eighteenth century.

The probable post- AD 1680 date for the *kuaiwi* within the project area supports evidence from Ka‘awaloa that the formal walled fields (*kuaiwi*) immediately above Kealakekua Bay were established after AD 1670 (Clark and Rechtman 2002), during what has been termed the Competition Period (Burtchard 1995).

It could be that the land sandwiched between the *kuaiwi* represented an ‘*ili*, or land division. An ‘*ili* was typically a long and narrow strip of land running lengthwise along an *ahupua‘a,* or tax unit. An ‘*ili* could be discontinuous and represented portions of *ahupua‘a* land allotted to the families who lived on them and cultivated them. The right to continue to use and cultivate these small strips of land stayed with the *‘ohana* (extended families) living on them regardless of any transfer of title to the *ahupua‘a* (Kelly 1980:22-25). Division chiefs of any particular *ahupua‘a* could construct an agricultural shrine, or *heiau*, where increase ceremonies could be attended by those who worked the land.

The Kuakini Wall (SIHP 50-10-28-6302/-7276), that falls in the *makai* third of the project area, was probably constructed during Governor Kuakini’s administration (AD 1820-1844). The most likely date of this wall’s construction falls within the latter portion of Phase D and so the wall is probably roughly contemporary with the Feature 251 proposed cattle enclosure. Indeed, one likely function of the Kuakini Wall was to keep cattle away from settlements along the coast.

Data recovery results have for the most part upheld the primary hypothesis given above under research objectives. As can be inferred from summary information in Table 50, the first use (ca. AD 1400-1460, or Phase A) was for short term habitation and associated opportunistic agriculture (i.e., only one probable cooking and eating facility of a temporary nature and an associated structure of uncertain function), followed by formal agriculture and associated recurrent habitation (ca. AD 1460-1680, or Phases B and C) (i.e., *hale noa* sleeping quarters appearing not far from fairly permanent-looking *hale mua* eating houses as well as the eventual appearance of *heiau*-looking platforms and terrace walls), then the end of the sequence (ca. AD 1680-1850, or Phase D) is marked by more consistent habitation (i.e., more than two *hale noa* common houses and *kuaiwi*) with associated animal pens. The dates of associated household gardens are not certain due to the lack of charcoal from these contexts (but see discussion below).

Table 50. Summary of site and feature function types through time.

Phase	*Date range (AD)*	*Sites/ Features (n)*	*hale mua (n)*	*hale noa (n)*	*terrace wall (n)*	*heiau (n)*	*unknown agricultural (n)*	*Kuaiwi (n)*	*cattle enclosure (n)*
A	1400-1460	2	1	-	-	-	1	-	-
B	1460-1580	5	3	1	1	-	-	-	-
C	1580-1680	7	2	2	1	1	1	-	-
D	1680-1850	9	1	3	-	3	-	1	1

Material traces that survived on the landscape suggest changing trends in gender presence and activities. The two temporary Phase A structures probably represent temporary male eating and sleeping quarters. The drastic increase of Phase B structures, particularly the prominent Site 23673 proposed *hale mua*, suggests that some time after AD 1460 men slept and ate in the fields on a more permanent basis. However, the fairly rudimentary Site 23671 probable *hale noa* suggests that common sleeping structures for the entire family was still temporary. This situation seemed to have changed by the late sixteenth and

early seventeenth centuries, for by then the prominent Site 23672 probable *hale noa* appears on the landscape with an associated cooking area. This is also the time period that a possible *heiau* platform makes its appearance. By the late seventeenth century a prominent *hale mua* (i.e., Site 23675) occurs in the roughly the same locale of where an earlier but smaller *hale mua* structures (i.e., Site 23674 and Feature 250) stood previously. The late seventeenth to early eighteenth centuries also witnessed the construction of two prominent probable *hale noa*, one at Site 23678 and the other at Site 23677. Both of these latter two sites yielded considerable amounts of items, suggesting that by that time families were more-or-less permanently settled in the *kula* zone of the project area. The stepped platform probable *heiau* at Site 23670 and Feature 291 *kuaiwi* wall support this evidence for increasingly permanent occupation of the area.

It is perhaps of tangential interest that through time recognizable concentrations of sites and features shifted *makai* (southwest) to *mauka* (northeast): the two Phase A features are in the southwestern portion of the project area; the five Phase B features are in the center to the southeastern portion of the project area; the seven Phase C features are in the east-central portion of the project area; whereas the Phase D occupation expanded to the north of the previous three (compare Figures 132, 133, 134, and 135).

Assuming that agricultural features, such as field-clearing piles and modified outcrops, were not far from the dated features, certain tentative inferences can be made about the intensity of agricultural activities based on the number of agricultural features near dated features. As six agricultural features (i.e., Features 19-24) occur near Features 293 and 294 of Phase A, it can be assumed that these features probably date to the earlier known phase of agricultural activity in the project area (see Figure 76). Site 23673 of Phase B is the only dated structure near twenty seven agricultural features (i.e., Features 34-37, Features 84-93, Features 102-104, Feature 106, Feature 112, Feature 118, Feature 260, Feature 263, and Features 276-279) in the southeastern portion of the project area. Bearing in mind that the eastern portion of Phase D overlaps Phase C, it is not clear to what component the agricultural features in the eastern third of the project area belong. However, the forty two agricultural features *makai* of the westernmost known Phase C structure, Site 23672, seem to best fit the spatial spread of Phase D sites and features. These are Features 1 to 17 and Features 218 to 242. An addition eleven agricultural features (i.e., Features 146, 148, 150, 152, 154, 156, 158, 160-163) *mauka* of the Phase D Feature 291 *kuaiwi* most likely are associated with the Site 23678 proposed *hale noa* structure. Judging from these spatial associations then, the latest occupation, Phase D, witnessed the culmination of agricultural activity within the project area. Due to its spatial overlap with Phase D, the agricultural activity during Phase C is uncertain, although a fair number of agricultural features occur in the vicinity of Sites 23672 and Features 250 and 254. Undated and ostensibly sterile agricultural features in the far western and far northern portions of the project area probably date to the latest phase of Hawaiian occupation.

From the evidence presented thus far it would appear that each phase is more extensive than the preceding one. Most notably, Phase A is represented by two habitation features and six agricultural features, Phase B by five substantial features and at least twenty seven associated features, Phase C by seven substantial features and an unknown number of associated features, and Phase D by nine substantial features and at least fifty three associated features. However, it is proposed that these ostensible increases in site and feature numbers and their spatial expansion across the landscape are not echoed by the mass, kinds, and varieties of resources extracted during the different time periods. Once the weights of recovered items and variety of items from the different phases are compared it would become apparent that resource exploitation did not necessarily increase linearly with time.

Changes in Resource Exploitation through Time

Albeit not directly addressed in the research objectives, a potentially interesting trend apparent in the results is variation in the weight and variety of items used through time. When recovered items from only the twelve radiocarbon dated proveniences are considered (taking into consideration that EU-10 yielded 2 dates, EU-21 yielded 3 dates, EU-22 yielded 2 dates, and EU-29 yielded 2 dates, so the number of dated proveniences (n=12) are less than the total of radiocarbon dates (n=17)), temporal associations are more tight and reliable. The following dated proveniences are included in this assessment: Feature 293 of Site 23686 (Phase A); Site 23676 (Phase B); Feature B of Site 23673 (Phase B); Site 23671 (Phase B); Feature 247 of Site 23686 (Phase B); Feature 250 of Site 23686 (Phase C); Feature 254 of Site 23686 (Phase C);

Feature B of Site 23672 (Phase C); Site 23675 (Phase D); Site 23678 (Phase D); Feature A of Site 23677 (Phase D); Feature A of Site 23677 (Phase D).

From the radiocarbon evidence we can see that one provenience dates to Phase A, four proveniences date to Phase B, three proveniences date to Phase C, and four proveniences date to Phase D. The number of dates alone suggests that there is an ostensible drop in intensity (as opposed to extensiveness) of occupation during Phase C (i.e., the period roughly dating to between AD 1580 and AD 1680). Fluctuations in the total weight of charcoal recovered from the different phases indeed suggest that wood was not equally available or exploited with the same intensity through time. This can be seen when the following total weights of charcoal recovered from the different dated proveniences are compared: 2 grams from Phase A; 26.2 grams from Phase B; 3.3 grams from Phase C; and 19.4 grams from Phase D. According to these numbers then most wood was burned during Phase B and then picking up again in Phase D after a drop in Phase C.

This fluctuation in the amount of recovered charcoal is mirrored by other items recovered from the different phases (Table 51). As can be seen in Table 51, Phase B (i.e., the period dating to roughly between AD 1460 and 1580) has a greater average weight and variety of items than the other three phases. Phase C represents a drop in weight and variety of items recovered, whereas Phase D represents an increase. The Phase D increase is perhaps not that substantial, however, considering that it lasted roughly two centuries (i.e., from approximately AD 1680 to AD 1850) as opposed to the shorter century-long duration of each other phase.

Table 51. Weight and variety of items recovered by Phase.

Phase	*Number of Dated Proveniences*	*Total weight of recovered items (g)*	*Corrected weight per square meter (g)*	*Different kinds of items recovered*
A	1	116	58	10
B	4	935	63	32
C	3	118	32	17
D	4	829	91	29

The same fluctuation trend is apparent when the presence/absence of recovered items is considered; Phase B represents a rapid increase in variety of items recovered over Phase A. This increase contrasts with a drop during Phase C and a rise in Phase D (Table 52). Specifically, beach shell (i.e., *Turbo* sp., *Nassarius* sp., *Cantharus* sp., *Brachidontes* sp., *Fimbria* sp., *Conus* sp.. *Mitra* sp., *Terebra* sp., and *Venus* sp.) and basalt tools/flakes are absent from directly dated Phase A and Phase C proveniences. Moreover, comparatively rare items, such as tuna, octopus lure, and bird (chicken?) remains were only recovered from Phase B deposits. Considered overall then, Phase B, dating to roughly between AD 1460 and AD 1580, represents both an expansion and an intensification of activities over the previous Phase A. Even though Phase C might have been associated with more sites and features than the earlier Phase B, individually dated Phase C sites and features yielded a smaller mass of items and a smaller variety of items than their Phase B predecessors. The drop-off in weight and variety of items during the period dating roughly to between AD 1580 and AD 1680 is worth additional investigation in neighboring areas. Depending on results from neighboring areas, it can be determined if the drop-off is of local or regional extent, for instance.

Table 52. Presence/absence and percentage ubiquity of recovered items by Phase.

	Ocean fish	*Rocky shell*	*Beach shell*	*UID shell*	*Bird*	*Pig*	*Dog*	*Rat*	*UID bone*	*Kukui* nutshell	*Charcoal*	*Basalt adze*	*Basalt flake*	*Volcanic flake*	*Volcanic shatter*	*Basalt utilized*	*Total presence*
Phase A presence	1	3	-	-	-	1	-	1	-	1	1	-	-	1	-	1	10
Phase A ubiquity %	10	30	-	-	-	10	-	10	-	10	10	-	-	10	-	10	100
Phase B presence	3	26	7	3	1	2	1	2	4	2	4	-	2	3	-	-	60
Phase B ubiquity %	5	43	12	5	2	3	2	3	7	3	7	-	3	5	-	-	100
Phase C presence	3	8	-	1	-	1	1	1	-	2	3	-	-	2	1	1	24
Phase C ubiquity %	13	33	-	4	-	4	4	4	-	8	13	-	-	8	4	4	100
Phase D presence	3	25	5	4	-	1	1	1	4	2	4	1	2	4	2	2	61
Phase D ubiquity %	5	41	8	7	-	2	2	2	7	3	7	2	3	7	3	3	100

Assessing Permanent, Temporary, and Agricultural Features

The above discussed features were identified not only through the nature and variety of items recovered, but also in terms of their shapes, sizes, and the deposits they contain. Ultimately, the functions of the excavated sites and features could be inferred via certain similarities with ethnographically recorded instances. However, due to variations in human behavior, even within one cultural group living during the same time period, residues left at sites and their shapes and sizes are bound to vary somewhat. Idiosyncrasies, especially between families, are bound to result in some variation between sites with similar functions. For instance, one *hale mua* can be expected to differ somewhat in architecture from the next, depending on preferences and wealth of a particular family. The nature and time of site abandonment or even possible re-use are also factors to consider. For example, were sites abandoned in a "clean" or "messy" state and were they left in a hurry or gradually? It is for reasons such as these then that rigidly quantifiable categories or threshold values might not be realistic ways to categorize sites.

With these caveats in mind the following discussion uses the results from the excavated sites and features to assess Cordy's (1981) model that uses surface attributes to differentiate permanent from temporary occupations (also included are features identified as agricultural in terms of surface criteria). Related to Clark's (1987) use of abundance and diversity of accumulated habitation debris to assess permanence of habitation, the following assessment considers total average weight and variety of recovered items per square meter. Basically, if assessments based on surface features alone are valid, then permanent habitations will have a greater weight and variety of items than temporary habitations or agricultural features. In other words, there would be a clear rank ordering of permanent habitations, temporary habitations, and agricultural features in terms of descending weight and variety of items recovered. That this is clearly not the case within the project area is shown in Table 53; proposed temporary habitations are interspersed with permanent habitations and agricultural features. Of particular note are the oval structure of Site 23678 and the platform of Site 23676 that were both thought to be temporary but turned out to be at the top of the list in terms of weight and variety of items recovered. On the opposite side of the spectrum is the paucity of items from the proposed permanent platform complex at Site 23670. If anything, Table 53 shows that the relationship between feature shape, size, and associated items is a complicated one.

