
**Archaeological Inventory Survey of a
224.43-Acre Parcel within Portions of Kaloko and
Kohanaiki Ahupua‘a
North Kona District, Hawai‘i Island
TMK: [3] 7-3-009:017**

**Prepared for
Stanford Carr Development LLC**

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Management Summary

Reference	Archaeological Inventory Survey of a 224.43-Acre Parcel within Portions of Kaloko and Kohanaiki Ahupua'a, North Kona District, Hawai'i Island TMK: [3] 7-3-009:017
Date	March 2008
Project Number (s)	Cultural Surveys Hawai'i (CSH) Job Code: KOHAN 1
Investigation Permit Number	CSH performed the inventory survey fieldwork under state archaeological permit number 07-19, issued by State of Hawai'i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD).
Project Location	The project area is comprised of TMK: [3] 7-3-09:017. Fieldwork for the present project area was conducted simultaneously with fieldwork for three other adjacent parcels (TMK: [3] 7-3-009:025, 026, 028). The project area is located in portions of Kaloko and Kohanaiki <i>ahupua'a</i> ; and is approximately 1300 m east from the western coast of Hawai'i. The project area is bound by Queen Ka'ahumanu Highway to the west and Hina Lani Street to the south. This area is depicted on the 1996 USGS 7.5-Minute Series Topographic Map, Keahole Point Quadrangle.
Land Jurisdiction	Private, Stanford Carr Development Kaloko Makai, LLC
Reviewing Agencies	State Historic Preservation Division / Department of Land and Natural Resources (SHPD/DLNR).
Project Description	The proposed project comprises the development of a residential subdivision with limited retail establishments near Queen Ka'ahumanu Highway. Associated ground disturbance will include grading and excavation related to the project area's development, to include engineering topography, placement of structural footings, utility installation, roadway, and parking area installation, and landscaping. Importation of substantial construction gravel and fill dirt will also likely accompany much of the construction.
Project Acreage	224.43 acres.
Area of Potential Effect (APE) and Survey Acreage	The project's APE was generally conceived as the project's footprint (delimited by the boundaries of TMK: [3] 7-3-009:017). However, consideration was also given to potential project effects to known or potential historic properties outside the project footprint, for example those historic properties in the Kaloko-Honokōhau National Historic Park, located <i>makai</i> of the project area.

Historic Preservation Regulatory Context	At the request of Stanford Carr Development LLC, CSH undertook this archaeological inventory survey. In consultation with SHPD, the inventory survey investigation was designed to fulfill the state requirements for archaeological inventory survey (HAR Chapter 13-276). This document was prepared to support the proposed project's historic preservation review under Hawaii Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-284. The present document builds on, updates and improves a prior draft Archaeological Inventory Survey for this parcel (Collin et al. 1996) reviewed by the SHPD twice (8/15/1996, 4/7/1997) but not accepted by the SHPD.
Fieldwork Effort	The additional fieldwork effort for this revised archaeological inventory survey was carried out by Matthew Bell, B.A., Mindy Simonson, M.A., David Shideler, M.A., Jason Pickin, B.A., Mark Oxley, B.A., Shawn Fehrenbach, B. A., Doreen Hrivnak, B.A. and Hallett H. Hammatt, Ph.D (principle investigator). The fieldwork took place on the following dates: 20 February 2007 - 16 March 2007; July 9-13 2007, taking 100 person-days to complete.
Number of Historic Properties Identified	A total of 59 historic properties were identified within the project area. 53 of the historic properties were previously identified and 6 were newly recorded as part of the current inventory survey investigation.
Historic Properties Recommended Eligible to the Hawai'i Register of Historic Places (Hawai'i Register) ¹	<p>All 59 historic properties identified within the project area are recommended eligible to the Hawai'i Register:</p> <p>SIHP # 50-10-27-13493, Criterion D SIHP # 50-10-27-15324, Criterion D SIHP # 50-10-27-15325, Criterion D SIHP # 50-10-27-15329, Criterion D SIHP # 50-10-27-20696, Criterion D SIHP # 50-10-27-20697, Criterion D SIHP # 50-10-27-20698, Criterion D SIHP # 50-10-27-20699, Criterion D SIHP # 50-10-27-20700, Criterion D SIHP # 50-10-27-20701, Criterion D SIHP # 50-10-27-20702, Criterion D SIHP # 50-10-27-20703, Criterion D SIHP # 50-10-27-20704, Criterion D SIHP # 50-10-27-20705, Criterion D & E* SIHP # 50-10-27-20707, Criterion D SIHP # 50-10-27-20708, Criterion D SIHP # 50-10-27-20709, Criterion C & D SIHP # 50-10-27-20710, Criterion D SIHP # 50-10-27-20711, Criterion D SIHP # 50-10-27-20712, Criterion D</p>

<p>SIHP # 50-10-27-20713, Criterion D SIHP # 50-10-27-20714, Criterion D SIHP # 50-10-27-20715, Criterion D SIHP # 50-10-27-20716, Criterion D & E* SIHP # 50-10-27-20717, Criterion D SIHP # 50-10-27-20718, Criterion D SIHP # 50-10-27-20719, Criterion D SIHP # 50-10-27-20720, Criterion D & E* SIHP # 50-10-27-20721, Criterion D SIHP # 50-10-27-20722, Criterion D SIHP # 50-10-27-20724, Criterion D SIHP # 50-10-27-20725, Criterion D SIHP # 50-10-27-20726, Criterion D SIHP # 50-10-27-20727, Criterion D SIHP # 50-10-27-20728, Criterion D SIHP # 50-10-27-20730, Criterion D SIHP # 50-10-27-20731, Criterion D SIHP # 50-10-27-20732, Criterion D SIHP # 50-10-27-20733, Criterion D SIHP # 50-10-27-20734, Criterion D SIHP # 50-10-27-20736, Criterion D SIHP # 50-10-27-20737, Criterion D SIHP # 50-10-27-20738, Criterion D SIHP # 50-10-27-20739, Criterion D SIHP # 50-10-27-20740, Criterion D SIHP # 50-10-27-20742, Criterion D SIHP # 50-10-27-20743, Criterion D SIHP # 50-10-27-20744, Criterion D SIHP # 50-10-27-20745, Criterion D SIHP # 50-10-27-20746, Criterion D SIHP # 50-10-27-20747, Criterion D SIHP # 50-10-27-20748, Criterion D SIHP # 50-10-27-20749, Criterion D SIHP # 50-10-27-26259, Criterion D SIHP # 50-10-27-26260, Criterion D SIHP # 50-10-27-26261, Criterion D SIHP # 50-10-27-26262, Criterion D SIHP # 50-10-27-26263, Criterion D SIHP # 50-10-27-26264, Criterion D (* Site is a probable burial)</p>
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Historic Properties Recommended Ineligible to the Hawai‘i Register	None
Effect Recommendation	The proposed project will affect historic properties recommended eligible to the Hawai‘i Register. CSH’s project specific effect recommendation is “effect, with agreed upon mitigation measures.”
Mitigation Recommendation	<p>The following recommended significant historic properties will potentially be adversely affected by the proposed project. The recommended mitigation measures listed below are intended to alleviate this adverse effect. The scope and methods for these mitigation measures should be developed in consultation with SHPD. Historic properties not listed below have been adequately documented as part of this investigation and are not recommended for further cultural resource management work.</p> <p>SIHP # 50-10-27-15325, data recovery SIHP # 50-10-27-20697, data recovery SIHP # 50-10-27-20698A & B, data recovery SIHP # 50-10-27-20700, data recovery SIHP # 50-10-27-20702, data recovery SIHP # 50-10-27-20703A, data recovery SIHP # 50-10-27-20705, data recovery SIHP # 50-10-27-20708, data recovery SIHP # 50-10-27-20709, preservation SIHP # 50-10-27-20710A, data recovery SIHP # 50-10-27-20711, data recovery SIHP # 50-10-27-20715, data recovery SIHP # 50-10-27-20716, data recovery SIHP # 50-10-27-20719A, data recovery SIHP # 50-10-27-20721A, B, & D data recovery SIHP # 50-10-27-20725, preservation SIHP # 50-10-27-20727, data recovery SIHP # 50-10-27-20730, data recovery SIHP # 50-10-27-20749A & B, data recovery SIHP # 50-10-27-26260, data recovery SIHP # 50-10-27-26261, data recovery SIHP # 50-10-27-26263, data recovery</p>

¹ To be considered eligible for listing on the Hawai‘i Register a cultural resource must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet one or more of the following broad cultural/historic significance criteria: “A” associated with events that have made an important contribution to the broad patterns of our history; “B” associated with the lives of persons important in our past; “C” embodies the distinctive

characteristics of a type, period, or method of construction, represents the work of a master, or possesses high artistic value; “D” have yielded, or is likely to yield information important for research on prehistory or history; and, “E” have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property, or due to associations with traditional beliefs, events or oral history accounts – these associations being important to the group’s history and cultural identity

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Section 1 Introduction

1.1 Project Background

At the request of Stanford Carr Development, LLC, Cultural Surveys Hawai'i, Inc. (CSH) conducted an archaeological inventory survey of an approximately 224.43-acre parcel within portions of Kaloko and Kohanaiki Ahupua'a, North Kona District, Hawai'i Island, TMK: [3] 7-3-009:017. The project area is located approximately 1300 m east of the western coastline of Hawai'i; and is bound by Queen Kaahumanu Highway to the west and Hina Lani Street to the south (Figure 1 & Figure 2).

The approximately 224.43-acre parcel is privately owned by Stanford Carr Development Kaloko Makai, LLC. The proposed project comprises the development of a residential subdivision with limited retail establishments near Queen Ka'ahumanu Highway. Associated ground disturbance will include grading and excavation related to the project area's development, to include engineering topography, placement of structural footings, utility installation, roadway, and parking area installation, and landscaping. Importation of substantial construction gravel and fill dirt will also likely accompany much of the construction.

The survey area for the current investigation included the entire approximately 224.43-acre APE/project area. The proposed project was considered for its potential to impose adverse visual, auditory or other environmental impact to any known historic properties, including standing architecture, located outside the project area. Based on available information about the proposed development and the visual gravity of industrial/commercial development flanking the project area to the north and south, and Queen Ka'ahumanu Highway to the west (*makai*), the proposed project is considered to add to an established urban trend in coastal North Kona. Due to the standing precedent of visual, auditory and other potential environmental impact from existing and ongoing urban developments not related to the project, the project's APE is formally defined as the same as the project area. However, potential for the proposed project to affect nearby historic properties, such as those in Kaloko-Honokōhau National Park to the west, is taken into consideration in the Project Effect and Mitigation Recommendations section.

Fieldwork for the present project area was conducted simultaneously with fieldwork for three other adjacent parcels (TMK: [3] 7-3-009:025, 026, 028), for the same private owner. The CSH project number (job code) for the entire project is "KOHAN 1". Given the large size of the total project area (over 1,100-acres), a decision was made to split the archaeological inventory survey reports by individual TMK, producing a total of four reports. The present report is the archaeological inventory survey for TMK: [3] 7-3-009:017 only.

In 1996, Cultural Surveys Hawai'i conducted an archaeological inventory survey (Colin et al. 1996) with limited subsurface testing of the current 224.43-acre project area (TMK [3] 7-3-09:017) for Kimura International. Fifty-five (55) sites were identified within the project area. All identified sites were of pre-contact traditional Hawaiian origin and included the following site types: cairn, simple agricultural features, recurrent and temporary habitation sites, trails, enclosures, walls, and a quarry.

The Colin et al. 1996 report was reviewed by the State Historic Preservation Division (SHPD) twice [8/15/1996 (LOG NO: 17718; DOC NO: 9607PM22) and 4/7/1997 LOG NO: 19087; DOC NO: 9703PM02], however further revisions were requested (see Appendix A). During the review process the project was terminated; project funding stopped and final revisions to the report were not completed. Thus the Colin et al. report (1996) was never accepted by SHPD.

The current archaeological study has incorporated and updated the findings of the Colin et al. report (1996). Due to the improvements in technology used to locate sites, some sites reported in the Colin et al. 1996 report were found to better fit into the next parcel east (TMK 7-3-009:25). In these cases, the site descriptions have been moved into an upcoming report by CSH for this Tax Map Key parcel (Parcel 25).

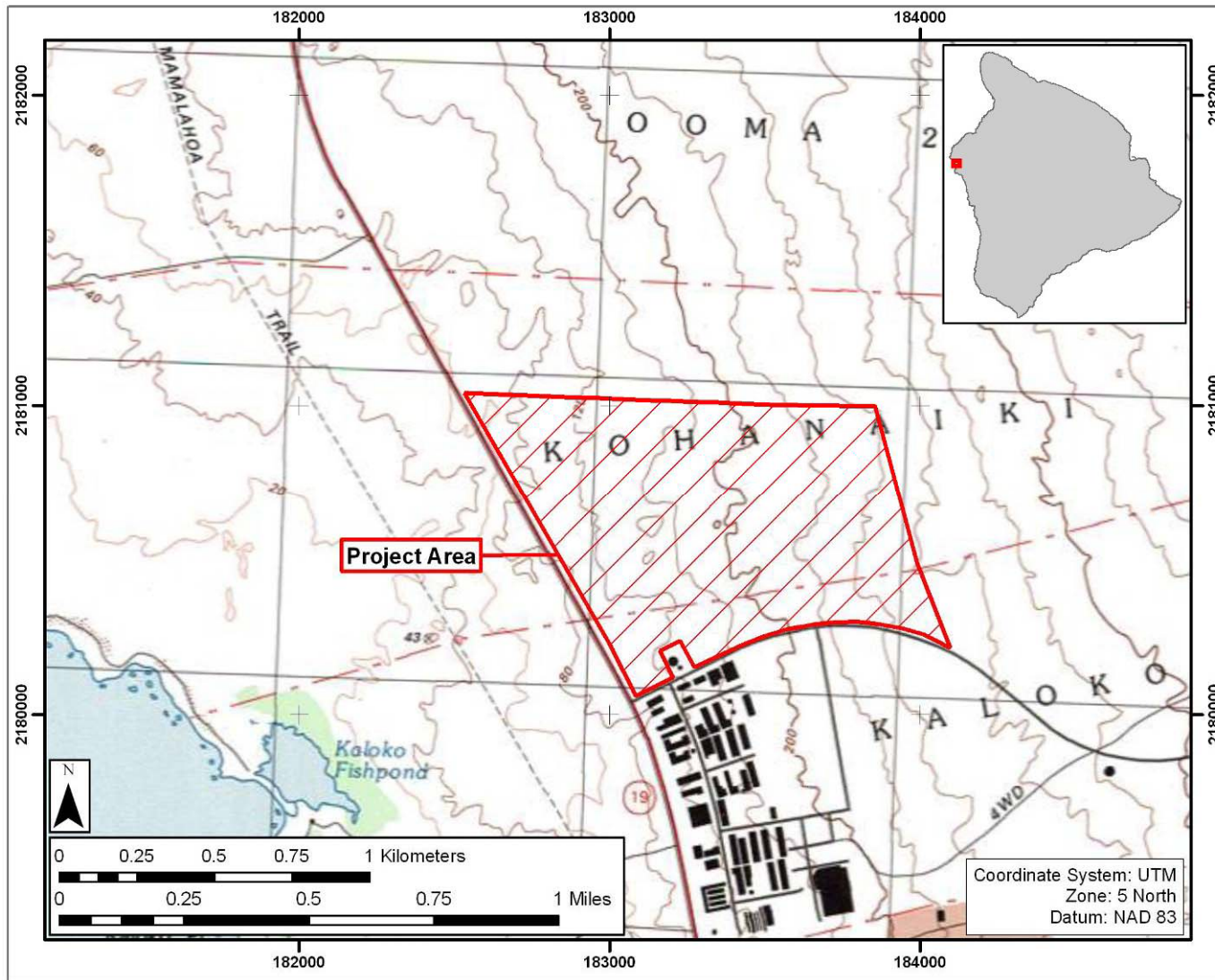


Figure 1. USGS 7.5 Minute Series Topographic Map, Keahole Point Quadrangle (1996), showing the location of the project area

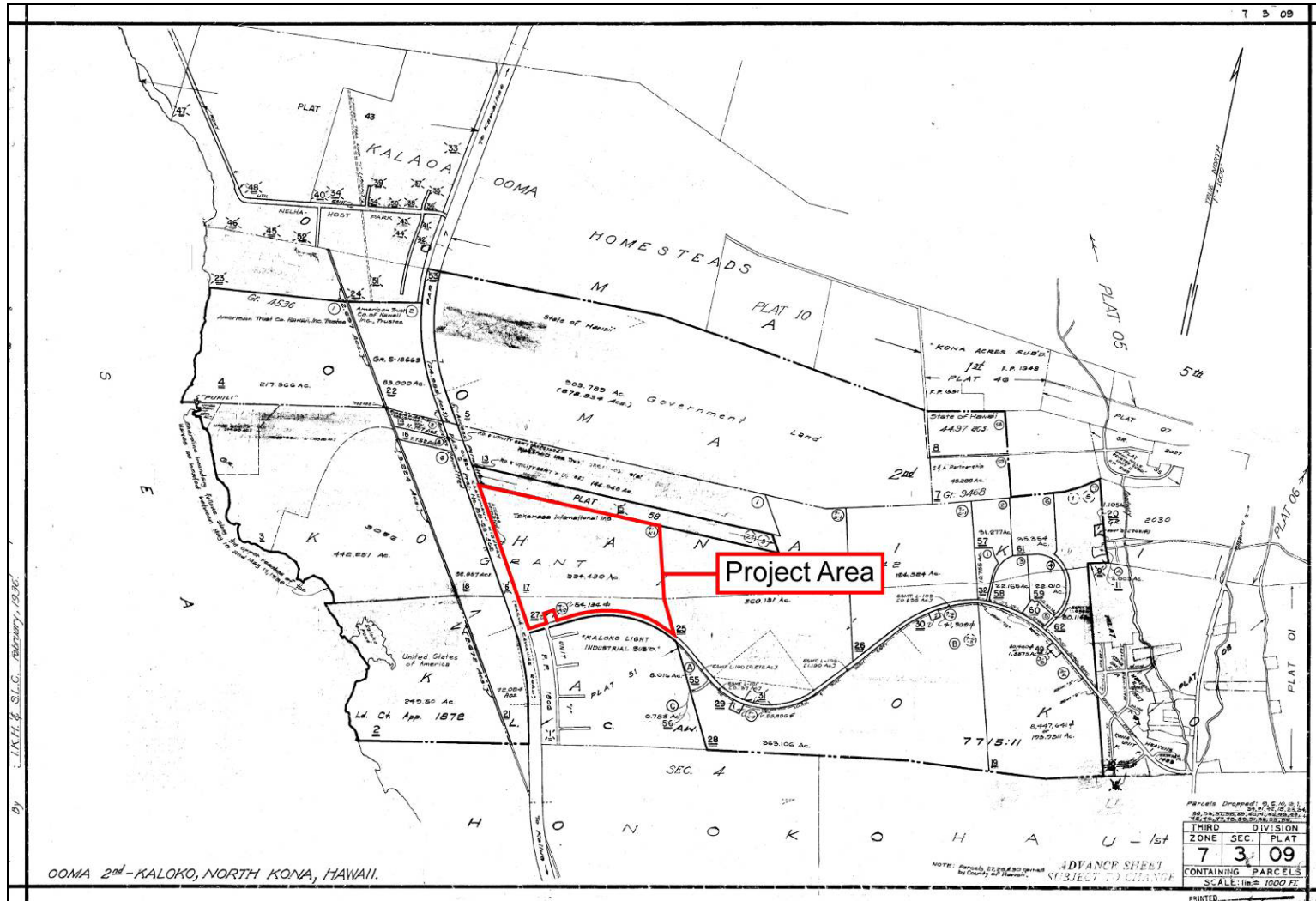


Figure 2. Tax Map Key (TMK) [3] 7-3-009: 017, showing project area

1.2 Historic Preservation Regulatory Context and Document Purpose

As a privately funded venture on private lands, the proposed development is a “project” subject to state of Hawai‘i historic preservation review legislation (Hawaii Revised Statutes [HRS] Chapter 6E-42 and Hawai‘i Administrative Rules [HAR] Chapter 13-284). Based on the project’s scope, cultural setting, and the results of previous cultural resource management investigations in the vicinity, Stanford Carr Development, LLC had this archaeological inventory survey investigation completed. This investigation was carried out as part of and in compliance with the proposed development’s historic preservation review.

Under Hawai‘i state historic preservation legislation, archaeological inventory surveys are designed to identify, document, and provide significance and mitigation recommendations for historic properties. Under this legislation, historic properties are defined as any “building, structure, object, district, area, or site, including *heiau* and underwater site, which is over fifty years old.” A project’s effect and potential mitigation measures are evaluated based on the project’s potential impact to “significant” historic properties (those historic properties determined eligible, based on established significance criteria, for inclusion in the Hawai‘i Register of Historic Places [Hawai‘i Register]). Determinations of eligibility to the Hawai‘i Register result when a state agency official’s historic property “significance assessment” is approved by the State Historic Preservation Division (SHPD), or when SHPD itself makes an eligibility determination for an historic property (HAR Chapter 13-284).

In consultation with SHPD, this inventory survey investigation was designed to fulfill the state requirements for archaeological inventory surveys (HAR Chapter 13-276). This inventory survey report was prepared to support the proposed project’s historic preservation review. The report includes a project-specific effect recommendation and mitigation recommendations for the project area’s historic properties that are recommended eligible to the Hawai‘i Register. This document is intended to support project-related historic preservation consultation among state agencies and interested Native Hawaiian and community groups.

1.3 Scope of Work

The following archaeological inventory survey scope of work was developed and implemented to satisfy SHPD requirements. The scope of work for this inventory survey was designed in accord with State Historic Preservation Division rules governing standards for archaeological inventory surveys and reports (HAR 13-13-276):

- 1) Appropriate consultation with knowledgeable members of the community, requesting information on historic properties in the project area.
- 2) A complete ground survey of the entire project area for the purpose of historic property identification and documentation. All historic properties would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected historic properties. All historic properties will be assigned *Inventory of Historic Properties* numbers by the State.
- 3) Subsurface testing to determine if subsurface deposits are located in the project area, and, if so, evaluate their significance. If appropriate samples from these excavations are found, they will be analyzed for chronological and paleoenvironmental information.

- 4) Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents. This research will focus on the specific area with general background on the *ahupua'a* and district and will emphasize settlement patterns.
- 5) Preparation of a survey report which will include the following:
 - a. A topographic map of the survey area showing all historic properties;
 - b. Results of consultation with knowledgeable community members about the property and its historical and cultural issues.
 - c. Description of all historic properties with selected photographs, scale drawings, and discussions of function;
 - d. Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the project area's historic properties;
 - e. A summary of historic property categories and their significance in an archaeological and historic context;
 - f. Recommendations based on all information generated that will specify what steps should be taken to mitigate impact of development on the project area's significant historic properties - such as data recovery (excavation) and preservation of specific areas. These recommendations will be developed in consultation with the client and the State agencies.

This scope of work includes full coordination with the State Historic Preservation Division (SHPD), and the County of Hawai'i relating to archaeological matters. This coordination takes place after consent of the landowner or representatives.

1.4 Environmental Setting

1.4.1 Natural Environment

The project area comprises approximately 224 acres in the *ahupua'a* of Kaloko and Kohanaiki. The lands are located on the leeward coast of Hawai'i Island within the district of North Kona on the lower west slope of Hualālai Volcano. The project area stretches *mauka* from Queen Ka'ahumanu Highway, and is bordered by Hina-Lani Road to the southwest. Elevation within the project area ranges from 90 ft a.m.s.l. at Queen Ka'ahumanu Highway to 340 ft a.m.s.l. along the eastern boundary.

Kona weather is typified by afternoon showers brought on by warm air which has been moved inland by light sea breezes. The humid air gradually condenses over higher altitudes throughout the day. At night the land cools resulting in breezes that send warm air back out to sea. Rainfall in the Kaloko project area averages 10 inches per year (Cordy 1991). There are no natural springs or perennial streams within the project area.

The land surface is comprised predominately of exposed *'a'ā* and *pāhoehoe* lava. Two *'a'ā* lava flows occur along the north side of the project area, extending in a *mauka/makai* direction for the entire length of the project area. A smaller *'a'ā* flow is also located in the south west corner of the project area, and extends in a roughly southeast/northwest direction. The surface of the *'a'ā* lava ranges from roughly level expanses to rough fractured ridges.

Pāhoehoe lava covers the central and south sections of the project area from *mauka* to *makai*. The surface is generally uneven and characterized by numerous tumuli and pressure ridges with depressions or undulations in the *pāhoehoe* having thin soil pockets. Collapsed portions of lava tubes also contribute to the uneven surface of the *pāhoehoe* flows.

Grasses dominate the project area vegetation, with predominately non-native fountain grass (*Pennisetum sectacacum* or *sectacacum*) and the less common native *pili* (*Heteropogon contortus*). Shrubs and trees present include: the native *'ilima* (*Sida fallax*) in scattered numbers, the non-native *klu* (*Acacia fornesiana*), lantana (*Lantana camera*), native *noni* (*Morinda citrifolia*), and a few *kiawe* (*Prosopis pallida*), and *'ōhi'a* (*Metrosideros polymorpha*) trees, along with an abundance of the non-native *koa haole* (*Leucanena glauca*).

1.4.2 Built Environment

Though much of the land around the project area remains rural, the built environment is distinct near the Queen Ka'ahumanu Highway. To the north of the project area is a light industrial area bordering Huliko'a Drive built after the Colin et al. 1996 study. This area is marked by the Matsuyama Market and Pine Tree Cafe near the intersection of Huliko'a Drive and the highway. The area is marked by a stone sign "Kohanaiki." Today the industrial area is nearly complete, though some construction on lots there continues.

To the south of the project area is a second and older industrial area often referred to as "Kaloko Industrial" or "New Industrial" (in reference to an older industrial area near the old Kona airport). This area features numerous large warehouses, light industrial and commercial occupying industrial style buildings (Home Depot and Costco, among others). As of the writing of this report, construction has commenced on additions to this commercial/industrial area *mauka* of the existing warehouses.

A large, white water tank is located on the north side of Hina Lani immediately adjacent to the property. It is a distinct landmark and is very near the intersection of Hina Lani and the highway.

The project area appears not to have been dramatically impacted by modern activity. However, portions of the *'a'ā* flow along the *mauka* boundary of the project area have numerous bulldozer roads crossing them. Bulldozer push piles and tracks are also visible around the edges of the *'a'ā* within this boundary area and along a barbwire fence that runs south along the boundary from the *'a'ā* to Hina Lani Street. This barbed wire fence has a cattle gate near the *'a'ā* flow, indicating regular ranching access to the project area was likely, though no evidence of extended grazing was noted. Occasionally, other bulldozer roads cross the *'a'ā* in the central project area, and bulldozer tread scars were noted occasionally on bedrock, but broad areas of bulldozing such as grubbing or grading are rare and are generally within a short distance (approximately 20m) of Hina Lani Street. At least one previously identified historic property may have been destroyed by some of this limited bulldozing near Hina Lani. Similarly, there is a swath of bulldozing around the water tank located on Hina Lani in the lower project area.

Section 2 Methods

2.1 Field Methods

The fieldwork effort was carried out by Matthew Bell, B.A., Mindy Simonson, M.A., David Shideler, M.A., Jason Pickin, B.A., Mark Oxley, B.A., Shawn Fehrenbach, B. A., Doreen Hrivnak, B.A., Kelley Esh, M.A. and Hallett H. Hammatt, Ph.D (principle investigator). The fieldwork took place on the following dates: 20 February 2007 - 16 March 2007; July 9-13 2007, taking 100 person-days to complete. This does not take into account time spent on pedestrian sweeps during the Colin et. al. 1996 study for which this information is not available.

The fieldwork component of the archaeological inventory survey was carried out under archaeological permit number 07-19 issued by the Hawai'i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai'i Administrative Rules (HAR) Chapter 13-282.

Fieldwork consisted of a 100% coverage pedestrian inspection of the approximately 224-acre study area with limited subsurface testing at select archaeological sites. The pedestrian inspection of the study area was accomplished through systematic sweeps. The interval between the archaeologists was generally 5-10 m. All historic properties encountered were recorded and documented with a written field description, scale drawings, photographs, and located with high quality GPS units including Garmin 60CSx high sensitivity units (accuracy +/- 3 m), and sites requiring the highest precision available, such as those recommended for preservation, were further located using Trimble Pro XR GPS survey technology (accuracy +/- 1 m).

Subsurface testing consisted of the partial excavation, by hand, of selected surface archaeological features located during the pedestrian survey. The purpose of the subsurface testing was to aid in determining the function of located surface sites, and to attempt to obtain datable materials for later radiocarbon dating. In order to focus subsurface testing at sites with the best excavation potential, depth of deposits or construction was assessed as part of determining excavation potential. This assessment consisted of careful observation of the depth of crevices, stacked rock and piled rock that included careful removal and replacement of small portions of the top course of construction. In the event this minor removal of material allowed a natural ground surface to be observed and an absence of cultural material to be confirmed, excavation potential was generally observed to be poor. Otherwise a formal excavation was generally undertaken and reported in detail in conjunction with the respective site description.

All excavated material was sifted through a 1/8 in. wire mesh screen to separate out the soil matrix. All cultural material was collected for analysis in the lab, except in the event excavation determined the site was a burial (or probable burial) in which case cultural material was carefully returned to the excavation. Each test excavation was documented with a scale section profile, photographs, and sediment descriptions. Sediment descriptions included characterizations of Munsell color designations, compactness, texture, structure, inclusions, cultural material present, and boundary distinctness and topography. A stratigraphic profile is usually generated for at least one soil profile per test unit, five test units had such shallow (5 cm / 0.2 ft. or less) soil layers, with only a single soil stratum present, that graphic presentations would not aid in strata description and were therefore not included with the testing results.

2.2 Laboratory Methods

Laboratory analyses of material recovered from limited subsurface testing within the project area included:

1. Preparation and submittal of datable material, such as charcoal, to Beta Analytic for radiocarbon dating.
2. Identification of invertebrate midden. Common marine shells were identified and analyzed at the Cultural Surveys Hawai'i laboratory in Kailua, Hawai'i.
3. Identification of vertebrate faunal material. All vertebrate faunal material was identified and analyzed at the Cultural Surveys Hawai'i laboratory in Kailua, Hawai'i.
4. Identification and cataloguing of traditional Hawaiian artifacts. Any artifacts collected in situ at the project area or contained within sediment samples were measured, weighed and classified by material type and artifact form. The analysis then focused on distinguishing artifact function.

2.3 Document Review

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR); a review of geology and cultural history documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Mission Houses Museum Library, the Hawai'i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai'i State Archives and the Archives of the Bishop Museum; and a study of historic maps at the Survey Office of the DLNR. Information on LCAs was accessed through Waihona 'Āina Corporation's Māhele Data Base (www.waihona.com).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected type and location of sub-surface pre and post-contact historic properties in the project area.

2.4 Consultation

A cultural impact assessment (Hammatt & Shideler 1996) was conducted for the project area in 1996 as a companion study to the Collin et al. (1996) study of the project area. Informants knowledgeable of the project area were interviewed. These consultations focused on identifying traditional cultural practices conducted within the project area as well as addressed community concerns regarding possible burial sites. A summary of the consultation effort is presented in Section 6 of the present study.

Section 3 Background Research

3.1 Mythological and Traditional Accounts

The *ahupua'a* of Kohanaiki and Kaloko lie at the southern end of Kekaha, the portion of North Kona extending from Honokōhau to 'Anaeho'omalū. The character of Kekaha - as it had been established in the Hawaiian consciousness - is represented in a traditional saying recorded by Mary Kawena Pukui and in a brief description by John Papa 'Ī'ī. The saying, "*Kekaha wai 'ole na Kona*", is defined by Pukui as "waterless Kekaha of the Kona district" and explicated by her as "Kekaha in Kona, Hawai'i, is known for its scarcity of water but is dearly loved by its inhabitants" (Pukui 1983:184). 'Ī'ī describes

...a cold wind from Kekaha, the Hoolua. Because of the calm of that land, people often slept outside of [sic] the tapa drying sites at night. It is said to be a land that grows cold with a dew-laden breeze, but perhaps not so cold as in Hilo when the Alahonua blows. ['Ī'ī 1959:122]

These passages suggest that Kekaha was firmly identified with its austere physical environment. A legend told in Maguire (1966) reveals the importance of water resources in this general area (see also Wolforth 2005:8-9). The story takes place at the Cave of Mākālei, which is located outside of the current project *ahupua'a* near 'Akahipu'u (a nearby mountain). The story focuses on a man named Ko'amokumokuohe'eia, who moved to this area and was told by the current residents that water here is very scarce. They told him that water could be obtained in "celebrated" caves, but that these were *kapu* (forbidden), and if caught he will likely be killed by the owner of the cave. However, Ko'amokumokuohe'eia discovered a very small cave entrance which apparently no else knew about. The cave had water dripping from the roof of the cave (Maguire 1966:30). Ko'amokumokuohe'eia and his father used carved 'ōhi'a and wiliwili trees to capture the dripping water, and his family was thus able to survive during dry spells. This legend clearly demonstrates the importance of water as a general resource as well as the importance of water collection caves.

Describing the apportioning of land by the *ali'i* (royalty) before the ascendancy of Kamehameha, the pioneer nineteenth-century Hawaiian historian Samuel M. Kamakau records:

Waimea was given to the Pa'ao kahuna class in perpetuity and was held by them up to the time of Kamehameha III when titles had to be obtained. But there was one land title held by the kahuna class for many years and that was Puuepa in Kohala. In the same way the land of Kekaha was held by the kahuna class of Ka-uahi and Nahulu. (Kamakau 1961:231)

Kamakau further records that during the 1770s, "Kekaha and the lands of that section" were held by descendants of the Nahulu line, the Ka-me'e-ia-moku and Ka-manawa, the twin half brothers of Ke'e-au-moku, the Hawai'i island chief (Kamakau 1961:310).

Kamakau mentions Kaloko in an episode that suggests that *ahupua'a*'s significance within the pre-contact Kekaha landscape. Kamakau recounts an extraordinary day's reconnaissance of the west coast of Hawai'i Island by the spy Ka-uhi-o-ka-lani, sent to the island by Kama-lala-walu,

chief of Maui. Having reached Kawaihae by canoe at night, Ka-uhi-o-ka-lani “ran about that same evening [reaching as far south as Ka‘awaloa] and returned before the canoes were dismantled...” Ka-uhi-o-ka-lani, recounting his journey and the landmarks he had observed, relates: “I went on to the long stretch of sand, to the small bay with a point on that side and one on this side. There are large inland ponds.” He is told that the “sandy stretch is ‘Ohiki, and the walled-in ponds are Kaloko and Honokōhau” (Kamakau 1961:56). This event unfolds during the time of the sixteenth-century Hawai'i Island *ali'i* Lono-i-ka-makahiki, suggesting that by the 1500s Kaloko and its fishpond were well-known features in the Kekaha landscape.

Intensive archaeological investigation during recent decades has clarified the picture of pre-contact Hawaiian life within Kekaha and the two *ahupua'a* under study. A detailed study of Kaloko by Cordy et al. for the National Parks Service has developed a model of pre-contact settlement throughout the *ahupua'a*. The following is a summary of this model provided by the National Parks Service:

Permanent settlements in the leeward portions of Hawai'i Island began by the A.D. 900s to 1000s, and possibly earlier. These would have occurred near favorable water sources, Kaloko bay probably having been one of the most sheltered and inviting large inlets along the Kona Coast. Coastal habitations had expanded by the 1200s, utilizing inland fields as well as sea resources for subsistence. The Kekaha lands north of Kaloko and extending to Kohala are thought to have undergone initial permanent settlement beginning in the 1400s, with subsequent occupation of the coast north and south over the next few centuries.

Sometime during the period of 1580 to 1600, Laeanuikaumanamana, the *kahuna-nui* of the ruling chief, Liloa, acquired the Kekaha region. It is thought that the construction of fishponds at Kaloko and Honokahau began during this time, with Kaloko Fishpond dating from at least the 1400s to 1500s. During the 1600s to 1700s, as the Kona Coast population grew with the establishment of the royal residence of 'Umi-a-Liloa at Kona and the consequent increased demand for food production, Kaloko also increased to probably almost 200 residents. It continually supported a higher population than other Kekaha areas because of its fishpond and extensive inland field system [Cordy et al. 1991 summarized online by the National Parks Service, http://www.nps.gov/history/history/online_books/kona/history8a.htm].

The general pattern of land use and settlement suggested for Kaloko may also have existed within the similar environment of neighboring Kohanaiki.

Into the last decades of the 18th century - following western contact - Kohanaiki and Kaloko - as elements of the larger Kekaha area -remained under the control of Ka-me'e-ia-moku, who resided to the north at Ka'ūpūlehu (Kamakau 1961:147).

3.2 1800 to 1850s

By the first decades of the 19th century, the inhabitants of Kaloko and Kohanaiki would have long experienced the social pressures and consequences of western contact. “As early as 1788, Hawaiians began enlisting as seamen on the foreign ships that stopped at Island ports, and their

number increased rapidly with the growth of whaling in the Pacific” (Schmitt 1973:16). As harbor facilities were developed at Kailua and Kealahou during the early 1800s, these burgeoning ports became centers of a population drawn from increasingly isolated (economically and socially) areas like Kaloko and Kohanaiki. Newly-introduced diseases cut the population severely.

Kaloko is recorded by Kamakau as the site where Kamehameha's bones were cached after his death in 1819:

Kamehameha had...entrusted his bones to Ulu-maheiehi Hoa-pili with instructions to put them in a place which would never be pointed out to anyone. At midnight, therefore, when black darkness had fallen and no one was likely to be on the road and the rough lava plains of Pu'ukaloa lay hushed, Hoa-pili sent his man, Ho'olulu, to bring the container of wicker work in which the bones of Kamehameha were kept to Kaloko in Kekaha...The next morning Hoa-pili and Ke-opu-lani took canoe to Kaloko where Hoa-pili met the man who had charge of the secret cave and together they placed the bones there [Kamakau 1961:215].

Kamakau's account, if accurate, suggests that Kaloko's population, toward the end of the 19th century's second decade, had diminished to such an extent that the *ahupua'a* could provide the necessary isolation and secrecy for the burial.

Missionary censuses of the 1830s chart the diminishing population of Kekaha and North Kona. In 1834, the total population of Kekaha is recorded as 1,244, comprising 21% of the total North Kona population of 5,957 (Schmitt 1973:31). The North Kona figure represents a population loss of 692 since the previous census of 1831 (during which no figure specific to Kekaha was noted), which recorded 6,649 persons in the district (Schmitt 1973:9). One factor - inter-island migration - inducing the diminishing population of Kona was specifically noted by missionaries in 1832: “We have been sensible for some time that the number of inhabitants in this island is on the decrease. There is an almost constant moving of the people to the leeward islands, especially since the removal of the governor (Kuakini) to Oahu. Some leave by order of the chiefs, and others go on their own responsibility” (cited in Schmitt 1973:16).

Records generated during the 1840s for Land Commission Awards (LCAs) conferred at mid-century document the disposition of population and land use within Kohanaiki and Kaloko *ahupua'a* that had evolved since western contact. At the Māhele of 1848, Kaloko was claimed by and awarded (LCA 7715) to Lot Kamehameha (who would become Kamehameha V). Kohanaiki was classified as Government Land. Subsequently, 18 *kuleana* claims - by commoners claiming to occupy and/or cultivate land parcels - were made in Kaloko. Twelve of these claims were awarded. All claims were for *mauka* lands - between 1200 and 1700 ft. elevation - adjacent to or just *makai* of the Government Road. Only testimony for Kahiona's LCA 9205/9237 claim (which was not awarded) mentions a fishpond; no site within the coastal area is claimed. Farmlands claimed are *māla*, *kāhāpai*, and *mo'ō*, i.e. forms of dry land agriculture; actual crops identified in the award testimonies are taro and sweet potato. Only five of the total 18 claims mention residence on or use of the Kaloko lands dating to the time of Kamehameha I, the first decades of the nineteenth century; the remaining claims testify to residence/use beginning in the 1830s and 1840s.

Parcels within Kohanaiki, having become Government Land, were subject to sale - designated grants - by the Hawaiian government. Land sales began in the 1850s with Grant 2030 to Kaiakoili in 1856, awarding 102 acres adjacent to and *makai* of the Government Road. Also beginning in the 1850s, the first taxpayer rolls for Kohanaiki and Kaloko were documented: they indicate, within Kohanaiki, 8, 13 and 12 taxpayers during the years 1857, 1859 and 1860, respectively; within Kaloko, during the same years, 19, 21 and 23 taxpayers were recorded. Just past the middle of the 19th century, the populations of Kaloko and Kohanaiki have been drawn beyond the original subsistence-based economy into the western commercial paradigm.

As Cordy notes about Kaloko: "The historical documents suggest that by the 1840s-1850s, the Coastal Zone had been abandoned as a residential area, except probably for a house used by the fishpond's caretaker. This pattern would have been a stunning change from prehistoric and early historic times, when many coastal residences were present" (Cordy 1991:288). This pattern likely also held for Kohanaiki.

3.3 1860-1900

The division of Kohanaiki - through sales of Government lands -continued throughout the remainder of the 19th and into the 20th century. Grant 2942 in 1864 awarded to Huliko'a 929.75 acres which included the width of the *ahupua'a*, extending *makai* from Kaiakoili's grant. In 1871, Grant 3086 awarded 154 acres to Kapena; this parcel extended *makai* from Huliko'a's grant to the shoreline.

Kaloko is documented during the 1870s in testimonies by Hawaiians before the government's Boundary Commission. Testifying on August 12, 1873, Nahuina (who had earlier received LCA 10327 in Kaloko) describes himself as "born at Kaloko North Kona Hawaii at the time of Keikepui, the building of the *heiau* at Kailua, and have always lived there" and states that the boundaries of Kaloko were shown to him by his father, the former *konoiki* of the *ahupua'a*. Identifying the *mauka* portions of the boundary, Nahuina notes bounds defined by vegetation and a wall (*iwi 'aina*), and recalls a former habitation site:

...From the *makai* side of Kaupulehu the boundary runs along said land, the *koa* being on Kaloko and the *mamani* and *pukeawe* [*sic*] on Kaupulehu to the corner of Lanihau 2nd Keahuolu and Honokohaunui...Ohiawela, a *pali*, on the road through the woods is a point on the boundary. This place is above Honokohaunui, thence turn *makai* to Kahua, a place in the fern where houses used to stand, from thence the boundary runs *makai* along an *iwi aina* to Kapokalani, at the Government road. Thence *makai* still following the *iwi aina* to Kiikii an *ili aina*, thence to Kaohe, a grove of trees thence to *aa*...

Nahuina adds that Kaloko has "ancient fishing rights extending out to sea." Testifying on the same date, Hoohia, who "moved to Honokohauiki when quite small and reside there now", adds details that suggest the *mauka* Kaloko-Honokōhau boundary was defined by different vegetation that also reflected former traditional gathering rights: "Honokohaunui ends at Ohiawela, a *pali*. Kaloko takes the *koa*, and Honokohaunui, the *ohia*...The *olona* grows on Honokohaunui and Kealakehe and the *koa* on Kaloko."

Kaloko continued to be held by the *ali'i* throughout the remainder of the 19th century, passing, after the death of Lot Kamehameha, successively to Bernice Pauahi Bishop, Kalākaua and Kapi'olani.

During the 1880s, Kona lands - including Kaloko and Kohanaiki - were surveyed by J.S. Emerson for the Hawaiian government. Emerson produced three maps corresponding to the project area during this time period: Registered Map (RM) 1280, RM 1449, and RM 1512. Emerson's assistant, J. Perryman also produced sketches of the west slopes of Hualālai. Though other surveyors and historians have produced maps for the area, these maps are the most comprehensive known. RM 1280 (Figure 3) is perhaps cited and reproduced with the most frequency. It is often dated to 1888, but in fact the map does not indicate the date, only the date the map was traced by another surveyor in 1952 for reproduction purposes. An independent attempt to verify its date during the present study was unsuccessful, as the original map is now retired and not available from the State Survey office. Circumstantial evidence dating the map includes the sketches of J. Perryman dated to 1882 which match the features of this map well and a date range penciled on the back of the traced map on file - "1877-1903." RM 1449 and RM 1512, dating to 1888 and 1889 respectively, are essentially maps of the same series. RM 1449 is a broad overview map ranging from Kaloko to Kūki'o in the north, RM 1512 is a detail of the land grants around the government road.

A portion of RM 1280 (Figure 3) shows the locations of the three large Kohanaiki grants discussed earlier. Also indicated are "Kealiihelepa Hse" at the coast above the Kaloko fish pond and, near the government roads, "Kaloko Cath. Church" and "Kohanaiki Church" which is likely the Protestant church recorded as built by a minister, Kaanohimaka, and his congregation in the 1870s (Kelly 1971:14). As noted by Cordy (1991:418), Emerson's map of the area including the Kohanaiki Church indicates "a set of about 16 stone house enclosures and a Protestant church, collectively called the Kohanaiki Homesteads"; Cordy suggests a "late 1880s age for the formation of the Kohanaiki Homesteads". Kelly (1971) notes that the Kohanaiki Homesteads would draw people as other areas of North Kona were abandoned. Government records of Kohanaiki grants show 18 parcels ranging in size from 0.73 acres to 25.45 acres awarded between 1895 and 1904.

A composite of RM 1449 and RM 1512 (Figure 4) shows an alternative view of both the country side and the detail in the area of the Kohanaiki Homesteads. Most visible are family claims in the Kohanaiki Homesteads and Kohanaiki Road running directly *makai* from the homesteads. The road ends abruptly on RM 1449, though it appears to come close to joining the prominent "Lower Government Road." Strangely the indication of the "Lower Government Road" also ends shortly into Kaloko.

While all three Emerson maps are informative of the area, there are inconsistencies that are difficult to interpret. RM 1280 was likely produced with a somewhat different intent than the other two maps though they were all surveyed in such a short time period. Suggestive of the different intent, RM 1280 does not indicate survey stations as the others do. However, perhaps the largest inconsistency is the route of the two roads extending *makai* from the homesteads – on RM 1280 crossing into Kaloko just outside of the homesteads and on RM 1449 crossing just upslope of the project area. Since RM 1280 does not give a name to this road and the date of the map is somewhat uncertain, it could be that there were two roads, one superseding the other. It is

also likely that RM 1280 was a simply a preliminary survey (if the dates for J. Perryman's sketches date the map) and was less accurate (didn't extensively use survey markers).

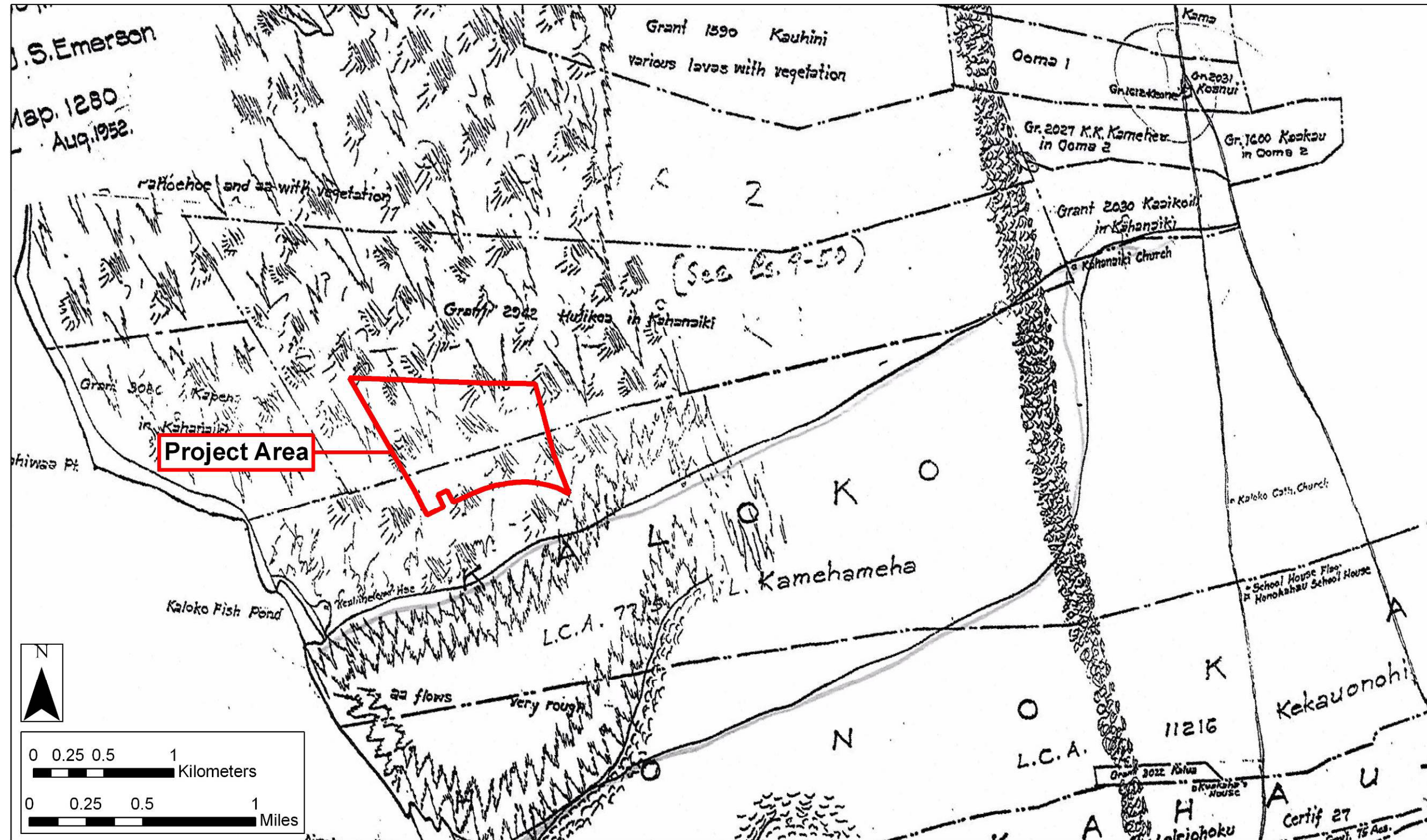


Figure 3. Portion of Registered Map 1280 by J. S. Emerson showing approximate location of project area

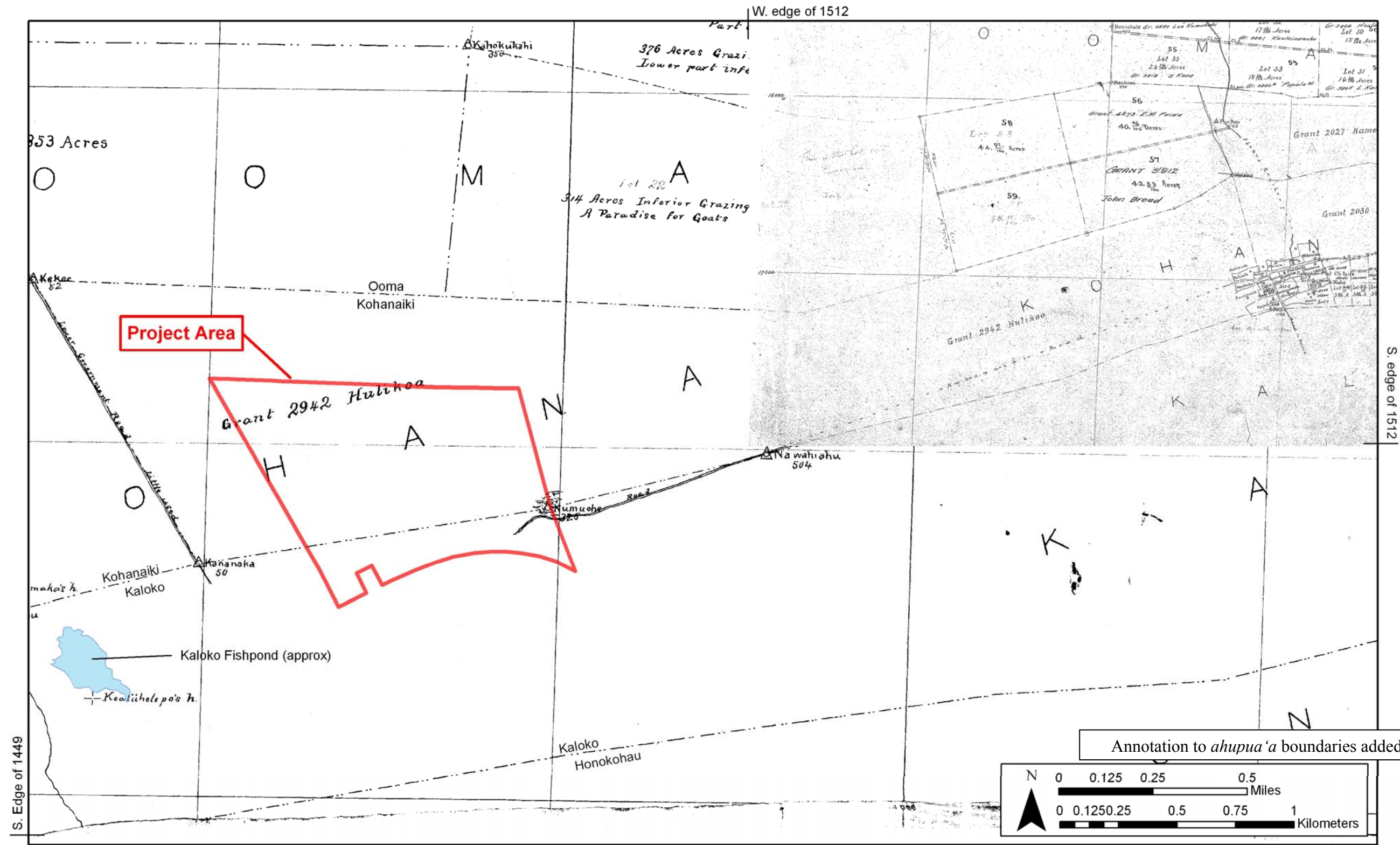


Figure 4. Composite of Registered Maps 1449 and 1512 (1888 and 1889) showing the location of the project area in respect to landmarks such as Kohanaiki Homesteads, Kohanaiki Road and Kaloko Fishpond.

3.4 1900s

During the 20th century, major developments focused on Kaloko Ahupua'a, with continuing commercial use of the fishpond and increasing animal husbandry. The Kohanaiki Homesteads were apparently in decline during the early part of the century (Maly and Maly 2003), and are mentioned only in passing in H.W. Kinney's 1913 visitor's guide, which notes that it is an "inland settlement without much interest". The USGS/Territory of Hawai'i 1928 series quadrangles show the Kohanaiki Homesteads consisting of four to five houses at this time, linked to Kaloko Fishpond by an unlabeled road or trail (see Figure 5).

Ranching steadily increased during the 1900s. Once John Maguire purchased the former chiefly lands of Kaloko in 1906, the uplands of the *ahupua'a* were incorporated into the Huehue Ranch. Maly and Maly (2003) discuss the acquisition of these lands and the types of ranching that were common:

In 1899, John A. Maguire, founder of Huehue Ranch applied for a Patent Grant on... lots in 'O'oma 2nd, but he only secured Grant No. 4536.... Maguire's Huehue Ranch did secure General Lease No.'s 1001 and 590 for grazing purposes on the remaining government lands in the Kohanaiki and 'O'oma vicinity. Thus, by the turn of the century, Huehue Ranch utilized both the upper forest lands and lower *kula* lands to the shore for ranching purposes. Oral history interviews with elder former ranch hands record that this use extended across the Kapena and Huliko'a grant lands of Kohanaiki, from the fee and leasehold lands of Kaloko and 'O'oma. Nineteenth century goat drives, gave way to formalized cattle drives and round ups on these lands. [Maly and Maly 2003:78].

Until the construction of the Queen Ka'ahumanu Highway in the 1970s, access to the "*kula kai* (shoreward plains)" (Maly and Maly 2003:101) was limited to local residents. In the first half of the century, the primary method of travel was "by foot or on horse or donkey, and those who traveled the land, were almost always native residents of Kalaoa, 'O'oma, Kohanaiki, Kaloko and Honokōhau" (Maly and Maly 2003:99). The open landscape of this period can be seen in the 1928 series USGS/Territory of Hawai'i Quadrangle shown in Figure 5. Later, Huehue Ranch bulldozed a jeep road to the shore around 1955 during the construction of the Kailua pier, and this was used primarily by the ranch employees for duties or for going fishing along the coast.

The Kaloko fishpond - leased from the Huehue ranch - continued as a commercial fishing operation until the 1950s. During the 1970s, the pond was incorporated into the newly-established Kaloko-Honokōhau National Historic Park.

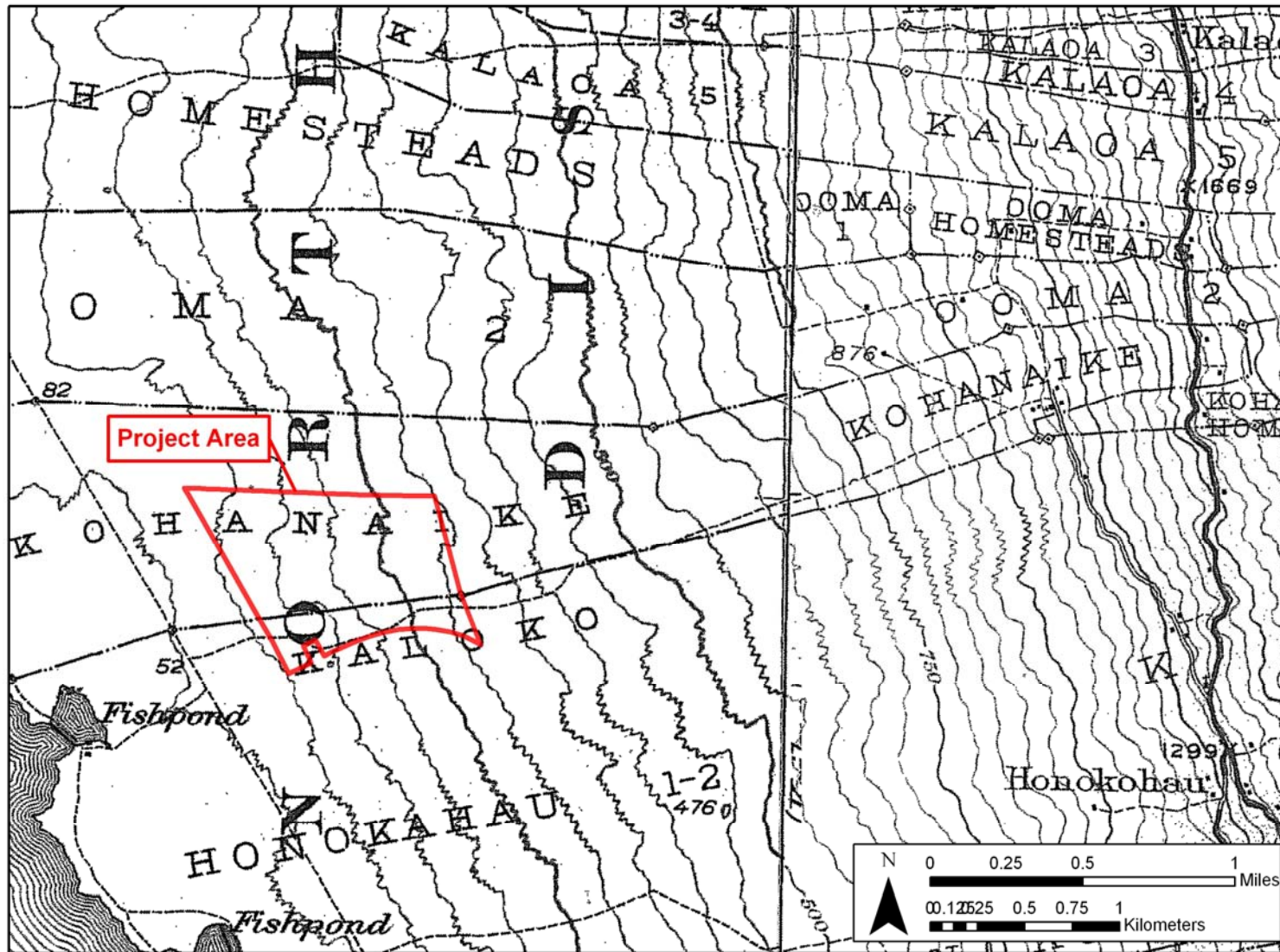


Figure 5. Portion of the 1928 USGS/Territory of Hawai'i Keahole Point and Kailua Quads, showing the location of the project area.

Archaeological Inventory Survey of a 224.43-Acre Parcel within Portions of Kaloko and Kohanaiki Ahupua'a

3.5 Previous Archaeological Research

3.5.1 Overview of Archaeological Studies Conducted within Kohanaiki and Kaloko

Previous archaeological surveys (Figure 4 & Table 2) conducted within portions of Kohanaiki and Kaloko *ahupua'a* began with the early coastal survey conducted by John Reinecke for the Bernice P. Bishop Museum in 1929-1930 (Reinecke 1930). This was a cursory survey in which approximate site locations and very brief site descriptions were recorded. John Reinecke (1930) recorded eight sites at the coast of Kohanaiki; the sites - minimally documented and mapped - included habitation sites and a *heiau*. The next survey was undertaken by Kenneth Emory and Lloyd Soehren in 1961 (Emory and Soehren 1971). This was also a coastal survey, and focused specifically upon the coast of Kaloko, Honokōhau and Kealakehe. In 1970 and 1971, Robert Renger and students from the University of California at Santa Barbara conducted an intensive survey of Kaloko and Honokōhau between present day Queen Ka'ahumanu Highway and the coast (Cordy et al. 1991). This survey also included subsurface testing of selected sites. These three surveys identified a total of 94 sites within Kaloko between the coast and Queen Ka'ahumanu Highway.

Additional archaeological work and historical research undertaken within or about Kaloko during the 1970s and 1980s include: an historical study by Marion Kelly (Kelly 1971); research relating to the establishment of the Kaloko-Honokōhau National Park (e.g. Honokōhau Study Advisory Commission 1974, National Park Service 1975); research stemming from the fieldwork conducted by Renger in 1970-71 (see the list presented in Cordy et al. 1991:2), and several reconnaissance-level studies (Ching 1980, Hammatt 1980, Soehren 1983).

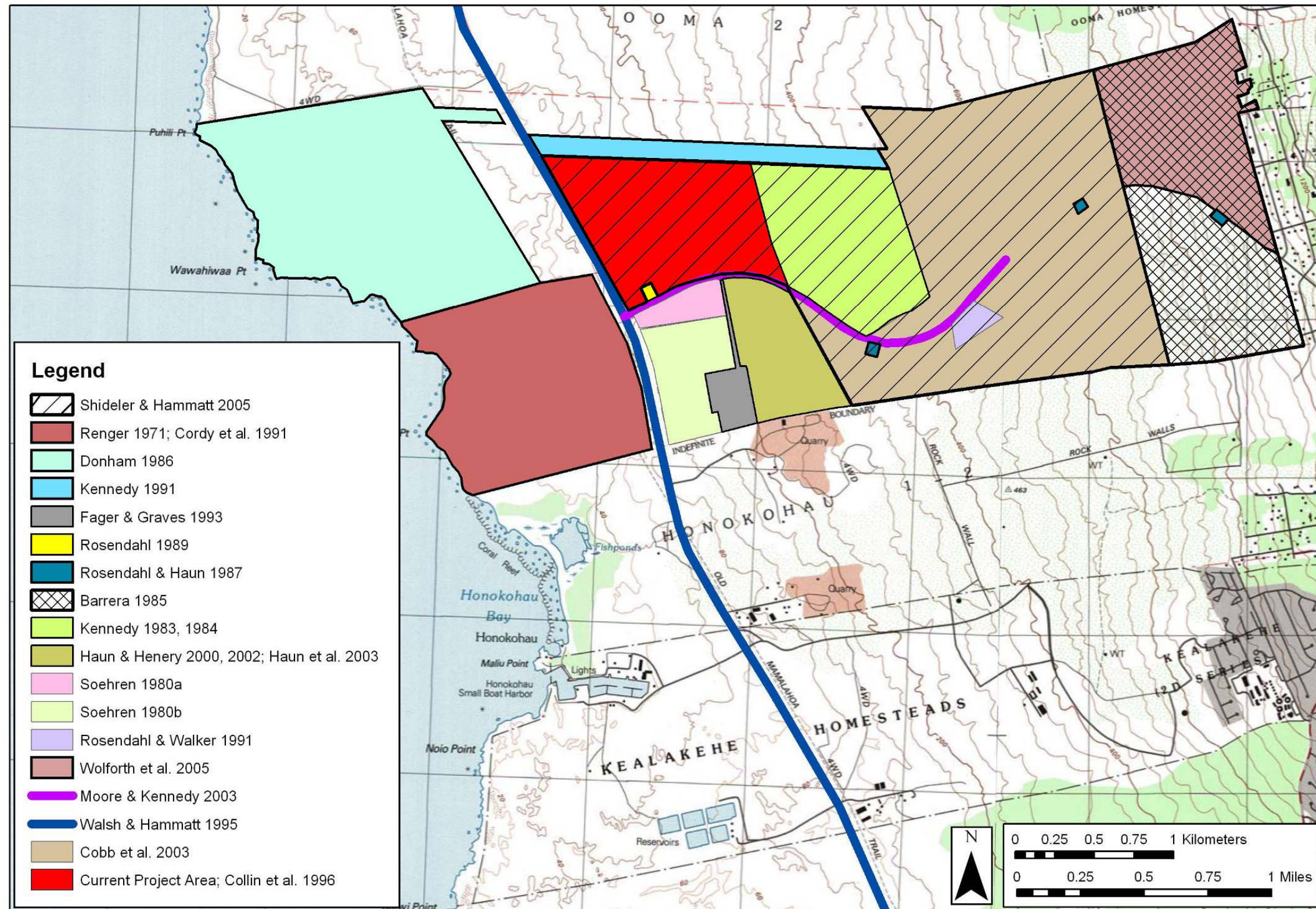


Figure 6. USGS 7.5 Minute Series Topographic Map, Keahole Point Quadrangle (1996), Showing Previous Archaeological Studies in the Vicinity of the Project Area (indicated in red)

Table 1. Previous Archaeological Studies Conducted Within Kohanaiki and Kaloko Ahupua'a

Source	Type of Investigation	General Location	Findings
Reinecke 1930	Cursory survey	Coastal Survey	Briefly notes numerous sites
Emory & Soehren 1971	Cursory survey	Coastal Survey	Briefly notes numerous sites
Kelly 1971	Historical survey and background	Kaloko and Kuki'o ahupua'a	Background study
Renger 1971	"Field Notes" of "Mauka excavations"	"Mauka excavations"	"Field Notes" describe several sites
Hammatt (ARCH) 1980	Archaeological Reconnaissance	410 acre parcel	Identified 2 sites
Soehren 1979	Letter Report Reconnaissance Survey	Kaloko Access Road Corridor (Hina Lani Street)	No finds
Soehren 1980a	Letter Report Reconnaissance Survey	Kaloko lowlands	No finds
Soehren 1980b	Letter Report Reconnaissance Survey	Kaloko Access Road Corridor	Discusses 3 stepping stone trails, 2 cairn & a lava tube complex
Barrera Jr. 1983	Archaeological Reconnaissance	TMK 7-3-9:19	No finds
Kennedy 1983	Archaeological Reconnaissance	TMK: 7-3-09: 01	Identifies 27 sites
Kennedy 1984	Intensive Archaeological Survey	TMK: 7-3-09: 01	Results of investigations of 25 sites
Barrera Jr. 1985	Archaeological Survey	409 acres 700 to 1080' elevation	58 sites
Donham 1986	Archaeological Reconnaissance Survey	470-acres makai of Queen K Hwy	105 sites
Rosendahl M. & Haun 1987	Archaeological Reconnaissance Survey	3 1-acre parcels for potential water tank sites	1 site
Barrera Jr. 1988	Archaeological Excavations	YO Project Area	60 sites

Source	Type of Investigation	General Location	Findings
Barrera Jr. 1991	Archaeological Inventory Survey & Data Recovery Report	800 to 1100'	Identified 61 sites
Cordy et al 1991	An Ahupua'a Study: The 1971 Archaeological Work at Kaloko	Kaloko-Honokōhau National Park	94 sites identified
Kennedy 1991	Surface Reconnaissance	Long thin industrial development	No significant finds
Rosendahl & Walker 1991	Archaeological Field Inspection	Industrial crusher site, 2 adjacent 10 acre parcels within present project area	Identified a trail with two cairns
Barrera Jr. 1993	Archaeological Inventory Survey	5.7 acres; 1450 to 1630' elevation	Identified 40 features of Kona Field System
Fager & Graves 1993	Archaeological Inventory Survey	Kaloko Industrial Park parcel	Identified 17 sites with 60 component features
Fager & Rosendahl 1993	Interim Report Archaeological Inventory Survey	Kaloko Industrial Park parcel; 15+ acres	Identified 17 sites with 60 component features
Henry & Graves 1993	Archaeological Inventory Survey	Transmission line project <i>Mauka</i> side of Queen K Hwy.	Identified 4 sites in present project area
O'Hare & Rosendahl 1993	Report on burials	On coast	Report on burials
Rosendahl 1993	Archaeological Field Inspection	Kaloko <i>Mauka</i> Parcel	4 sites discussed
Nees & Williams 1995	Archaeological Investigations	110 acres, 2100 to 2900' elevation	Identified enclosure, lava tube, terrace, wall, mounds
Walsh & Hammatt 1995	Archaeological Inventory Survey	Queen K Hwy Right-of-Way	Identified 9 sites adjacent to <i>makai</i> side of Hwy in Kohanaiki & Kaloko
Rechtman 1998	Archaeological Field Inspection	2400-2500' elevation	No finds
Rechtman & Henry 1999	Archaeological Inventory Survey	1450-1620' elevation	Identified 15 sites

Source	Type of Investigation	General Location	Findings
Wolforth 1999	Monitoring Report	HELCO Keāhole-Kailua Transmission line corridor	Describes 1 site 21258
Haun & Henry 2000	Archaeological Inventory Survey	Kaloko Industrial Park TMK: 7-3-51:60; 102-acre parcel	45 sites with 81 features
Rosendahl 2000	Archaeological Assessment	2435-2730' elevation	No finds
Clark & Rechtman 2002	Archaeological Inventory Survey	1200' to 1600' elevation	Identified 5 sites
Haun & Henry 2002	Data Recovery Plan	Kaloko Industrial Park TMK: 7-3-51:60; 102-acre	Data Recovery Plan addresses 8 specific sites
Rechtman & Rivera 2002	Archaeological Assessment	3-7-3-26:4; 3,100'	No finds
Cobb Elmore, and Kennedy 2003	Archaeological Assessment	TMK: 7-3-09:25, 26 & 28 at Kaloko and Kohanaiki (400 acres)	Briefly identifies 154 features
Haun 2003	Archaeological Assessment	400-Acre Portion of TMK 7-3-09:28 Kaloko	Identifies only 8 sites (63 features) all in 'a 'ā
Haun et al. 2003	Data Recovery Report	Kaloko Industrial Park TMK: 7-3-51:60; 102-acre	Data Recovery Report addresses 8 specific sites
Moore & Kennedy 2003	Archaeological Inventory Survey	Roadway Corridor	Identified 1 site (23973) 2 mounds
Puette & Dye 2003	Archaeological Inventory Survey	22 acres 2100 to 2400' elevation	No finds
Rechtman 2003	Archaeological Assessment	3-7-3-26:5; 3,100' elevation	No finds
Elmore et al. 2004	Archaeological Inventory Survey	1400' elevation	Identified one historic site 24133
Shideler, and Hammatt 2005	Archaeological Field Inspection and Literature Review	1,200+ Acres in Kaloko and Kohanaiki	Numerous pre-contact sites including: habitations, agricultural features, petroglyphs, boundary walls, and burials observed

Source	Type of Investigation	General Location	Findings
Wolforth et al. 2005	Archaeological Inventory Survey	TMK: [3] 7-3-09: 032	A total of 89 sites were identified, consisting of burials, permanent habitations, temporary habitations, religious sites, trails, boundary walls, and agricultural sites

During the 1980s, PHRI began investigations of the entire *makai* portion of Kohanaiki Ahupua'a, bounded by its boundaries with 'O'oma 2 and Kaloko, and by the Pacific Ocean and the Māmalahoa Trail. During an inventory survey in 1986 (Donham 1986), "14 previously recorded sites were relocated and 91 sites were newly identified...Habitation sites represented over half of the identified site total, and included habitation complexes, habitation/ceremonial and/or habitation/burial complexes, and temporary habitation sites" (Donham 1986:7-8). In 1991, PHRI performed data recovery of the project area (O'Hare and Goodfellow 1992); this work included: "detailed recording of (a) 31 sites (224 features) previously recorded in the project area, and (b) seven sites newly recorded during the Phase II work" (O'Hare and Goodfellow 1992: ii). Summarizing Kohanaiki settlement pattern within the zones represented by the project area, the report notes:

The data recovery work indicates that permanent habitation sites between Puhili and Wawahiwaa Points are concentrated in the coastal zone, near the shoreline. In the coastal area south of Wawahiwaa Point permanent habitation sites were near the shoreline and further inland. Temporary habitation sites were present in all areas of the coastal zone and in the barren rockland zones. The radiocarbon date ranges indicate that sites in the northern coastal zone might have been inhabited as early as AD 1020. Sites in the southern coastal zone may have been inhabited as early as AD 1370, and sites in the barren rockland zones may have been inhabited as early as AD 1180. In the barren rockland zones, use of the sites was terminated before the historic period, and in the coastal zone most of the sites were not used in the historic period [O'Hare and Goodfellow 1992:ii].

