
**Archaeological Inventory Survey of a
360.131-Acre Parcel within Portions of
Kohanaiki Ahupua‘a and Kaloko Ahupua‘a
North Kona District, Hawai‘i Island
TMK: [3] 7-3-009:025**

**Prepared for
Stanford Carr Development LLC**

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Management Summary

Reference	Archaeological Inventory Survey of a 360.131-Acre Parcel within Portions of Kohanaiki Ahupua'a and Kaloko Ahupua'a, North Kona District, Hawai'i Island TMK: [3] 7-3-009:025
Date	April 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 number 07-19 and 08-14, 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] 7-3-09:025. The project area is located in portions of Kaloko Ahupua'a and Kohanaiki Ahupua'a, and the west boundary is approximately 2.4 kilometers east from the western coast of Hawai'i. The project area is bound by undeveloped parcels to the west and east, with Hina Lani Street to the south and Huliko'a Drive bordering a portion of the north parcel boundary. This area is depicted on the 1996 USGS 7.5-Minute Series Topographic Map, Keahole Point Quadrangle (Figure 1). Fieldwork for the present project area was conducted concurrently with fieldwork for three other adjacent parcels (TMK: [3] 7-3-009:017, 026, 028).
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	360.131 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] 7-3-009:025). 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.
Fieldwork Effort	The fieldwork effort for the archaeological inventory survey was carried out by Matthew Bell, B.A., Mindy Simonson, M.A., David Shideler, M.A., Kelley Esh, M.A., Jason Pickin, B.A., Mark Oxley, B.A., Shawn Fehrenbach, B.A., Doreen Hrivnak, B.A., Kevin Dalton, B.A, and Hallett H. Hammatt, Ph.D (principle investigator). The fieldwork took place on the following dates: March 6, 2007 – May 17, 2007; with limited testing occurring between July 6 and August 8, 2007, taking 230 person-days to complete.
Number of Historic Properties Identified	A total of 121 historic properties were identified within the project area. Two (2) of the historic properties were previously identified and 119 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	All 121 historic properties identified within the project area are recommended eligible to the Hawai'i Register: SIHP # 50-10-27-10712, Criterion D SIHP # 50-10-27-20741, Criterion C & D SIHP # 50-10-27-26275, Criterion C, D & E SIHP # 50-10-27-26276, Criterion D SIHP # 50-10-27-26277, Criterion D SIHP # 50-10-27-26278, Criterion D SIHP # 50-10-27-26279, Criterion D SIHP # 50-10-27-26280, Criterion D SIHP # 50-10-27-26281, Criterion D SIHP # 50-10-27-26282, Criterion D SIHP # 50-10-27-26283, Criterion D SIHP # 50-10-27-26284, Criterion C & D SIHP # 50-10-27-26285, Criterion D SIHP # 50-10-27-26286, Criterion D SIHP # 50-10-27-26287, Criterion D SIHP # 50-10-27-26288, Criterion C & D SIHP # 50-10-27-26289, Criterion D

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.

SIHP # 50-10-27-26290, Criterion D & E*
SIHP # 50-10-27-26291, Criterion D
SIHP # 50-10-27-26292, Criterion D
SIHP # 50-10-27-26293, Criterion D
SIHP # 50-10-27-26294, Criterion D
SIHP # 50-10-27-26295, Criterion D
SIHP # 50-10-27-26296, Criterion C & D
SIHP # 50-10-27-26297, Criterion D
SIHP # 50-10-27-26298, Criterion D
SIHP # 50-10-27-26299, Criterion D
SIHP # 50-10-27-26300, Criterion D
SIHP # 50-10-27-26301, Criterion D
SIHP # 50-10-27-26302, Criterion D
SIHP # 50-10-27-26303, Criterion D
SIHP # 50-10-27-26304, Criterion D
SIHP # 50-10-27-26305, Criterion D
SIHP # 50-10-27-26306, Criterion D
SIHP # 50-10-27-26307, Criterion C, D & E
SIHP # 50-10-27-26308, Criterion D
SIHP # 50-10-27-26309, Criterion D
SIHP # 50-10-27-26310, Criterion D & E*
SIHP # 50-10-27-26311, Criterion D & E*
SIHP # 50-10-27-26312, Criterion D
SIHP # 50-10-27-26313, Criterion D
SIHP # 50-10-27-26314, Criterion D
SIHP # 50-10-27-26315, Criterion D
SIHP # 50-10-27-26316, Criterion D
SIHP # 50-10-27-26317, Criterion D
SIHP # 50-10-27-26318, Criterion D
SIHP # 50-10-27-26319, Criterion D
SIHP # 50-10-27-26320, Criterion D
SIHP # 50-10-27-26321, Criterion D
SIHP # 50-10-27-26322, Criterion D
SIHP # 50-10-27-26323, Criterion D
SIHP # 50-10-27-26324, Criterion D & E**
SIHP # 50-10-27-26325, Criterion D
SIHP # 50-10-27-26326, Criterion D
SIHP # 50-10-27-26327, Criterion D
SIHP # 50-10-27-26328, Criterion D
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SIHP # 50-10-27-26331, Criterion C & D
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SIHP # 50-10-27-26345, Criterion D
SIHP # 50-10-27-26346, Criterion D
SIHP # 50-10-27-26347, Criterion D
SIHP # 50-10-27-26348, Criterion C & D
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SIHP # 50-10-27-26361, Criterion D
SIHP # 50-10-27-26362, Criterion D & E*
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SIHP # 50-10-27-26378, Criterion D

	<p>SIHP # 50-10-27-26379, Criterion D SIHP # 50-10-27-26380, Criterion D SIHP # 50-10-27-26381, Criterion C & D SIHP # 50-10-27-26382, Criterion D SIHP # 50-10-27-26383, Criterion D SIHP # 50-10-27-26384, Criterion D SIHP # 50-10-27-26385, Criterion D SIHP # 50-10-27-26386, Criterion D SIHP # 50-10-27-26387, Criterion D SIHP # 50-10-27-26388, Criterion D SIHP # 50-10-27-26389, Criterion D SIHP # 50-10-27-26390, Criterion D SIHP # 50-10-27-26391, Criterion D SIHP # 50-10-27-26392, Criterion D SIHP # 50-10-27-26393, Criterion D *Site contains confirmed human remains **Site contained human remains removed by a previous study</p>
<p>Historic Properties Recommended Ineligible to the Hawai'i Register</p>	<p>None</p>
<p>Effect Recommendation</p>	<p>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."</p>
<p>Mitigation Recommendation</p>	<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 or previous investigation and are not recommended for further cultural resource management work.</p> <p>SIHP # 50-10-27-10712, Preservation (with breaches) SIHP # 50-10-27-20741, Preservation SIHP # 50-10-27-26275, Preservation SIHP # 50-10-27-26277, Data Recovery SIHP # 50-10-27-26284, Preservation SIHP # 50-10-27-26288, Preservation SIHP # 50-10-27-26289, Data Recovery SIHP # 50-10-27-26290, Preservation SIHP # 50-10-27-26291, Data Recovery SIHP # 50-10-27-26293, Data Recovery SIHP # 50-10-27-26296, Preservation SIHP # 50-10-27-26297, Data Recovery</p>

	<p>SIHP # 50-10-27-26300, Data Recovery SIHP # 50-10-27-26303, Data Recovery SIHP # 50-10-27-26304, Data Recovery SIHP # 50-10-27-26307, Preservation SIHP # 50-10-27-26310, Preservation SIHP # 50-10-27-26311, Preservation SIHP # 50-10-27-26315, Data Recovery SIHP # 50-10-27-26318, Data Recovery SIHP # 50-10-27-26321, Data Recovery SIHP # 50-10-27-26324, Preservation SIHP # 50-10-27-26326, Data Recovery SIHP # 50-10-27-26328, Data Recovery SIHP # 50-10-27-26331, Preservation SIHP # 50-10-27-26334, Data Recovery SIHP # 50-10-27-26337, Data Recovery SIHP # 50-10-27-26341, Data Recovery SIHP # 50-10-27-26342, Data Recovery SIHP # 50-10-27-26343, Data Recovery SIHP # 50-10-27-26344, Data Recovery SIHP # 50-10-27-26347, Data Recovery SIHP # 50-10-27-26348, Preservation SIHP # 50-10-27-26349, Data Recovery SIHP # 50-10-27-26350, Preservation SIHP # 50-10-27-26353, Preservation SIHP # 50-10-27-26354, Preservation SIHP # 50-10-27-26362, Preservation SIHP # 50-10-27-26364, Preservation SIHP # 50-10-27-26365, Data Recovery SIHP # 50-10-27-26373, Data Recovery SIHP # 50-10-27-26374, Data Recovery SIHP # 50-10-27-26379, Data Recovery SIHP # 50-10-27-26380, Data Recovery SIHP # 50-10-27-26381, Preservation SIHP # 50-10-27-26388, Data Recovery SIHP # 50-10-27-26389, Data Recovery</p> <p>NOTE: for details on Preservation recommendations, including some discussion of a preservation plan, see the Project Effect and Mitigation Recommendations Section.</p>
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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 a 360.131 acre parcel within portions of Kaloko Ahupua'a and Kohanaiki Ahupua'a, North Kona District, Hawai'i Island, TMK: [3] 7-3-009:025. The project area's west boundary is approximately 2.4 kilometers east from the western coastline of Hawai'i. The project area is bound by TMK [3] 7-3-009:017 and 026 to the west and east respectively, and Hina Lani Street to the south (Figures 1-4).

The approximately 360.131-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.

Fieldwork for the present project area was conducted simultaneously with fieldwork for three other adjacent parcels (TMK: [3] 7-3-009:017, 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] 7-3-009:025 only, but because fieldwork was occasionally conducted simultaneously, certain numerical sequences span all four TMKs. Specifically, burials were reported to SHPD upon their discovery, and therefore their numerical sequence reflects the discovery date for the entire Kohan 1 project; these numerical designations are therefore not necessarily sequential within the TMK.

The survey area for the current investigation included the entire approximately 360.131-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 *makai* portions of the project area (i.e., the Kaloko Industrial Area, Queen Ka'ahumanu Highway, and Hina-Lani Street), 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.