Table 53. Sites and features by descending weight and variety of items recovered.

Site	Feature	Unit	Form	Function	Tentative assignment	Area (sq. m)	Total weight of items (g)	Weight per sq.m (g)	Variety of items
23678		E15	Oval enclosure	*Hale noa*	Temporary habitation	55.0	489	245	19
23675		T20	Enclosed platform depression	*Hale mua*	Permanent habitation	33.1	200	200	5
23676		E21	Platform	*Hale mua* kitchen	Temporary habitation	18.0	472	118	24
23675		E10	Enclosed platform depression	*Hale mua*	Permanent habitation	33.1	469	117	18
23678		E14	Oval enclosure	*Hale noa*	Temporary habitation	55.0	222	111	16
23673	A	E27	Platform	*Hale mua* kitchen	Permanent habitation	26.5	220	110	11
23676		T18	Platform	*Hale mua* kitchen	Temporary habitation	18.0	105	105	16
23673	A	E28	Platform	*Hale mua* kitchen	Permanent habitation	26.5	207	103	14
23673	A	T17	Platform	*Hale mua* kitchen	Permanent habitation	26.5	95	95	12
23677	A	E22	Small platform in enclosure	*Hale noa* kitchen	Temporary habitation	7.3	89	89	13
23686	291	E13	Linear wall	*Kuaiwi*	Agricultural	273.0	145	73	10
23673	B	E29	Enclosure	*Hale mua*	Permanent habitation	74.8	280	70	16
23672	B	T13	Enclosure	*Hale noa* kitchen	Permanent habitation	8.8	69	69	9
23674		E06	Platform	*Hale mua*	Temporary habitation	17.2	249	62	20
23686	293	E36	Enclosure	*Hale mua*	Agricultural	3.6	116	58	10
23677	A	T16	Small platform in enclosure	*Hale noa* kitchen	Temporary habitation	7.3	49	49	15
23686	247	E05	Terrace	Wall w/midden	Agricultural	28.6	75	37	8
23671		E04	Platform	*Hale noa*	Temporary habitation	26.2	109	27	14
23686	250	E11	Pavement	*Hale mua*	Agricultural	4.5	104	26	10
23686	289	E20	Pavement	Platform	Agricultural	49.5	43	11	5
23673	B	E30	Enclosure	*Hale mua*	Permanent habitation	74.8	42	11	9
23686	289	E19	Pavement	Platform	Agricultural	49.5	11	5.5	5
23672	A	E02	Enclosure	*Hale noa*	Permanent habitation	114.8	4.6	4.6	2
23670	A	E31	Lower two-tiered platform	*Heiau*	Permanent habitation	10.2	14	3.4	4
23675		E09	Enclosed platform depression	*Hale mua*	Permanent habitation	33.1	3	3	2
23677	B	E24	Enclosure	*Hale noa*	Temporary habitation	125.4	5.5	2.8	2
23686	254	E12	Terrace	Terrace wall	Agricultural	54.0	4.5	2.3	5
23672	A	E03	Enclosure	*Hale noa*	Permanent habitation	114.8	5.1	1.3	4
23670	A	E32	Lower two-tiered platform	*Heiau*	Permanent habitation	55.8	0.5	0.1	1
23677	B	E23	Enclosure	*Hale noa*	Temporary habitation	125.4	0	0	0
23672	A	T11	Enclosure	*Hale noa*	Permanent habitation	114.8	0	0	0
23674		E07	Circular enclosure	*Hale mua* yard	Temporary habitation	18.0	0	0	0
23670	B	E34	Upper two-tiered platform	*Heiau*	Permanent habitation	10.2	0	0	0
23670	B	T12	Upper two-tiered platform	*Heiau*	Permanent habitation	10.2	0	0	0
23670	C	E33	Platform	*Heiau*	Permanent habitation	9.5	0	0	0
23672	B	E1b	Enclosure	*Hale noa* kitchen	Permanent habitation	8.8	0	0	0

Perhaps it can be argued that the permanent versus temporary dichotomy is problematic due to the terms used. Substantial and carefully constructed structures, such as the residences of royalty, can be labeled as temporary if they are occupied for a brief period only, whereas a seemingly insignificant agricultural shed can be re-occupied over a long period and so become a permanent fixture. One potentially effective way of distinguishing permanent from temporary structures might be to compare thickness of stratigraphic build-up between structures and/or temporal spread of different radiocarbon dates from the same structure. Arguably the most important finding that emerges from this assessment is the need for excavation, bearing in mind that interpretations based on surface inspections alone can be misleading.

CONCLUDING REMARKS

This data recovery effort satisfactorily mitigated the adverse effects to Ten Sites on TMKs: 3-7-5-10:85 and 3-7-5-17:06 that resulted from development of the area. The research objectives were addressed concerning the determination of both dates and possible duration of occupation as well as site function assessment. The information collected from this data recovery project will hopefully contribute to the growing corpus of knowledge concerning Pre-contact use of Kona's *kula* zone, and is available for use into future regional syntheses. It is hoped that the interpretations of feature use and site layout proposed in the concluding section would prove to be of heuristic value, especially if the interpretations help generate opposing interpretations and encourage looking at the archaeological record in innovative and revealing ways.

REFERENCES CITED

Burtchard, G.
1995 Population and Land-Use on the Keauhou Coast, the Mauka Lands Inventory Survey, Keauhou, North Kona, Hawaii Island, (the Narrative Part I). IARII Report. Submitted to Belt Collins Inc. and Kamehameha Investment Corporation, Honolulu.

Bryan, W.
1915 *Natural History of Hawaii*. Hawaiian Gazette Co., Honolulu.

Cheever, H. T.
1851 *The Island World of the Pacific*. Harper and Brothers, New York.

Clark, J.
1987 Waimea-Kawaihae, A Leeward Hawaii Settlement Pattern. Unpublished Ph.D. dissertation, Department of Anthropology, University of Illinois at Urbana-Champaign.

Clark, M. and R. Rechtman
2002 Data Recovery Investigations at SIHP Sites 13658 and 13669, Kaʻawaloa Ahupuaʻa, South Kona, Island of Hawaiʻi. Rechtman Consulting Report RC-0025. Prepared for Pali-K Ranch, Captain Cook, Hawaiʻi.

2003 An Archaeological Inventory Survey of TMK:3-7-5-10:85 and 3-7-5-17:06. Waiʻaha Ahupuaʻa, North Kona District, Island of Hawaiʻi. Rechtman Consulting report RC-0153. Prepared for U of N Bencorp, Kailua-Kona, Hawaiʻi.

Corbin, A., and P. Rosendahl
2002 Archaeological Assessment Survey U of N BENCORP Development, Lands of Waiaha 1st and 2nd, North Kona District, Island of Hawaiʻi (TMK:3-7-5-17:6; 3-75-18:73). PHRI Report 2235-041102. Prepared for U of N Bencorp, Kailua-Kona.

Cordy, R.
1995 Central Kona Archaeological Settlement Patterns. State Historic Preservation Division, DLNR, State of Hawaiʻi. Prepared for the Planning Department, County of Hawaiʻi.

1978 A Study of Prehistoric Social Change: The Development of Complex Societies in the Hawaiian Islands. Unpublished Ph.D. dissertation, Department of Anthropology, University of Hawaii at Manoa.

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

1995 Central Kona Archaeological Settlement Patterns. State Historic Preservation Division, DLNR, State of Hawaiʻi. Prepared for the Planning Department, County of Hawaiʻi.

2000 *Exalted Sits the Chief: The Ancient History of Hawaiʻi Island*. Mutual Publishing, Honolulu.

Cordy, R., J. Tainter, R. Renger, and R. Hitchcock,
1991 An Ahupuaʻa Study: The 1971 Archaeological Work at Kaloko Ahupuaʻa, North Kona, Hawaiʻi. Western Archaeological and Conservation Center *Publications in Anthropology No. 58*. Prepared for the National Park Service, U.S. Department of the Interior.

Ellis, W.
1916 Journal of William Ellis: A Narrative of a Tour Through Hawaii in 1823. Hawaiian Gazette Co., Honolulu.

Hammatt, H., and S. Clark
1980 Archaeological Testing and Salvage Excavations of a 155 Acre Parcel in Na Ahupua'a Pahoehoe, La'aloa and Kapala'aea, Kona, Hawai'i. Archaeological Research Center Hawaii Report 14-152 III. Prepared for Pacific Basin Resorts, Inc.

Hammatt, H. and V. Meeker
1979 Archaeological Excavations and Heiau Stabilization at Kahalu'u, Kona, Hawaii Island. Archaeological Research Center Hawaii Report 14-172 (II). Prepared for Gerald Park, Urban Planner.

Handy, E. S. C. and E. G. Handy
1972 Native Planters in Old Hawaii: Their Life, Lore and Environment. *B. P. Bishop Museum Bulletin* 223. Bishop Museum Press, Honolulu. (with M. K. Pukui)

Holland, J. J.
1971 Land and Livelihood: The Kona Coast About 1825. MA Thesis, The University of Hawai'i, Honolulu.

Kelly, M.
1980 Land Tenure in Hawaii. *Amerasia Journal* 7(2):57-73..

Kirch, P.
1983 The Hawaiian Case, Review of Cordy 1981. "A Study of Prehistoric Social Change: The Development of Complex Societies in the Hawaiian Islands." Review in *Anthropology* 10:17-28.

1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawai'i Press, Honolulu.

Ladefoged, T.
1991 Hawaiian Architectural Transformations during the Early Historic Era. *Asian Perspectives* 30(1):55–70.

Loubser, J. H. N. and B. Rechtman
2006 Archaeological Data Recovery Investigations at SIHP Sites 7827, 7829, and 7830 (TMK: 3-7-8-010:093) Kahalu'u *ahupua'*a North Kona District, Hawai'i. Rechtman Consulting Report RC-0038. Prepared for Keauhou Lot 14C, LLC.

Malo, D.
1951 *Hawaiian Antiquities*. Bishop Museum Press, Honolulu.

Newman, T.
1970 Report on Reconnaissance at Old Kona Airport. Letter. Historic Sites Section, Department of Land and Natural Resources, State of Hawai'i.

O'Hare, C., and T. Wolforth
1998 Archaeological Inventory Survey of the Gomes Property Parcel, Land of Kahului 1st, Island of Hawaii (TMK: 3-7-5-19:5, 38, 40). PHRI Report 1807-090998. Submitted to Towne Development of Hawai'i, Inc.

Rechtman, R.
2002 Archaeological Mitigation Plan for Fourteen Sites in the Kiʻilae Estates Development Area (TMK:3-8-5-05:19,22). Kiʻilae and Kauleolī Ahupuaʻa, South Kona District, Island of Hawaiʻi. Rechtman Consulting report RC-0138. Prepared for Mr. Steven A. Jiran, Kiʻilae Estates, Makawao, Hawaiʻi.

2004 An Archaeological Data Recovery Plan for Ten Sites on TMKs:3-7-5-17:06. Waiʻaha Ahupuaʻa, North Kona District, Island of Hawaiʻi. Rechtman Consulting report RC-0223. Prepared for U of N Bencorp, Hawaiʻi.

Rechtman, R., K. Maly, M. Clark, D. Dougherty, and O. Maly
2001 Archaeological Inventory Survey of the Kiʻilae Estates Development Area (TMK:3-8-5-05:19, 22, 26, 27), Kiʻilae and Kauleolī Ahupuaʻa, South Kona District, Island of Hawaiʻi. Report RC-0034. Prepared for Mr. Steven Jiran, Kiʻilae Estates, LLC.

Reinecke, J.
1930 Survey of Hawaiian Sites, 1929-1930. Manuscript. Department of Anthropology, B.P. Bishop Museum, Honolulu.

Sato, H. H., W. Ikeda, R. Paeth, R. Smythe, and M. Takehiro, Jr.
1973 *Soil Survey of the Island of Hawaii, State of Hawaii.* U.S. Department of Agriculture, Soil Conservation Service and University of Hawaiʻi Agricultural Experiment Station. Washington, D.C.: Government Printing Office.

Schilt, A.
1983 *Subsistence and Conflict in Kona, Hawaii. An Archaeological Study of the Kuakini Highway Realignment Corridor*. Departmental Report Series 84-1. Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for the Department of Transportation, State of Hawaiʻi.

Soehren, L. J. and T. S. Newman.
1968 *The Archaeology of Kealakekua*. Department of Anthropology, B.P. Bishop Museum, University of Hawaiʻi, Honolulu.

Tomonari-Tuggle, M.
1993 Draft Report, the Archaeology of the ʻOhiʻa Preserve; An Inventory Survey of Surface Structures. International Archaeological Research Institute, Inc. (IARII). Submitted to Kamehameha Investment Corporation, Honolulu.

Valeri, V.
1985 Kingship and Sacrifice: Ritual and Society in Ancient Hawaiʻi. The University of Chicago Press, Chicago.