In 1983 Joseph Kennedy conducted a reconnaissance and subsequent intensive survey (1984) of a parcel that abuts the eastern boundary of the present project area. The 1983 reconnaissance located and briefly described twenty-seven sites. These sites included 17 lava tubes, 3 cairns, 2 walls, 2 platforms, an enclosure, a modified outcrop, and a trail. The 1984 intensive survey identified:

45 separate cave openings and approximately 200 chambers in these caves. In addition there were 4 walls recorded, 5 enclosures, 13 platforms, 9 cairns, 2 trails and 2 sets of petroglyphs. Out of the 79 separate features on the property, 30 were judged to be worthy of re-investigation ... the remaining 49 sites that were not reinvestigated were comprised almost exclusively of relatively shallow caves with little or no evidence of cultural remains or associated modifications [Kennedy 1984:18].

In 1985, Barrera (1985) surveyed approximately 409 acres within Kaloko and Kohanaiki *ahupua'a*; the 409-acre parcel is located between Māmalahoa Highway and Queen Ka'ahumanu Highway, *mauka* of the present project area. Four sites were recorded in Kaloko, including an enclosure, a lava tube cave, a wall and a platform (possible burial). Fifty-five sites were recorded within Kohanaiki and include mounds, platforms, habitation complexes, walls, and terraces. A portion of that study area included the historic period Kohanaiki Homestead. Barrera's site #59 comprises constructions associated with the homestead and is described as a "series of Habitation areas enclosed by large stone walls." No estimate is given of the ages of the other fifty-eight sites.

In 1987, Paul H. Rosendahl Inc. accomplished an archaeological reconnaissance survey of three one-acre parcels - proposed water tank sites - in Kaloko (TMK: 7-3-09:Por.1, 17) (Rosendahl and Haun 1987), along the south side of the then "main access road between Queen Ka'ahumanu Highway and Kona Heavens Subdivision" - *i.e.* the present Hina-Lani Road. The parcels were located at 350 ft. above mean sea level (A.M.S.L.), 630 ft. A.M.S.L., and 910 ft. A.M.S.L. Only one site (State site 10-28-10887) - an historic wall interpreted as a boundary or cattle wall - was recorded and that was within the *mauka*-most parcel.

Subsequently, in 1989, an additional water tank site parcel (TMK: 3-7-3-10:Por.17) - measuring 360 ft. N/S and E/W - was subject of an archaeological inventory survey (Rosendahl 1989, Rosendahl and Walker 1990). The parcel bordered the north side of the then "proposed Kamanu Street extension in the Kaloko Light Industrial Park" - *i.e.* within the present project area at the south boundary along Hina-Lani Road (the seaward most water tank location). One site was recorded and designated state site 50-10-27-13493:

a steppingstone trail segment measuring 7.5 m long (E-W) by 0.6-0.7 m wide (N-S)...located on a section of 'a'ā lava...The segment consists of approximately six flat and roughly round *pāhoehoe* slab steppingstones set on worn 'a'ā gravel. The steppingstones measure c. 0.4 m in diameter by 0.1 m thick. The trail is oriented c. 159 degrees Az. (magnetic). No portable remains were present in association with the trail. The trail appears to be prehistoric, and appears to have been used as a secondary transportation route [Rosendahl 1989:1].

In 1991, Archaeological Consultants of Hawaii (Kennedy 1991) performed a reconnaissance survey of a narrow corridor - 500 ft. N/S by 7260 ft. *mauka/makai* E/W (TMK: 7-3-09:15) - in Kohanaiki extending *mauka* from Queen Ka'ahumanu Highway, located adjacent to the northern boundary of the present study area. No sites or features were observed; seven caves "were examined to term and were determined to be devoid of cultural materials" (Kennedy 1991:C-1).

In 1988, Cordy et al. (1991) began preparing a study of Kaloko *ahupua'a* for the new Kaloko-Honokōhau National Park. The study was based on Renger's 1971 fieldwork conducted for planned development of coastal Kaloko for Huehue Ranch. The fieldwork "included survey work in the intermediate and upland zones of Kaloko, which located additional sites, extensive excavation in the coastal area, and some excavation in the intermediate and upland sites" (Cordy et al. 1991:2). Renger identified, and in some cases re-identified, 94 sites that included 59 in the Coastal Zone, 30 in the Middle Zone, and five *mauka/makai* trails that crossed both zones and continued heading inland. As only "summary papers" had been previously written, the

monograph published in 1991 includes the 1971 fieldwork data and resultant analyses, and additional fieldwork conducted by Cordy and Hitchcock in the 1970s and 1980s (Cordy et al. 1991:2, 44).

Rosendahl and Walker (1991) carried out an Archaeological Field Inspection for proposed Kaloko Industrial crusher sites just south of Hina Lani Road at an elevation of approximately 450 ft AMSL. A trail and two associated cairns were identified.

Discussion of multiple braided trails on *pāhoehoe* leading towards pond. Those in TMK 17 do lead indirectly to pond, based on his maps do not appear to be any more pronounced than any other route.

In 1993, Paul H. Rosendahl Inc. conducted an inventory survey (Fager and Graves 1993) of an approximately 15-acre parcel adjacent to, and *mauka* of the Kaloko Industrial Park, which includes a road corridor that extended from the main project area to Kamanu Street. This road corridor abuts the southern boundary of the current project area. The survey recorded 17 sites incorporating 60 component features. The sites were judged:

...in poor to good condition and comprised the following formal types: terraces, modified outcrops, mounds, walls, caves, pahoehoe excavations, cairns, filled cracks, enclosures, and a trail. The formal types comprised the following functional types: animal husbandry, temporary habitation, agriculture, marker, quarry, and transportation [Fager and Graves 1993:ii].

In 1995, Cultural Surveys Hawai'i conducted an archaeological inventory survey with limited subsurface testing within a narrow strip of land, averaging 300 ft wide, along Queen Ka'ahumanu Highway between Palani Road and the Keāhole Airport entrance road (Walsh and Hammatt 1995). Three sites were identified in Kohanaiki: two trails and a set of three cairns. One of the trails - a *mauka-makai* trail - had been previously identified and designated Site 50-10-27-15324. The site is described as consisting of:

...two converging trail segments designated Features A and B...Both trail segments extend in a roughly *mauka-makai* direction, but angle toward each other and converge into one trail that continues inland. The point where the two trails meet is located at the edge of the bulldozed portion of the present highway right of way, 164 feet (50 m.) from the *makai* edge of the highway pavement...On the *mauka* side of the highway, the trail was observed at the edge of the bulldozed portion of the power line (the new right-of-way boundary) and continuing inland at 65 degrees T.N. for at least another 100 feet (30 m.). (*Ibid.*:51)

This trail site is located within the present study area.

A series of studies (Haun & Henry 2000, 2002, Haun et al. 2003) were carried out on a 102-acre Kaloko Industrial Park parcel immediately adjacent to the south of the present project area on the south side of Hina Lani Road. Of note are the fairly dense and widely distributed site concentration and also extensive areas of both 'a'ā flow and bulldozing.

In 2005 Wolforth et al. conducted an archaeological inventory survey of the northern portion of the Kaloko Heights Project (TMK [3] 7-3-09: 032), located approximately 2200 m east of the

current project area. A total of 89 sites were identified, consisting of burials, permanent habitations, temporary habitations, religious sites, trails, boundary walls, and agricultural sites.

In 2005 CSH completed an archaeological field inspection of a 1200+ acre project area in Kaloko and Kohanaiki [TMK (3) 7-3-009:017, 025, 026, and 028]. Numerous pre-contact sites including, habitations, agricultural features, petroglyphs, boundary walls, and burials were observed (Shideler & Hammatt 2005). While the current project area was included in this study, a field inspection of it was not undertaken as CSH had previously conducted an archaeological inventory survey of the parcel in 1996 (Collin et al. 1996). The results of the inventory survey are presented in Section 3.5.2 below.

3.5.2 Archaeological Studies Conducted within the Present Project Area

The following is a summary of previous archaeological studies conducted within the current project area. Table 2 provides a list of previously identified historic properties located within the current project area.

In 1970 Renger's survey between the coast and Queen Ka'ahumanu Highway followed braided trails over *pāhoehoe* into the southwest corner of the project area (Figure 7). In 1991 Cordy published a similar map, but he was not able to trace the trail routes nearly as far and only identified the trails 40 meters east of the highway, an area largely graded during later installation of electrical transmission lines.

In 1993 Henry and Graves carried out site identification along a Keāhole to Kailua 69 kV transmission line, which comprised a 50-100 ft wide alignment on the *mauka* (east) side of Queen Ka'ahumanu Highway. Ten sites were identified within the current project area (Figure 8). During the current inventory survey only three (SIHP No. -15324, -15325, & -15329) of the ten sites were relocated. It is believed that the seven sites not relocated were either situated outside of the current project area, within the *mauka* (eastern) road easement or were destroyed (*via* bulldozing) during the installation of new powerlines along the eastern side of Queen Ka'ahumanu Highway.

In 1996, Cultural Surveys Hawai'i conducted an archaeological inventory survey (Colin et al. 1996) with limited subsurface testing within a 224.43-acre project site (TMK [3] 7-3-09: 017) for Kimura International. This project comprises the exact area of the current project area. Fifty-five (55) sites were identified within the project area. Figure 9 shows the locations of these historic properties. All identified sites were of pre-contact traditional Hawaiian origin and included the following site types: cairn, simple agricultural features, recurrent and temporary habitation sites, trails, enclosures, walls, and a quarry. During the current inventory survey two sites (Site -20706 & -20741) identified by Colin et al. were determined to be located outside of the current project area. This discrepancy of site location is probably due to the lack of GPS technology during the Colin et al. survey.

The Colin et al. 1996 report was reviewed by the State Historic Preservation Division twice (8/15/1996 and 4/7/1997), however, during the review process the project was terminated; project funding stopped and final revisions to the report were not completed. Thus the Colin et al. report (1996) was never accepted by SHPD.

Table 2. Historic Properties Previously Identified within the Current Project Area

SIHP No. (50-10-27-)	Site Type	Function	Significance	Age	Reference
13493	Trail	Transportation	D	pre-contact	Rosendahl 1989; Rosendahl & Walker 1990; Colin et al. 1996
15324	Trail	Transportation	D, E*	pre-contact	Henry & Graves 1993; Walsh & Hammatt 1995; Colin et al. 1996
15325	Wall / Cupboard / Terrace	Boundary / Storage / Indeterminate	D	pre-contact	Henry & Graves 1993
15326	Modified outcrop	Agriculture	D	pre-contact	Henry & Graves 1993
15327	Cairn	Marker	D	pre-contact	Henry & Graves 1993
15328	Modified outcrops	Agriculture	D	pre-contact	Henry & Graves 1993
15329	Modified tumulus	Temporary habitation	D	pre-contact	Henry & Graves 1993
15330	Modified outcrops	Agriculture	D	pre-contact	Henry & Graves 1993
15331	Modified outcrops & mound	Agriculture	D	pre-contact	Henry & Graves 1993
15332	Cupboard	Storage	D	pre-contact	Henry & Graves 1993
15333	Modified outcrops	Agriculture	D	pre-contact	Henry & Graves 1993
20696	Lava tube	Indeterminate	D	pre-contact	Colin et al. 1996
20697	Modified tumulus	Temporary habitation	D	pre-contact	Colin et al. 1996
20698	Pavements	Temporary habitation	D	pre-contact	Colin et al. 1996

SIHP No. (50-10-27-)	Site Type	Function	Significance	Age	Reference
20699	Modified tumulus	Indeterminate	D	pre-contact	Colin et al. 1996
20700	Modified tumulus, Enclosure	Temporary habitation / Agriculture	D	pre-contact	Colin et al. 1996
20701	Modified tumulus	Indeterminate	D	pre-contact	Colin et al. 1996
20702	Mod. tumulus/terrace	Possible burial	D,E*	pre-contact	Colin et al. 1996
20703	Terrace, Pavement, Modified tumulus	Temporary habitation / Mining	D	pre-contact	Colin et al. 1996
20704	Trails, walls	Temporary habitation / Transportation	D	pre-contact	Colin et al. 1996
20705	Modified tumulus	Possible burial	D, E*	pre-contact	Colin et al. 1996
20706	Modified tumulus	Temporary habitation	D	pre-contact	Colin et al. 1996
20707	Lava tube	Indeterminate	D	pre-contact	Colin et al. 1996
20708	Modified tumulus	Temporary habitation	D	pre-contact	Colin et al. 1996
20709	Platform, enclosures, modified lava blister	Recurrent habitation / Agriculture / Storage	C,D	pre-contact	Colin et al. 1996
20710	Lava tube, Alignment, Mound, Modified tumulus, Pavement	Temporary habitation	D	pre-contact	Colin et al. 1996
20711	Enclosure	Temporary habitation	D	pre-contact	Colin et al. 1996
20712	C-shape	Temporary habitation	D	pre-contact	Colin et al. 1996
20713	Cairn	Marker	D	pre-contact	Colin et al. 1996
20714	Wall	Indeterminate	D	pre-contact	Colin et al. 1996
20715	Terrace	Temporary habitation	D	pre-contact	Colin et al. 1996
20716	Modified tumulus	Possible Burial	D,E*	pre-contact	Colin et al. 1996
20717	Modified tumulus	Possible Burial	D,E*	pre-contact	Colin et al. 1996
20718	Modified tumulus	Agriculture	D	pre-contact	Colin et al. 1996
20719	Rock shelter / Hearth	Temporary habitation	D	pre-contact	Colin et al. 1996
20720	Terrace	Possible Burial	D,E*	pre-contact	Colin et al. 1996
20721	Modified tumulus	Temporary habitation	D	pre-contact	Colin et al. 1996
20722	Trail	Transportation	D	pre-contact	Colin et al. 1996

SIHP No. (50-10-27-)	Site Type	Function	Significance	Age	Reference
20724	Trail	Transportation	D	pre-contact	Colin et al. 1996
20725	Modified tumulus	Recurrent habitation	D	pre-contact	Colin et al. 1996
20726	Trail	Transportation	D	pre-contact	Colin et al. 1996
20727	Lava tube	Temporary habitation	D	pre-contact	Colin et al. 1996
20728	Enclosure	Temporary habitation	D	pre-contact	Colin et al. 1996
20729	Modified tumulus	Temporary habitation	D	pre-contact	Colin et al. 1996
20730	Modified tumulus	Temporary habitation	D	pre-contact	Colin et al. 1996
20731	Modified tumulus	Possible Burial	D,E*	pre-contact	Colin et al. 1996
20732	Trail	Transportation	D	pre-contact	Colin et al. 1996
20733	Trail	Transportation	D	pre-contact	Colin et al. 1996
20734	Modified depression	Agriculture	D	pre-contact	Colin et al. 1996
20735	Wall, excavated pits, mound	Temporary habitation / Transportation / Storage	D	pre-contact	Colin et al. 1996
20736	Trail	Transportation	D	pre-contact	Colin et al. 1996
20737	Trail	Transportation	D	pre-contact	Colin et al. 1996
20738	Enclosure	Agriculture	D	pre-contact	Colin et al. 1996
20739	Enclosure / Trail	Transportation	D	pre-contact	Colin et al. 1996
20740	Modified tumulus	Agriculture	D	pre-contact	Colin et al. 1996
20741	Pavement, trail, C-shape, wall, upright	Temporary habitation / Agriculture / Ceremonial	D,E	pre-contact	Colin et al. 1996
20742	Lava tube	Temporary habitation	D	pre-contact	Colin et al. 1996
20743	Modified tumulus	Possible Burial	D,E*	pre-contact	Colin et al. 1996
20744	Trail	Transportation	D	pre-contact	Colin et al. 1996
20745	Trail	Transportation	D	pre-contact	Colin et al. 1996
20746	Lava tube	Shelter	D	pre-contact	Colin et al. 1996
20747	Trail	Transportation	D	pre-contact	Colin et al. 1996
20748	Lava tube	Storage	D	pre-contact	Colin et al. 1996
20749	Lava tube, terrace	Temporary habitation / Possible Burial	D,E*	pre-contact	Colin et al. 1996

* Criterion E would only apply if burial was confirmed.

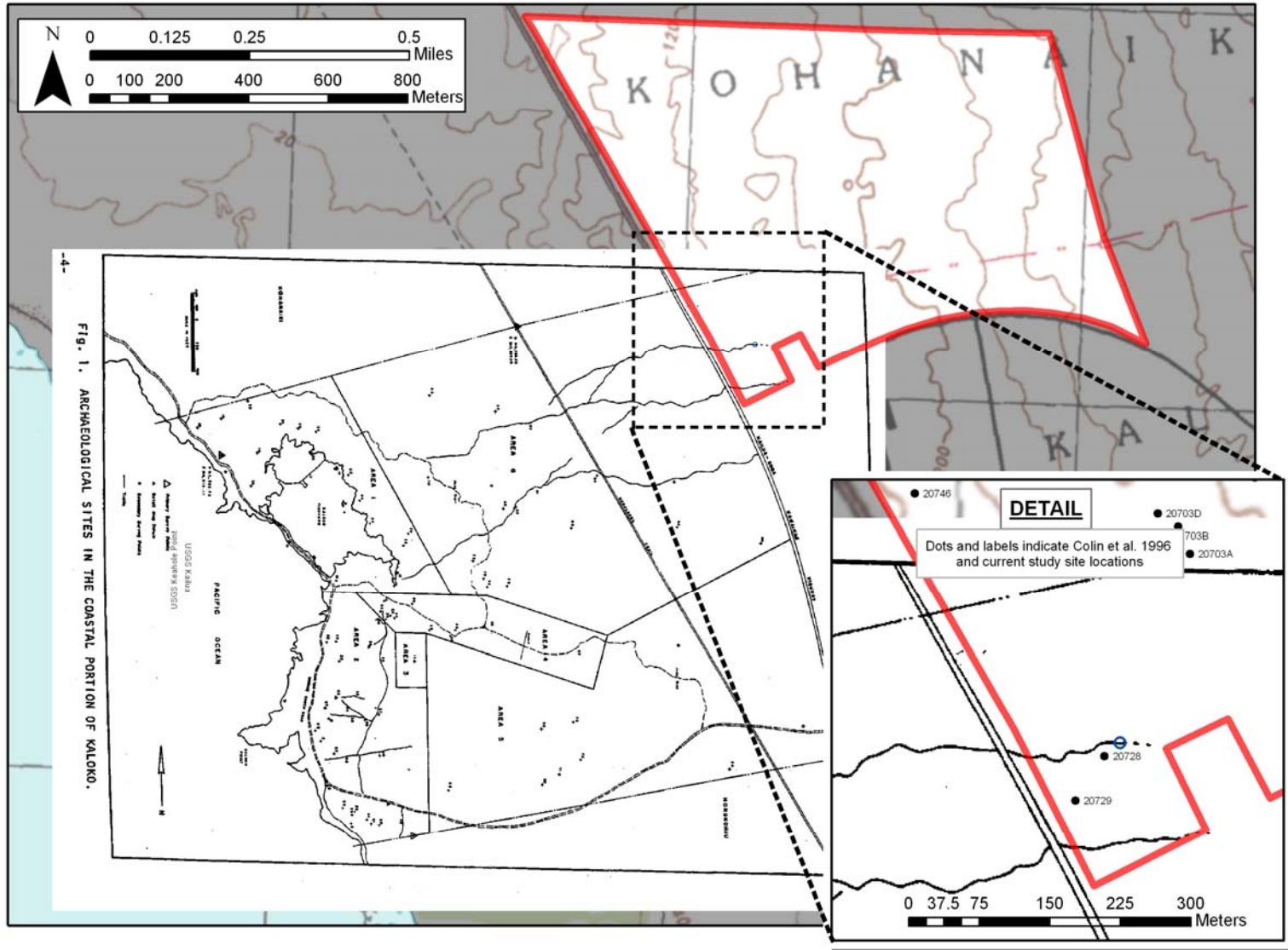


Figure 7. Renger 1970 site map overlay, showing braided trails traced into the southwest corner of the project area.

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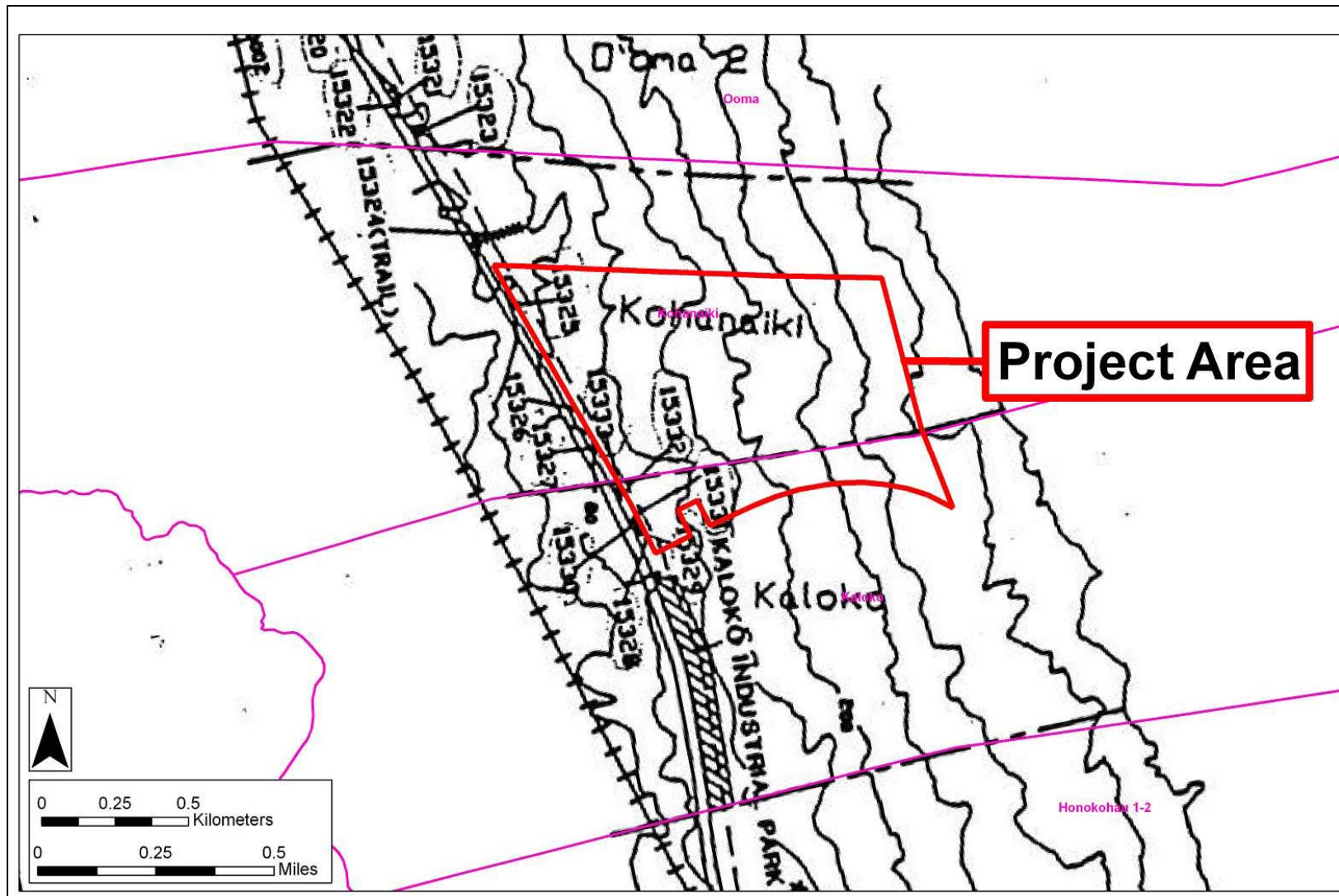


Figure 8. Archaeological site map showing sites previously identified by Henry & Graves (1993) in relation to the current project area (*Map adapted from original Henry & Graves site map)

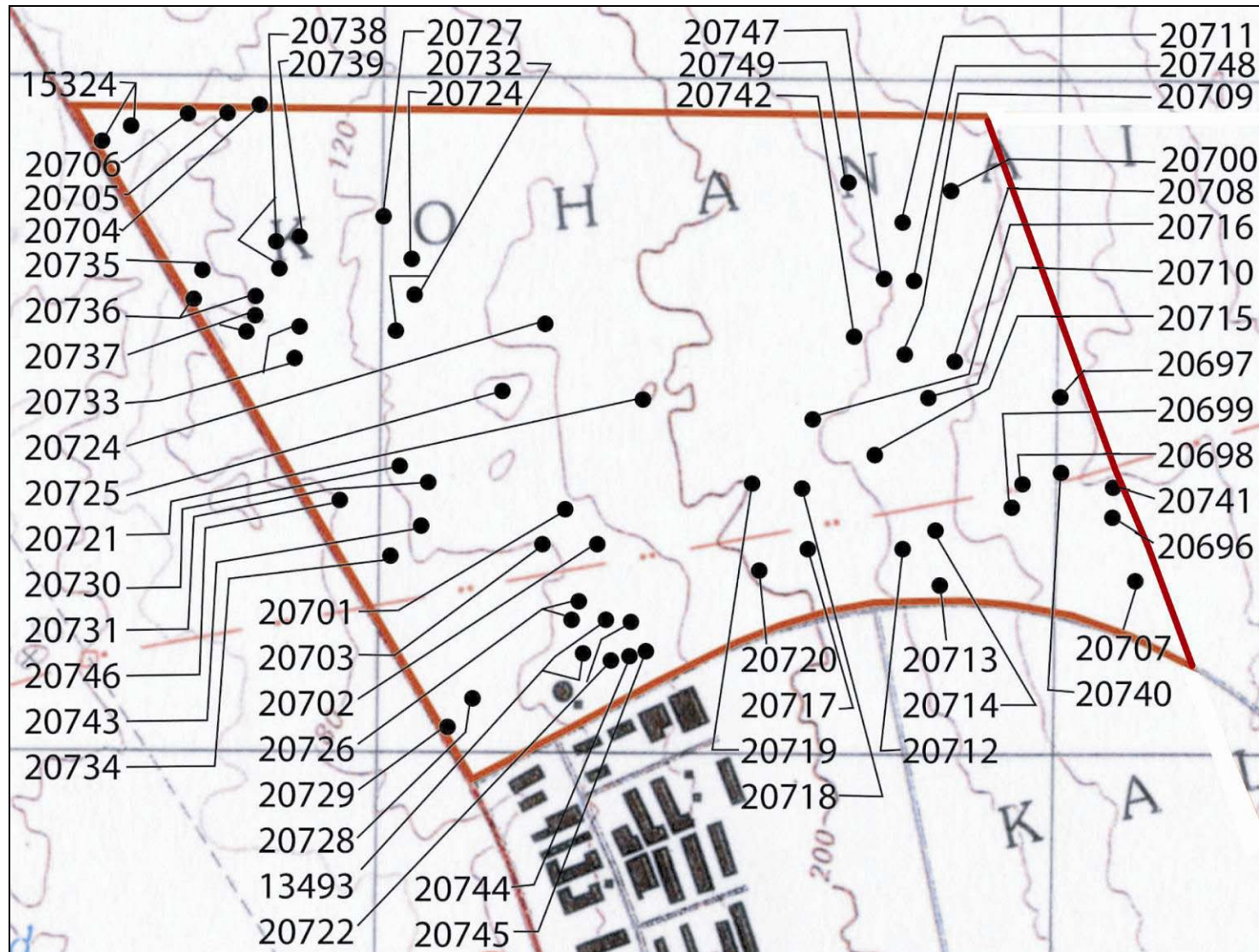


Figure 9. Location of historic properties previously identified within the current project area (adapted from Colin et al. 1996)

3.6 Settlement Pattern

Kaloko and Kohanaiki *ahupua'a* are located within the Kekaha region of North Kona. The Kekaha region, or "Kekaha-Waiole, the desolate land without water" (Kelly 1973:74) refers to the barren lava fields extending north from Kailua-Kona to 'Anaeho'omalua (Kelly 1973:74).

As has been observed in Kaloko, Kohanaiki and other *ahupua'a* in Kekaha, this band of barren lava fields does not encompass entire *ahupua'a* nor does it inhibit land usage from occurring along the coast and inland where rainfall is sufficient for intensive agriculture. Instead, Kekaha refers more accurately to portions or "zones" of the regions where lava flows encompass the lands, which - according to elevation - sustain little rainfall. Correspondingly, the lands of Kekaha are suggested, based on ethnographies, ethno-histories and archaeological sources, to contain three general terrestrial zones that directly influenced land usage of pre-contact and historic populations. These three zones include: (1) Coastal; (2) Intermediate or Transitional and; (3) Upland. Based on the archaeological record of the present study area and previous archaeology in the Kaloko Ahupua'a (Cordy et al. 1991) a land usage summary of each zone is provided below.

3.6.1 Coastal Zone

The Coastal zone begins at sea level and extends to approximately 15 ft a.m.s.l. The zone contains evidence of pre-contact and historic settlement in both Kaloko and Kohanaiki.

Traditional Hawaiian Land Use-Coastal Zone

Kaloko contained a permanent settlement concentrated along the coast. The settlement probably comprised several local residential groups with constituent households (Cordy et al. 1991). Radiocarbon dating for the coastal region within Kaloko Ahupua'a has produced dates ranging between A.D. 920 and A.D. 1430 (Cordy et al. 1991:465). Cordy concludes that one site (D13-3) on the Kaloko coast - with date ranges between A.D. 920-980 and A.D. 1005-1290 is one of the oldest permanent habitations known in leeward Hawai'i (Cordy et al. 1991:473).

Although few absolute dates are known for the construction of fishponds, Cordy conjectures that the Kaloko and Honokōhau fishponds were constructed by at least the A.D. 1400-1500 period (Cordy et al. 1991:576).

3.6.2 Intermediate Zone

The Intermediate Zone extends from the *mauka* margin of the coastal zone (15 ft a.m.s.l.) to approximately 400 ft a.m.s.l. (The present project area is located within this zone). Similar to other portions of Kekaha, the intermediate zone of Kaloko and Kohanaiki is characterized by low rainfall and uneroded lava terrain.

Traditional Hawaiian Land Use-Intermediate Zone

The Intermediate Zone of Kaloko and Kohanaiki contained a scattered distribution of habitations of different modes (i.e. temporary and recurrent) which were generally located within the vicinity of *mauka/makai* trails or in association with other functional site types like agricultural and lithic resource procurement.

The general lack of consistent rainfall and virtual absence of soil directly limits agricultural use within the Intermediate Zone. Nonetheless, small concentrations of mounds, modified outcrops (enclosing minimal soil areas), enclosures, and some *pāhoehoe* excavations evidence a degree of agricultural productivity. Lava tubes and blisters are abundant in this zone and contain temporary components, and post-habitation burial interments.

The Intermediate Zone is also characterized by an extensive network of *mauka/makai* trails. These trails facilitated inter-*ahupua'a* travel of residence between their coastal habitation and the Upland agricultural fields.

Within the Intermediate Zone permanent habitation may occur directly adjacent to the Coastal Zone and are associated with small scale agricultural activities.

3.6.3 Upland Zone

The Upland Zone of Kaloko and Kohanaiki begins at approximately 400 ft a.m.s.l. and continues *mauka*. The Upland Zone is characterized by an increase in permanent habitation sites, in association with intensive non-irrigated (dry land) agricultural features. Gradually, the ascending natural landscape contains a greater soil base and due to an increase in elevation, the rainfall is more plentiful and consistent.

Traditional Hawaiian Land Use-Upland Zone

Intensive non-irrigated agriculture is characteristic of the Kona slopes and other regions of Hawaii and Maui where irrigation, because of the lack of perennial waterways, is not possible. The "Kona Field System" - generally defined by a grid-like patterning of stone constructed field boundaries - represents an interrelated network of intensive non-irrigated agriculture covering an estimated area of 139 km² (Kirch 1985:225) between Kealakekua Bay and Kailua Bay. Archaeological studies beyond the arbitrary northern boundary of the "Kona Field System", have documented evidence of intensive non-irrigated agriculture in the Kekaha region within the Upland Zone between 400 to 1200 ft a.m.s.l. (i.e., Cordy 1985; Hammatt et al. 1987; Walker and Rosendahl 1990; Robins et al. 1993).

Intensive non-irrigated agriculture is characterized by concentrated occurrences of similar feature types (i.e. field walls, modified *'a'a* lava, *pāhoehoe* excavations, and mound complexes). Variations in the methods of non-irrigated agriculture occur as a response to topographical and geological variation, and rainfall in the region. Radiocarbon dates taken from upland field shelters within the Kona Field System indicates that intensive agriculture began developing between ca. A.D. 1400 - 1600 and intensified with permanent upland settlements between ca. A.D. 1600 - 1779 (Schilt 1984).

3.6.4 Settlement Pattern Summary

The settlement pattern described above reveals a variety of land uses across all zones - including the Intermediate Zone - during the pre-contact and early historic period. The pattern then dramatically changed during the middle to late historic period (post *māhele* ca. 1850's).

The original settlement of both Kaloko and Kohanaiki was focused on the coast starting around 900 A.D. (Cordy et al. 1991). These earlier settlers were likely drawn to the coast by the presence of potable water found in the brackish ponds, the excellent fishing, and Kaloko

specifically to which offered one of the most protected inlets on the Kona Coast (Cordy et al. 1991:575).

Radiocarbon dates from the Kekaha region, may indicate that all three zones of the Kaloko and Kohanaiki *ahupua'a* were utilized to some degree or another as early as A.D. 1280 (Walker and Haun 1988). This period of time correlates with an apparent population increase and geographical expansion in the Hawaiian islands identified as the "Expansion Period" (Kirch 1985:303) or the middle of the "Pioneer Settlement" (Schilt 1984:276). Permanent settlement continued to be centered on the coast and agriculture developed upland as the endemic forest lands were gradually reduced by slash-and-burn methods.

Development of the intensive upland agricultural system probably occurred between ca. A.D. 1400 and 1650 (Schilt 1984:277) and focused along the more prime agricultural lands, at elevations where soil was abundant and rainfall sufficient for productive cultivation. During this period permanent settlement continued to be centered at the coast but also began to be developed in the upland localities of Kaloko and Kohanaiki, as the distance between the upland farms and original coastal settlement expanded. By the end of this period it is expected that most of the upland permanent habitations were occupied. This period is when the fishponds in Kaloko were likely constructed and a four class hierarchy: "ruler, high chiefs, local chiefs and commoners" was formed in Hawaii (Cordy et al. 1991:575).

During early historic times (ca A.D. 1800-1840) following western contact, Kaloko and Kohanaiki populations undoubtedly declined rapidly due to disease, and a major shift in the traditional Hawaiian settlement pattern. The residents who survived disease likely shifted their residences to economic centers - such as Kailua-Town - or in closer proximity to major roadways and localities of churches and schools established by the missionaries.

Following the Māhele (ca 1850's), Kaloko and Kohanaiki shorelines were virtually abandoned "with the Kohanaiki Homesteads the new upland population focus in the Kaloko area" (Cordy et al. 1991:580). As a result, the vacant lands were subsequently acquired for cattle ranching.

3.7 Project Area Predictive Model

The present project area's location within the interpreted "intermediate zone" places it outside the major areas of pre-contact Hawaiian habitation and activity which would have focused at the coast. It is thus suggested that traditional Hawaiian sites likely to occur within the project area would include:

- 1) temporary or recurrent habitations;
- 2) limited agricultural activity areas including *pāhoehoe* excavations and minimal soil enclosures;
- 3) *mauka/makai* trails connecting coastal residences and upland agricultural areas, with branch trails extending to specific use areas within the project area; and
- 4) burial sites utilizing features of the terrain - including lava tubes and cracks.

As noted above, during the decades following western contact, populations of both *ahupua'a* would have declined significantly - reduced by disease and out migration to developing

commercial centers. As the western commercial model continued to displace the traditional subsistence economy, localities like the present project area would have been further marginalized and abandoned. Land Commission Award documents indicate that by the middle of the 19th century, habitation and activity within Kaloko (and likely Kohanaiki as well) had shifted far *mauka* to land between 1200 and 1700 ft. elevation near the Government Road. During the second half of the 19th century this *mauka*-ward shift is fully established with the formation of the Kohanaiki Homesteads near the Government Road. Throughout the 19th century, use of the project area would likely have been limited to use of existing *mauka/makai* trails for ocean access by *ahupua'a* residents of the uplands.

Into the 20th century, major developments within Kohanaiki and Kaloko have occurred outside the project area, which has remained undeveloped. Activities of the Huehue Ranch (established early in the century) - including walls and fencing - may have impacted the project area. Such activities are evidenced by the wall along the Kaloko-Kohanaiki boundary - site 40 - recorded by Kennedy (1984) in a project area immediately *mauka* of the present project area; as Cordy (1991) notes, documentary evidence - including the absence of the wall in J.S. Emerson's 1888 notes and maps - suggests that the wall was constructed for the ranch in this century.

Section 4 Results of Fieldwork

A total of 59 historic properties were identified within the project area. Fifty-three (53) of the historic properties were previously identified and 6 were newly recorded as part of the current inventory survey investigation (Table 3 & Figure 10).

Table 3. Archaeological Site Summary

SIHP No. (50-10-27-)	Site Type	Function	Significance	Age
13493	Trail	Transportation	D	pre-contact
15324	Trail	Transportation	D, E*	pre-contact
15325	Wall, modified depressions, mound	Temporary habitation / Transportation / Storage	D	pre-contact
15329	Modified tumulus	Temporary habitation	D	pre-contact
20696	Lava tube	Temporary habitation	D	pre-contact
20697	Modified tumulus	Temporary habitation	D	pre-contact
20698	Pavements	Temporary habitation	D	pre-contact
20699	Modified tumulus	Indeterminate	D	pre-contact
20700	Modified tumulus, Enclosure	Temporary habitation / Agriculture	D	pre-contact
20701	Modified tumulus	Temporary habitation	D	pre-contact
20702	Mod. tumulus/terrace	Temporary habitation	D	pre-contact
20703	Terrace, Pavement, Modified tumulus	Temporary habitation / Mining	D	pre-contact
20704	Trails, walls	Temporary habitation / Transportation	D	pre-contact
20705	Modified tumulus	Possible burial	D, E*	pre-contact
20706	N/A	N/A	N/A	N/A
20707	Lava tube	Temporary habitation	D	pre-contact
20708	Modified tumulus	Temporary habitation	D	pre-contact
20709	Platform, enclosures, modified lava blister	Recurrent habitation / Agriculture / Storage	C,D	pre-contact
20710	Lava tube, Alignment, Mound, Modified tumulus, Pavement	Temporary habitation	D	pre-contact
20711	Enclosure	Temporary habitation	D	pre-contact
20712	C-shape	Temporary habitation	D	pre-contact
20713	Cairn	Marker	D	pre-contact
20714	Wall	Temporary habitation	D	pre-contact
20715	Terrace	Temporary habitation	D	pre-contact
20716	Modified tumulus	Possible Burial	D,E*	pre-contact

SIHP No. (50-10-27-)	Site Type	Function	Significance	Age
20717	Modified tumulus	Temporary habitation	D	pre-contact
20718	Modified tumulus	Agriculture	D	pre-contact
20719	Rock shelter / Hearth	Temporary habitation	D	pre-contact
20720	Terrace	Possible Burial (destroyed)	D,E*	pre-contact
20721	Modified tumulus	Temporary habitation	D	pre-contact
20722	Trail	Transportation	D	pre-contact
20724	Trail	Transportation	D	pre-contact
20725	Modified tumulus	Temporary habitation	D	pre-contact
20726	Trail	Transportation	D	pre-contact
20727	Lava tube	Temporary habitation	D	pre-contact
20728	Enclosure	Temporary habitation	D	pre-contact
20729	N/A	N/A	N/A	N/A
20730	Modified tumulus	Temporary habitation	D	pre-contact
20731	Modified tumulus	Indeterminate	D	pre-contact
20732	Trail	Transportation	D	pre-contact
20733	Trail	Transportation	D	pre-contact
20734	Modified depression	Agriculture	D	pre-contact
20735	N/A	N/A	N/A	N/A
20736	Trail	Transportation	D	pre-contact
20737	Trail	Transportation	D	pre-contact
20738	Enclosure	Agriculture	D	pre-contact
20739	Enclosure / Trail	Transportation	D	pre-contact
20740	Modified tumulus	Agriculture	D	pre-contact
20742	Lava tube	Temporary habitation	D	pre-contact
20743	Modified tumulus	Indeterminate	D	pre-contact
20744	Trail	Transportation	D	pre-contact
20745	Trail	Transportation	D	pre-contact
20746	Lava tube	Temporary Habitation	D	pre-contact
20747	Trail	Transportation	D	pre-contact
20748	Lava tube	Storage	D	pre-contact
20749	Lava tube, terrace	Temporary habitation	D	pre-contact
26259	Trail	Transportation	D	pre-contact
26260	Lava tube	Temporary habitation	D	pre-contact
26261	Terrace	Temporary habitation	D	pre-contact
26262	C-shape	Temporary habitation	D	pre-contact
26263	Lava tube	Temporary habitation	D	pre-contact
26264	Modified tumulus	Agriculture	D	pre-contact

* Site is a probable burial

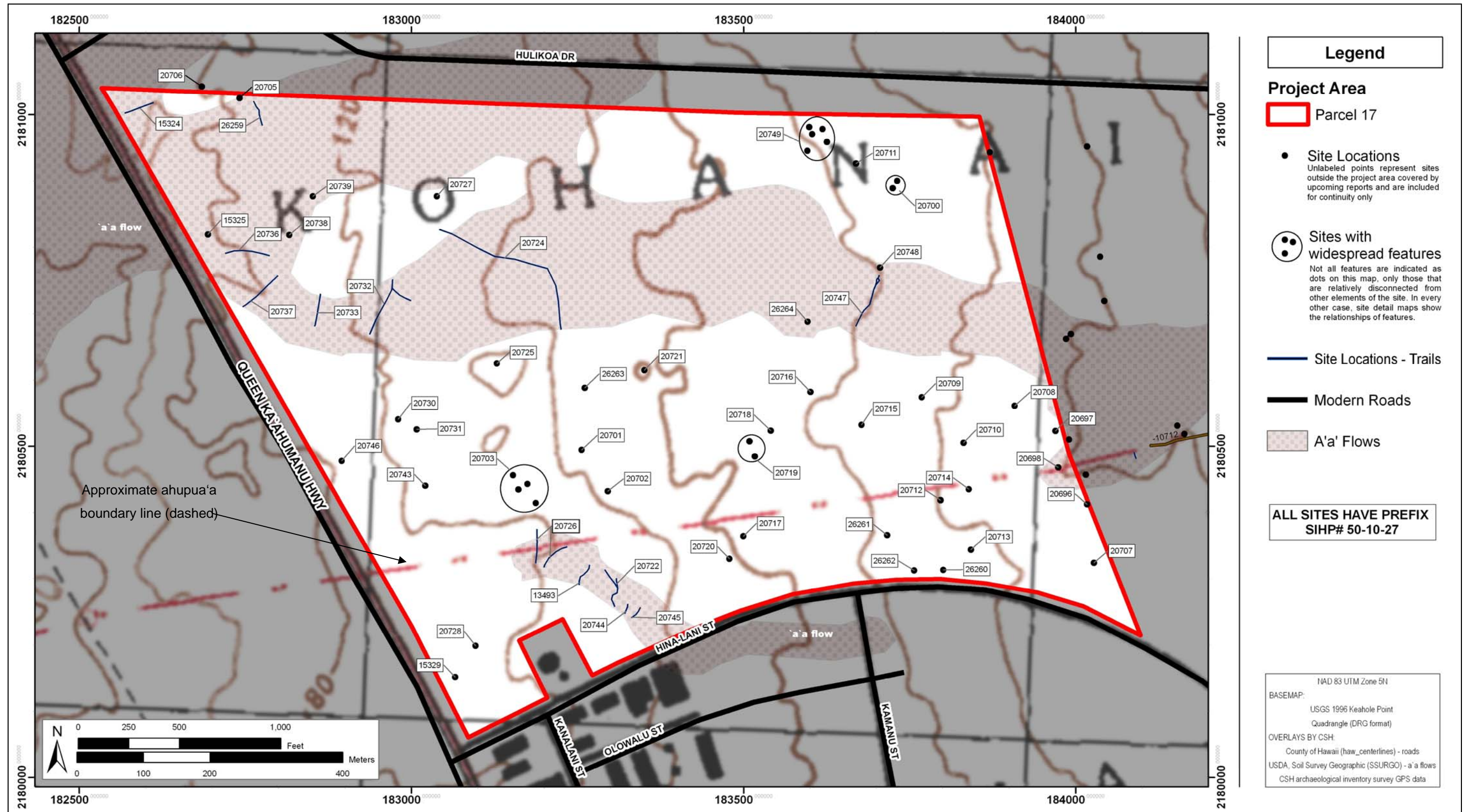


Figure 10. Portion of USGS topographic map showing the locations of historic properties within the project area

Archaeological Inventory Survey of a 224.43-Acre Parcel within Portions of Kaloko and Kohanaiki Ahupua'a

4.1 Formal Feature Types

Formal feature type designations are descriptive - based on physical characteristics - and commonly refer to structural elements of a site. Seventeen primary feature types were identified within the project area. The following are brief descriptions of the different feature types encountered during the inventory survey:

<u>Cairn:</u>	A marker of stacked or piled stones.
<u>Alignment:</u>	A single row of stones one courses high.
<u>C- and L-shape:</u>	A walled structure that partially encloses an area.
<u>Cupboard:</u>	A void in a wall or structure used as storage and/or protection against weather.
<u>Enclosure:</u>	A walled structure that completely encloses an area.
<u>Hearth:</u>	Generally a circular area with placed rocks and ashes. Some foods were cooked with hot coals (<i>ko 'ala</i>) or hot ashes (<i>pulehu</i>).
<u>Lava blister:</u>	A small subterranean lava formation. Unlike lava tubes, however, they tend to be circular and do not extend in any direction for a great length.
<u>Lava tube:</u>	Modifications or apparent usage of a subterranean lava formation characteristic of <i>pāhoehoe</i> lava flows.
<u>Modified depression:</u>	An area in which stones have been removed to create a depression or to expose a soil area. Two types of modified depressions were encountered, one type (encountered on a lava flow) appears to have functioned as a storage area and the second type in which the only modification consists of the removal of stones to create an area suitable for agriculture either in soil or possibly through mulching.
<u>Modified tumulus:</u>	An area within an existing lava flow in which a portion of the flow has been humanly modified by the placement or removal of stones (a modified tumulus differs from a modified outcrop in that a modified tumulus is in a field of exposed outcrop whereas a modified outcrop may be surrounded by soil). This functional type also includes areas in which there has been clearly definable mining of stone.
<u>Mound:</u>	Linear, circular or amorphous stone pile that typically lacks a vertical face and level surface.
<u>Pavement:</u>	A stone-filled floor or surface.
<u>Platform:</u>	A raised free-standing stone structure with three or more vertical faces.

Rock shelter: Varying degrees of construction which modifies a rock shelter (or outcrop overhang). This structure is distinguished by an apparent primary focus on the enhancement of natural features.

Terrace: A raised stone construction partially built against, or level to, a ground or outcrop surface. These structures commonly resemble platforms. Unlike platforms, however, they are not totally free-standing.

Trail: A trodden lava surface, pavement or stone alignment set into the ground or outcrop surface.

Wall: A bi-faced and free-standing stone structure which is an isolated segment or defines large boundaries.

Table 4 tallies the total occurrences of these formal feature types in the project area.

Table 4. Occurrences of Formal Feature Types (Total number of features: 99)

Formal Feature Type	Number	Percentage
Cairn	1	1.0
Alignment	1	1.0
C-/L-shape	3	3.0
Cupboard	2	2.0
Enclosure	9	9.1
Hearth	1	1.0
Lava Blister	1	1.0
Lava Tube	10	10.1
Modified Depression	2	2.0
Modified Tumulus	26	26.3
Mound	3	3.0
Pavement	7	7.1
Platform	2	2.0
Rock Shelter	1	1.0
Terrace	7	7.1
Trail	21	21.2
Wall	2	2.0

4.2 Functional Categories

Function interpretation of a site or feature is determined by criteria which included: site construction and complexity; locational context (association with other sites and/or geological determinates); analysis of cultural remains (surface and subsurface); and external correlations with other archaeological sites in Hawai'i.

Eight primary function categories were identified among the sites within the project area: agriculture; habitation; human burial (probable); indeterminate; marker; mining; storage; and transportation. Table 5 below tallies site function not feature function.

Table 5. Occurrences of Formal Function Types

Function	Number of sites
Agriculture	5
Indeterminate	3
Marker	1
Probable Burial	3
Recurrent Habitation/Agriculture/Storage	1
Storage	1
Temporary Habitation	27
Temporary Habitation/Agriculture	1
Temporary Habitation/Mining	1
Temporary Habitation/Transportation	1
Temporary Habitation/Transportation/Storage	1
Transportation	14

4.3 Site Descriptions

4.3.1 State Site # 50-10-27-13493

SIHP #	50-10-27-13493
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	46 m by 6 m (150.9 ft. by 19.7 ft.)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	120 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-13493 is a stepping stone trail in good condition located on an undulating 'a'ā flow in the southwest corner of the project area (Figure 11). The trail was designated Site -13493 based on survey work within the adjoining water tank parcel (Rosendahl 1989). No soil is present on the flow and vegetation consists of sparse grasses.

The trail crosses the 'a'ā flow in a southwest/northeast direction for 46 m (150.9 ft). Flat *pāhoehoe* slabs (30-40 cm / 1-1.3 ft.) were set into 'a'ā cobbles at evenly spaced intervals, creating an easily traveled and well constructed path across the 'a'ā flow. Discoloration of the *pāhoehoe* slabs and small 'a'ā cobbles as a result of bruising make this trail easily discernable from the surrounding 'a'ā. Approximately 15 m (49.2 ft) of the trail is heavily discolored.

The trail was not discernable on the *pāhoehoe* lava on either the east or west side of the 'a'ā flow. Additionally, a bulldozer road has destroyed the northeast end of the trail along the edge of the 'a'ā flow.

No midden or artifacts were observed in association with the site.

Excavation potential is considered poor.

The function of the site is transportation. The site is one of many closely spaced and approximately parallel trails crossing a pronounced 'a'ā flow from the northeast/southwest, suggesting a relatively high degree of traffic in the area.



Figure 11. SIHP# 50-10-27-13493, photograph taken 10 m (32.8 ft) from the southwest end of the trail, view to the north

4.3.2 State Site # 50-10-27-15324

SIHP #	50-10-27-15324
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	45 m by 0.6 m (147.6 ft by 2.0 ft)
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	80 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-15324 is a trail segment just *mauka* of the highway in the extreme northwest corner of the project area (Figure 12). The trail was observed at the edge of the bulldozed portion of the existing power line and continued inland at 65° for at least another 45 m (147.6 ft), to *pāhoehoe* lava where it is no longer discernable. On the *makai* side of the highway (outside of the present project area) the trail divides into two segments, extending *mauka/makai* for approximately 91.0 m (298.5 ft).

The trail segment averages 0.6 m (2.0 ft) in width and consists of a trodden surface that meanders over 'a'ā. A few isolated steppingstones consisting of *pāhoehoe* slabs were observed. A PHRI site tag was found along the trail on the *mauka* side of the highway labeled 92-1118 1118-12.



Figure 12. SIHP# 50-10-27-15324, Overview photograph of trail from northeast end, view to the southwest

4.3.3 State Site # 50-10-27-15325

SIHP #	50-10-27-15325
FUNCTION:	Temporary habitation/storage/transportation
SITE TYPE:	Wall, modified depressions, and mound
TOTAL FEATURES:	4
DIMENSIONS:	1539.0 m ² (16,559.6 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	80 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-15325 (Figure 13) consists of four features designated A-D. Feature A is a *mauka-makai* oriented wall, Feature B is a modified depression consisting of nine separate pits, Feature C is a mound, and Feature D, a cobble trail extending eastward runs through the southern portion of the site. The site is located on a rough 'a'ā flow that slopes gently *makai*. Paved areas of the site are very prominent. Vegetation at the site consists of sparse areas of various grasses and *koa haole*.

Feature A is a wall located in the northwest portion of the site on an 'a'ā ridge (Figure 14). The wall runs in a general east/west direction for 27.5 m (90.2 ft) with a maximum height of 1.2 m (3.9 ft) and the width ranges from 0.7 m (2.3 ft) to 2.5 m (8.2 ft). The wall is constructed of roughly piled and stacked 'a'ā cobbles and boulders with facing apparent in various locations. A level area of 'a'ā pebbles measuring 2.5 m (8.2 ft) north/south by 2.0 m (6.6 ft) east/west is located 1.6 m (5.2 ft) north of the eastern end of Feature A. On the south side of Feature A (between Feature A and Feature B) is a large leveled area of 'a'ā pebbles. The southeast edge of this level area slopes southward for 2.5 m (8.2 ft) to the northern edge of Feature B.

Feature B consists of nine pits and several small leveled areas within an area (Figure 15) measuring 10.0 m (32.8 ft) north/south by 12.0 m (39.4 ft) east/west and located south of Feature A and west of Feature C. The pits vary slightly in size and condition with the smallest measuring 0.3 m (0.9 ft) by 0.2 m (0.6 ft) and 0.3 m (0.9 ft) deep; and the largest measuring 0.6 m (2.0 ft) by 0.5 m (1.7 ft) and 0.8 m (2.6 ft) deep. All of the pits are constructed of 'a'ā cobbles and small boulders placed upright at angles to create a small enclosed space. The pits bases are filled with 'a'ā pebbles. Between the pits are sporadic areas of leveled 'a'ā cobbles.

Feature C is a mound located at the southeast corner of Feature B (Figure 16). The modification consists of an 'a'ā cobble and small boulder fill area between two protruding accretion boulders. The mound measures 2.5 m (8.2 ft) north/south by 2.0 m (6.6 ft) east/west with a maximum height of 0.7 m (2.3 ft).

Feature D consists of a trail and adjacent modified 'a'ā overhang. The cobble trail runs roughly NW/SE from the eastern edge of Feature B for 26.5 m where it ends in the center of an 'a'ā flow. The modified overhang measures 1.5 m NW/SE by 1.0 m NE/SW and consists of three placed stones that partially block the entrance of the overhang.

The site is interpreted as temporary habitation with a storage area that is adjacent to a trail. This interpretation is based on the extent of modification and necessary labor. No artifacts or midden were observed at the site; excavation potential is considered fair.

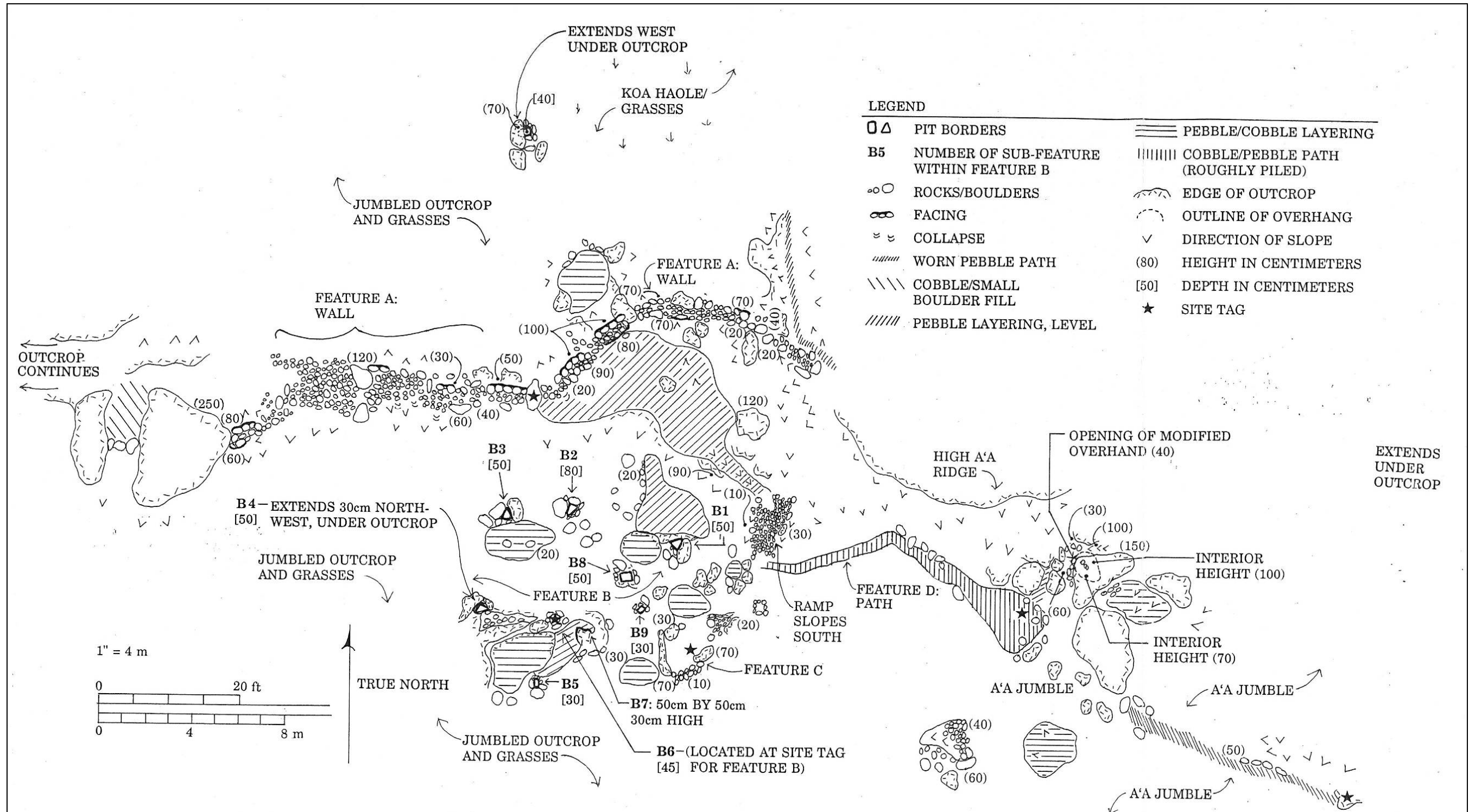


Figure 13. SIHP # 50-10-27-15325; plan view



Figure 14. SIHP# 50-10-27-15325 Feature A, photograph of wall, view to the northwest



Figure 15. SIHP# 50-10-27-15325 Feature B, photograph of stone pavement, view to the southeast



Figure 16. SIHP# 50-10-27-15325 Feature C, photograph of mound, view to the north

4.3.4 State Site # 50-10-27-15329

SIHP #	50-10-27-15329
FUNCTION:	Temporary habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	27.0 m ² (290.5 ft ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-15329 (Figure 17) is a modified tumulus with the modification consisting of a discontinuous piled rock alignment (Figure 18). The terrain consists of *pāhoehoe* gently sloping *makai*, with sparse soil deposits, which support exotic grasses, *koa haole*, *kiawe*, *noni*, and some *klu*. The site is approximately 60 m (196.9 ft) northwest of the intersection of Hina Lani Street and Queen Ka'ahumanu Highway.

An old site tag was discovered that reads: PHRI 92-1118 Site 1118-18.

The alignment is constructed of piled cobbles and small boulders on an exposed raised portion of the *pāhoehoe* tumulus. The piling is never more than 2 courses high with a maximum height of 0.2 m (0.7 ft), forming a discontinuous alignment with bare bedrock visible under the piled rocks. The upper surface of the tumulus is relatively level, and some of the cracks atop the tumulus are filled in while others are not.

A small cairn is in the center of the west side of the top of the *pāhoehoe* tumulus; this may be a previous survey marker. Next to the cairn is a nail driven into the bedrock.

The site's function is interpreted as a recurrent use site/shelter based on structural modifications, however, there is a possibility for a burial. No artifacts or midden were observed and excavation potential of the site is poor due to the lack of construction and lack of soil deposits.

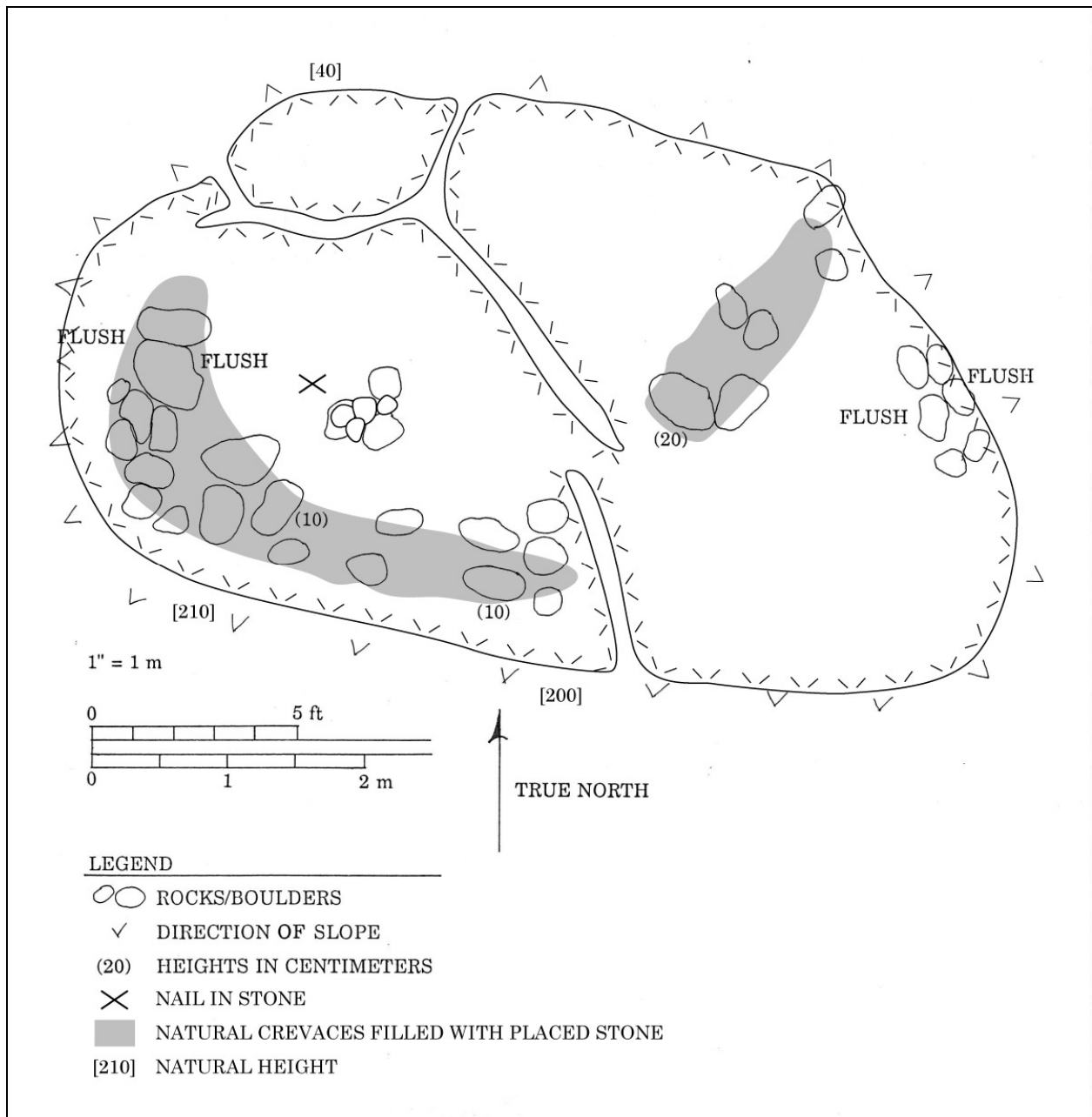


Figure 17. SIHP # 50-10-27-15329; plan view



Figure 18. SIHP # 50-10-27-15329, photograph of southeast portion of modified tumulus, view to the southeast

4.3.5 State Site # 50-10-27-20696

SIHP #	50-10-27-20696
FUNCTION:	Temporary habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	26 m by 5.3 m 137.8m ² (1482.7m ²)
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	305 ft a.m.s.l.

DESCRIPTION: Site 50-10-27-20696 is a lava tube with an entrance in a small sink located beneath a gently sloping *pāhoehoe* terrain in the southeast corner of the project area (Figure 19, Figure 20, & Figure 21). Vegetation on the surface consists primarily of *koa haole* and various grasses.

The tube measures approximately 26.0 m (85.3 ft) long east/west and 5.3 m (17.4 ft) wide with a maximum ceiling height of 1.3 m (4.3 ft). There is an area of mounded rubble and ceiling collapse directly within the tube entrance that measures approximately 7.0 m (23.0 ft) north/south by 6.0 m (19.7 ft) east/west. The lava tube is unmodified; the only evidence of utilization consists of a few burnt sticks at the northeast end of the tube and a bamboo pole near the entrance. The tube contained no soil deposits. The western end of the tube contained no cultural material, evidence of utilization, or soil deposits.

No midden was observed within the site. Excavation potential is considered poor. The only area where excavation would even be possible is within the rubble pile in the entrance of the tube.

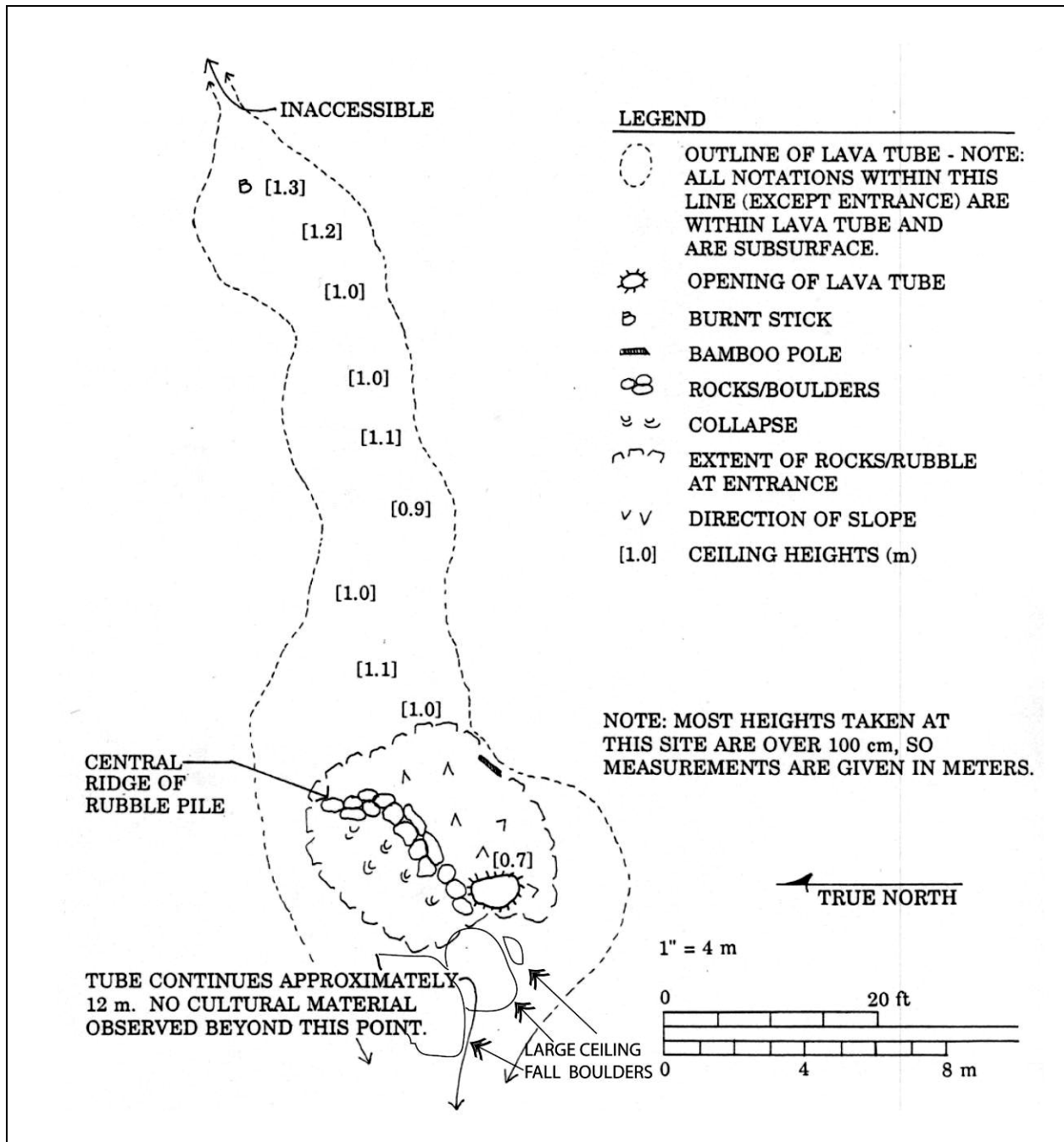


Figure 19. SIHP # 50-10-27-20696; plan view



Figure 20. SIHP# 50-10-27-20696, Overview photograph of tube opening, view to the northeast



Figure 21. SIHP# 50-10-27-20696, Photograph taken inside tube, view to the northeast

4.3.6 State Site # 50-10-27-20697

SIHP #	50-10-27-20697
FUNCTION:	Temporary habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	10 m by 10 m (1076 ft ²)
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	310 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20697 (Figure 22 & Figure 23) is a modified *pāhoehoe* tumulus located in the center of the east edge of the project area. Modification consists of two areas of stacked and piled boulders on the dome shaped surface creating an extended level surface on the top portion of the tumulus. The pavement on the east/southeast side of the site is not as level/even as the as the pavement on the north side. The north side pavement is comprised of smaller cobbles. The pavements at this site are not as level or smooth as the pavement found at site -20741 just outside the project area to the east. In addition, larger flat stone have been utilized to cover “storage” areas within a natural depression in the tumulus. The surrounding terrain consists of undulating *pāhoehoe* with the site situated on the edge of a moderate slope to the west. Vegetation on the site itself is limited to several patches of exotic grasses. Surrounding vegetation consists of various grasses, *klu*, and *koa haole*.

The first artificially leveled area measures 2.7 m (8.9 ft) north/south by 2.1 m (6.9 ft) east/west, with a maximum height of 0.7 m (2.3 ft) along the northwest facing edge (note: this height includes existing bedrock along the lower portion, the actual constructed portion only measures 0.2 to 0.3 m (0.7 to 1.0 ft). Along the northeast to east sides of the paved area is a long hollow space, up to a maximum of 0.5 m (1.6 ft) in depth, created by the natural lip of the tumulus and well placed vertical slabs and with slab capstones. The hollow space is assumed to be related to storage. The second artificially leveled area measures 2.0 m (6.6 ft) north/south by 0.7 m (2.3 ft) east/west with the average height of the construction being 0.2 m (0.7 ft) with the height of the overall area (including the lower raised bedrock) being 0.9 m (3.0 ft).

No artifacts or midden were observed. Excavation potential is considered poor due to the lack of observable midden, the shallowness of construction and the general scarcity of soil.

The function of the site is a temporary habitation site due its construction on the top of a tumulus creating a level area suitable to habitation and the construction of storage areas that are typically associated with habitation. The site was not interpreted as a permanent habitation site due to its informality and insubstantial construction and its general small size.

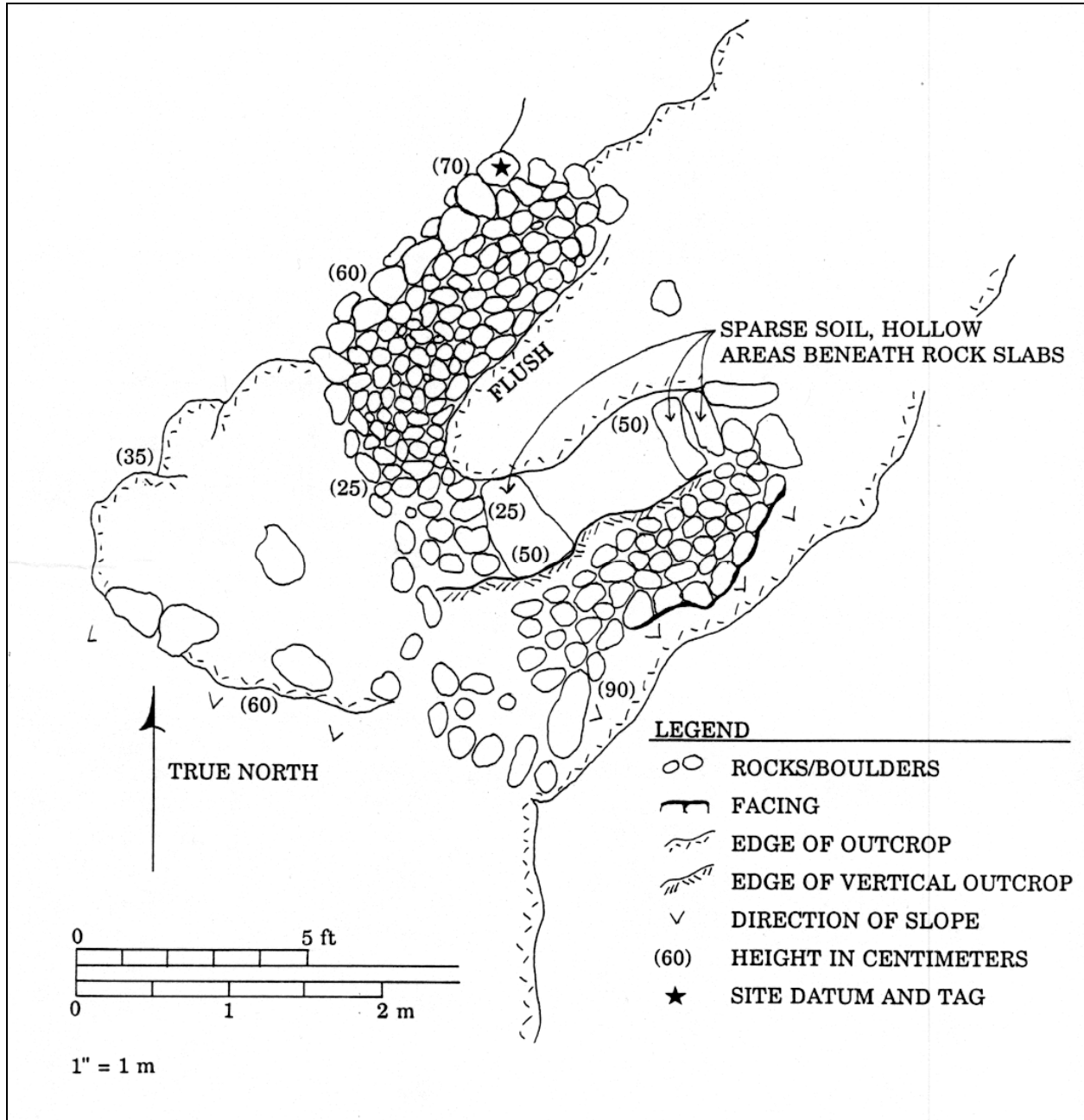


Figure 22. SIHP # 50-10-27-20697; plan view



Figure 23. SIHP # 50-10-27-20697, Overview photograph of tumulus, view to the northeast

4.3.7 State Site # 50-10-27-20698

SIHP #	50-10-27-20698
FUNCTION:	Temporary habitation
SITE TYPE:	Pavements/ Shelter
TOTAL FEATURES:	3
DIMENSIONS:	59.2m ² (637.0 ft ²)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	300 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20698 (Figure 24) consists of two paved areas (Features A and B) constructed at the *makai* edge of an 'a'ā flow in the southeast corner of the project area. The surrounding terrain consists of an 'a'ā flow which slopes gently to the west. Vegetation at the site consists of *koa haole*, and various grasses.