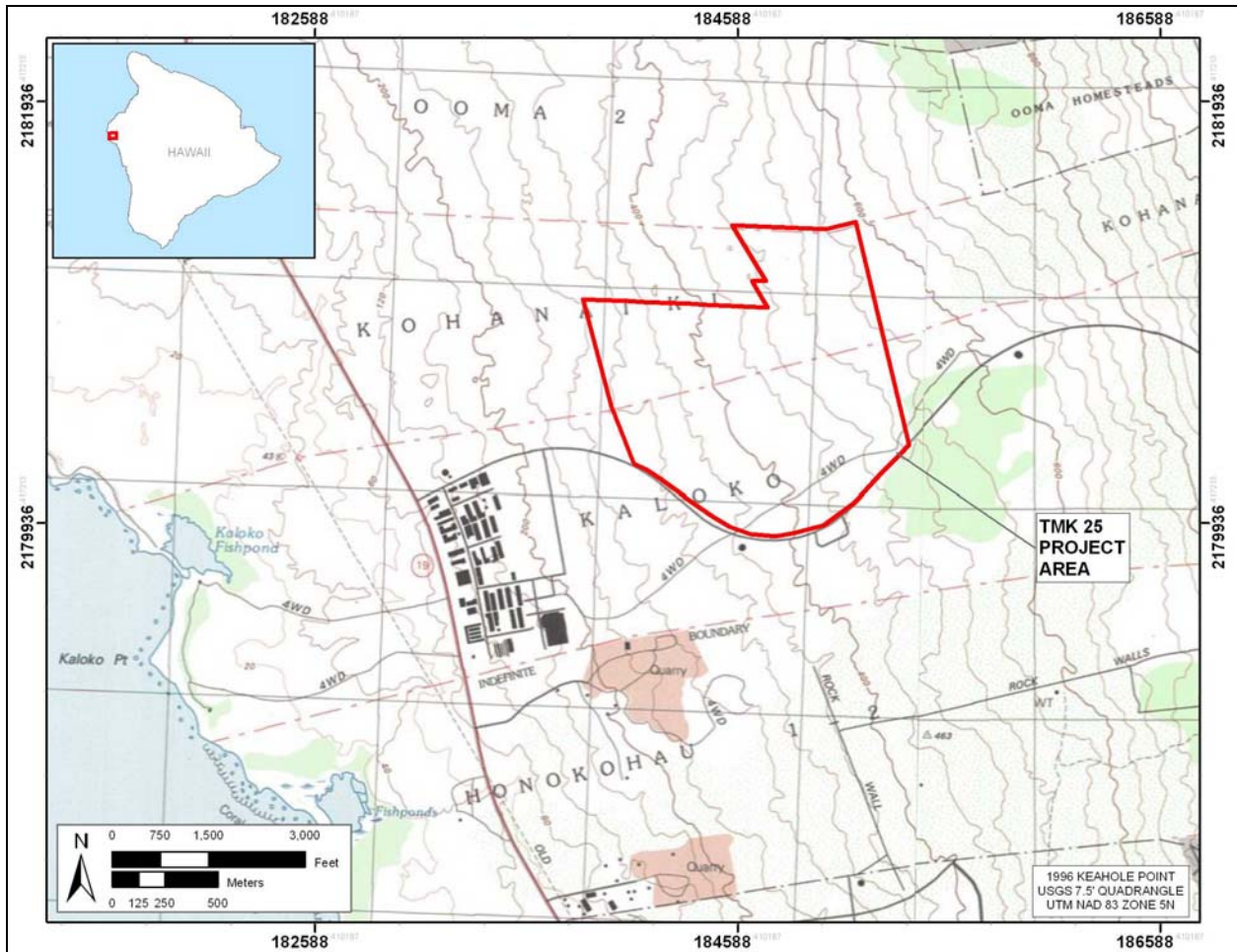


Figure 1. U. S. Geological Survey Quad Map showing project area

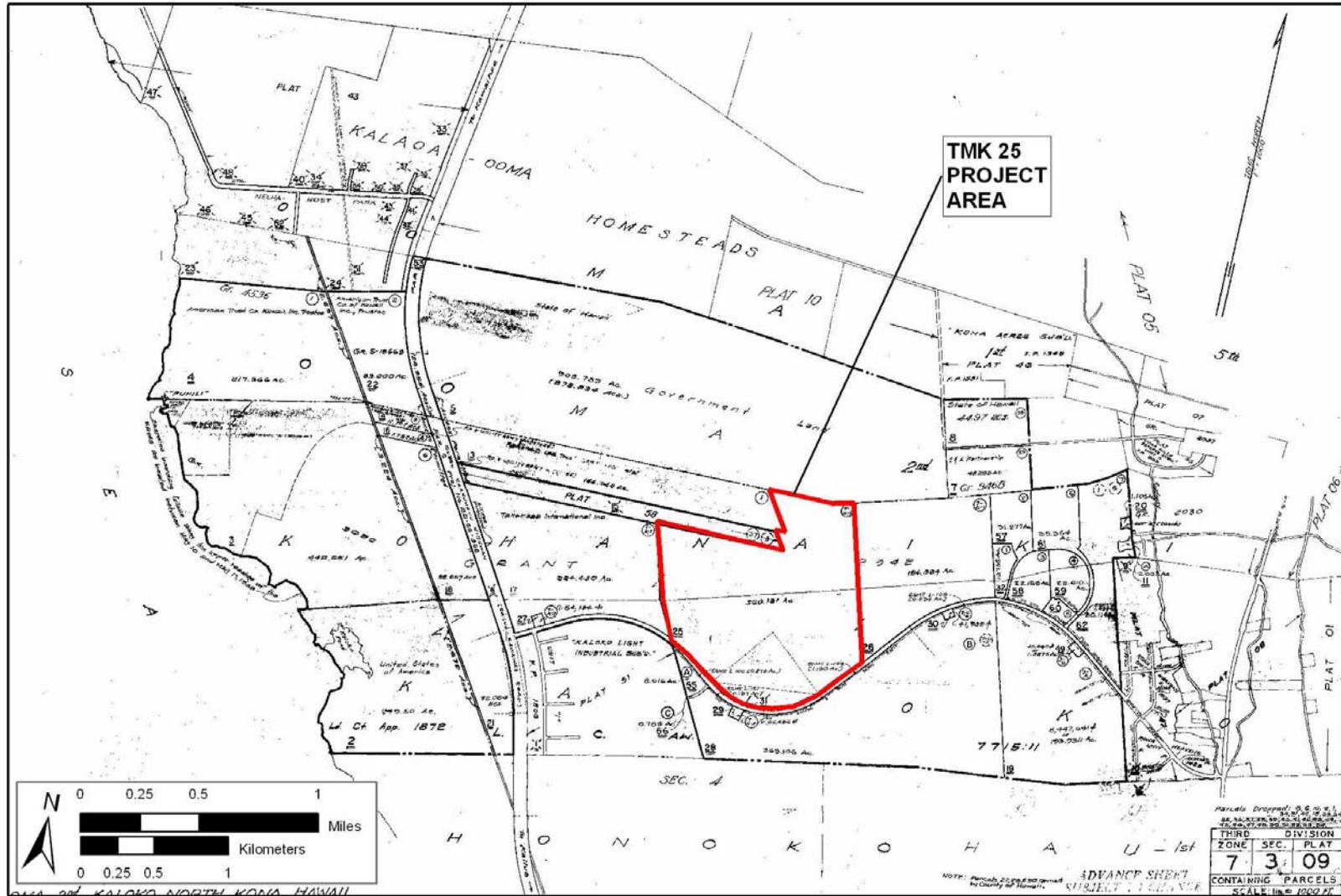


Figure 2. Tax Map Key (TMK) showing project area

Archaeological Inventory Survey of a 360.131-Acre Parcel within Kohanaiki and Kaloko, North Kona, Hawai'i Island

TMK: [3] 7-3-009:025

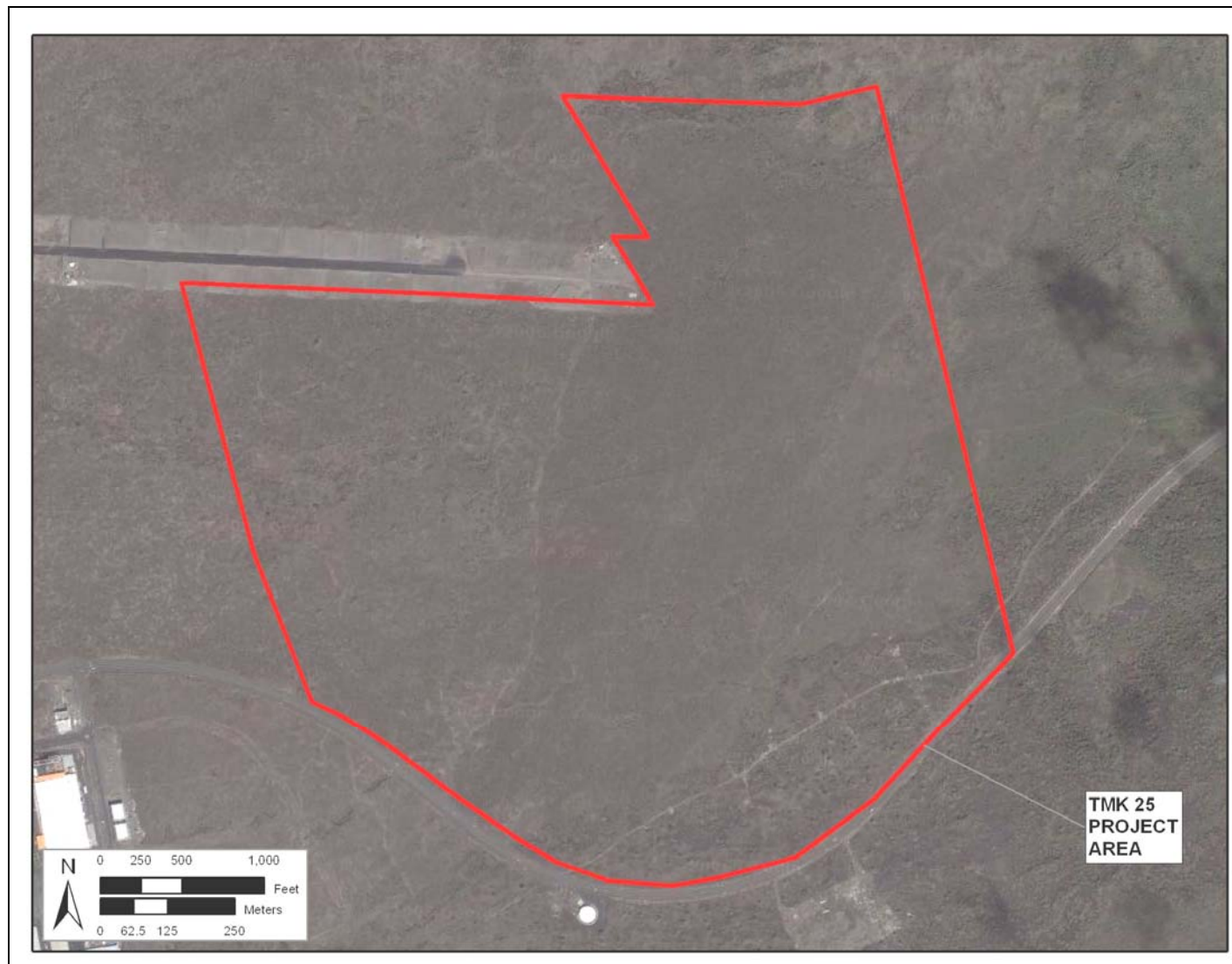


Figure 3. Aerial view of project area (source: USGS Orthoimagery 2005)

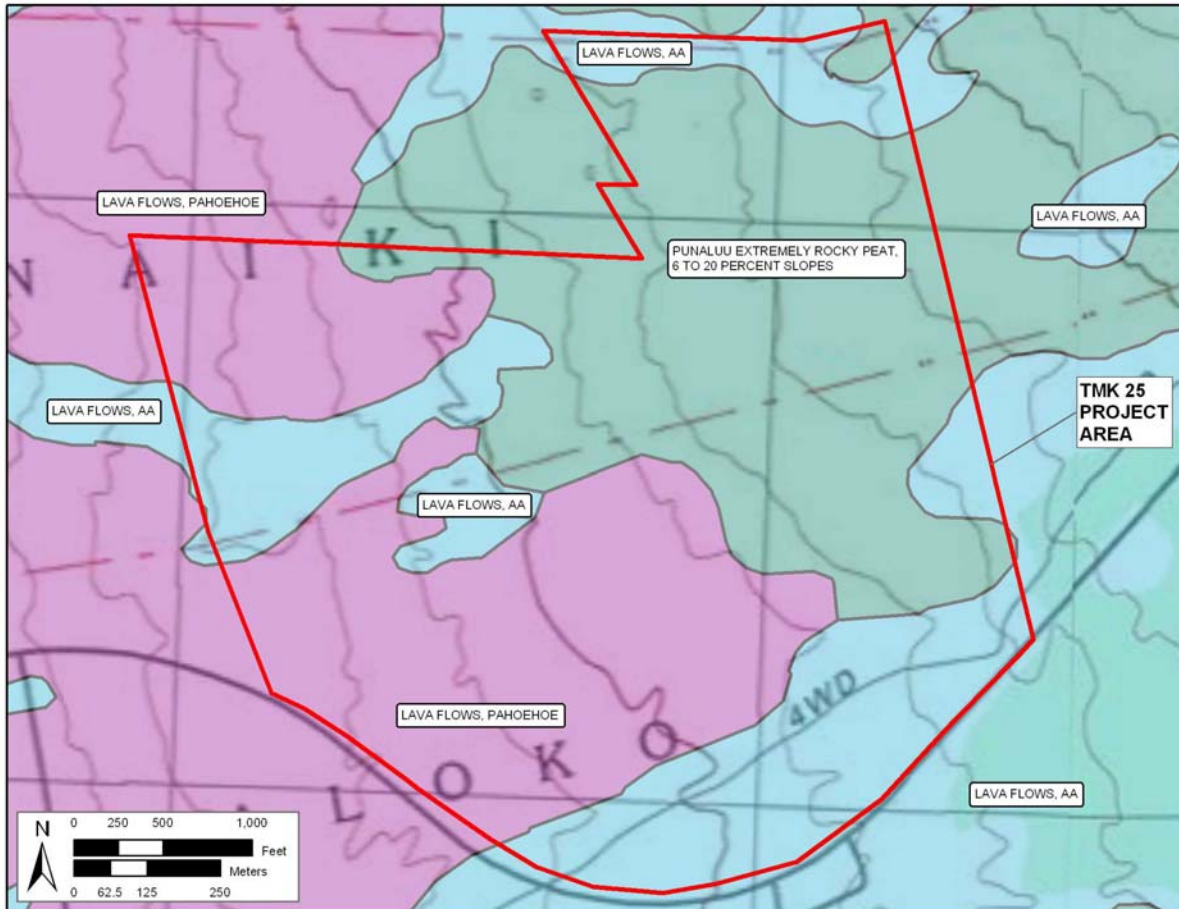


Figure 4. Soil map of the project area and vicinity

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 are to be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation is to include photographs and scale drawings of selected historic properties. All historic properties are to 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 were found, they were 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 was to focus on the specific area with general background on the *ahupua'a* and district and was to 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 City and County of Honolulu 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 360 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 Hualalai Volcano. The western boundary of the project area is 1.1 kilometers *mauka* of Queen Ka'ahumanu Highway, and is bordered by Hina-Lani Street to the south. Elevation within the project area ranges from 320 ft. a.m.s.l. at the western boundary to 560 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 which send warm air back out to sea. Rainfall in the 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 (Figure 4). An *'a'ā* lava flows occurs along the northern-most portion of the project area, extending roughly in a *mauka/makai* direction the entire length of the project area. Two smaller *'a'ā* flows are located in the center of the project area. One extends in a roughly northeast/southwest direction to the western boundary; the other is just to the south, and extends in the same direction for approximately 350 m. The largest *'a'ā* lava flow within the project area occurs along the southern-most portion of the project area, extending roughly in a *mauka/makai* direction the

entire length of the project area. 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.