Wolfe E. and J. Morris.
1996 *Geologic Map of the Island of Hawai'i.* Geologic Investigations Series Map 1-2524-A. U.S. Department of the Interior, U.S. Geological Survey.

APPENDIX—A—Master Catalog

SIHP Site 23672 Feature A EU-2.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
1	I	1	Marine shell	*Cypraea* sp.	1	1	1.8
2	II	1	Volcanic glass	Flake	1	-	2.8

SIHP Site 23672 Feature A EU-3.

ACC#	**Layer**	**Level**	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
3	I	1	Mammal bone	Unidentified rodent	6	-	2.0
4	I	1	Coral	Waterworn	3	-	2.1
5	I	2	Volcanic glass	Flake	2	-	0.6
6	I	2	Organic	Charcoal	-	-	0.4

SIHP Site 23671 EU-4.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
7	I	1	Marine shell	*Cypraea* sp.	3	2	6.8
8	I	1	Coral	Waterworn	2	-	3.2
9	I	1	Echinoderm	Echinoidea	1	-	0.4
10	I	2	Organic	Charcoal	-	-	1.6
11	I	2	Basalt	Flake	1	-	5.7
12	I	2	Marine shell	*Cypraea* sp.	17	4	14.6
13	I	2	Mammal bone	Unidentified rodent	1	-	0.3
14	I	2	Marine shell	*Morula* sp.	3	3	2.7
15	I	2	Marine shell	*Conus* sp.	1	1	1.5
16	I	2	Marine shell	*Drupa* sp.	1	1	0.7
17	I	2	Marine shell	*Nerita* sp.	1	1	0.4
18	I	2	Marine shell	*Isognomon* sp.	14	4	1.6
19	I	2	Marine shell	*Brachiodontes* sp.	50	10	3.4
20	I	2	Echinoderm	Echinoidea	167	-	13.5
21	I	2	Marine shell	*Turbo* sp.	1	1	0.5
22	I	2	Marine shell	Unidentified	3	-	0.4
23	II	1	Organic	Charcoal	-	-	0.5
24	II	1	Volcanic glass	Flake	1	-	0.5
187	II	1	Volcanic glass	Utilized flake	1	-	1.0
25	II	1	Marine shell	*Isognomon* sp.	80	30	4.2
26	II	1	Marine shell	*Brachidontes* sp.	58	14	3.8
27	II	1	Marine shell	*Cypraea* sp.	24	4	18.0
28	II	2	Echinoderm	Echinoidea	208	-	14.2
29	II	2	Marine shell	*Cypraea* sp.	1	1	2.4
30	II	2	Coral	Waterworn	1	-	0.6
31	II	2	Marine shell	*Conus* sp.	1	1	2.2
32	II	2	Marine shell	*Drupa* sp.	5	2	4.1

SIHP Site 23686 Feature 247 EU-5.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
33	Surface	-	Marine shell	*Cypraea* sp.	1	1	23.4
34	I	1	Metal	Iron horseshoe nail	1	-	2.1
35	I	1	Coral	Unidentified	10	-	9.7
36	I	1	Marine shell	*Cypraea* sp.	3	1	4.3
37	I	1	Organic	*Kukui* nutshell	4	-	2.6
38	I	1	Marine shell	*Cellana* sp.	1	1	0.7
39	II	1	Organic	*Kukui* nutshell	5	-	2.2
40	II	1	Volcanic glass	Flake	1	-	1.4
41	II	1	Coral	Unidentified	3	-	1.2
42	II	1	Marine shell	*Cypraea* sp.	2	1	1.1
43	II	2	Organic	Charcoal	-	-	3.3
44	II	2	Basalt	Flake	1	-	4.2
45	II	2	Marine shell	*Cypraea* sp.	7	2	9.0
46	II	2	Organic	*Kukui* nutshell	7	-	2.2
47	II	2	Marine shell	*Drupa* sp.	1	1	2.8
48	II	2	Basalt	Flake	8	-	6.7

SIHP Site 23674 EU-6.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
49	I	1	Marine shell	*Cypraea* sp.	59	10	50.4
50	I	1	Marine shell	*Drupa* sp.	11	5	6.4
51	I	1	Marine shell	*Conus* sp.	6	2	0.7
52	I	1	Marine shell	*Cellana* sp.	1	1	0.8
53	I	1	Marine shell	Unidentified	3	-	2.0
54	I	1	Mammal bone	*Canis* sp.	2	1	2.0
55	I	1	Bird bone	Unidentified	5	-	1.0
56	I	1	Fish bone	*Scarus* sp. teeth	4	1	0.6
57	I	1	Volcanic glass	Flake	23	-	15.0
564	I	1	Volcanic glass	Shatter	7	-	12.1
58	I	1	Basalt	Flake	2	-	2.8
60	I	1	Organic	*Kukui* nutshell	1	-	0.4
61	I	1	Coral	Waterworn	12	-	24.4
62	I	1	Organic	Charcoal	-	-	0.2
63	II	1	Marine shell	*Cypraea* sp.	18	2	10.4
64	II	1	Marine shell	*Drupa* sp.	9	3	2.9
65	II	1	Marine shell	*Conus* sp.	3	2	1.2
66	II	1	Marine shell	Unidentified	3	-	0.6
67	II	1	Echinoderm	Echinoidea	7	-	6.6
68	II	1	Mammal bone	Unidentified	1	-	0.1
69	II	1	Fish Bone	Unidentified jaw	1	-	0.4
70	II	1	Volcanic glass	Flake	73	-	26.1
71	II	1	Organic	*Kukui* nutshell	3	-	0.8
72	II	1	Coral	Waterworn	1	-	2.9
73	II	1	Organic	Charcoal	-	-	0.3
74	II	2	Marine shell	*Cypraea* sp.	16	2	7.6
75	II	2	Marine shell	*Drupa* sp.	7	3	4.5
76	II	2	Marine shell	*Conus* sp.	3	2	5.2
77	II	2	Marine shell	Unidentified	4	-	0.7
78	II	2	Echinoderm	Echinoidea	2	-	0.4
79	II	2	Bird bone	Unidentified	2	-	1.8
80	II	2	Fish bone	Unidentified vertebrae	1	-	0.8
81	II	2	Mammal bone	Unidentified rodent	1	-	0.2
82	II	2	Volcanic glass	Flake	30	-	22.8

83	II	2	Organic	*Kukui* nutshell	2	-	0.2
84	II	2	Organic	Charcoal	-	-	0.2
85	II	3	Marine shell	*Cypraea* sp.	25	3	10.6
86	II	3	Marine shell	*Drupa* sp	8	1	2.2
87	II	3	Marine shell	*Conus* sp.	6	2	4.0
88	II	3	Marine shell	*Nerita* sp.	1	1	0.4
89	II	3	Marine shell	Unidentified	5	-	1.5
90	II	3	Echinoderm	Echinoidea	6	-	0.5
91	II	3	Crustacean	Unidentified claw fragment	1	-	0.2
92	II	3	Mammal bone	Unidentified rodent	10	-	0.5
93	II	3	Volcanic glass	Flake	48	-	14.3
94	II	3	Organic	Charcoal	-	-	0.5

SIHP Site 23686 Feature 251 EU-8.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
95	I	1	Mammal bone	Bovine bone and teeth fragments	17	1	34.5

SIHP Site 23675 EU-9.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
96	II	1	Organic	Charcoal	-	-	0.4
97	II	1	Marine shell	*Cypraea* sp.	3	2	2.6

SIHP Site 23675 EU-10.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
98	I	-	Organic	Charcoal in situ	-	-	2.3
99	I	-	Volcanic glass	Flake	1	-	1.5
100	I	-	Mammal bone	*Sus* sp.	1	1	1.5
101	I	-	Marine shell	*Cypraea* sp.	4	1	6.7
102	I	-	Marine shell	*Nerita* sp.	1	1	0.8
103	I	-	Coral	Unidentified	20	-	209.5
104	I	-	Coral	Waterworn	1	-	6.3
105	II	1	Organic	Charcoal	-	-	2.0
106	II	1	Organic	*Kukui* nutshell	2	-	0.5
107	II	1	Volcanic glass	Flake	3	-	4.1
108	II	1	Mammal bone	*Sus* sp.	2	1	1.1
109	II	1	Coral	Abrader	1	-	1.0
110	II	1	Marine shell	*Cellana* sp.	2	1	1.3
111	II	1	Marine shell	*Nerita* sp.	7	6	2.3
112	II	1	Marine shell	*Cypraea* sp.	26	5	21.8
113	II	1	Echinoderm	Echinoidea	5	-	0.5
114	II	1	Marine shell	*Drupa* sp.	3	1	2.3
115	II	1	Marine shell	*Cellana* sp.	1	1	1.1
116	II	1	Marine shell	Unidentified	2	-	0.4
117	II	1	Coral	Unidentified	54	-	69.5
118	II	1	Coral	Waterworn	3	-	16.0
119	II	1	Coral	Unidentified	4	-	4.2
120	II	2	Organic	Charcoal	-	-	2.0
121	II	2	Volcanic glass	Flake	6	-	9.5
122	II	2	Small mammal bone	Unidentified	9	-	0.8
059	II	2	Small mammal bone	Unidentified/worked	1	-	0.2
123	II	2	Marine shell	*Nerita* sp.	19	16	4.2
124	II	2	Fish bone	*Scarus* sp.	2	1	0.7
125	II	2	Echinoderm	Echinoidea	4	-	0.8

126	II	2	Marine shell	*Cypraea* sp.	33	6	21.0
127	II	2	Marine shell	*Drupa* sp.	1	1	0.4
128	II	2	Coral	Unidentified	12	-	22.5
129	II	2	Coral	Waterworn	1	-	0.4
130	II	3	Organic	Charcoal	-	-	4.6
131	II	3	Basalt	Flake	6	-	2.2
132	II	3	Volcanic glass	Flake	9	-	5.2
133	II	3	Mammal bone	*Sus* sp.	5	1	1.7
134	II	3	Mammal bone	*Canis sp.* tooth	2	1	0.9
135	II	3	Fish bone	Unidentified	1	-	0.05
136	II	3	Marine shell	*Nerita* sp.	18	15	3.9
137	II	3	Marine shell	*Cypraea* sp.	23	2	13.2
138	II	3	Coral	Unidentified	2	-	1.3
139	II	3	Coral	Waterworn	1	-	9.4
140	II	3	Coral	Unidentified	8	-	6.7
141	II	3	Marine shell	*Drupa* sp.	1	1	0.4

SIHP Site 23686 Feature 250 EU-11.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
142	I	1	Marine shell	*Drupa* sp	1	1	20.5
143	I	1	Marine shell	*Cellana* sp.	1	1	59.1
144	II	1	Organic	*Kukui* nutshell	3	-	1.0
145	II	1	Volcanic glass	Flake	2	-	1.8
146	II	1	Mammal bone	*Canis* sp. tooth	1	1	1.0
147	II	1	Fish bone	*Scarus* sp. pharyngeal plate	1	1	0.6
148	II	1	Marine shell	*Drupa* sp.	1	1	2.2
149	II	1	Coral	Unidentified	1	-	0.4
150	II	2	Organic	Charcoal	-	-	0.5
151	II	2	Organic	*Kukui* nutshell	2	-	0.9
152	II	2	Volcanic glass	Flake	5	-	3.2
153	II	2	Fish bone	Unidentified	1	-	0.1
154	II	2	Marine shell	*Cypraea* sp.	4	1	1.3
155	II	2	Marine shell	*Drupa* sp.	3	1	3.5
156	II	2	Coral	Unidentified	10	-	7.2
157	II	2	Coral	Unidentified	1	-	0.3

SIHP Site 23686 Feature 254 EU 12.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
158	II	1	Organic	Charcoal	-	-	0.2
159	II	1	Marine shell	*Cypraea* sp.	1	1	0.7
160	II	2	Organic	Charcoal	-	-	0.5
161	II	2	Mammal bone	*Sus* sp. vertebrae	1	1	1.1
162	II	2	Coral	Unidentified	4	-	1.5
163	II	2	Marine shell	Unidentified	1	-	0.2
164	II	3	Organic	Charcoal	-	-	0.3

SIHP Site 23686 Feature 291 EU-13.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
165	I	1	Marine shell	*Cypraea* sp.	7	2	15.3
166	I	1	Marine shell	*Drupa* sp	1	1	1.2
167	I	1	Marine shell	*Conus* sp.	1	1	2.1
168	I	1	Coral	Unidentified	1	-	2.8
169	I	1	Coral	Unidentified	12	-	67.5
170	I	1	Marine shell	*Conus* sp.	1	1	0.25
171	II	1	Basalt	Waterworn pebble	2	-	3.7
172	II	1	Marine shell	*Cypraea* sp.	7	1	5.3
173	II	1	Marine shell	*Drupa* sp.	3	1	1.1
174	II	1	Marine shell	*Conus* sp.	6	2	2.4
175	II	1	Marine shell	Unidentified	1	-	0.2
176	II	1	Coral	Unidentified	20	-	7.7
177	II	1	Coral	Unidentified	1	-	1.5
178	II	1	Coral	Waterworn	2	-	1.1
179	II	2	Volcanic glass	Flake	1	-	0.9
180	II	2	Marine shell	*Cypraea* sp.	11	1	5.2
181	II	2	Echinoderm	Echinoidea	1	-	0.25
182	II	2	Marine shell	*Conus* sp.	4	1	1.5
183	II	2	Marine shell	*Isognomon* sp.	1	1	0.05
184	II	2	Marine shell	*Drupa* sp	1	1	1.5
185	II	2	Marine shell	*Morula* sp.	1	1	1.0
186	II	2	Marine shell	Unidentified	5	-	1.6
188	II	2	Coral	Unidentified	2	-	1.5
189	II	2	Coral	Waterworn	2	-	0.4
190	II	2	Coral	Unidentified	5	-	3.3
191	II	3	Marine shell	*Cypraea* sp.	10	2	6.1
192	II	3	Marine shell	*Conus* sp.	8	2	3.9
193	II	3	Echinoderm	Echinoidea	3	-	0.5
194	II	3	Marine shell	*Drupa* sp.	1	1	0.4
195	II	3	Marine shell	Unidentified	12	-	1.1
196	II	3	Coral	Unidentified	5	-	1.7
197	II	3	Coral	Waterworn	6	-	2.5