Feature A is a paved area located on the west edge of a large 'a'ā flow and is thus elevated above the surrounding terrain (Figure 25). The paved area measures 4.5 m (14.8 ft) north/south by 3.4 m (11.2 ft) east/west. The feature is formed by the artificial leveling and clearing of an area to form an even pavement. The south and west sides are defined by small vertically placed boulders with a maximum height of 0.7 m (2.3 ft). Extending from the southwest corner of Feature A is a small leveled area measuring 1.5 m (4.9 ft) northwest/southeast by 0.7 m (2.3 ft) northeast/southwest which extends between two portions of 'a'ā outcrop. On the southern edge adjoining this area to the southeast is another leveled area measuring 2.0 m (6.6 ft) north/south by 1.0 m (3.3 ft) east/west.

Feature B is located 1.7 m (5.6 ft) to the east of Feature A. Feature B is a small triangular paved area measuring 2.4 m (7.9 ft) north/south by 2.2 m (7.2 ft) east/west (Figure 26). The southeast portion of the paved area lies under an overhang created by an adjoining large natural 'a'ā outcrop. The overhang affords some protection from wind and sun. The northeast wall of the shelter is an 'a'ā boulder wall stacked 2-3 courses with a maximum height of 0.9m at the east corner and tapering down toward the north corner. The southeast wall is formed by a large overarching boulder approximately 1m high

Feature C is located 14 m at 330 degrees from the center of Feature B. Feature C is a natural cupboard approximately 1.5 m (4.9 ft.) east/west by 0.6 m (2 ft.) north/south (Figure 27). The east end of the cupboard is filled with 'a'ā boulders. The west end of the cupboard appears more excavated with distinctly darker stones from inside of the cupboard and placed along the north end of the feature.

This site is in good condition with a fair excavation potential. No artifacts or midden were observed at the site. The site is interpreted as a temporary habitation site due to the small leveled surfaces suitable to habitation. The site was interpreted as a temporary habitation unit due to its location, informality of construction and the natural protection afforded the site by existing 'a'ā outcrop.

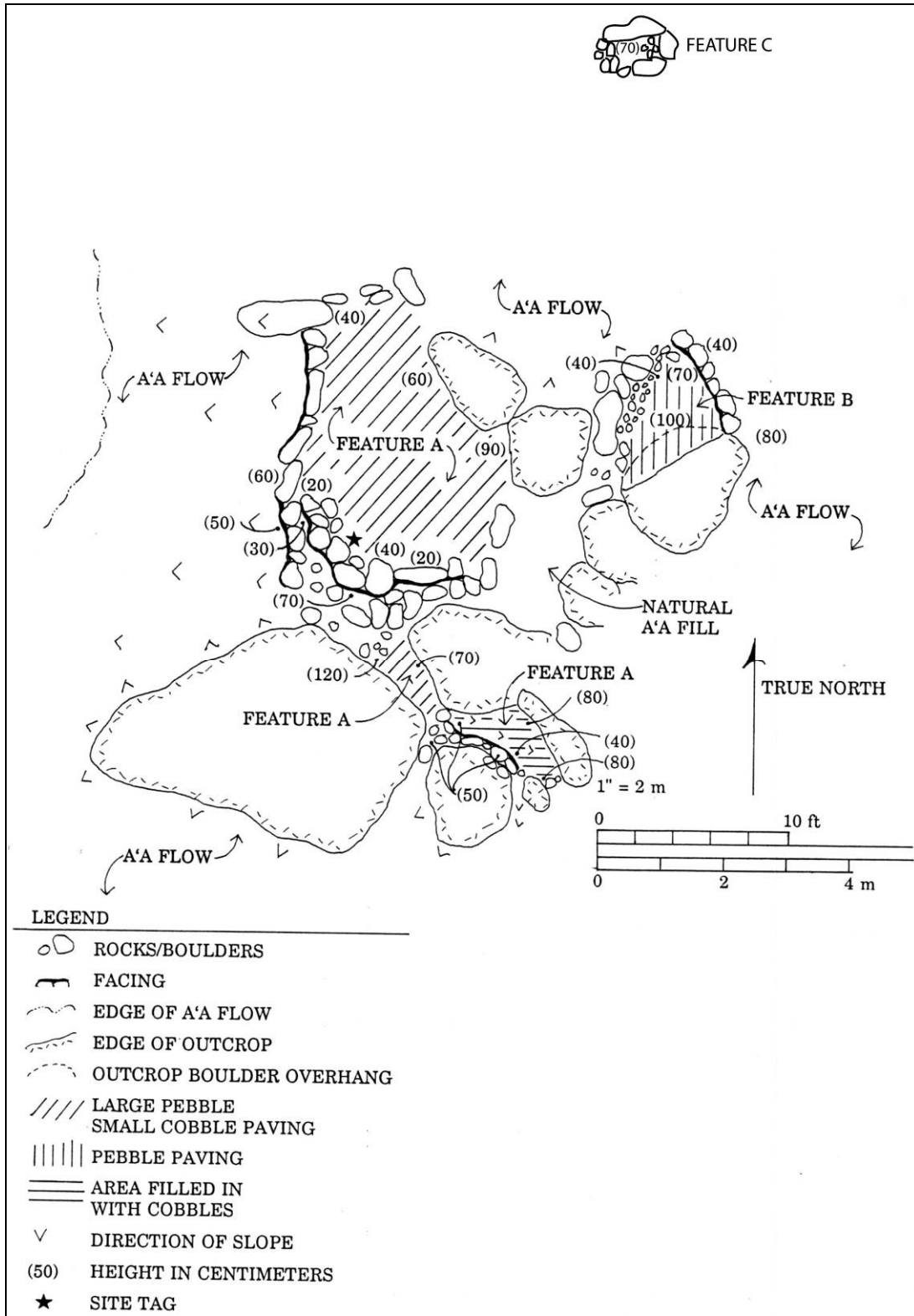


Figure 24. SIHP # 50-10-27-20698 site complex; plan view



Figure 25. SIHP # 50-10-27-20698, Feature A, cobble pavement, view to the south



Figure 26. SIHP # 50-10-27-20698, Feature B, shelter, view to the southeast

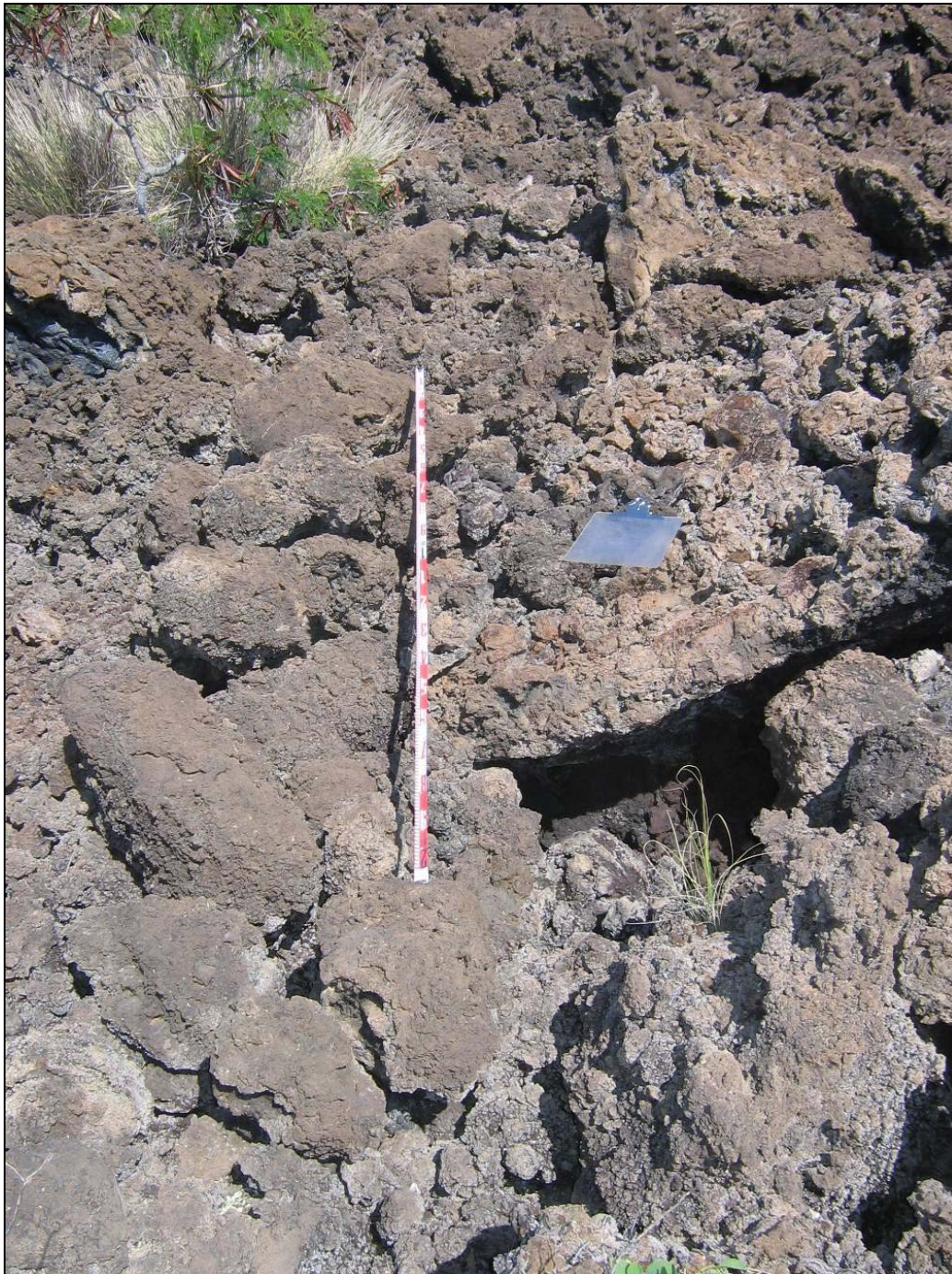


Figure 27. SIHP # 50-10-27-20698, Feature C, excavated cupboard, view to the northwest

4.3.8 State Site # 50-10-27-20699

SIHP #	50-10-27-20699
FUNCTION:	Indeterminate (temporary habitation?)
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	8.8 m ² (94.7 ft. ²)
CONDITION:	Not relocated
AGE	Pre-contact
ELEVATION:	290 ft a.m.s.l.

DESCRIPTION: Site 50-10-27-20699 (Figure 28) was described in Colin et al. (1996:50) as consisting of a modified tumulus measuring 3.9 m (12.8 ft) north/south by 2.5 m (8.2 ft) east/west located in the southeast corner of the project area. Modification was reported as consisting of cobbles placed between cracks in the tumulus to create a roughly level area ranging in height from 0.2 m (0.7 ft) to 0.4 m (1.3 ft). The level of effort to construct this site was presumably minimal. Due to the lack of midden/artifacts and its informal construction the function was indeterminable.

Excavation potential was considered poor.

Relocation of site -20699 for further observation was attempted twice in 2007 but was not successful. A secondary attempt to identify the site involved sweeps by two CSH archaeologists for one hour followed by sweeps by four CSH archaeologists for one hour. The survey proceeded by following the edge of the 'a'ā flow; the survey area was bounded with several relocated sites. The nature of this site is ephemeral, consisting primarily of modified bedrock. Many small depressions, shallow crevices, and natural alignments at the bottom of small slopes were observed, but nothing matching the description was found. Due to the less formal nature of the site, even small disturbance may have caused it to appear very natural, and the thick vegetation, especially grasses, could have easily completely covered such modification. Following repeated efforts to identify the location of this previously identified modest site, no further consideration is suggested to be warranted.

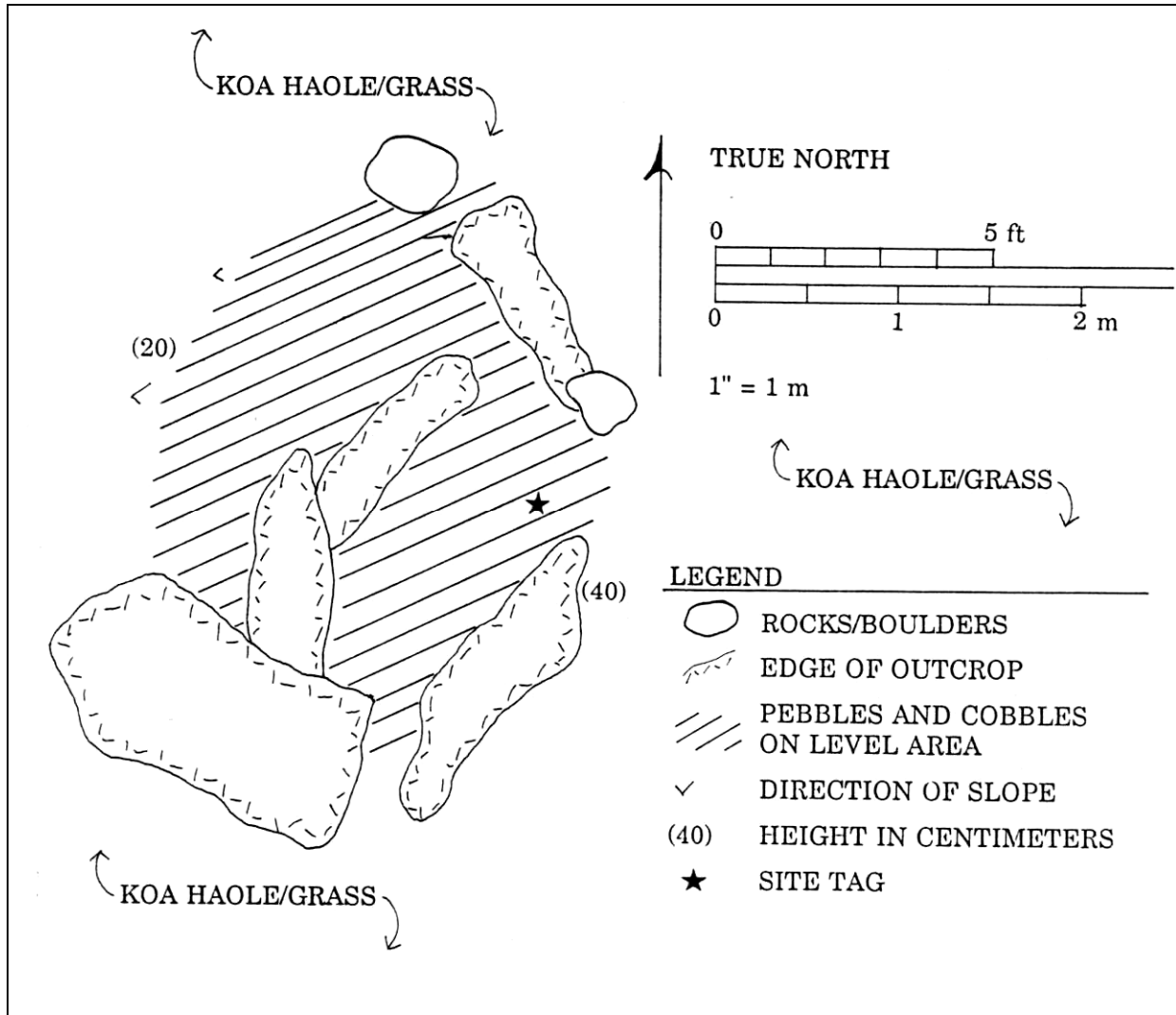


Figure 28. SIHP # 50-10-27-20699; plan view

4.3.9 State Site # 50-10-27-20700

SIHP #	50-10-27-20700
FUNCTION:	Temporary habitation
SITE TYPE:	Enclosures
TOTAL FEATURES:	2
DIMENSIONS:	4.5 m by 3.0 m 182.0 m ² (1958.3 ft ²)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	270 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20700 (Figure 29) is a complex consisting of two primary features: a modified tumulus (Feature A), and a semi-circular enclosure which abuts Feature A tumulus (Feature B) located in the northeastern portion of the project area. Vegetation at the site consists of various grasses and *koa haole*.

Feature A is a rectangular enclosure on flat bedrock on top of volcanic tumulus; an adjoining constructed terrace, created by a filled crevice, is immediately (within 60 cm / 2 ft.) north of the enclosure (Figure 30 & Figure 31). The small terraced area is constructed of well stacked *pāhoehoe* cobbles and small boulders which measures 2.4 m (7.9 ft) northeast/southwest by 3.0 m (9.8 ft) with a maximum height of 0.9 m (2.9 ft) along the northwestern face. To the south of the terrace, 4.0 m (13.1 ft), is a wide (80 cm / 2.6 ft.) southern wall of the rectangular enclosure made of *pāhoehoe* boulders. This rectangular enclosure measures 4.5 m (14.8 ft.) north/south by 3 m (9.8 ft.) east/west. The walls are low (15 cm / 0.5 ft.) and in poor condition, and likely stood approximately two courses high and may have never been formal but would be good for supporting a wooden structure. The enclosure's walls are currently only approximately one course high, stacked on the natural flat bedrock of the tumulus and are approximately 50 cm (1.6 ft.) wide (except for the wider south wall). In the center (east/west) and near the back (south) of the enclosure is a roughly rectangular depression in the bedrock. It appears to be a slightly modified (pecked) natural depression, 50 by 50 cm (1.6 ft. by 1.6 ft.) square. It contains approximately 3 cm (0.1 ft.) of sediment. This depression is interpreted as a hearth based on its location within the enclosure and its shape. The feature's habitation area between the southern enclosure wall and the terraced area measures 7.0 m (23.0 ft) north/south by 6.0 m (19.7 ft) east/west. A small concentration of marine shell midden was found within the enclosure in the general vicinity of the hearth. Shell includes cowrie and small pearlescent bivalves, most of which are fragmentary and sun bleached. The feature's condition is good and excavation potential is fair since the only location that excavation is possible is within the terraced area.

Feature B is a semi-circular enclosure that is located west and down slope from Feature A. The enclosure, which measures 7.3 m (24.1 ft) east/west by 13.0 m (42.9 ft) north/south, has stacked *pāhoehoe* cobbles and small boulder walls with a maximum height of 0.9 m (2.9 ft), and a maximum width of 1.0 m (3.28 ft). Large sections of the enclosure wall are collapsed and only a small area of facing remains on the southern end of the enclosure. The enclosure's interior consists of a roughly level soil base (the depth of the soil base was not determined but appears fairly substantial) with scattered cobbles; this area is suitable for agricultural pursuits.

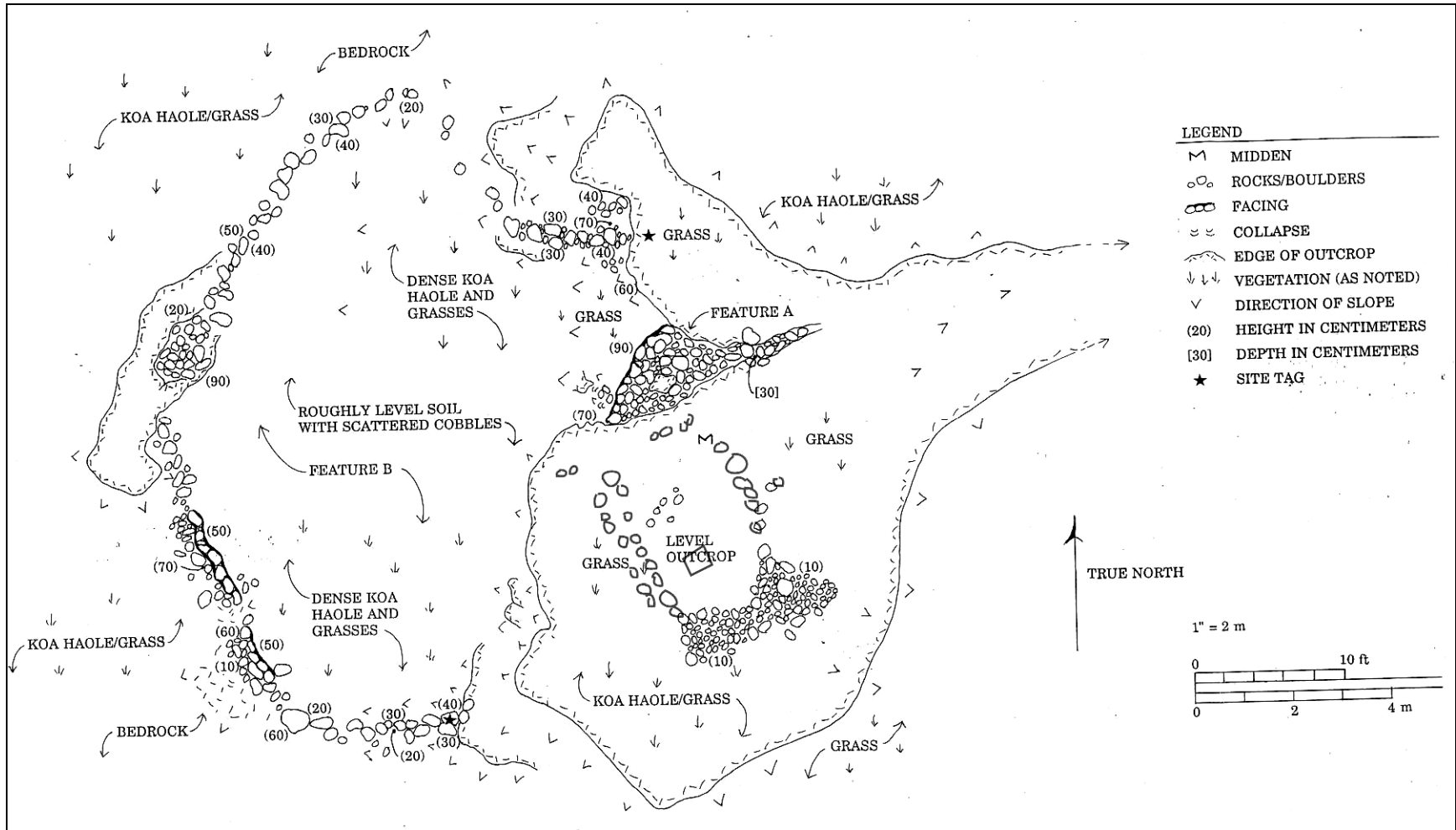


Figure 29. SIHP # 50-10-27-20700 site complex; plan view



Figure 30. SIHP # 50-10-27-20700, Feature A, overview photograph, view to the northeast

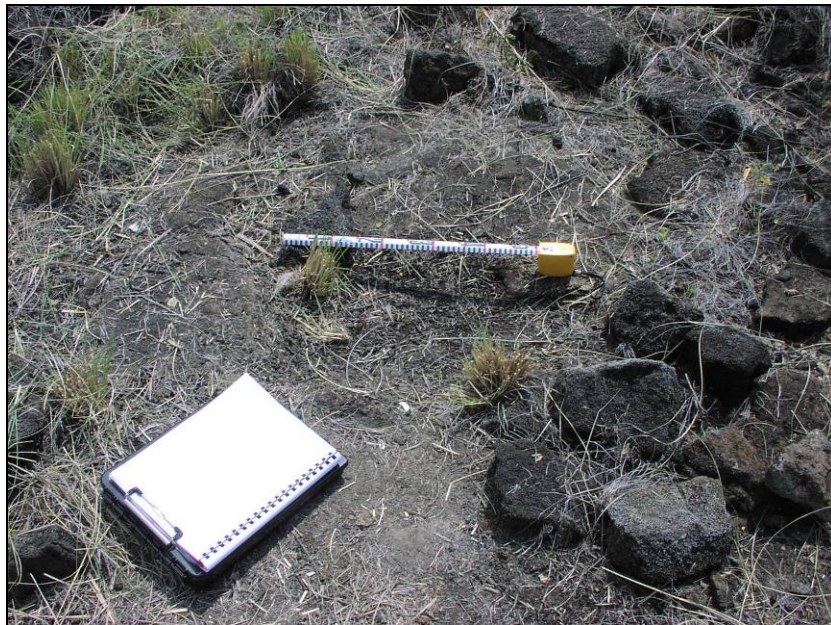


Figure 31. SIHP # 50-10-27-20700, Feature A, overview photograph of habitation area, view to the northeast

The site's function is interpreted as a temporary habitation site. This interpretation is based on the presence of the hearth and the enclosure with a north opening to minimize the sun. The presence of midden suggests habitation. Data recovery is recommended. Feature A's excavation potential is good based on the presence of a thin sediment layer in the hearth; some sediment is also present among Feature B's cobbles.

4.3.10 State Site # 50-10-27-20701

SIHP #	50-10-27-20701
FUNCTION:	Temporary Habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	3 m by 1.5 m (9.8 ft by 4.9 ft)
CONDITION:	Poor
AGE	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 20701 is a temporary habitation enclosure utilizing a natural depression in a *pāhoehoe* outcrop with stacked small boulders creating the lower wall extending 4.0 m (13.1 ft) east/west by 1.0 m (3.3 ft) north/south atop a *pāhoehoe* tumulus (Figure 32). The enclosure is oriented *makai* (west) and is on the western slope of a large *pāhoehoe* outcrop. The enclosure's interior measures 1.5 m (4.9 ft) north/south by 3 m (9.8 ft) east/west. The maximum natural height created is 1.35 m (4.4 ft) while the maximum cultural height is 0.70 m (2.3 ft). The enclosure has a small hole (*puka*) within its interior floor, which may have been used for storage. Little to no soil was found within the enclosure. Vegetation surrounding the site consists of *koa haole* and various grasses sporadically dispersed on the undulating *pāhoehoe* flow.

No artifacts or midden were observed in association with the site. The site exhibits poor excavation potential due to the lack of soil and insubstantial construction.

The site's function is interpreted as a temporary habitation.

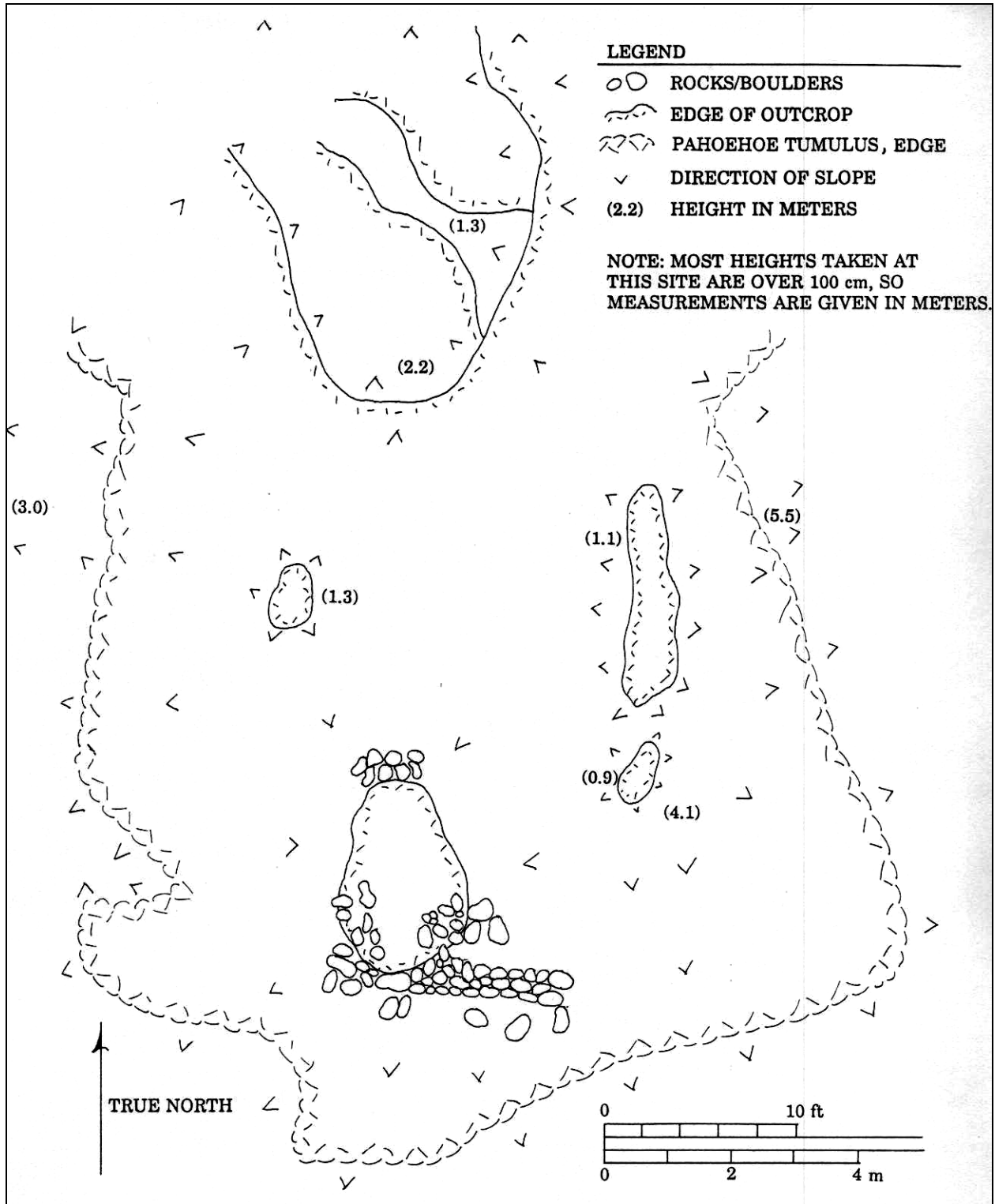


Figure 32. SIHP # 50-10-27-20701; plan view

4.3.11 State Site # 50-10-27-20702

SIHP #	50-10-27-20702
FUNCTION:	Temporary Habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	2
DIMENSIONS:	46.4 m ² (499.3 ft ²)
CONDITION:	Poor
AGE	Pre-contact
ELEVATION:	160 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20702 (Figure 33) consists of a modified tumulus and a terrace designated A and B, located in the southwest quadrant of the project area. The terrain consists of rugged *pāhoehoe* raised outcrop moderately sloping to the west. Vegetation at the site itself consists primarily of exotic grasses and sparse *koa haole*. The immediate area around the site is full of dense exotic grasses and dense *koa haole*.

Feature A is a large crevice 3.0 m (9.8 ft) southwest/northeast by 2.0 m (6.6 ft) that has been filled with small to medium angular basalt boulders (Figure 34). It is relatively flat and roughly level but not smooth. It is more angular and less even than Feature B. The fill tapers down into the north end of the crevice. The boulders are not well laid and slightly loose upon stepping on. The depth of the fill is estimated to be 2.0 m (6.6 ft). The function of Feature A could not be determined.

Feature B is a terrace that is composed of stacked small to medium angular boulders located 2.6 m (8.5 ft) southeast from Feature A and abutting the southeast side of the tumulus (Figure 35). The terrace measures 7.9 m (25.9 ft) southwest/northeast by 1.6 m (5.2 ft) southeast/northwest with a maximum height of 0.4 m (1.3 ft) along the southeastern edge. The terrace is flat and roughly level but not smooth. There is some natural rock fall that has fallen onto the terrace from the abutting outcrop on which Feature A is located. Most of the terrace is covered with lichen, indicating the absence of any recent disturbance or modification. Along the base of the outcrop wall near the surface are a number of small crevices that may have served as storage.

No artifacts or midden were observed at the site.

The site's function is interpreted as temporary habitation. Feature B likely functioned as temporary habitation given the size of the terrace and the presence of open crevices that may have been utilized for storage.

Testing Results

Subsurface testing was conducted at Site -20702, Features A & B to aid in determining the site's function.

The excavation unit at Feature A, approximately 1 m long by 1 m wide (3.3 ft. by 3.3ft.), was placed in the deepest portion of the filled crevice (Figure 33). The fill consisted of large *pāhoehoe* cobbles and small to medium boulders, ranging in size from 15 to 70 cm (0.5 to 2.3 ft.); the average size was 40 cm (1.3 ft.). Excavation ceased at bedrock, approximately 115 cm (3.8 ft.) below surface (Figure 36). No cultural material was found and no burial was present.

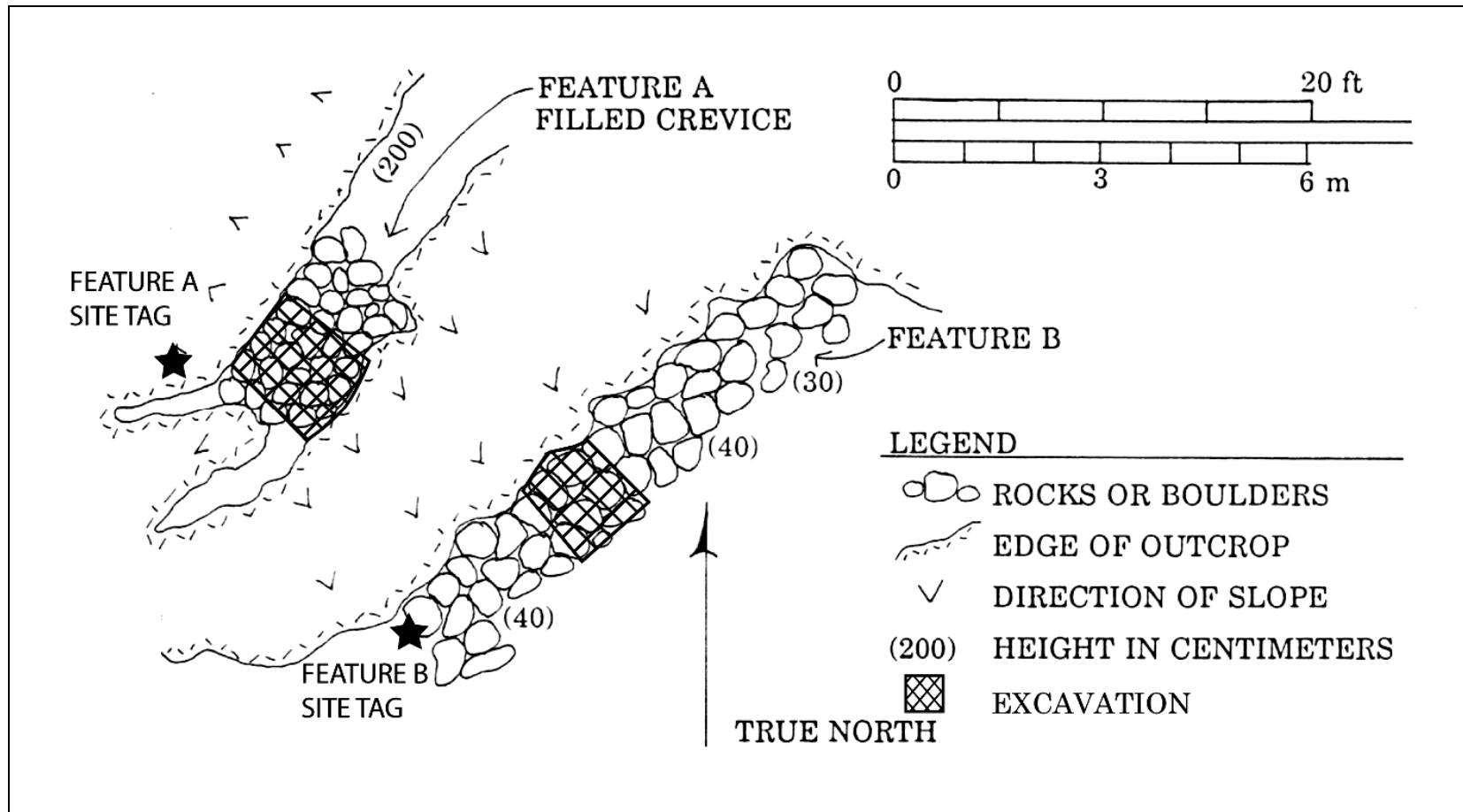


Figure 33. SIHP # 50-10-27-20702 site complex; plan view



Figure 34. SIHP # 50-10-27-20702, Feature A, overview photograph, view to the southwest



Figure 35. SIHP # 50-10-27-20702, Feature B, overview photograph, view to the north

The excavation unit at Feature B, approximately 1 m long by 1 m wide (3.3 ft. by 3.3ft.), was placed in the southwestern end of the small terrace (see Figure 33 & Figure 37). The excavation was terminated when bedrock was encountered at a depth of approximately 60 cm (below datum) (Figure 37). No soil was encountered during excavation. Test excavation revealed that the terrace was constructed of loosely stacked small to medium boulders abutting a basalt bedrock outcrop. No cultural material and/or human burials were observed during excavation.

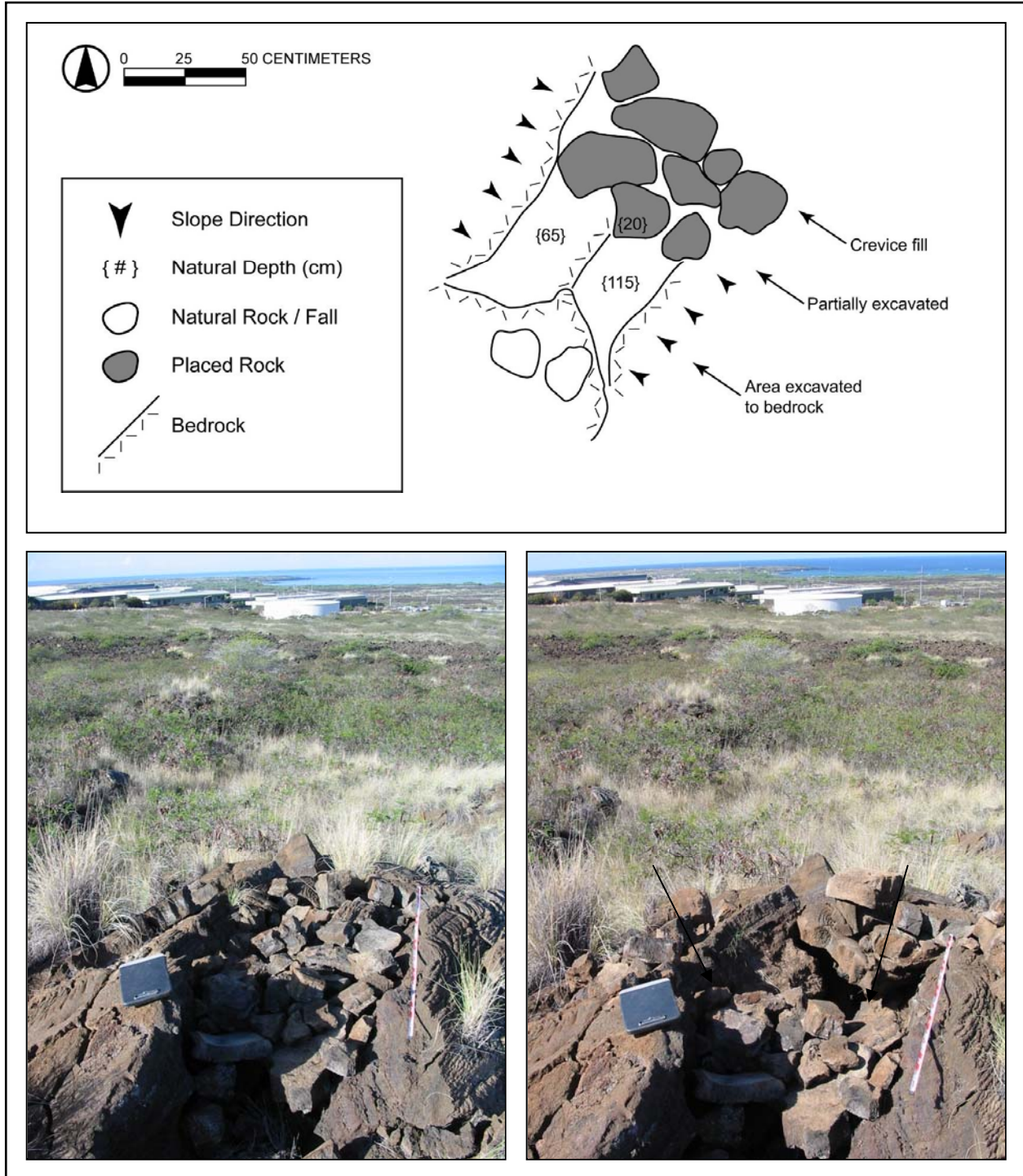


Figure 36. SIHP # 50-10-27-20702 Feature A excavation figures. Clockwise from top: post-excitation plan view, pre-excitation overview looking southwest, post-excitation overview looking southwest (black arrows indicate excavation location)

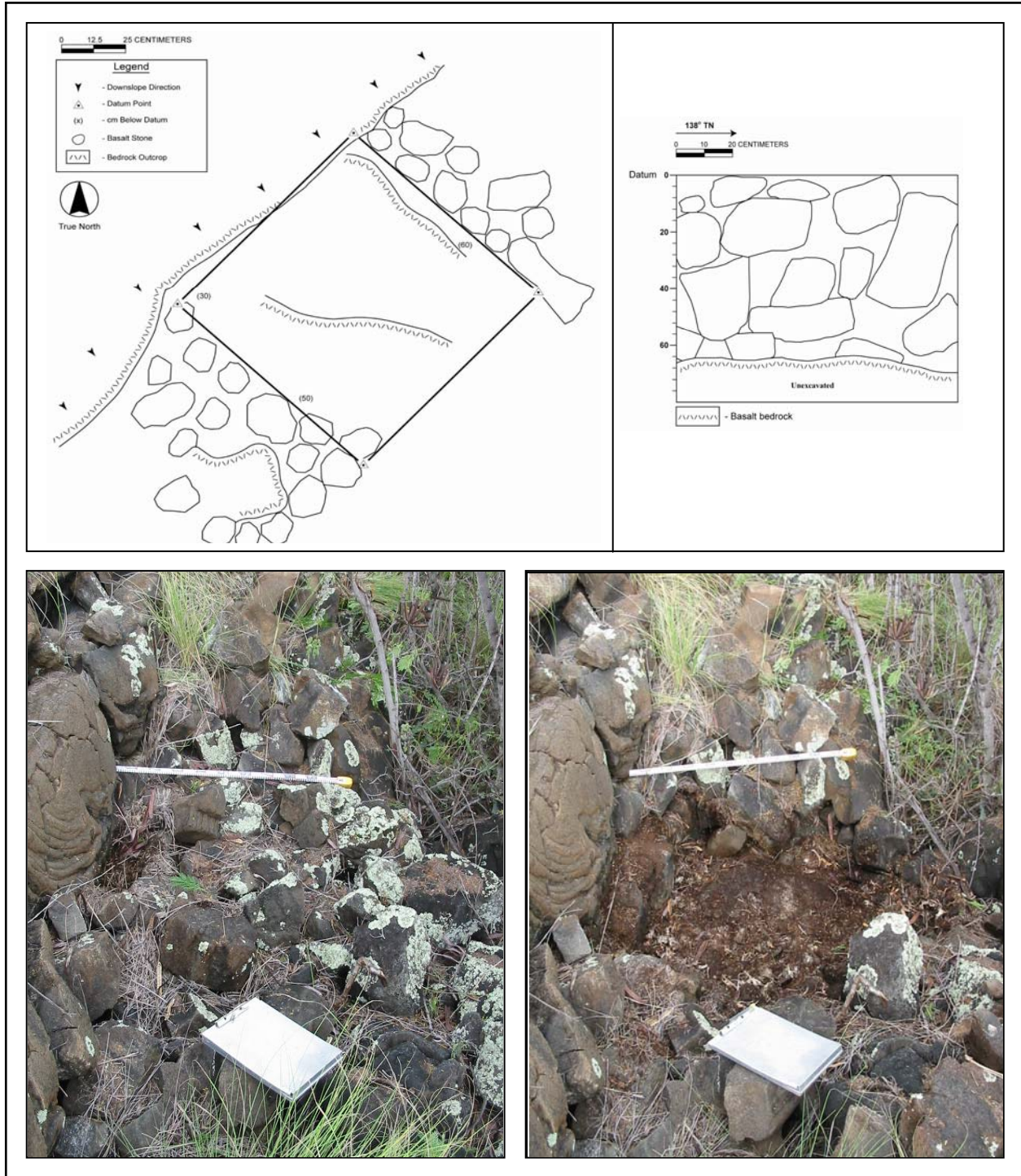


Figure 37. # 50-10-27-20702 Feature B excavation figures. Clockwise from top left: plan view, northeast wall profile, pre-excavation overview photo looking northeast, post-excavation overview photo looking northeast.

4.3.12 State Site # 50-10-27-20703

SIHP #	50-10-27-20703
FUNCTION:	Habitation/Quarry
SITE TYPE:	Terraces, pavement, modified tumulus
TOTAL FEATURES:	4
DIMENSIONS:	1204.5 m ² (12,960.4 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	160 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20703 (Figure 38) is a complex of four features (designated features A through D) located in the southwest quadrant of the project area. These features consist of two small terraces and associated pavement (Feature A), a pavement (Feature B), and a modified tumulus (Feature C). The site is situated along the southern edge of an undulating *pāhoehoe* flow and is centered on a prominent tumulus. Sparse pockets of soil at the site support various grasses and *koa haole*. The site overlooks an 'a'ā flow which runs along the southern boundary of the project area on which trail sites 13493, 20722, 20726, 20744, and 20745 are located.

Feature A is the largest terrace measuring 1.4 m (4.6 ft) high at its highest point on its north face (Figure 39). The terrace is stacked 3-4 courses on top of a *pāhoehoe* flow that measures 40 cm (1.3 ft.) above the natural depression. A small cupboard has been constructed of 2-3 boulders and an up righted *pāhoehoe* slab oriented north/west along the base of a bedrock outcrop that abuts the west end of the largest terrace. The cupboard floor is 1.4 m (4.6 ft) below the top of the bedrock outcrop. The cupboard depth below the surrounding constructed walls of the cupboard is 30-40 cm (1-1.3 ft.). Bridging the area between the largest terrace and the second terrace is a roughly paved area filled with small to medium cobbles leveling areas with exposed bedrock. Some rough facing is present on the north face of this area where a crevice in the bedrock has been filled. The eastern face of the second terrace is four courses of *pāhoehoe* slabs and boulders stacked atop the *pāhoehoe* flow. A piece of coral was observed on the surface of the *pāhoehoe*

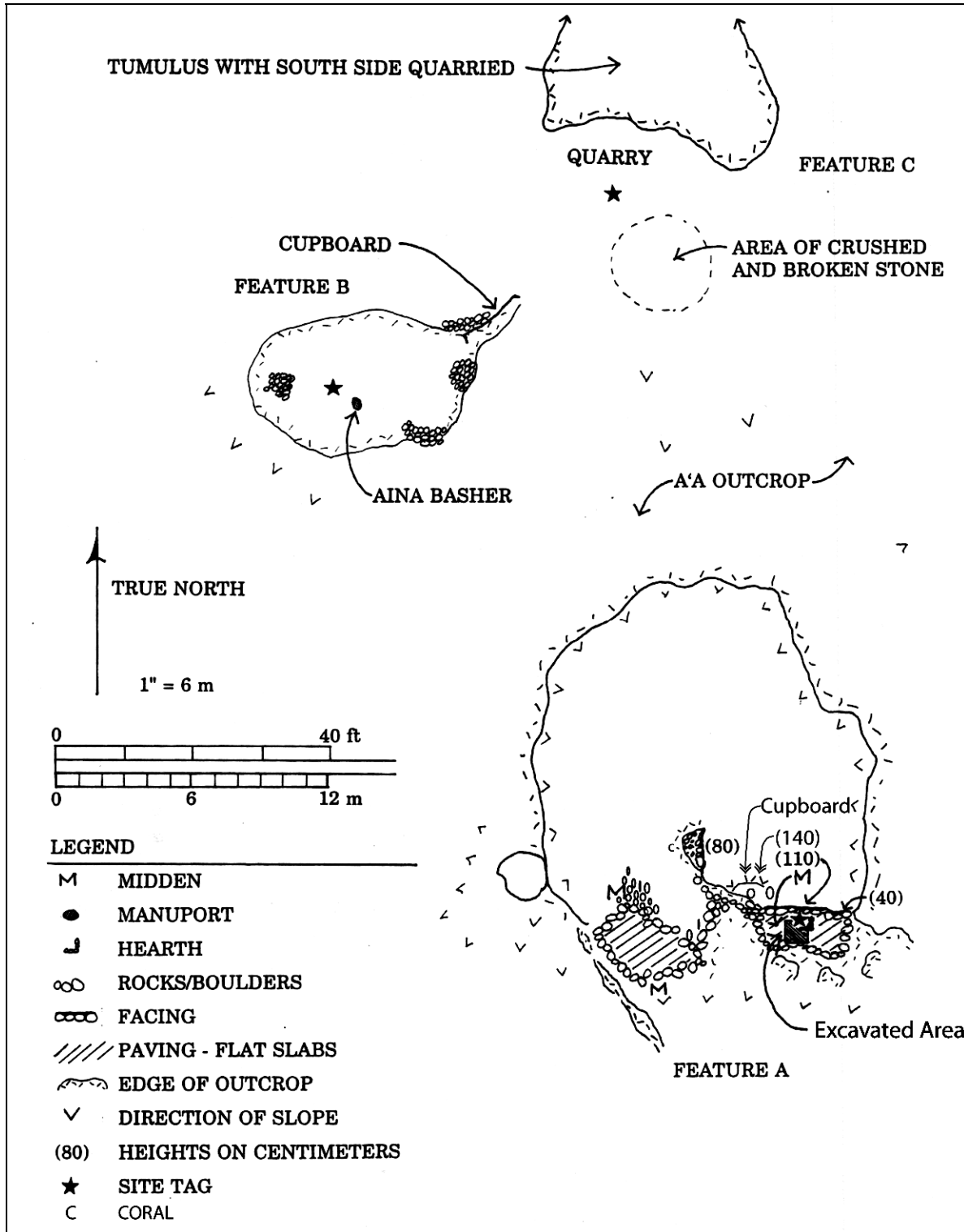


Figure 38. SIHP # 50-10-27-20703 site complex; plan view



Figure 39. SIHP # 50-10-27-20703, Feature A, northeast end of faced terrace, view to the southwest

flow that is flush with the surface of the second terrace. It is located approximately 70 cm (2.3 ft.) southwest of the west corner of the second terrace. The informal pavement is connected to both terraces via filled cracks that have been leveled with the exposed bedrock. The pavement measures approximately 4 m (13.1 ft) east/west by 2.5 m (8.2 ft) north/south. It is constructed of small and large cobbles and boulders and some *pāhoehoe* slabs. The pavement is level and fairly smooth. A ridge runs approximately northeast/southwest down slope on the tumulus that abuts the west end of the pavement and has four *pāhoehoe* slabs on its top adjacent to the pavement. Small amounts of shell midden including a nearly whole urchin shell were observed in the fill of the largest terrace.

Feature B is a pavement formed by filling in cracks and the undulating surface of the *pāhoehoe* exposed bedrock to create a more level area (Figure 40). Given the rough nature of the outcrop itself, the distinctly paved areas are not easily discernable. Feature B's cupboard is a slightly modified natural feature. There is a natural lip in the bedrock that is parallel to and on top of the pavement; small boulders and slabs have been placed to create a small storage cupboard. Feature B is located on a naturally rough but level surface on the tumulus that extends to the northwest approximately 4 m (13.1 ft). The paving/modification does not extend the length of this surface although to do so would not have required extensive additional labor investment as Feature A. A piece of coral was found on the surface approximately 1 m (3.3 ft) northeast of the hammerstone ("āina basher"). (Figure 38) The hammerstone shows slight discoloration from use, however, there is no significant wear.

Excavation potential is poor due to the lack of soil deposits and shallow depths of filled crevices.

Feature C is a modified *pāhoehoe* tumulus that has been quarried (Figure 41). The quarry is approximately 15 m (49.2 ft) northeast of Feature B. Evidence of quarrying consists of the removal of the outer sections of the tumulus' southwest end. Although some degree of quarrying is likely, the basalt/*pāhoehoe* itself is low quality and therefore would not be a likely source for tool production. However, some interior portions of the *pāhoehoe* may have been useful components of building projects (trails, terraces, etc.). It is also very likely that due to the fractured nature of the large protruding tumulus, a majority of the broken angular boulders lying at the base of the tumulus are the result of a natural fall. It would be presumably easier to gather these materials rather than to exert the physical force necessary to obtain similar quality material within the actual tumulus.

Feature D is a natural cupboard feature with an associated *pāhoehoe* slab lid (Figure 42). Feature D is located 25 m (82 ft.) at 158 degrees east of north from the site tag at feature B. The opening of the cupboard is 39 cm (1.3 ft.) north/south and 34 cm (1.1 ft.) east/west. The depth at the opening is 75 cm (2.5 ft.) and the interior size is approximately 2 m (6.6 ft) southwest/northeast and 1 m (3.3 ft) northwest/southeast. The cupboard opening was too small for surveyors to enter, therefore, the cupboard's contents are not completely known. No artifacts were found in the cupboard's visible areas although a small amount of soil was present at the opening. Excavation potential is considered fair due to the possibility of the feature's use as storage.



Figure 40. SIHP # 50-10-27-20703, Feature B, view to the north



Figure 41. SIHP # 50-10-27-20703, Feature C, overview photograph, view to the northwest

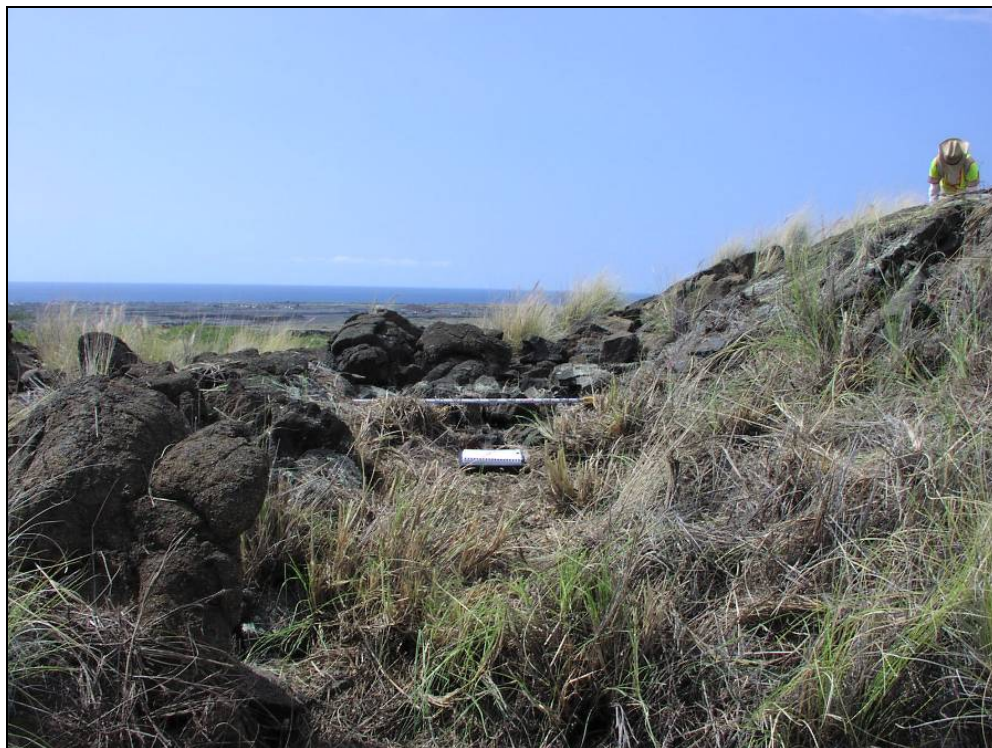


Figure 42. SIHP # 50-10-27-20703, Feature D, photograph taken from east end, view to the west

The site's function is interpreted as a recurrent use habitation site with a quarry. This interpretation is based on the presence of the inlaid hearth feature and the labor investment required to construct these well-faced and well-stacked terraces. The site's location at the end of the 'a'ā is also quite prominent. The site's habitation may have been intermittent but was recurrent based on the quarry activities and labor investment.

Testing Results

Subsurface testing was conducted at Feature A to better define the feature's function and to attempt to collect charcoal for radiocarbon analysis. A 1.0 m (3.28 ft) by 1.0 m (3.28 ft) test unit was placed in the center of the largest terrace of Feature A. The unit incorporated the terraces hearth within the northeast corner of the unit. Marine shell midden was observed on the surface of the test unit within the hearth feature.

The hearth fill was removed from the test unit and bagged for analysis. The hearth extended to a maximum of 16.5 cm (0.5 ft.) below the surface and consisted of a grey (5Y 6/1) silt or ash intermixed with 'a'ā gravel and pebbles (Figure 43). A variety of assorted marine shell and scant terrestrial midden was recovered from the hearth portion of the test unit, including the following: 0.3 g of snakehead cowrie (*lehokupu* or *Cypraea caputserpentis*); 0.2 g polished nerite (*kupe'e* or *Nerita polita*); 0.4 g *Theodoxus cariosus*; 0.1 g *Isognomon* sp.; 3.8 g sea urchin (Echinoderm); and 1.4 g of charcoal.

The remaining portion of the test unit - outside the hearth feature - was excavated to a maximum depth of 20 cm (0.66 ft.) below the surface where *pāhoehoe* bedrock was reached. The profile revealed a relatively homogenous 'a'ā cobble and small boulder fill (Stratum I) with no consolidated soil encountered. Small pockets of organic material were encountered to the maximum depth of excavation. Material collected from this Stratum consisted of 1.3 g of snakehead cowrie (*Cypraea caputserpentis*); 0.4 g pitchy sea snail (*pipipi* or *Nerita picea*); 1.4 g *Theodoxus cariosus*; 4.4 g *Isognomon* sp.; 0.1 unidentified bone; and 18.3 g of *kukui* endocarps; and 0.4 g Echinoderm. 3.3 g of charcoal was also collected.

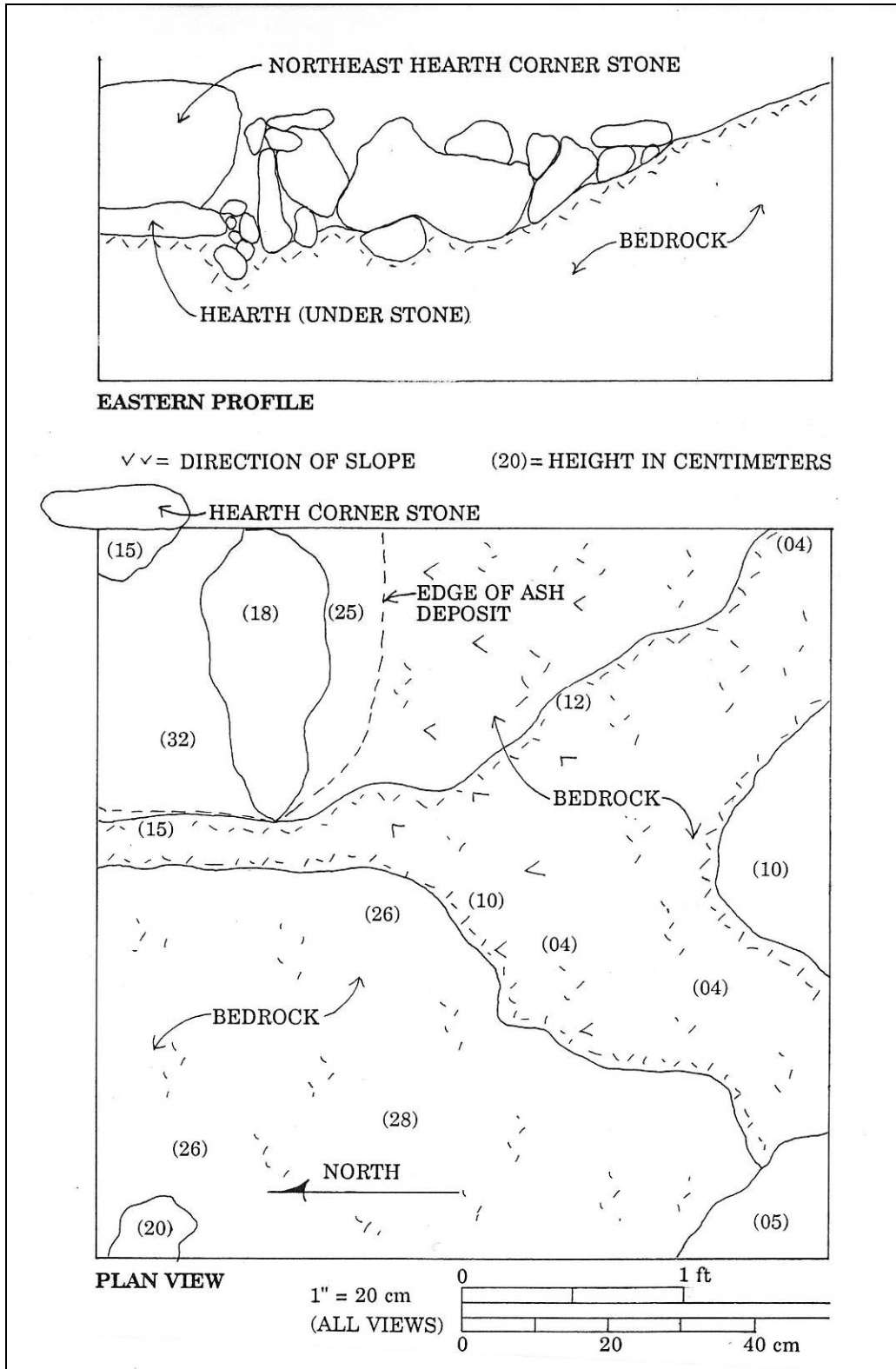


Figure 43. SIHP # 50-10-27-20703, Feature A Test Unit; plan view and profile post excavation

4.3.13 State Site # 50-10-27-20704

SIHP #	50-10-27-20704
FUNCTION:	Temporary habitation/Transportation
SITE TYPE:	Trails, wall
TOTAL FEATURES:	5
DIMENSIONS:	3255.0 m ² (35,023.8 ft. ²)
CONDITION:	Site destroyed
AGE:	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20704 (Figure 44) was described in Colin et al. (1996:56-58) as a complex consisting of five features (designated A-E) located in the west side of the north edge of the project area. The features were believed to be associated because of similar construction style, proximity, and similar states of preservation. The site was located on the northern edge of an 'a'ā flow. Only sparse grasses were present in the site area.

Relocation of site -20704 for further observation was not successful. In total, the relocation effort was conducted by three CSH archaeologists for 45 minutes including following the edge of the 'a'ā flow where the site is plotted and calculating its position off of site -20705. It appears that this site was destroyed during the construction of warehouses along Huliko'a Drive to the north. The original (Colin et al. 1996) site location map plots the site north of the project area boundary at that time. During research for previous archaeological studies in the area, no further record for the site was noted in a report accompanying this development.

Feature A was a trail, 92.5 m (303.5 ft) long extending northwest to southeast, and was characterized primarily by a worn 'a'ā cobble path. A 13.5 m (44.3 ft) segment of the northwest portion of the trail was constructed of flat *pāhoehoe* steppingstones averaging 0.3 m (1.0 ft) in size. At 6.5 m (21.3 ft) from the northwest edge of Feature A was an intersection with Feature C trail.

Feature B was an L-shaped wall constructed of large stacked 'a'ā cobbles and medium boulders, measuring 8.1 m (26.6 ft) north/south by 13.5 m (44.3 ft) east/west, with a maximum height of 0.8 m (2.6 ft). Two segments of facing were present on the east/west leg of the wall consisting of upright stones. A flat area of 'a'ā pebbles and small cobbles was present along the east side of the north/south wall segment. The interior of the area enclosed by the wall consisted of level cobble fill. The feature was interpreted as a temporary habitation feature since the interior of the enclosed area appeared suitable for habitation.

Feature C is a trail segment constructed of 'a'ā pebbles that extends between the east/west segment of Feature B wall, 4.4 m (14.4 ft) from the east end of the wall segment toward the northwest end of Feature A.

Feature D was a trail segment consisting of a worn 'a'ā path and scattered stepping stones. This segment extended 10.0 m (32.8 ft) northeast from the midpoint of Feature B wall 6.7 m (22.0 ft) from its eastern edge. The trail was no longer visible once atop a *pāhoehoe* flow to the north.

Feature E consisted of a trail segment and an area in which the larger stones appeared to have been removed to create a leveled area. The trail segment was composed of worn 'a'ā cobbles with scattered *pāhoehoe* stepping stones extending roughly north/south for 8.4 m (27.5 ft) leading to the leveled area. It measured 2.7 m (8.9 ft) north/south by 4.2 m (13.8 ft). The leveled area was situated within a depressed area of 'a'ā and was possibly utilized for agriculture.

The site's function was interpreted as temporary habitation and transportation. This interpretation was based on the type of structures and the time investment necessary for their construction. The site was reported in good condition in 1996, however, excavation potential was deemed poor due to the lack of observed cultural material and soil deposits.

No further consideration for the site is believed to be warranted since all evidence suggests this site was destroyed during nearby construction and was technically north of the present project area.

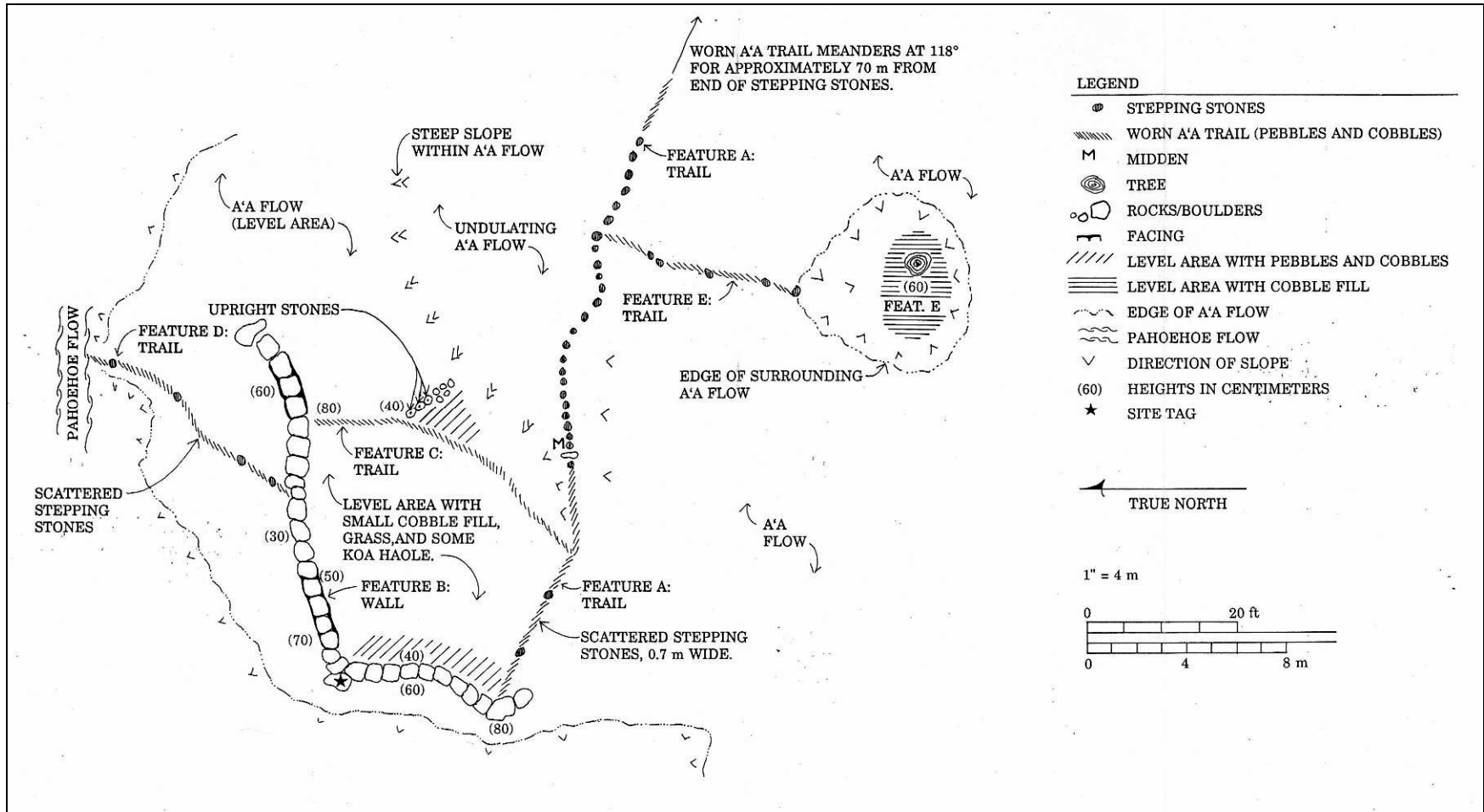


Figure 44. SIHP # 50-10-27-20704 site complex; plan view

4.3.14 State Site # 50-10-27-20705

SIHP #	50-10-27-20705
FUNCTION:	Probable burial
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	9.2 m ² (99.0 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20705 (Figure 45 & Figure 46) is a modified *pāhoehoe* tumulus defined by a filled crevice on its surface; it is located in the west end of the north edge of the project area. The terrain consists of undulating *pāhoehoe* with small amounts of soil present within pockets that support various grasses, *kiawe*, and *koa haole*.

The crevice runs northwest/southeast with a maximum width of 1.7 m (5.6 ft). 'A'ā cobbles fill the crevice's surface and *pāhoehoe* cobbles were neatly stacked beneath. The fill measures 5.4 m (17.7 ft) northwest/southeast. The cobbles filling the crevice are quite angular and they do not appear to have been selected as paving stones or stacked high enough to level the crevice with the tumulus surface. The fill tapers down into the crevice at its northwest and southeast ends, having the effect of very little level surface created by the fill. The site is in good condition and no artifacts or midden were observed on the surface.

The site's function is interpreted as a burial based on the length of the fill, and the width and depth of the crevice, which are suitable for burial. Furthermore, the lack of intentional leveling or selection of flat slabs for the top of the filled crevice is highly suggestive that this tumulus was not modified for habitation. Excavation results support this conclusion.

Testing Results

Subsurface testing was conducted at Site -20705 to better define the feature's function (Figure 47 & Figure 48). Stratum I consisted of *pāhoehoe* and 'a'ā cobbles and boulders. These rocks ranged in size between 5 cm and 50 cm (0.16 ft. and 1.6 ft.). Near the top, the stones were generally approximately 20 cm (0.66 ft.); towards the bottom, the average size was somewhat smaller (approximately 8 cm / 0.26 ft.), although larger rocks were found throughout the unit. Two pieces of midden, one *nerita* shell (120 cmbs / 3.9 ft.) and one small piece of coral (100 cmbs / 3.3 ft.), were found during excavation. These materials were returned to the test unit prior to backfilling because the site's function is interpreted as burial.

No human remains were found during excavation; the filled crevice conceals a chamber below the west portion of the tumulus. An opening to this chamber was found at 110 cmbs (3.6 ft.) in the southwest corner of the test unit. It was not possible to enter this chamber without expanding the test unit significantly to the south, dramatically impacting the integrity of a majority of the construction at the site. A chamber was visible through the opening; it measures at least 2.5 m (8.2 ft.) south, 3.3 m (10.8 ft.) southwest, and 2.5 m (8.2 ft.) west. The chamber's ceiling height was estimated to be approximately 70 cm (2.3 ft.). A clear *pāhoehoe* bedrock floor was visible through the excavated opening. The end of the chamber was not identified but is

presumed to be terminal due to the geological nature of the tumulus, though there is some possibility it continues as a tube.

The site's function is interpreted as burial. The crevice is filled where it cuts through the highest point of the tumulus. Other crevices and other portions of this crevice are not filled. The fill thus appears to have been located to conceal the chamber that was exposed during excavation.

Habitation function might be considered a possibility for this site based on the fairly flat fill surface. However, there is no modification to the most level natural surface of the tumulus that also features the smallest (thus easiest to fill) portion of the crevice. This area appears to be a considerably better location for habitation that would have been easier to modify. Therefore, with these additional observations added to previous arguments for the site's function and despite no human remains being encountered, the site's function is confidently interpreted as burial. Based on the large percentage of the fill excavated, and the certainty that this site contains burials, the excavation unit was not expanded.



Figure 45. SIHP# 50-10-27-20705, Overview photograph of modified tumulus, view to the northwest, Huliko'a Drive in background.