Punaluu extremely rocky peat extends *mauka/makai* to the center of the project area (Figure 4). Punaluu soils consist of well-drained, thin organic soils over *pāhoehoe* lava bedrock. The soils are gently sloping to moderately steep. The natural vegetation associated with this soil type consists of *koa haole*, Christmas berry (*Schinus terebinthifolius*), guineagrass (*Panicum maximum*), natal redbud (*Rhynchelytrum repens*), and sand bur. These soils are used for pasture (Sato et al. 1973).

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 (Figure 5-7), the built environment is distinct in the area surrounding the parcel. South of the project area is a large 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.

Hina-Lani Street, a major coastal/inland (*makai/mauka*) connector road, forms the southern boundary of the project lands. Bulldozer roads and activity are present in the project area and some may be related to the construction of Hina Lani Street. Isolated push piles, intermittent bulldozing and short roads are concentrated within the vicinity of Hina Lani Street and the center of the project area. A jeep road present since mid-century runs more or less *mauka/makai* just north of Hina Lani Street and is visible on the aerial view (see Figure 3). A bulldozer road, also visible on the aerial view, extends from Hina Lani Street north to the end of Huliko'a Drive, a modern road located north of the northwest half of the project area. There is also industrial development along Huliko'a Drive.

The historic *ahupua'a* wall between Kaloko and Kohanaiki runs *mauka/makai* across the center of the project area. The easternmost portion of the wall has been bulldozed and a second portion was damaged by the bulldozer road running from Hina Lani Street to Huliko'a Road. Bulldozer activity also removed sites that had been previously identified by Kennedy (1983, 1984) and impacted other sites found during the survey.

The project lands themselves are generally undeveloped, and appear not to have been dramatically impacted by modern activity other than the fairly extensive bulldozing. Some

modern cattle ranching has apparently taken place intermittently within the project area, with some barbed-wire fencing and a wooden trough present; the historic *ahupua'a* wall is also a good indication that historic animal husbandry occurred in the area. Modern trash and occasional transient camps were found near some historic properties, but generally this type of modern disturbance is concentrated near the project boundaries (i.e., near Hina-Lani Street).



Figure 5. Overview photo of the central project area from near SIHP -26324, looking *mauka* (northeast) over thick *koa haole* and grasslands on older *pāhoehoe*.



Figure 6. Overview photo of project area, looking *makai* (southwest), from same location as above. Light grass alignment is a probable bulldozer road.



Figure 7. Overview photo of project area, looking *mauka* over 'a'ā flow along *makai* boundary of the project area. Hualālai dominated far background and industrial development visible along Huliko'a Drive on far left

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., Kelley Esh, M.A., Jason Pickin, B.A., Mark Oxley, B.A., Shawn Fehrenbach, B.A., Doreen Hrivnak, B.A., Kevin Dalton, B.A., and Hallett H. Hammatt, Ph.D (principle investigator). The fieldwork took place on the following dates: 6 March 2007 to 17 May 2007; with limited testing occurring periodically from July 6 to August 8, 2007, taking 230 person-days to complete.

The fieldwork component of the archaeological inventory survey was carried out under archaeological permit number 07-19 and 08-14 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 360-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 to 10 meters, varying based on visibility due to vegetation cover. 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.

2.1.1 Recording Agricultural Sites

Agricultural features in the project area tended to be minimal modification, low-intensity and spread over broad areas (sometimes over several hundred meters). For recording purposes, a single agricultural site number (SIHP No. 50-10-27-26281) was assigned for these pervasive agricultural features, with feature and sub-feature designations serving to differentiate various levels of intensity and variations in form. Minor agricultural activity associated directly with a site primarily functioning for other purposes (i.e., habitation), was included in the description for that site.

2.1.2 Recording Lava Tubes

Lava tubes are common within the project area, especially on the *pāhoehoe*, and vary greatly in size and shape. All openings in the bedrock were examined for the presence of cultural modification or cultural material. Any opening that appeared large enough to explore was examined thoroughly. Generally, an average size person can fit through a tube entrance 30 centimeters in diameter or greater, but the shape and geology of lava tubes varies greatly and occasionally a smaller size opening could be entered; likewise, sometimes a larger than 30 centimeter opening could not be traversed due to jagged edges, etc. Every effort was made to explore the entirety of all lava tubes to their terminus, within reason as far as tube size and safety (i.e., heavily collapsed tubes were entered with caution). When a tube can no longer be explored due to size or safety, this is considered its cultural terminus, and is denoted as impassable on maps. It should be noted that cultural material and burials have been located in lava tubes with entrances which were only barely physically passable, even for the most petite archaeologists in our group, and that native Hawaiians certainly did utilize some passages measuring far less than 30 centimeters in diameter.

The primary purpose for the intensive exploration of lava tubes is to locate any human remains that may be present in remote areas of a lava tube, in addition to locating other cultural material. Lava tubes were traditionally used for concealment of burials, and human remains are often located far from any other cultural modification, sometimes at great distances from tube entrances; these burials may have been placed in the lava tube using an entrance that was then filled and concealed on the surface. Therefore, in an effort to locate all burial locations within the project area, a thorough effort was made to explore all lava tubes and side tubes to their natural or cultural terminus.

As mentioned above, human utilization of lava tubes sometimes involved blockage of entrances and inner side tubes. In order to complete the inventory survey, it was necessary to pass this type of blockage; when possible, this was done by finding another passageway for access behind the blockage or attempting to assess what was behind the blockage (i.e., solid lava tube wall vs. a continuing passageway) without disturbing the blockage. If it was determined that the tube did continue past blockage and there was no other way to access the tube, a photo was taken of the blocked area and then boulders and cobbles were carefully removed until an archaeologist could pass through. After inspection of the lava tube, the rocks were replaced as carefully as possible to their original position.

All lava tubes with cultural material present were mapped using a compass for bearing and a laser for distances (Stanley FatMax Tru-laser Distance Measurer; stated accuracy for this device is +/- 6 cm). The laser reflects well off most surfaces in tubes, and is an excellent alternative to the rather impractical method of pulling measuring tapes through cramped areas, or simply estimating distances (it is extremely difficult to accurately estimate distances in lava tubes; see Wolforth 2005:24). The laser method may actually increase the efficiency of mapping tubes, since accurate measurements can be obtained nearly instantaneously; overall the laser method seems to produce more accurate maps than simply estimating distances in about the same amount of time. In small tubes a regular measuring tape was used when practical.

Occasionally lava tubes extend long distances beyond any cultural modification. When this occurs, lava tubes are explored to their natural or cultural terminus. Maps are produced for all areas containing cultural materials, and the rest of the lava tube is described but not necessarily mapped. A distance and bearing from the site tag is given for all burials within lava tubes.

2.2 Laboratory Methods

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

1. Identification of invertebrate midden. Common marine shells were identified and analyzed at the Cultural Surveys Hawai'i laboratory in Kailua, Hawai'i.
2. Identification of vertebrate faunal material. All vertebrate faunal material was identified and analyzed at the Cultural Surveys Hawai'i laboratory in Kailua, Hawai'i.
3. 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.
4. Preparation and submittal of datable material, such as charcoal, to Beta Analytic for radiocarbon dating was planned, however, the amount of charcoal recovered was not sufficient for data.

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 and Shideler 1996) was conducted for TMK 7-3-09:17, adjacent to the project area, in 1996. Informants knowledgeable of TMK 7-3-09:17 and the project area vicinity were interviewed. These consultations focused on identifying traditional cultural practices conducted adjacent to the project area as well as addressed community concerns regarding possible burial sites. A summary of the consultation effort is presented in Section 6.

Cultural Surveys Hawaii, Inc. is currently conducting consultation with organizations and the community to identify *kūpuna* and other individuals with knowledge of the history of the project area and its surroundings. The results of these interviews will be presented in a companion report for this project, titled “Cultural Impact Assessment for the Kohanaiki Project (Magat et al. 2008)”, and will include consultation for all four parcels within the “Kohan 1” project (including the current project area). The on-going consultation with organizations includes the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), and the Hawai'i Island Burial Council.

Section 3 Background Research

3.1 Traditional and Historical Background

3.1.1 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 area 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 was very scarce. Water, he was told, could be obtained in "celebrated" caves, but these caves were *kapu* (forbidden), and if caught, trespassers would be killed by the owner of the cave. However, Ko'amokumokuohe'eia discovered a very small cave entrance that no else knew about. The cave had water dripping from its roof (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 difficult to procure resource, as well as highlighting the importance of water collection caves.

John Ka'elemakule Sr., a Kekaha native wrote newspaper articles between 1928 and 1930 that provide details about life and customs in the last half of the 19th century. Kepa Maly (2003:41-42) translated these serial accounts that appeared in *Ka Hoku o Hawaii* written. The two following excerpts provide additional details related to water collection.

There were not many water holes, and the water that accumulated from rain dried up quickly. Also there would be weeks in which no rain fell... The water which the people who lived in the uplands of Kekaha drank, was found in caves. There are many caves from which the people of the uplands got water... [*Ka Hoku o Hawaii*, September 17, 1929:3].

...The *kūpuna* had very strict *kapu* (restrictions) on these water caves. A woman who had her menstrual cycle could not enter the caves. The ancient people kept this as a sacred *kapu* from past generations. If a woman did not know that her time was coming and she entered the water cave, the water would die, that is, it

would dry up. The water would stop dripping. This was a sign that the *kapu* of Kāne-of-the-water-of-life (Kaneikawaiola) had been desecrated. Through this, we learn that the ancient people of Kekaha believed that Kāne was the one who made the water drip from within the earth, even the water that entered the sea from the caves. This is what the ancient people of Kekaha wai 'ole believed, and there were people who were *kia 'i* (guardians) who watched over and cleaned the caves, the house of Kāne... [*Ka Hoku o Hawaii*, September 24, 1929:3].

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 this information about the lands of Kekaha:

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. Especially detailed study of Kaloko has resulted in the following analysis of the development of pre-contact settlement throughout the *ahupua 'a*:

Throughout its span of occupation Kaloko was but part of a larger society. Kaloko was apparently a unified community after A.D. 1200-1300. When initially occupied (A.D. 1000-1500), it may have been an outlier of another community. Nevertheless, from its initial occupation, Kaloko had 1 or more internal local residence groups containing constituent households. By A.D. 1200-1300 at least 2 residential groups were present in the community, and by contact (circa A.D. 1778) at least 4 residential groups had dwelled in the area. Each residential group performed religious functions as well as being a leisure unit. Members of the group held use rights to adjacent farm lands and probably to areas where forest

and marine resources were located. Within each residential group, 1 household seems to have been dominant, being the spatial focus for its group's religious activities. It is suggested that such dominance was a function of consanguineal seniority and/or wealth. (Cordy et al. 1993:45)

While exact population figures for Kaloko were not possible, the study suggested that the “community seems to have gradually grown in size but could never have been larger than 118 and most likely was about 60-100 in size” (Cordy et al. 1993:45). The general pattern of land use and settlement suggested for Kaloko may also have existed within the similar environment of neighboring Kohanaiki.

A detailed study of Kaloko by Cordy et al. (1991) 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 (2001):

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 [National Parks Service 2001].

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).

3.1.2 Early Historic Period

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 Kealakekua 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-maheihei 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*, *kīhāpai*, 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.