SIHP Site 23678 EU-14.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
198	I	1	Organic	Charcoal	-	-	0.2
199	I	1	Basalt	Fire cracked	1	-	54.2
200	I	1	Basalt	Flake	1	-	0.7
201	I	1	Volcanic glass	Flake	9	-	4.7
202	I	1	Marine shell	*Conus* sp.	6	-	2.8
203	I	1	Marine shell	*Cellana* sp.	1	1	0.1
204	I	1	Marine shell	*Cypraea* sp.	37	4	29.1
205	I	1	Marine shell	Unidentified	4	-	0.7
567	I	1	Marine shell	*Cellana* sp.	1	1	0.5
568	I	1	Marine shell	*Conus* sp.	1	1	1.0
569	I	1	Marine shell	Unidentified Bivalve	3	-	1.9
206	I	1	Coral	Unidentified	12	-	12.2
207	I	1	Coral	Unidentified	19	-	22.2
208	I	1	Coral	Waterworn	11	-	6.5
209	I	2	Organic	Charcoal	-	-	1.0
210	I	2	Organic	Unidentified Wood	1	-	0.1
211	I	2	Volcanic glass	Shatter	1	-	2.5
212	I	2	Volcanic glass	Flake	18	-	7.5

213	I	2	Basalt	Waterworn pebble	1	-	0.5
214	I	2	Marine shell	*Conus* sp.	7	3	3.8
215	I	2	Marine shell	*Drupa* sp	5	-	2.3
216	I	2	Marine shell	*Isognomon* sp.	2	1	0.1
217	I	2	Marine shell	*Cypraea* sp.	30	3	17.5
218	I	2	Echinoderm	Echinoidea	11		0.9
219	I	2	Marine shell	Unidentified	20	-	6.0
220	I	2	Coral	Unidentified	22	-	2.0
221	I	2	Coral	Unidentified	30	-	30.5
222	I	2	Coral	Waterworn	3	-	0.6
223	I	3	Basalt	Adze fragment	1	-	0.2
224	I	3	Marine shell	*Cypraea* sp.	7	1	4.0
225	I	3	Echinoderm	Echinoidea	1	-	0.05
226	I	3	Marine shell	Unidentified	6	-	2.0
227	I	3	Coral	Unidentified	2	-	0.4
228	I	3	Coral	Unidentified	5	-	2.8

SIHP Site 23768 EU-15.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
229	I	1	Marine shell	*Cypraea* sp.	2	1	2.9
230	I	1	Coral	Branch	2	-	67.0
231	I	1	Coral	Unidentified	3	-	12.2
232	I	1	Coral	Unidentified	15	-	66.4
233	II	1	Volcanic glass	Flake	1	-	0.8
234	II	1	Basalt	Waterworn pebble	1	-	2.3
235	II	1	Fish bone	Unidentified	1	-	0.05
236	II	1	Marine shell	*Conus* sp.	7	3	3.5
237	II	1	Marine shell	*Drupa* sp.	2	1	0.5
238	II	1	Marine shell	*Cypraea* sp.	16	2	12.0
239	II	1	Marine shell	*Morula* sp.	2	2	0.3
240	II	1	Marine shell	Unidentified	15	-	4.3
241	II	1	Marine shell	*Drupa* sp.	2	1	0.6
242	II	1	Coral	Unidentified	16	-	12.2
243	II	1	Coral	Unidentified	42	-	43.9
244	II	1	Echinoderm	Echinoidea	5	-	0.3
245	II	2	Organic	Charcoal	-	-	0.3
246	II	2	Basalt	Flake	4	-	2.8
247	II	2	Volcanic glass	Flake	10	-	7.7
248	II	2	Volcanic glass	Shatter	1	-	1.8
249	II	2	Bird bone	Unidentified	1	-	0.1
250	II	2	Marine shell	*Cypraea* sp.	58	4	36.5
251	II	2	Marine shell	*Conus* sp.	20	3	9.4
252	II	2	Marine shell	*Drupa* sp	3	1	0.9
253	II	2	Marine shell	*Morula* sp.	2	1	0.7
254	II	2	Marine shell	*Isognomon* sp.	2	1	0.3
255	II	2	Marine shell	*Cellana* sp.	1	1	0.1
256	II	2	Marine shell	Unidentified bivalve	3	-	1.4
257	II	2	Marine shell	*Strombus* sp.	2	2	0.6
258	II	2	Marine shell	Unidentified	59	-	19.7
259	II	2	Echinoderm	Echinoidea	44	-	2.6
260	II	2	Coral	Unidentified	32	-	13.2
261	II	2	Coral	Unidentified	72	-	75.3
262	II	3	Volcanic glass	Flake	1	-	0.8
263	II	3	Marine shell	*Conus* sp.	17	3	8.2
264	II	3	Marine shell	*Drupa* sp	5	2	2.6

265	II	3	Marine shell	*Nerita* sp.	1	1	0.1
266	II	3	Marine shell	*Cypraea* sp.	16	2	13.5
267	II	3	Marine shell	Unidentified bivalve	3	-	1.7
268	II	3	Marine shell	Unidentified	18	-	8.0
269	II	3	Echinoderm	Echinoidea	24	-	1.1
270	II	3	Coral	Unidentified	12	-	3.7
271	II	3	Coral	Unidentified	30	-	30.0
272	II	3	Coral	Waterworn	3	-	1.2
273	II	4	Basalt	Waterworn pebble	1	-	0.5
274	II	4	Marine shell	*Cypraea* sp.	4	1	2.8
275	II	4	Marine shell	*Conus* sp.	2	1	1.2
276	II	4	Marine shell	Unidentified	5	-	1.2
277	II	4	Marine shell	Unidentified bivalve	1	-	0.6
278	II	4	Echinoderm	Echinoidea	4	-	0.9
279	II	4	Coral	Unidentified	3	-	2.0
280	II	4	Coral	Unidentified	8	-	6.2
281	II	4	Coral	Waterworn pebble	1	-	0.1

SIHP Site 23686 Feature 289 EU-19.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
282	II	1	Marine shell	*Cypraea* sp.	10	2	7.6
283	II	1	Marine shell	*Conus* sp.	1	1	0.2
284	II	1	Marine shell	*Isognomon* sp.	2	1	0.4
285	II	1	Coral	Unidentified	1	-	0.3
286	II	3	Marine shell	*Cypraea* sp.	1	1	0.7
287	II	4	Marine shell	*Cypraea* sp.	3	1	1.0
288	II	4	Marine shell	*Morula* sp.	1	1	0.7

SIHP Site 23686 Feature 289 EU-20.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
289	I	1	Marine shell	*Cypraea* sp.	2	1	5.6
290	I	1	Coral	Unidentified	1	-	17.2
291	I	1	Volcanic glass	Flake	1	-	0.5
292	I	1	Marine shell	*Cypraea* sp.	14	2	7.8
293	I	1	Marine shell	*Conus* sp.	2	1	2.9
294	I	1	Marine shell	*Cymatium* sp.	1	1	3.1
295	II	2	Marine shell	*Cypraea* sp.	4	1	1.6
296	II	2	Marine shell	*Conus* sp.	2	1	1.5
297	II	2	Coral	Unidentified	1	-	2.5

SIHP Site 23676 EU-21.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
298	I	-	Organic	Charcoal	-	-	3.0
299	I	-	Organic	*Kukui* nutshell	4	-	0.8
300	I	-	Volcanic glass	Flake	12	-	20.0
301	I	-	Marine shell	*Cellana* sp.	2	1	0.8
302	I	-	Marine shell	*Morula* sp.	1	1	0.6
302	I	-	Marine shell	*Drupa* sp.	2	1	6.6
304	I	-	Marine shell	*Cypraea* sp.	73	4	68.0
305	I	-	Marine shell	Unidentified	44	-	0.2
306	I	-	Marine shell	*Conus* sp.	2	1	0.2
307	I	-	Mammal bone	*Canis* sp. tooth	1	1	0.4
308	I	-	Mammal bone	*Rattus* sp.	1	1	0.1
309	I	-	Mammal bone	*Sus* sp.	6	1	2.0

310	I	-	Marine shell	*Serpuloris variabilis*	2	-	2.9
311	I	-	Echinoderm	Echinoidea	5	-	0.4
312	I	-	Coral	Unidentified	14	-	15.0
313	I	-	Coral	Unidentified	2	-	9.1
314	II	1	Organic	Charcoal	-	-	2.4
315	II	1	Organic	*Kukui* nutshell	10	-	4.3
316	II	1	Volcanic glass	Flake	17	-	10.8
317	II	1	Mammal bone	*Sus* sp.	18	1	3.4
318	II	1	Fish bone	Shark tooth burnt	1	1	0.4
319	II	1	Marine shell	*Cypraea* sp.	81	6	33.7
320	II	1	Marine shell	*Nerita* sp.	5	4	1.0
321	II	1	Marine shell	*Cellana* sp.	7	1	3.2
322	II	1	Marine shell	*Conus* sp.	7	2	1.9
323	II	1	Marine shell	*Morula* sp.	2	2	1.4
324	II	1	Marine shell	*Drupa* sp.	5	2	9.9
325	II	1	Marine shell	*Serpuloris variabilis*	1	1	0.3
326	II	1	Marine shell	*Nassarius* sp.	2	2	1.6
327	II	1	Marine shell	*Chama* sp.	1	1	4.0
328	II	1	Marine shell	Unidentified	26	-	3.2
329	II	1	Coral	Unidentified	1	-	16.9
330	II	1	Coral	Unidentified	22	-	119.2
331	II	1	Echinoderm	Echinoidea	10	-	1.2
332	II	2	Organic	Charcoal	-	-	3.3
333	II	2	Organic	*Kukui* nutshell	19	-	3.1
334	II	2	Volcanic glass	Flake	11	-	5.4
335	II	2	Mammal bone	*Rattus* sp. jaw	1	1	0.1
336	II	2	Mammal bone	*Sus* sp. /burnt	5	1	3.4
337	II	2	Mammal bone	Unidentified/awl	1	-	0.4
338	II	2	Marine shell	*Cellana* sp.	1	1	0.1
339	II	2	Marine shell	*Conus* sp.	2	1	2.0
340	II	2	Marine shell	*Morula* sp.	3	3	1.8
341	II	2	Marine shell	*Drupa* sp.	3	1	3.7
342	II	2	Marine shell	*Nassarius* sp.	6	5	2.8
343	II	2	Marine shell	*Cypraea* sp.	52	7	29.2
344	II	2	Marine shell	Unidentified	22	-	3.2
345	II	2	Coral	Waterworn	1	-	0.6
346	II	2	Coral	Unidentified	10	-	5.9
347	II	2	Echinoderm	Echinoidea	20	-	0.9
348	II	3	Organic	Charcoal	-	-	1.6
349	II	3	Volcanic glass	Flake	8	-	3.9
350	II	3	Mammal bone	*Canis* sp. teeth/burnt	2	1	0.5
351	II	3	Mammal bone	Unidentified/burnt	4	-	1.0
352	II	3	Mammal bone	Unidentified/awl	1	-	2.8
353	II	3	Marine shell	*Drupa* sp.	1	1	4.0
354	II	3	Marine shell	*Conus* sp.	1	1	0.3
355	II	3	Marine shell	*Nerita* sp.	2	2	0.5
356	II	3	Marine shell	*Nassarius* sp.	3	3	1.4
357	II	3	Marine shell	*Fimbria* sp.	1	1	0.3
358	II	3	Marine shell	*Cypraea* sp.	37	6	23.1
359	II	3	Marine shell	Unidentified	13	-	1.5
360	II	3	Coral	Unidentified	3	-	0.8
361	II	3	Echinoderm	Echinoidea	15	-	1.5
362	II	4	Organic	Charcoal	-	-	0.1
363	II	4	Volcanic glass	Flake	2	-	0.5
364	II	4	Medium mammal bone	Unidentified/cut	1	-	0.4
365	II	4	Mammal bone	*Canis* sp. tooth	1	1	0.8