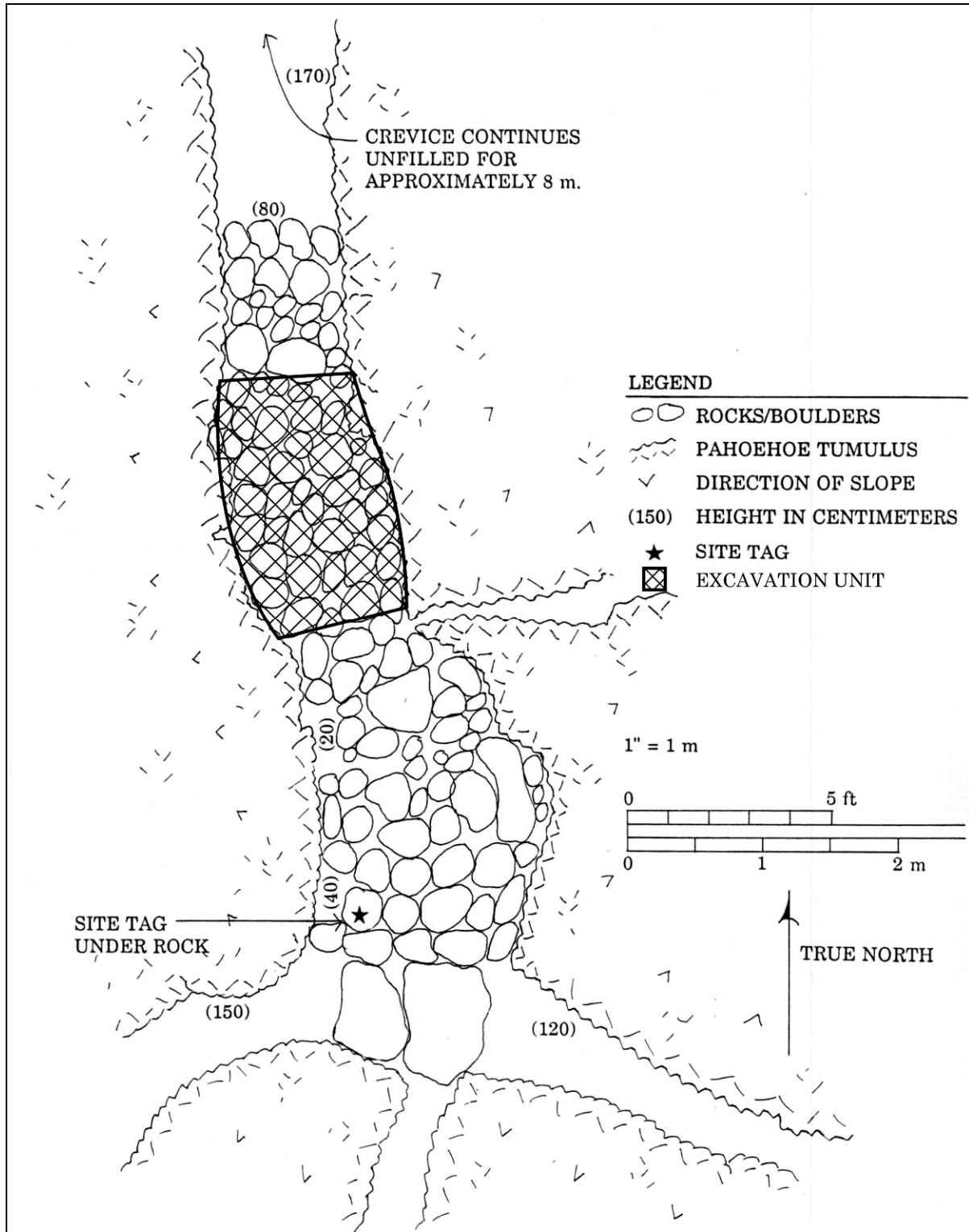


Figure 46. SIHP # 50-10-27-20705; plan view

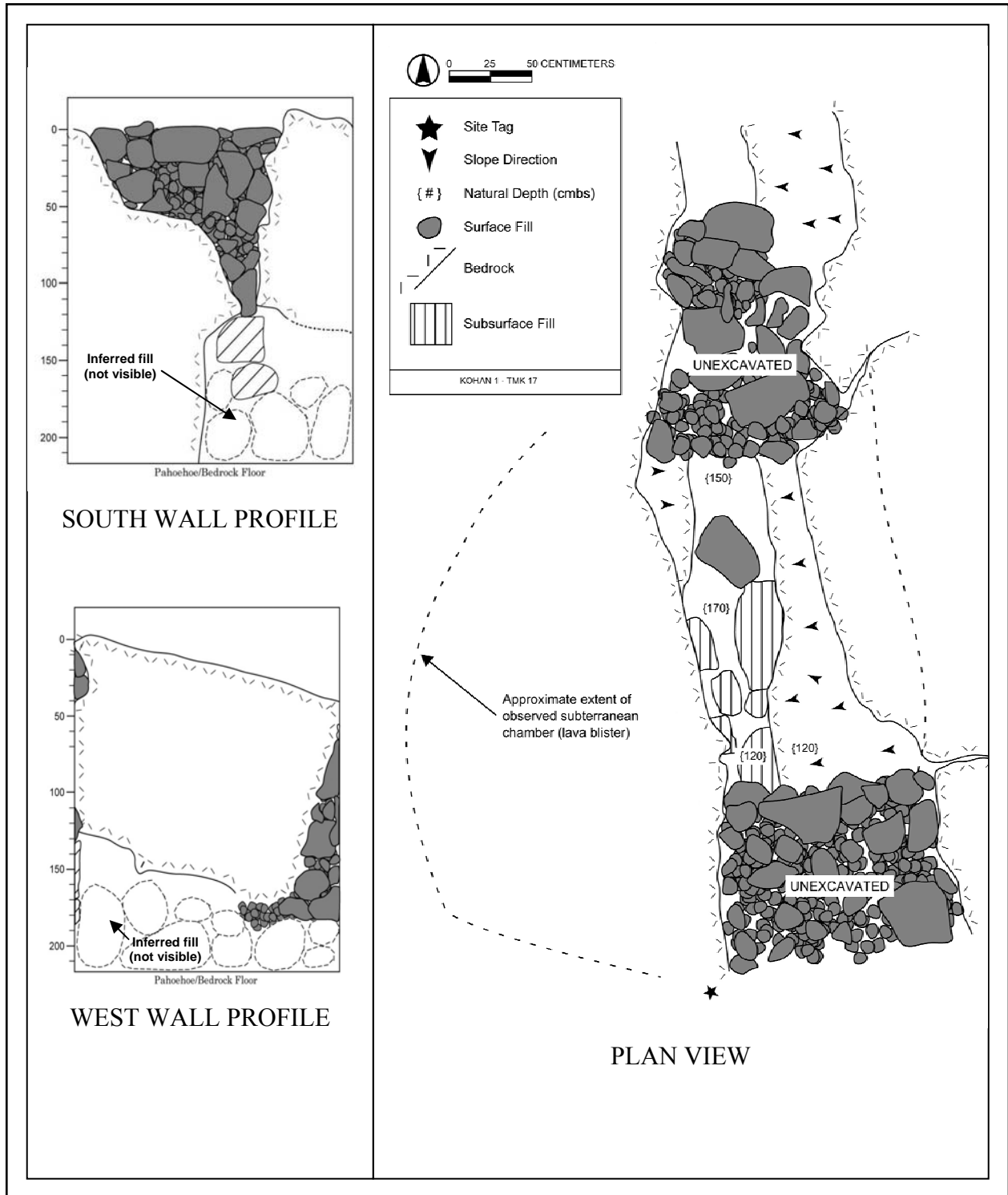


Figure 47. SIHP # 50-10-27-20705 excavation profiles and plan view.



Figure 48. SIHP # 50-10-27-20705 excavation photos. Clockwise from top left: pre-excitation overview facing south, post-excitation overview facing south, south wall profile with opening to chamber below in lower right corner.

4.3.15 State Site # 50-10-27-20706

This SIHP number was assigned during the Colin et al. 1996 study, but its use is discontinued here as the site was determined to be outside of the project area

4.3.16 State Site # 50-10-27-20707

SIHP #	50-10-27-20707
FUNCTION:	Temporary habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	21.8 m ² (234.6 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	80 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20707 (Figure 49) is an unmodified lava tube located in the southeast corner of the project area. The terrain is a moderately southwest-sloping *pāhoehoe* flow. There are sparse patches of soil on the surrounding *pāhoehoe* flow that support various grasses, *Ficus* sp., and *koa haole*. A *koa haole* tree approximately 2.5 m (8.2 ft) tall is growing in the center of the lava tube entrance.

The lava tube measures 4.1 m (13.5 ft) north/south by 6.4 m (21.0 ft) east/west, with a maximum ceiling height of 1.2 m (3.9 ft).

The main entrance, measuring 0.8 m (2.6 ft) in diameter, is located near the center of the accessible chamber (Figure 50). Very sparse cultural material, consisting of two to four pieces of marine shell and a few *kukui* endocarps, was observed directly within the entrance. No other artifacts or midden were observed. The tube's floor consists of exposed *pāhoehoe* and retains approximately 5 cm (0.2 ft.) of soil near the northwest corner (Figure 51). The site is in fair condition but exhibits no excavation potential due to a limited soil deposit and sparse midden.

This site's function is interpreted as a temporary habitation based on its relatively small size and the presence of very limited food remains.

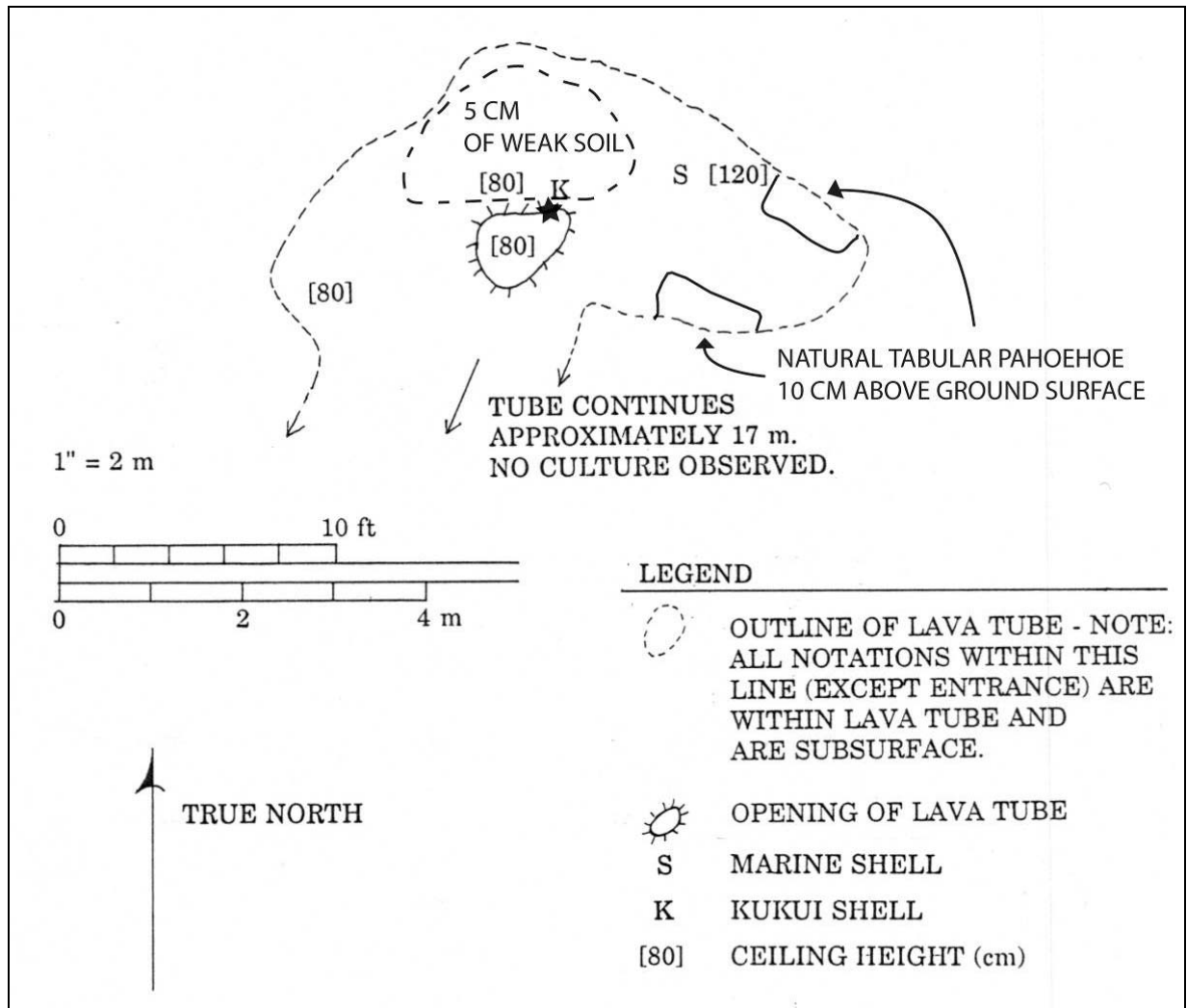


Figure 49. SIHP # 50-10-27-20707; plan view



Figure 50. SIHP# 50-10-27-20707, Overview photograph of tube opening, view to the northeast



Figure 51. SIHP# 50-10-27-20707, Photograph taken inside tube, view to the northeast

4.3.17 State Site # 50-10-27-20708

SIHP #	50-10-27-20708
FUNCTION:	Temporary habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	34.3 m ² (369.1 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	80 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20708 (Figure 52 & Figure 53) is a modified tumulus located in the east central portion of the project area. The modification consists of two adjoining leveled areas and a partially filled crevice. The terrain consists of moderately sloping undulating *pāhoehoe*, with vegetation of various grasses and Christmas berry.

The site is formed by the filling and leveling of the top portion of the tumulus. The larger of the two leveled areas is oval in shape and measures 3.4 m (11.2 ft) north/south by 2.9 m (9.5 ft) east/west. The smaller leveled area measures 2.0 m (6.6 ft) north/south by 1.8 m (5.9 ft) east/west. Both leveled areas are constructed by removal of small to medium boulders to smooth a naturally jagged surface and filling. The larger level area is approximately 45 cm (1.5 ft.) above the lower level floor. It also incorporates a naturally level portion of outcrop within its center. Though the leveling has created surfaces that are quite flat, they are not as formal as the pavement found at state site -20709. Approximately 3.5 m (11.5 ft) to the west of the leveled areas is a natural crevice in the tumulus that is informally filled with piled boulders.

No artifacts or midden were observed at the site. The site is in fair condition; excavation potential is considered fair due to the presence of relatively large filled in crevices, which could contain cultural material.

The site's function is interpreted as a temporary habitation based on the amount of labor invested in construction and the size of the site.

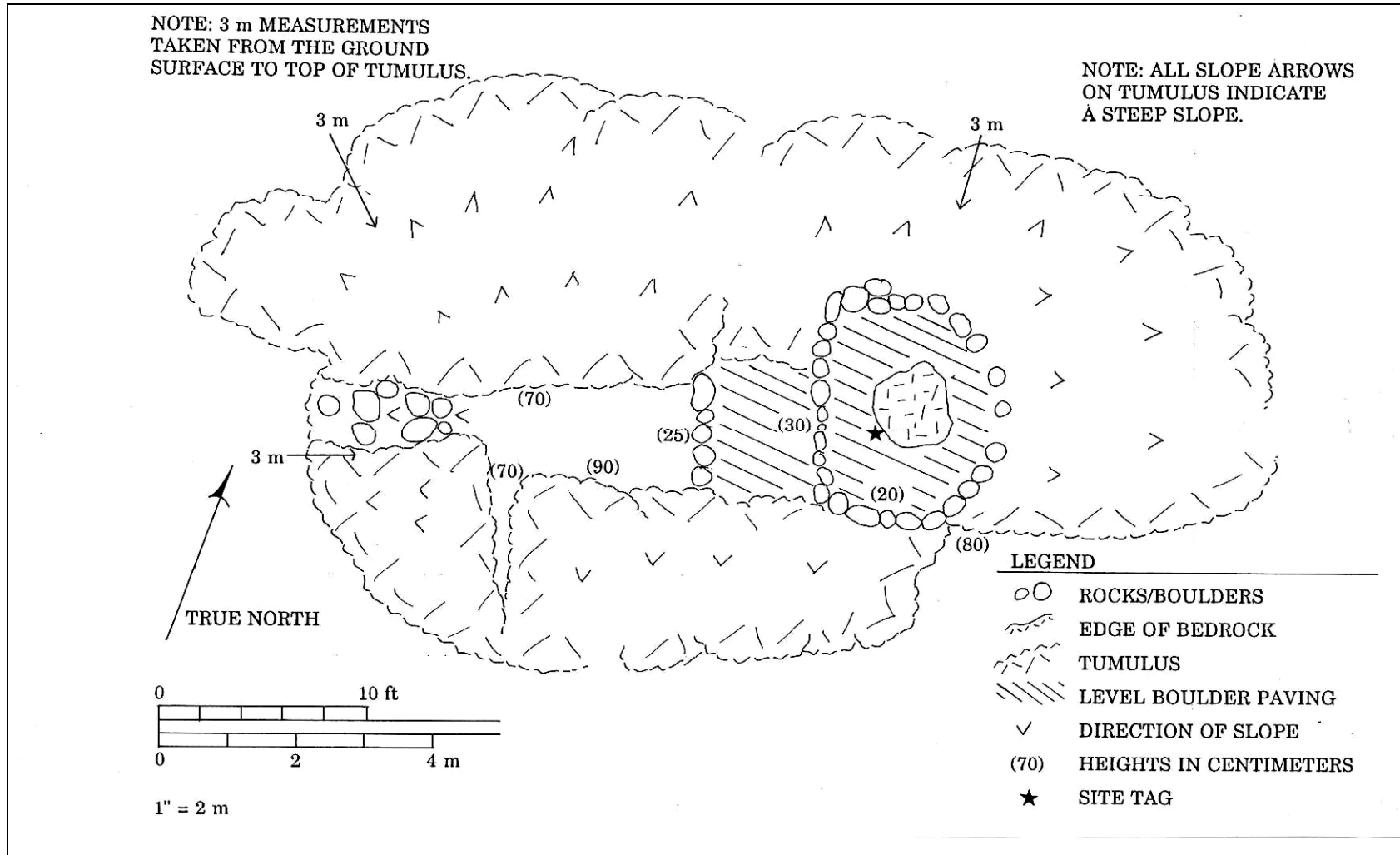


Figure 52. SIHP # 50-10-27-20708; plan view



Figure 53. SIHP# 50-10-27-20708, Overview photograph of modified tumulus, view to the east

4.3.18 State Site # 50-10-27-20709

SIHP #	50-10-27-20709
FUNCTION:	Permanent habitation
SITE TYPE:	Platform, enclosures, mound, & modified tumulus
TOTAL FEATURES:	4
DIMENSIONS:	1000.3 m ² (10,763.2 ft. ²)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	260 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20709 (Figure 54) is a complex consisting of four features, designated A to D, located on the surface of a gently sloping *pāhoehoe* flow to the southwest located in the east central portion of the project area. Vegetation at the site consists of various grasses and *koa haole*.

Feature A is an irregular, well constructed platform measuring 6.8 m (22.3 ft) north/south by 4.0 m (13.2 ft) east/west with a maximum height of 0.9 m (3.0 ft) on its east side (Figure 55). It is constructed directly on an exposed outcrop. The south and east sides are well faced and the surface of the structure is well paved with small and medium sized cobbles. A hearth is located in the central area of the platform (Figure 56). Four large flat *pāhoehoe* slabs are placed at right angles creating a square-shaped hearth. A shallow soil deposit with a few fragments of marine shell was observed within the hearth. A manuport was observed 0.3 m (1.0 ft) east of the hearth on the platform surface. The outcrop, which extends in a westerly direction from the platform, has been modified in a number of locations. The modification consists of the filling of two crevices along the northern edge of the platform and an area of filling and leveling to the southwest of the platform. The two filled crevices consist of natural fractures within the outcrop in which boulders and cobbles have been placed to fill the crevice and to create an extended leveled surface on the outcrop. The area between the southern edge of the platform and the northwestern edge of Feature C has been filled and leveled with stacked and piled boulders and cobbles. The surface of this filled area ranges from well paved to mounded. The most formal portion measures 1.5 m (4.9 ft) north/south by 2.0 m (6.6 ft) east/west and is located 3.8 m (12.5 ft) from the southern edge of the platform and at the junction with the northwestern portion of Feature C. Exotic grasses cover nearly half of the platform with more grasses and *koa haole* in the immediate area. Elevation is 106 m.

Feature B is an irregularly shaped enclosure. The enclosing wall extends from the northeast corner of Feature A for a length of 25.6 m (84.0 ft) with a maximum height of 1.1 m (3.6 ft) (Figure 57). The wall is bi-faced and is constructed of stacked basalt boulders and cobbles. Portions of the enclosure wall are collapsed but appear to have been continuously faced at one time. The interior of the enclosure consists of rocky soil with portions of exposed outcrop.

Feature C is a semi-circular enclosure situated to the south of Features A and B (Figure 58). One wall of the enclosure abuts the southwestern portion of Feature A. The enclosure extends 25.0 m (82.0 ft) to the southeast to the base of a large *pāhoehoe* tumulus. There is then a short gap (6.0 m / 19.7 ft) in the enclosure construction. Within this gap, the *pāhoehoe* tumulus

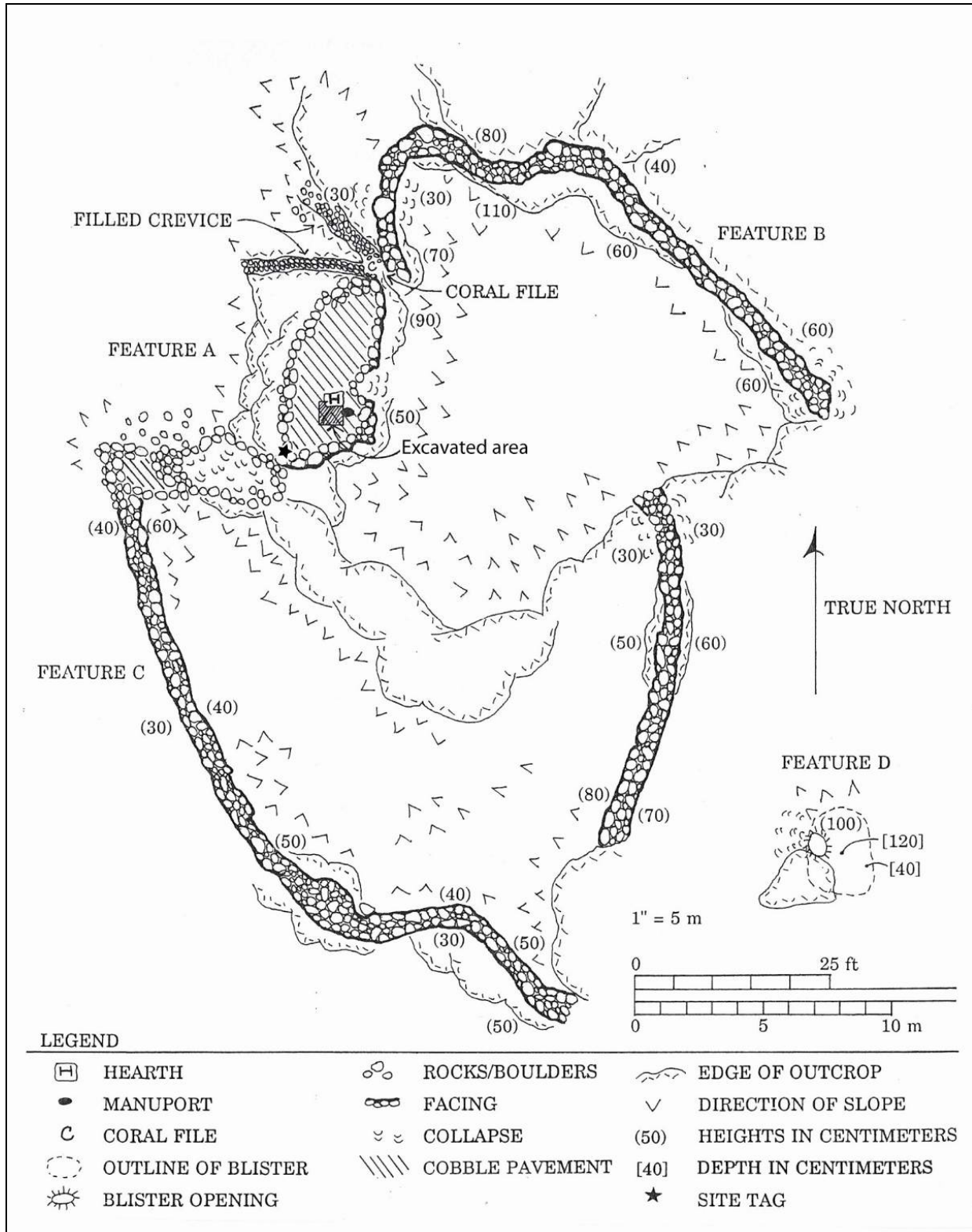


Figure 54. SIHP # 50-10-27-20709 site complex; plan view



Figure 55. SIHP # 50-10-27-20709, Feature A, overview photograph, view to the south



Figure 56. SIHP # 50-10-27-20709, Feature A, close-up view of hearth



Figure 57. SIHP # 50-10-27-20709, Feature B, stone wall, view to the northwest



Figure 58. SIHP # 50-10-27-20709, Feature C, stonewall, view to the north

naturally forms the sidewall of the enclosure. The enclosure then extends 13.9 m (45.6 ft) to the north to the edge of the sink that Feature B buffers. The maximum height of the enclosure wall is 0.8 m (2.6 ft). The feature is constructed of well stacked basalt boulders and cobbles. The large amount of lichen on various portions of the enclosure indicates the absence of any recent disturbance or modification.

Feature D is an unmodified lava blister located 23.1 m (75.8 ft) southeast of Feature A (Figure 59). The interior of the blister measures 3.5 m (11.5 ft) north/south by 2.5 m (8.2 ft) with a maximum ceiling height of 1.2 m (3.9 ft). The only cultural material encountered within the blister consisted of a few *kukui* endocarps. The feature's function is interpreted as a storage area based on its proximity to the other features, its suitability for storage (i.e. dry, easily accessible etc.) and the presence of sparse midden.

The site is in good condition and excavation potential is considered good due to the presence of the hearth, the architecture, and the presence of soil deposits within the complex boundaries.

The site's function is interpreted as a permanent habitation based on the time investment necessary to construct this site, including a formal hearth, and the results of testing (discussed below).

Testing Results

Limited testing was conducted at Feature A to aid in determining the site's function, to examine subsurface deposits and to collect charcoal for radiocarbon analysis. A 1.0 m (3.3 ft) by 1.0 m (3.3 ft) test unit was placed in the south central portion of the feature, overlapping the southern half of the hearth. Marine shell midden was observed on the surface of the interior of the hearth.

The hearth fill was removed from the test unit and bagged separately for laboratory analysis. The subsurface portion of the hearth extended to a maximum of 6.0 cm (0.2 ft.) below the surface to the hearth understone and consisted of a grey (10 YR 4/3) ash intermixed with soil, charcoal, and midden (Figure 60). An abundance of marine midden and sparse terrestrial midden was recovered from the hearth portion of the test unit, including the following: 5.8 g cone shell (*pupu'ala* or *Conus sp.*); 76.7 g snakehead cowrie (*lehokupu* or *Cypraea caputserpentis*); 6.6 g pitchy sea snail (*pipipi* or *Nerita picea*); 12.5 g dyeshells (*papua* or *Thaididae sp.*); 2.5 g *Tellina palatam*; 129.0 g sea urchin (*wana* or *Echinoderm*); 2.3 g misc. shell; 0.2 g unidentified bone; and 1.6 g of *kukui* endocarp. A total of 36.7 g of charcoal was collected of which 32.1 g were sent to Beta Analytic, Inc. for radiocarbon analysis. The sample taken from 10-20 cmbs (0.3-0.6 ft.), within the hearth, returned a date range of cal AD 1670 to 1780 and cal AD 1795 to 1945 (2 sigma, 95% probability).

The south and southwestern portions of the test unit - outside the hearth feature - were excavated to a maximum depth of 43 cmbs (1.4 ft.) and excavation was terminated upon encountering bedrock. Stratum I - 34 cm (1.1 ft.) thick - consisted of loosely compacted, dark brown (10 YR 4/3) fine grained ash soil with numerous rootlets, and angular basalt cobbles. Marine and terrestrial midden were recovered from Stratum I and include the following: 34.8 g snakehead cowrie (*lehokupu* or *Cypraea caputserpentis*); 3.4 g pitchy sea snail (*pipipi* or *Nerita*



Figure 59. Feature D, lava blister, view to the south

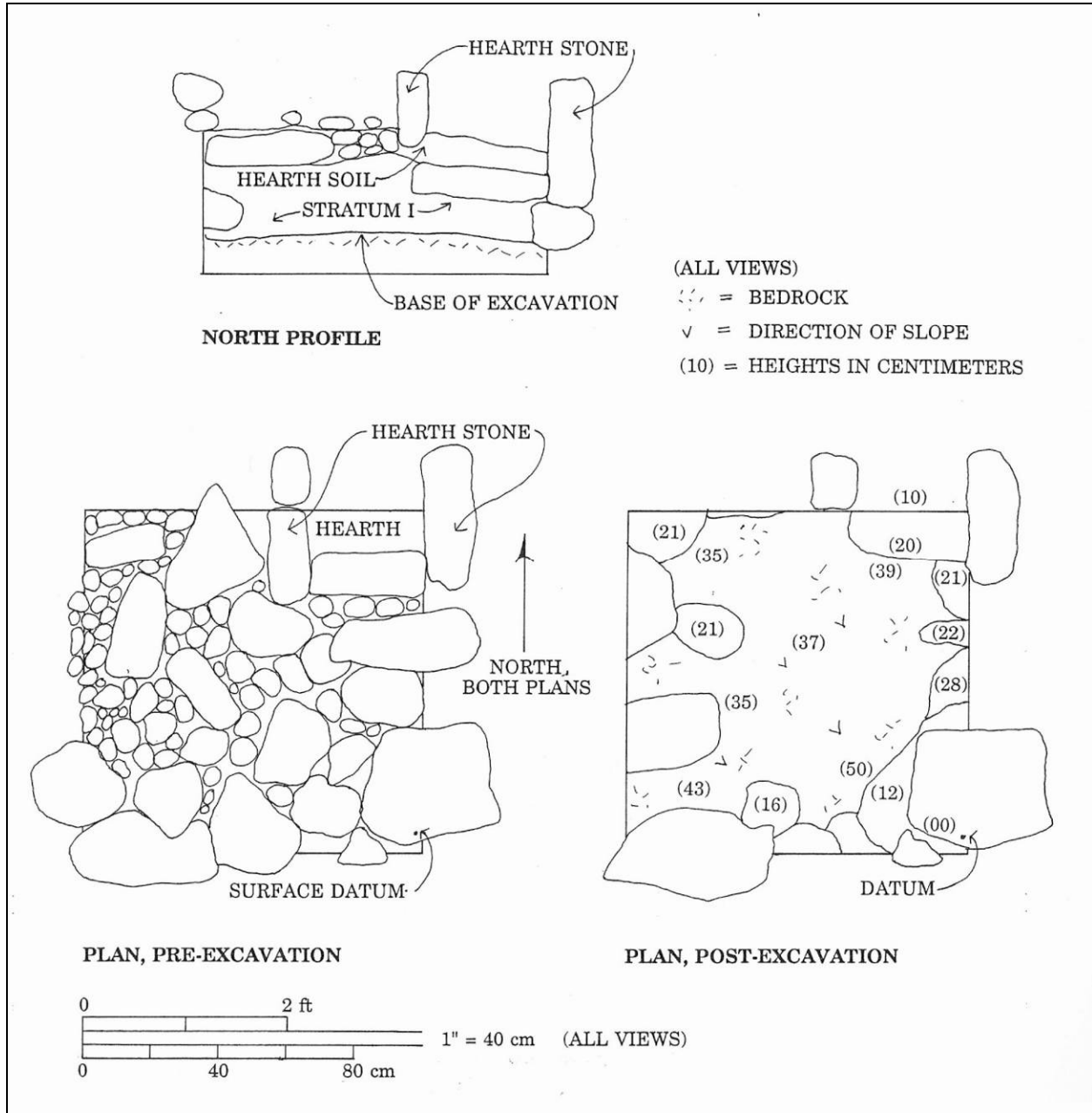


Figure 60. SIHP # 50-10-27-20709, Feature A; plan view pre-excavation, plan view and profile post-excavation

picea; 3.6 g *Theodoxus cariosus*; 1.0 g dye shells (*papua* or Thaididae); 0.6 g *Brachidontes crebristratus*; 1.1 g *Isognomon*; 43.6 g *Tellina palatam*; 99.7 g sea urchin (*wana* or Echinoderm); 23.4 g unidentified shell; 2.1 g fish bone; and 75.9 g of *kukui* endocarp. A total of 59.8 g of charcoal was also collected.

Stratum II - 3 cm (0.1 ft.) thick - consisted of orange brown gravel of decomposing bedrock. However because of the loose matrix and filtration from Stratum I; Stratum II contained: 0.9 g snakehead cowrie (*lehokupu* or *Cypraea caputserpentis*); 0.3 g pitchy sea snail (*pipipi* or *Nerita picea*); 0.1 g *Theodoxus cariosus*; 1.2 g *Brachidontes crebristriatus*; 4.5 g *Tellina palatam*; 5.8 g sea urchin (*wana* or Echinoderm); and 1.4 g of unidentified shell.

4.3.19 State Site # 50-10-27-20710

SIHP #	50-10-27-20710
FUNCTION:	Temporary habitation
SITE TYPE:	Lava tube, alignments, mound, & modified tumulus
TOTAL FEATURES:	5
DIMENSIONS:	769.5 m ² (8279.8 ft. ²)
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	270 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20710 (Figure 61) is a site complex comprised of five features (designated A through E) that are located on an uneven *pāhoehoe* terrain that is gently sloping to the southwest located in the east central portion of the project area. Vegetation on and in the immediate area of the site is dense exotic grasses and *koa haole*. This vegetation makes the various features difficult to discern upon initial inspection.

Feature A is a lava tube situated in the western portion of the complex (Figure 62). The tube measures 13.0 m (42.6 ft) north/south by 6.0 m (19.7 ft) east/west with a maximum ceiling height of 1.5 m (4.9 ft). The tube entrance is on the western edge of a *pāhoehoe* outcropping. *Kukui* endocarps (approximately 6) and various marine shell fragments were observed on the tube floor. Six additional *kukui* endocarps were immediately south of the entrance amidst ceiling fall. Portions of the tube floor, in the immediate vicinity of the entrance and to the south, are covered with soil with a maximum depth of approximately 5 cm (0.2 ft), although most of the cave is remarkably free of ceiling fall (Figure 63). Excavation potential is considered fair due to the lack of substantial soil deposit within the tube, although shell midden was observed occasionally within 3 m (9.8 ft) of the entrance. Numerous urchin shells were observed around the entrance and to the south, extending as far as 4 m (13.1 ft). Immediately inside the entrance to the east is a circular alignment measuring 69 m (226.4 ft) to the east, 61 m (200.13 ft) to the north. A fragment of a water worn ventricular basalt cobble was also noted in the cave that may be modified. Drips of water run across the ceiling; the ceiling and floor are very moist.

Feature B consists of two low semi-circular alignments that both measure approximately 3.6 m (11.8 ft) north/south, with a maximum height of 0.5 m (1.6 ft) (Figure 64). They are constructed of stacked and piled *pāhoehoe* cobbles and boulders with no apparent facing. Feature B is thickly surrounded by exotic grasses and *koa haole*. One area of the exterior alignment in the southeast corner suggests this alignment was faced, however, the remainder of the wall appears to be in fair to poor condition since many potential boulder and cobble alignment pieces have fallen down slope. The interior alignment is less uniform and consists of piled cobbles and boulders. A small single piece of coral, approximately 10 cm by 10 cm (0.3 ft. by 0.3 ft.), was observed at the feature.

Feature C is a low mound of piled *pāhoehoe* cobbles and boulders which measures 1.5 m (4.9 ft) east/west by 0.5 m (1.6 ft) north/south with a maximum height of 0.45 m (1.5 ft) (Figure 65).

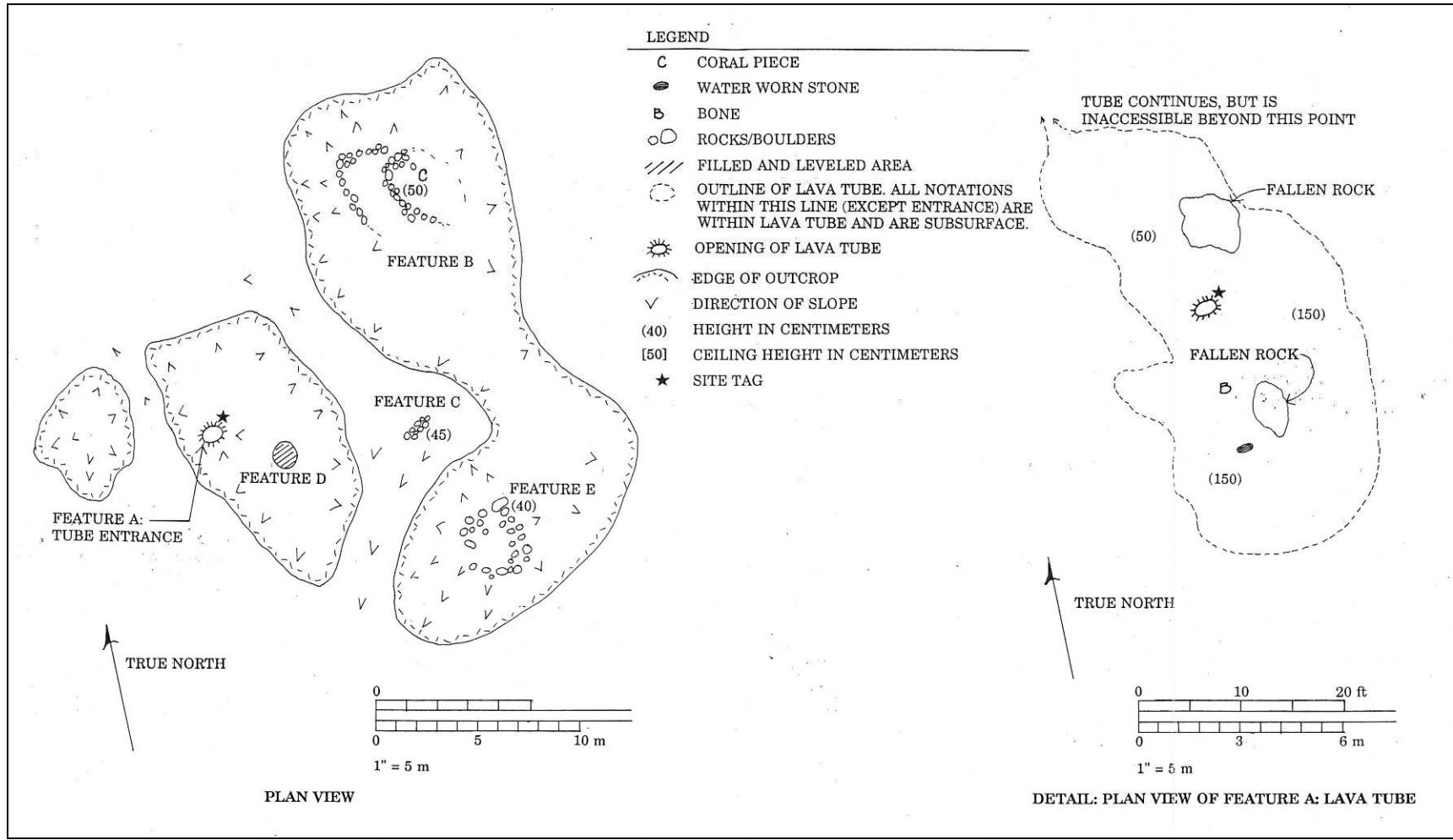


Figure 61. SIHP # 50-10-27-20710 site complex; plan view



Figure 62. SIHP# 50-10-27-20710 Feature A, photograph of tube opening, view to the southeast



Figure 63. SIHP# 50-10-27-20710 Feature A, photograph of interior of tube, view to the northwest



Figure 64. SIHP# 50-10-27-20710 Feature B, overview photograph, view to the north



Figure 65. SIHP# 50-10-27-20710 Feature C, Overview photograph of mound, view to the east

Feature D is a modified tumulus; the top of the tumulus has been leveled (Figure 66). The modification measures 1.1 m (3.6 ft) north/south by 1.0 m (3.3 ft) east/west. The modification is composed of small to medium *pāhoehoe* cobbles. The level area is not leveled with the surrounding tumulus. This paved area is approximately 10 cm (0.3 ft.) below the surrounding tumulus. No artifacts or midden were observed in association with the feature.

Feature E is a circular paved area within an undulation in the *pāhoehoe* lava 12.5 m (41.0 ft) southeast of Feature A's entrance (Figure 67). The paved area measures 3.6 m (11.8 ft) north/south by 3.5 m (11.5 ft) east/west with a maximum height of 0.4 m (1.3 ft). The feature is constructed of piled boulders and cobbles. The feature is not well defined and is in poor condition. Excavation potential of the site is considered poor due to the lack of substantial soil deposits and the insubstantial construction defining the architecture. The pavement is not as level as Feature D or as at site -20709, however, Feature E is in fair condition and while it is not well defined, it is certainly not poorly defined.

The site's function is interpreted as a temporary habitation based on the types of modifications and the labor investment necessary for the modifications.



Figure 66. SIHP# 50-10-27-20710 Feature D, photograph of paved tumulus, view to the southwest



Figure 67. SIHP# 50-10-27-20710 Feature E, overview photograph, view to the northeast

4.3.20 State Site # 50-10-27-20711

SIHP #	50-10-27-20711
FUNCTION:	Temporary habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	1
DIMENSIONS:	19.4 m ² (208.7 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	230 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20711 (Figure 68) is a square enclosure located in terrain consisting of undulating *pāhoehoe* in the northeast corner of the project area. Vegetation at the site consists of various grasses and *koa haole*.

The site measures 4.5 m (14.8 ft.) north/south by 4.3 m (14.1 ft.). The interior of the enclosure consists of level well-paved boulders and cobbles. The east and west walls of the enclosure are well faced along the interior with heights ranging from 0.3 to 0.65 m (1.0 to 2.1 ft.). The exterior portion of the eastern wall is also well faced with heights ranging from 0.7 to 0.8 m (2.3 to 2.6 ft.). The north and south walls of the enclosure are raised but not well faced. The exterior portions of the north, south and west walls are all directly abutting existing outcrop.

The site's function is interpreted as a temporary habitation based on the extent of modification and labor investment. Excavation potential of the site is considered poor due to the lack of soil deposits and associated cultural material.

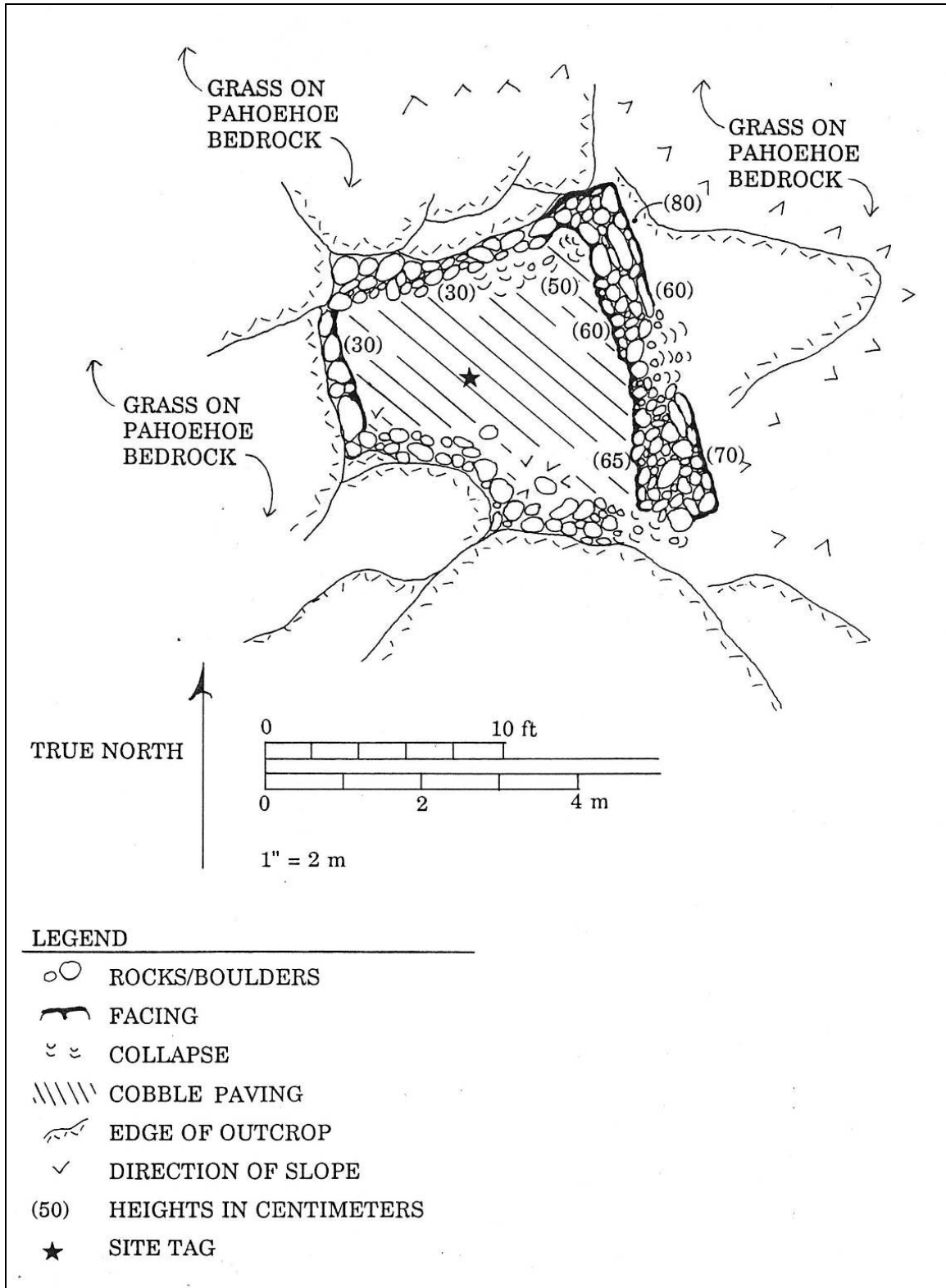


Figure 68. SIHP # 50-10-27-20711; plan view

4.3.21 State Site # 50-10-27-20712

SIHP #:	50-10-27-20712
FUNCTION:	Temporary habitation
SITE TYPE:	C-shaped
TOTAL FEATURES:	1
DIMENSIONS:	13.1 m by 9.8 m (43 ft by 32.2 ft)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	250 ft (106 m) a.m.s.l.

DESCRIPTION: Site 50-10-27-20712 (Figure 69 & Figure 70) is a rough C-shaped enclosure located in the southeast quadrant of the project area. The C-shape is constructed with large piled cobbles and small boulders that partially encloses a small level area of outcrop that is absent of any soil or vegetation. There is no facing on the enclosure and there is some collapse of the northwest corner. The northeast end of the north face of the enclosure and the northeast is piled slightly above/higher than the level/paved surface. Vegetation surrounding the site consists of thick exotic grasses and *koa haole*.

The C-shape measures 4.0 m (13.1 ft) east/west by 3.0 m (9.8 ft) north/south with a maximum height of 0.45 m (1.5 ft). No artifacts or midden were observed at the site and excavation potential is considered poor due to the lack of soil deposits, midden, and the informality of construction directly over outcrop.

The site's function is interpreted as a temporary habitation based on the size and the use of the natural outcrop. The C-shaped enclosure form is generally indicative of temporary habitation, and the less-formal construction style suggests temporary habitation rather than recurrent habitation.

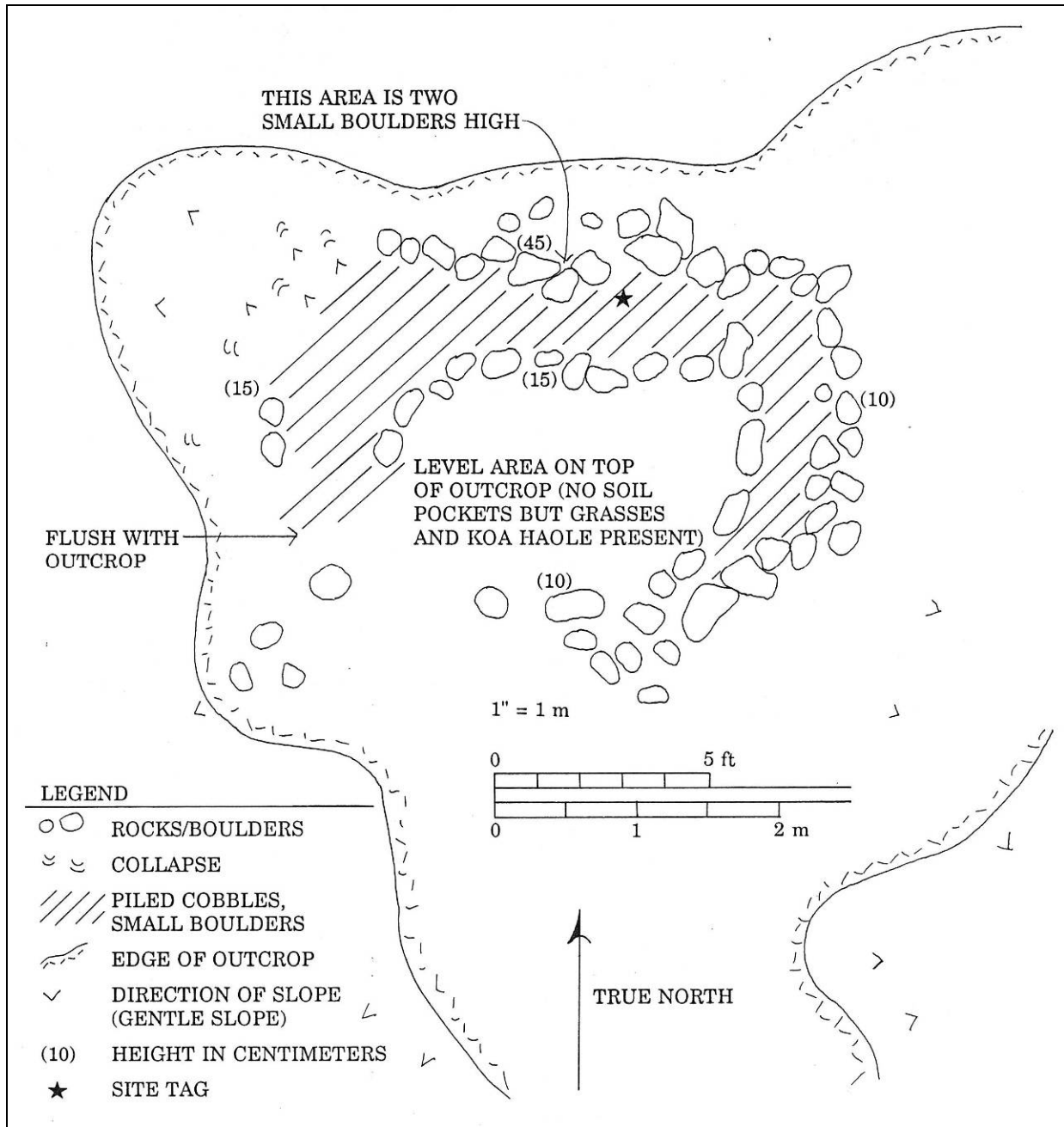


Figure 69. SIHP # 50-10-27-20712; plan view



Figure 70. SIHP # 50-10-27-20712, overview photograph, view to the northeast

4.3.22 State Site # 50-10-27-20713

SIHP #	50-10-27-20713
FUNCTION:	Marker
SITE TYPE:	Cairn
TOTAL FEATURES:	1
DIMENSIONS:	0.4 m ² (4.3 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	270 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20713 (Figure 71 and Figure 72) is a round cairn located on a large prominent *pāhoehoe* tumulus that slopes to the southwest with a separating crevice at 250 degrees southwest/northeast. The tumulus is approximately 2 m (6.6 ft) high from the northwest side. The cairn is located on the northern edge of a large crevice atop a high point of tumulus. Vegetation at the site consists of various grasses and *koa haole*.

The cairn is constructed of fifteen stacked *pāhoehoe* boulders and measures 0.55 m (1.8 ft) north/south by 0.7 m (2.3 ft) east/west with a maximum height of 0.6 m (2.0 ft).

The cairn is located on the southwest portion of the large tumulus and is 60 cm (2 ft.) in height and 60 cm (2 ft.) wide. The remainder of the crevice was sealed and several voids were detected, however, no artifacts or midden was observed. The interior of the crevice is a maximum of 135 cm (4.4 ft.) deep. The entire length of the tumulus is fractured and contains mature short *koa haole* and natural boulder fall. The maximum extent of the tumulus is 10 m (32.8 ft) northeast/southwest/ by 5 m (16.4 ft) southeast/northwest.

The site is in good condition. No artifacts or midden were observed. The site has a poor to no excavation potential due to lack of soil deposits, midden or artifacts and the construction of the site on outcrop.

The site's function is interpreted as a marker based on the size of the tumulus and nature of the cairn. Currently, it is unknown what the cairn was marking.

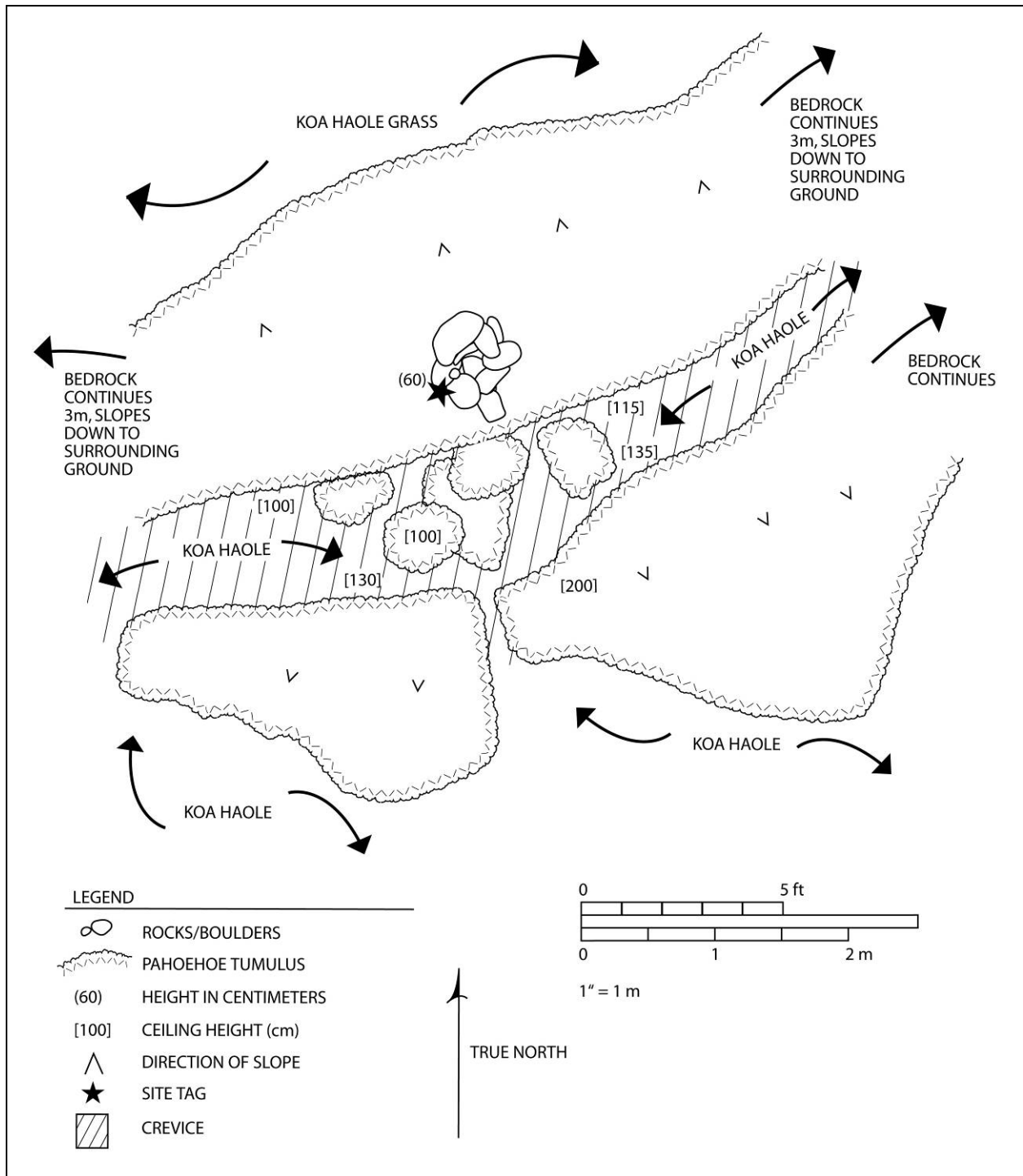


Figure 71. SIHP # 50-10-27-20713; plan view



Figure 72. SIHP # 50-10-27-20713, photograph of north end of cairn, view to the south

4.3.23 State Site # 50-10-27-20714

SIHP #	50-10-27-20714
FUNCTION:	Temporary Habitation
SITE TYPE:	Wall
TOTAL FEATURES:	1
DIMENSIONS:	3.7 m ² (39.8 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	270 (113 m) a.m.s.l.

DESCRIPTION: Site 50-10-27-20714 (Figure 73 & Figure 74) is a low wall with a temporary habitation situated on an area of exposed outcrop in the southeast quadrant of the project area. The outcrop area has pockets of soil supporting exotic grasses. Vegetation in the immediate vicinity is dense exotic grasses and *koa haole*.

The wall is constructed along the top of a relatively level area of outcrop. The wall measures approximately 3.7 m (12.1 ft) northeast/southwest by 1.0 m (3.3 ft) northwest/southeast with a maximum height of 0.45 m (1.5 ft). It is constructed with piled and stacked small boulders a single row wide and 2-3 courses high. Portions of the eastern face of the wall are faced. Fifty centimeters to the northeast of the center of the wall is a concentration of smaller rocks (cobbles and rubble) scattered over an area of a thicker soil deposit (3-4 cm / 0.1-0.13 ft.). This area is interpreted as a living area, sheltered by the wall.

A small amount, approximately eight pieces, of marine shell midden (predominantly *Cypraea sp.*, *Nerita picea*) was observed scattered on the outcrop in the vicinity of the rock scatter. The site is in good condition and excavation potential is considered fair based on the presence of marine shell and small soil deposits.

The site's function is interpreted as a temporary habitation based on its size, the use of the natural bedrock, and the presence of marine shell midden.

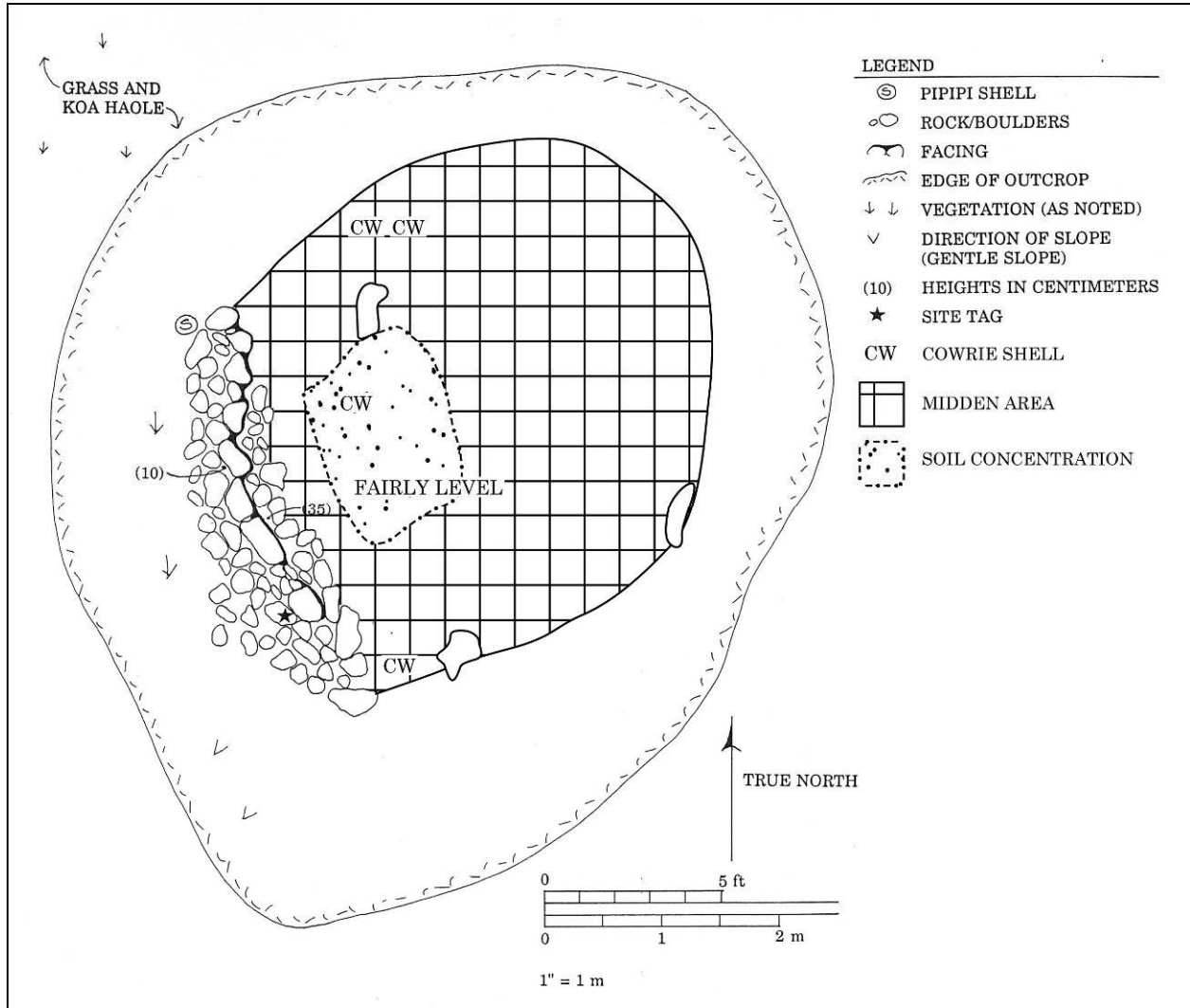


Figure 73. SIHP # 50-10-27-20714, plan view



Figure 74. SIHP # 50-10-27-20714, photograph of northeast facing wall, view to the southwest

4.3.24 State Site # 50-10-27-20715

SIHP #	50-10-27-20715
FUNCTION:	Temporary habitation
SITE TYPE:	Terrace
TOTAL FEATURES:	1
DIMENSIONS:	6.1 m ² (65.6 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	260 ft (79.3 m) a.m.s.l.

DESCRIPTION: Site 50-10-27-20715 (Figure 75 & Figure 76) is a terrace located in the southeast central portion of the project area at the top of a *pāhoehoe* tumulus surrounded by undulating *pāhoehoe* that is gently sloping to the west. Vegetation consists of small patches of exotic grasses on the surface. The outcrop itself has numerous patches of grass growing out of the cracks and small crevices. Exotic grasses and *koa haole* fill the immediate area around the site.

The terrace is roughly rectangular in shape measuring 3.2 m (10.5 ft) north/south by 1.9 m (6.2 ft) east/west with a maximum height of 0.9 m (3.0 ft) along the western side. Construction is stacked boulders and cobbles with a boulder perimeter and pavement is mixed stones consisting of both large and small pebbles and cobbles. The east side of the terrace directly abuts a raised portion of bedrock.

No midden or artifacts were observed. Excavation potential is considered fair due to the substantive of architecture and lack of soil deposits.

The site's function is interpreted as temporary habitation based on the extent of modification and lack of midden or cultural material.

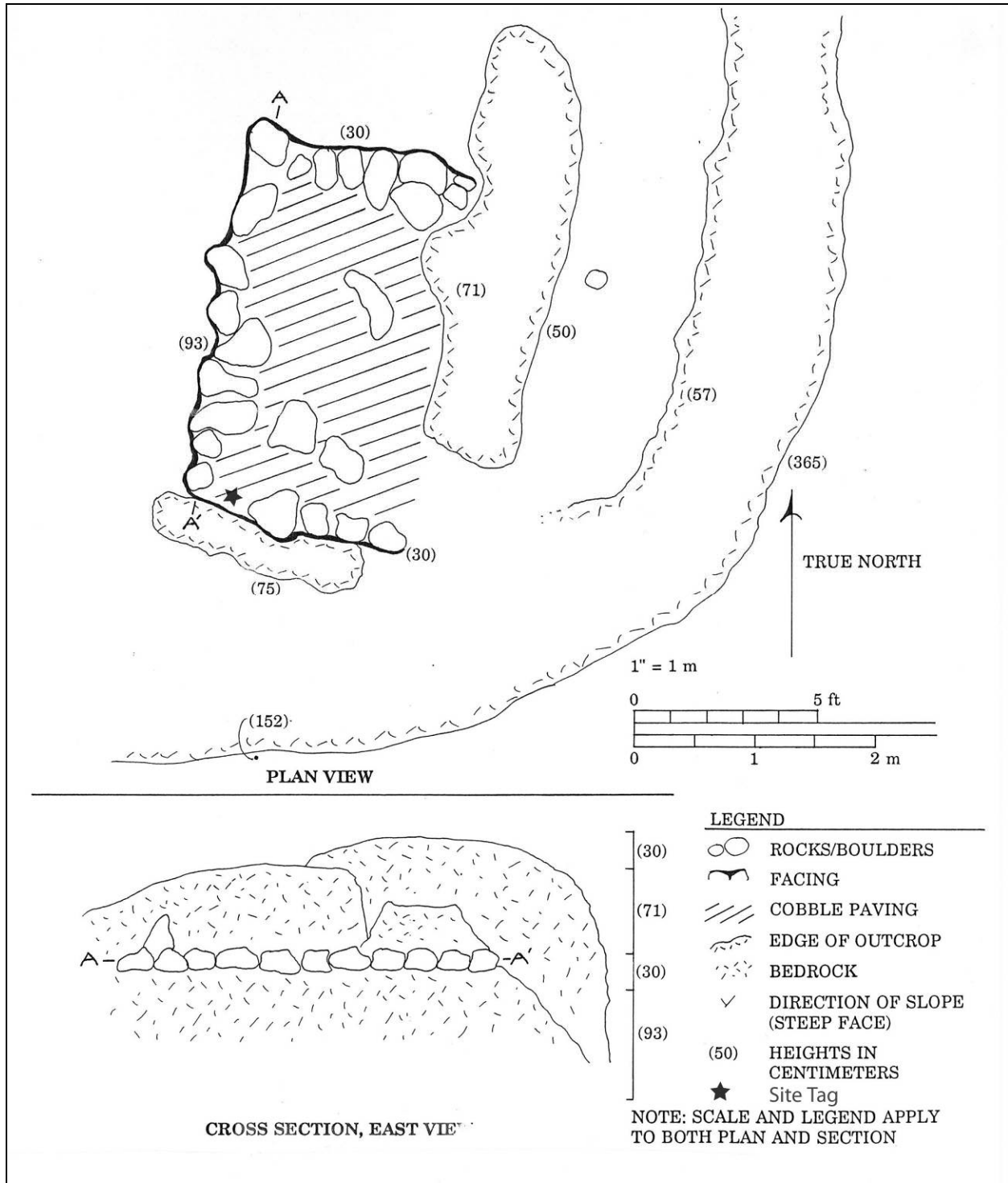


Figure 75. SIHP # 50-10-27-20715; plan view and cross section



Figure 76. SIHP# 50-10-27-20715, overview of site, view to the southwest

4.3.25 State Site # 50-10-27-20716

SIHP #	50-10-27-20716
FUNCTION:	Burial
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	4
DIMENSIONS:	46.0 m ² (495.0 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	230 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20716 (Figure 77 & Figure 78) is a modified tumulus located in the central southeast portion of the project area defined by a four distinct areas of modification of the *pāhoehoe* tumulus. The terrain consists of gently sloping *pāhoehoe*. Vegetation consists of various grasses, and koa haole.

The tumulus is tall (2.5 m / 8.2 ft. tall on average) and steep. It features a major north/south trending crevice. This crevice has been filled with cobbles and small boulders in four distinct areas that have been designated Features A to D.

Feature A measures 2.8 m (9.2 ft.) north/south by 1.5 m (4.9 ft) east/west (Figure 79). The surface of the feature is level cobble fill. Feature A directly abuts Feature B (to the east and southeast) and Feature C (to the south). Feature A is delineated from Features B and C by a semi-circular boulder alignment.

Feature B consists of a cobble filled area measuring 7.8 m (25.6 ft) north/south by 2.5 m (8.2 ft) east/west (Figure 80). The surface area is similar to Feature A. All sides of the feature directly about existing outcrop.

Feature C consists of a cobble filled area measuring 2.7 m (8.9 ft) northeast/southwest by 0.7 m (2.3 ft) northwest/southeast (Figure 81). The filled portion of Feature C extends to the northwest edge of the *pāhoehoe* tumulus.

Feature D lies 0.3 m (1.0 ft) southeast from the southern end of Feature A and measures 0.7 m (2.3 ft) east/west by 0.6 m (2.0 ft) north/south. The paved surface of Feature D is level with the surrounding bedrock.

No artifacts or midden were observed.

The site's function is interpreted as a burial based on the size and shape of the crevice; it appears deep enough to contain multiple burials. Habitation is unlikely due to inaccessibility. Additionally, the time investment appears higher than might be expected for a temporary habitation and the size and layout of the tumulus is not ideal for a more formal recurrent habitation site.

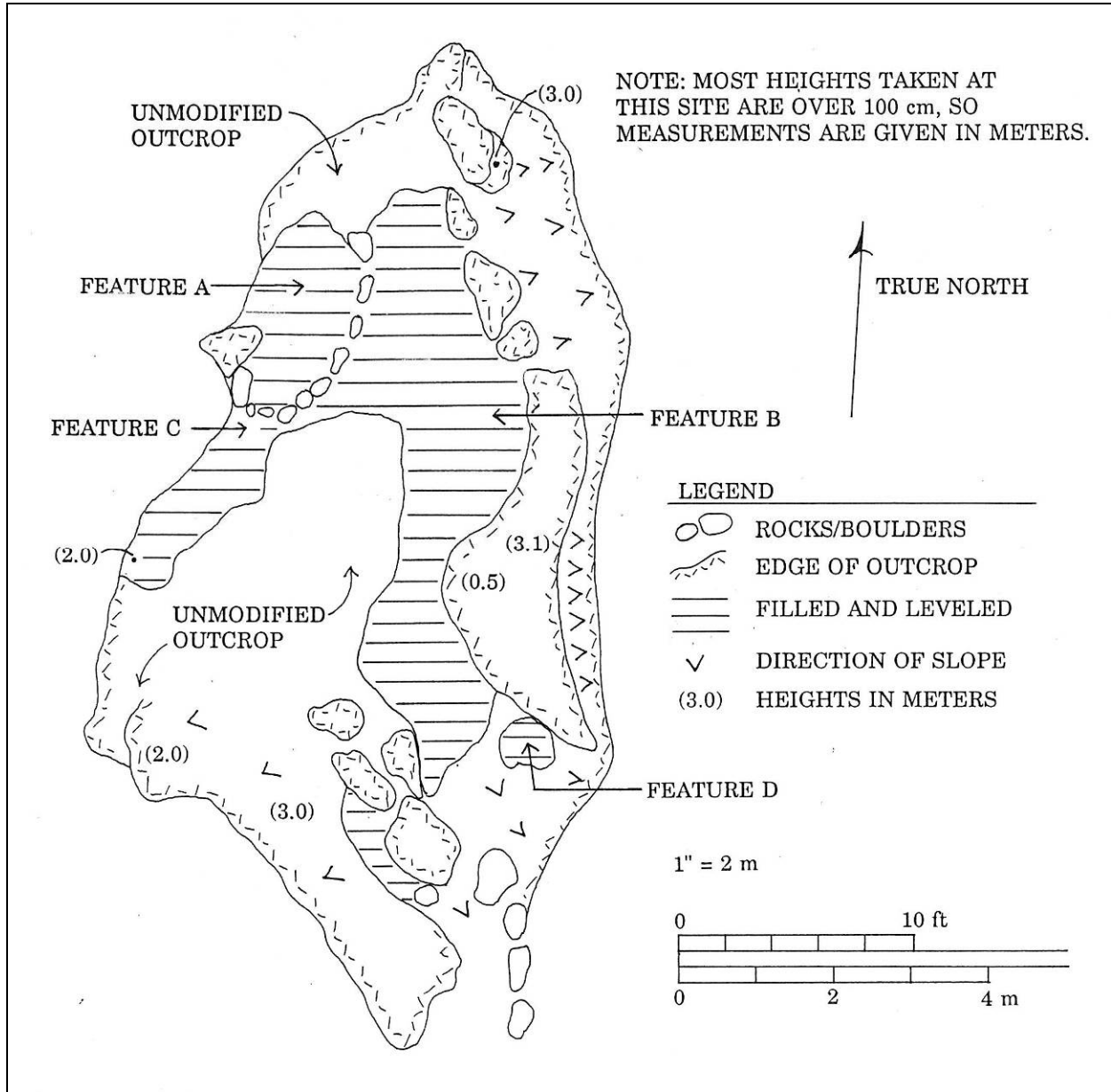


Figure 77. SIHP # 50-10-27-20716; plan view



Figure 78. SIHP # 50-10-27-20716 overview of tumulus.



Figure 79. SIHP# 50-10-27-20716 Feature A, overview photograph, view to the west



Figure 80. SIHP# 50-10-27-20716 Feature B, detail photograph, view to the south



Figure 81. SIHP# 50-10-27-20716 Feature C, detail photograph, view to the west

4.3.26 State Site # 50-10-27-20717

FUNCTION:	Temporary habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	5.8m ² (62.4ft. ²)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	220 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20717 (Figure 82) is a modified tumulus defined by a filled crevice located on a very low outcrop no more than 1.5 m (4.9 ft.) above the surrounding terrain. The site measures 2.5 m (8.2 ft) north/south by 2.3 m (7.5 ft) east/west. A moderate amount of exotic grass grows in the filled crevice's cracks and in the surrounding area.