3.1.3 Mid- to late -1800s

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 Hulikoa 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 Hulikoa’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 Keikepuipui, 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 *konohiki* 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[s] there now”, adds details that suggest the mauka Kaloko-Honokohau 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.”

During the 1880s, Kona lands - including Kaloko and Kohanaiki - were surveyed by J.S. Emerson for the Hawaiian government. A portion of his Registered Map (RM) 1449, Akapipu‘u Section (Figure 8) shows a trail through the project area; the trail actually ran from the Kohanaiki Homesteads to the Kaloko fishpond. Emerson produced three maps corresponding to the project area during this time period: Registered Map (RM) 1280, RM 1449, and RM 1512. Emerson’s

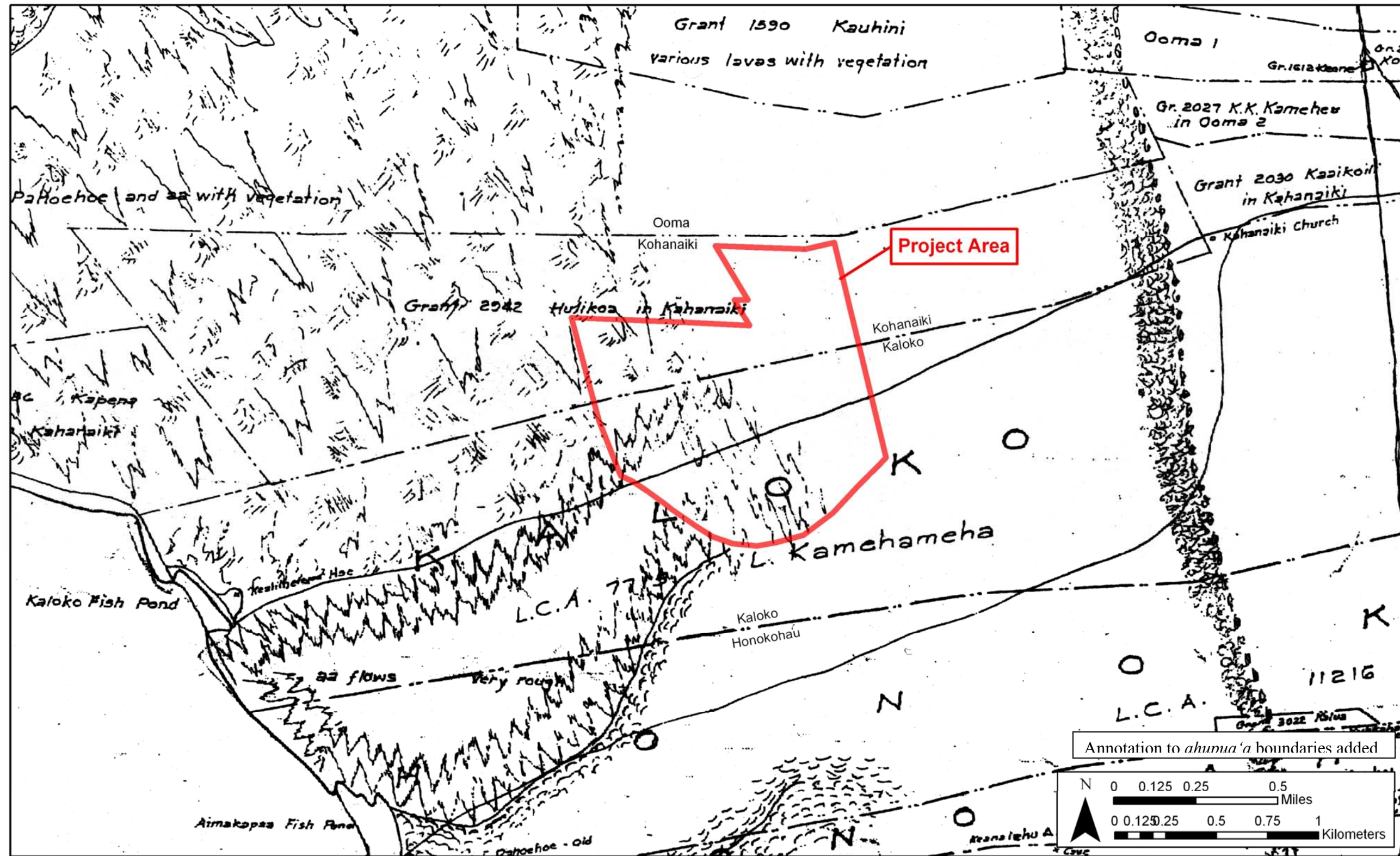


Figure 8. Portion of Registered Map 1280 by J. S. Emerson showing approximate location of project area

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 8) 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 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 9) 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 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 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)

Oral history interviews (Maly and Maly 2003) relate that in the mid 1800s only a few residences were on the coastal lands, in the uplands above 900 ft. elevation, and in the vicinity of Māmalahoa Highway (east of the project area). The land between 900 ft. and the coast was cattle, donkey, and goat pasturage. *Mauka/makai* trails through Kohanaiki, Kaloko, Kalaoa, and

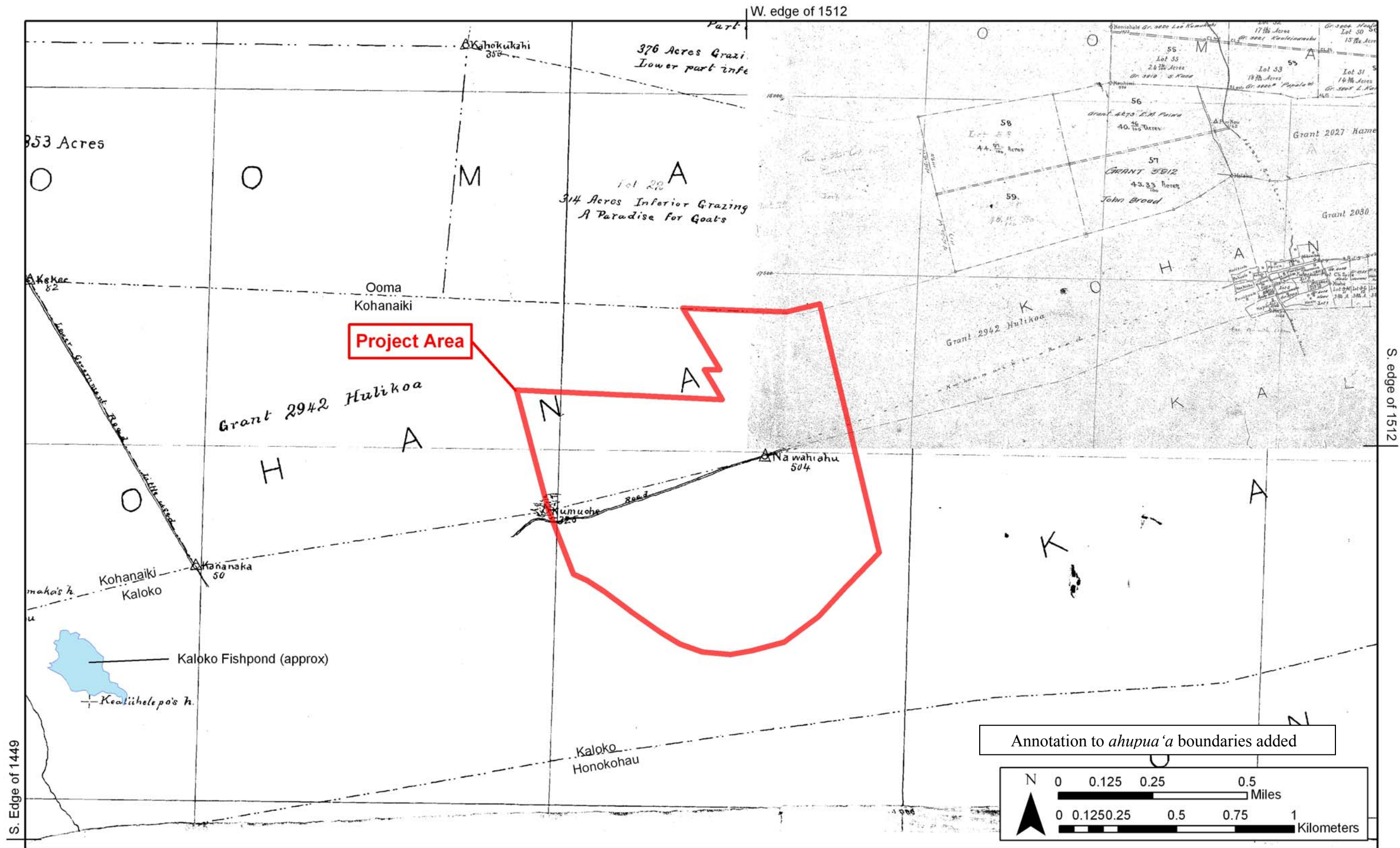


Figure 9. Portions of Emerson's RM 1449 (1888) and RM 1512 (1889) showing the road from Kohanaiki Homesteads

Honokōhau were utilized by upland families to access the coast to fish, and gather water during upland droughts.

Kaloko and most of Kohanaiki 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.

3.1.4 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".

Ranching, however, steadily increased. Once John Maguire purchased the former chiefly lands of Kaloko in 1906 after the deaths of Kalakaua and Kapiolani (Kelly 1971:29), the *ahupua'a* uplands were developed 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. The 1924 USGS map (Figure 10) shows "the road to the sea" connecting the Kohanaiki Homesteads with the Kaloko fishpond, and crossing the project area at the *ahupua'a* boundary between Kohanaiki and Kaloko. In the first half of the 20th 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). Huehue Ranch bulldozed a jeep road to the shore around 1955 (Figure 11) 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.

3.1.5 Modern Land Use

While the present project area is largely undeveloped, surrounding areas have seen increasing modern use. The Huehue Ranch jeep road and other signs of animal husbandry activity can be

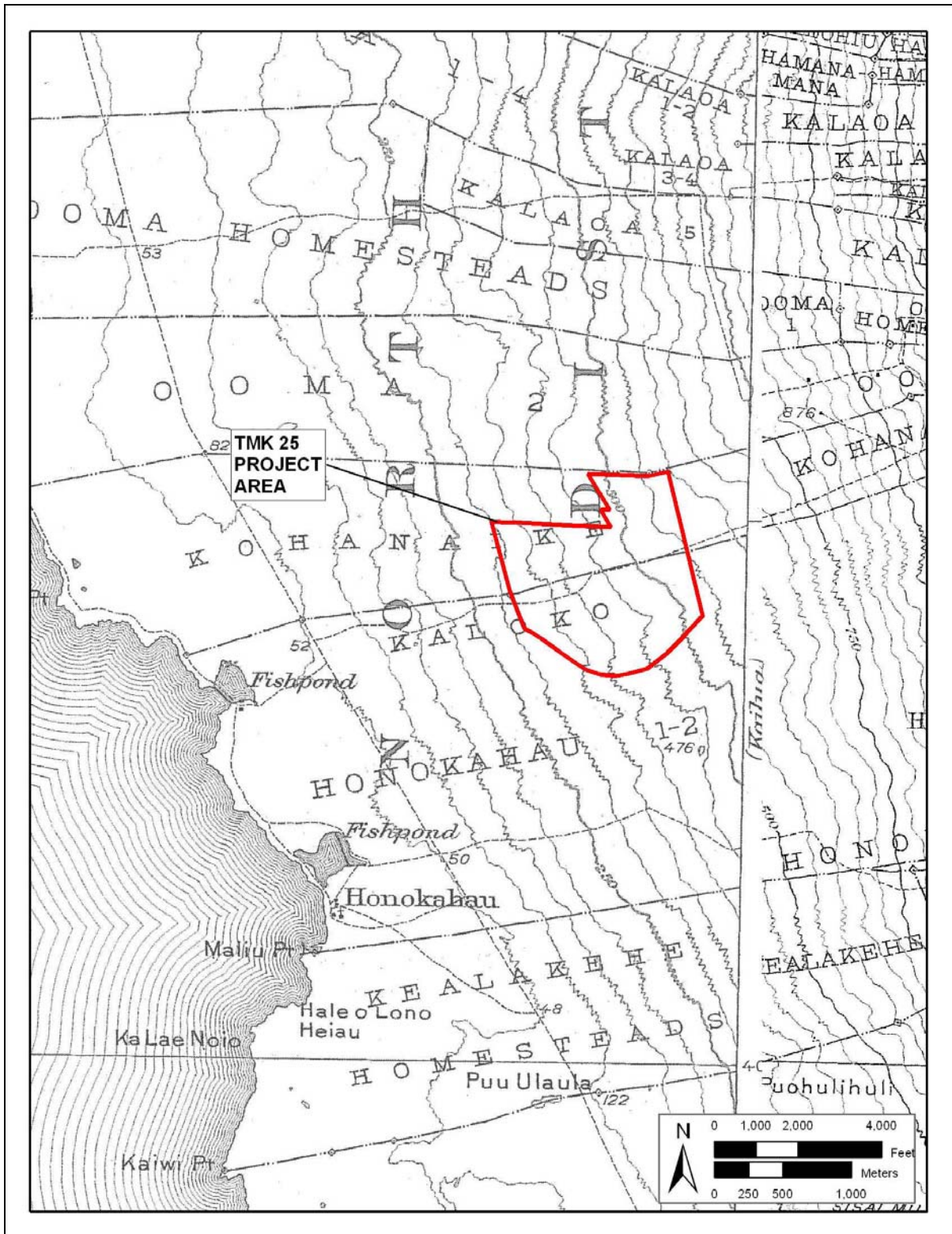


Figure 10. Portion of 1924 USGS map, Keahole Point and Kailua quadrangles, with overlay of project area

seen on the 1959 USGS map (Figure 10). More recent nearby development is largely industrial, and the Kaloko Industrial Area is just southwest of the project area, including large stores such as Home Depot and Costco. Hulikoa Road is also heavily developed, primarily as an industrial area, along a portion of the north border of the project area. Hina-Lani Street runs along the south border of the project area, and leads mauka to a residential area (Kona Heavens) before the Palani junction (at Māmalahoa Highway), as well as leading *makai* to the modern Queen Kaʻahumanu Highway.