366	II	4	Bird bone	Unidentified	2	-	0.2
367	II	4	Marine shell	*Cypraea* sp.	5	2	6.2
368	II	4	Marine shell	*Morula* sp.	1	1	0.5
369	II	4	Marine shell	*Drupa* sp.	1	1	2.6
370	II	4	Marine shell	*Conus* sp.	2	1	0.5
371	II	4	Marine shell	*Nassarius* sp.	2	2	0.8
372	II	4	Marine shell	*Serpuloris variabilis*	1	1	0.9
373	II	4	Marine shell	Unidentified	2	-	0.1
374	II	4	Fish bone	Shark tooth	1	1	0.1
375	II	4	Coral	Unidentified	1	-	0.2
376	II	4	Coral	Unidentified	1	-	0.3
377	II	4	Echinoderm	Echinoidea	3	-	0.2

SIHP Site 23677 Feature A EU-22.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
378	II	1	Organic	Charcoal	-	-	1.0
379	II	1	Small mammal bone	*Rattus* sp.	1	1	0.2
380	II	1	Marine shell	*Cypraea* sp.	2	1	2.8
381	II	1	Coral	Unidentified	15	-	3.1
382	II	2	Marine shell	*Conus* sp.	2	1	0.7
383	II	2	Marine shell	*Cypraea* sp.	1	1	1.2
384	II	2	Coral	Unidentified	1	-	5.1
385	II	2	Coral	Unidentified	2	-	3.7
386	II	2	Echinoderm	Echinoidea	1	-	0.1
387	II	3	Marine shell	*Cypraea* sp.	4	3	5.2
388	II	3	Marine shell	*Drupa* sp.	1	1	1.1
389	II	3	Coral	Unidentified	1	-	0.6
390	III	1	Organic	Charcoal	-	-	0.2
391	III	1	Volcanic glass	Flake	1	-	0.4
392	III	1	Marine shell	*Cypraea* sp.	4	1	5.8
393	III	1	Marine shell	*Conus* sp.	3	1	1.1
394	III	1	Marine shell	*Nerita* sp.	2	2	0.5
395	III	1	Coral	Unidentified	1	-	0.1
396	III	1	Echinoderm	Echinoidea	2	-	0.3
397	III	2	Organic	Charcoal	6	-	0.4
398	III	2	Organic	Charcoal in situ	14	-	0.2
399	III	2	Organic	*Kukui* nutshell	1	-	0.2
400	III	2	Volcanic glass	Flake	3	-	2.8
401	III	2	Mammal bone	Unidentified/burnt	2	1	0.9
402	III	2	Marine shell	*Cypraea* sp.	35	5	26.4
403	III	2	Marine shell	*Conus* sp.	3	1	1.0
404	III	2	Marine shell	*Nerita* sp.	7	5	1.4
405	III	2	Marine shell	*Drupa* sp.	1	1	0.1
406	III	2	Marine shell	Unidentified	9	-	2.2
407	III	2	Coral	Unidentified	4	-	3.9
408	III	2	Echinoderm	Echinoidea	45	-	4.6
409	III	3	Organic	Charcoal	37	-	1.5
410	III	3	Volcanic glass	Flake	1	-	1.2
411	III	3	Marine shell	*Cypraea* sp.	6	1	9.2
412	III	3	Marine shell	*Nerita* sp.	1	1	0.4
413	III	3	Marine shell	*Drupa* sp.	1	1	0.3
414	III	3	Marine shell	*Pseudochama* sp.	2	1	0.3

SIHP Site 23677 Feature B EU-24

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
562	II	2	Marine shell	*Cypraea* sp.	1	1	5.2
563	II	2	Marine shell	*Conus* sp.	1	1	0.3

SIHP Site 23673 Feature A EU-27.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
415	I	1	Organic	Charcoal	-	-	0.2
416	I	1	Volcanic glass	Flake	1	-	0.7
417	I	1	Basalt	Waterworn pebble	1	-	51.4
418	I	1	Organic	*Kukui* nutshell	3	-	5.1
419	I	1	Marine shell	*Cypraea* sp.	1	1	3.8
420	I	1	Marine shell	*Fimbria* sp.	2	1	2.6
421	I	1	Coral	Branch	4	-	59.0
422	I	1	Coral	Unidentified	-	-	54.2
423	II	1	Organic	*Kukui* nutshell/burnt	8	-	1.2
424	II	1	Volcanic glass	Flake	1	-	0.1
570	II	1	Volcanic glass	Shatter	1	-	13.5
425	II	1	Shell	*Isognomon* sp.	2	1	0.2
426	II	1	Echinoderm	Echinoidea	2	-	0.1
427	II	2	Organic	Charcoal	-	-	0.2
428	II	2	Organic	*Kukui* nutshell	7	-	0.9
429	II	2	Volcanic glass	Flake	9	-	2.6
571	II	2	Volcanic glass	Shatter	7	-	21.5
430	II	2	Marine shell	Unidentified	3	-	0.7
431	II	2	Coral	Unidentified	1	-	0.1
432	II	2	Echinoderm	Echinoidea	6	-	0.7
433	II	3	Volcanic glass	Flake	2	-	0.8
434	II	3	Marine shell	*Cypraea* sp.	1	1	0.05

SIHP Site 23673 Feature A EU-28.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
435	I	-	Volcanic glass	Flake	6	-	6.3
572	I	-	Basalt	Flake	1	-	6.0
573	I	-	Volcanic glass	Shatter	1	-	6.6
436	I	-	Marine shell	*Cypraea* sp.	1	1	2.2
437	I	-	Marine shell	Unidentified	1	-	3.8
438	I	-	Coral	Unidentified	25	-	88.4
439	I	-	Coral	Abrader	1	-	17.3
440	II	1	Volcanic glass	Flake	7	-	4.8
441	II	1	Fish bone	Unidentified	1	-	1.0
442	II	1	Marine shell	*Cypraea* sp.	2	2	15.9
443	II	1	Marine shell	*Drupa* sp.	1	1	0.9
444	II	1	Organic	*Kukui* nutshell	6	-	0.4
445	II	1	Coral	Unidentified	5	-	41.2
446	II	1	Coral	Unidentified	1	-	0.6
447	II	1	Echinoderm	Echinoidea	5	-	0.2
448	II	2	Organic	Charcoal	-	-	0.3
449	II	2	Volcanic glass	Volcanic glass	10	-	6.0
450	II	2	Coral	Worked	1	-	0.5
451	II	2	Small mammal bone	Unidentified jaw and teeth	2	-	0.4
452	II	2	Marine shell	*Cypraea* sp.	1	-	1.4
453	II	2	Marine shell	*Terebra* sp.	1	1	0.05
454	II	2	Marine shell	*Mitra* sp.	1	1	0.1

455	II	2	Marine shell	Unidentified	1	-	0.1
456	II	2	Coral	Unidentified	3		0.8
457	II	2	Echinoderm	Echinoidea	5	-	0.1
565	II	2	Echinoderm	Echinoidea abrader	1	-	1.6

SIHP Site 23673 Feature B EU-29.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
458	II	1	Organic	Charcoal	-	-	1.1
459	II	1	Volcanic glass	Flake	1	-	0.2
460	II	1	Fish bone	*Thynnus thynnus*, from 3ft. specimen	2	1	0.8
461	II	1	Mammal bone	Unidentified	1		0.1
462	II	1	Marine shell	*Cypraea* sp.	9	2	7.8
463	II	1	Marine shell	*Nerita* sp.	1	1	0.15
464	II	1	Marine shell	Unidentified	2	-	0.4
465	II	1	Coral	Unidentified	1	-	27.4
466	II	1	Coral	Unidentified	2	-	3.1
467	II	1	Echinoderm	Echinoidea	9	-	0.6
468	II	2	Organic	Charcoal	-	-	1.2
469	II	2	Volcanic glass	Flake	4	-	2.0
470	II	2	Marine shell	*Cypraea* sp.	29	2	25.0
471	II	2	Marine shell	*Conus* sp.	2	1	0.6
472	II	2	Echinoderm	Echinoidea	22	-	2.0
473	II	2	Coral	Unidentified	3	-	3.6
474	II	3	Organic	Charcoal	21	-	2.0
475	II	3	Marine shell	*Cypraea* sp.	36	7	36.5
476	II	3	Marine shell	*Isognomon* sp.	6	1	1.2
477	II	3	Mammal Bone	Unidentified	3	-	0.6
478	II	3	Marine shell	*Nerita* sp.	1	1	0.1
479	II	3	Metal	Lead .177 cal Pellet	1	-	0.9
480	II	3	Fish bone	Unidentified	1		<0.1
481	II	3	Volcanic glass	Flake	2	-	1.8
482	II	3	Echinoderm	Echinoidea abrader fragment	1	-	0.2
483	II	3	Marine shell	*Conus* sp.	5	2	3.0
484	II	3	Coral	Unidentified	10	-	33.9
485	II	3	Marine shell	Unidentified	18	-	4.5
486	II	3	Marine shell	*Thais* sp.	1	1	0.5
487	II	3	Marine shell	*Drupa* sp.	2	2	0.6
488	II	3	Echinoderm	Echinoidea	208	-	25.8
489	II	4	Organic	Charcoal	47	-	5.5
490	II	4	Echinoderm	Echinoidea	42	-	4.9
491	II	4	Marine shell	*Cypraea* sp.	12	3	10.2
492	II	4	Mammal bone	*Sus* sp. vertebrae	1	1	2.2
493	II	4	Organic	Unidentified nut	1	-	0.6
494	II	4	Marine shell	*Trochus* sp.	1	1	0.3

SIHP Site 23673 Feature B EU-30.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
495	I	1	Fish bone	*Thynnus thynnus*	13	1	4.7
496	I	1	Mammal bone	*Canis* sp.	1	1	0.2
497	II	1	Fish bone	*Thynnus thynnus*	8	1	4.1
498	II	1	Mammal bone	Unidentified	6	-	4.7
566	II	1	Mammal bone	Unidentified/cut	3	-	13.2
499	II	1	Coral	Unidentified	2	-	7.8
500	II	1	Organic	*Kukui* nutshell	2	-	2.1
501	II	2	Fish bone	*Thynnus thynnus*	3	1	0.2
502	II	2	Mammal bone	*Rattus* sp.	1	1	<0.1
503	II	2	Echinoderm	Echinoidea	2	-	0.1
504	II	2	Coral	Unidentified	3	-	0.7
505	II	2	Organic	*Kukui* nutshell	2	-	0.2
506	II	3	Fish bone	*Thynnus thynnus*	2	1	<0.1
507	II	3	Organic	*Kukui* nutshell	1	-	1.9
508	II	3	Coral	Unidentified	1	-	0.2
509	II	3	Marine shell	*Drupa* sp.	1	1	1.9

SIHP Site 23670 Feature A EU-31.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
510	I	1	Organic	Charcoal	-	-	0.4
511	I	1	Organic	*Kukui* nutshell	14	-	6.8
512	I	1	Marine shell	*Cypraea* sp.	3	1	3.3
513	I	1	Metal	Iron fragments	4	-	0.9
514	I	1	Glass	Brown bottle fragment	1	-	0.4
515	I	1	Echinoderm	Echinoidea	7	-	0.6
516	I	1	Metal	Brass button part	1	-	0.8
517	I	1	Metal	Brass button part inscribed	1	-	0.8
518	II	1	Organic	Charcoal	-	-	0.2
519	II	1	Echinoderm	Echinoidea	2	-	0.1
520	II	1	Organic	*Kukui* nutshell	7	-	2.1

SIHP Site 23670 Feature A EU-32.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
521	I	1	Glass	Brown bottle fragment	1	-	0.7
522	I	1	Organic	*Kukui* nutshell	2	-	0.5

SIHP Site 23670 Feature B EU-34.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
523	II	1	Organic	Charcoal	-	-	0.4

SIHP Site 23686 Feature 293 EU-36.