The filled crevice contains *pāhoehoe* medium to large cobbles and small boulders. Minor cracks in the tumulus have been filled with small to medium size cobbles. The cobble fill measures 0.4 m (1.3 ft) deep. The southeast portion of the modified tumulus has a rough faced wall that is not level or built up to the tallest portion of the *pāhoehoe* bedrock (Figure 83). The site's largest natural crack measures no more than 50 cm (1.6 ft) wide. Another filled crevice is located 7 m (23 ft) northwest from the north corner of the site and measures 2 m by 0.5 m (6.6 ft by 1.6 ft). This filled crevice is also defined by medium to large cobbles and small boulders.

No artifacts or midden was observed at this site.

All the crevices filled at this site are essentially highly localized pavements that improve the livability of a naturally level low outcrop. The rock alignment along the edge of the bedrock creates a very small, elongated chamber against the side of the bedrock that appears to most likely be either an incomplete attempt to formalize the edge of the bedrock or a cupboard. Due to these observations this site's function is interpreted as a temporary habitation. It should be noted that this site was initially interpreted as a probable burial during the Colin et al (1996) inventory survey, but this function was ruled out upon re-investigation of this site.

Testing Results

An excavation unit, approximately 1 m long by 1 m wide (3.3 ft. by 3.3ft.), was placed in the southwest corner of Site -20717 in order to confirm a previously determined function of probable burial by Colin et al. (1996) (see Figure 82). Test excavation confirmed survey observations which determined that the site consisted of narrow and relatively shallow crevices that were filled in to level out a natural bedrock outcrop (Figure 84 & Figure 85). No cultural material and/or human burials were observed during excavation.

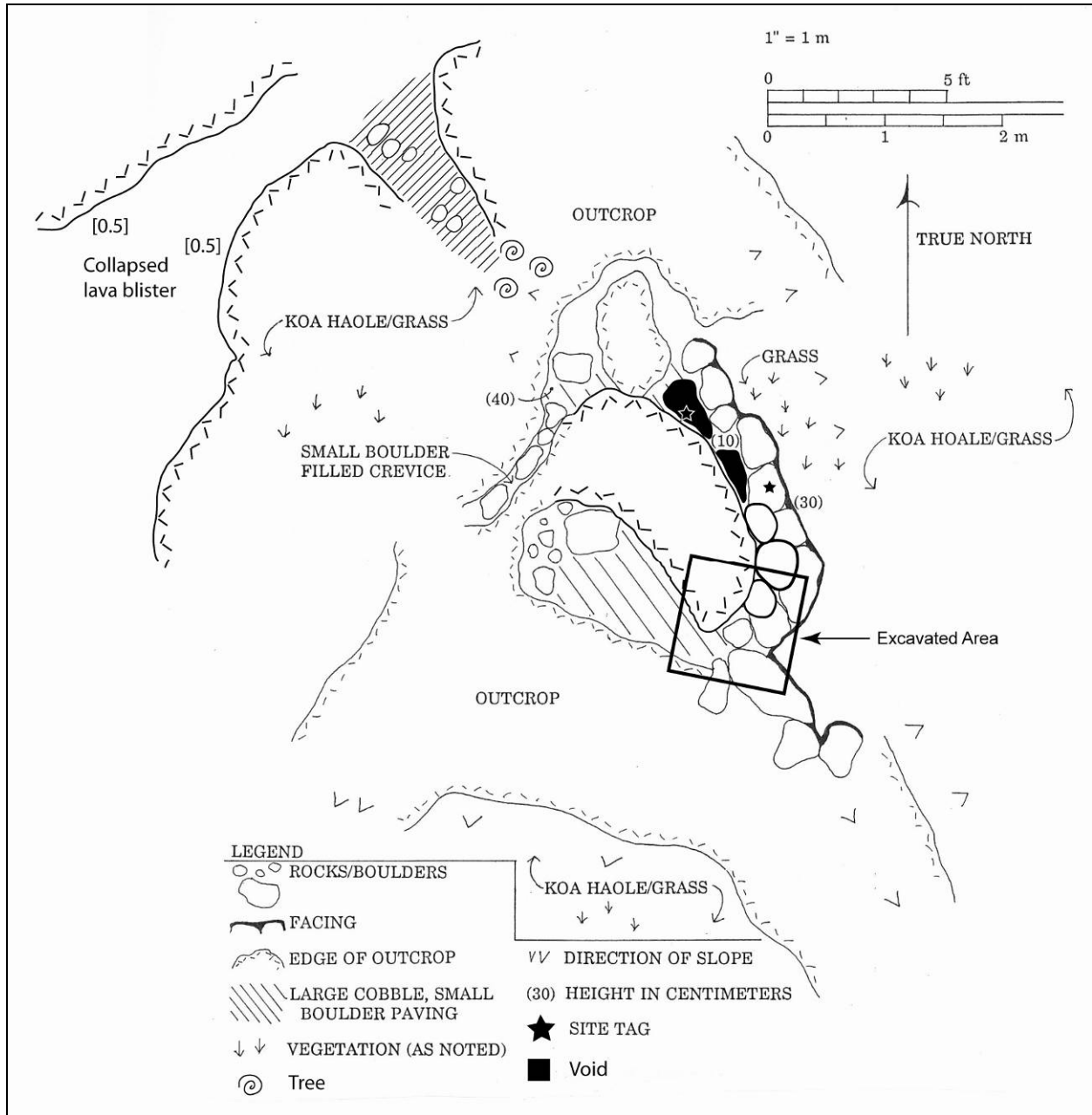


Figure 82. SIHP # 50-10-27-20717; plan view



Figure 83. SIHP# 50-10-27-20717, photograph of east faced wall, view to the west

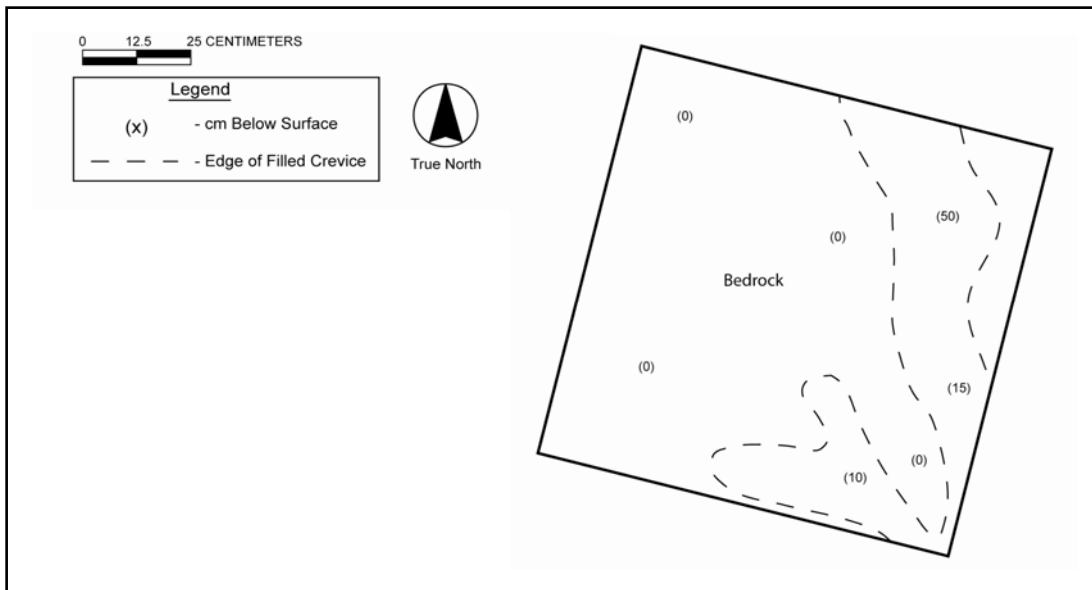


Figure 84. SIHP# 50-10-27-20717, post-excavation plan view



Figure 85. SIHP # 50-10-27-20717 excavation photographs. View to southwest, Top - pre-excavation, Bottom – post-excavation

4.3.27 State Site # 50-10-27-20718

SIHP #	50-10-27-20718
FUNCTION:	Agriculture
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	5.0 m ² (53.8 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	225 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20718 (Figure 86 & Figure 87) is a modified tumulus located in the south central portion of the project area defined by a filled and leveled crevice. The terrain consists of undulating *pāhoehoe* gently sloping to the northwest, with sparse soil deposits that support various grasses and *koa haole*.

The crevice, measuring 2.8 m (9.2 ft) northeast/southwest by 1.8 m (5.9 ft) northwest/southeast, has been leveled using cobbles and small boulders. The northeast portion of the crevice is characterized by dense grass growth. The filled area is shallow, 0.2 m (0.6 ft) in depth, and the existing bedrock was visible through spaces between the cobble and small boulder fill. No artifacts or midden were observed at the site. Excavation potential of the site is poor.

The site's function is interpreted as agriculture based on its location and modifications. The site is located near the bottom of a slope, in an area believed to contain more moisture than usual; modern exotic foxtail grass grows very well in thin soil deposits in the general vicinity of the filled crevice. Proximity to habitation site -20719, approximately 40 m (131 ft.) east of -20718, suggests the sites may be closely related. Due to the shallow nature of the filled crevice (20 cm / 0.65 ft.), it is unlikely to contain a burial. The site is not large enough to serve as any type of habitation.



Figure 86. SIHP # 50-10-27-20718, overview photograph of tumulus, view to the northeast

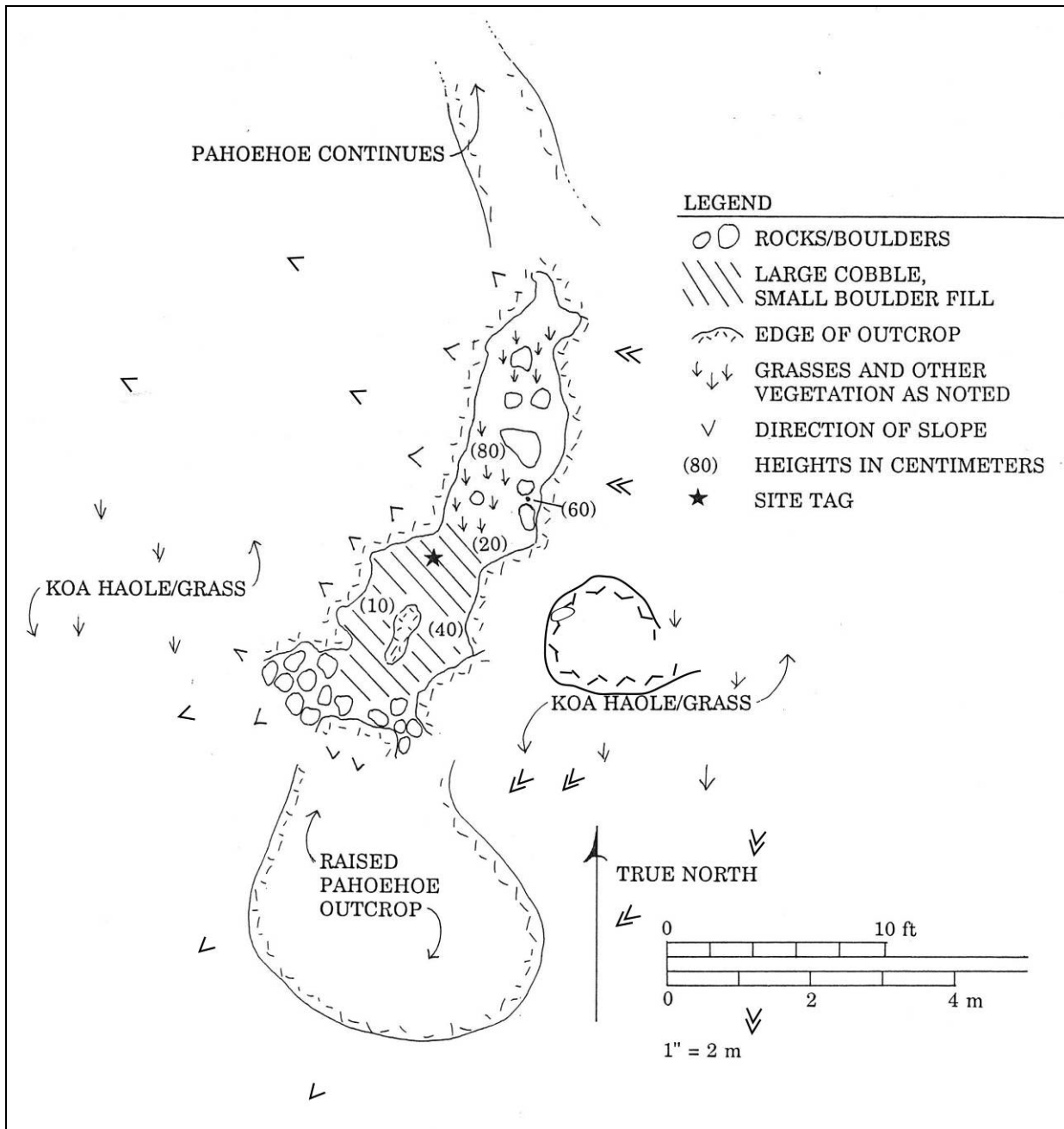


Figure 87. SIHP # 50-10-27-20718; plan view

4.3.28 State Site # 50-10-27-20719

SIHP #	50-10-27-20719
FUNCTION:	Temporary habitation
SITE TYPE:	Rock shelter & hearth
TOTAL FEATURES:	2
DIMENSIONS:	35.6 m ² (383.1 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	210 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20719 (Figure 88 and Figure 89) is a small modified rock shelter (Feature A), and a fireplace (Feature B) located in a distinct depression in undulating *pāhoehoe* lava in the south central portion of the project area. The surface vegetation consists of various grasses and *koa haole*.

Feature A is a rock shelter that utilizes a natural overhang that is partially terraced on the southwest end and appears to be a temporary habitat (Figure 90). The terrace is constructed of small basalt boulders and cobbles that measure 4.1 m (13.4 ft) southwest/northeast by 1.7 m (5.6 ft) southeast/northwest with a maximum height of 0.4 m (1.3 ft) on the southeast edge. The natural outcropping forms an overhang that extends to the northeast for 4.0 m (13.1 ft) from the northwest corner of the terraced area and has a maximum ceiling height of 0.6 m (2.0 ft). The function of the feature is temporary habitation, given the small terrace and level resting surface of the rock shelter interior.

An unmodified lava tube is 4 m (13.1 ft) southeast of Feature A and runs parallel to the overhang. The entrance is 50 cm (1.6 ft.) wide and 2 m (6.6 ft) long with a vertical crack running southwest/northeast. The tube entrance is 2.5 m (8.2 ft) wide with a level floor. The ceiling is 1 m (3.3 ft) high and the tube narrows to 1.5 m (4.9 ft) wide to the east and runs approximately 20 m (65.6 ft) in this manner. Very little of the tube's ceiling has fallen, and approximately 4 cm (0.13 ft.) of sedimentation covers the tube floor. The tube is cool and moist and, although there is no evidence as such, it would be a good location for gathering water after rain.

Feature B is a fireplace located 30 m (98.4 ft.) at 155 degrees from Feature A on the opposite side of a distinct bowl in the terrain. It consists of two courses of medium flat *pāhoehoe* slabs on exposed bedrock, arranged in a semi-circular pattern measuring 0.8 m (2.6 ft) north/south by 0.85 m (2.8 ft) (Figure 91). Feature B is located on a *pāhoehoe* tumulus near the bottom of a small knoll, the bottom of which runs northeast/southwest where the feature is located and runs and faces Feature A. The tumulus is highly fractured and otherwise unmodified. This feature is almost certainly a fireplace; given Feature B's low visibility at the bottom of a knoll and since it is not constructed to a notable height, it is unlikely to be a marker.

No midden or artifacts were observed at the site. Excavation potential is fair as there is a thin soil deposit in the lava tube and the terrace may contain evidence of habitation.

The site's function is interpreted as temporary habitation based on the modifications and level of labor necessary; the fireplace supports this function. Because of the distance between the two features, it is possible that the depression's broad floor was used for more extensive habitation than is currently visible.

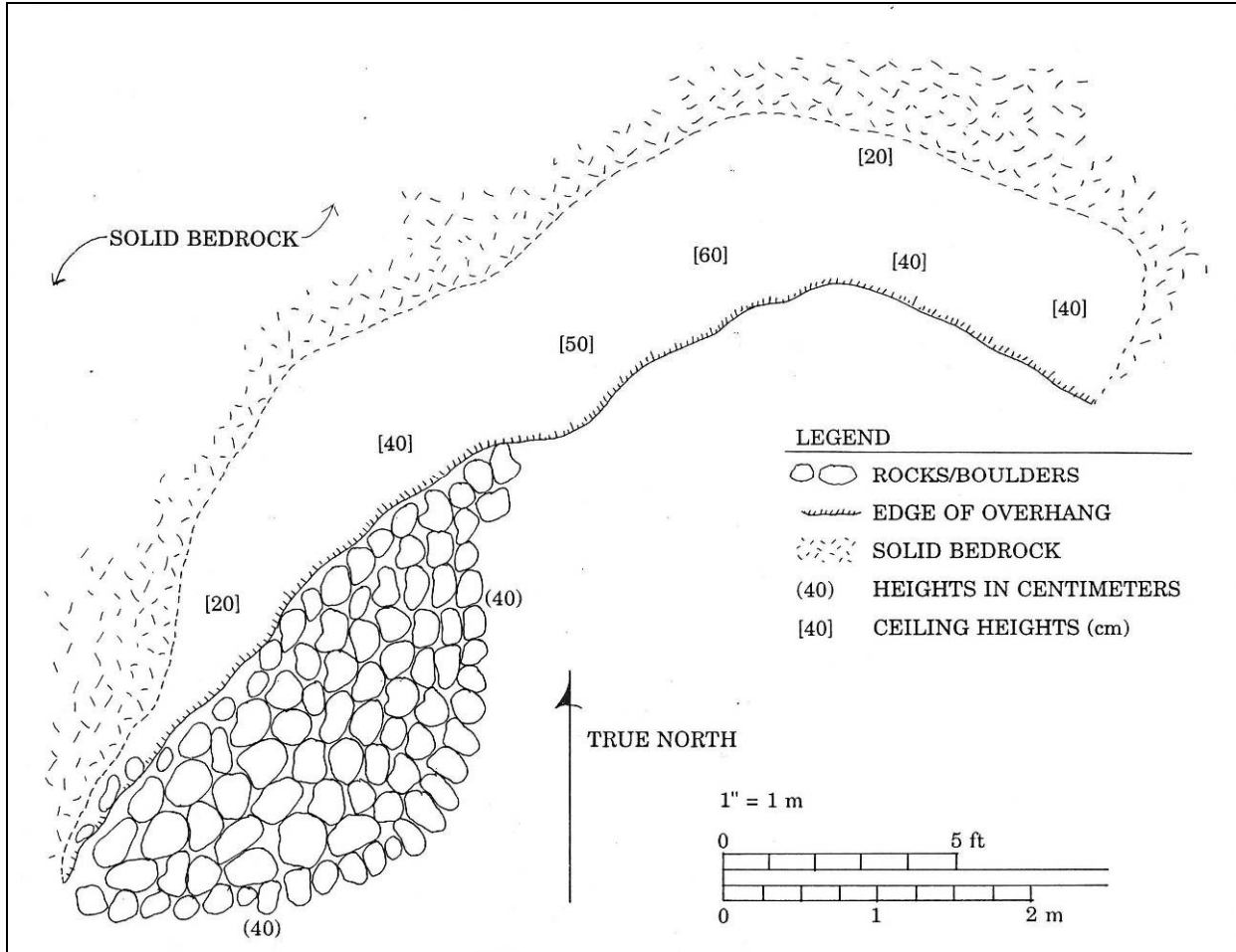


Figure 88. SIHP # 50-10-27-20719 Feature A; plan view

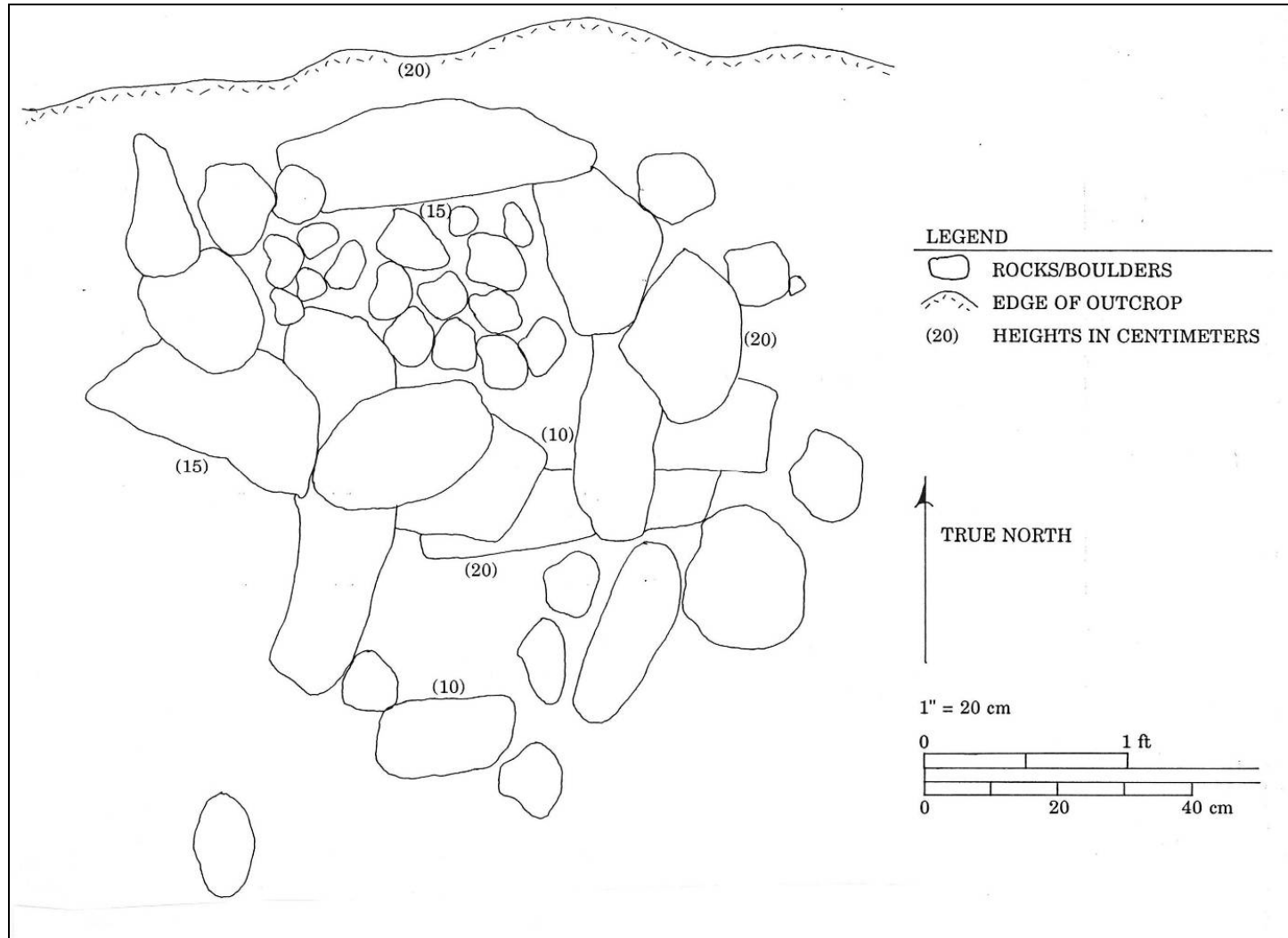


Figure 89. SIHP # 50-10-27-20719 Feature B; plan view



Figure 90. SIHP # 50-10-27-20719 Feature A, *pāhoehoe* overhang with terraced area in foreground, view to the northwest

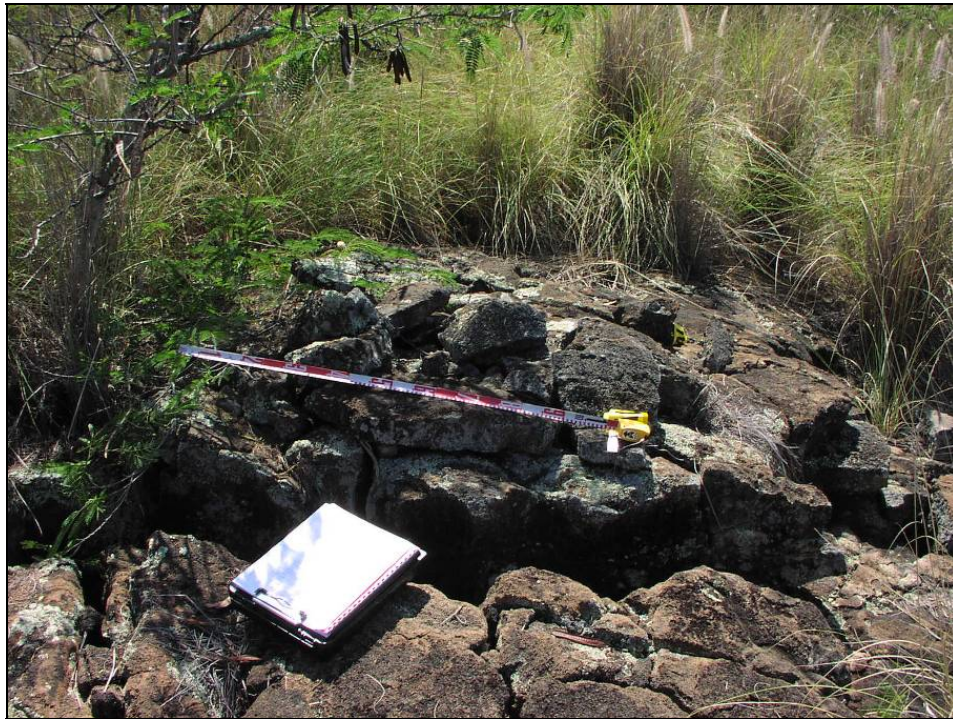


Figure 91. SIHP # 50-10-27-20719 Feature B, rock feature, view to the southeast

4.3.29 State Site # 50-10-27-20720

SIHP #	50-10-27-20720
FUNCTION:	Possible burial
SITE TYPE:	Terrace
TOTAL FEATURES:	1
DIMENSIONS:	7.4 m ² (79.6 ft ²)
CONDITION:	Destroyed
AGE:	Pre-contact
ELEVATION:	210 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20720 (Figure 92) was described in Colin et al. (1996:82) as a terrace located in the south central portion of the project area on undulating *pāhoehoe* that sloped gently southward. Sparse and dispersed soil pockets supported various grasses and *koa haole*.

The terrace measured 3.2 m (10.5 ft) north/south by 2.3 m (7.5 ft) east/west with a maximum facing height of 0.3 m (1.0 ft). The perimeter of the terrace to the west and south was composed of medium boulders with cobbles used for the level surface fill. The northeast and northwest sides of the terrace directly abutted the existing bedrock to form a flush edge.

Relocation of site -20720 for further observation was not successful. In total the relocation effort involved sweeps by three CSH archaeologists for 45 minutes, followed by a search along the topography by two CSH archaeologists for 20 minutes. The CSH field crew extensively and systematically searched the area of the site's location. A likely location for the site was identified, as the site was reported located on a pronounced outcrop. Of the two most pronounced outcrops in the area, one is site-20717 and the other has undergone extensive disturbance. Indeed, the outcrop appears to be almost entirely destroyed by heavy machinery and is located near the end of a fan-shaped bulldozed area originating at Hina Lani and approximately 30 m (98.4 ft.) in diameter near the location of -20720. All that remains in this likely location of site -20720 is a pile of boulders and a remnant tumulus bedrock. As a result of these observations, all lines of evidence indicate this site has been destroyed.

Following repeated efforts to locate the previously identified site, and the determination that the site was destroyed, no further testing appears to be warranted at this time.

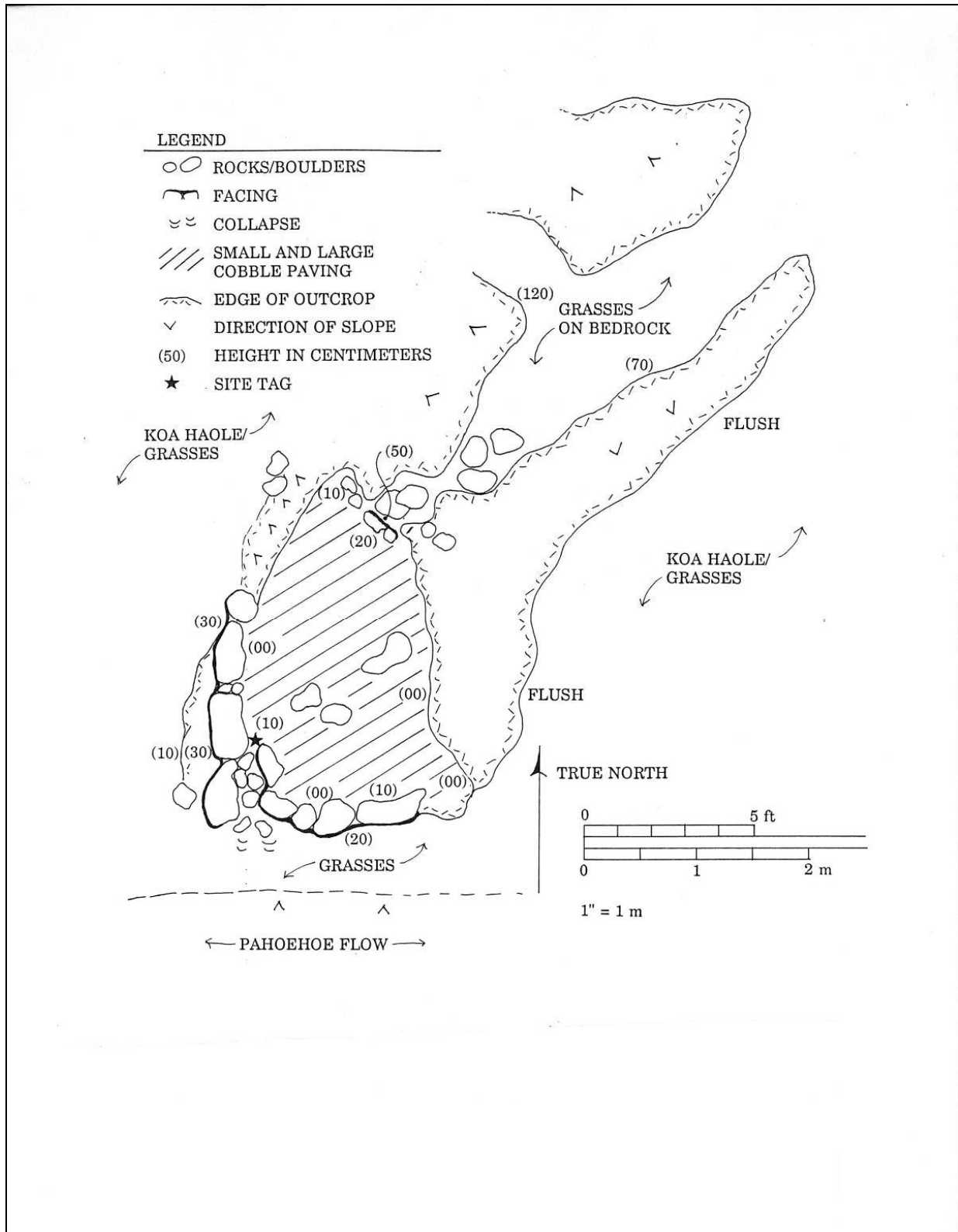


Figure 92. SIHP # 50-10-27-20720; plan view

4.3.30 State Site # 50-10-27-20721

SIHP #	50-10-27-20721
FUNCTION:	Temporary habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	4
DIMENSIONS:	226.3 m ² (2435.0 ft ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	200 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20721 (Figure 93) is a large tumulus comprised of four features, three pavements and a modified tumulus, (designated features A through D) located in the central portion of the project area on the surface of a large *pāhoehoe* tumulus. The tumulus rises approximately 8 m (26.3 ft) above the surrounding terrain (especially to the west) and is roughly round with a diameter of approximately 20 m (65.6 ft). Scattered pockets of soil support various grasses and *koa haole*. The features are deemed associated due to proximity, similarity of construction styles, and degree of preservation.

Feature A is a paved terrace measuring 3.0 m (9.8 ft) north/south by 2.8 m (9.2 ft) east/west, constructed of stacked and piled *pāhoehoe* cobbles. The feature is located on the western side of the tumulus. Feature B is directly below and to the west of Feature A, on the side of the *pāhoehoe* tumulus.

Feature A has slight stacking on the bedrock at the northeast end and above the wide crevice from the ground level. This stacking was formed by a collapsed void (where Feature B is located) and creates a very low terrace (one course of large cobble) extending from above Feature B and the collapsed void to 3 m (9.8ft) to fractured bedrock. A leveled area between is raised bedrock that runs the total length of 3.1 m (10.1 ft) to the north where it abuts a crevice that was slightly modified with large boulders, as shown on Figure 93. It is estimated that the deepest part of the crevice filled to create Feature A is approximately 50 cm (1.6 ft.) as evidenced by the exposed crevice around the positioned boulders. Feature A also contains a natural small void in the *pāhoehoe*, measuring approximately 50 cm (1.6 ft.) square, opposite the level area from the Feature B crevice. No artifacts or midden, nor modification were observed.

Feature B is located 1.5 m (4.9 ft) directly below the western edge of Feature A and directly abuts the edge of the tumulus. It measures 3.4 m (11.2 ft) north/south by 2.6 m (8.5 ft) east/west. It is a modified natural collapse of tumulus containing large cobbles and small boulders from the collapse of the void and erosion from higher on the tumulus. These fallen rocks have been rearranged to form a relatively square terrace edge facing south. The pavement is not faced and the leveled area is rough. It is located in a wide crevice on the western edge of the tumulus and is 2 m (6.6 ft) below Feature A. The crevice formed by a collapsed void, a small "cupboard-like" arch that overhangs to the northwest and northeast of the northeast end of the crevice and measures approximately 2 m (6.6 ft) deep (northwest/southeast) and 2 m (6.6 ft) long. The overhangs may have been utilized for storage, but no evidence of floor clearing, floor leveling, midden, or other artifacts was found.

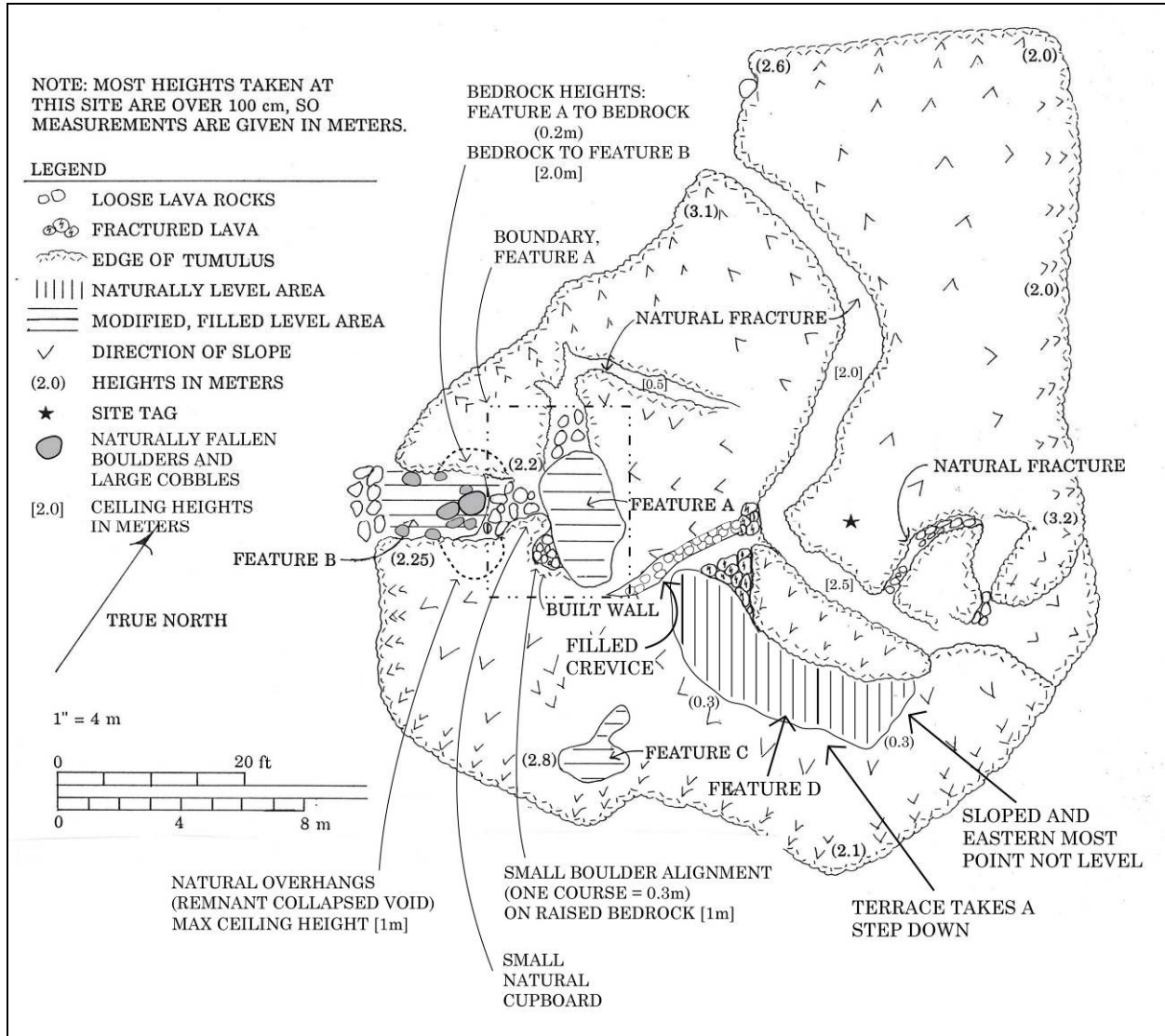


Figure 93. SIHP # 50-10-27-20721 site complex; plan view

Feature C is an irregular shaped pavement located on the southwest portion of the tumulus. It measures 1.0 m (3.3 ft) north/south by 2.3 m (7.5 ft) east/west and is constructed of stacked and piled cobble creating a level surface. Feature C is located 7 m (23 ft) southwest of Feature D, on the southern most end of the tumulus.

Feature D is another paved area that measures 2.7 m (8.9 ft) north/south by 7.0 m (23 ft) east/west. The feature is constructed of stacked and piled cobbles creating a level cobble surface excluding a 1 m (3.3 ft) portion at the eastern most side of the feature, which is not level and slopes eastward. The feature is on the southern slope of a large tumulus approximately 2.5 m (8.2 ft) from the summit and 4.5 m (14.76 ft) above ground level. A crevice measuring 4 m (13.1 ft) north/south by 1 m (3.3 ft) east/west that has been filled with large to medium sized *pāhoehoe* boulders is on the west end of Feature D.

The sites' largest crevice (Figure 93) contains an even distribution of large boulders, tightly spaced 1.5 m (4.9 ft) below the top of the crevice. They are believed to be natural based on their form and the surrounding bedrock.

No artifacts or midden were observed at the site. Excavation potential for the site is considered fair due to the lack of soil deposits and the substantive architecture. Excavation may be possible over and through Feature D's paving, which is currently covered with dense grass and grass blade litter. Excavating Feature B, especially around the shallow overhangs, may provide insight into the site's function.

The site's function is interpreted as temporary habitation based on the nature of the construction, the terracing of Feature A over the edge, and the proximity of three natural cupboards. Feature B also provides considerable shelter from wind and elements. Currently, the bottom portion of the paved area is heavily covered with various grasses and is buried with approximately 5 cm (0.16 ft.) of grass roots and dust. Burials are unlikely because Feature B's overhangs could have been easily utilized for burials and were not. Agricultural terracing also appears unlikely due to the relatively small paved areas and the size of cobbles and boulders in the pavement. However, if the site was not used for temporary habitation, than agricultural terracing is the most likely function. No midden, hearths, or artifacts were observed.

4.3.31 State Site # 50-10-27-20722

SIHP #	50-10-27-20722
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	70 m (230 ft.) northwest/southeast
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20722 is a stepping stone trail located on 'a'ā lava (Figure 94). No soil is present and the area is virtually devoid of vegetation.

From the *makai* edge of the lava flow the trail is oriented in a north/south direction for approximately 13.1 m (43.0 ft) where it then forks, with one leg extending 41.0 m (134.5 ft) to the northwest, and the other leg extending 23.4 m (76.8 ft) to the northeast to the *mauka* side of the 'a'ā flow. Numerous attempts were made to follow the trail on both sides of the 'a'ā flow without success.

The trail is constructed of flat *pāhoehoe* slabs set into small 'a'ā cobbles at evenly spaced intervals creating an easily traveled well-constructed path across the 'a'ā flow. The fork in the trail is very pronounced; approximately ten *pāhoehoe* slabs were placed together to mark the fork. Some of the *pāhoehoe* slabs are set into 'a'ā cobbles while others are set on top of cobbles. The south leg of the trail runs approximately 45 m (147.5 ft) between the south end of the trail and the fork. Paving stones vary in size from 5 cm to 30 cm (0.16 to 1 ft.) across. The northeast leg of the trail was cut off by a bulldozer.

The site's function is interpreted as transportation. No midden or artifacts were observed. Excavation potential is considered poor.



Figure 94. SIHP# 50-10-27-20722 Photograph of *pāhoehoe* slab trail fork, view to the north

4.3.32 State Site # 50-10-27-20724

SIHP #	50-10-27-20724
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	225 m northwest/southeast
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	130-160 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20724 is a trail located within a rough 'a'ā flow (Figure 95). No soil is present and vegetation consists of sparse areas of various grasses and *koa haole*.

The trail crosses the 'a'ā flow in a *mauka/makai* direction for approximately 228.7 m (750.0 ft). The trail is formed by the clearing of large angular 'a'ā boulders leaving only well worn sub-angular cobbles and pebbles and several *pāhoehoe* slabs. The trail has an average width of 50 cm (1.6 ft.), however, there are several portions of the trail that exceed 1 m (3.3 ft) in width.

Approximately 30 m (98.4 ft) from the east end of the trail is a large 10 m x 10 m (32.8 ft x 32.8 ft) relatively level area devoid of any large boulders or cobbles. A path of worn 'a'ā cobbles place every 10 cm (0.3 ft.) transects the middle. Numerous attempts were made to follow the trail on both sides of the 'a'ā flow without success.

Approximately 65 m (213.3 ft) from the east end of the trail is a large filled crevice which appears to have been filled and level at an angle in order for the path to transect the middle. The majority of the path is devoid of vegetation, although various grasses and are along the path.

The site's function is interpreted as transportation. No artifacts or midden were observed. Excavation potential is considered poor.

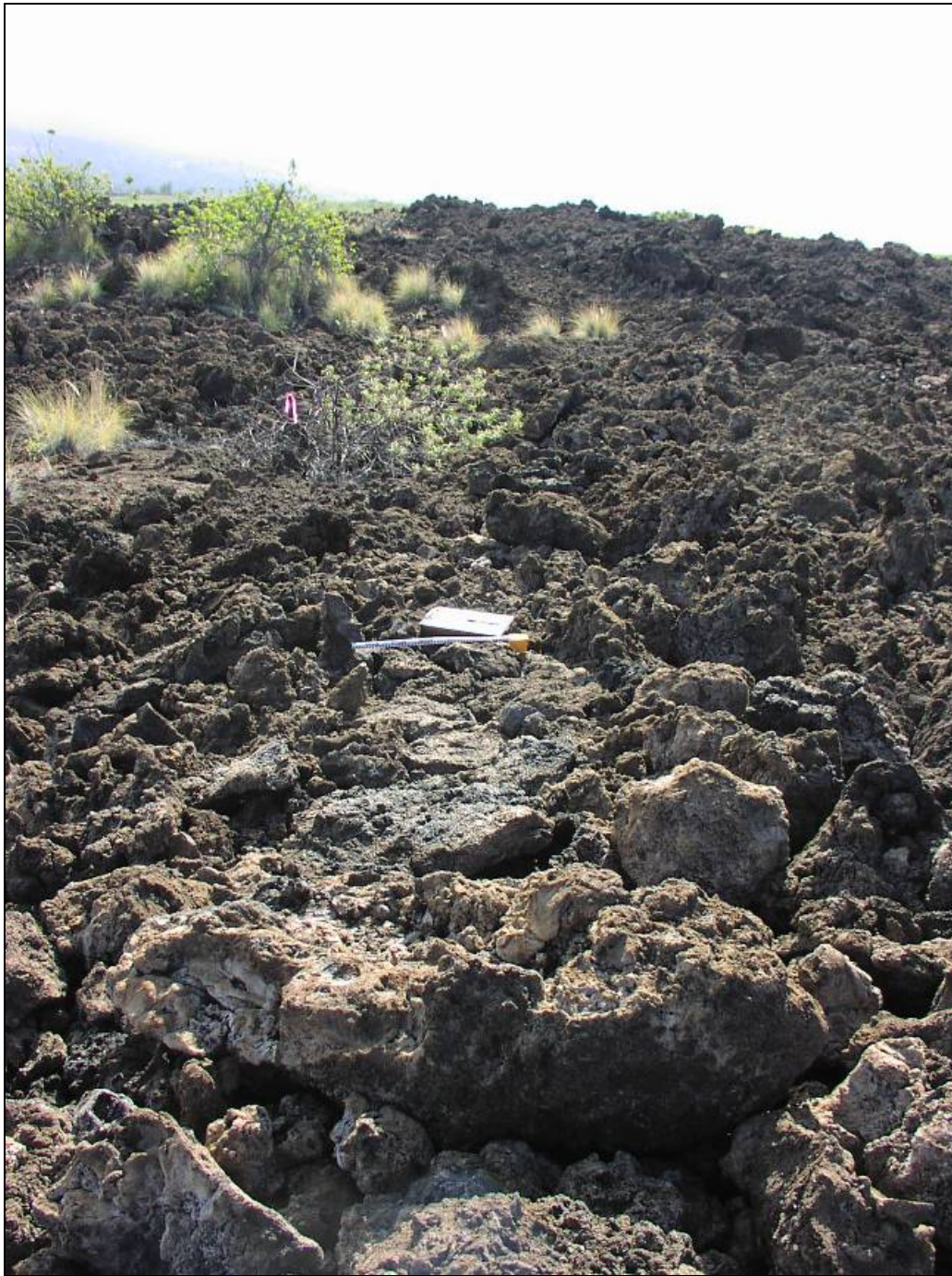


Figure 95. SIHP# 50-10-27-20724 Photograph of smooth 'a'ā slab paving, view to the southeast

4.3.33 State Site # 50-10-27-20725

SIHP #	50-10-27-20725
FUNCTION:	Activity Area/Temporary Habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	4
DIMENSIONS:	187.5 m ² (2017.5 ft. ²)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	170 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20725 (Figure 96) is a modified tumulus consisting of four features, a terrace (Feature A), a platform (Feature B), a modified tumulus (Feature C), and a small pavement (Feature D). Small pockets of soil at the site support various grasses and *koa haole*. The area immediately surrounding the site contains thick grasses, *klu* and *koa haole*, and a very large *koa haole* tree just west of Feature D.

Feature A is a terrace located at the northern end of the tumulus (Figure 97). The terrace measures 3.0 m (9.8 ft) north/south by 2.5 m (8.2 ft) east/west with a maximum height of approximately 1.7 m (5.6 ft). It is constructed of small to medium well stacked *pāhoehoe* boulders and cobbles. The north and east sides of the terrace are faced with a maximum height of 1.7 m (5.6 ft) along the northeast side.

Feature B, a platform, abuts the southern side of Feature A (Figure 98). The platform measures 5.1 m (16.7 ft) north/south by 6.0 m (19.7 ft) east/west, with a maximum height of 0.4 m (1.3 ft) on the northeastern edge. It is constructed of small to medium *pāhoehoe* boulders and some cobble fill. Facing is present along the north and southeast sides. The interior surface of the platform consists of portions of exposed outcrop with cobbles.

Feature C is a tumulus exhibiting minor modification, a number of the fill boulders appear natural. Intermittent patches of grasses and sparse *koa haole* cover the feature. The tumulus extends southward from the southeast corner of Feature B and has been filled with weathered *pāhoehoe* cobbles and small boulders. The fill does not extend beyond the sides of the crevice.

Feature D, paved area, is located in the center of the *pāhoehoe* tumulus, 1.3 m (4.3 ft) south of the southern edge of Feature B platform. The paved area measures 4.2 m (13.9 ft) north/south by 1.6 m (5.2 ft), and is constructed of *pāhoehoe* boulders. The paved area of Feature D makes use of the level tumulus surface. Small *pāhoehoe* boulders and cobbles are filled in to level the area and make the cracks flush with the surrounding outcrop. The surface of the filled area is not raised.

An unmodified flat depression is located approximately 15 m (49.2 ft) southeast of Feature D. The depression likely resulted from the collapse of a void in the tumulus where the basalt slab top surface of the tumulus fell straight down. It does not appear to be modified, however, given its flat surface, it is likely the depression was utilized. The surface is approximately 1 m (3.3 ft) lower than the surrounding tumulus on the opposite sides of the surrounding crevices.

A 1.0 m by 1.0 m (3.3 ft by 3.3 ft) test unit was placed in the northeast portion of Feature B, and excavated to a maximum depth of 86 cm (2.8 ft.) below the platform surface (Figure 99).

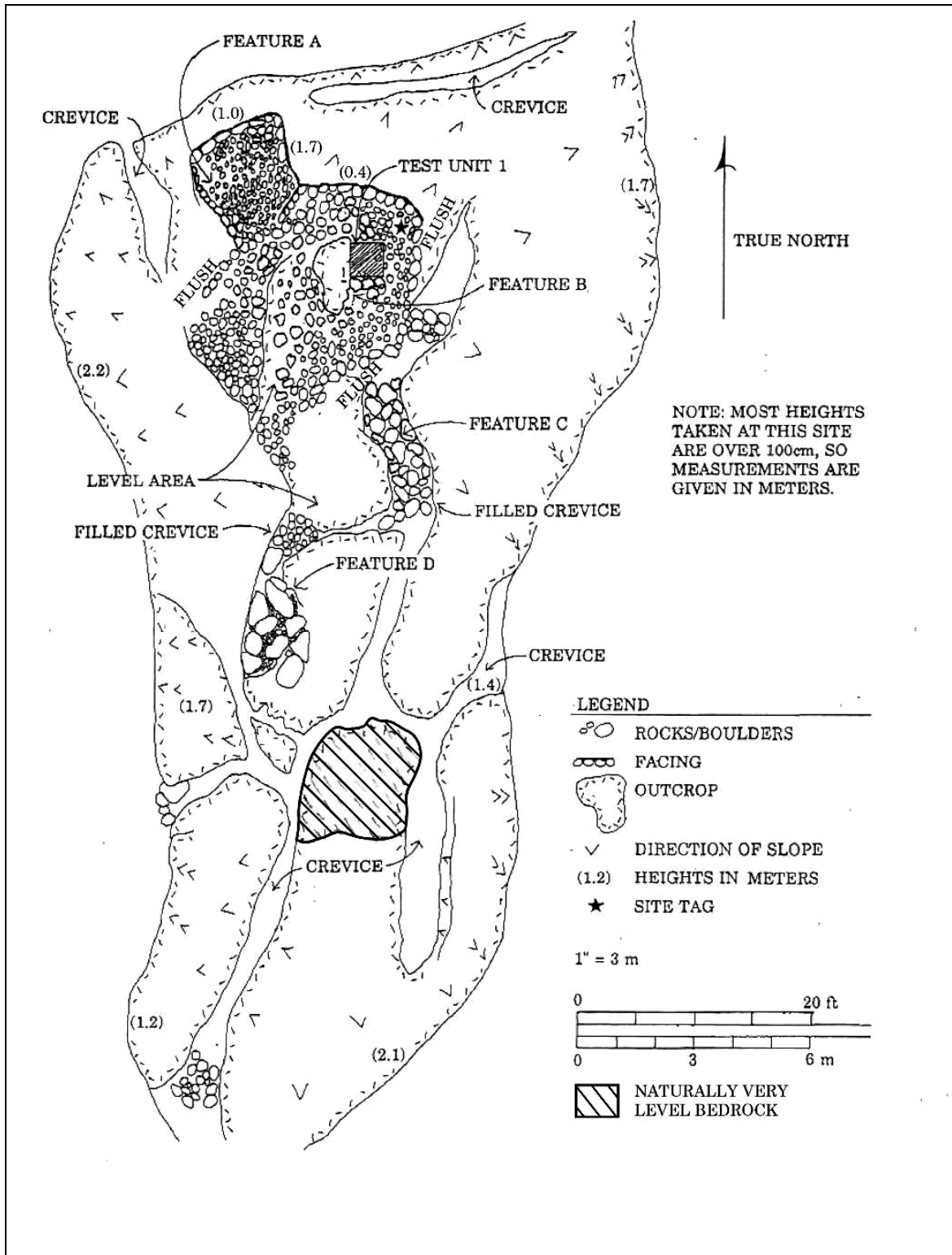


Figure 96. SIHP # 50-10-27-20725 site complex; plan view



Figure 97. SIHP # 50-10-27-20725, Feature A, view to southwest



Figure 98. SIHP # 50-10-27-20725, Feature B, view to southeast

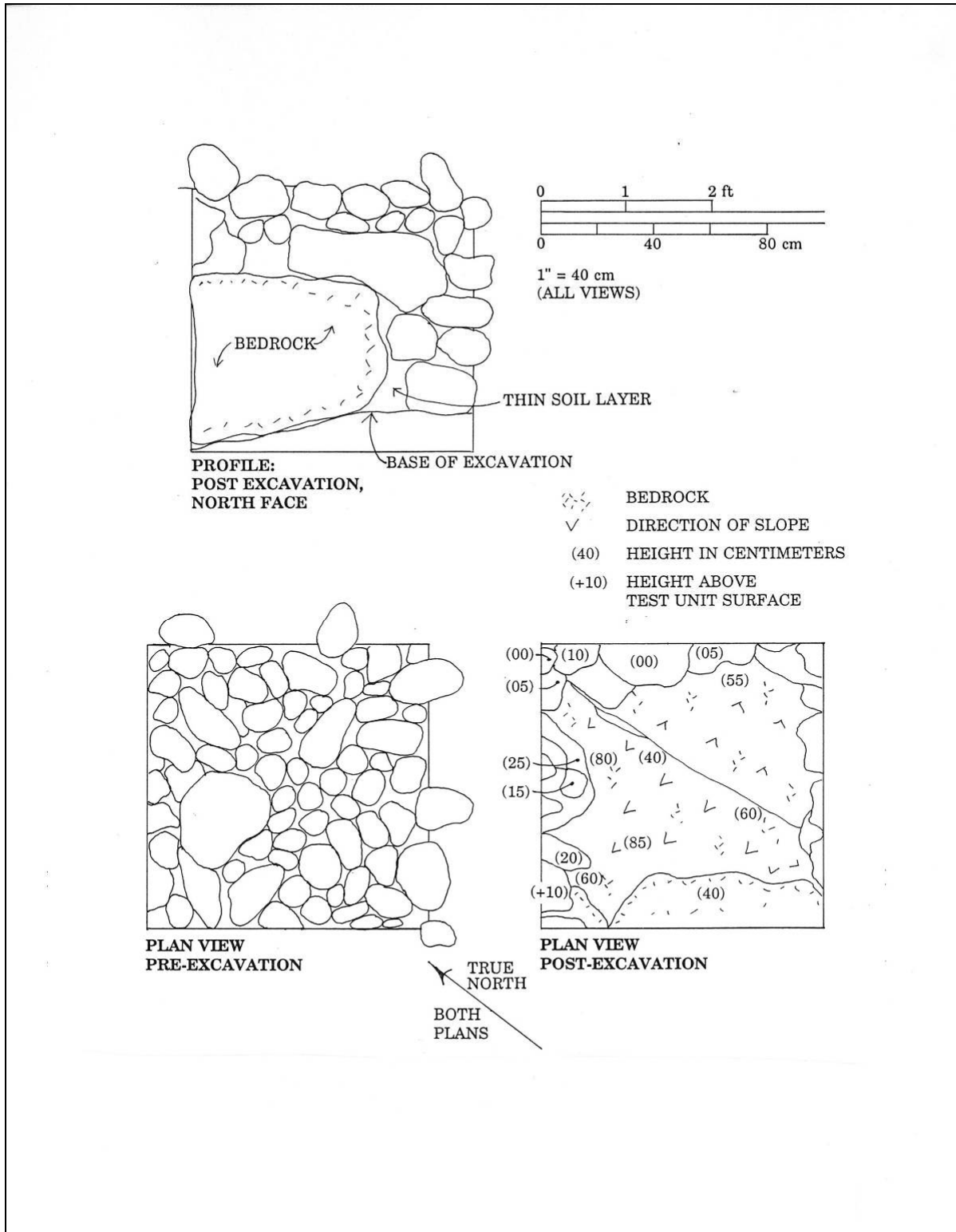


Figure 99. SIHP # 50-10-27-20725 Feature B; plan view pre-excavation, plan view and profile post-excavation

The excavation extended through the platform fill and into a small section of underlying soil located in a thin crevice at 85 cm (2.7 ft.). The platform fill (Stratum I) consisted of small to medium *pāhoehoe* boulders and cobbles. The soil excavated was very dark brown (10 YR 4/3) silt loam, which contained only 0.4 g of *kukui* endocarp and 2.2 g of charcoal. A large segment of the test unit reached a vertical bedrock formation in the center portion of the unit. This bedrock impeded further excavation beneath 86 cm (2.8 ft.).

The site's function is interpreted as a temporary habitation, and due to its position and construction likely specialized as a lookout. The primary evidence for this specialization is the selection of the outcrop for its natural alignment and height, and the heaviest modification concentrated in Features A and B that face the 'a'ā flow to the north that is crossed by numerous trails (-20724 and -20732 being the closest). Also notable is the large, level depression, Feature D, which is perfectly suitable for habitation itself appears to be largely unmodified. The majority of the tumulus, but especially the modification at Features A and B, also have a commanding view of the coast. Testing results from Feature B also support a temporary habitation function, though the apparent absence of food remains is suggestive of a function more specialized than a rest area or a temporary agriculture related habitation.

Though there is significant investment in the site's construction it is most likely for temporary rather than permanent use. The site does not have features that are expected in a permanent habitation, such as a hearth or nearby related structures. The site is unlikely to have been used for burials since the surface of Feature B appears to have been constructed for leveling rather than filling in cracks for a burial. Construction of Feature A for burial seems unlikely when there are large open crevices that would more easily serve this purpose. The site is also unlikely to have been used for agriculture based on the depth of the Feature B platform, exposure of the tumulus top to desiccating winds and the non-utilization of an adjacent depression that contains significant moisture as evidenced by current vegetation.

4.3.34 State Site # 50-10-27-20726

SIHP #	50-10-27-20726
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	2
DIMENSIONS:	Feature A – 45 m (147.6 ft.) north/south Feature B – 40 m (131.2 ft.) northeast/southwest
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	120 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20726 consists of two trails (one stepping stone and one cobble), designated Features A and B, which are in good condition and located on 'a'ā lava.

Feature A is a stepping stone trail that crosses the 'a'ā flow in a southwest/northeast direction for a total length of 16.7 m (54.8 ft) before it is no longer discernable (Figure 100). The flow is somewhat undulating but relatively level. The overall 'a'ā flow is relatively barren; there is more grass in the south and more dense *haole koa* in the north. Construction of the trail consists of flat *pāhoehoe* slabs set into 'a'ā cobbles that are almost contiguous and generally have a diameter of 30 cm (1 ft.). At the trail's north end are 3 or 4 constructed steps descending from the 'a'ā. Vegetation in the immediate trail area includes *koa haole* and Christmas berry. More stepping stones are present on the northern section of the trail with the number of stepping stones decreasing significantly as the trail extends southward. Feature A crosses the west end of the generally east/west traversing flow in a north/south direction for approximately 80 m (262.47 ft).

Feature B is a worn (i.e. trodden path) cobble trail that extends for a measured length of approximately 60 m (196.8 ft) (Figure 101). The south end of Feature B is approximately 20 m (65.6 ft) *mauka* of the south end of Feature A. The trail is relatively free of cobbles and boulders and is discolored by bruising of foot traffic. The trail angles significantly more *mauka* than Feature A at 49 degrees. Vegetation in the immediate area is Christmas berry, otherwise the area is relatively barren.

The site's function is interpreted as transportation. No artifacts or midden were observed at the site. Excavation potential is considered poor.



Figure 100. SIHP# 50-10-27-20726 Feature A, photograph from south end of trail, view to the north

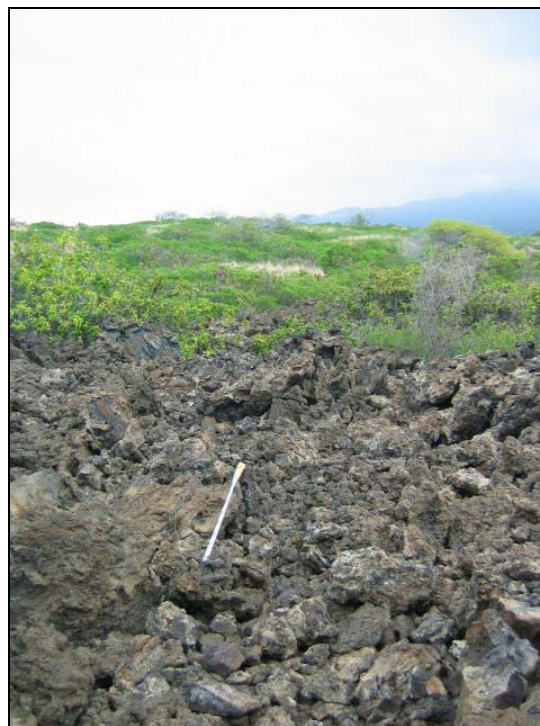


Figure 101. SIHP# 50-10-27-20726 Feature B, photograph taken from south end of trail, view to the north

4.3.35 0.State Site # 50-10-27-20727

SIHP #	50-10-27-20727
FUNCTION:	Temporary habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	37 m by 5.1 m
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	130 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20727 (Figure 102) is a lava tube shelter located beneath a generally level *pāhoehoe* lava surface on a narrow exposed *pāhoehoe* flow that runs approximately east/west. The surface vegetation consists of two *koa haole* trees growing directly from the largest opening into the tube; dense grasses, *koa haole* and some *klu* are in the immediate vicinity of the site; and sporadic patches of grass are on the surface of the lava flow. A dead *keawe* tree (204 m / 669.3 ft. tall) is on the side of the tube west of the largest entrance.

The tube measures 5.1 m (16.8 ft) north/south (the maximum width) by 37.0 m (121.4 ft) east/west (maximum length) with a maximum ceiling height of 0.9 m (3.0 ft). The tube has three entrances, the largest one is located 11.0 m (36.1 ft) from the western end of the tube. The second entrance is located at the eastern end of the tube. The third entrance lies 13.1 m (43.0 ft) from the eastern end of the tube. The tube's floor is generally exposed bedrock with a few scattered pockets of soil that range in depth from a maximum of 8 cm (0.3 ft.) to a trace. A variety of midden, including *pipipi*, urchin, *kukui* endocarps, and volcanic glass, an adz fragment, charcoal, pig and goat bones and at least one placed goat skull were observed on the tube floor. The largest entrance contains over 100 large shell fragments including *nerita*, urchin and cowrie and a concentration of between 6 and 10 *kukui* endocarps on the floor just west of the largest entrance.

Excavation potential of the site is considered fair based on testing results.

The site's function is interpreted as temporary habitation based on several factors. The cave is large for the area; has natural light from the cave's multiple entrances; contains substantial food remains and tool remains, and is relatively easy to find due to the extent of the exposed *pāhoehoe* flow and the relatively thin vegetation on the surface. However, the site is not believed to be a recurrent habitation because it is not tall enough to stand in; there is an absence of alignments and floor clearing in the cave; and while the site is readily visible, it is not a very prominent spot.

Testing Results

Limited testing was conducted at Site 20727 to aid in determining the function of the site, to examine subsurface deposits, and to attempt to collect charcoal for radiocarbon dating analysis. The testing consisted of excavating a 1.0 m by 1.0 m (3.3 ft by 3.3 ft) test unit placed within a soil area beneath the lava tube's western entrance. One piece of marine midden was found on the unit's surface.

The unit was excavated to underlying bedrock to a maximum depth of 2 cm (0.07 ft.). One stratigraphic layer - Stratum I - was observed during excavation. Stratum I was a very dark grayish brown (10 YR 3/2) fine salty loam.

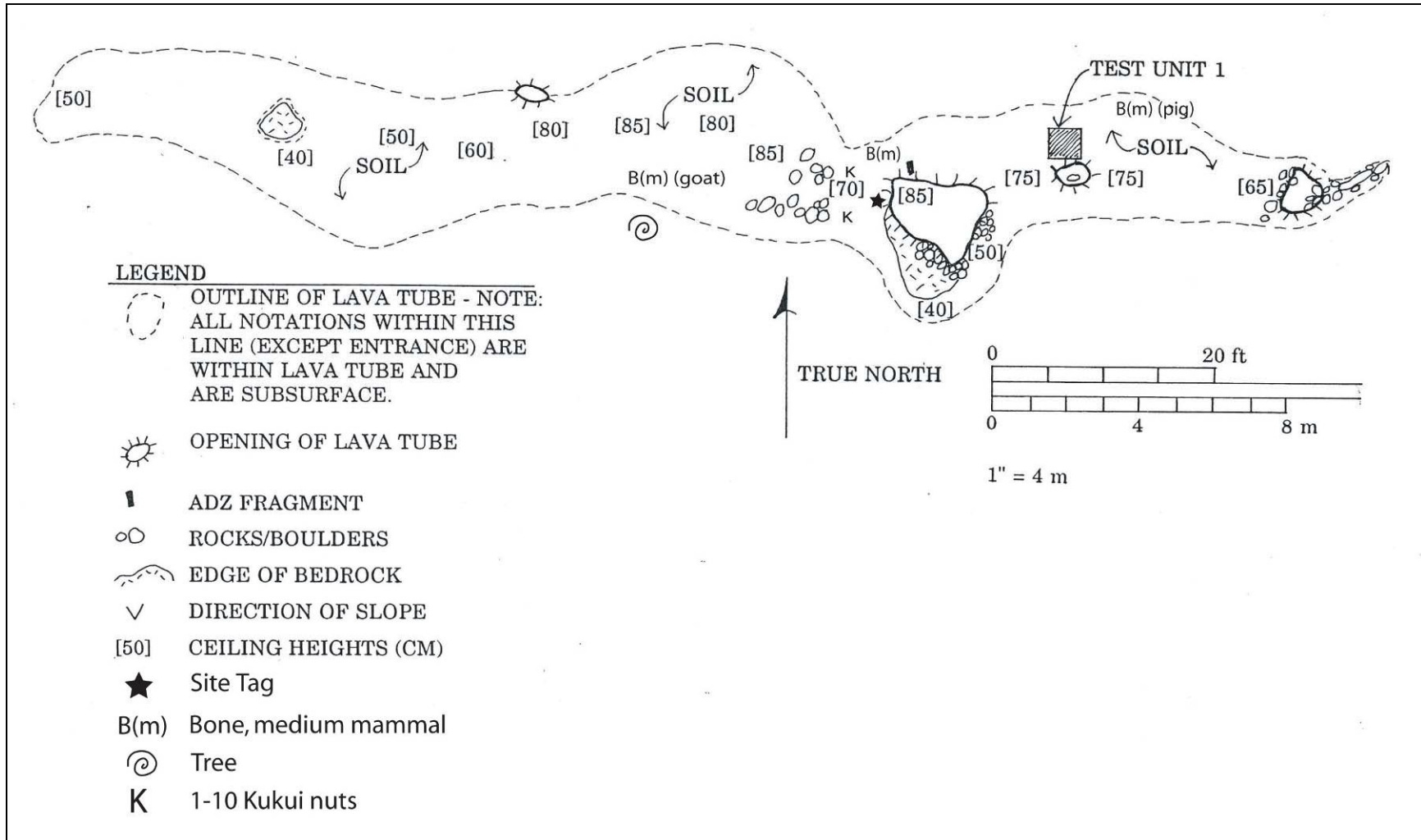


Figure 102. SIHP # 50-10-27-20727 plan view

The midden inventory includes the following: 1.4 g of unidentified marine shell; 0.5 g sea urchin (*wana* or Echinoderm); 4.2 g pig bone; and 2.6 g of *kukui* endocarp.

4.3.36 State Site # 50-10-27-20728

SIHP #	50-10-27-20728
FUNCTION:	Temporary habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	1
DIMENSIONS:	18.2 m ² (195.8 ft ²)
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	110 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20728 (Figure 103, Figure 104, & Figure 105) is a semi-circular enclosure located on undulating *pāhoehoe* terrain and is located in the southwest portion of the parcel.

The enclosure measures 3.4 m (11.1 ft) north/south by 5.3 m (17.3 ft) east/west. The eastern segment of the enclosure wall is well faced with a maximum height of 0.65 m (2.1 ft) with 3-5 courses of small boulders and larger cobbles (Figure 105 and Figure 104). The south, north, and west sides of the enclosure are formed by a natural lip in the existing bedrock. The interior of the enclosure is bedrock with scattered boulders. Stones are covered with lichen, indicating that the structure has not been significantly disturbed in recent times.

No artifacts or midden were observed at the site.

The site's function is interpreted as a temporary habitation site based on the paucity of midden recovered from the test unit and the lack of other associated features. Based upon testing results, no further work is recommended for this site.

Testing Results

Subsurface testing was conducted at Site 20728 to aid in determining the site function, examine cultural deposits, and to attempt to collect datable charcoal for radiocarbon analysis. A 1.0 m by 1.0 m (3.3 ft by 3.3 ft) test unit was placed within the interior of the enclosure abutting the western portion of the faced wall. The unit was excavated to a maximum depth of 18 cm (0.6 ft.) below surface and excavation was terminated upon encountering bedrock. The bedrock at the base of the unit was covered by a 2-3 cm (0.06-0.1 ft.) layer of organic humus and rootlets. There was no soil layer present within the unit and only 7.5 g of *kukui* endocarp were recovered.

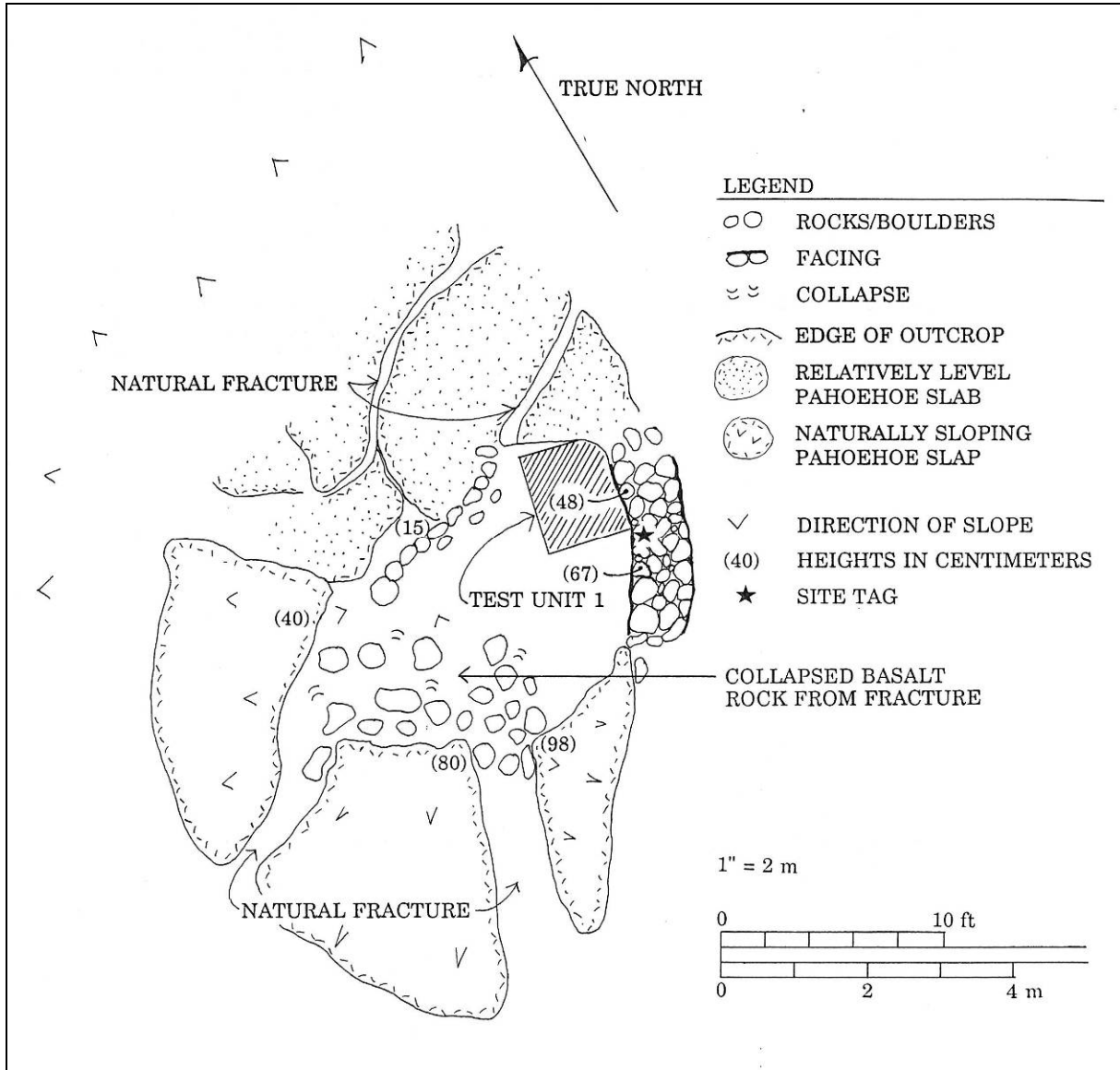


Figure 103. SIHP # 50-10-27-20728; plan view



Figure 104. SIHP# 50-10-27-20728 Overview of enclosure, view to the south



Figure 105. SIHP# 50-10-27-20728 Detail of southeast wall of enclosure, view to the southeast

4.3.37 State Site # 50-10-27-20729

This SIHP number was assigned during the Colin et al. 1996 study, but its use is discontinued here as the site was determined to already have an existing site number (see SIHP 50-10-27-15329) assigned during the Henry & Graves 1993 study.