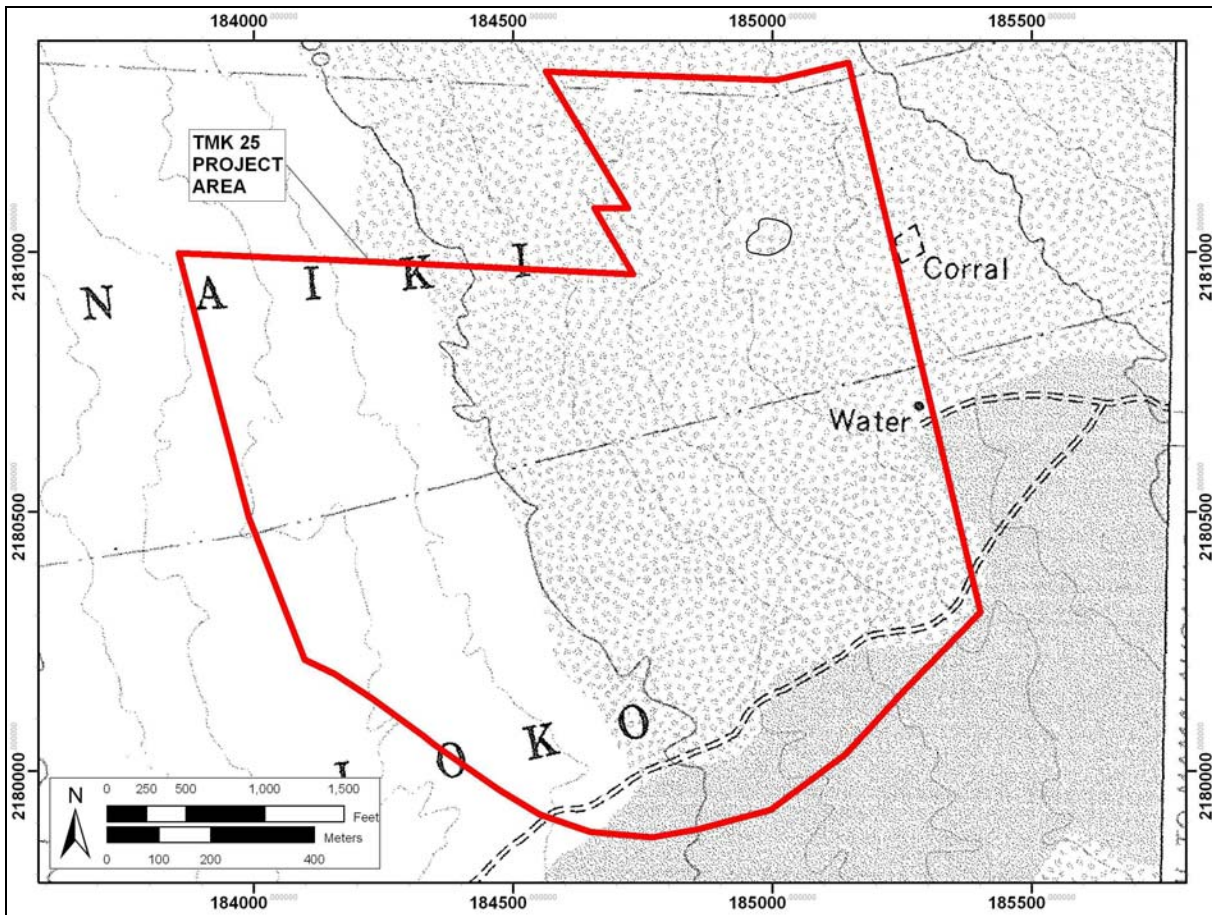


Figure 11. Portion of 1959 USGS map, Keahole Point quadrangle, with overlay of project area showing jeep road and signs of historic/modern animal husbandry

3.2 Previous Archaeological Research

3.2.1 Overview of Archaeological Studies Conducted within Kohanaiki and Kaloko

This section provides a general overview of archaeological studies in Kaloko and Kohanaiki *ahupua'a*. Table 1 lists archaeological studies in this area with brief comments; studies most relevant to the current project are discussed in additional detail in the text. The section following this discusses previous archaeological studies within the present project area in greater detail.

Previous archaeological surveys conducted (Figure 12) 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, Honokohau, 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 Honokohau 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 as of 1971.

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-Honokohau National Park (e.g. Honokohau 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).

Cordy (1981) conducted a survey of the coastal area (up to 1/2 mile inland) of Kohanaiki in 1975; twelve sites were recorded including: pavings, platforms, enclosures and a trail. Eleven of the sites were interpreted as habitation constructs including sleeping houses, men's houses, special purpose, and a canoe house/men's house.

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

Table 1. Previous Archaeological Studies Within Kohanaiki and Kaloko *ahupua'a* (projects in present study area are in bold)

Source	Nature of Study	Area of Study	Finds	Comments
Reinecke 1930	Cursory survey	Coastal Survey	Briefly notes numerous sites	All sites <i>makai</i> of present project area
Emory & Soehren 1971	Cursory survey	Coastal Survey	Briefly notes numerous sites	All sites <i>makai</i> of present project area
Kelly 1971	Historical survey and background	Kaloko and Kuki'o <i>ahupua'a</i>	Background study	Good background study
Renger 1971	"Field Notes" of " <i>Mauka</i> excavations"	" <i>Mauka</i> excavations"	"Field Notes" describe several sites	No site location map thus hard to be sure where sites are
Soehren 1979	Letter Report Reconnaissance Survey	Kaloko Access Road Corridor (Hina-Lani Street)	No finds	Letter Report not actually seen
Soehren 1980a	Letter Report Reconnaissance Survey	Kaloko lowlands	No finds	Letter Report not actually seen
Soehren 1980b	Letter Report Reconnaissance Survey	Kaloko Access Road Corridor	Discusses 3 stepping stone trails, 2 <i>ahu</i> & a lava tube complex	Hina-Lani Street Letter Report not actually seen
Hammatt (ARCH) 1980	Archaeological Reconnaissance	410 acre parcel	Identified 2 sites	<i>Mauka</i> of present project area
Barrera Jr. 1983	Archaeological Reconnaissance	TMK 7-3-9:19	No finds	No map
Soehren 1983	Archaeological Reconnaissance Letter Report	-	-	Not seen
Kennedy 1983	Archaeological Reconnaissance	Within present project area	Identifies 27 sites	Within present project area
Kennedy 1984	Intensive Archaeological Survey	Within present project area	Results of investigations of 25 sites	Within present project area
Barrera Jr. 1985	Archaeological Survey	409 acres 700 to 1080' elevation	58 sites	<i>Mauka</i> of present project area

Source	Nature of Study	Area of Study	Finds	Comments
Donham 1986	Archaeological Reconnaissance Survey	470-acres <i>makai</i> of Queen K Hwy	105 sites	Kohana-iki development
Rosendahl & Haun 1987	Archaeological Reconnaissance Survey	3 1-acre parcels, 2 in present project area	Their project area <i>mauka</i> of present project area had one site	Water tanks along Hina-Lani Street
Barrera Jr. 1988	Archaeological Excavations	YO Project Area	60 sites	Report not actually seen
Rosendahl 1989a	Letter Report Addendum to Archaeological Inventory Survey	Addl info re: site 13493 stepping stone trail by <i>makai</i> tank	Identified one <i>pāhoehoe</i> slab trail (site 13493)	Water tank <i>makai</i> of present project area
Rosendahl 1989b	Field Inspection	Kaloko Mauka Parcel # 1	Identified 4 sites	Report not actually seen
Rosendahl 1989c	Field Inspection	Kaloko Mauka Parcel # 2	No sites identified	Report not actually seen
Rosendahl & Walker 1990	Addendum to Archaeological Inventory Survey	Addl info re: site 13493 trail by <i>makai</i> tank	Addl info re: site 13493 trail by <i>makai</i> tank	Water tank <i>makai</i> of present project area
Rosendahl & Walker 1991	Archaeological Field Inspection	Industrial crusher site, 2 adjacent 10 acre parcels	Identified a trail with two cairns	South of present project area
Barrera Jr. 1991	Archaeological Inventory Survey & Data Recovery Report	800 to 1100'	Identified 61 sites	<i>Mauka</i> of Present Project Area
Cordy et al 1991	An Ahupua'a Study: The 1971 Archaeological Work at Kaloko	Kaloko-Honokōhau National Park	94 sites identified	<i>Makai</i> of Present Project Area
Kennedy 1991	Surface Reconnaissance	Long thin industrial development	No significant finds	<i>Makai</i> of present project area
Barrera Jr. 1993	Archaeological Inventory Survey	5.7 acres; 1450 to 1630' elevation	Identified 40 features of Kona Field System	<i>Mauka</i> of Present Project Area

Source	Nature of Study	Area of Study	Findings	Comments
Fager & Graves 1993	Archaeological Inventory Survey	Kaloko Industrial Park parcel	Identified 17 sites with 60 component features	<i>Makai</i> of present project area, south of Hina-Lani Street
Fager & Rosendahl 1993	Interim Report Archaeological Inventory Survey	Kaloko Industrial Park parcel; 15+ acres	Identified 17 sites with 60 component features	Just <i>makai</i> of present project area, south of Hina-Lani Street
Henry & Graves 1993	Archaeological Inventory Survey	Transmission line project <i>mauka</i> side of Queen K Hwy.	Identified 8 sites <i>makai</i> of project area	<i>Makai</i> of present project area
O'Hare & Rosendahl 1993	Report on burials	On coast	Report on burials	Kohana-iki Resort project
Rosendahl 1993	Archaeological Field Inspection	Kaloko Mauka Parcel	4 sites discussed	Report not actually seen
Nees & Williams 1995	Archaeological Investigations	110 acres, 2100 to 2900' elevation	Identified enclosure, lava tube, terrace, wall, mounds	<i>Mauka</i> of Present Project Area
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	<i>Makai</i> of Present Project Area
Colin et al. 1996	Archaeological Inventory Survey	224 acres <i>makai</i> of present project area	Identified 55 sites	Just <i>makai</i> of present project area
Rechtman 1998	Archaeological Field Inspection	2400-2500' elevation	No finds	<i>Mauka</i> of Present Project Area
Rechtman & Henry 1999	Archaeological Inventory Survey	1450-1620' elevation	Identified 15 sites	<i>Mauka</i> of Present Project Area