ACC#	*Layer*	*Level*	*Material*	*Species/type*	*Count*	*MNI*	*Weight (g)*
524	I	1	Basalt	Waterworn	1	-	5.5
525	I	1	Coral	Unidentified	3	-	16.1
526	I	1	Marine shell	*Cypraea* sp.	1	1	8.3
527	II	1	Basalt	Waterworn	22	-	47.1
528	II	1	Organic	Charcoal	-	-	1.8
529	II	1	Synthetic	Plastic container	9	-	4.9
530	II	1	Metal	Steel nail	1	-	1.5
531	II	1	Metal	Iron fragments rusted	43	-	15.6
532	II	1	Metal	Steel nut	1	-	6.1
533	II	1	Fish bone	Unidentified	2	-	0.3
534	II	1	Glass	Brown bottle fragments	3	-	4.8
535	II	1	Organic	*Kukui* nutshell	1	-	0.9
536	II	1	Glass	Clear thin fragments	4	-	3.3
537	II	1	Glass	Clear thick fragments	2	-	0.7
538	II	1	Glass	Light green bottle fragments	2	-	0.7
539	II	1	Glass	Clear fragments	2	-	1.1
540	II	2	Metal	Iron fragments rusted	57	-	33.4
541	II	2	Mammal bone	*Sus* sp. rib	2	1	6.4
542	II	2	Basalt	Waterworn	13	-	24.1
543	II	2	Organic	*Kukui* nutshell	1	-	0.9
544	II	2	Coral	Unidentified	4	-	1.7
545	II	2	Marine shell	*Cypraea* sp.	1	1	3.0
546	II	2	Metal	Steel finish nails	3	-	5.6
547	II	2	Glass	Clear bottle fragments	8	-	10.5
548	II	2	Glass	Light green bottle fragments	3	-	5.8
549	II	2	Glass	Brown bottle fragments	6	-	2.5
550	II	2	Volcanic glass	Flake	1	-	0.5
551	II	2	Mammal bone	*Rattus* sp. jaw	1	1	0.1
552	II	2	Fish bone	Unidentified vertebrae	1		1.8
553	II	2	Fish bone	Unidentified	1		0.2
554	II	2	Glass	Clear fragments	5		4.2
555	II	2	Metal	Steel screw	1		3.8
556	II	2	Echinoderm	Echinoidea	1	-	<0.1
557	II	2	Glass	Clear fragment	1	-	2.7
558	II	2	Glass	Clear fragment	1	-	0.3
559	II	2	Synthetic	Plastic	4	-	0.9
560	II	2	Synthetic	Plastic	9	-	0.8
561	II	2	Organic	Charcoal	-	-	0.2

APPENDIX—B—Radiocarbon Results

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Bob Rechtman

Report Date: 2/14/2006

Rechtman Consulting, LLC

Material Received: 1/3/2006

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 212756	340 +/- 40 BP	-23.1 o/oo	370 +/- 40 BP
SAMPLE : RC-0223-10			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1440 to 1640 (Cal BP 510 to 310)			
Beta - 212757	350 +/- 40 BP	-26.9 o/oo	320 +/- 40 BP
SAMPLE : RC-0223-43			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1460 to 1660 (Cal BP 490 to 290)			
Beta - 212758	100 +/- 40 BP	-21.7 o/oo	150 +/- 40 BP
SAMPLE : RC-0223-98			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1660 to 1950 (Cal BP 290 to 0)			
Beta - 212759	190 +/- 80 BP	-26.2 o/oo	170 +/- 80 BP
SAMPLE : RC-0223-130			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1520 to 1580 (Cal BP 430 to 380) AND Cal AD 1630 to 1960 (Cal BP 320 to 0)			
Beta - 212760	300 +/- 40 BP	-27.4 o/oo	260 +/- 40 BP
SAMPLE : RC-0223-150			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1520 to 1590 (Cal BP 430 to 360) AND Cal AD 1620 to 1670 (Cal BP 330 to 280) Cal AD 1770 to 1800 (Cal BP 180 to 150) AND Cal AD 1940 to 1950 (Cal BP 10 to 0)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Bob Rechtman

Report Date: 2/14/2006

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 212761	250 +/- 40 BP	-24.4 o/oo	260 +/- 40 BP
SAMPLE : RC-0223-160			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1520 to 1590 (Cal BP 430 to 360) AND Cal AD 1620 to 1670 (Cal BP 330 to 280)			
Cal AD 1770 to 1800 (Cal BP 180 to 150) AND Cal AD 1940 to 1950 (Cal BP 10 to 0)			
Beta - 212762	200 +/- 40 BP	-24.1 o/oo	210 +/- 40 BP
SAMPLE : RC-0223-209			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1640 to 1690 (Cal BP 310 to 260) AND Cal AD 1730 to 1810 (Cal BP 220 to 140)			
Cal AD 1920 to 1950 (Cal BP 30 to 0)			
Beta - 212763	390 +/- 60 BP	-23.4 o/oo	410 +/- 60 BP
SAMPLE : RC-0223-298			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1420 to 1640 (Cal BP 540 to 310)			
Beta - 212764	410 +/- 70 BP	-25.4 o/oo	410 +/- 70 BP
SAMPLE : RC-0223-314			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1410 to 1650 (Cal BP 540 to 300)			
Beta - 212765	340 +/- 60 BP	-25.1 o/oo	340 +/- 60 BP
SAMPLE : RC-0223-332			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1440 to 1660 (Cal BP 510 to 290)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA

BETA ANALYTIC INC.

DR. M.A. TAMERS and MR. D.G. HOOD

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Bob Rechtman

Report Date: 2/14/2006

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 212766	60 +/- 40 BP	-24.1 o/oo	70 +/- 40 BP
SAMPLE : RC-0223-378			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1680 to 1740 (Cal BP 270 to 210) AND Cal AD 1810 to 1930 (Cal BP 140 to 20) Cal AD 1950 to beyond 1960 (Cal BP 0 to 0)			
Beta - 212767	120 +/- 40 BP	-22.6 o/oo	160 +/- 40 BP
SAMPLE : RC-0223-409			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1660 to 1950 (Cal BP 290 to 0)			
Beta - 212768	400 +/- 80 BP	-22.5 o/oo	440 +/- 80 BP
SAMPLE : RC-0223-474			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1320 to 1340 (Cal BP 630 to 600) AND Cal AD 1390 to 1640 (Cal BP 560 to 310)			
Beta - 212769	300 +/- 50 BP	-24.4 o/oo	310 +/- 50 BP
SAMPLE : RC-0223-489			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1460 to 1660 (Cal BP 490 to 290)			
Beta - 212770	520 +/- 80 BP	-23.5 o/oo	540 +/- 80 BP
SAMPLE : RC-0223-528			
ANALYSIS : Radiometric-Standard delivery (with extended counting)			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 1290 to 1480 (Cal BP 660 to 470)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.1:lab. mult=1)

Laboratory number: **Beta-212756**

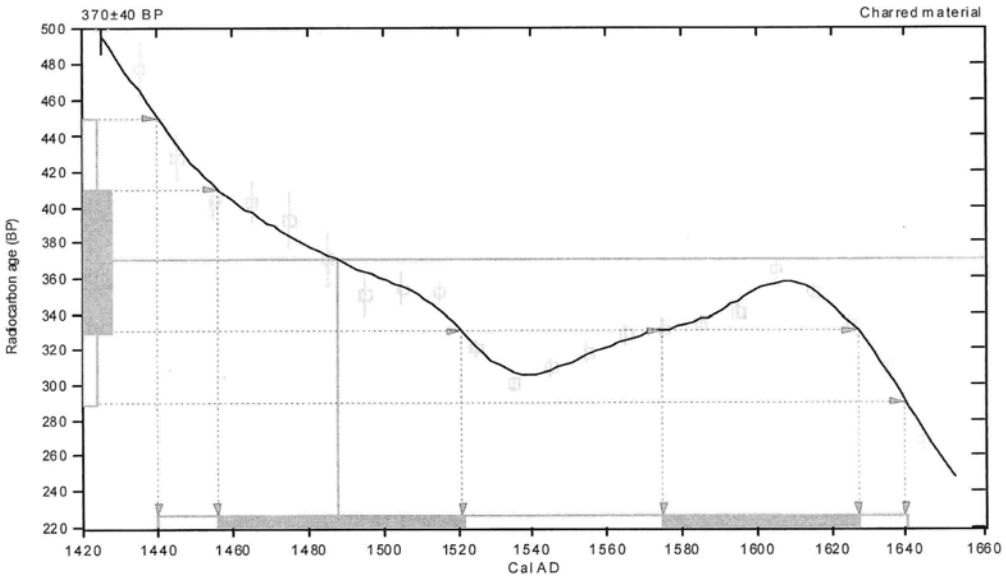
Conventional radiocarbon age: **370±40 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1440 to 1640 (Cal BP 510 to 310)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1490 (Cal BP 460)

1 Sigma calibrated results: (68% probability) Cal AD 1460 to 1520 (Cal BP 490 to 430) and Cal AD 1580 to 1630 (Cal BP 380 to 320)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.9:lab. mult=1)

Laboratory number: **Beta-212757**

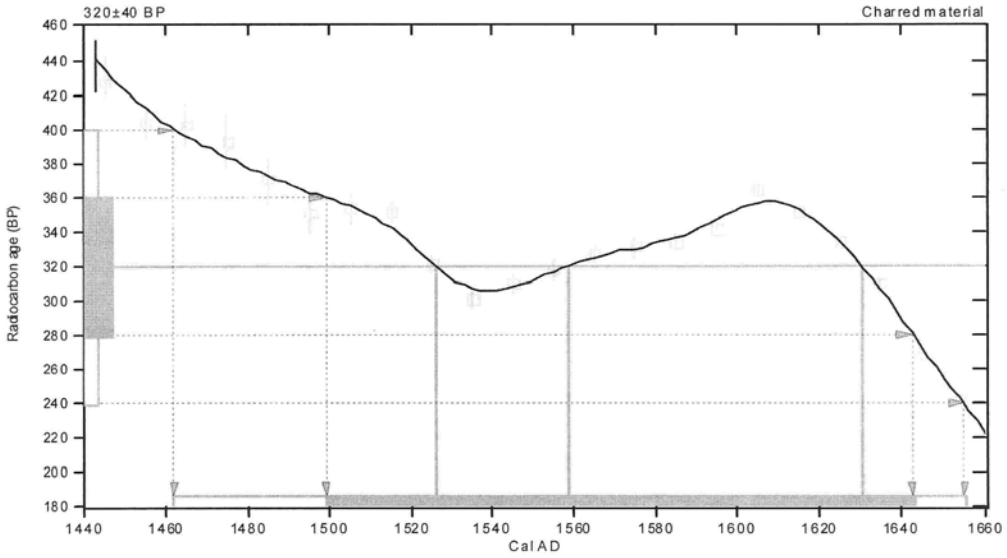
Conventional radiocarbon age: **320±40 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1460 to 1660 (Cal BP 490 to 290)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1530 (Cal BP 420) and Cal AD 1560 (Cal BP 390) and Cal AD 1630 (Cal BP 320)

1 Sigma calibrated result: (68% probability) Cal AD 1500 to 1640 (Cal BP 450 to 310)



References:

Database used
INTCAL98

Calibration Database

Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21.7:lab. mult=1)

Laboratory number: **Beta-212758**

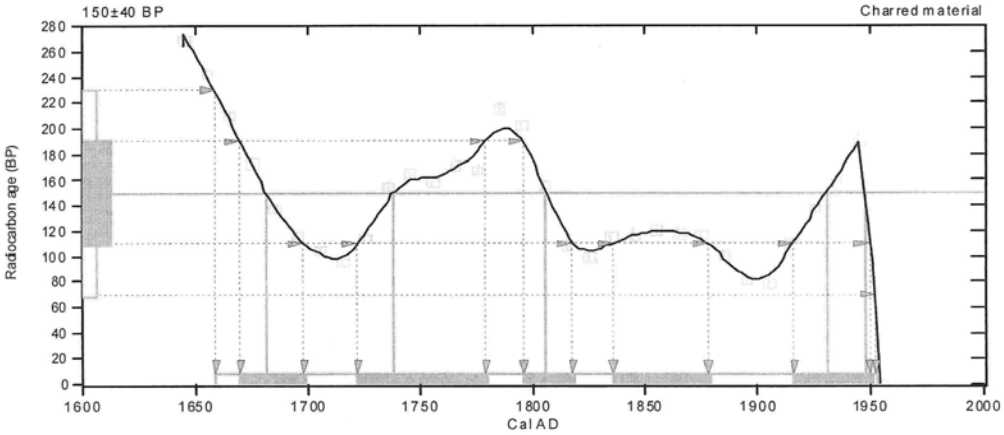
Conventional radiocarbon age: **150±40 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1660 to 1950 (Cal BP 290 to 0)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1680 (Cal BP 270) and
Cal AD 1740 (Cal BP 210) and
Cal AD 1810 (Cal BP 140) and
Cal AD 1930 (Cal BP 20) and
Cal AD 1950 (Cal BP 0)

1 Sigma calibrated results: (68% probability) Cal AD 1670 to 1700 (Cal BP 280 to 250) and
Cal AD 1720 to 1780 (Cal BP 230 to 170) and
Cal AD 1800 to 1820 (Cal BP 150 to 130) and
Cal AD 1840 to 1880 (Cal BP 110 to 70) and
Cal AD 1920 to 1950 (Cal BP 30 to 0)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.2:lab. mult=1)

Laboratory number: **Beta-212759**

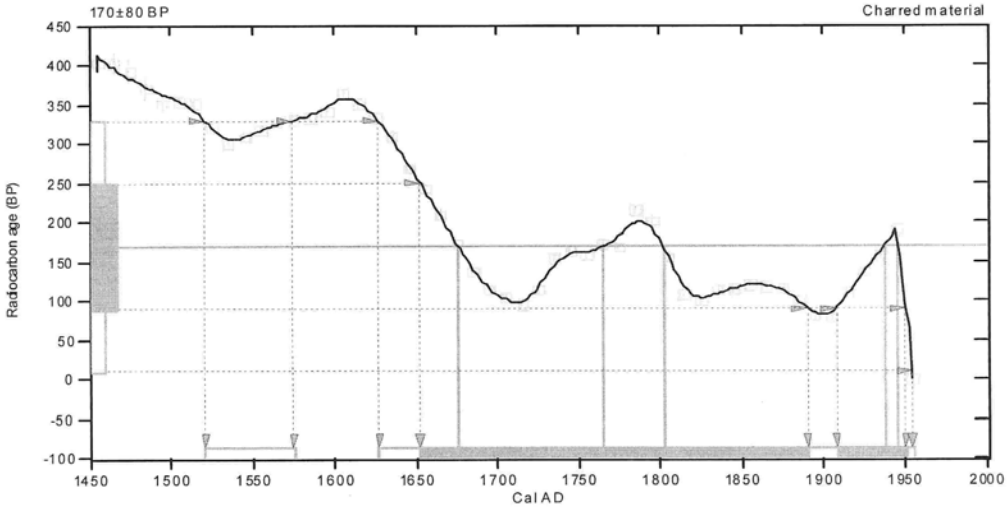
Conventional radiocarbon age: **170±80 BP**