4.3.38 State Site # 50-10-27-20730

SIHP #	50-10-27-20730
FUNCTION:	Temporary habitation
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	2
DIMENSIONS:	69.3 m ² (745.7 ft. ²)
CONDITION:	Poor
AGE	Pre-contact
ELEVATION:	140 ft (68 m) a.m.s.l.

DESCRIPTION: Site 50-10-27-20730 (Figure 106) is a modified tumulus defined by a leveled area on the top of the tumulus and a small terraced area at the tumulus base. The terrain consists of undulating *pāhoehoe* lava with sparse deposits of soil that support various grasses and *koa haole*.

Feature A is a leveled area measuring 4.2 m (13.8 ft.) north/south by 3.3 m (10.8 ft.) east/west, with a maximum height of 0.4 m (1.3 ft.) on the faced portion of the eastern edge (Figure 107). The leveled area is defined by medium to small boulders with the interior consisting of cobbles. A terraced area is located at the base of the tumulus, 4.2 m (13.8 ft.) to the northwest from western edge of the leveled area. The terraced area measures 2.6 m (8.5 ft.) northwest/southeast by 1.1 m (3.6 ft.) northeast/southwest with a maximum height of 0.4 m (1.3 ft.). Construction consists of stacked small to medium boulders.

The modified tumulus has a large natural relatively smooth wide flat face running approximately 10 m (32.8 ft.) northwest/southeast. The northwest side is flush with the tumulus surface. A natural formation rises to the southeast. The tumulus rises to a maximum height of approximately 6 m (19.7 ft) from the surrounding terrain and is severely fractured with crevices as wide as 2 m (6.6 ft) and as deep as 2.5 m (8.2 ft). The crevices support half a dozen *koa haole* trees.

Feature B is a modification of the relatively smooth natural rise to the southeast that consists of two clearly discernable terrace structures (Figure 108). The first terrace is approximately 3.5 m (11.48 ft.) upslope from the bottom of the tumulus. It is highly collapsed with a concentration of small and large cobbles extending approximately 115 m (377.3 ft.) down slope northwest. Approximately 2.5 m (8.2 ft) wide, there is a slight terrace corner expressed in the northeast corner - small boulders are stacked 1-2 courses high on the bedrock. It is roughly level approximately 1 m (3.3 ft) upslope to the southeast. From the level area, the tumulus climbs 3.5 (11.5 ft) upslope to an upper terrace. This sloping area between the terraces is mostly bedrock with small soil pockets supporting grasses and *koa haole*. The upper terrace is approximately 4 m (13.1 ft) wide northeast/southwest and 90 cm (3 ft.), 4-5 courses, high; it is roughly faced and/or slumped. The top of the stacked face runs northwest/southeast a maximum of 3.6 m (11.8 ft) as a relatively level area towards the top of the tumulus face. At the very top of the tumulus, there is a very sharp rise in the bedrock about 40 cm (1.3 ft.) with an alignment of 7 small boulders across the top that adds height to the natural wall. The eastern side of the upper terrace is 1 course high and faced. There is an alignment of small boulders along a crevice wall and is directly abutted for 110 cm (3.6 ft.) with diverse fill of large cobbles and rubble. Unlike the lower terrace, the

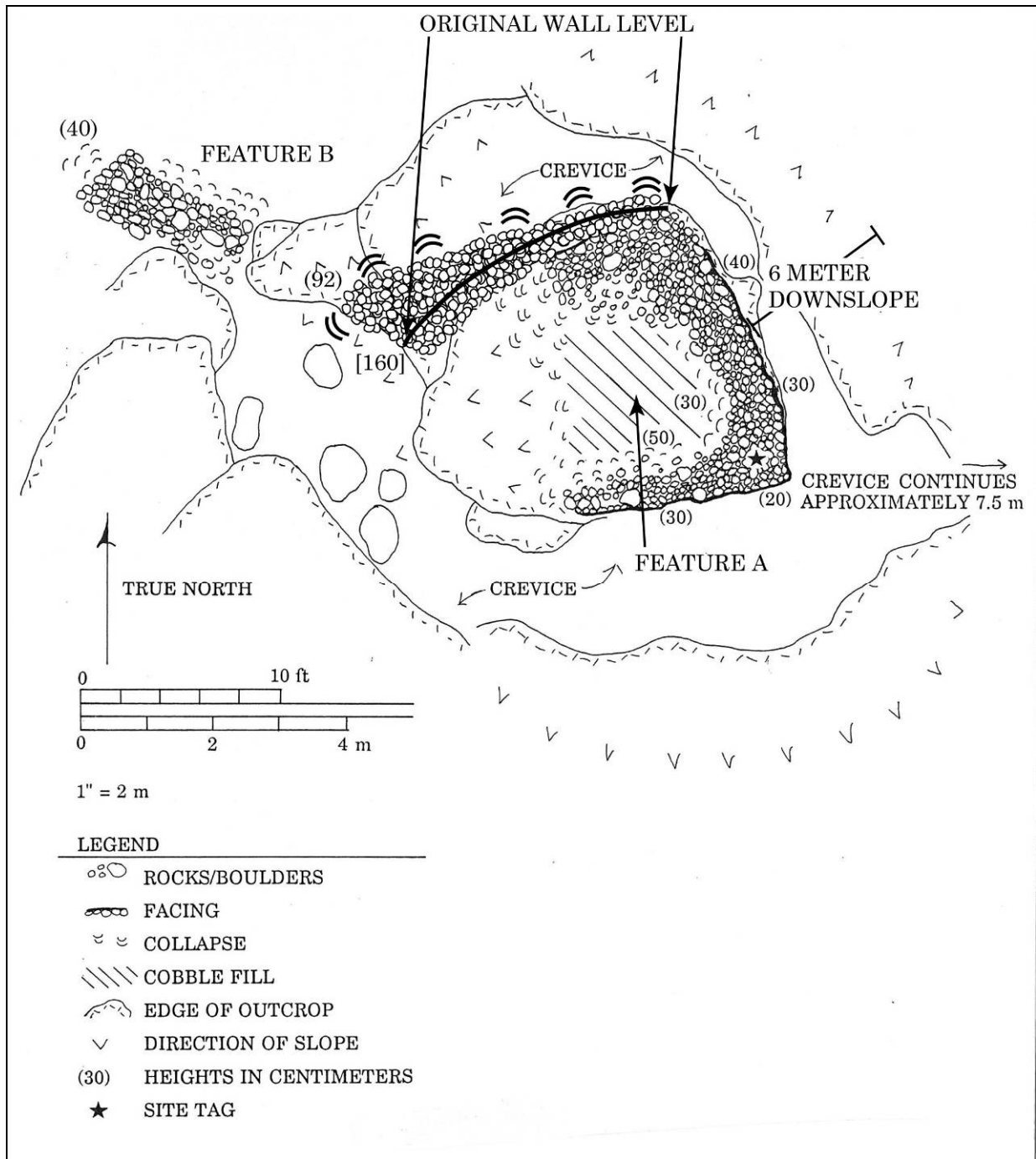


Figure 106. SIHP # 50-10-27-20730 site complex; plan view

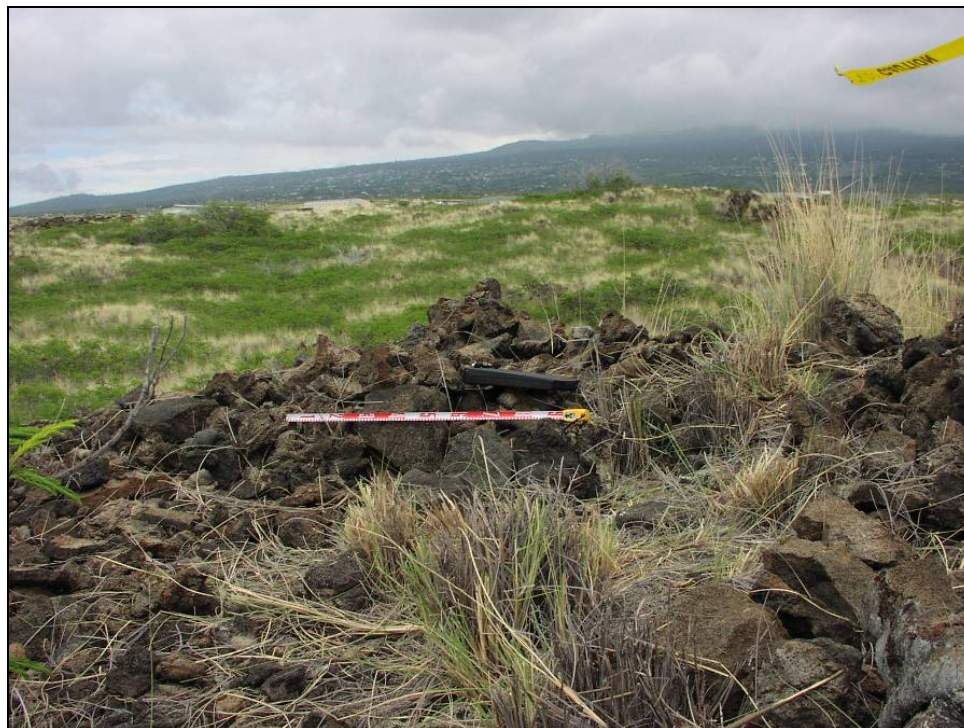


Figure 107. SIHP # 50-10-27-20730, Feature A, view to southeast



Figure 108. SIHP # 50-10-27-20730, Features B taken from north end, view to south

upper terrace is not the full width of the tumulus face. Stacked small boulders and cobbles on the west wall of the upper terrace are not directly abutted by dense fill but collapsed and taper off to the northwest where the entire corner is missing. It appears to have undergone a large amount of collapse. The largest crevice in the tumulus is directly to the south of the upper terrace. No modifications or food remains were found in the crevice. The low spot in the center of the upper terrace measures approximately 2 m by 2 m (6.6 ft by 6.6 ft) and is about 10 cm (0.3 ft.) lower than the east wall, 60 cm (2 ft.) lower than the south wall, and 20 cm (0.6 ft.) lower than the north wall. There is a bit of exposed bedrock to the south that is well leveled with small cobbles and rubble to the north.

The site's function is interpreted as a temporary habitation area based on the extent of modification and the lack of midden or artifacts. The Feature B boulders, small to medium sized, are too large for an agricultural terrace, therefore, the site is not interpreted as agricultural. Since the site is not a filled crevice of a formally stacked platform, it is not viewed as a possible burial. Excavation potential is considered poor.

It is also possible that Feature B may be the result of a large scale collapse, as it appears a large boulder 1.5 m x 1 m (4.9 ft x 3.3 ft) has broken off and lunged forward into the crevice and propelled a large number of rocks into the direction of the interpreted terrace area.

4.3.39 State Site # 50-10-27-20731

SIHP #	50-10-27-20731
FUNCTION:	Indeterminate
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	3.0 m ² (32.3 ft ²)
CONDITION:	
AGE	Pre-contact
ELEVATION:	120 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20731 (Figure 109 & Figure 110) is a modified tumulus defined by a filled crevice. The terrain consists of undulating *pāhoehoe* that is gently sloping to the southwest. Vegetation at the site consists of various grasses and *koa haole*.

The site measures 3.7 m (12.1 ft) east/west by 1.5 m (4.9 ft) north/south. The fill, which consists of small to medium boulders, is not level with the surrounding outcrop.

The site's function was interpreted as a possible burial based on the elimination of other functions and the fact that filled crevices often contain burials. However, excavation testing results (see below) found no burial. Habitation is unlikely given the small size and the rough unlevelled nature of the fill. Agricultural use is also unlikely based on its position on the outcrop and the size of the boulders used for construction. Generally, agricultural features have small to medium cobbles rather than small to medium boulders. No artifacts or midden were observed at the site.

Testing Results

Subsurface testing was conducted at Site -20731 to aid in determining site function, and to confirm the presence/absence of a burial.

The filled crevice was excavated since it was the only portion of the site that appeared to contain modification (Figure 110). Approximately nine medium to large *pāhoehoe* cobbles were removed from the crevice prior to encountering bedrock. No cultural material was found and no burial was present. This tumulus exhibits extremely ephemeral modification. Excavation confirms that this site is not a burial but does not aid in determining the site's function.

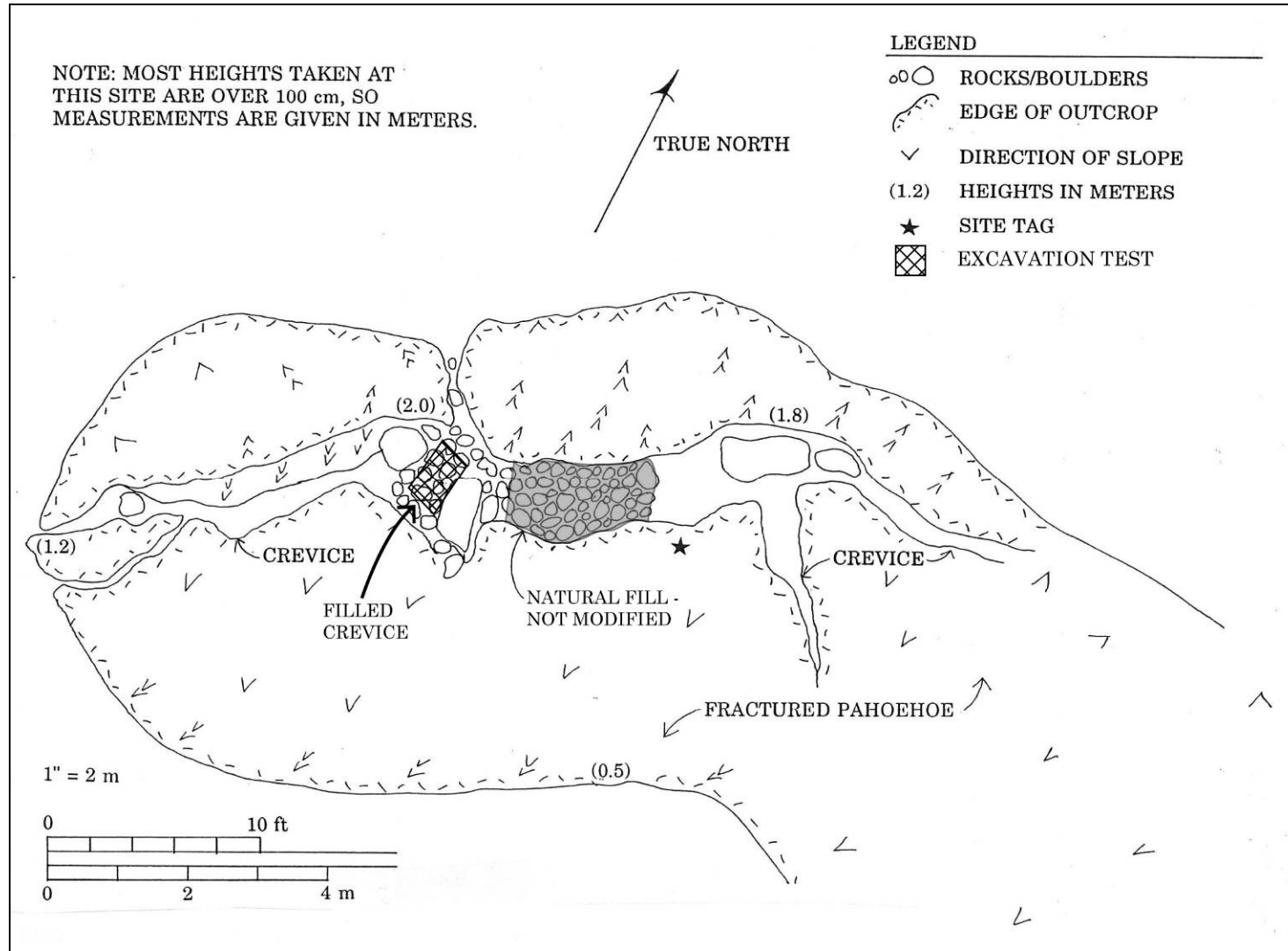


Figure 109. SIHP # 50-10-27-20731 plan view

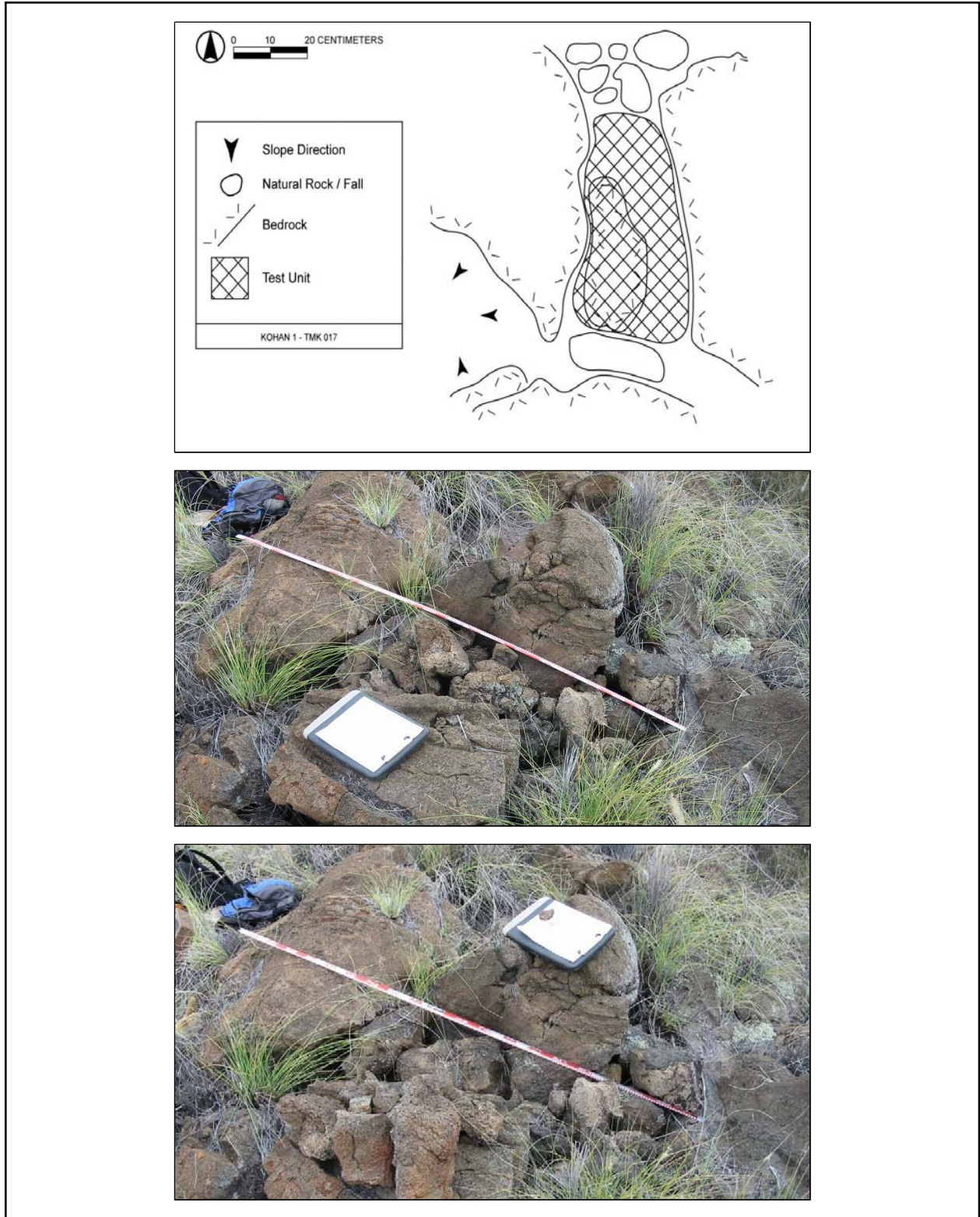


Figure 110. SIHP # 50-10-27-20731 excavation figures. Top to Bottom: post-excitation plan view, pre-excitation photo, post excavation photo (removed rocks in foreground).

4.3.40 State Site # 50-10-27-20732

SIHP #	50-10-27-20732
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	90 m northeast/southwest
CONDITION:	Fair
AGE	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20732 is a *pāhoehoe* stepping stone trail located on a rough undulating 'a 'ā flow. No soil is present, and vegetation consists of sparse grass.

The trail extends in a *mauka/makai* direction from the edge of the 'a 'ā flow for 90 m (295.3 ft) across the 'a 'ā flow. At approximately 20 m (65.6 ft) south from the north trail exit off the 'a 'ā is a Y-intersection, at this point another *pāhoehoe* stepping stone trail heads in a *mauka* direction for 40 m (131.2 ft) until it is no longer discernable on the 'a 'ā.

The trail is constructed of well set *pāhoehoe* stepping stones.

The site's function is interpreted as transportation. No artifacts were observed. Excavation potential is poor due to the lack of soil.

4.3.41 State Site # 50-10-27-20733

SIHP #	50-10-27-20733
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	45 m north/south
CONDITION:	Poor remnant
AGE:	Pre-contact
ELEVATION:	110 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20733 is a cobble trail located on the surface of the undulating 'a 'ā lava (Figure 111).

The trail crosses the 'a 'ā flow in a north/south direction. It is constructed of 'a 'ā pebbles to 'a 'ā cobbles. Larger 'a 'ā boulders have been cleared from the trail. The stones are worn and rounded, along some portions of the trail. The trail is discernable for approximately 78m.

The trail is only visible across the 'a 'ā flow. Numerous attempts were made to follow the trail on either side of the 'a 'ā flow without success.

The trail is discernable due to discoloration of the stone caused by foot traffic. The trail makes an almost 90-degree turn to the west about 50 m (164.1 ft) north from the south end. Almost immediately following the turn, the trail corners around a large boulder and continues heading north. A trail of grasses grows along the south end of the trail. Aside from that line of grasses, the trail is barren with a few patches of *koa haole*. It is only along some portions of the trail that

any stones are worn or rounded. The trail is braided with a second path on an outcrop just south of the 90-degree turn. This second path rejoins the trail at a corner.



Figure 111. SIHP# 50-10-27-20733 Photograph taken from north end of trail, view to the southwest

4.3.42 State Site # 50-10-27-20734

SIHP #	50-10-27-20734
FUNCTION:	Agriculture
SITE TYPE:	Modified depression
TOTAL FEATURES:	1
DIMENSIONS:	3.6 ² (38.7 ft ²)
CONDITION:	Destroyed
AGE	Pre-contact
ELEVATION:	125 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20734 (Figure 112) was described in Colin et al. (1996:100) as a modified depression located in gently sloping *pāhoehoe* lava flow. Vegetation at the site consisted of various grasses and *haole koa* located within sparse pockets of soil.

The site consisted of a natural depression within the exposed *pāhoehoe* measuring 3.0 m (9.8 ft) north/south by 1.2 m (3.9 ft) east/west that had been cleared of all internal boulders and cobble. This fill had been thrown onto the surrounding outcrop creating a depression with a maximum depth of 0.6 m (2.0 ft). Pockets of soil were present within the depression.

No artifacts or midden were observed at the site; excavation potential was poor.

Relocation of site -20734 for further observation was not successful. In total the relocation effort involved sweeps by five CSH archaeologists for 45 minutes. The site, a modified depression, was located in a low lying area near the highway that has numerous natural small depressions. Vegetation in the area is generally very thick and just below head level, limiting view of the ground. This site is also relatively informal in nature and even minor disturbance of the placed rocks could have easily destroyed the integrity of this site. Following the intensive effort to identify the location of this modest site, no further consideration is suggested to be warranted.

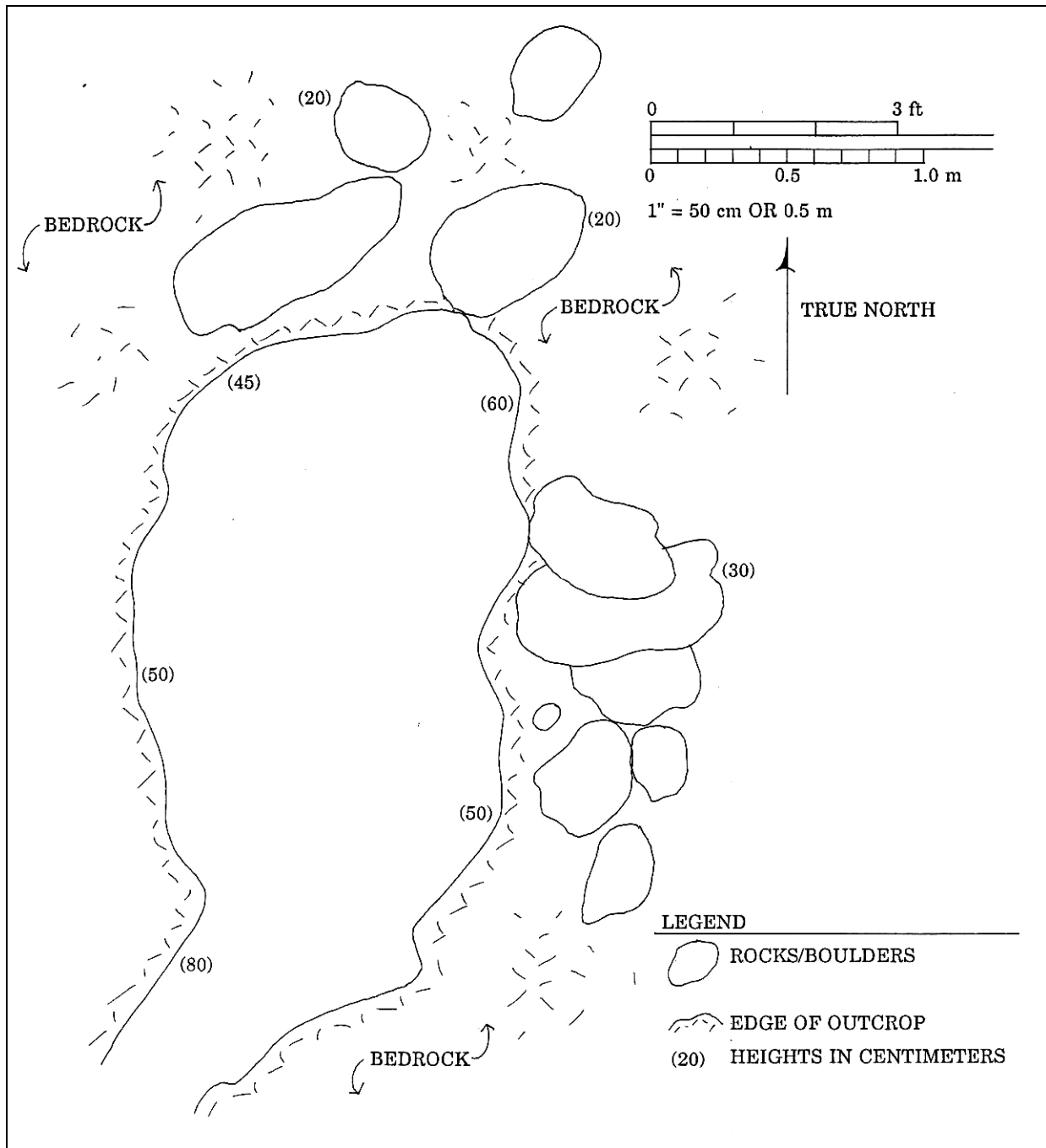


Figure 112. SIHP # 50-10-27-20734; plan view

4.3.43 State Site # 50-10-27-20735

This SIHP number was assigned during the Colin et al. 1996 study, but its use is discontinued here as the site was determined to already have an existing site number (see SIHP 50-10-27-15325) assigned during the Henry & Graves 1993 study.

4.3.44 State Site # 50-10-27-20736

SIHP #	50-10-27-20736
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	70 m east/west
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	95 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20736 is a stepping stone trail located within an undulating 'a'ā terrain (Figure 113). Vegetation consists of areas of sparse *koa haole*.

The trail consists of small to medium sized 'a'ā cobbles and an extensively cleared path through the 'a'ā. The trail runs in a *mauka/makai* direction. Near the discernable *mauka* end, the trail forks, with one fork heading to the northwest. Both branches continue for another 10-13 m (32.8-42.6 ft) at which point both segments are no longer discernable on the *pāhoehoe* terrain. Attempts were made to follow the trail on both sides of the 'a'ā flow without success. The discernable portion of the trail is approximately 85.3 m (279.8 ft) in length.

At the end of the trail segment that branches off to the northwest is a cairn constructed of *pāhoehoe* boulders stacked five courses high.

The site's function is interpreted as transportation. The excavation potential of the site is poor.



Figure 113. SIHP# 50-10-27-20736 Overview photograph of trail, view to the east

4.3.45 State Site # 50-10-27-20737

SIHP #	50-10-27-20737
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	95 m northeast/southwest (311.7 ft.)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	80 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20737 is a trodden path located on an undulating 'a'ā flow (Figure 114). The trail is composed of 'a'ā cobbles that are worn smooth. The trail is only visible on the surface of the 'a'ā flow. Attempts were made to follow the trail on the *pāhoehoe* without success. The discernable portion of the trail is approximately 95 m (311.7 ft) in length and is at an elevation of 45 m (147.6 ft).

The southwest end of the trail terminates at the bulldozer road. The 'a'ā cobbles that make up the trail are only worn smooth in some spots. The trail is primarily discernable due to its discoloration. The southwest end of the trail is not as clear and becomes more difficult to follow. There is a fair amount of vegetation interspersed along this trail compared to other trails on the same flow. The trail was approximately 0.5 m (1.64 ft) wide.

The site's function is interpreted as transportation. No artifacts or midden were observed and excavation potential is considered poor.



Figure 114. SIHP# 50-10-27-20737 Overview photograph of modified trail, view to the northeast

4.3.46 State Site # 50-10-27-20738

SIHP #	50-10-27-20738
FUNCTION:	Agriculture
SITE TYPE:	Enclosure
TOTAL FEATURES:	2
DIMENSIONS:	159.1 m ² (1711.9 ft ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20738 (Figure 115 and Figure 116) consists of two features, designated A and B, located adjacent to an 'a'ā flow. The features are considered to be associated due to their proximity, similarity in construction style, and degree of preservation. The terrain consists of undulating 'a'ā and *pāhoehoe*. Vegetation at the site consists of various grasses, *kiawe*, and *koa haole*.

Feature A is a C-shaped enclosure measuring 8.6 m (28.2 ft) north/south by 5.9 m (19.3 ft) east/west; both ends about the vertical edge of the 'a'ā flow (Figure 117). The enclosure wall is bi-faced in most areas with a maximum height of 0.6 m (2.0 ft), except where collapse has taken place. The wall is constructed of well-stacked boulders and cobbles. The interior of the enclosure consists of areas of sparse soil and exposed bedrock.

Feature B is a semi-circular enclosure located 2.5 m (8.2 ft) south of the south wall of Feature A (Figure 118). The enclosure measures 8.0 m (26.2 ft) north/south by 3.4 m (11.2 ft) east/west, with a maximum interior height of 0.8 m (2.6 ft). A large portion of the enclosure's wall is composed of *pāhoehoe* outcrop that has been filled and leveled with small boulders to form the wide low enclosure. The exterior of the wall is flush with the surrounding terrain.

The site's function is interpreted as agriculture based on the construction of the enclosures and the lack of midden or artifacts.

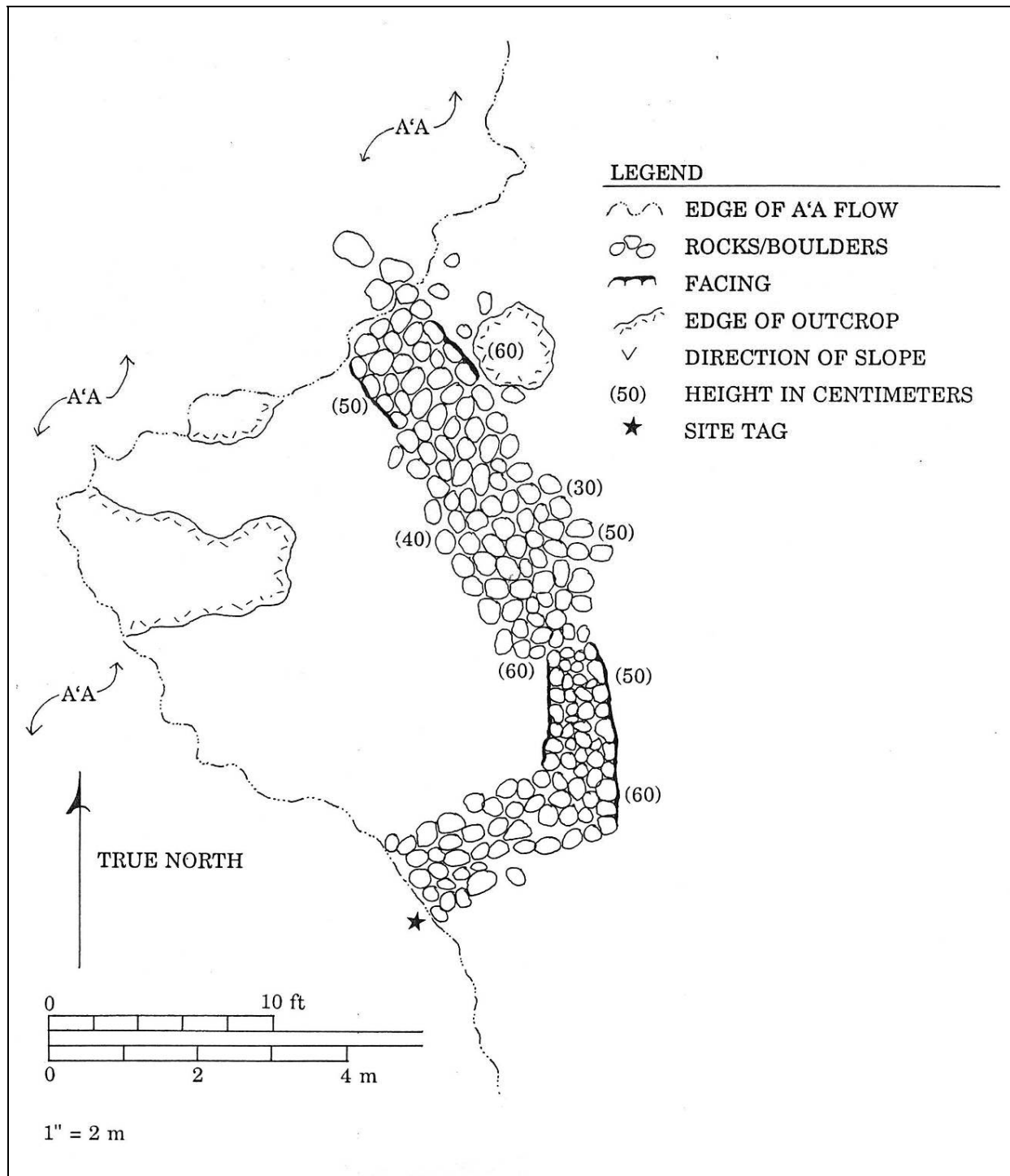


Figure 115. SIHP # 50-10-27-20738 Feature A; plan view

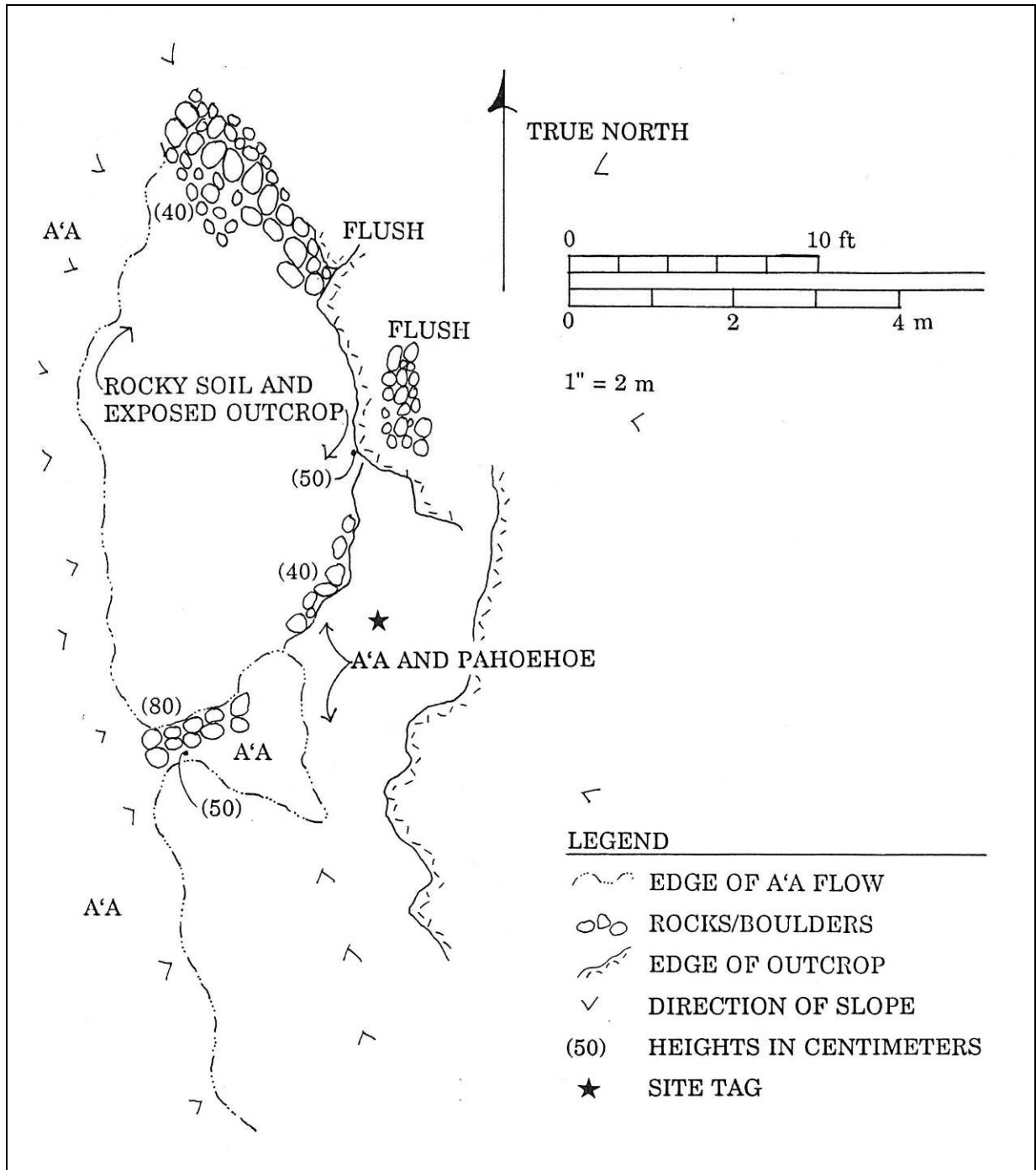


Figure 116. SIHP # 50-10-27-20738 Feature B; plan view



Figure 117. SIHP# 50-10-27-20738 Feature A, Overview photograph, view to the north



Figure 118. SIHP# 50-10-27-20738 Feature B, Overview photograph, view to the east

4.3.47 State Site # 50-10-27-20739

SIHP #	50-10-27-20739
FUNCTION:	Transportation
SITE TYPE:	Enclosure/Trail
TOTAL FEATURES:	2
DIMENSIONS:	2.5 m ² (26.9 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	160 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20739 (Figure 119) is a rectangular enclosure (Feature A) (Figure 120) and a short trail segment (Feature B) (Figure 121).

Feature A is located within a small *pāhoehoe kipuka* surrounded to the east and west by an 'a'ā flow. Vegetation at the site consists of various grasses and *koa haole*. The enclosure measures 1.7 m (5.6 ft) north/south by 1.5 m (4.9 ft) east/west with a maximum interior height of 0.6 m (1.97 ft). It is constructed of small to medium *pāhoehoe* boulders stacked 1-2 courses high and is constructed directly on exposed outcrop.

Feature B is a cobble trail segment that runs roughly southwest/northeast along the southwest edge of Feature A. The trail is not discernable on either side of the 'a'ā flow, although attempts were made to follow the trail, off the 'a'ā, without success.

The site's function is interpreted as transportation with an enclosure. No artifacts or midden were observed at the site. Excavation potential is considered poor.

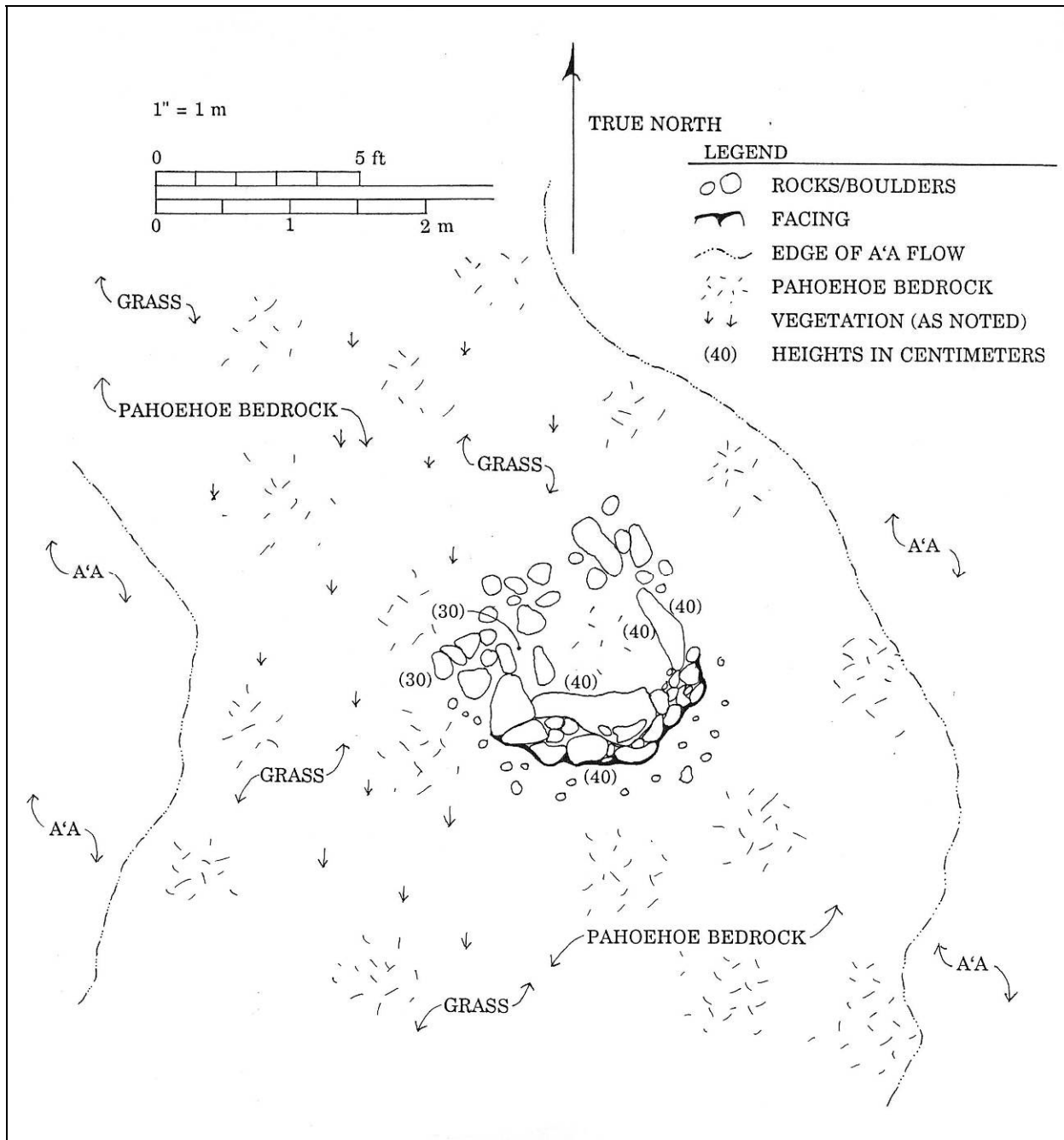


Figure 119. SIHP # 50-10-27-20739; plan view



Figure 120. SIHP# 50-10-27-20739 Feature A, Overview photograph, view to the southeast



Figure 121. SIHP# 50-10-27-20739 Feature B, Overview photograph, view to the east

4.3.48 State Site # 50-10-27-20740

SIHP #	50-10-27-20740
FUNCTION:	Agriculture
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	4.2 m ² (45.2 ft. ²)
CONDITION:	Not found
AGE:	Pre-contact
ELEVATION:	310 ft. a.m.s.l

DESCRIPTION: Site 50-10-27-20740 (Figure 122) was described in Colin et al. (1996:108) as a modified tumulus in which the modification consists of a C-shaped alignment constructed around a filled crevice. Vegetation at the site consisted of various grasses and *koa haole*.

The C-shaped alignment measured 2.1 m (6.8 ft) north/south by 2.0 m (6.6 ft) east/west and was constructed of a single row of vertically placed small boulders and cobbles. A small blister opening measuring 0.5 m (1.6 ft) was located directly adjacent to the modifications northeast edge. The interior of the blister measured 0.7 m (2.3 ft) in diameter with a maximum ceiling height of 0.5 m (1.6 ft).

Another filled crevice was located 2.0 m (6.6 ft) from the northern edge of the modification which measured 2.1 m (6.8 ft) north/south by 0.4 m (1.3 ft). The crevice was filled with cobbles and was constructed flush with the surrounding outcrop.

The site's function was interpreted to be agriculture based on modifications. No artifacts or midden were observed at the site. Excavation potential was considered fair.

Relocation of -20740 for further observation was not successful. In total the relocation effort involved sweeps by two CSH archaeologists for 30 minutes followed by sweeps by four CSH archaeologists for one hour. The sweeps were well bounded by the nearby 'a'ā flow to provide good relative location of the site. Sweeps followed the entire edge of the flow, traveling from south (near site -20798) across to the hard boundary of the east/west running 'a'ā flow to the north. Site -20697 was encountered during this sweep and is close to the plotted location of -20740. The possibility that site numbers were transposed on the original map was tested with sweeps that followed the 'a'ā flow from the location of -20697 north and then west along the edge of the 'a'ā flow until just east of site -20708. A total of approximately 30-40 m (98.4-131.2 ft.) from the flow were swept in this manner. While it seems that a simple error in transposing site numbers initially confounded relocation of site -20740, its actual location is yet unknown due to the combination of thick vegetation and the previously identified relatively minor modification that even a minor disturbance would render unidentifiable. Following repeated efforts to identify the location of this previously identified modest site, no further consideration is suggested to be warranted at this time.

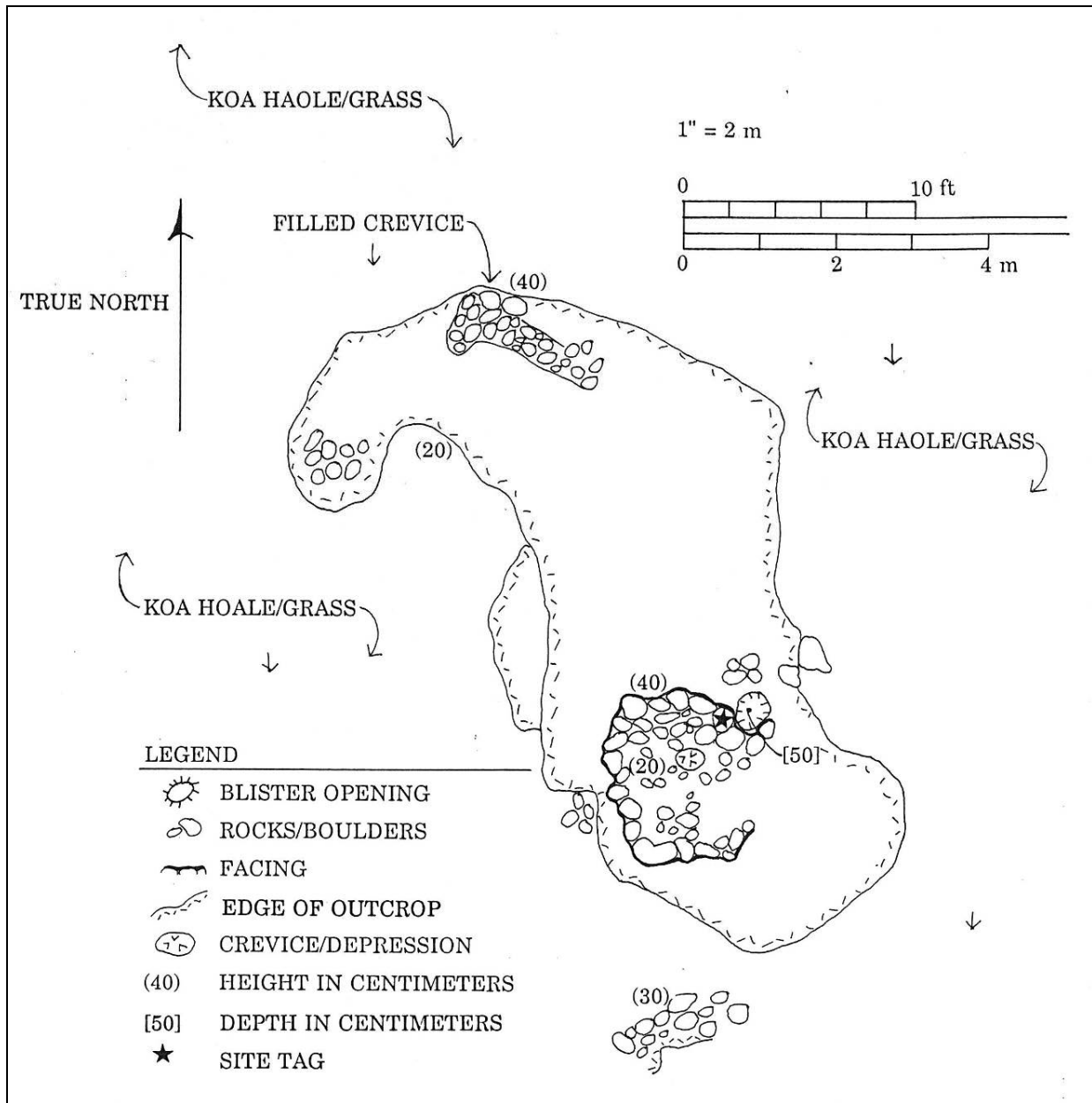


Figure 122. SIHP # 50-10-27-20740; plan view

4.3.49 State Site # 50-10-27-20742

SIHP #	50-10-27-20742
FUNCTION:	Temporary habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	70.1 m ² (754.4 ft ²)
CONDITION:	Not found
AGE	Pre-contact
ELEVATION:	290 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20742 (Figure 123) was described in Colin et al. (1996:111) as a lava tube with an entrance located in a small crevice. The terrain was undulating *pāhoehoe* lava. Vegetation on the surface of the site area consisted of various grasses and *koa haole*.

The entrance was located approximately midway between the tube's north and south ends. The floor of the tube was generally rough lava with sporadic areas of sparse soil. The tube measured 17.1 m (56.1 ft) north/south with the widths ranging from 3.2 m (10.5 ft.) near the entrance, to approximately 1.0 m (3.3 ft) at the north and south ends. Ceiling height did not exceed 0.8 m (2.6 ft).

Midden -including *kukui*, urchin, and cowrie- was observed throughout the tube, along with several fragments of gourd in the southern end of the tube.

Testing Results

Limited testing was conducted in 1995 at Site -20742 lava tube to aid in determining the function of the site, examine subsurface deposits, and to attempt to collect charcoal for radiocarbon dating analysis. Testing consisted of excavating an 50 cm by 50 cm (1.6 ft. to 1.6 ft.) unit placed within a soil area beneath the lava tube's entrance. The surface of the unit contained scattered marine midden.

The unit was excavated to underlying *pāhoehoe* bedrock at a maximum depth of 5 cm (0.16 ft.). One stratigraphic layer - Stratum I - was observed during the 1995 excavation. Stratum I was a very dark grayish brown (10 YR 3/2) silty loam.

An ash sample was taken from the northeast corner of the test unit from 3-5 cm (0.1-0.16 ft.) below the surface which contained 1.3 g pitchy sea snail (*pipipi* or *Nerita picea*); 0.9 g sea urchin (*wana* or Echinoderm); and 0.5 gm of charcoal. Total midden collected from the rest of the test unit consists of: 13.2 g snakehead cowrie (*lehokupu* or *Cypraea caputserpentis*); 1.7 gm. pitchy sea snail (*pipipi* or *Nerita picea*); 0.2 g dye shells (*papua* or *Thaididae* sp.); 0.9 g *Isognomon* sp.; 4.0 g sea urchin (*wana* or Echinoderm); 0.4 g unidentified bone; 2.7 gm. *kukui* endocarp; and 7.8 g of charcoal, all of which were collected. Excavation was terminated upon encountering bedrock throughout the unit.

Interpretation: Based on the relative small amount (43.6 g total) of midden recovered from the test unit and the lack of associated features, it is interpreted as a temporary habitation site.

Relocation of site -20742 for further observation was not successful. In total the relocation effort involved sweeps by two CSH archaeologists for 45 minutes followed by sweeps by four

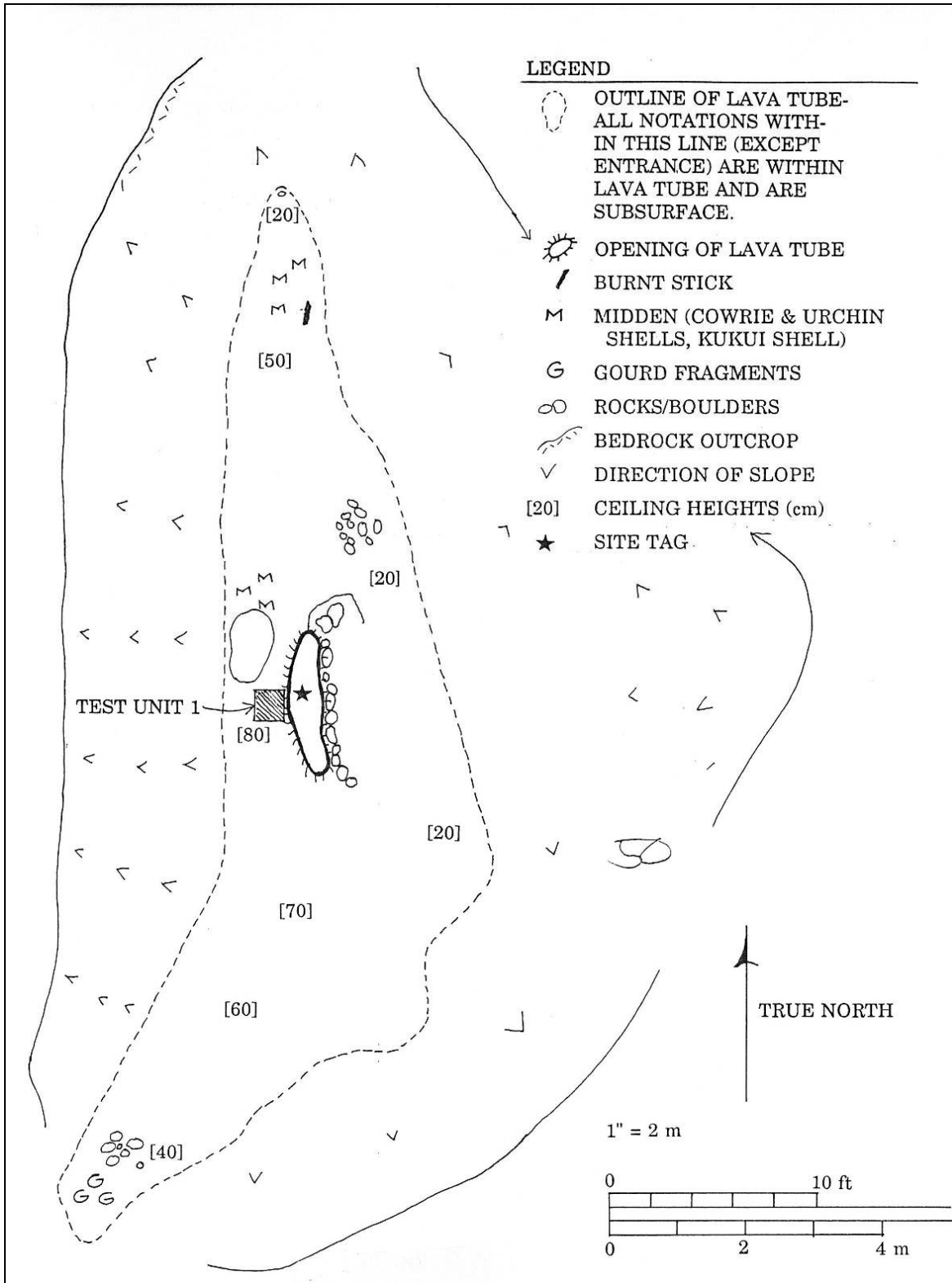


Figure 123. SIHP # 50-10-27-20742; plan view

CSH archaeologists for 1.5 hours. Long sweeps were conducted at tight (approximately 5 m / 16.4 ft.) spacing between site -20709 and the southward bulge in the 'a'ā flow due north of -20716. All bedrock exposures and tumuli of all sizes were thoroughly inspected for any lava tube openings. The opening to this lava tube is a small target that would be highly visible if not covered by vegetation. As was usually the case in the parcel, very dense grasses obscured ground visibility and even if vegetation only partially blocked the entrance, it could reduce the target to 50 cm (1.6 ft.) or less. Due to a possible inaccuracy in either the original plotting or original base map, this site is unlikely to be relocated without a significant change in vegetation. Following repeated efforts to identify the location of this previously identified site, no further research is recommended at this time.

4.3.50 State Site # 50-10-27-20743

SIHP #	50-10-27-20743
FUNCTION:	Indeterminate
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	1
DIMENSIONS:	4.0 m ² (43.0 ft. ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	115 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20743 (Figure 124) is a modified tumulus defined by a filled crevice (Figure 125 and Figure 126). The terrain consists of undulating *pāhoehoe* with scattered pockets of soil that support various grasses and *koa haole*. The immediate filled area lacks vegetation although grasses and *koa haole* cover much of the remainder of the outcrop. None of the bedrock is level.

The modification measures 2.0 m (6.6 ft) north/south by 2.0 m (6.6 ft) east/west. The fill consists of *pāhoehoe* cobbles that create a semi-level area although the modification is far less continuous or even than -20729.

The site's function was interpreted as a possible burial based on the type of modification, however, excavation testing results (see below) found no burial. The site does not appear to be a habitation. No artifacts or midden were observed at the site.

Testing Results

Subsurface testing was conducted at Site -20743 to aid in determining site function, and to confirm the presence/absence of a burial.

An excavation unit was placed at the widest portion of the small crevice at the southern end of the tumulus (Figure 127). One bone fragment and one marine shell were recovered from the screened soil. The bone was too small to identify although it was in fairly good condition. More bones would have been present if the site was a burial. Therefore, the site's function is interpreted as temporary habitation.

Excavation ceased at bedrock and the majority of the leveled area was excavated. There is therefore no possibility the site contains a burial. The deepest portion of the leveled area was excavated; the portion of the site that was not excavated is very shallow compared to the area that was excavated.

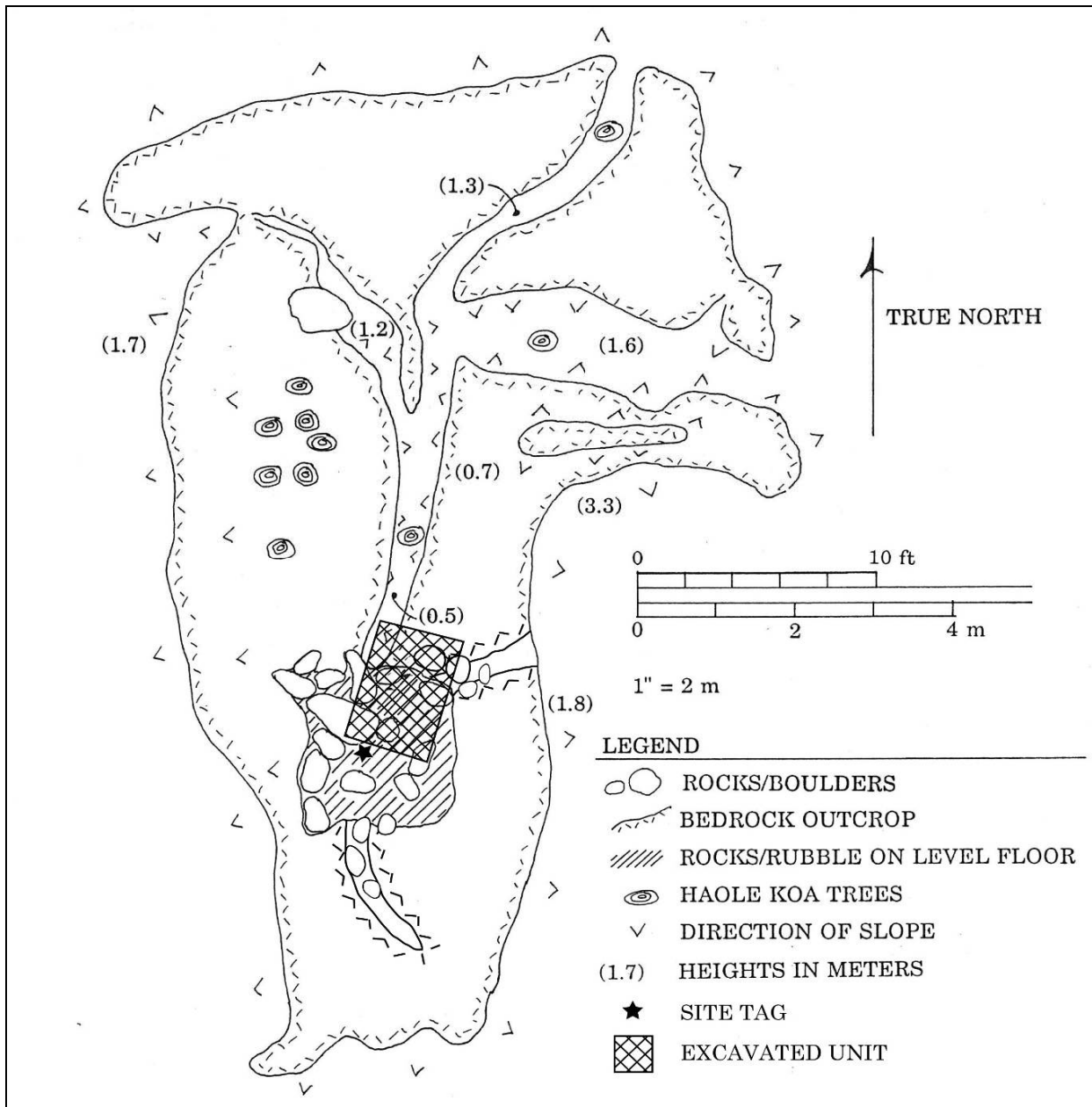


Figure 124. SIHP# 50-10-27-20743, plan view



Figure 125. SIHP# 50-10-27-20743 Overview photograph of modified tumulus, view to the south



Figure 126. SIHP# 50-10-27-20743 Photograph of modified tumulus, view to the north

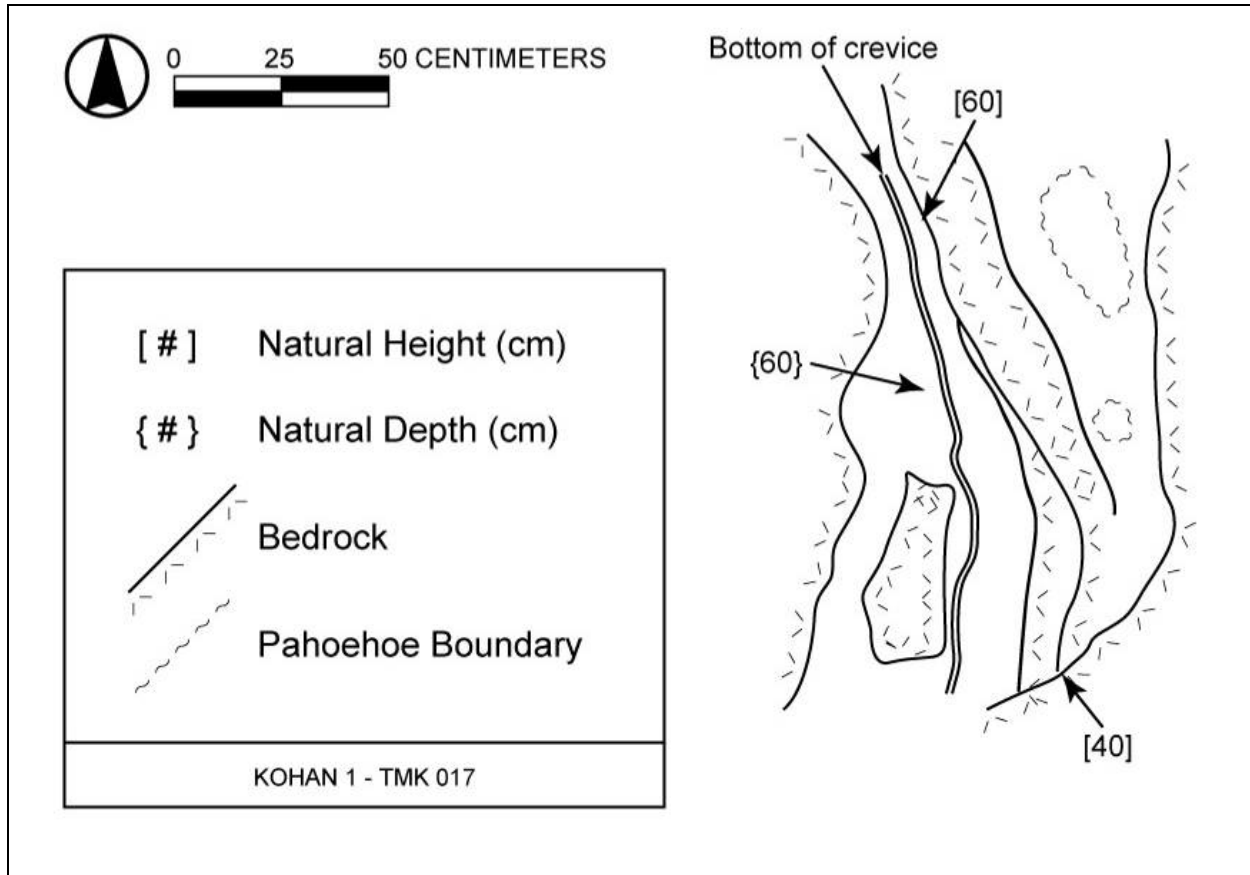


Figure 127. SIHP# 50-10-27-20743, excavation plan view

4.3.51 State Site # 50-10-27-20744

SIHP #	50-10-27-20744
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	15.0 m (75 m ²) (49.2 ft (806.8 ft ²))
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	120 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20744 is a stepping stone trail located on an undulating 'a'ā flow (Figure 128). The immediate trail area lacks vegetation.

The trail segment crosses an 'a'ā flow in a north/south direction and measures 15.0 m (49.2 ft) in length by 0.5 m (1.6 ft) wide. The trail is composed of *pāhoehoe* stepping stones set into 'a'ā cobbles; the stepping stones are well laid in spots. All paving stones measure approximately 20 cm (0.66 ft.) in diameter or less. The stones are evenly spaced and continue for the length of the trail. Numerous attempts were made to follow the trail on both sides of the 'a'ā flow without success; the north end of trail terminates on the 'a'ā flow.

It appears that there is some reuse of stones in the area and that this trail may have previously been part of -20722, or that a portion of trail -20744 was replaced by -20722.

The site's function is interpreted as transportation. No artifacts or midden were observed. Excavation potential is considered poor.



Figure 128. SIHP# 50-10-27-20744 Photograph taken 3 m (9.84 ft) from northwest end of trail, view to the northwest

4.3.52 State Site # 50-10-27-20745

SIHP #	50-10-27-20745
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	40 m northeast/southwest
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	120 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20745 is a stepping stone trail located on an 'a'ā flow (Figure 129). The trail crosses the 'a'ā flow in a southwest/northeast direction and measures 28.0 m (91.8 ft) long by 0.7 - 0.8 m (2.3 ft by 2.6 ft) wide. The trail is composed of *pāhoehoe* stepping stones laid in worn 'a'ā cobbles. The stones are evenly spaced and continue for the entire length of the trail. The trail is only visible on the surface of the 'a'ā flow. Attempts were made to follow the trail off the 'a'ā flow without success. The north end of the trail is braided and has been cut off by a bulldozer road. Discoloration of the stones from bruising is pronounced, although not as pronounced as -13493, the most distinct of the numerous trails on this particular 'a'ā flow.

The immediate area is vegetation free. An excavated and constructed cupboard, 50 cm (1.6 ft.) across and 70 cm (2.3 ft.) deep, is on the trail's east side.

The site's function is interpreted as transportation. No midden or artifacts were observed. Excavation potential is considered poor.



Figure 129. SIHP# 50-10-27-20745 Photograph 6 m (19.7 ft) from south end of trail, view to the north

4.3.53 State Site # 50-10-27-20746

SIHP #	50-10-27-20746
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	48.2 m ² (518.6 ft. ²)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	80 ft. a.m.s.l.

DESCRIPTION: Site-50-10-27-20746 (Figure 130) is a lava tube located in the western portion of the project area in undulating *pāhoehoe* terrain, and is 73 degrees from road pole #6 (Figure 131). A few small grass patches are on top of the tube; vegetation immediately surrounding the tube consists of various grasses and *koa haoloe*.

The tube measures 11.2 m (36.7 ft) northeast/southwest by 5.2 m (17.1 ft) northwest/southeast with a maximum ceiling height of 1.4 m (4.6 ft). The only entrance into the tube is located in the northeast corner: the entrance diameter measures 0.5 m (1.6 ft). The tube floor is bare lava except for the shallow (less than 2 cm / 0.7 ft.) soil deposit in the area directly around the entrance (Figure 132). Some roof collapse has occurred in the center of the tube; there are a few boulders that measure approximately 50 cm (1.6 ft.).

During fieldwork in 1995, CSH identified a wooden artifact 1.7 m (5.6 ft.) to the northeast of the entrance (Colin et al. 1996:155-116). It appeared to be a tapa beater and measured 36.0 cm long, by 5.8 cm wide with a maximum thickness of 5.6 cm (1.18 ft. long, by 2.3 inches wide, by 2.2 inches thick). The 2007 field work was not able to relocate this artifact, and determined that it either decomposed beyond recognition or was looted prior to 2007.

The site's function is interpreted as shelter based on the lack of modification. No other artifacts or midden were observed. Excavation potential of the site is considered poor.

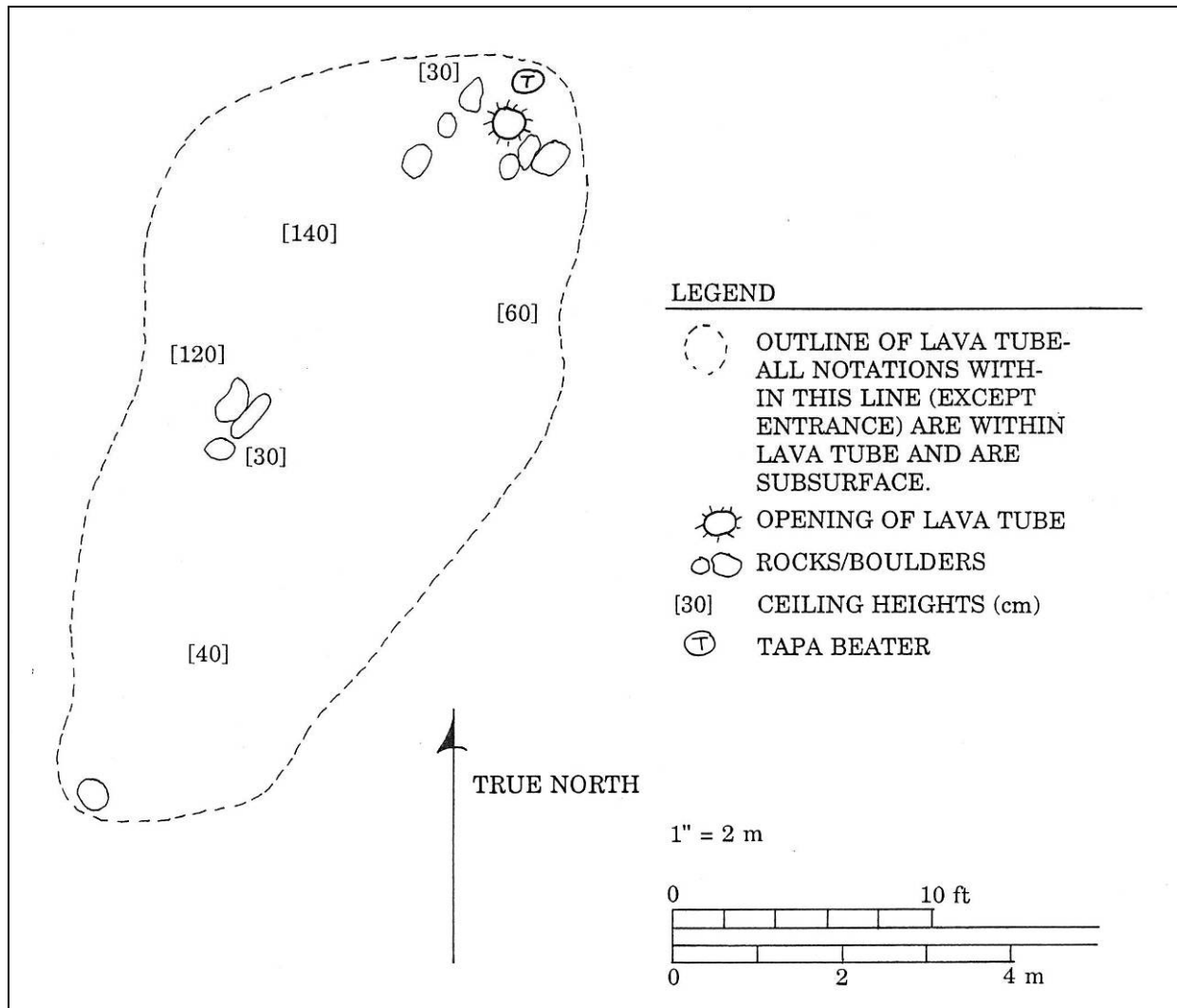


Figure 130. SIHP # 50-10-27-20746; plan view



Figure 131. SIHP# 50-10-27-20746, Overview photograph of tube opening, Queen Ka‘ahumanu Highway in the background, view to the west



Figure 132. SIHP# 50-10-27-20746, Photograph of interior of tube, view to the southwest

4.3.54 State Site # 50-10-27-20747

SIHP #	50-10-27-20747
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	80 m (265.5 ft.)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	270 ft. (100 m) a.m.s.l

DESCRIPTION: Site 50-10-27-20747 is a trail that runs southwest to northeast and is composed of small to medium cobbles with worn and significant discoloration from foot traffic. The trail measures approximately 80 m (262.5 ft) in length. Patches of foxtail grass grow along portions of the trail, and areas of overgrown grasses and *klu* are as long as 5-6 m (16.4-19.7 ft). At the trail's southwest end are some *koa haole* and also a few Christmas berry trees in the immediate vicinity of the trail.