Source	Nature of Study	Area of Study	Finds	Comments
Wolforth 1999	Monitoring Report	HELCO Keāhole- Kailua Transmission line corridor	Describes one site 21258	Says Walsh & Hammatt previously id'd site as 19946 (on <i>makai</i> side of hwy)
Haun & Henry 2000	Archaeological Inventory Survey	Kaloko Industrial Park TMK: 7- 3-51:60; 102- acre parcel	45 sites with 81 features	<i>Makai</i> of present project area south of Hina- Lani Street
Rosendahl 2000	Archaeological Assessment	2435-2730' elevation	No finds	<i>Mauka</i> of Present Project Area
Clark & Rechtman 2002	Archaeological Inventory Survey	1200' to 1600' elevation	Identified 5 sites	<i>Mauka</i> of Present Project Area
Haun & Henry 2002	Data Recovery Plan	Kaloko Industrial Park TMK: 7- 3-51:60; 102- acre	Data Recovery Plan addresses 8 specific sites	<i>Makai</i> of present project area south of Hina-Lani Street
Rechtman & Rivera 2002	Archaeological Assessment	3-7-3-26:4; 3,100'	No finds	<i>Mauka</i> of Present Project Area
Cobb, Elmore, and Kennedy 2003	Archaeological Assessment	TMK: 7-3- 09:25, 26 & 28 at Kaloko and Kohanaiki (400 acres)	Briefly identifies 154 features	Descriptions quite brief; map hard to correlate with sites found in present survey
Haun 2003	Archaeological Assessment	400-Acre Portion of TMK 7-3-09:28 Kaloko	Identifies 8 sites (63 features) in present project area	Helicopter flight overhead led him to focus on open 'a 'ā area

Source	Nature of Study	Area of Study	Finds	Comments
Haun et al. 2003	Data Recovery Report	Kaloko Industrial Park TMK: 7-3-51:60; 102-acre	Data Recovery Report addresses 8 specific sites	<i>Makai</i> of present project area south of Hina-Lani Street
Moore & Kennedy 2003	Archaeological Inventory Survey	Roadway Corridor	Identified 1 site (23973) 2 mounds	South boundary of project area
Puette & Dye 2003	Archaeological Inventory Survey	22 acres 2100 to 2400' elevation	No finds	<i>Mauka</i> of Present Project Area
Rechtman 2003	Archaeological Assessment	3-7-3-26:5; 3,100' elevation	No finds	<i>Mauka</i> of Present Project Area
Elmore et al. 2004	Archaeological Inventory Survey	1400' elevation	Identified one historic site 24133	<i>Mauka</i> of present project area
Shideler, and Hammatt 2005	Archaeological Field Inspection and Literature Review	1,200+ Acres in Kaloko and Kohanaiki	Numerous pre-contact sites observed, including: habitations, agricultural features, petroglyphs, boundary walls, and burials	Within present project area
Wolforth et al. 2005	Archaeological Inventory Survey	TMK: [3] 7-3-09: 032	A total of 89 sites were identified, consisting of burials, perm. habitation, temp. habitations, religious sites, trails, boundary walls, and agricultural sites	<i>Mauka</i> of present project area

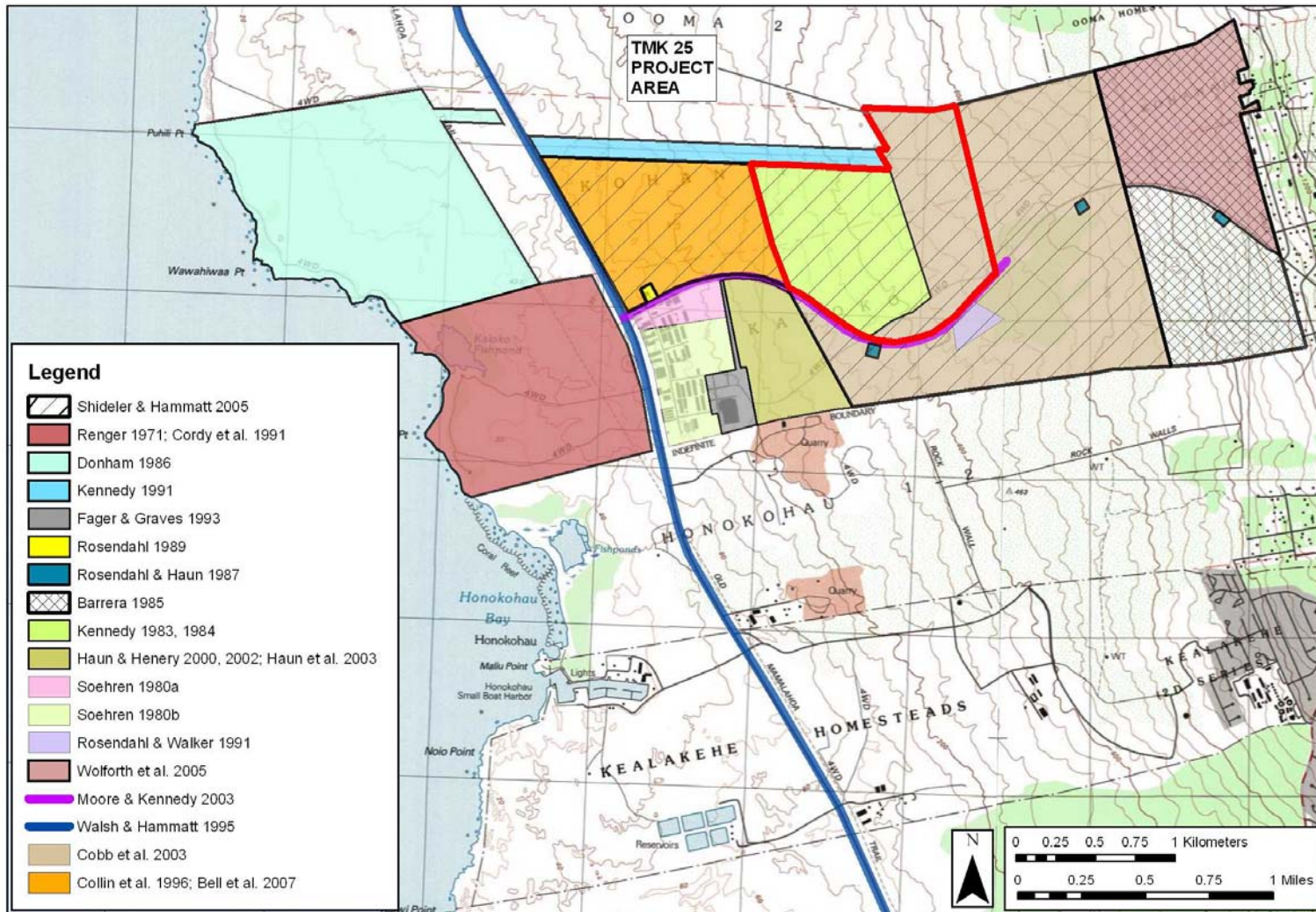


Figure 12. Map of previous archaeological studies in the project area and its vicinity

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 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, 750 meters *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 the 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 within the *mauka*-most parcel. Subsequently, in 1989, an additional water tank site parcel (TMK: 3-7-3-10:Por.17) - measuring 360 ft. north/south and east/west - was subject of an archaeological inventory survey (Rosendahl 1989). The parcel bordered the north side of the then "proposed Kamanu Street extension in the Kaloko Light Industrial Park" at the south boundary along Hina-Lani Road. One site was recorded and designated state site 50-10-27-13493:

a steppingstone trail segment measuring 7.5 m (24.6 ft.) long (E-W) by 0.6-0.7 m wide (1.97-2.30 ft.) (N-S)...located on a section of aa lava...The segment consists of approximately six flat and roughly round pahoehoe slab steppingstones set on worn aa gravel. The steppingstones measure c. 0.4 m (1.31 ft.) in diameter by 0.1 m (0.33 ft.) 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. north/south by 7260 ft. *mauka/makai* (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 1991, William Barrera produced an archaeological inventory survey and data recovery report of an extensive area just inland (*mauka*/east) of the present study area in which he identified 61 sites. These sites were rather clumped in the east central portion of his project area.

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 sites in the Coastal Zone, 30 sites 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 Street at an elevation of approximately 450 ft AMSL. A trail and two associated cairns were identified.

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 extended from the main project area to Kamanu Street. 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 powerline (the new right-of-way boundary) and continuing inland at 65 degrees T.N. for at least another 100 feet (30 m.) [Walsh and Hammatt 1995:51].

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

In recent years a number of studies have been undertaken in the Kaloko Mauka lands (east and upslope from the present project area) including studies by Barrera Jr. 1993, Nees & Williams 1995, Rechtman 1998, Rechtman and Henry 1999, Rosendahl 2000, Clark & Rechtman 2002, Rechtman and Rivera 2002, Puette & Dye 2003, Rechtman 2003, and Elmore et al. 2004.

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 1,000 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. A historic wall that runs along the *ahupua'a* boundary between Kaloko and Kohanaiki extends from TMK 32 into TMK 25.

In 2007, CSH completed an archaeological inventory survey of a 224+ acre project area in Kaloko and Kohanaiki [TMK (3) 7-3-009:017], *makai* of and adjacent to the current project area. 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 during the inventory survey investigation. CSH had previously conducted an archaeological inventory survey (Colin et al. 1996) in the same project area in 1996 with limited subsurface testing for Kimura International; the project was terminated during the review process. Fifty-five (55) sites were identified in 1996. 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 2007 inventory survey two sites (Site -20706 & -20741) identified by Colin et al. were determined to be outside of the project area, likely due to the lack of GPS technology during the 1996 survey. Site -20741 is within TMK 25, the current project area.

3.2.2 Archaeological Studies Conducted within the Present Project Area

The following is a summary of previous archaeological studies conducted within the current project area, discussed in chronological order (see Table 1, bold entries). Table 2 lists historic properties previously identified in the current project area

Survey work was undertaken in 1970-71 by Renger inland of the highway - i.e. that middle zone of Kaloko that includes a portion of the present study area. Although the findings of much of this fieldwork within the middle zone were written up in detail (Cordy et al. 1991), the findings from the survey sample conducted specifically within the project area (i.e. that portion of the middle zone situated on the inland side of the Queen Ka'ahumanu Highway) were not included because, "regrettably... it appears that the maps and survey records have been misplaced since the end of the 1971 field season" (Cordy et al. 1991:340). Renger's summary of the findings from that part of the survey indicated that fifteen features were identified:

Very few sites were discovered within the "transitional middle zone" ... between the coastal and upland exploitation zones ...Seven lava tube shelters, four trails (coast-upland), three platforms, two cairns ... two low-walled enclosures, and an L-shaped structure were recorded. (cited in Cordy et al. 1991:340)

These sites are presumably the subject of a set of Renger's (1971) "Kaloko Field Notes" that begins "*Mauka* Excavations" but in the apparent absence of any site location map it is difficult to relate these notes to specific sites in the field.

It is our understanding that Lloyd Soehren (1979) conducted a reconnaissance survey of the Kaloko access road corridor, understood as the present alignment of present Hina-Lani Street, but identified no sites.

In 1983 Joseph Kennedy conducted a reconnaissance and subsequent intensive survey (1984) of a parcel within the *makai* portion 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 cairn, 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].

Many (but not all) of the sites identified in 1984 are described and some of these sites were mapped. Excavations were carried out in three caves (Sites 11, 22 and 49 in the Kennedy 1984 numbering system)

In 2003, Archaeological Consultants of the Pacific, Inc. (Cobb et al. 2003) conducted an archaeological assessment of TMK (3) 7-3-009: 025, 026, and 028. One hundred fifty-four (154) features were identified and included "caves, walls, mounds, platforms, enclosures, trails, cairn, "C"-shaped structures, possible *heiau*, terraces, alignments and modified outcrops" (Cobb et al. 2003:1). Each feature was identified with a number prefaced with "TF", and descriptions included feature type, a brief description, possible function and a preliminary significance evaluation. The report map does not show the location of particular sites found during the survey but has colored points for sites indicating "High Concern, Potential High Concern, and Minimal Concern" (Cobb et al. 2003:5). The *mauka* portion of the current project area was included in the survey and several site tags from the 2003 survey were found in sites recorded during the current project (see below). One site, TF142, a cave with a small entrance and indeterminate function, was thoroughly surveyed by CSH in 2007; no cultural materials or modifications were present.

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] that included the current project area. Numerous pre-Contact sites including, habitations, agricultural features, petroglyphs, boundary walls, and burials were observed (Shideler & Hammatt 2005).