2 Sigma calibrated results: **Cal AD 1520 to 1580 (Cal BP 430 to 380) and**
(95% probability) **Cal AD 1630 to 1960 (Cal BP 320 to 0)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1680 (Cal BP 270) and
Cal AD 1770 (Cal BP 180) and
Cal AD 1800 (Cal BP 150) and
Cal AD 1940 (Cal BP 10) and
Cal AD 1950 (Cal BP 0)

1 Sigma calibrated results: Cal AD 1650 to 1890 (Cal BP 300 to 60) and
(68% probability) Cal AD 1910 to 1950 (Cal BP 40 to 0)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27.4:lab. mult=1)

Laboratory number: **Beta-212760**

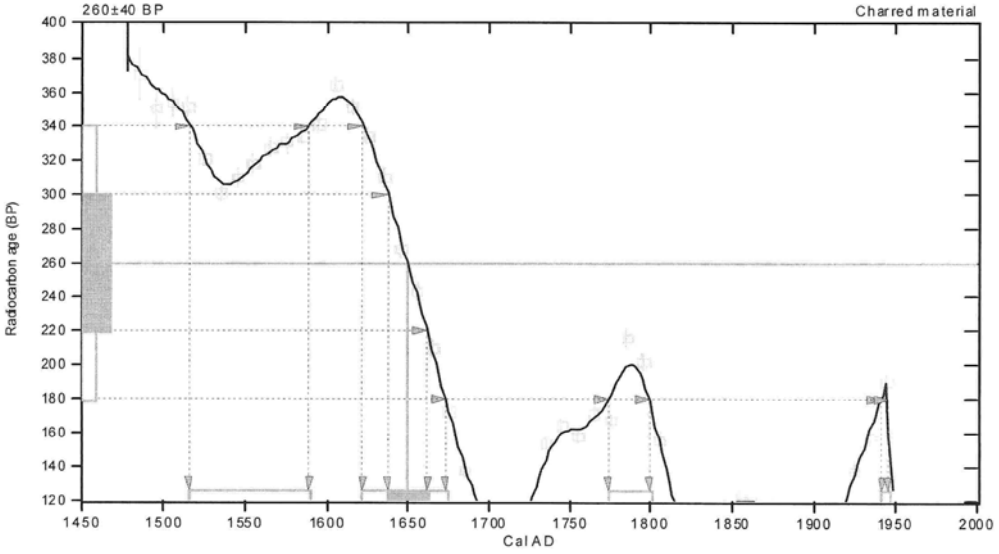
Conventional radiocarbon age: **260±40 BP**

2 Sigma calibrated results: **Cal AD 1520 to 1590 (Cal BP 430 to 360) and**
(95% probability) **Cal AD 1620 to 1670 (Cal BP 330 to 280) and**
Cal AD 1770 to 1800 (Cal BP 180 to 150) and
Cal AD 1940 to 1950 (Cal BP 10 to 0)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1650 (Cal BP 300)

1 Sigma calibrated result: Cal AD 1640 to 1660 (Cal BP 310 to 290)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.4:lab. mult=1)

Laboratory number: **Beta-212761**

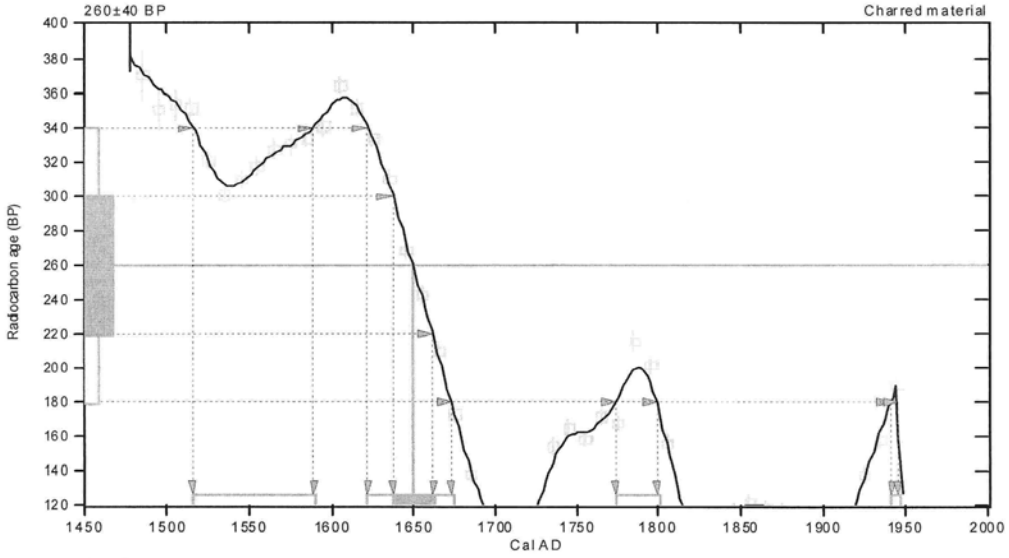
Conventional radiocarbon age: **260±40 BP**

2 Sigma calibrated results: (95% probability) **Cal AD 1520 to 1590 (Cal BP 430 to 360) and Cal AD 1620 to 1670 (Cal BP 330 to 280) and Cal AD 1770 to 1800 (Cal BP 180 to 150) and Cal AD 1940 to 1950 (Cal BP 10 to 0)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1650 (Cal BP 300)

1 Sigma calibrated result: (68% probability) Cal AD 1640 to 1660 (Cal BP 310 to 290)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.1:lab. mult=1)

Laboratory number: **Beta-212762**

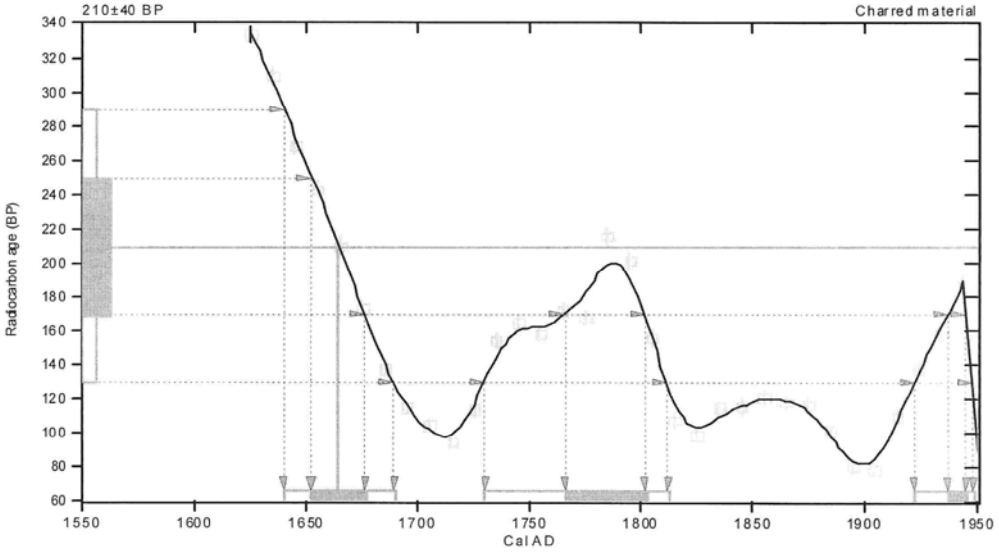
Conventional radiocarbon age: **210±40 BP**

2 Sigma calibrated results: (95% probability) **Cal AD 1640 to 1690 (Cal BP 310 to 260) and Cal AD 1730 to 1810 (Cal BP 220 to 140) and Cal AD 1920 to 1950 (Cal BP 30 to 0)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1660 (Cal BP 290)

1 Sigma calibrated results: (68% probability) Cal AD 1650 to 1680 (Cal BP 300 to 270) and Cal AD 1770 to 1800 (Cal BP 180 to 150) and Cal AD 1940 to 1950 (Cal BP 10 to 0)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.4:lab. mult=1)

Laboratory number: **Beta-212763**

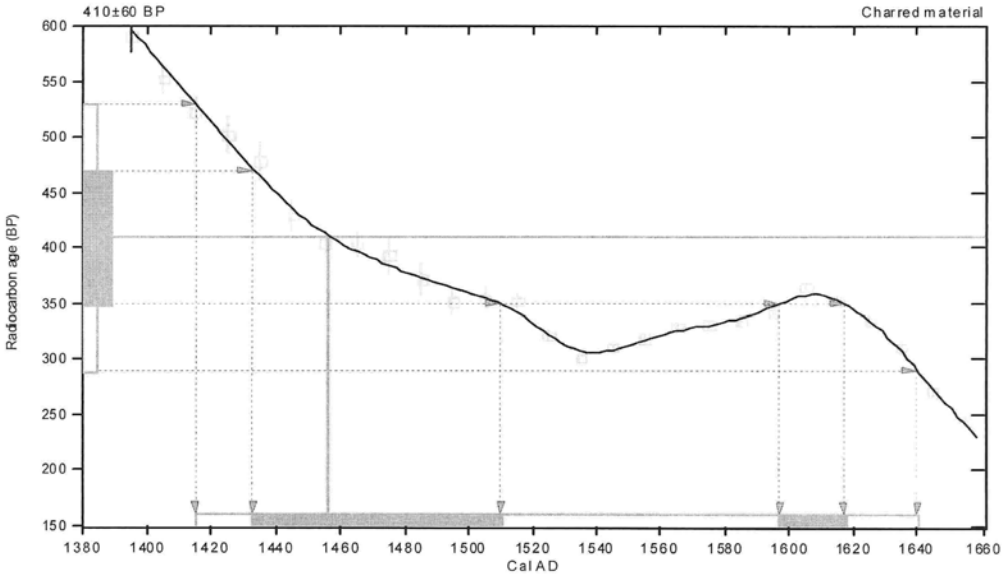
Conventional radiocarbon age: **410±60 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1420 to 1640 (Cal BP 540 to 310)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1460 (Cal BP 490)

1 Sigma calibrated results: (68% probability) Cal AD 1430 to 1510 (Cal BP 520 to 440) and Cal AD 1600 to 1620 (Cal BP 350 to 330)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.4:lab. mult=1)

Laboratory number: **Beta-212764**

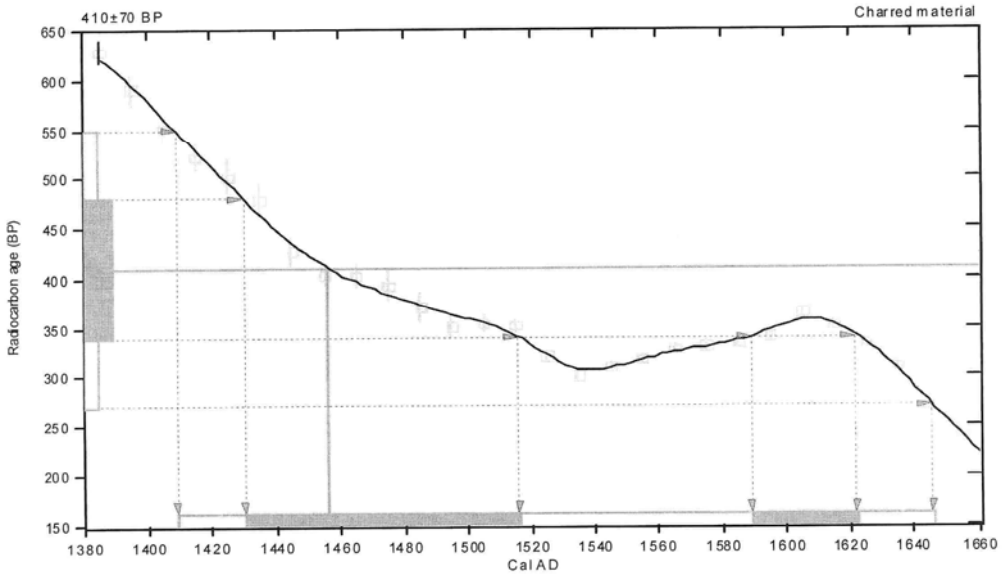
Conventional radiocarbon age: **410±70 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1410 to 1650 (Cal BP 540 to 300)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1460 (Cal BP 490)

1 Sigma calibrated results: (68% probability) Cal AD 1430 to 1520 (Cal BP 520 to 430) and Cal AD 1590 to 1620 (Cal BP 360 to 330)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.1:lab. mult=1)