The trail meanders slightly across the 'a'ā flow. At the northeast portion of the trail, approximately 15 m (49.2 ft.) before the trail's northeast end, the 'a'ā becomes slightly braided as it forks; one leg is to the northeast and the other to the northwest. The northeast leg turns west after approximately 7 m (23 ft.), braids around a large boulder and then rejoins the northwest leg just before the end of the trail. The trail ranges in width from 40 cm (1.3 ft.) across to as wide as 1 m (3.3 ft.) on the trail's northeast fork leg. There are no stepping stones present on the trail and it is continuous across the 'a'ā flow. Some portions of the trail are completely cleared of larger cobbles and boulders; other portions of the trail are composed of large cobbles and small boulders with surface wear and discoloration. Three small *pāhoehoe* slabs are laid at the southwest end of the trail on a large boulder at the end of the 'a'ā flow. Grass runs along most of the trail's southern portion, marking its course. This southern portion of the trail has two *pāhoehoe* slabs; one is partially obscured by a fallen chunk of 'a'ā, and the other is along the side of the trail, approximately 6 m (19.7 ft.) northeast of the slab on the trail.

The site's function is interpreted as transportation.

4.3.55 State Site # 50-10-27-20748

SIHP #	50-10-27-20748
FUNCTION:	Storage
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	66.0 m ² (710.2 ft. ²)
CONDITION:	Fair
AGE:	pre-contact
ELEVATION:	280 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20748 (Figure 133) is a lava tube. The surface vegetation consists of various grasses and *koa haole*.

The lava tube measures 11.0 m (36.1 ft) northwest/southeast by 6.0 m (19.7 ft) northeast/southwest with a maximum ceiling height of 0.8 m (2.6 ft) (Figure 134). The only possibility of cultural modification or evidence of use of the site are the four flat *pāhoehoe* slabs that may be in alignment. These *pāhoehoe* slabs are in the northeast corner of the lava tube (Figure 135). Although no midden or shell was present in the tube, approximately 3.5 cm (0.1 ft.) of soil was found in the vicinity of the slabs in the northeast corner.

The site's function was initially interpreted as temporary habitation based on the size of the *pāhoehoe* slabs within the possible shelter, and cracks in the lava tube's surface that allow some light to filter into the back of the cave. The lack of midden or shell in the cave suggests storage as the most likely function since some midden is expected in temporary habitation areas. Additionally, the *pāhoehoe* slabs allow easy access to the back portions of the tube. No artifacts or midden were observed. Excavation potential of the site is fair due to the presence of soil in the northeast corner of the tube.

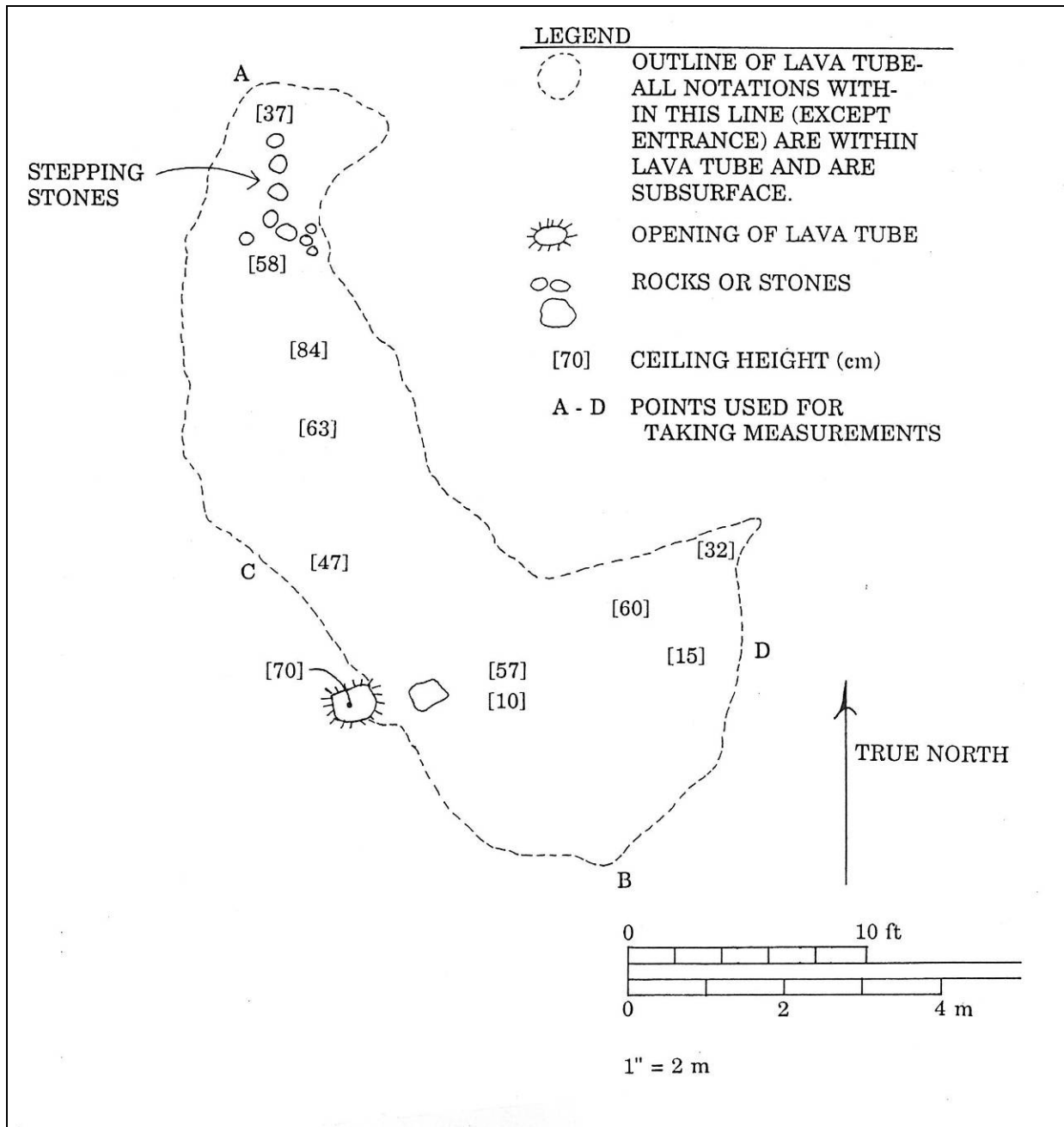


Figure 133. SIHP # 50-10-27-20748; plan view



Figure 134. SIHP # 50-10-27-20748, photograph of tube opening, view to the east



Figure 135. SIHP # 50-10-27-20748, photograph of *pāhoehoe* slab within interior of tube, view to the north

4.3.56 State Site # 50-10-27-20749

SIHP #	50-10-27-20749
FUNCTION:	Temporary habitation
SITE TYPE:	Terrace/Lava tube
TOTAL FEATURES:	5
DIMENSIONS:	106.7 m ² (1148.1 ft ²)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	200-250 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20749 consists of five features (Features A-E), a terrace a lava tube, and three tumulus. These features are located on a *pāhoehoe* tumulus that slopes gently to the west. Vegetation at the site consists of various grasses and *koa haole*.

Feature A (Figure 136 & Figure 137) is a terrace that abuts the west edge of the *pāhoehoe* tumulus. It measures 5.7 m (18.8 ft) north/south by 2.2 m (7.3 ft) east/west, with a maximum height on the western side of 1.0 m (3.3 ft). The terrace's surface is level and paved with cobbles and flat *pāhoehoe* slabs; it is constructed of well stacked boulders and cobbles.

There are three areas, at the junction of the terrace and the tumulus, where natural cracks in the tumulus have been filled and leveled with cobbles creating an extended level surface. Approximately 1.5 m (4.9 ft) from the northeastern corner of the terrace is another long narrow crevice that has also been filled and leveled. This crevice measures 4.0 m (13.1 ft) by 0.4 m (1.3 ft).

Feature B (Figure 138) is a lava tube located just *mauka* of Feature A at the base of the *pāhoehoe* tumulus. Access to the tube was gained through the single entrance (Figure 139). The tube extended in a northeast/southwest direction for a total length of 18.1 m (59.4 ft), with a maximum ceiling height of 0.9 m (3.0 ft) in the northeast section of the tube.

Significant amounts of midden were observed in the tube, including various marine shell fragments, small to medium mammal bone, *kukui* endocarps, burnt wood, and possible human bone fragments. There were also six artifacts scattered throughout the tube. The floor contained soil deposits near the entrance and sparse pockets of soil scattered in small areas.

Feature C is a modified tumulus that measures 7.4 m (24.3 ft.) north/south by 5.5 m (18 ft.) east/west (Figure 140). The tumulus rises approximately 2.5 m (8.2 ft.) above the surrounding ground surface. Modifications to the tumulus include a filled crevice and a constructed small terrace. The filled crevice is approximately 5 m (16.4 ft.) long and it is filled with large *pāhoehoe* cobbles and small boulders. The fill's upper surface is not particularly level; the upper portion of the tumulus is relatively flat and level. The constructed terrace on the northeast side of the tumulus extends across this level surface. The terrace is 1-2 courses high and faced. The facing is primarily constructed with *pāhoehoe* boulders. The terrace's fill consists of small to medium *pāhoehoe* cobbles. The maximum constructed height of the terrace is 60 cm (2 ft.). The top surface of the terrace is relatively flat, level, and smooth and is flush with the level top surface of the tumulus.

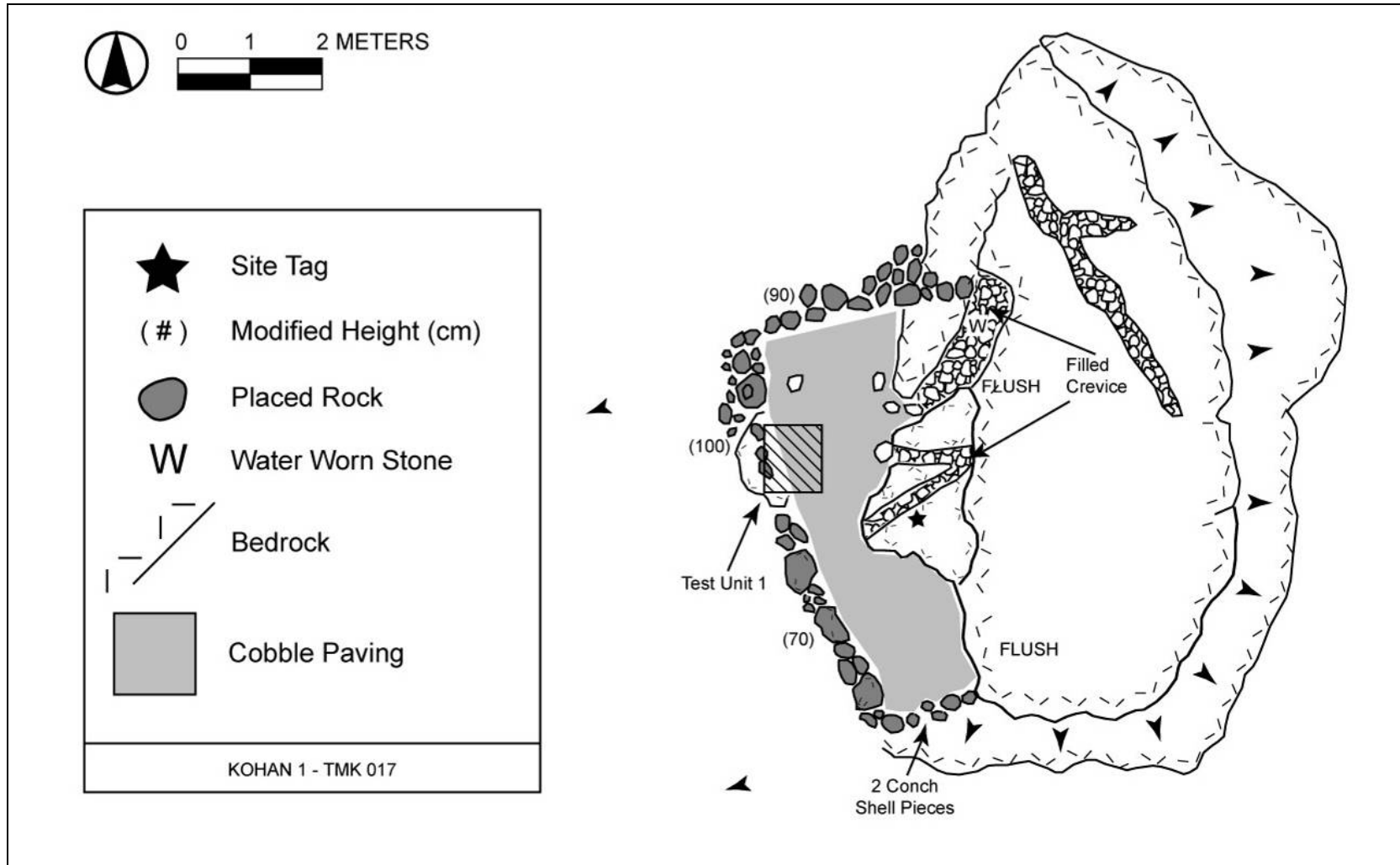


Figure 136. SIHP # 50-10-27-20749 Feature A; plan view



Figure 137. SIHP # 50-10-27-20749, Feature A, view to south

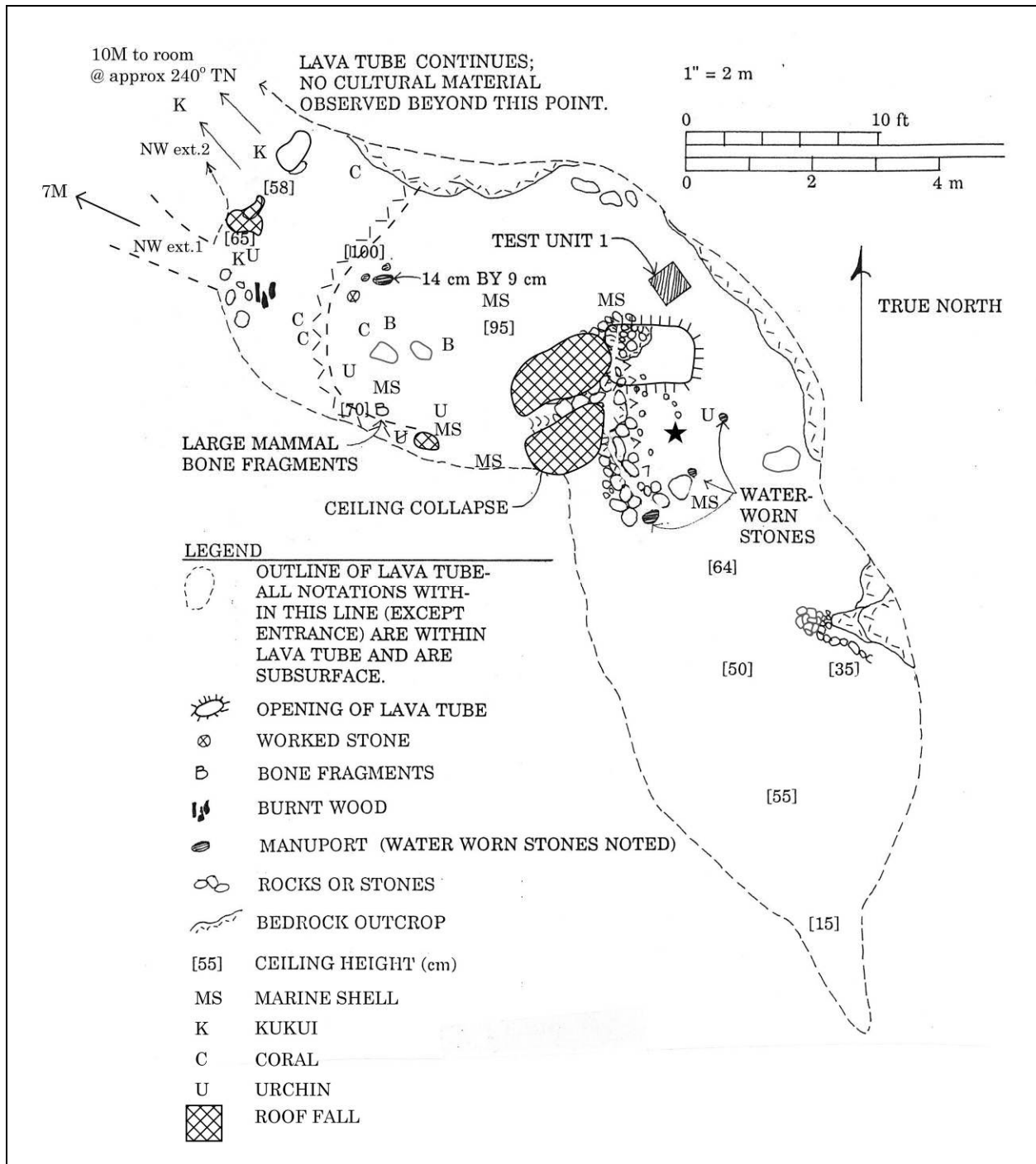


Figure 138. SIHP # 50-10-27-20749 Feature B; plan view



Figure 139. SIHP # 50-10-27-20749 Feature B lava tube entrance, view to the northeast.

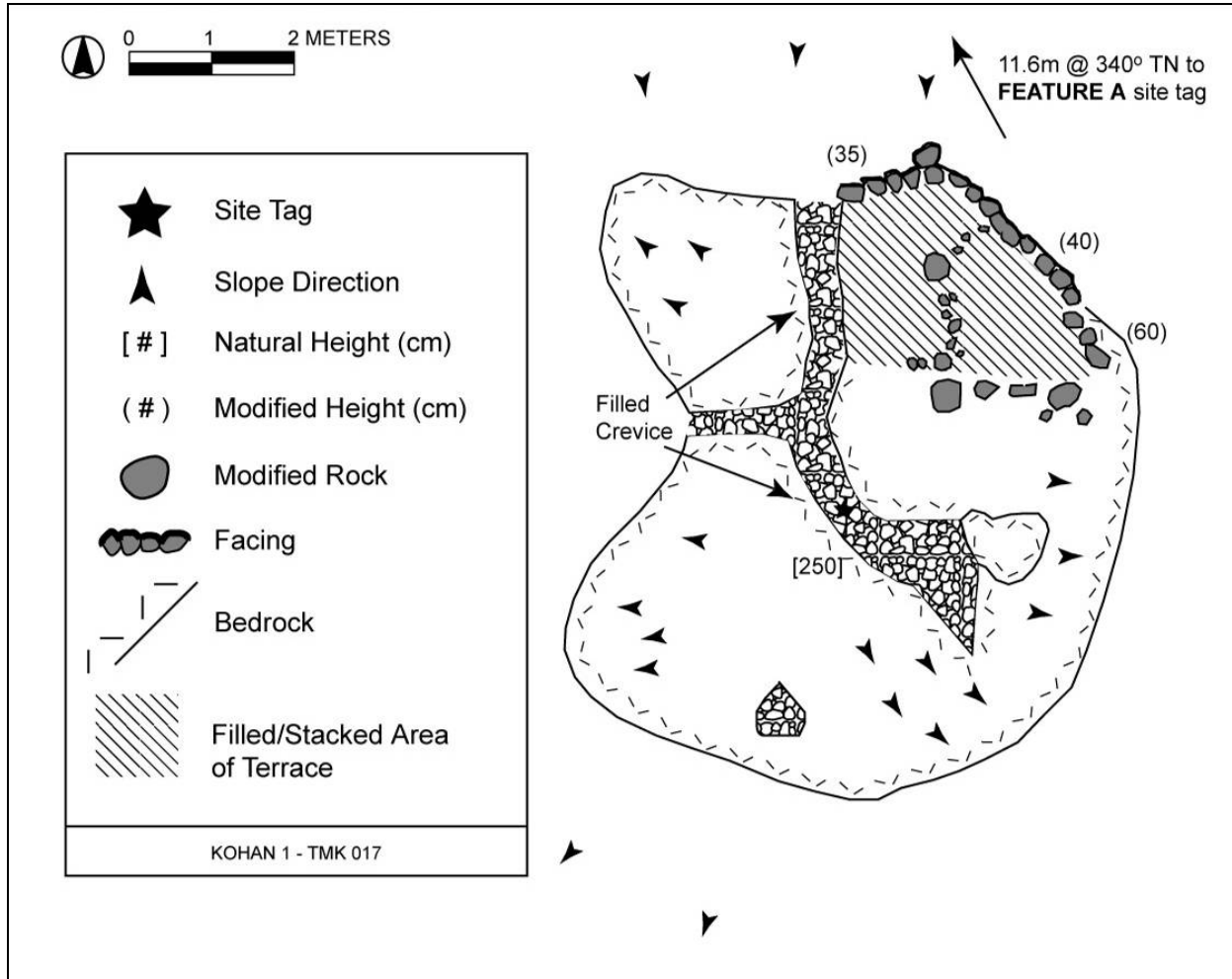


Figure 140. SIHP # 50-10-27-20749 Feature C plan view

The feature's function is interpreted as temporary habitation. The constructed terrace and the filled crevice extend the naturally flat and level surface of the tumulus to create a good living surface. The construction style is not formal enough, such as the slightly rough fill of the crevice, to indicate more permanent habitation. The feature's association with the other habitation features of this site further supports this temporary habitation function.

Feature D is a modified tumulus (Figure 141). The area's topography gently slopes *makai* and; the area's geology is *pāhoehoe* with many tumulus. Vegetation consists of fox tail grasses and *koa haole*. The Koloko fishponds and the harbor are readily visible from atop Feature D. Feature D is located at the northern edge of TMK 17, 35 m (114.8 ft.) east of Feature A. Feature A's site tag is 14.5 m (47.6 ft.) and 350 degrees from the Feature D site tag.

Cracks in the center and southern end of Feature D have been filled with *pāhoehoe* slabs to create a level surface with the exposed bedrock of the tumulus. The *pāhoehoe* slabs range in size from 10 cm to 50 cm (0.3 to 1.6 ft.). The cracks have been filled with small cobbles with one course of flat *pāhoehoe* slab on top to create a level/flat surface. Feature D's condition is good; it does not appear to have been tampered with by looters. Feature D's excavation potential is poor due to the lack of sediments, artifacts, and midden.

Features D's function is interpreted as temporary habitation based on the labor investment that is more typical of temporary habitation sites. There are no faced rocks or formal construction. The construction is not formal enough to have been used for ceremonial purposes. The cracks/crevices that have been modified to create a level/somewhat paved surface of the tumulus are too small to contain a burial. A good line of sight of the coast, the lack of artifacts or midden, and informal construction all indicate temporary habitation.

Feature E is a modified tumulus that rises relatively steeply on the southwest side, where the terrain slopes steeply southwest, and provides a good view of the coastline and the nearby 'a'ā flow (Figure 142). The modified tumulus measures 12 m northeast/southwest by 7 m southwest/southeast. Modifications include two small filled crevices. The crevice on the northeast side of the tumulus is small, 1 m by 1 m (3.3 ft. by 3.3 ft.); it is immediately adjacent to a naturally level depression on the top of the tumulus. The crevice is filled with small to medium *pāhoehoe* cobbles and a small *pāhoehoe* slab. The filled surface is very flat and level, and flush with the surrounding tumulus surface. The second filled crevice is located on the southwest side of the tumulus. The fill is approximately 1.7 m (5.6 ft.) long and is constructed with large *pāhoehoe* cobbles and small to medium *pāhoehoe* boulders. The filled area creates a relatively level area on this steeply sloped southwest side of the tumulus.

The feature's function is interpreted as temporary habitation. Although the top of this tumulus is uneven and rough, and it has fairly steep sides, the naturally level depression in the top of the tumulus and the two filled crevices create a good living space. Additionally, the long distance view, access to a good breeze, and association with the site's other habitation features support temporary habitation function.

The site's function is interpreted as temporary habitation. Each of the five features individually contain aspects indicative of temporary habitation that is additionally supported by the features association with each other. This interpretation is also based on the relative

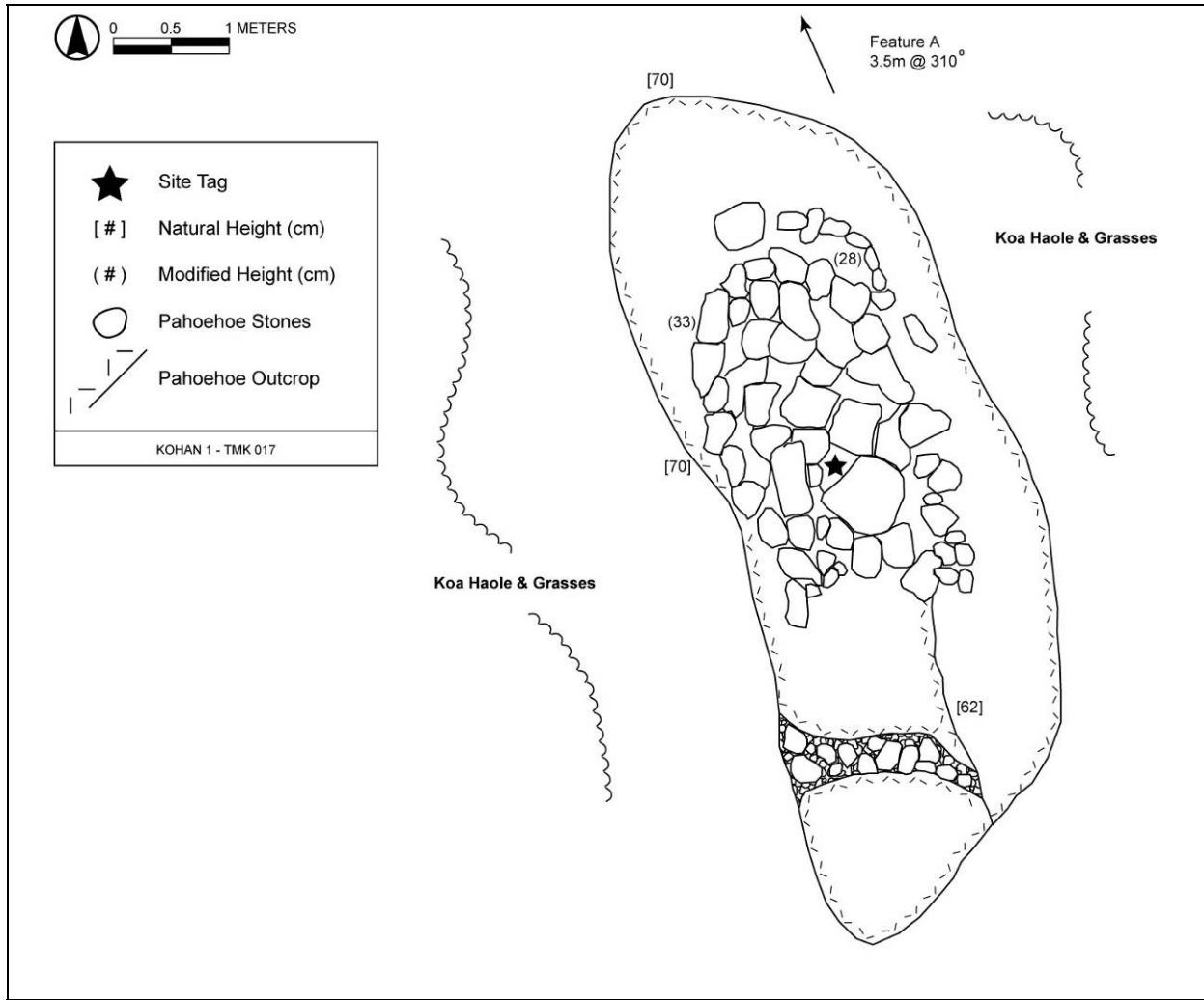


Figure 141. SIHP # 50-10-27-20749 Feature D plan view

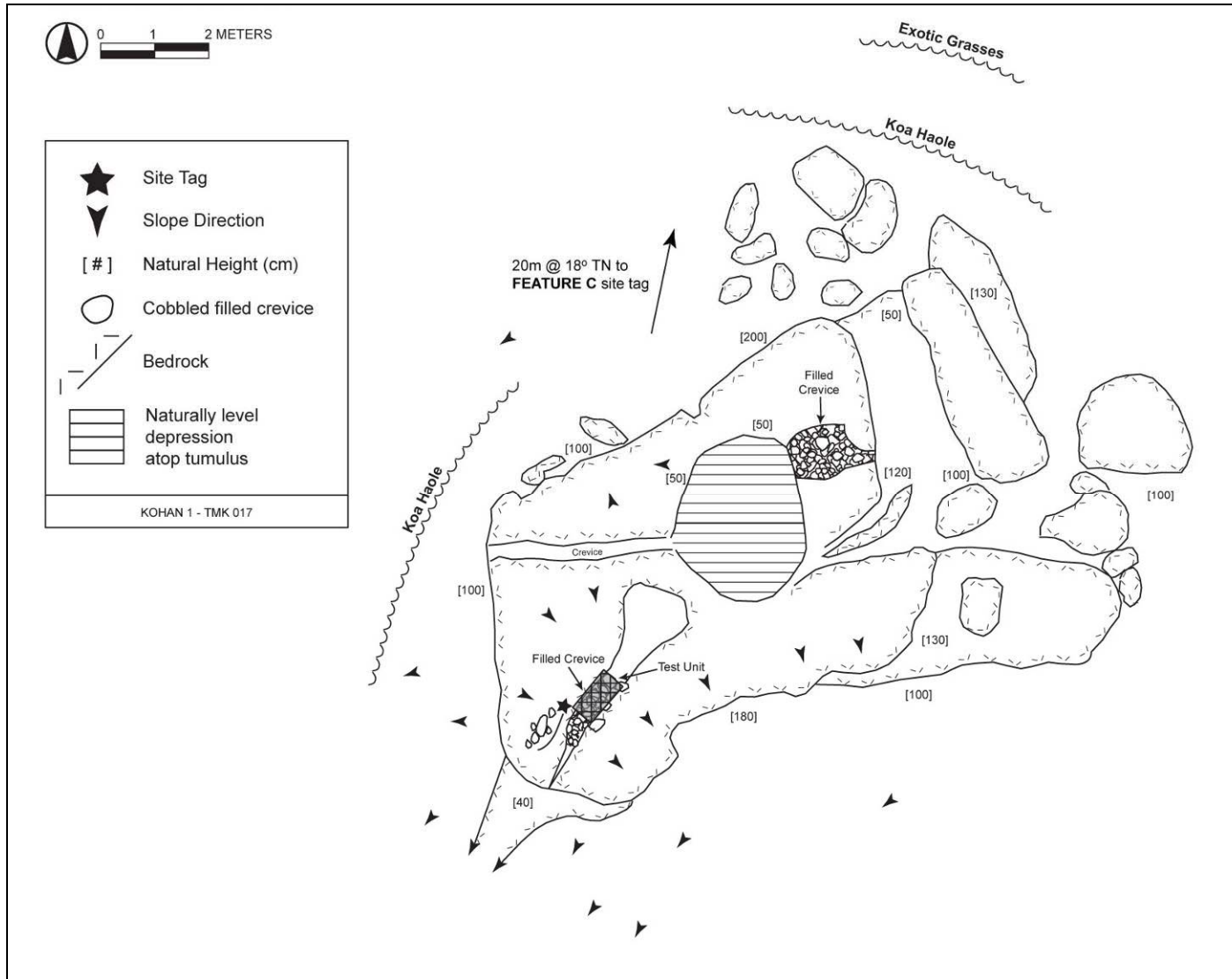


Figure 142. SIHP # 50-10-27-20749 Feature E plan view

Archaeological Inventory Survey of a 224.43-Acre Parcel within Portions of Kaloko and Kohanaiki Ahupua'a

abundance and variety of cultural material in association with Feature A. Feature B, lava tube, is interpreted as a component feature for temporary habitation, utilized more intensively than the other temporary habitation sites and more closely approximating quantities from the recurrent habitation site, -20709. The possibility that the site contained a burial was proposed, however, no burials were found during testing (see below).

Testing Results

Subsurface testing was conducted at Features A, B, and E of Site -20749. The features were tested to aid in determining site function, and to confirm the presence/absence of a burial.

Feature A: a 1.0 m by 1.0 m (3.3 ft by 3.3 ft) unit (test unit 1) was placed at the center of Feature A terrace (Figure 143). The unit was excavated to a maximum depth of 42 cm (1.4 ft.) below surface and terminated upon reaching bedrock. The boulder-cobble fill of the terrace reached a maximum depth of 30 cm (1 ft.) (designated Stratum I). A soil layer, designated Stratum II was present at the base of the rock fill and extended to the underlying bedrock at 42 cm (1.4 ft.).

Stratum I (0-30 cm / 0-1 ft.) consisted of angular basalt cobbles. No soil was present. Terrestrial midden was recovered, including: 2.3 g sea urchin (*wana* or *Echinoderm*); 0.3 g unidentified bone; 47.1 g *kukui* endocarp; and 4.1 g of charcoal.

Stratum II (12 cm / 0.4 ft. thick) consisted of loosely compacted, dark brown (7.5 YR 3/2) silt loam with a 5% basalt pebble content and many rootlets. No cultural material was observed.

Feature B: a 1.0 m by 1.0 m (3.3 ft by 3.3 ft) unit (test unit 2) was excavated in Feature B lava tube. The surface of the unit was covered with scattered marine midden. The unit was excavated to underlying bedrock at a maximum depth of 3 cm (0.1 ft.). One stratigraphic layer - Stratum I - was observed. Stratum I was a very dark grayish (10 YR 3/1) silt loam.

Terrestrial and marine midden was collected from Stratum I. The midden inventory includes the following: 2.0 g limpets (*'opihi* or *Cellana*); 39.9 g cone shell (*pupu'ala* or *Conus sp.*); 16.8 g snakehead cowrie (*lehokupu* or *Cypraea caputserpentis*); 4.9 g pitchy sea snail (*pipipi* or *Nerita picea*); 1.4 g polished nerita (*kupe'e* or *Nerita polita*); 1.0 g auger shell (*pupulolo* or *Terebra sp.*); 1.5 g dye shell (*papua* or *Thaididae sp.*); 0.8 g *Isognomon*; 17.6 g unidentified shell; 20.8 g sea urchin (*wana* or *Echinoderm*); 2.2 g unidentified bone; 61.9 g *kukui* endocarp; and 48.2 g of charcoal. Artifacts collected in the test unit consisted of: 1 bird bone pick; 1 basalt manuport; 1 volcanic glass scraper; and 9 flakes of volcanic glass. A total of 48.2 g of charcoal was also collected and sent to Beta Analytic Inc. for radiocarbon analysis. Two wood samples were also collected from the surface of the lava tube. The radiocarbon analysis produced date ranges of cal AD 1690 to 1735 and cal AD 1815 to 1925 (2 sigma, 95% probability).

Feature E: a 1.1 m by 0.4 m (3.6 ft. by 1.3 ft.) unit was excavated in Feature E at the northern end of the crevice (Figure 144). Medium to large sized *pāhoehoe* cobbles were removed to expose the bedrock. No cultural material was present.

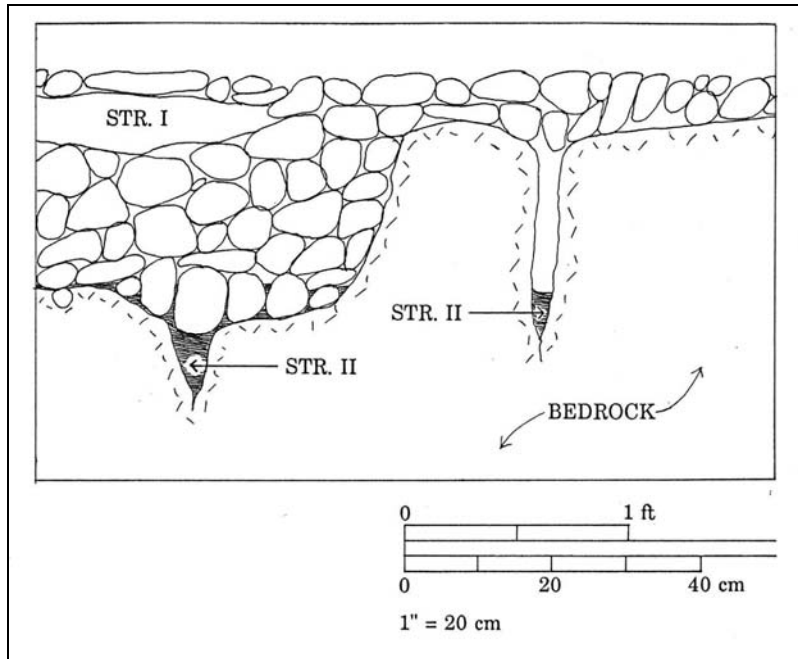


Figure 143. SIHP # 50-10-27-20749, Feature A, post-excavation profile.

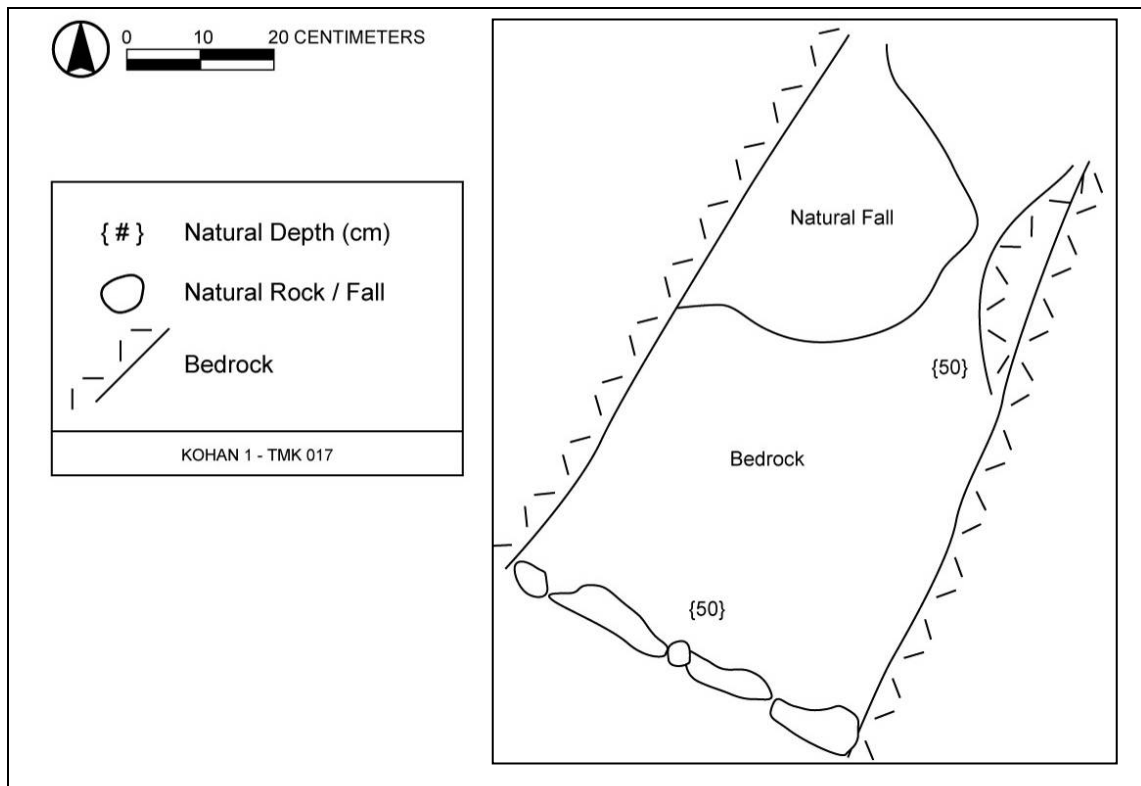


Figure 144. SIHP # 50-10-27-20749, Feature E, post-excavation plan view

4.3.57 State Site # 50-10-27-26259

SIHP #	50-10-27-26259
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	1
DIMENSIONS:	3.5 m by 0.3 m (11.5 ft by 1 ft)
CONDITION:	Good
AGE	Pre- contact
ELEVATION:	100 ft. a.m.s.l.

DESCRIPTION: SIHP No. 50-10-27-26259 is a cobbled 'a'ā trail (Figure 145) running northwest/southeast for approximately 85 m (278.9 ft). Vegetation beside the trail consists of multiple patches of exotic grasses, *koa haole* trees, and a Christmas berry tree. Little vegetation grows in the 'a'ā flow. The trail skirts a large depression (with a maximum width of 12 m / 39.4 ft) in which a second Christmas berry tree grows.

The trail is discernable due to the stones' discoloration caused by foot traffic, although the discoloration and the trail itself are not dramatically pronounced. The trail ends on the 'a'ā and is no longer discernable to the southeast; the northwest end the trail is no longer discernable just before the *pāhoehoe* flow. Three boulders cross the trail approximately 17 m (55.8 ft) to the southeast of the *pāhoehoe* flow.

The site's function is interpreted as transportation.



Figure 145. SIHP No. 50-10-27-26259, view to northwest

4.3.58 State Site # 50-10-27-26260

SIHP #	50-10-27-26260
FUNCTION:	Temporary habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	1
DIMENSIONS:	2.4 m by 5 m (7.87 ft by 16.4 ft)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	270 ft. a.m.s.l.

DESCRIPTION: SIHP No. 50-10-27-26260 is a lava tube located in a *pāhoehoe* outcrop and is just north of the modern Hina Lani Road, approximately 105 m (344.5 ft) at 62 degrees from the intersection with Kamanu Street (Figure 146). Vegetation in the surrounding area is *koa haole* and grasses.

The lava tube has two entrances; a natural collapse entrance near the middle tube area, 0.7 m (2.3 ft) north/south by 1 m (3.3 ft) east/west, and an artificial entrance to the south that has been created by the road cut for Hina Lani Road (Figure 147). This entrance can be seen from the road and measures 0.80 m (2.62 ft) in height and 1.1 m (3.6 ft) east/west. The cave measures 24 m (78.7 ft) north/south by 5 m (16.4 ft) east/west with a maximum ceiling height of 149 cm (4.9 ft.); the average height is 60 cm (2 ft.) (Figure 148). The cave's interior retains two soil pockets as deep as 9 cm (0.3 ft.) in certain areas. Dog teeth; approximately 10 placed rocks; 3 sea urchin spines (two of which appear to have been files); two crustacean claws; and a small burnt stick were found in the cave.

The larger soil deposit is 5 m (16.4 ft) southwest of the central lava tube entrance and is approximately 3 m (9.8 ft) wide and 9 cm (0.3 ft.) deep. The second soil deposit is located 4 m (13.1 ft) from the larger soil deposit and is approximately 5 cm (0.2 ft.) deep.

The ground surface above the cave does not appear to have been culturally modified. The natural cave opening has experienced some natural collapse and there is no evident floor clearing at that entrance. The southwest end of the lava tube (in the vicinity of the recently created entrance) did not yield any evidence of cultural activity.

The site's function is interpreted as a temporary habitation based on the lack of intensive time investment and the cultural material found in the lava tube. The excavation potential of the lava tube is considered good to fair based on the presence of the soil deposits and the few cultural modifications. No other artifacts or midden were observed on the surface of the cave floor.



Figure 146. SIHP No. 50-10-27-26260 entrance overview, Home Depot in background, view to southwest

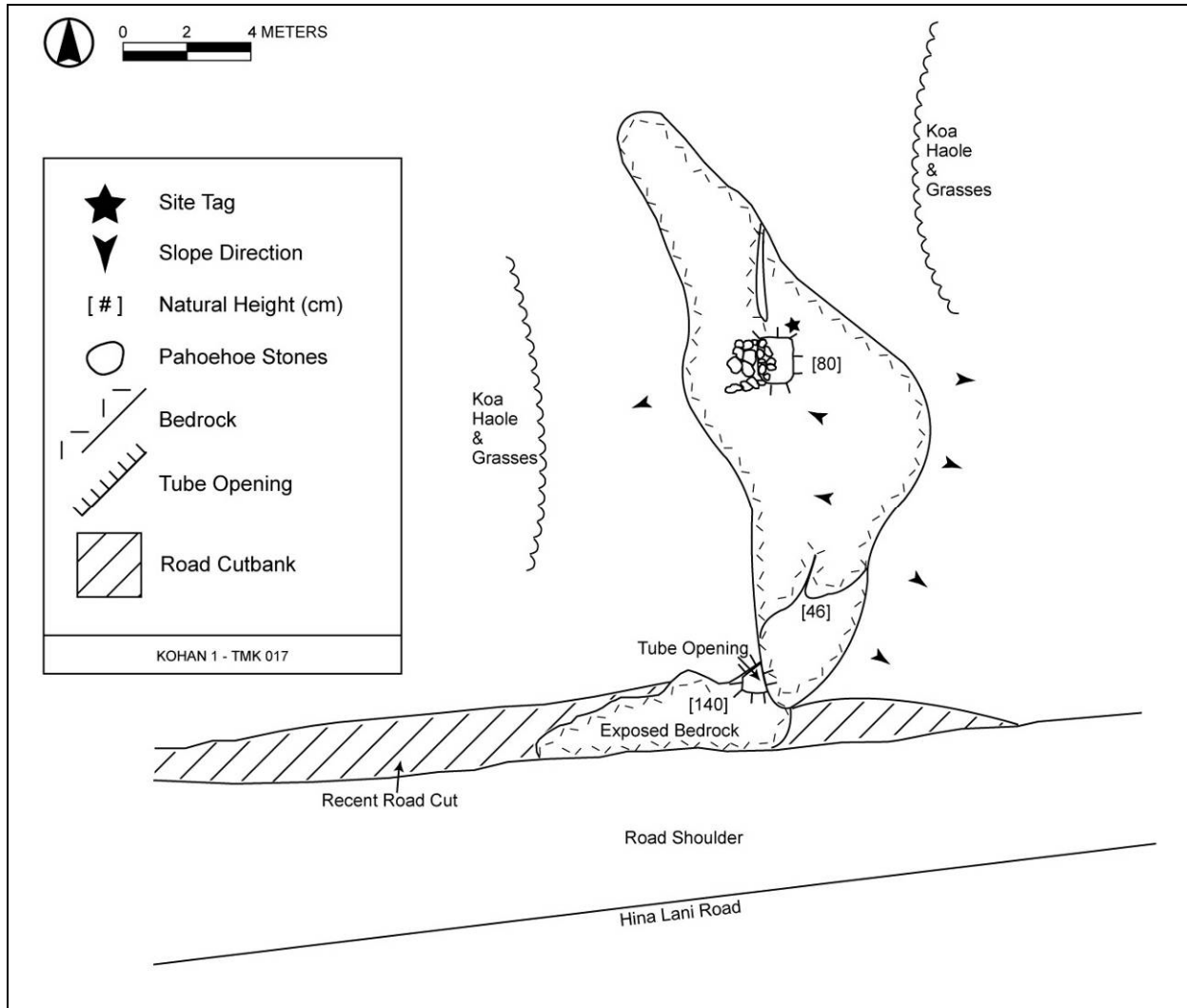


Figure 147. SIHP No. 50-10-27-26260; plan view (exterior)

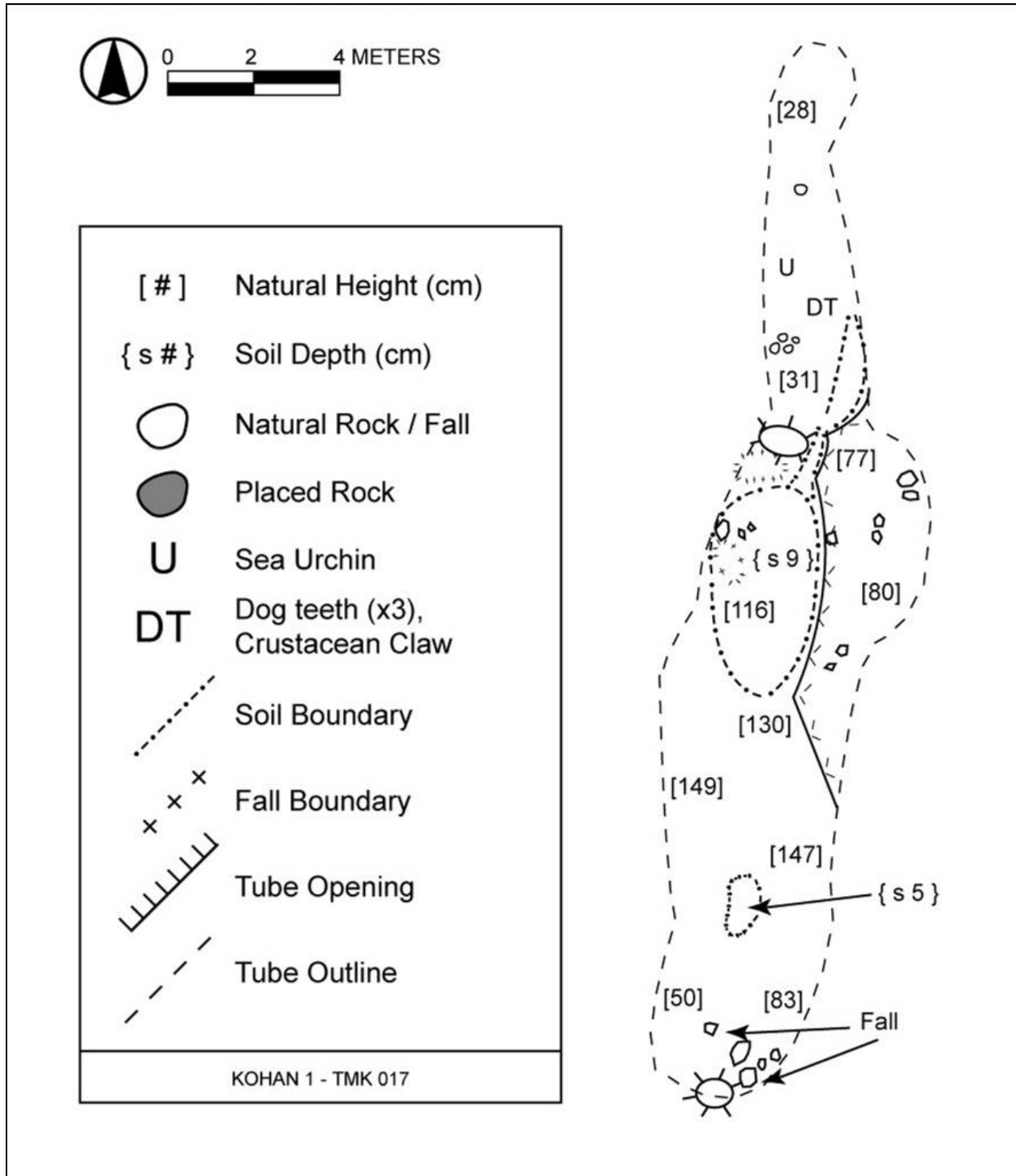


Figure 148. SIHP No. 50-10-27-26260; plan view (interior)

4.3.59 State Site # 50-10-27-26261

SIHP #	50-10-27-26261
FUNCTION:	Temporary Habitation
SITE TYPE:	Terrace
TOTAL FEATURES:	1
DIMENSIONS:	6 m by 5 m (19.7 ft by 16.4 ft)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	270 ft. a.m.s.l.

SIHP No. 50-10-27-26261 is a modified natural terrace situated on the west face of a two-tiered *pāhoehoe* outcrop (Figure 149). The site was a temporary habitation. Vegetation within and adjacent to the site consist of *koa haole* and dense exotic grasses. No artifacts were observed at the site.

The northern portion of the terrace measures 4 m (13.1 ft., east-west) by 3 m (9.8 ft., north-south) with a maximum height of 95 cm (3.1 ft.). The north end of the terrace is roughly faced (see map).

Partially collapsed stacked boulders enclose the natural terrace along the northwest face of the outcrop. This modification is 2.9 m long by 75 cm wide (9.5 ft by 2.5 ft.).

The site's function is interpreted as temporary habitation based on the rough construction of the terracing including the absence of any extensive facing suggests it was not likely permanent habitation. The slight modification of the natural terrace also suggests temporary rather than recurrent or permanent habitation. Excavation potential is considered poor.

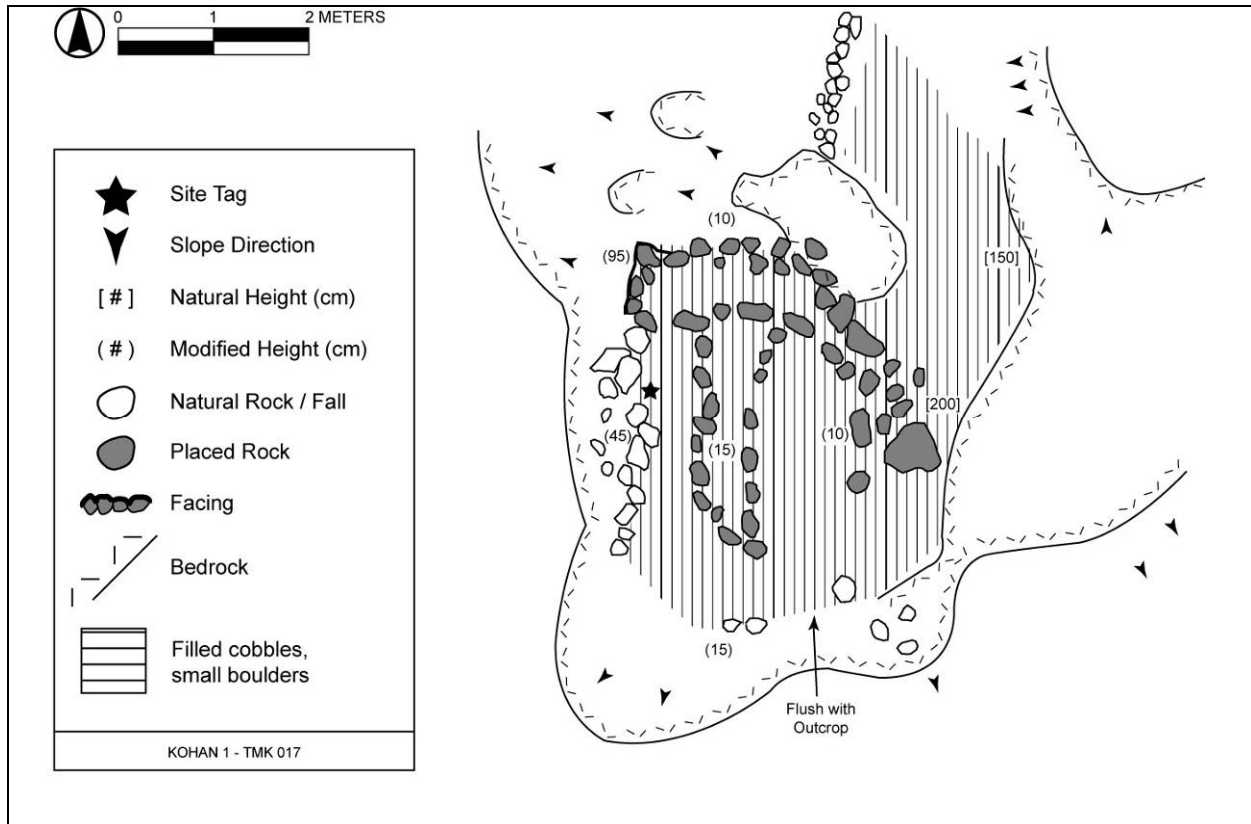


Figure 149. SIHP No. 50-10-27-26261, plan view

4.3.60 State Site # 50-10-27-26262

SIHP #	50-10-27-26262
FUNCTION:	Temporary Habitation
SITE TYPE:	C-shape
TOTAL FEATURES:	1
DIMENSIONS:	3.6 m by 1.8 m
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	260 ft. a.m.s.l.

DESCRIPTION: SIHP No. 50-10-27-26262 consists of a stacked stone C-shaped enclosure located in the southeastern portion of the project area, near the project area's southern boundary. Vegetation on and in the immediate vicinity of the site consists of *koa haole* and dense exotic grasses.

The C-shape is constructed of loosely stacked basalt boulders that form a low mounded wall situated atop a relatively level *pāhoehoe* outcrop (Figure 150 & Figure 151). The site measures 3.6 m long (N/S) and 1.8 m wide (E/W), with a maximum height of 47 cm. Due to the unstable nature of construction, the site has suffered substantial collapse, most notable is a breach through the middle of the structure probably due to animal disturbance.

No surface midden or artifacts were observed within or in the vicinity of the site. Excavation potential for this site is considered poor as the site is constructed upon a *pāhoehoe* outcrop with no soil deposits.

SIHP No. -26262 is determined to be of pre-contact origin. This is based on the construction techniques utilized to construct the site, the site's proximity to other pre-contact sites, and the absence of historic and/or modern debris (trash, artifacts, etc.). The site likely functioned as a temporary habitation, providing a shelter/rest stop within the desolate Intermediate Zone during treks between the more accommodating Coastal and Upland Zones. This determination is based on the site's informal construction style, relatively small size, and lack of artifacts and midden.

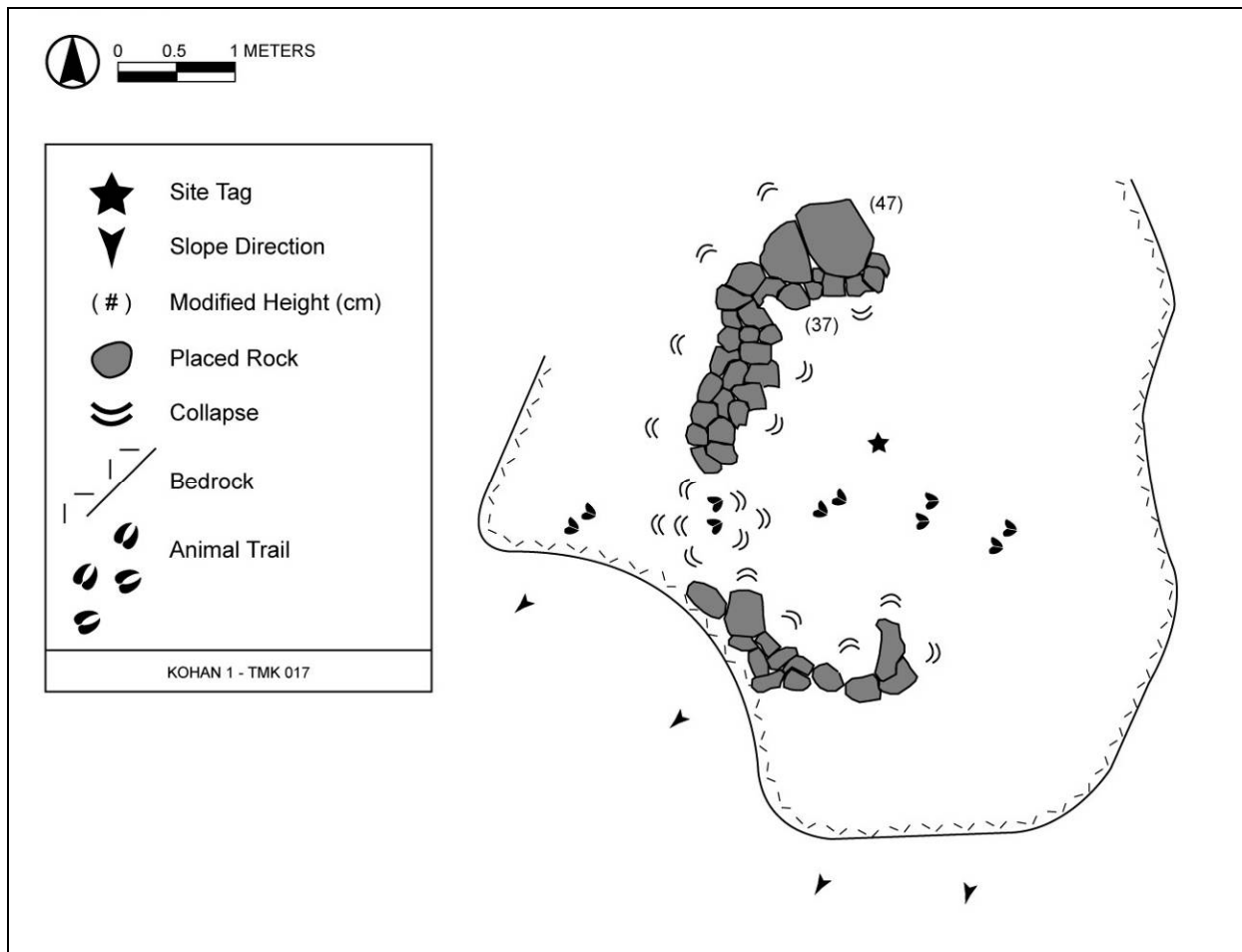


Figure 150. SIHP No. 50-10-27-26262; plan view



Figure 151. Photograph of SIHP No. 50-10-27-26262, C-shape interior, view to northwest

4.3.61 State Site # 50-10-27-26263

SIHP #	50-10-27-26263
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	1
DIMENSIONS:	6.5 m by 6.5 m (21.3 ft by 21.3 ft)
CONDITION:	Excellent
AGE:	Pre-contact
ELEVATION:	180 ft. a.m.s.l.

DESCRIPTION: SIHP No. 50-10-27-26263 is a low *pāhoehoe* tumulus with a lava tube blister at its north end (Figure 152). The tumulus has scattered tufts of grass but is largely free of vegetation in comparison to the surrounding grass and *koa haole*.

The tumulus is oblong - roughly oval in shape with the long axis oriented north/south. The northern half of the tumulus is lower in elevation, about 1.5 to 2.0 m (4.9 ft to 6.6 ft) than the surrounding topography. The southern portion of the tumulus is higher, 3-5 m (9.84 ft – 16.4 ft), than the surrounding land surface and has a pronounced crack down the center. The entrance to the cave is vertical, and drops down 1.2 m (3.94 ft) into the cave floor. Immediately southwest of the cave entrance is a small rectangular terrace full of *pāhoehoe* boulders; this vertical face forms the southwest cave entrance wall (Figure 153). This terrace face effectively walls off a portion of the cave. A small bread loaf sinker and two pieces of sea urchin were found at the base of the terrace. This walled off portion of the cave is accessible. North and west of the cave entrance are natural cracks in the tumulus that are artificially filled with boulders and cobbles. Inside the cave (see Figure 152), the ceiling height varies between 35 and 102 cm (1.1 and 3.3 ft.). Generally the height is 50-60 cm (1.6-2 ft.). The western half of the cave is partially sealed off by a crude north/south trenching alignment of large *pāhoehoe* boulders (3-5 in number). No sediment accumulation is apparent, so excavation potential is poor; sediment may be present in the constructed terrace face if it is dismantled.

Artifacts and midden were observed and included a cowrie shell lure, two pieces of *kukui* nut shell, some sea urchin, and a bread loaf sinker. There was no sign of burning or a hearth observed and no significant midden deposit.

The site's function is interpreted as informal shelter and/or storage. There is no actual evidence for habitation, except for the few artifacts and the 6 or 7 pieces of midden (*kukui* nut and sea urchin). There is no evidence of agriculture due to the lack of soil/humus accumulation. An informal shelter is possible due to the lack of surface architecture and no evidence of burning to suggest habitation.

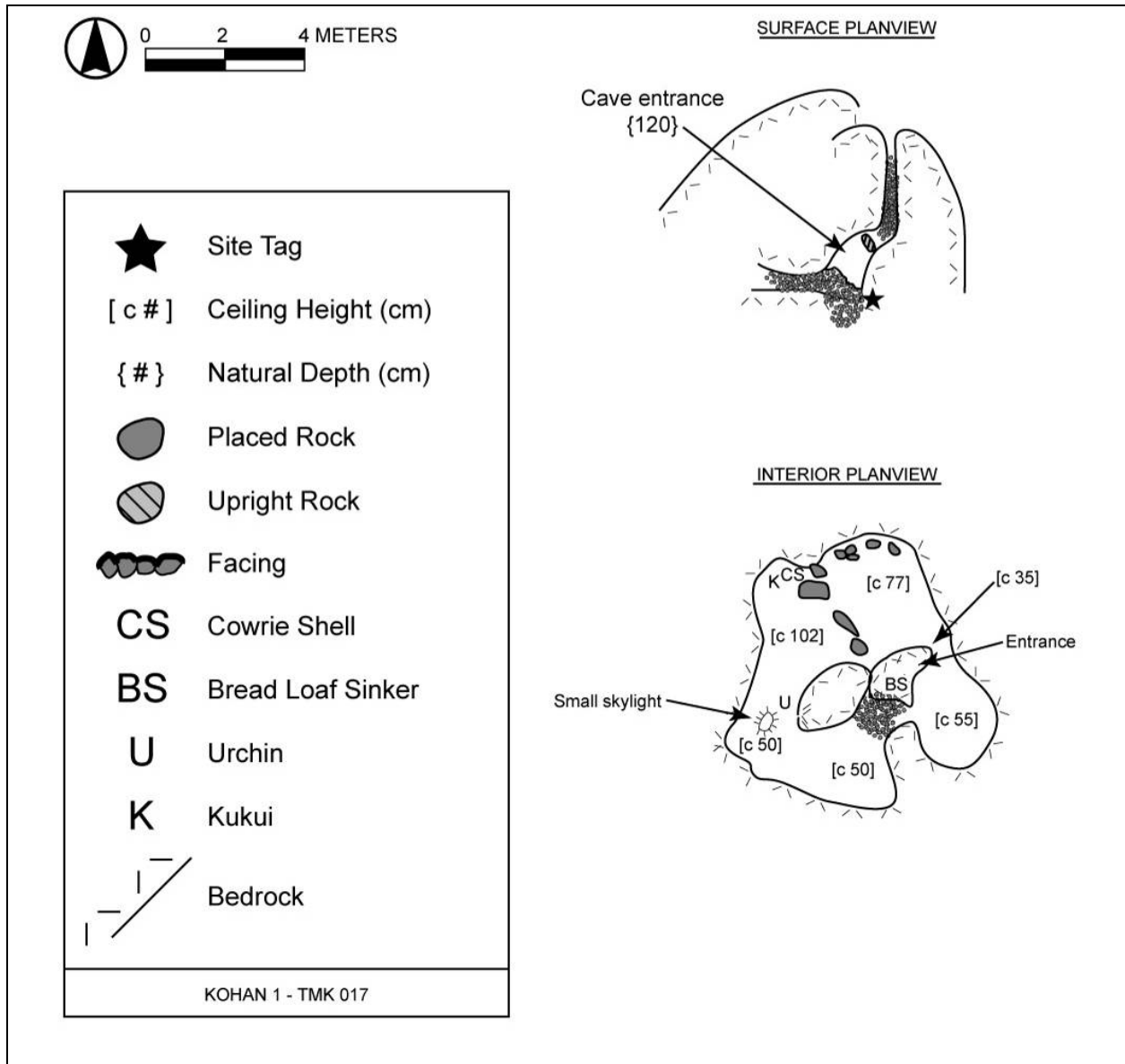


Figure 152. SIHP No. 50-10-27-26263, plan view



Figure 153. SIHP No. 50-10-27-26263, stacked boulders at cave entrance, view to west

4.3.62 State Site # 50-10-27-26264

SIHP #	50-10-27-26264
FUNCTION:	Agriculture
SITE TYPE:	Modified tumulus
TOTAL FEATURES:	3
DIMENSIONS:	15 m by 6 m (49.2 ft.by 19.7 ft.)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	230 ft. a.m.s.l.

DESCRIPTION SIHP No. 50-10-27-26264 consists of three agricultural features (Features A-C) (Figure 154). Based on the proximity of the three features, their similarity in construction technique, and preservation, these features form a site.

Feature A is a mound with stacked *pāhoehoe* medium and large cobbles, and small boulders, measuring 2.0 m (6.6 ft) northeast/southwest and 1.9 m (6.2 ft) northwest/southeast (Figure 155). The mound is on the north side of the *pāhoehoe* flow outcrop at the bottom of a depression with an 'a'ā flow to the north and west approximately 2 m (6.6 ft) and 3 m (9.84 ft) away respectively. The mound is 95 cm (3.1 ft.) in height above ground level and creates a sloped surface that faces north. The *pāhoehoe* bedrock contains a 70 cm (2.3 ft.) wide crack that has been filled and stacked approximately 40 cm (1.3 ft.) above the *pāhoehoe* bedrock. A natural source of *pāhoehoe* boulders and cobbles is to the feature's northeast and southeast; this is the likely source of the materials used for construction. There is no habitation evidence; it is likely the 70 cm (2.3 ft.) wide crack was utilized for agriculture.

Feature B is a modified tumulus (Figure 156). The tumulus is located 1.5 m (4.9 ft) southeast from and above Feature A, on the northwest end of a *pāhoehoe* flow. There appears to be a 45 cm (1.5 ft.) crack in the tumulus which has been filled and stacked with medium to large *pāhoehoe* cobbles and small *pāhoehoe* boulders. The filled crevice slopes downward toward the northwest at about a 45 degree angle. There is no habitation evidence within or adjacent to Feature B. It is likely the 45 cm (1.5 ft.) wide crack was utilized for agriculture.

Feature C is a modified tumulus that measures 6 m (19.6 ft) east/west by 4 m (13.2 ft) north/south and 1.5 m (4.9 ft) high (Figure 157). A filled crevice on top of the tumulus is approximately 3.1 m (10.2 ft) northeast/southwest and is 80 cm (2.6 ft.) wide. There is a crack in the crevice 1 m (3.3 ft) deep. On the north side of the crevice, the lip of the tumulus, is approximately 3.1 m (10.2 ft) northeast/southwest and is approximately 50 cm (1.6 ft.) above the south side of the crevice. The fill, which is composed of small, medium, and large cobbles, does not create a level surface on the top of the tumulus. A small mound of stacked small boulders along the northwest face of the tumulus, approximately 70 cm (2.3 ft.) high, consists of approximately 30 boulders. There are small collapsed natural fall piles of rock at both the east and west ends of the tumulus. Feature C was likely utilized for agriculture.