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

SIHP No. (50-10-27-)	Site Type	Function	Age	Reference
-10712	Wall	Animal Husbandry	Historic	Kennedy 1983, 1984; Wolforth et al. 2005
-20741	Complex	Temporary Habitation	Pre-contact	Colin et al. 1996
-26314	Enclosure	Permanent Habitation	Pre-contact	Cobb et al. 2003
-26319	Lava Tube	Activity areas	Pre-contact	Kennedy 1983, 1984; Shideler & Hammatt 2005
-26324	Lava Tube	Temporary Habitation	Pre-contact	Kennedy 1983, 1984; Shideler & Hammatt 2005
-26341	Lava Tube	Temporary Habitation	Pre-contact	Cobb et al. 2003
-26342	Lava Tube	Temporary Habitation	Pre-contact	Cobb et al. 2003
-26343	Lava Tube	Temporary Habitation	Pre-contact	Cobb et al. 2003
-26345	Complex	Quarry	Pre-contact	Cobb et al. 2003
-26375	Modified outcrop	Quarry	Pre-contact	Cobb et al. 2003

3.3 Background Summary and Predictive Model

3.3.1 Settlement Pattern

Kaloko Ahupua'a 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'omalu (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 the 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 prehistoric 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 archaeological research in Kaloko Ahupua'a (Cordy et al. 1991) a land usage summary of each zone is provided below.

3.3.1.1 Coastal Zone

The Coastal zone begins at sea level and extends to approximately 15 ft. a.m.s.l. The zone contains evidence of prehistoric 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. One household headed each residential group" (Cordy et al. 1991:522). 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 habitation known in leeward Hawaii (Cordy et al. 1991:473).

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

3.3.1.2 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.

3.3.1.3 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 (456,037 ft.)² between Kealahou Bay and Kailua Bay (Kirch 1985:225). 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).

3.3.1.4 Settlement Pattern Summary

The settlement pattern described above reveals a variety of land uses across all zones - including the Intermediate Zone - during the prehistoric 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.

3.3.2 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 21st 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 20th 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 as recorded by Kennedy 1984) and Woforth et al. (2005) in the 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 the early 1900s.

Section 4 Results of Fieldwork

4.1 Survey Findings

A total of 121 historic properties were identified within the project area (Table 3 and Figure 13). Making correlations with site identifications by Kennedy (1983, 1984) was highly problematic and was generally not possible with any certainty. Two of the historic properties were clearly previously identified and 119 are regarded as effectively newly recorded as part of the current inventory survey investigation (Table 3). Temporary CSH field numbers used during the field work portion of the inventory survey are listed in Appendix B.

Table 3. Archaeological Site Summary

SIHP No. (50-10-27-	Site Type	Function	Significance	Age
10712	Wall	Animal Husbandry	D	Historic
20741	Complex	Temporary Habitation	C, D	Pre-Contact
26275	Complex	Ceremonial	C, D, E	Pre-Contact
26276	Modified depression	Temporary Habitation	D	Pre-Contact
26277	Complex	Temporary Habitation	D	Pre-Contact
26278	Trail	Transportation	D	Pre-Contact
26279	Modified outcrop	Indeterminate	D	Pre-Contact
26280	Lava blister	Temporary Habitation	D	Pre-Contact
26281	Mounds	Agriculture	D	Pre-Contact
26282	Lava blister	Temporary Habitation	D	Pre-Contact
26283	Enclosure	Temporary Habitation	D	Pre-Contact
26284	Complex	Permanent Habitation	C, D	Pre-Contact
26285	Enclosure	Temporary Habitation	D	Pre-Contact
26286	Modified outcrop	Quarry	D	Pre-Contact
26287	Lava tube	Temporary Habitation	D	Pre-Contact
26288	Complex	Temporary Habitation	C, D	Pre-Contact
26289	Lava tube	Temporary Habitation	D	Pre-Contact
26290	Lava tube	Burial	D, E*	Pre-Contact
26291	Lava tube	Temporary Habitation/Quarry	D	Pre-Contact
26292	Lava tube	Temporary Habitation	D	Pre-Contact
26293	Lava tube	Temporary Habitation	D	Pre-Contact
26294	Wall	Indeterminate	D	Pre-Contact/ Historic
26295	Cairn	Marker	D	Pre-Contact
26296	Enclosure	Permanent Habitation	C, D	Pre-Contact/ Historic
26297	Lava tube	Temporary Habitation	D	Pre-Contact
26298	Platform	Temporary Habitation	D	Pre-Contact
26299	Lava tube	Temporary Habitation	D	Pre-Contact

SIHP No. (50-10-27-	Site Type	Function	Significance	Age
26300	Lava tube	Temporary Habitation	D	Pre-Contact
26301	Terrace	Temporary Habitation	D	Pre-Contact
26302	Cairn	Marker	D	Pre-Contact
26303	Lava tube	Temporary Habitation	D	Pre-Contact
26304	Lava tube	Temporary Habitation	D	Pre-Contact
26305	Modified outcrop	Temporary Habitation	D	Pre-Contact
26306	Modified outcrop	Indeterminate	D	Pre-Contact
26307	Complex	Ceremonial	C, D, E	Pre-Contact
26308	Enclosure	Temporary Habitation	D	Historic
26309	Complex	Temporary Habitation	D	Pre-Contact
26310	Lava tube	Temporary Habitation/Burial	D, E*	Pre-Contact
26311	Lava tube	Burial	D, E*	Pre-Contact
26312	Cairn	Marker	D	Pre-Contact
26313	Enclosure	Temporary Habitation	D	Pre-Contact
26314	Enclosure	Permanent Habitation	D	Pre-Contact
26315	Complex	Temporary Habitation	D	Pre-Contact
26316	Lava tube	Temporary Habitation	D	Pre-Contact
26317	Lava tube	Temporary Habitation/Quarry	D	Pre-Contact
26318	Lava tube	Temporary Habitation	D	Pre-Contact
26319	Lava tube	Activity Area	D	Pre-Contact
26320	Lava tube	Temporary Habitation	D	Pre-Contact
26321	Lava tube	Temporary Habitation	D	Pre-Contact
26322	Cairn	Marker	D	Pre-Contact
26323	Lava tube	Temporary Habitation	D	Pre-Contact
26324	Lava tube	Temporary Habitation	D, E**	Pre-Contact
26325	Lava tube	Temporary Habitation	D	Pre-Contact
26326	Lava tube	Temporary Habitation	D	Pre-Contact
26327	Lava tube	Temporary Habitation	D	Pre-Contact
26328	Platform	Temporary Habitation	D	Pre-Contact
26329	Enclosure	Temporary Habitation	D	Pre-Contact
26330	Lava tube	Temporary Habitation	D	Pre-Contact
26331	Complex	Permanent Habitation	C, D	Pre-Contact
26332	Enclosure	Temporary Habitation	D	Pre-Contact
26333	Lava tube	Temporary Habitation	D	Pre-Contact
26334	Complex	Temporary Habitation	D	Pre-Contact
26335	Enclosure	Permanent Habitation	D	Pre-Contact
26336	Trail	Transportation	D	Pre-Contact
26337	Complex	Temporary Habitation	D	Pre-Contact
26338	Lava tube	Temporary Habitation	D	Pre-Contact

SIHP No. (50-10-27-	Site Type	Function	Significance	Age
26339	Lava tube	Temporary Habitation	D	Pre-Contact
26340	Trail	Transportation	D	Pre-Contact
26341	Lava tube	Temporary Habitation	D	Pre-Contact
26342	Lava tube	Temporary Habitation	D	Pre-Contact/ Historic
26343	Lava tube	Temporary Habitation	D	Pre-Contact
26344	Complex	Permanent Habitation	D	Pre-Contact
26345	Modified outcrop/Lava tube	Quarry	D	Pre-Contact
26346	Trail	Transportation	D	Pre-Contact
26347	Lava tube	Temporary Habitation	D	Pre-Contact
26348	Complex	Permanent Habitation	C, D	Pre-Contact
26349	Complex	Temporary Habitation	D	Pre-Contact
26350	Complex	Permanent Habitation	C, D	Pre-Contact
26351	Lava blister	Temporary Habitation	D	Pre-Contact
26352	Cairn	Marker	D	Historic
26353	Trail	Transportation	D, E	Pre-Contact
26354	Complex	Temporary Habitation	D	Pre-Contact
26355	Trail/Wall	Transportation	D	Pre-Contact/ Historic
26356	Lava blister	Temporary Habitation	D	Pre-Contact
26357	Lava tube	Temporary Habitation	D	Pre-Contact
26358	Unknown/Bulldozed	Habitation/Indeterminate	D	Pre-Contact
26359	Trail	Transportation	D	Pre-Contact
26360	Wall	Animal Husbandry	D	Historic
26361	Trail	Transportation	D	Pre-Contact
26362	Lava tube	Burial	D, E*	Pre-Contact
26363	Lava tube	Temporary Habitation	D	Pre-Contact
26364	Lava tube	Temporary Habitation	D, E	Pre-Contact
26365	Lava tube	Temporary Habitation	D	Pre-Contact
26366	Wall	Animal Husbandry	D	Historic
26367	Enclosure	Animal Husbandry	D	Historic
26368	Trail	Transportation	D	Pre-Contact
26369	Trail	Transportation	D	Pre-Contact
26370	Lava tube	Temporary Habitation	D	Pre-Contact
26371	Trail	Transportation	D	Historic
26372	Trail	Transportation	D	Pre-Contact
26373	Lava tube	Temporary Habitation	D	Pre-Contact/ Historic
26374	Lava tube	Temporary Habitation	D	Pre-Contact
26375	Modified outcrop	Quarry	D	Pre-Contact
26376	Enclosure	Temporary Habitation	D	Pre-Contact

SIHP No. (50-10-27-	Site Type	Function	Significance	Age
26377	Lava tube	Temporary Habitation	D	Pre-Contact
26378	Lava tube	Temporary Habitation	D	Pre-Contact
26379	Complex	Temporary Habitation/ Agriculture	D	Pre-Contact
26380	Lava tube	Temporary Habitation	D	Pre-Contact
26381	Enclosure	Permanent Habitation	C, D	Pre-Contact
26382	Trail	Transportation	D	Pre-Contact
26383	Enclosure	Temporary Habitation	D	Pre-Contact
26384	Lava tube	Temporary Habitation	D	Pre-Contact
26385	Mounds	Temporary Habitation	D	Pre-Contact
26386	Modified outcrop	Activity Area	D	Pre-Contact
26387	Modified outcrop	Activity Area	D	Pre-Contact
26388	Lava tube	Temporary Habitation	D	Pre-Contact
26389	Enclosure	Permanent Habitation	D	Pre-Contact
26390	Lava Blister	Temporary Habitation	D	Pre-Contact
26391	Lava Tube	Temporary Habitation	D	Pre-Contact
26392	Mound	Agriculture	D	Pre-Contact
26393	Mound	Agriculture	D	Pre-Contact

* Site contains confirmed human remains

** Site contained human remains removed during a previous study (Kennedy 1983/1984)

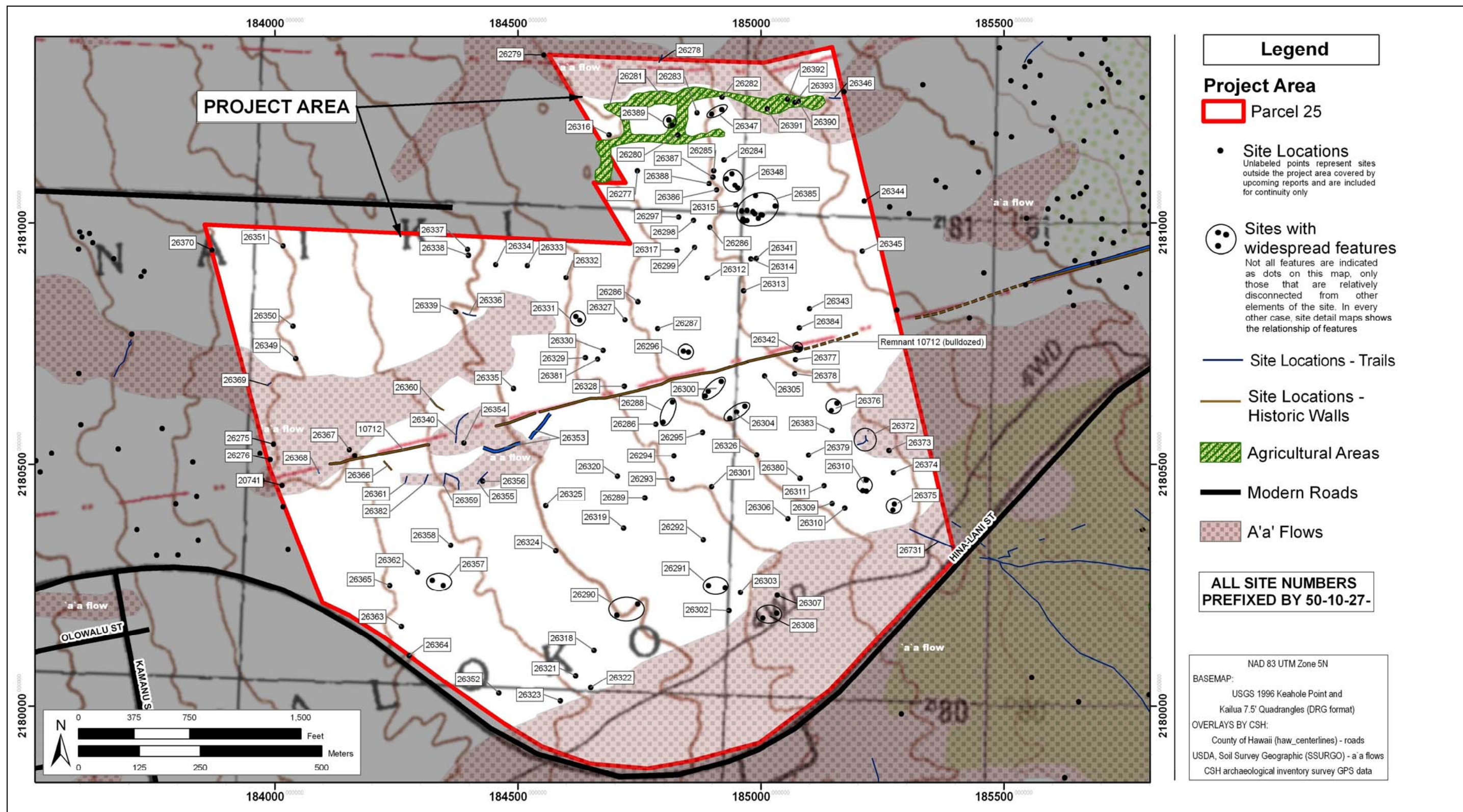


Figure 13. Portion of USGS topographic map showing the locations of historic properties within the project area

4.1.1 Formal Feature Types

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

Alignment: A single row of stones one courses high.