Laboratory number: **Beta-212765**

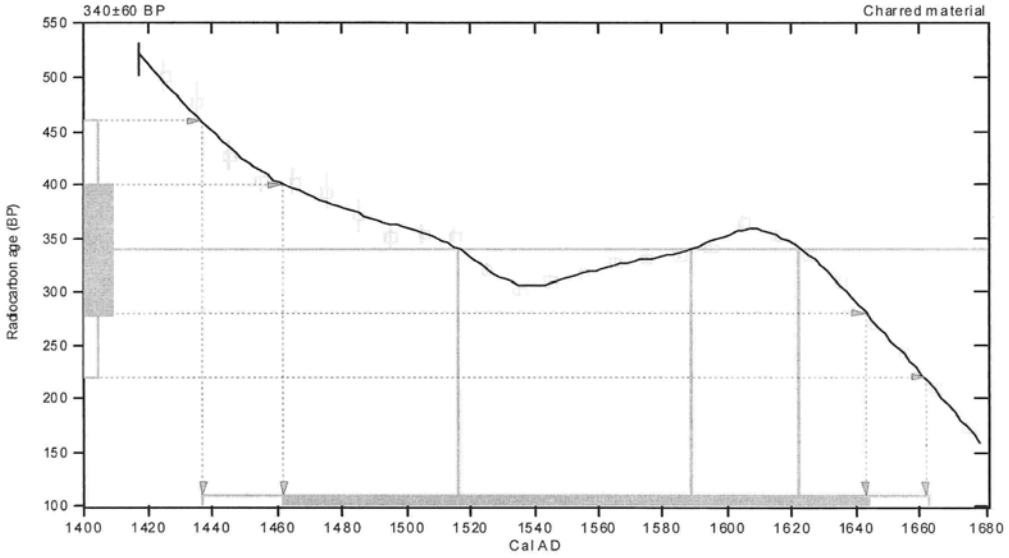
Conventional radiocarbon age: **340±60 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1440 to 1660 (Cal BP 510 to 290)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1520 (Cal BP 430) and Cal AD 1590 (Cal BP 360) and Cal AD 1620 (Cal BP 330)

1 Sigma calibrated result: (68% probability) Cal AD 1460 to 1640 (Cal BP 490 to 310)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.1:lab. mult=1)

Laboratory number: **Beta-212766**

Conventional radiocarbon age: **70±40 BP**

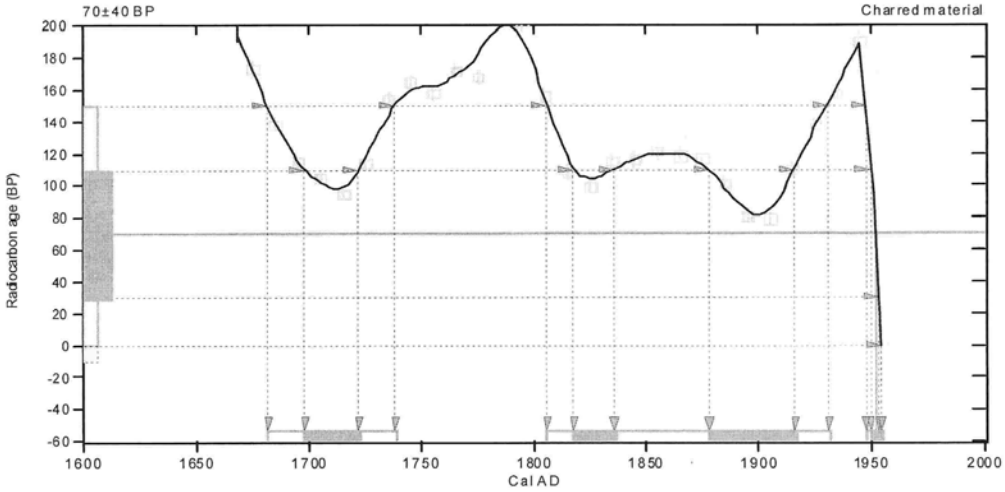
2 Sigma calibrated results[2]: (95% probability)
Cal AD 1680 to 1740 (Cal BP 270 to 210) and
Cal AD 1810 to 1930 (Cal BP 140 to 20) and
Cal AD 1950 to beyond 1960 (Cal BP 0 to 0)

[2] 2 Sigma range being quoted is the maximum antiquity based on the minus 2 Sigma range

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1950 (Cal BP 0)

1 Sigma calibrated results: (68% probability)
Cal AD 1700 to 1720 (Cal BP 250 to 230) and
Cal AD 1820 to 1840 (Cal BP 130 to 110) and
Cal AD 1880 to 1920 (Cal BP 70 to 30) and
Cal AD 1950 to 1950 (Cal BP 0 to 0)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.6:lab. mult=1)

Laboratory number: **Beta-212767**

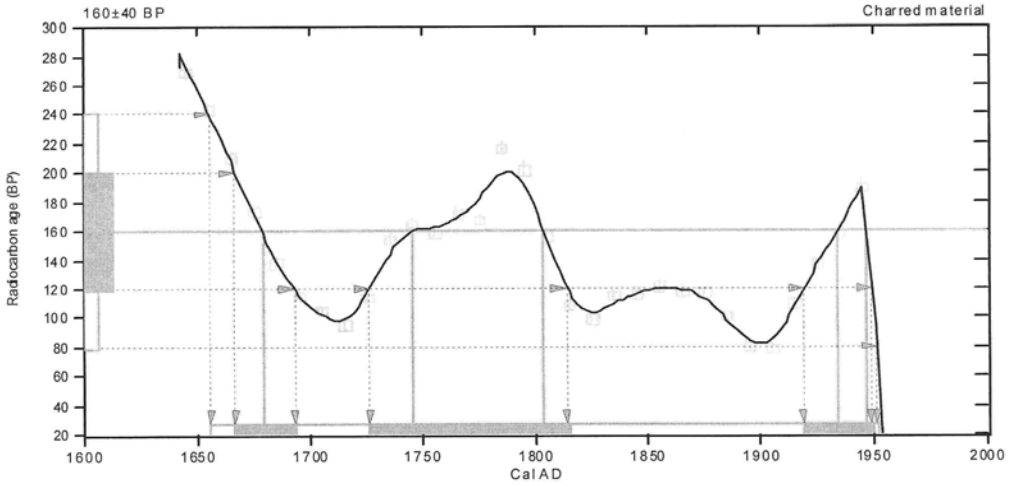
Conventional radiocarbon age: **160±40 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1660 to 1950 (Cal BP 290 to 0)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1680 (Cal BP 270) and
Cal AD 1740 (Cal BP 200) and
Cal AD 1800 (Cal BP 150) and
Cal AD 1930 (Cal BP 20) and
Cal AD 1950 (Cal BP 0)

1 Sigma calibrated results: (68% probability) Cal AD 1670 to 1690 (Cal BP 280 to 260) and
Cal AD 1730 to 1810 (Cal BP 220 to 140) and
Cal AD 1920 to 1950 (Cal BP 30 to 0)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.5:lab. mult=1)

Laboratory number: **Beta-212768**

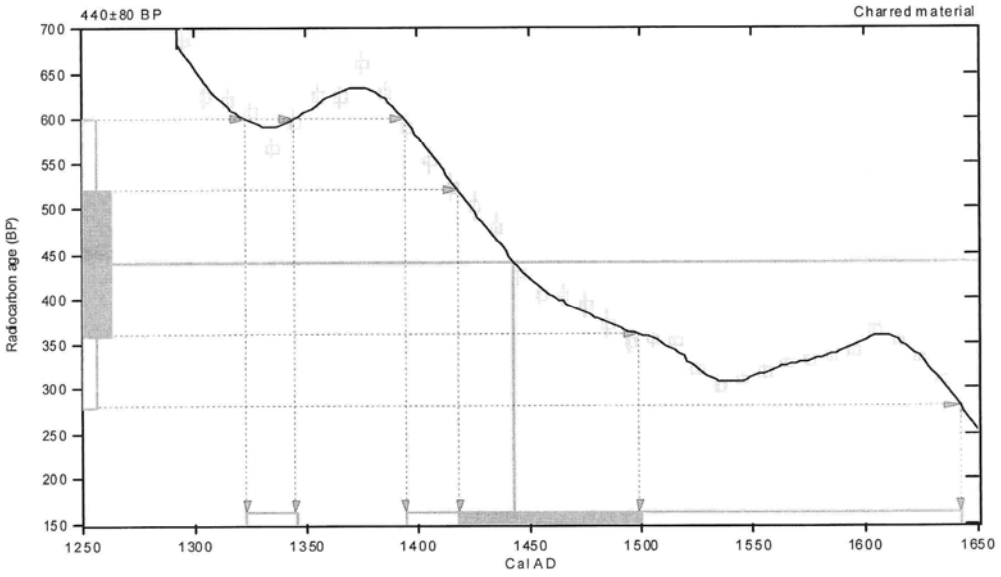
Conventional radiocarbon age: **440±80 BP**

2 Sigma calibrated results: **Cal AD 1320 to 1340 (Cal BP 630 to 600) and**
(95% probability) **Cal AD 1390 to 1640 (Cal BP 560 to 310)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1440 (Cal BP 510)

1 Sigma calibrated result: (68% probability) Cal AD 1420 to 1500 (Cal BP 530 to 450)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.4:lab. mult=1)

Laboratory number: **Beta-212769**

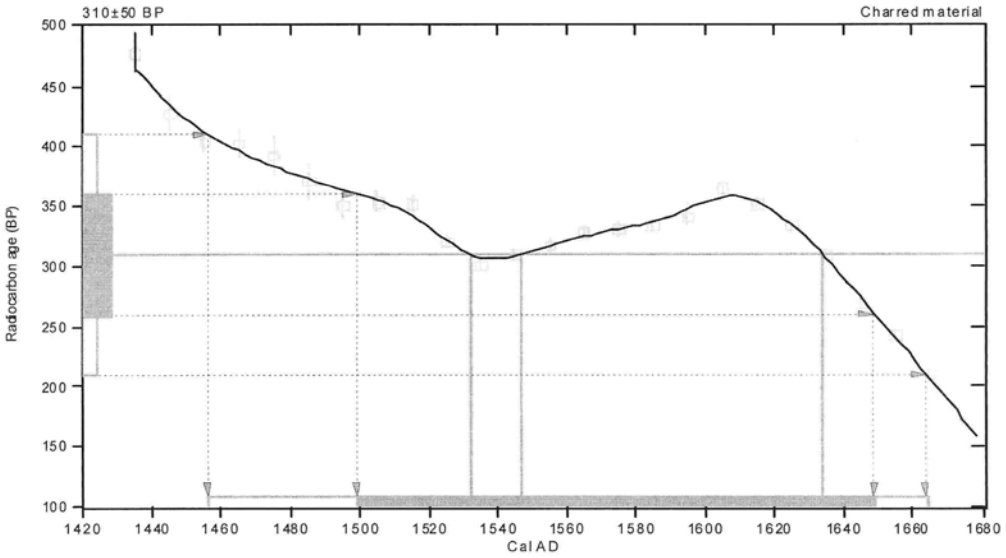
Conventional radiocarbon age: **310±50 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1460 to 1660 (Cal BP 490 to 290)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1530 (Cal BP 420) and Cal AD 1550 (Cal BP 400) and Cal AD 1630 (Cal BP 320)

1 Sigma calibrated result: (68% probability) Cal AD 1500 to 1650 (Cal BP 450 to 300)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.5:lab. mult=1)

Laboratory number: **Beta-212770**

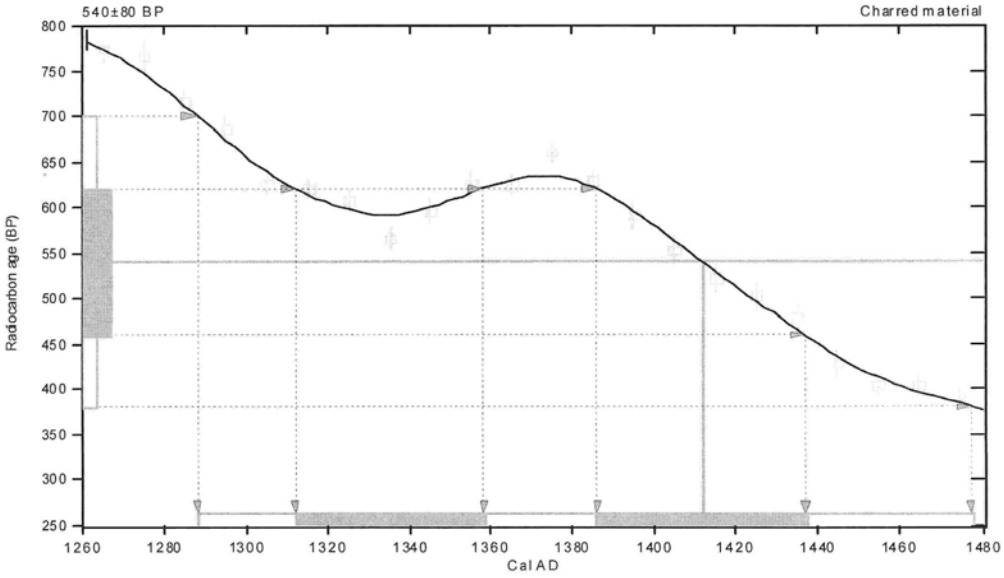
Conventional radiocarbon age: **540±80 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1290 to 1480 (Cal BP 660 to 470)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1410 (Cal BP 540)

1 Sigma calibrated results: (68% probability) Cal AD 1310 to 1360 (Cal BP 640 to 590) and Cal AD 1390 to 1440 (Cal BP 560 to 510)



References:

Database used

INTCAL98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com