The site's function is interpreted as agricultural features. Burial in crevices was ruled out during excavation at the site (see below). Habitation is not likely since the crevices' fill is quite rough, not level, or even flat. The crevices' fill is not as well sorted as usual for an

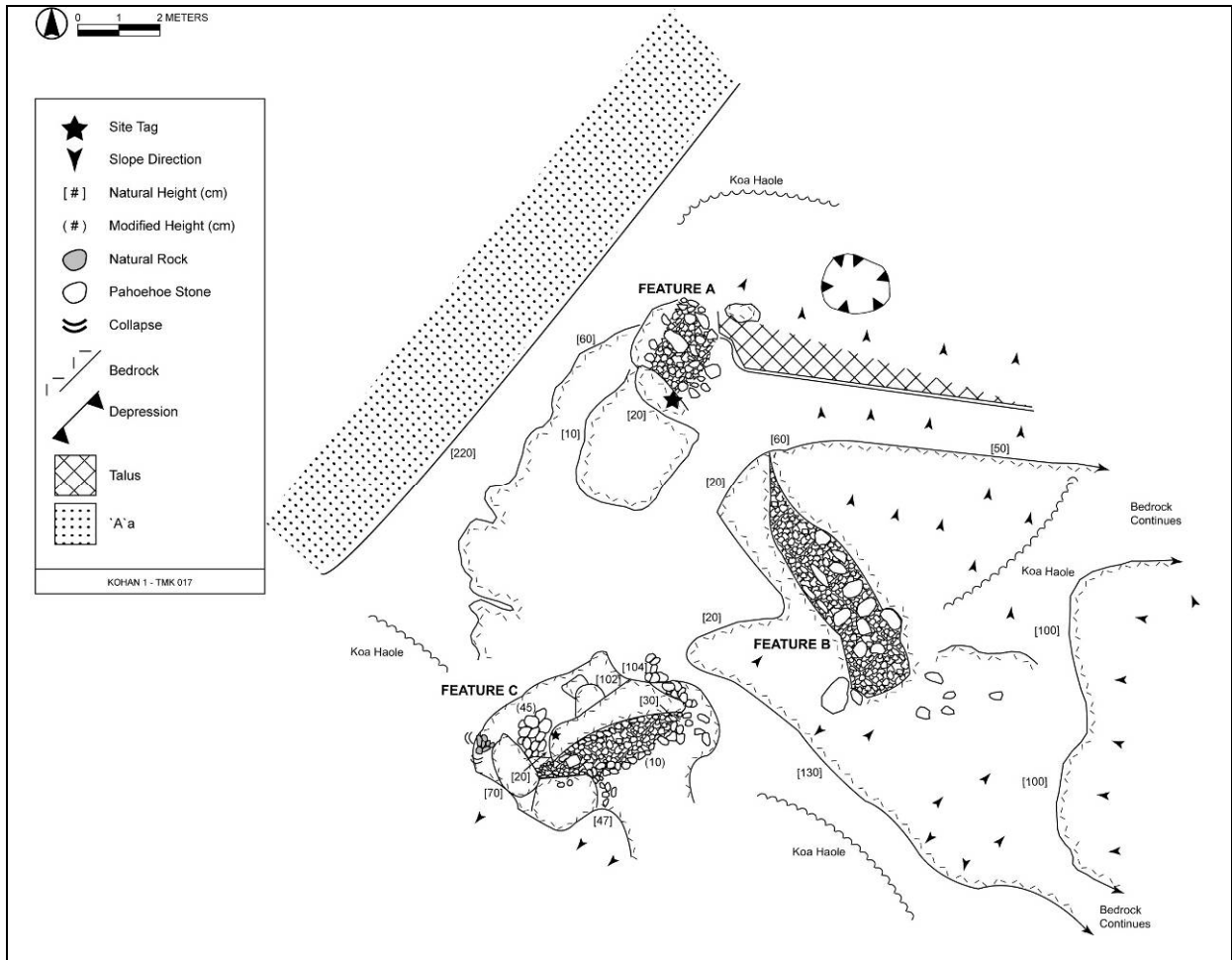


Figure 154. SIHP No. 50-10-27-26264; plan view map



Figure 155. SIHP No. 50-10-27-26264, Feature A, view to southwest



Figure 156. SIHP No. 50-10-27-26264, Feature B, view to southeast



Figure 157. SIHP No. 50-10-27-26264, Feature C, view to southeast

agricultural function, however, based on the elimination of other possibilities, the site's function was determined to be agriculture.

Testing Results

Feature A and Feature C were excavated to determine if burials are present and to aid in identifying the sites' function. *Pāhoehoe* cobbles were removed from Feature A to reveal bedrock. The cobbles appear to be from the depression just north of Feature A; the depression was probably used for agriculture.

Small irregular fill was removed from Feature C, above the eroding bedrock. Bedrock was found below the eroding bedrock and no burial was found. No cultural material was found within or adjacent to the features.

Section 5 Results of Laboratory Analysis

Subsurface testing was conducted at 14 sites with a total of 17 test units being excavated ranging in size from 0.5 m (1.6 ft) by 0.5 m (1.6 ft) to 1.0 m (3.3 ft) by 1.0 (3.3 ft). All material collected was screened through 1/8 inch mesh and, later in the laboratory, washed and sorted. Midden was sorted down to the species level (Table 6). Artifacts were sorted, identified, measured, weighed, and cataloged (Table 7). Charcoal was separated, weighed, and catalogued; two samples were sent for dating analysis (Table 8).

5.1 Midden Analysis

Midden was recovered from 9 of the 17 test units excavated during the testing phase of the project.

Marine midden (vertebrate and invertebrate) accounted for 73.2% (614.1 g) of all the midden recovered from the Tax Map Key parcel 17 project area. Of the total marine midden inventory, 99.6% represents shellfish (invertebrates), and the remaining 0.4% consists of unidentifiable fish bone.

The most common components of marine midden recovered in the project area include the following types in descending order: Sea urchin (Echinoderm), Snakehead cowrie (*Cypraea caputserpentis*), Rough tellina (*Tellina palatam*), and Cone shells (*Conus sp.*). Other shellfish types represented in the midden inventory include the following (in descending order): pitchy sea snail (*Nerita picea*), Auger shell (*Terebra sp.*), dye shell (*Thaididae sp.*), *Theodoxus cariosus*, Pearl shell (*Isognomon sp.*), Striate Mussel (*Brachidontes crebristriatus*), polished nerite (*Nerita polita*), and limpets (*Cellana sp.*). The majority of these shellfish species are typically found in the tidal zone along rocky shores or sandy areas. Unidentified fish bone accounted for only 0.4% of the marine midden inventory.

Of the total midden inventory, 26.8% was terrestrial midden. Of the total terrestrial midden inventory 1.9% represented pig bone (*Sus scrofa*), 96.7% *kukui* endocarps, and the remaining 1.4% consisted of unidentifiable mammal bone.

The predominance of marine midden recovered from the project area clearly attests that coastal resources were a primary source of protein-related food for the residents of the Kaloko and Kohanaiki *ahupua'a*.

The shellfish types represented in the midden inventory are typically found in the tidal zones (shallow water) of both rocky and sandy areas with the Bivalves of *Isognomon* possibly from a fishpond environment (Cordy et al. 1991:559). Most of the shellfish species were likely obtained locally along the Kaloko/Kohanaiki coastline and are attributable to near shore shellfish collection.

Table 6. Midden Catalog

State Site #50-10-27-	20703	20703	20709	20709	20709	20709	20725	20727	20728	20742	20742	20749	20749
Feature	A	A	A	A	A	A	B		A		Ash	A	B
Trench	1	1/NE quad	1	1	1/hearth	1/hearth	1	1	1	1	1	1	1
Depth/Stratum	I (rockfill)	Hearth	0-?/I	II	0-10/fill	10-20/fill	I	0-2/I	30-42/II	0-6/I	2-?/I	0-30/I	0-3/I
<i>Cellana sp.</i>													2
<i>Conus sp.</i>					5.8								39.9
<i>Cypraea caputserpentis</i>	1.3	0.3	34.8	0.9	64.6	12.1				13.2			16.8
<i>Nerita picea</i>	0.4	0.2	3.4	0.3	6.3	0.3				1.7	1.3		4.9
<i>Nerita polita</i>													1.4
<i>Theodoxus cariosus</i>	1.4	0.4	3.6	0.1									
<i>Terebra sp.</i>													1
<i>Thaididae sp.</i>			1	1.2	8.8	3.7				0.2			1.5
<i>Brachidontes crebristriatus</i>			0.6										
<i>Isognomon sp.</i>	4.4	0.1	1.1							0.9			0.8
<i>Periglypta sp.</i>													
<i>Tellina palatam</i>			43.6	4.5		2.5							
Misc./ Unid shell			23.4	1.4		2.3		1.4					17.6
Total shell midden	7.5	1	111.5	8.4	85.5	20.9	0	1.4	0	16	1.3	0	85.9
Echinoderm	0.4	3.8	99.7	5.8	87.9	41.1		0.5		4	0.9	2.3	20.8
Fish bone			2.1	0.1									

State Site #50-10-27-	20703	20703	20709	20709	20709	20709	20725	20727	20728	20742	20742	20749	20749
Feature	A	A	A	A	A	A	B		A		Ash	A	B
Trench	1	1/NE quad	1	1	1/hearth	1/hearth	1	1	1	1	1	1	1
Depth/Stratum	I (rockfill)	Hearth	0-?/I	II	0-10/fill	10-20/fill	I	0-2/I	30-42/II	0-6/I	2-?/I	0-30/I	0-3/I
Total marine midden	7.9	4.8	213.3	14.3	173.4	62	0	1.9	0	20	2.2	2.3	106.7
Pig bone								4.2					
Misc./Unident. bone	-0.1					0.2				0.4		0.3	2.2
<i>Kukui</i> endocarp	18.3		75.9			1.6	0.4	2.6	7.5	2.7		47.1	61.9
Total Midden	26.3	4.8	289.2	14.3	173.4	63.8	0.4	8.7	7.5	23.1	2.2	49.7	170.8

Table 7. Artifact Catalog

Acc #	SIHP # 50-10-27-	Feature	Trench	Stratum	Depth (cm)	# pieces	Length (cm)	Width (cm)	Thickness (cm)	Weight (g)	Material	Function	Comments
1	20746	N/A	N/A	Lava tube	Surface	1	36	5.8	5.6	274	Wood	Tapa beater	Stage one
2	20749	B	1	1	0-3	1	4.0	0.6	0.4	0.6	Bone	Pick	-
3	20749	B	1	1	0-3	1	2.4	2.3	1.1	12.2	Basalt	Manuport	Water-rounded pebble
4	20749	B	1	1	0-3	1	2.6	1.1	0.2	0.8	V-glass	Scraper	-
5	20749	B	1	1	0-3	9	0.9/1.3	0.4/1.3	0.2/0.3	1.9	V-glass	Flakes	-
6	26263	N/A	N/A	Lava tube	Surface	1	9.0	6.0	4.5	130.1	Shell	Lure	Cowrie octopus lure
7	26263	N/A	N/A	Lava tube	Surface	1	5.3	2.7	2.9	77.6	Basalt	Sinker	Bread loaf

Table 8. Charcoal Sample Catalog

Acc#	SIHP # 50-10-27-	Feature	Test Unit	Stratum	Depth (cm)	Weight (g)	Description
C-1	20703	A	1	I (rock fill)	-	3.3	Small charcoal flecks
C-2	20703	A	1/NE quad	Hearth fill	-	1.4	Small charcoal flecks
C-3	20709	A	1	I	-	59.8	Small charcoal flecks
C-4	20709	A	1	II	-	3.1	Small charcoal flecks
C-5	20709	A	1	Hearth fill	0-10	4.1	Small charcoal flecks
C-6*	20709	A	1	Hearth fill	10-20	32.6	Small charcoal flecks
C-7	20725	B	1	I	-	2.2	Small charcoal flecks
C-8	20742	N/A	1	I	0-6	6.2	Small charcoal flecks
C-9	20742	N/A	1	I	3-5	1.6	Small charcoal flecks
C-10	20742	N/A	1	Ash	2-?	0.5	Small charcoal flecks
C-11	20749	A	1	I	0-30	4.1	Small charcoal flecks
C-12*	20749	B	1	I	0-3	48.2	Small charcoal flecks

* = Sample sent to Beta Analytic for radiocarbon analysis

5.2 Artifact Analysis

A total of 15 indigenous Hawaiian artifacts were identified from surface and subsurface contexts of sites in the project area. Nine of these were volcanic glass flakes from the same provenience and were collectively accessioned. No historic artifacts were recovered from the surface or subsurface contexts of sites in the project area.

The majority of the indigenous artifacts (66.7%) are made up of volcanic flakes (9) and the 1 scraper. All of the volcanic glass artifacts were recovered from a single test unit at Site 50-10-27-20749 Feature B (lava tube).

Single items consisting of one water worn basalt manuport (Site 20749), one bird bone pick (Site 20749), one wooden tapa beater (Site 20746), one cowry octopus lure and one bread loaf sinker (Site 26263) complete the artifact inventory.

The basalt artifact (Acc #3 Table 7) is a small basalt water-rounded manuport that did not show evidence of utilization.

The bird bone pick (Acc #2 Table 7 and Figure 158) probably represents a tool utilized during food consumption and or processing.

The tapa beater (i.e., wooden club) appears to be a "preliminary stage" beater termed "Hohua" (Buck 1964:170). This artifact was left in the field during the 1996 fieldwork and was not re-located in the 2007 fieldwork.

The cowry lure (Acc #6 Table 7 and Figure 159) and bread loaf sinker (Acc #7 Table 7 and Figure 160) were likely originally part of a single octopus lure.

Site 20749 Feature B contained 12 of the 15 recovered artifacts, thus attesting to its more intensive use. Additionally the cave environment from which 13 artifacts were recovered provides for some protection from the elements, especially the more fragile bone and wood artifacts.

5.3 Radiocarbon Analysis

Charcoal collected from SIHP No. 50-10-27-20709 and SIHP No. 50-10-27-20749 was sent to Beta Analytic, Inc. for radiocarbon dating, utilizing the standard radiometric method, in order to better establish the age range of occupation at each site. Dating results are shown in Table 9 below (also refer to Appendix B).

The charcoal sample (Beta-91932) collected from SIHP No. 50-10-27-20709 yielded two possible date ranges, with a calibrated 2-sigma date of 1795AD-1945AD (62.3%) being the most probable. The relatively broad calibrated date range and multiple intercepts do not provide conclusive evidence for dating the primary occupation of from SIHP No. 50-10-27-20709. The charcoal sample (Beta-91933) collected from SIHP No. 50-10-27-20749 yielded three possible date ranges, with a calibrated 2-sigma date of 1800AD-1940AD (66.4%) being the most probable. The relatively broad calibrated date range and multiple intercepts do not provide conclusive evidence for dating the primary occupation of from SIHP No. 50-10-27-20749.



Figure 158. Bone pick (Acc # 2) from site 50-10-27-20749



Figure 159. Cowrie shell octopus lure (Acc # 6) from site 50-10-27-26263



Figure 160. Breadloaf sinker (Acc # 7) from site 50-10-27-26263

Table 9. Results of Radiocarbon Analysis

SIHP No.	Beta Analytic ID #	Sample Material / Analytic Technique	Provenience	Conventional Radiocarbon Age	C13/C12 Ratio	Oxcal Calibrated Calendar Age (2 sigma)
50-10-27-20709	Beta-91932	Charcoal / Radiometric	Hearth fill, 10-20 cmbs, Trench 1	80 +/- 60 BP	-25.0 o/oo	1670AD-1780AD (33.1%) 1795AD-1945AD (62.3%)
50-10-27-20749	Beta-91933	Charcoal / Radiometric	Stratum I, 0-3 cmbs, Trench 1	40 +/- 50 BP	-22.9 o/oo	1680AD-1740AD (24.3%) 1800AD-1940AD (66.4%) 1950AD-1960AD (4.8%)

Section 6 Results of Cultural Consultation

The cultural consultation effort focused on mitigation issues related to the eight sites within the project area which were considered probable burial sites (SIHP No. 20702, 20705, 20716, 20717, 20720, 20731, 20743, and 20749). This was done following the cultural consultation guidelines of HAR Chapter 13-284-6(c), regarding historic property significance, and HAR Chapter 13-284-8(a) (2), regarding potential historic property mitigation.

During the current investigation five of the eight sites (SIHP No. 20702, 20717, 20731, 20743, and 20749) were determined to not be burials based on site re-examination and the results of test excavations; one of the sites (SIHP No. 20720) could not be relocated and was determined to be destroyed by bulldozing. Thus this current investigation has established that there are only two probable burials located within the project area (SIHP No. 20705 & 20716).

6.1 Cultural Impact Assessment

A cultural impact assessment (Hammatt & Shideler 1996) was conducted for the project area in 1996 as a companion study to the Collin et al. (1996) study of the project area. Informants knowledgeable of the project area were interviewed. These consultations focused on identifying traditional cultural practices conducted within the project area as well as addressed community concerns regarding probable burial sites.

This summary of the cultural impact assessment focuses on the probable burial sites located within the project area. The reader is referred to the cultural impact assessment (Hammatt & Shideler 1996) for a detailed discussion and analysis of the traditional cultural practices documented within the project area.

On March 16, 1996, CSH staff interviewed the Reverend Norman Keanaaina, a *kama'āina* (native-born, one born in a place) of Kohanaiki since the 1940s. Reverend Keanaaina stated his belief that there were indeed burials within the project area. He stated that interment within the project area continued into the 1930s or 1940s, when his "grandmother's husband", the Kapaa family, was buried. Reverend Norman Keanaaina made a site visit with CSH personal and was taken to three sites (SIHP No. -20702, -20717, and -20720) in the south central portion of the project area which had been previously identified by CSH as probable burials. The reverend agreed that the filled-in cracks at these sites were probable burials. He stated that the common practice was to wrap the body in a mat or a horse blanket, then inter it in a sufficiently large crack which would subsequently be filled with stones.

At the time of the CIA, eight possible burial sites (SIHP No. 20702, 20705, 20716, 20717, 20720, 20731, 20743, and 20749) had not been tested to determine the presence or absence of human skeletal remains and testing was deferred to data recovery. Because the current study sought to reevaluate and improve records for all of these sites, many of these sites were tested. The focus of this effort was to improve decision making that now depends more heavily on findings of the archaeological inventory survey. The result of this testing was reduction of eight possible burial sites to 2 probable burial sites. A third possible burial site (20720) was determined to have been destroyed and is therefore no longer a current possible burial site.

Section 7 Summary and Interpretation

The inventory survey of the 224-acre parcel resulted in the identification and documentation of 59 archaeological sites, 53 of which were previously identified. Based on historic background literature and previous archaeological studies, the site density may appear somewhat high (see the Background Research section of this report). However, the types, functions, and distribution of sites present match closely the anticipated finds for the intermediate zone of the Kekaha region of North Kona within which the project area lies. Detailed summation by feature type and function follows.

7.1 Feature Types

The most prevalent site types observed within the project area are modified tumuli (26), trails (21), enclosures (9), terraces (7) and lava tubes and blisters (11).

7.1.1 Modified tumuli (modified outcrops)

Modified tumuli refers to the "dome shaped hillocks" (MacDonald and Abbott 1970:28) of *pāhoehoe* lava that have been humanly modified for a variety of functions (e.g. temporary habitation and possible burial). These modified tumuli are equivalent to the "modified outcrops" mentioned in other studies done in the region.

7.1.2 Trails

The twenty-one trails or trail segments observed during the inventory survey indicate a network of transportation corridors. The network includes both *mauka/makai* and cross slope-oriented trails. The network of trails thus provides fairly direct coast-to-uplands routes via the project area and access to activity areas within the project area. The activity areas include: lithic resource procurement (Site 20703), agricultural pursuits (e.g. Site 20738), and temporary and recurrent habitation sites (e.g. Sites 20709, 20735). More detailed discussion is provided below in the Transportation Feature Function discussion.

7.1.3 Enclosures

Enclosures are a commonly identified feature type and have a number of functional uses. In the project area, enclosures were utilized for agriculture (e.g. Sites 20738/A and B, and, storage (e.g. Site 20739), and temporary habitation (e.g. Sites 20711 and 20728).

7.1.4 Terraces

Terraces are a common feature type identified in this lower elevation, topographically characterized by undulating *pāhoehoe* flows and raised tumuli. A total of 7 terraces were identified in the present project area (sites 20702/B, 20703/A, 20715, 20721/A, 20725/A, 20749/A, and 26261). All of the terraces identified were determined to serve temporary habitation functions.

7.1.5 Lava tubes and blisters

Lava tubes and blisters are numerous throughout the region and - depending on a wide range of factors such as size, accessibility, and interior environmental conditions - were utilized for various functions. Many blisters and small tubes, inspected during the present survey, showed no evidence of utilization. The range of functions for tubes and blisters within the project area include: possible burial/ temporary habitation (Site 20749), temporary habitation (Sites 20727, 20742), storage (Site 20709/D, 20746, and 20748), and indeterminate (Site 20696).

Lava tubes and blisters also generally offer a greater degree of midden and artifact preservation compared to surface sites. In the present project area all 15 of the indigenous artifacts were recovered from tubes, with 12 of the 15 from Site 20749/B.

7.2 Feature Function

The bases for functional interpretations are presented in the Survey Results section of this report. Eight primary function categories were identified within the project area and include: agriculture, human burial (probable), habitation (temporary and recurrent), indeterminate, marker, mining, storage and transportation.

7.2.1 Agriculture

During the inventory survey seven sites, or 11.9 percent of the total sites, were considered to function, in whole or part, in an agricultural capacity (State sites 20700, 20709, 20718, 20734, 20738, 20740, 26264). Features of agricultural function numbered eight, 8.1 percent of the feature total. Two of the features designated as agricultural are part of complexes (Sites 20700, 20709) with more than one function assigned to its features. Habitation, either temporary or recurrent, was at least one of the functions assigned to the additional features in the complex for both of the multiple function sites associated with agriculture.

Agricultural sites within the project area ranged from minimal constructions, characterized by the removal of stones to clear a small depression within *pāhoehoe* type lava (Site 20734, 20718, and 20740), to larger more defined enclosures (Site 20700, 20709, 20738) typically abutting 'a'ā lava flows and probably placed to maximize water retention. The scattered nature and rough constructions (indicating little energy expended) suggest that intensive agricultural activity was not practiced within the project area. The agricultural features within the project represent agriculture activity associated with temporary habitation and the numerous trails within the project.

In general the agricultural features are not considered part of the intensive agricultural area termed the "Kona Field System" (State site 50-10-37-6601) because of their subtle character and dispersion. Still, they are a part of subsistence patterns often discussed primarily around the higher elevations that have the intensive "Kona Field System."

Agricultural subzones generally provide some insight into what activities may have occurred in the project area's agricultural sites. These subzones have been long in development but are clearly set out by Rose Schilt in *Subsistence and Conflict in Kona Hawai'i*. The subzones follow rainfall gradients generally predicted by elevation in Kona and, thus, delineate optimum areas for

intensive agriculture. The following subzone classifications are based on Schilt's compiled data (the first zone *kula* is applicable to the present study area):

Kula Subzone/Coastal Area

Elevation: Sea level to 500 ft (0 to 150 m)

Annual Rainfall: c. 30-50 in. (0.8-1.2 mm.)

Late Pre-contact crops: Sweet potatoes (*'uala*), gourd (*ipu*), and mulberry (*wauke*).

Kaluulu Subzone/Seaward Slope

Elevation: 500-1000 ft. (c. 150-300 m)

Annual Rainfall: c. 40-55 in. (1.00-1.35 mm.)

Late Pre-contact Crop: Breadfruit (*'ulu*), with sweet potatoes (*'uala*) and mulberry (*wauke*) interspersed; mountain apple (*'ōhia 'ai*) and some taro (*kalo*).

'Apa 'a Subzone/Upland Slope

Elevation: 1000-2500 ft (300-750 m)

Annual Rainfall: c. 55-80 in. (1.35-2.00 mm.)

Late Pre-contact Crop: Taro (*kalo*), sweet potatoes (*'uala*), ti (*kī*), and sugarcane (*kō*).

'Ama 'u Subzone/Upland Jungle

Elevation: 2500-4000 ft (750-1200 m)

Annual Rainfall: c. 80 in. (2.0 mm.)

Pre-contact Crops: Bananas and plantains (*mai 'a*)

Note: Historic period crops were also cultivated in the *Kaluulu* and *'Apa 'a* subzones and to a lesser degree in the *Kula* subzone. These crops included cabbage, melons, onions, oranges, tobacco, beans, coffee, corn, cotton, pineapple, Irish potatoes, and pumpkin.

Sweet potato was likely the most abundantly grown crop in the project area because of its adaptability to stony and dry environments. It was commonly planted in mounds and in *pāhoehoe* excavations. Henry J. Lyman son of missionary couple that first arrived in Hilo in 1831, describes features in Puna similar to *pāhoehoe* clearings, as seen in the project, which were cultivated with sweet potatoes:

Whereever the lava could be pounded into scoria, a plantation of sweet potatoes was laboriously formed by digging among the stones and filling in the holes with dried grass brought from the mountainside. Placed in the nest, the tuberous buds were covered with gravel, and there grew with astonishing luxuriance, yielding the largest and finest potatoes on the island [in Frierson 1991:167].

During the mid 1800's, Captain Charles Wilkes of the American Exploring Team comments on the agricultural use of *pāhoehoe* excavations (similar to the modification of *pāhoehoe* outcrop seen in the project) which he observed specifically in the Kona region:

Cultivation is carried on in many places where it would be deemed almost impracticable in any other country. The natives, during the rainy season, also plant, in excavations among the lava rocks, sweet potatoes, melons, and pine-apples, all of which produce a crop (Wilkes 1845:91).

Sweet potatoes were also cultivated within walled fields or depressions in the walls themselves. E.S. Craighill Handy and Elizabeth Green Handy reveal this method using an account taken from the Hawaiian newspaper *Ka Nupepa Ku'oko'a* March 24, 1922):

Rocky lands in the olden days were walled up all around with the big and small stones of the patch until there was a wall (*kuaiwi*) about 2 feet high and in the enclosure were put weeds of every kind, 'ama'u tree ferns and so on, and then topped well with soil taken from the patch itself, to enrich ti, or in other words to rot the rubbish and weeds to make soil.

After several months, the rotted weeds were converted into soil of the best grade. The farmer waited for the time when he knew that the rains would fall, then he made the patch ready for planting. If for sweet potatoes, he made mounds for them and for taro too, on some places on Hawai'i [in Handy and Handy 1972:131].

The above accounts describe agricultural modifications in rough rocky terrain similar to that of the present project area, though no walled (i.e. *kuaiwi*) fields are present and would generally not be expected at this elevation.

7.2.2 Burial

A total of two sites within the project area are considered current probable burial sites (SIHP No. -20705 & -20716). Both sites consist of modified tumuli consisting of structural modifications that modify existing cracks or crevices within the exposed *pāhoehoe* lava. These features are designated as probable burials due to a number of criterion which are as follows: lack of suitability for habitation (rough unsuitable surfaces for habitation and size and location); apparent filling of existing crevices (which would be suitable for human burial); and local informant information (Rev. Norman Keanaaina personal communication). Further, subsurface testing was undertaken at site 20705 that confirmed there is a rather large lava blister chamber under the construction that is very well suited to the function of burial, significantly bolstering the case for a probable burial. Further details on this excavation are outlined in the site description for 20705. Excavation was not undertaken at 20716 because of the apparent unsuitability for habitation and the considerable risk to the site's integrity if excavation was undertaken.

7.2.3 Habitation

Thirty-two (32) sites (54.2 percent of the total sites) in the project area, in part or in whole, are interpreted as habitation sites (15325, 15329, 20696, 20697, 20698, 20700, 20701, 20702, 20703, 20704, 20707, 20708, 20709, 20710, 20711, 20712, 20714, 20715, 20717, 20719, 20721, 20725, 20727, 20728, 20730, 20742, 20746, 20749, 26260, 26261, 26262, and 26263). Five of these sites also contain non-habitation component features (15325, 20700, 20703, 20704, 20709), such as: agriculture, mining, storage, and transportation.

Two specific types of habitation types - recurrent and temporary - are used in the present analysis of these sites. Distinction of the typology of the habitation sites is based primarily on Dr. Ross Cordy's Model (Cordy et al. 1991) with one exception: site 20709 is termed a "recurrent

habitation" which is a variation of temporary habitation based on Jeffrey Todd Clark's model (Clark 1986).

Of the total 32 habitation sites in the project area, 31 sites fit the characteristics of temporary habitation units. The single site classified as recurrent habitation is a borderline site that has characteristic of both a temporary and permanent habitation but due to its location and isolation from other substantial habitation features it is believed to have been utilized on an extended or semi-annual basis rather than on a permanent basis.

7.2.4 Temporary Habitation

Thirty-one (31) of the habitation sites (96.9% of the total 32 habitation sites) including 54 structural and natural features (93.1% of the total 58 habitation features) are interpreted to be temporary habitation. Of these 31 sites, 27 are solely temporary habitation in use and four sites contain non-habitation components, including: agriculture, mining, storage, and transportation.

Elements of Interpretation - Temporary Habitation:

(Temporary Habitations, Short-term Camps - [Cordy et al. 1991:529])

Shape of Structures (Formal Types): Platforms, pavings, low enclosures, C- and L-shaped enclosures, caves.

Size of Structures: Small. <16 m²

Substantialness of Construction: Insubstantial (often poorly made w/unifaced walls).

Internal Features: Numerous features of internal stratification (e.g., firepits, lenses, thin layers).

Associated Structures: None or similar small structures.

Geographic Context: Along trails, among agricultural fields, on coast, in forest.

Table 10. Temporary Habitation Structures: Floor Area Measurements

Site Number/Feature	Formal Type*	Floor Size (m ²)
15325/A	Wall	19.3
15325/C	Mound	5.0
15329	Modified tumulus	18.0
20697	Modified tumulus	7.3
20698/A	Pavement	14.0
20698/B	Pavement	3.6
20700/A	Enclosure	13.5
20700/B	Enclosure	94.9
20701	Modified tumulus	4.5
20702/A	Modified tumulus	6.0
20702/B	Terrace	12.6
20703/A	Terrace	9.3
20703/B	Pavement	2.2
20704/B	L-shape	12.0

Site Number/Feature	Formal Type*	Floor Size (m ²)
20706	Modified tumulus	7.2
20708	Modified tumulus	13.3
20710/B	Alignment	8.8
20710/C	Mound	0.8
20710/D	Modified tumulus	1.1
20710/E	Pavement	12.6
20711	Enclosure	10.2
20712	C-shape	6.6
20714	Wall	20.0
20715	Terrace	5.6
20717	Modified tumulus	5.8
20719/A	Rock shelter	7.4
20719/B	Hearth	0.7
20721/A	Terrace	11.4
20721/B	Modified tumulus	8.1
20721/C	Pavement	4.0
20721/D	Pavement	11.1
20725/A	Terrace	6.3
20725/B	Platform	13.5
20725/C	Modified tumulus	4.5
20725/D	Pavement	4.6
20728	Enclosure	13.2
20730/A	Modified tumulus	13.9
20730/B	Modified tumulus	2.0
20749/A	Terrace	13.8
20749/C	Modified tumulus	40.7
20749/D	Modified tumulus	10.0
20749/E	Modified tumulus	28.0
26261	Terrace	30.0
26262	C-shape	12.0

*Excluding lava tubes and lava blisters

In general, the term temporary habitation has been used for sites, which contain structures that are relatively small and are not elaborately constructed. The utilization of temporary habitation sites within the project range from probable single use sites to sites that were utilized for short periods of time although this utilization in some instances was probably repeated.

Cordy proposes that temporary habitation structures generally measure less than 16.0 m² (52.49 ft). The temporary habitation structures (excluding lava tubes and lava blisters) in the present study area have floor areas that measure between 0.7 to 94.9 m² (2.46 ft- 45.93 ft) (Table 10). The shape of the structures encountered within the project also fit with Cordy's model with features ranging in shape from platforms (1), terraces (7), enclosures (4), C-/L-shapes (3), pavements (7), and rock shelters (1). There were a number of different structural types, within

the project area, identified as temporary habitation that were not included within Cordy's model but fit within the temporary habitation model due to other criteria and interpretation, these include; modified tumuli (15), walls (2), alignments (1), mounds (2), and hearths (1). These formal structural types, although not listed within Cordy's model, are believed to have similar characteristics to the structural types listed within Cordy's model. The modified tumulus, which is the most predominant temporary habitation structural category generally includes filling and leveling of a crevice, thus similar to Cordy's "paving"; the walls (2) and alignment approximate Cordy's C and L shaped enclosures.

The substantiveness of construction for temporary habitation sites within the project area is generally low. The majority of structures appear to have been constructed with relatively little effort and time.

The majority of temporary habitation sites within the project area are generally isolated from other sites within the project and are limited to a single or only a few (less than three) associated structures. Due to the difficulty in following trails on the *pāhoehoe* lava areas of the project (where the majority of the temporary habitation sites are located) it cannot be firmly established that these sites were situated along trails but this is a distinct possibility based on the alignments in adjoining 'a 'ā lava.

It is due to the aforementioned criterion that it is believed that the findings within the present study relating to temporary habitation fit Cordy's model of expected finds for the present study area.

7.2.5 Distribution of Temporary Habitation

The majority of the temporary habitation sites within the project area are located on the *pāhoehoe* flow that dominates the majority of the project area (81.8 percent of the temporary habitation sites are located on *pāhoehoe* lava). In terms of elevation the sites appear fairly evenly distributed within the project area. The majority of sites are located on raised areas of either *pāhoehoe* (i.e. tumuli) or 'a 'ā lava.

7.2.6 Recurrent Habitation

One (1) of the habitation sites (Site 20709) is regarded as recurrent in use. The site is comprised of four features; Feature A - platform (recurrent habitation); Feature B and Feature C - enclosures (Agriculture); and Feature D - Lava blister (Storage).

Interpretation Criteria - Recurrent Habitation

(Recurrent-Use Shelters - [Clark 1987:198])

Shape: C, U, Box-C, Linear, enclosures, irregular, and caves.

Construction: Similar to single-use shelters, although the larger and more frequently used features may be somewhat more formalized or modified - e.g., perhaps distinguishable living areas.

Size: A good deal of variation but generally small; less than 30 m² (98.43 ft²), but most from 7 to 12 m² (22.97 - 39.37ft²).

Associations: Usually found in associations with agricultural features or specialized resource areas. Generally not associated with other structural features such as burial monuments.

Geographic Context: Predominantly in leeward areas, and most commonly in agricultural zones, along trails, and scattered along the coast.

Cultural Deposit: Midden and artifacts likely to be present but in small quantities and relatively limited in range. Clear cultural deposit, although evidence of sequential abandonment and reoccupation may not be obvious. Multiple short-use fireplaces at different horizontal and vertical locations and/or charcoal flecks and possibly ash scattered through deposit.

A recurrent habitation feature is considered to be more substantially constructed than other temporary habitation feature, and commonly exhibits formal construction elements similar to permanent habitations sites, albeit, on a smaller scale. Clark suggests that recurrent habitation structures measure less than 30 m² (98.43 ft²). The recurrent habitation structure within the present study area has a floor size of 27.2 m² (89.24 ft²) for Feature A.

Midden and artifacts associated with recurrent habitation are generally more abundant than at less intensively utilized temporary habitation features but less abundant than at permanent habitation features; however, a limited range of artifact types and midden species may be represented at both temporary and recurrent habitation features, a key constituent of recurrent use, Clark maintains, is the horizontal distribution of multiple hearths or charcoal and ash flecking throughout a cultural deposit (Clark 1986:200). Although this may be difficult to prove through excavation of small structural features with little surface area (e.g. terraces and platforms).

The midden collected from site 20709 fits the model: it is substantial in amount though limited in variety, and considerably more plentiful than what was recovered from the other temporary habitation sites that were tested. A total of 540.7 g. of midden was collected from the 1.0 m² (3.28 ft²) test unit but no artifacts were observed or collected during testing. Only eight different species of marine shell were represented in the findings. The excavation revealed charcoal flecking virtually throughout the entire trench. The material collected from the hearth, which was cross-sectioned, proved to be relatively sparse with a high percentage of the volume excavated consisting of ash.

7.2.7 Indeterminate

A total of three sites within the project area lacked characteristics that would, upon field inspection, help to determine function (State sites 20699, 20731, & 20743). These sites have therefore been listed as "indeterminate." All three sites consist of modified tumuli. These sites were also listed as indeterminate due to their lack of modification, lack of cultural material and their lack of any excavation potential whatsoever.

7.2.8 Marker

One site within the project area is considered to function as a marker. It consists of a cairn (State site 20713). Site 20713 is a cairn situated directly off of the Hina-Lani Road. This site

possibly functioned as a boundary marker demarcating the Kaloko/Kohanaiki *ahupua'a* boundary or border.

7.2.9 Mining

One site in the project area (Site 20703 Feature C) appears to have been utilized as a quarry area for scoria. The site is located in the southwestern portion of the project area and is adjacent to (i.e. north of) a number of trails (e.g. Sites 13493, 20722, 20726, 20744, and 20745). Feature C consists of an area in which it appears that the outer crust of a high *pāhoehoe* tumulus was removed as a layer of low grade scoria. Mining activities do not appear to have been extensive and there is no evidence of further processing of the mined material (i.e. abrader basins or partially worked pieces of scoria). Due to the quality of the scoria and the lack of evidence of extensive mining it is believed by the authors that the activities represent a localized (*ahupua'a*) exploitation of a resource for local consumption.

7.2.10 Storage

A total of three sites within the project area contain features that have been designated as storage in function (Sites 15325/B, 20739/A, and 20748). Basically two types of storage activities have been identified within the project area; storage associated with water collection; and storage associated with habitation. The first type of storage activities identified within the project consists of small, modified depressions and a very small enclosure both of which are associated with existing transportation routes. These features are believed to be areas in which an opportunistic approach was taken to water catchment in which small areas were cleared to hold water catchment receptacles (i.e. gourds) that would be left in these depressions to retain rainfall if and when it occurred.

The second type of storage activities noted within the project area consist of lava tubes or blisters associated with habitation activities. These features are believed to have been utilized as storage of articles associated with habitation activities.

7.2.11 Transportation and Trails

Twenty-one trails (21.2 percent of the total features) were encountered during the inventory survey that was encompassed within sixteen sites (27.1 percent of the total 59 sites) (State sites 13493, 15324, 15325, 20704, 20722, 20724, 20726, 20732, 20733, 20736, 20737, 20739, 20744, 20745, 20747, and 26259). All of the trails within the project area appear to be pre-contact in nature. The trails are all located on *'a'ā*, are relatively narrow and often utilize *pāhoehoe* stepping stones. These trails are commonly interpreted as foot trails for people that are primarily pre-contact, and do conform to classifications that suggest the same function such as Apple 1965. Apple defines "Type A" trails as being pre-contact and early historic (prior to abolishment of the *kapu* system) "single-file foot trails" that follow the configuration of the shoreline and extend between the coast and upland localities (Apple 1965: Appendix 2). According to Apple "Type A" trails were designed in accordance to the *kapu* system, for example: trails would not cross *ahupua'a* boundaries because the *kapu* system prohibited residents to go beyond their *ahupua'a* boundaries. Notably, the very dense parallel series of trails (13493, 20722, 20726, 20744 and 20745) crossing *'a'ā* near the southern boundary of the project area virtually straddle our present day knowledge of the *ahupua'a* boundary.

The large number of trails within the project area reveal that the residents of both Kaloko and Kohanaiki had a significant network of travel routes that provided access to resources and exchange of resources between the coast and intermediate regions of the two *ahupua'a*.

The location of trails only on 'a'ā suggests less modified, braided trails crossed the *pāhoehoe*. Attempts were made with all trails in the project area to follow them to their full extent and where possible make relevant correlations. The uniformity of the terrain (usually consisting of undulating *pāhoehoe*) surrounding the 'a'ā flows negates the necessity of extensive trail construction and leads the authors to believe that while the trails followed a single route over the 'a'ā flows once the trail exited the 'a'ā more than one path likely was traversed by travelers.

As is generally indicated on RM 1449 (see Figure 4, page 17) one would expect Kohanaiki Road to be visible in the project area. This was not found to be the case, though there are some indications of where it may have run. A wooden gate is present in the barbed wire fence running along the *mauka* boundary of the project area. A single worn area of *pāhoehoe* was located near the *makai* boundary of the project area that likely corresponds to a remnant of one of the braided trails recorded by Renger 1970. Because Renger 1970, and subsequently Cordy 1991, found these trails to be so braided, it seems unlikely that Kohanaiki Road had a single route by the time it reached this lower elevation. As with the pre-contact trails, the route was more likely to be less formal when traversing *pāhoehoe*, which may explain why the road is not shown continuing further *makai* on RM 1449.

7.3 Site Distribution

Distribution of sites closely corresponds to expectations for the elevation of the project area. Sites generally are most frequent on ridges and tumuli, or in lava tubes. In this way, dense sites along the 120 foot contour (20730, 20731, 20703, 20702) and the distinct ridge are expected. Most temporary habitation sites are located near identifiable or inferred transportation routes.

Among these transportation routes, something peculiar appear to be going on with the numerous short trails crossing a small 'a'ā flow near the southern border of the project area (13493, 20722, 20726, 20744, 20745). Here there appears to have been great need for crossing the 'a'ā quickly without regard to the increased labor needed to build so many parallel trails. One explanation for this is that a larger *mauka-makai* route was nearby and that these trails converged upon it shortly after leaving the rugged flow. It may be that this hints at a route older than Kohanaiki Road, which could be either north or south of Hina Lani. Also unusual about this set of trails are their proximity to the *ahupua'a* boundary, suggesting that there was substantive traffic between Kohanaiki and Kaloko in this area.

Lava tubes are dispersed naturally, but are relatively small and widespread. They are almost always utilized when they are present.

There is a noticeable concentration of surface sites that runs from the center of the project area up a moderate *pāhoehoe* ridge that ends at a foot of a very prominent, tall 'a'ā flow near the *mauka* boundary of the project area (on which 20698 is located). Due to the height of this 'a'ā flow, there are many sites here, including some over the boundary of the project area.

7.4 Conclusions

Archaeological survey of the project area shows an area largely consistent with expectations, but with some more permanent use such as a formal recurrent habitation site. Agriculture was localized and limited in scope, but was certainly present primarily in association with habitation sites. Slab trails are numerous and attest to the importance of transportation across slope despite the considerable obstacles presented by very rugged 'a 'ā, suggesting considerable use of the dry, intermediate area resources.

All sites in the project area are consistent with pre-Contact site types and, as suggested by radiocarbon dates, could be later in origin but still traditional in style. Though there was known ranching in the vicinity and the Kohanaiki Road was recorded as extending into the project area, archaeological evidence for purely historic and modern use is very low. Modern impact to the landscape extending from adjacent road and warehouse construction and use is limited but present in the form of a few bulldozer roads and grading near the road edge. In the case of a several sites there is significant disturbance by localized bulldozing. .

Section 8 Significance Assessments

8.1 Significance Assessments

A total of 59 sites of varied archaeological significance are present in the project area. Individual site significance and recommended treatment are specified in Table 11. Sites were evaluated for significance according to the broad criteria established for the State Register. The five criteria are:

- A Site reflects major trends or events in the history of the state or nation.
- B Site is associated with the lives of persons significant in our past.
- C Site is an excellent example of a site type.
- D Site may be likely to yield information important in prehistory or history.
- E Site has cultural significance; probable religious structures (shrines, heiau) and/or burials present.

Of the total 59 sites with the project area, 55 sites (93.2%) are considered solely to yield information important to prehistory and history (Criterion D). A total of four sites within the project area meet multiple significance criteria, including the following: two sites to yield information important to prehistory and history (Criterion D) and in combination with cultural significance, probable religious structures and/or burials present (Criterion E). A third site previously identified (site 20720) met both Criterion D and E, but was determined to have been destroyed and has therefore been excluded from the present significance assessment. The final one site meets the multiple criterion of an excellent example of a site type (Criterion C) and likely to yield information important in prehistory or history (Criterion D).

Significance criterion C - "site is an excellent example of a site type" is assigned to one site in the project area (20709). This site represents the best example of structural and functional archaeological components within the project area, and is also in the best condition. Notably, there are many good examples of site types in the project area that are representative of activity in the land encompassed by the project area, but are not particularly excellent examples within in the *ahupua'a*.

Significance criterion D - "site may be likely to yield information important in prehistory and history" is assigned to all sites in the project area. All of these sites provide important information to the settlement patterns and livelihood of the Kaloko and Kohanaiki residents (by the sites plotted location, and structural and functional nature), and some of these sites may provide more detailed archaeological data through future excavations or other additional documentation.

Significance criterion E - "site has cultural significance; probable religious structures...and burials" - is given to two sites in the project area. These sites are both probable burial sites.

Table 11. Significance Assessments and Mitigation Recommendations of Historic Properties within Project Area

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
13493	-	Trail	Transportation	D	pre-contact	No Further Work
15324	-	Trail	Transportation	D	pre-contact	No Further Work
15325	A	Wall	Temporary habitation	D	pre-contact	Data Recovery
15325	B	Modified Depression	Storage	D	pre-contact	Data Recovery
15325	C	Mound	Temporary habitation	D	pre-contact	Data Recovery
15325	D	Trail	Transportation	D	pre-contact	Data Recovery
15329	-	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
20696	-	Lava tube	Temporary habitation	D	pre-contact	No Further Work
20697	-	Modified tumulus	Temporary habitation	D	pre-contact	Data Recovery
20698	A	Pavements	Temporary habitation	D	pre-contact	Data Recovery
20698	B	Pavement	Temporary habitation	D	pre-contact	Data Recovery
20698	C	Cupboard	Temporary habitation	D	pre-contact	No Further Work
20699	-	Modified tumulus	Indeterminate	D	pre-contact	No Further Work
20700	A	Enclosure	Temporary habitation	D	pre-contact	Data Recovery
20700	B	Enclosure	Temporary habitation	D	pre-contact	Data Recovery
20701	-	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
20702	A	Mod. tumulus	Temporary habitation	D	pre-contact	Data Recovery
20702	B	Terrace	Temporary habitation	D	pre-contact	Data Recovery
20703	A	Terrace	Temporary habitation	D	pre-contact	Data Recovery
20703	B	Pavement	Temporary habitation	D	pre-contact	No Further Work
20703	C	Modified tumulus	Mining	D	pre-contact	No Further Work

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
20703	D	Cupboard	Temporary habitation	D	pre-contact	No Further Work
20704	A	Trail	Transportation	D	pre-contact	No Further Work
20704	B	L-shape	Temporary habitation	D	pre-contact	No Further Work
20704	C	Trail	Transportation	D	pre-contact	No Further Work
20704	D	Trail	Transportation	D	pre-contact	No Further Work
20704	E	Trail	Transportation	D	pre-contact	No Further Work
20705	-	Modified tumulus	Probable Burial	D,E*	pre-contact	Preserve
20707	-	Lava tube	Temporary habitation	D	pre-contact	No Further Work
20708	-	Modified tumulus	Temporary habitation	D	pre-contact	Data Recovery
20709	A	Platform	Recurrent habitation	C, D	pre-contact	Preserve
20709	B	Enclosure	Recurrent habitation	C, D	pre-contact	Preserve
20709	C	Enclosure	Recurrent habitation	C, D	pre-contact	Preserve
20709	D	Lava blister	Recurrent habitation	D	pre-contact	No Further Work
20710	A	Lava tube	Temporary habitation	D	pre-contact	Data Recovery
20710	B	Alignment	Temporary habitation	D	pre-contact	No Further Work
20710	C	Mound	Temporary habitation	D	pre-contact	No Further Work
20710	D	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
20710	E	Pavement	Temporary habitation	D	pre-contact	No Further Work
20711	-	Enclosure	Temporary habitation	D	pre-contact	Data Recovery
20712	-	C-shape	Temporary habitation	D	pre-contact	No Further Work
20713	-	Cairn	Marker	D	pre-contact	No Further Work
20714	-	Wall	Temporary habitation	D	pre-contact	No Further Work
20715	-	Terrace	Temporary habitation	D	pre-contact	Data Recovery
20716	A	Modified tumulus	Probable Burial	D,E*	pre-contact	Preserve

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
20716	B	Modified tumulus	Probable Burial	D,E*	pre-contact	Preserve
20716	C	Modified tumulus	Probable Burial	D,E*	pre-contact	Preserve
20716	D	Modified tumulus	Probable Burial	D,E*	pre-contact	Preserve
20717	-	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
20718	-	Modified tumulus	Agriculture	D	pre-contact	No Further Work
20719	A	Rock shelter	Temporary habitation	D	pre-contact	Data Recovery
20719	B	Hearth	Temporary habitation	D	pre-contact	No Further Work
20721	A	Terrace	Temporary habitation	D	pre-contact	Data Recovery
20721	B	Modified tumulus	Temporary habitation	D	pre-contact	Data Recovery
20721	C	Pavement	Temporary habitation	D	pre-contact	No Further Work
20721	D	Pavement	Temporary habitation	D	pre-contact	Data Recovery
20722	-	Trail	Transportation	D	pre-contact	No Further Work
20724	-	Trail	Transportation	D	pre-contact	No Further Work
20725	A	Terrace	Temporary habitation	D	pre-contact	Data Recovery
20725	B	Platform	Temporary habitation	D	pre-contact	Data Recovery
20725	C	Modified tumulus	Temporary habitation	D	pre-contact	Data Recovery
20725	D	Pavement	Temporary habitation	D	pre-contact	Data Recovery
20726	A	Trail	Transportation	D	pre-contact	No Further Work
20726	B	Trail	Transportation	D	pre-contact	No Further Work
20727	-	Lava tube	Temporary habitation	D	pre-contact	Data Recovery
20728	-	Enclosure	Temporary habitation	D	pre-contact	No Further Work

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
20730	A	Modified tumulus	Temporary habitation	D	pre-contact	Data Recovery
20730	B	Modified tumulus	Temporary habitation	D	pre-contact	Data Recovery
20731	-	Modified tumulus	Indeterminate	D	pre-contact	No Further Work
20732	-	Trail	Transportation	D	pre-contact	No Further Work
20733	-	Trail	Transportation	D	pre-contact	No Further Work
20734	-	Modified depression	Agriculture	D	pre-contact	No Further Work
20736	-	Trail	Transportation	D	pre-contact	No Further Work
20737	-	Trail	Transportation	D	pre-contact	No Further Work
20738	A	Enclosure	Agriculture	D	pre-contact	No Further Work
20738	B	Enclosure	Agriculture	D	pre-contact	No Further Work
20739	A	Enclosure	Storage	D	pre-contact	No Further Work
20739	B	Trail	Transportation	D	pre-contact	No Further Work
20740	-	Modified tumulus	Agriculture	D	pre-contact	No Further Work
20742	-	Lava tube	Temporary habitation	D	pre-contact	No Further Work
20743	-	Modified tumulus	Indeterminate	D	pre-contact	No Further Work
20744	-	Trail	Transportation	D	pre-contact	No Further Work
20745	-	Trail	Transportation	D	pre-contact	No Further Work
20746	-	Lava tube	Temporary habitation	D	pre-contact	No Further Work
20747	-	Trail	Transportation	D	pre-contact	No Further Work
20748	-	Lava tube	Storage	D	pre-contact	No Further Work
20749	A	Terrace	Temporary habitation	D	pre-contact	Data Recovery
20749	B	Lava tube	Temporary habitation	D	pre-contact	Data Recovery

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
20749	C	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
20749	D	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
20749	E	Modified tumulus	Temporary habitation	D	pre-contact	No Further Work
26259	-	Trail	Transportation	D	pre-contact	No Further Work
26260	-	Lava tube	Temporary habitation	D	pre-contact	Data Recovery
26261	-	Terrace	Temporary habitation	D	pre-contact	Data Recovery
26262	-	C-shape	Temporary habitation	D	pre-contact	No Further Work
26263	-	Lava tube	Temporary habitation	D	pre-contact	Data Recovery
26264	A	Mound	Agriculture	D	pre-contact	No Further Work
26264	B	Modified tumulus	Agriculture	D	pre-contact	No Further Work
26264	C	Modified tumulus	Agriculture	D	pre-contact	No Further Work

* Site is a probable burial

Section 9 Project Effect and Mitigation Recommendations

9.1 Project Effect

The proposed project will affect historic properties recommended eligible to the Hawai'i Register. CSH's project specific effect recommendation is "effect, with agreed upon mitigation measures."

Historic properties outside of the project area do have the potential to be affected by the current development. The proximity of the project area to Kaloko-Honokōhau National Historical Park to the east is the primary concern. Historic properties north and south of the project area are of little concern due to the extensive industrial/commercial developments separating the project area from the potential sites here.

In the case of the National Historical Park, there is potential visual impact by further development of the slopes of Hualālai and potential auditory impact due to increased use and/or expansion of Queen Ka'ahumanu Highway and/or Hina Lani Street. In both cases, significant impact has already been made by large industrial/commercial developments *mauka* of Queen Ka'ahumanu Highway.

9.2 Mitigation Recommendations

It is recommended that of the 59 sites in the project area, 19 sites be subjected to a program of data recovery to address scientific and informational concerns and 3 sites be preserved (Figure 161).

The remaining 37 sites are not recommended to undergo further research, because the documentation and plotting of location during the current study has addressed the limited information available at these sites. These sites are classified only under Criterion D significance and are generally characterized as historic properties in poor structural condition or unmodified lava tubes that lack excavation potential.

Mitigation for impact on historic properties outside the project area is best addressed by architectural and landscaping measures to minimize visual impact on the environment in Kaloko-Honokōhau National Historical Park. Based on previous development of the vicinity, tall buildings directly adjacent to the highway, bright or light colored paint, heavy use of corrugated metal and landscaping using non-native plants would have the greatest visual impact on those properties in the park. Use of humble architecture, local stone, muted colors and native plants would be preferable from a mitigation perspective and would minimize the urban feel of the land most immediately visible from, and historically tied to, that preserved in the park.

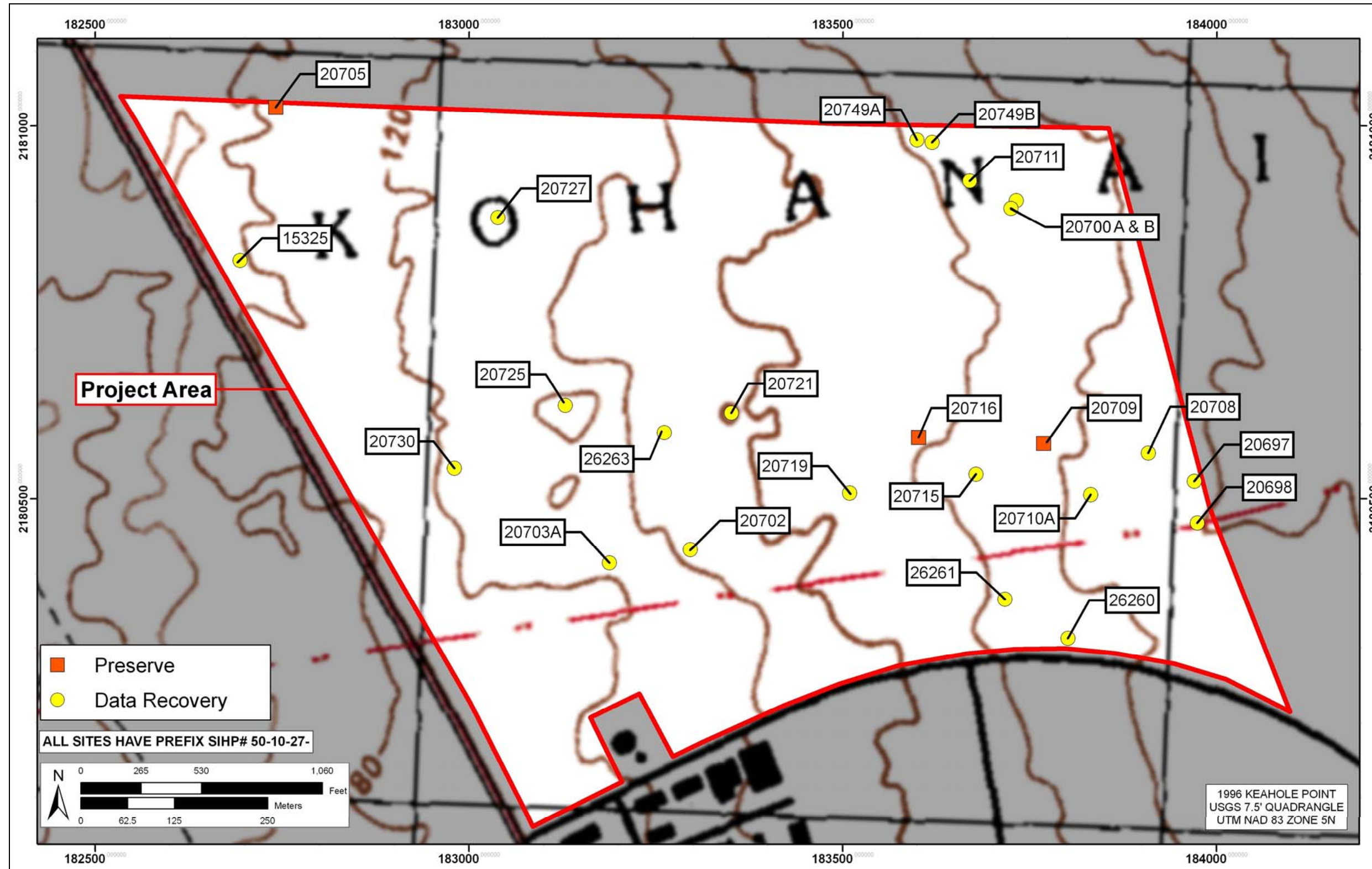


Figure 161. Portion of USGS topographic map showing the locations of historic properties recommended for data recovery and preservation

9.2.1 Data Recovery

Nineteen (19) sites are slated for data recovery and should be subjected to further documentation and, if feasible, excavation to address scientific and information interests (see Table 12). Data recovery should proceed in accordance with a data recovery plan that is to be submitted to the State Historic Preservation Division for review and approval.

The sites selected for data recovery include a variety of site and functional types attributable to traditional Hawaiian use. Functional types include: habitation (temporary), agricultural, trails, and sites deemed indeterminate that have excavation potential.

Potential research topics that further documentation could answer should be explored in the data recovery plan. At this time it is recommended that further consideration be given to research topics such as those listed below, as well as any pertinent questions raised by contemporary research on the island, or in comparable environments elsewhere in the Pacific region. Further, the plan should consider numerous new technologies entering the field of archaeology that could answer new types of questions.

Possible Data Recovery Topics:

- (1) An evaluation of historic property distribution as it compares to common settlement models (e.g., Schilt 1984; Kirch 1985; and Cordy et al. 1991). That is, were Kohanaiki and Kaloko exceptions to these models or do they confirm their veracity?
- (2) Further study of the use of temporary habitation sites in the intermediate zone to include further functional interpretation and analysis of greater quantities of midden for subsistence patterns in the area. Results could be compared with other temporary habitation models (e.g. Cordy et al. 1991; Mitchell and Kolb 1992; and Hammatt et al. 1995).
- (3) To a limited degree, temporary habitation research may collect data with potential provide some insight into social dynamics in both *ahupua'a* through a comparison with Dr. Ross Cordy's 1991 model of social rank determinants in coastal Kaloko and Honokōhau I and II *ahupua'a*.
- (4) Assessment of the suitability of non-radiometric dating of structures and/or trails, such as TL/OSL.
- (5) Higher quality digital photographic documentation.

9.2.2 Preserve

The three (3) sites in the project area recommended for preservation are: SIHP No. -20705, a probable burial; SIHP No. -20709, a recurrent habitation; and SIHP No. -20716, a probable burial (see also Table 13). It is recommended that considerations for the preservation of these sites be detailed in a burial treatment plan to be approved by the State Historic Preservation Division.

Table 12. Historic Properties Recommended for Data Recovery

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age
15325	-	Wall, modified depression, mound	Temporary habitation	D	pre-contact
20697	-	Modified tumulus	Temporary habitation	D	pre-contact
20698	A	Pavements	Temporary habitation	D	pre-contact
20698	B	Pavement	Temporary habitation	D	pre-contact
20700	A	Enclosure	Recurrent habitation	D	pre-contact
20700	B	Enclosure	Recurrent habitation	D	pre-contact
20702	A	Mod. tumulus	Temporary habitation	D	pre-contact
20702	B	Terrace	Temporary habitation	D	pre-contact
20703	A	Terrace	Temporary habitation	D	pre-contact
20708	-	Modified tumulus	Temporary habitation	D	pre-contact
20710	A	Lava tube	Temporary habitation	D	pre-contact
20711	-	Enclosure	Temporary habitation	D	pre-contact
20715	-	Terrace	Temporary habitation	D	pre-contact
20719	A	Rock shelter	Temporary habitation	D	pre-contact
20721	A	Terrace	Temporary habitation	D	pre-contact
20721	B	Modified tumulus	Temporary habitation	D	pre-contact
20721	D	Pavement	Temporary habitation	D	pre-contact
20725	A	Terrace	Temporary habitation	D	pre-contact
20725	B	Platform	Temporary habitation	D	pre-contact

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age
20725	C	Modified tumulus	Temporary habitation	D	pre-contact
20725	D	Pavement	Temporary habitation	D	pre-contact
20727	-	Lava tube	Temporary habitation	D	pre-contact
20730	A	Modified tumulus	Temporary habitation	D	pre-contact
20730	B	Modified tumulus	Temporary habitation	D	pre-contact
20749	A	Terrace	Temporary habitation	D	pre-contact
20749	B	Lava tube	Temporary habitation	D	pre-contact
26260	-	Lava tube	Temporary habitation	D	pre-contact
26261	-	Terrace	Temporary habitation	D	pre-contact
26263	-	Lava tube	Temporary habitation	D	pre-contact

* Site is a probable burial

Table 13. Historic Properties Recommended for Preservation

SIHP # 50-10-27-	Feature	Site Type	Function	Significance	Age
20705	-	Modified tumulus	Probable Burial	D,E*	pre-contact
20709	A	Platform	Recurrent habitation	C, D	pre-contact
20709	B	Enclosure	Recurrent habitation	C, D	pre-contact
20709	C	Enclosure	Recurrent habitation	C, D	pre-contact
20716	A	Modified tumulus	Probable Burial	D,E*	pre-contact
20716	B	Modified tumulus	Probable Burial	D,E*	pre-contact
20716	C	Modified tumulus	Probable Burial	D,E*	pre-contact
20716	D	Modified tumulus	Probable Burial	D,E*	pre-contact

* Site is a probable burial

9.3 Disposition of Materials

The complete collection of artifacts associated with this archaeological inventory survey was collected from private lands; accordingly, this material belongs to the landowner. The artifacts associated with this archaeological inventory survey will be temporarily housed at a CSH storage facility. CSH will make arrangements with the landowner regarding the disposition of the project's collection. Should the landowner request archiving of material, then the archive location will be determined in consultation with SHPD.

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Appendix A SHPD Correspondence

A.1 August 15, 1996 Review Letter of Colin et al 1996 Report

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
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HISTORIC PRESERVATION
DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

August 15, 1996

Dr. Hallett Hammatt
Cultural Surveys of Hawaii
733 North Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO: 17718
DOC NO: 9607PM22

Dear Dr. Hammatt:

SUBJECT: Draft Report: "*An Archaeological Inventory Survey and Limited
Subsurface Testing of 224.43 Acre Parcel within Portions of Kaloko and
Kohanaiki Ahupua`a*" (Colin, Devereux, Borthwick and Hammatt 1996)
TMK: 7-4-09: 17 and Por. 2

The Draft Environmental Impact Statement (DEIS) for the proposed Kaloko Town Center, which contains your reports on the archaeological inventory survey (Appendix F) and a cultural impact assessment study (Appendix K) of the project area, was sent to us for review by the Office of Environmental Quality Control (OEQC).

We have decided to review your two reports separately. The archaeological inventory survey report is the subject of this review letter.

We have the following general comments to make at this time (more detailed comments are presented in Attachment 1):

(1) We believe that the survey of the 224.43 acre parcel was adequate, finding a total of 55 sites.

(2) While we believe that the survey was complete and that all of the sites in the project area were identified, not all of the sites are adequately described and/or interpreted. Review of the first 8 site descriptions revealed a number of different problems (see Attachment 1 for detailed comments on individual sites), some of which appear to be

Dr. Hallett Hammatt
Page Two

widespread based on a spot check of some other descriptions. Two of the more common problems are noted here:

(a) The failure in some instances (e.g Site 20698) to note the presence/absence of cultural deposits, artifacts and midden.

(b) The failure in some instances (e.g. Site 20697) to justify or explain why a site has been assigned a given function.

(3) The problem with the site descriptions prevent us from undertaking a final review of significance evaluations and recommended mitigation treatments. In the case of Site 20696, for example, the lack of information concerning floor characteristics (sediments) in the lava tube prevents us from concurring with your recommendation of no further work at this site, even though you note that the excavation potential is poor. What is clearly needed is a careful review of all of the site descriptions to ensure that the descriptions are complete and the functional inferences justified in terms of the existing evidence.

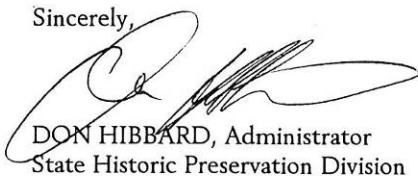
(4) Other kinds of problems exist in the draft report, such as inconsistencies in the formal-functional type classification and the lack of information concerning how many of the 55 sites had been previously recorded (see Attachment 1 for detailed comments).

(5) While there are a number of problems that need to be addressed to produce an acceptable report, we do want to say that parts of the draft report, such as the cultural-historical background, previous research, and settlement pattern sections, are quite well done.

Please revise the report and resubmit it for our continued review and approval.

If you have any questions about our review comments please contact Patrick McCoy at 587-0006.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

PM:jk

Attachment 1**Revisions Needed for Draft Report*****An Archaeological Inventory Survey and Limited Subsurface Testing of 224.43 Acre Parcel within Portions of Kaloko and Kohanaiki Ahupua`a*****(Colin, Devereux, Borthwick and Hammatt 1996)**

Methods

Page 4, Figure 4. The key to the map should make it clear that the lava flow margins that are shown are a`a flows and that the intervening areas are pahoehoe. The contour numbers are too small to read. What is the contour interval?

Page 6. The description of the survey methodology should include a discussion of limitations (e.g. poor ground visibility due to vegetation), if any.

Page 6, para. 4. We are pleased that you have included an explanation for why there are no stratigraphic profile drawings for all of the excavations.

Previous Archaeology

A map showing the locations of previous surveys would be extremely useful.

The summary of previous work should clearly indicate how many sites in the present project area had been previously identified.

Inventory

It makes more sense to us to know how a type is defined before it is used in a site description. We suggest that you move the definitions of formal and functional site types from the back of the report to the beginning of the Site Descriptions section.

Page 28, Site 13493. The description of this site gives the elevation but there is no other locational information to help the reader understand the context of this site. This comment applies to some other sites as well.

Page 29, Site 15324. Please check on the PHRI report and add the reference to the bibliography.

Page 29, Site 20696. The description says that the lava tube is unmodified but this does not agree with the site plan, which shows a line or row of rocks. Please correct this

discrepancy and also please add a description of the floor in terms of, for example, the presence/absence of sediments. This information is needed for us to evaluate your significance evaluation and recommended mitigation treatment.

Page 31, Site 20697. Modified tumulus does not seem to us an especially appropriate term to describe the form of this site since there is a C-shaped wall/paved area. The description of this site is also not too different from that of Site 20698, which is called "pavements." We suggest that you consider an alternative term. The description of a pavement with a height of 90 cm makes us wonder how the term pavement is being defined. It doesn't appear to fit the description on Page 108, although no height or thickness measurements are given in the definition. Also, we see no indication of a pavement on the plan map of the site (Figure 7). In the absence of artifacts and midden, what makes you think that this is a temporary habitation site? Hallow should read hollow on Figure 7.

Page 31, Site 20698. Are there any artifacts or midden? What makes you think that this is a habitation site?

Page 34, Site 20699. We note here that you use the absence of midden and artifacts to conclude that site function is indeterminate, in sharp contrast to the use of similarly negative evidence at Site 20697. This inconsistency needs to be eliminated.

Page 34, Site 20700. The word "complex" is in our view a poor term to employ for site type because it doesn't convey any information other than denoting the presence of more than one feature. The other problem is that the term is not used consistently throughout the report. Site 20698, for example, has two features, yet it is not called a "complex." We suggest that you find another term to replace "complex." Lastly, Site 20700 is interpreted as a "temporary habitation/agriculture" site but there is no discussion of what evidence was used in making this inference. We do not believe that the function is self-evident.

Page 37, Site 20701. It is difficult to understand how this site could be interpreted as a temporary habitation because all that is present to signify that it is a site are two short stone walls.

Please note that we have not reviewed all 55 site descriptions. The first 8 and a spot check of several others indicates that some of the same problems noted above recur over and over.

Survey Results

Pages 108-122. As already indicated, we think the report would be much improved by moving the material on these pages to the front.

Page 108, Formal Feature Types. Some of the types included here, such as planting area and quarry, are functional types. Please change.

Page 116, Table 4. Why is Site 20710/C, a mound with a floor area of less than 1 meter, included in the category of temporary habitation structures? The same question applies to Site 20741/G--a modified depression. In checking the site description there is no description of a Feature G. Please review and change as needed.

Testing Results

This section of the report is to a large extent redundant, since most of the information, except for the interpretations at the end, has been presented earlier. We recommend that this section be deleted and the interpretations incorporated into the body of the site descriptions.

Significance Evaluations and Recommended Mitigation Treatments

We have not undertaken a systematic review of this section of the report in view of the descriptive and interpretive problems noted above. While we are likely to concur with most of the evaluations and recommendations, the site descriptions must be complete and the functional interpretations well justified in order for us to do so.

A.2 April 7, 1997 Review Letter of Colin et al 1996 Report

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



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DEPARTMENT OF LAND AND NATURAL RESOURCES

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April 7, 1997

Dr. Hallett Hammatt
Cultural Surveys of Hawaii
733 North Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO: 19087
DOC NO: 9703PM02

Dear Dr. Hammatt:

**SUBJECT: Revised Report: "An Archaeological Inventory Survey
and Limited Subsurface Testing of 224.43 Acre Parcel within
Portions of Kaloko and Kohanaiki Ahupua'a
"(Colin, Devereux, Borthwick and Hammatt 1996)
TMK: 7-4-09: 17 and Por. 2**

Thank you for submitting the revised report to us and our apologies for the delay in completing our review.

The revised report, prepared in response to the comments in our review letter of August 15, 1996, is improved, but there are some continuing problems that will have to be addressed yet again. The biggest problem (see Attachment 1 for all of our detailed comments) is with the site descriptions and, more particularly, with the functional interpretations. We cannot understand, for example, how and why you have concluded that some sites and features are possible burials because there is no discussion of the evidence that you used in reaching such a conclusion. You need to specify which of the criterion used to identify a burial site apply in each situation. In at least one instance (Site 20696) we do not think there is enough evidence to conclude that this is an historic site. As with the first draft, we have sampled the first few site descriptions and noted the repetitive concerns. Your firm should carefully review all of the site descriptions to be sure that they meet those concerns and our Division's requirements. Until all of the site functions are justified with supporting evidence we cannot proceed to evaluate your significance assessments and recommended mitigation treatments.

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Please revise the report and resubmit it. If you have any questions about our review comments please contact Patrick McCoy (587-0006).

Aloha,



DON HIBBARD, Administrator
State Historic Preservation Division

PM:amk

H. Hammatt
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Attachment 1

Revisions Needed for Draft Report

An Archaeological Inventory Survey and Limited Subsurface Testing of 224.43 Acre Parcel within Portions of Kaloko and Kohanaiki Ahupua`a

(Colin, Devereux, Borthwick and Hammatt 1996)

Abstract

Page i, para. 2. One of the questions we had in our review of the first draft report was how many of the sites had been previously identified in the project area. We suggest that you add this information in the Abstract so the reader will know how many sites were previously known and how many are newly identified. To determine this you will need to consult PHRI Report 1118-022393 (see comment below on this reference).

Page i, para. 3. Rather than simply noting that some samples were submitted for dating, we suggest that you provide the actual dates, which is a lot more informative.

Page i, para. 4. The first sentence can be read to mean that all 55 sites are significant under multiple criteria. To eliminate this possible confusion we suggest that you be more specific, as you have done with the recommendations.

Introduction

Figure 4. The project area map is good, except that the differentiation between the pahoehoe and lava flows is still not clearly shown on this map because you show the margins of only one flow type, which is not identified. Please revise the map key to make this clear.

Methods

Page 5. The statement about ground visibility should refer instead to archaeological site visibility (we assume you could see the ground you were walking on) and should be more specific in terms of denoting what portions of the project area were more heavily vegetated.

Previous Archaeological Research

Page 21, para. 2. There is a PHRI report (1118-022393) in our library on this project. It is filed in the General Kona box because the project covered a large area.

Predictive Model

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Page 50 and 52, Site 20700. The revised site description has not addressed all of our earlier comments. We are still not convinced that this is a temporary habitation and agricultural site and question the association you make between short term habitation and agriculture. We think, too, that the terminology used to describe this site illustrates some of the larger problems with how the data are organized. To be consistent, all sites with more than one feature should be called "complexes." In place of the word "Complex" for Site Type we would use the terminology you use to describe the function because we think that most archaeologists conceive of "Site Type" as being synonymous with function. Finally, it is difficult to relate the text and illustration of this site because the boundaries of Features A and B are not shown. Please indicate these in some way on the map.

Page 53, Site 20701. We note that you have changed the function in response to our earlier question, but only here and not in Table 1. Please check to see that all of the information in this and other tables agrees with the information in the text.


Page 53, Site 20702. What makes you think that the features on this site contain burials?

Pages 53, 56-58, Site 20703. The descriptions of the pavements at Features A and B as consisting of "stacked and piled boulders" suggests that they are more like low mounds. They certainly do not seem to fit your definition of pavement at the beginning of the report. Please review this apparent inconsistency and make the necessary corrections. At Feature B you describe a large water rounded boulder, which we presume is the "aina basher" noted on the map. You need to make this clear and also define the term "aina basher," which we suggest you use parenthetically for a large hammerstone. The area of crushed and broken stone that is shown on the map is not described in the text. It would appear to be directly related to the quarrying, which likewise is never discussed in terms of the possible intended uses of the stone and the age of the activity. This site age is listed as probably prehistoric in Table 1, but there is no supporting evidence in the site description.

Page 60, Site 20705. What makes you think that this is a burial site?

Please note that we have not reviewed any of the report beyond this point.

Appendix B Radiocarbon Analysis

 BETA ANALYTIC INC. DR. J.J. STIPP and DR. M.A. TAMERS				UNIVERSITY BRANCH 4985 S.W. 74 COURT MIAMI, FLORIDA, USA 33155 PH: 305/667-5167 FAX: 305/663-0964 E-mail: beta@analytic.win.net			
REPORT OF RADIOCARBON DATING ANALYSES							
FOR: Dr. Hallett H. Hammatt		DATE RECEIVED: March 18, 1996					
Cultural Surveys Hawaii		DATE REPORTED: April 11, 1996					
Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)				
Beta-91932	80 +/- 60 BP	-25.0 o/oo	30 +/- 60 BP				
SAMPLE #: CSH 14 Feat A ANALYSIS: radiometric-standard MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid							
Beta-91933	10 +/- 50 BP	-22.9 o/oo	40 +/- 50 BP				
SAMPLE #: CSH 59 B ANALYSIS: radiometric-standard MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid							
NOTE: It is important to read the calendar calibration information and to use the calendar calibrated results (reported separately) when interpreting these results in AD/BC terms.							
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.			