Cairn: A marker of stacked or piled stones. Cairns are frequently referred to as *ahu*.

Enclosure: A walled structure that completely encloses an area.

Lava blister: 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.

Lava tube: Modifications or apparent usage of a subterranean lava formation characteristic of *pāhoehoe* lava flows.

Modified depression: 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.

Modified outcrop: 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.

Mound: Linear, circular or amorphous stone pile which typically lacks a vertical face and level surface.

Pavement: A stone-filled floor or surface.

Platform: A raised free-standing stone structure with three or more vertical faces.

Rock art: A carving or inscription on a boulder, cobble, or slab.

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. There are a total of 221 features in the project area at 121 sites. Lava tubes are the most common feature type. Some of the walls represent historic animal husbandry, and some trails, and cairns are

historic sites. Nearly all other feature types in the project area represent a pre-contact style of modification.

Table 4. Occurrences of Formal Feature Types (Total number of features: 221)

Formal Feature Type	Number	Percentage
Alignment	3	1.4
Cairn	8	3.6
Enclosure	31	14.0
Lava blister	5	2.3
Lava tube	80	36.2
Modified depression	9	4.1
Modified outcrop	14	6.3
Mound*	8	3.6
Pavement	6	2.7
Platform	8	3.6
Rock art	2	0.9
Terrace	13	5.9
Trail	17	7.7
Wall	17	7.7

*Two sites (26281 and 26385) contain numerous mounds, 37 and 27 respectively. As these individual mounds are considered sub-features of the larger sites, each site counts as one occurrence of the formal feature type.

4.1.2 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. Eleven primary function categories were identified among the sites within the project area: agriculture; animal husbandry; habitation; human burial (4 sites, one of which is a habitation site containing 2 burials); ceremonial; indeterminate; marker; mining (quarrying) and storage (activity areas); transportation; and water collection activity area. The following are brief descriptions of the different function types commonly encountered in this general area:

Activity area: The feature represents the extent of space serving a special function, or the scope of a specific activity; this category may include lithic production, water collection, storage, fishhook manufacture, quarrying or mining, etc.

Agriculture: Primary function is for farming, horticulture, or subsistence planting.

Animal husbandry: The feature is associated with the care of livestock.

Burial: Used for the interment of human skeletal remains. This functional category is also used for human remains found out of primary context.

Ceremonial: Used for ritual or religious purposes.

Fireplace: Burn pit or lens of burned material in a limited area.

Habitation: A place for living, which may be either temporary or permanent habitation. Habitation sites are generally distinguished from shelters by an increased energy investment in modification and formal construction.

Marker: A point visibly marked for the purpose of identifying a point on a line on the surface of the earth such as a boundary or trail.

Rock art: Petroglyphs and pictographs are functionally rock art.

Transportation: The feature was used as a road or trail.

Table 5 below tallies the total occurrences of these functional categories within the project area. The table lists the overall site function, not individual feature functions.

Table 5. Occurrences of Formal Function Types (Total number of Sites in Project: 121)

Function	Number of sites
Agriculture	3
Animal Husbandry	4
Burial	3
Ceremonial	2
Indeterminate	3
Marker	5
Quarrying	3
Habitation/Indeterminate	1
Permanent Habitation	10
Temporary Habitation	67
Temporary Habitation/Agriculture	1
Temporary Habitation/Burial	1
Temporary Habitation/Quarry	2
Transportation	13
Water Collection Activity Area	3

4.2 Test Excavations Findings

Of the 121 sites recorded in the project area, 13 sites (15 features) required subsurface testing to aid in determining the function of the site (Table 6; see also discussion of subsurface testing methods in Field Methods Section 2.1 above and Results of Laboratory Analysis 0below). Most subsurface testing was conducted to ensure that no burials were present at the site, though testing also examined subsurface deposits and attempted to collect charcoal for radiocarbon dating analysis. Though there were numerous habitation features in the project area, very few had excavation potential because of construction on bedrock and lack of sedimentation.

Of a total 15 test excavation units, only three sites (-20741, -36321, -26344) were found to contain midden, and no sites had charcoal in good context for dating. Most subsurface testing findings improved interpretation of site function and in many cases changed initial impressions of function.

Table 6. Summary of Subsurface Testing

SIHP No. (50-10-27-)	Feature	Unit No.	Site Type	Function assessment before testing	Findings resulted in function change?
20741*	A	1	Pavement	Temporary Habitation	No
26279	-	7	Modified Outcrop	Possible Burial	Yes, no burial present; function changed to indeterminate
26281	-	6	Mound	Possible Burial	Yes, no burial present; function changed to agriculture
26292	-	4	Lava Tube	Possible Burial	Yes, no burial present; function changed to temporary habitation
26304	A	14	Lava Tube	Possible Burial	Yes, no burial present; function changed to temporary habitation
26305	-	5	Modified Outcrop	Possible Burial	Yes, no burial present; function changed to temporary habitation
26306	-	3	Modified Outcrop	Possible Burial	Yes, no burial present; function changed to indeterminate
26321	A	10	Lava Tube	Possible Burial	Yes, no burial present; function changed to temporary habitation
26344	C	12	Platform	Ceremonial	Yes, function changed to permanent habitation
	E	13	Platform	Ceremonial	Yes, function changed to permanent habitaiton
26345	B	11	Modified Outcrop	Possible Burial	Yes, no burial present; function changed to indeterminate

SIHP No. (50-10-27-)	Feature	Unit No.	Site Type	Function assessment before testing	Findings resulted in function change?
26375	A	2	Modified Outcrop	Quarry	No
	B	1	Modified Outcrop	Possible Burial	Yes, no burial present; function changed to indeterminate
26392	-	8	Mound	Possible Burial	Yes, no burial present; function changed to agriculture
26393	-	9	Mound	Possible Burial	Yes, no burial present; function changed to agriculture

*Excavation of site -20741 was conducted in 1996 by Colin et al.

4.3 Site Descriptions

4.3.1 State Site # 50-10-27-10712

SIHP #	50-10-27-10712
FUNCTION:	Animal Husbandry
SITE TYPE:	Wall
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	1100 m by 70 cm (3908.9 ft. by 2.3 ft.)
CONDITION:	Good
AGE:	Historic
ELEVATION:	320 ft a.m.s.l. to 550 ft a.m.s.l.

DESCRIPTION: Site -10712 is a wall previously identified by Kennedy (1983, 1984) as site 40. Wolforth et al. (2005:169) also identified this boundary wall in a parcel east of the present project area (TMK: [3] 7-3-009:32). The wall runs roughly east/west across the present project area and into the adjacent eastern parcel (TMK: [3] 7-3-009:26), extending *mauka* (east) to Kohanaiki Homesteads. This wall runs along the boundary between Kohanaiki Ahupua'a to the north and Kaloko Ahupua'a to the south. Although the wall marks the pre-contact *ahupua'a* boundary, it is historic construction and did not appear on Emerson's survey maps (see Figure 8 in the Background Research section of this report).

The wall is constructed of *pāhoehoe* slabs and boulders, is faced on both sides and has a rubble filled center (Figure 14). The wall ranges between three and six courses high. A historic bottle was observed on top of the wall, and one portion of it contains a corrugated metal gate, confirming that it is a historic period wall. There is also a wooden gate in one portion of the wall (Figure 15). The west end of the wall terminates at the 'a'ā flow near the border between TMK: [3] 7-3-009:17 and the present project area (*makai* end of present project area). The east end of the wall (within the project area) is very disturbed and disappears completely, likely due to bulldozing, approximately 80 m west of the project area's eastern boundary (the boundary with TMK: [3] 7-3-009:26).

Function of site -10712 is a historic animal husbandry wall. This area was utilized for goat and cattle ranching in the late 19th and 20th century, and the wall was likely constructed as part of the ranching activity. There is no excavation potential for this site given the type of construction and lack of soil deposits associated with the site.



Figure 14. Site -10712, showing wall construction, view to northwest



Figure 15. Site -10712, showing wooden gate, view to south

4.3.2 State Site # 50-10-27-20741

SIHP #	50-10-27-20741
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	6
DIMENSIONS:	607.5 m ² (6536.7 ft. ²)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft. a.m.s.l.

DESCRIPTION: Site 50-10-27-20741 (Figure 16) is a complex consisting of six features designated A through F. The features are believed to be associated due to similarity of construction style, proximity, and similar states of preservation. The site is located on the edge of an 'a'ā flow, where it drops steeply down to *pāhoehoe*. Vegetation in the area consists of sparse grass and *koa haole*.

Emerson's Registered Map (RM) 1449 (see Background Research section of this report) shows a historic survey control point ("Kumuohe") in the current project area (on the *makai* border; see Figure 17) near site -20741. The historic control point "Kumuohe" has nominally been identified as an 'a'ā *pu'u* (elevated outcrop) that has writing in yellowed paint saying "KUMU" (Figure 18; also visible at top left of Figure 22). The same type of yellowed paint also says "KEAWE" on the east side of the outcrop. The 'a'ā *pu'u* is 2 to 3 meters high and has an incised triangle on top of the *pu'u*. This protrusion of 'a'ā on the larger 'a'ā flow is immediately north of site -20741, which is located very near the tip of the flow. While the Emerson map does not show the entire 'a'ā flow, it does indicate that the survey control point is on rough 'a'ā. As can be seen on Figure 17, Emerson labeled the survey point as being at the 325 ft. elevation; the identified 'a'ā protrusion adjacent to -20741 is consistent with this elevation. It is also notable that the distance from -20741 (and the 'a'ā *pu'u*) to the -26353 trail appears to approximately match the distance from the "Kumuohe" to "Kohanaiki road" shown on Emerson's RM 1449.

In addition to the older yellowed paint, the 'a'ā *pu'u* has been reused as evidenced by fresh white paint indicating "HWY" and an illegible date (possibly "'68"). It was hoped that the surveyors that presumably used this point for highway ("HWY") work were aware of its origins. An effort was made to contact by phone the State and County agencies responsible for road engineering and maintenance, including Stanley Tomura, Engineering Program Manager for Hawaii District Office of the State of Hawaii Department of Transportation, Highway Division and Trevor Jackson, Land Surveyor IV for the County of Hawaii, Dept. of Public Works. At this time it does not appear that the reuse of this survey point was by a public entity.

Feature A of site -20741 is an irregular shaped paved area that measures 8.0 m (26.2 ft) north/south by 7.3 m (23.9 ft) east/west (Figure 19). It consists of a leveled area that has been cleared of all large 'a'ā boulders and paved with small 'a'ā cobbles. The only artifacts or midden observed within the site consisted of a single piece of marine shell at Feature A. This cowry shell appears to have been heavily bleached by the sun, and it has two puncture holes on opposite ends of the shell indicating its possible use as an octopus lure (Figure 20).

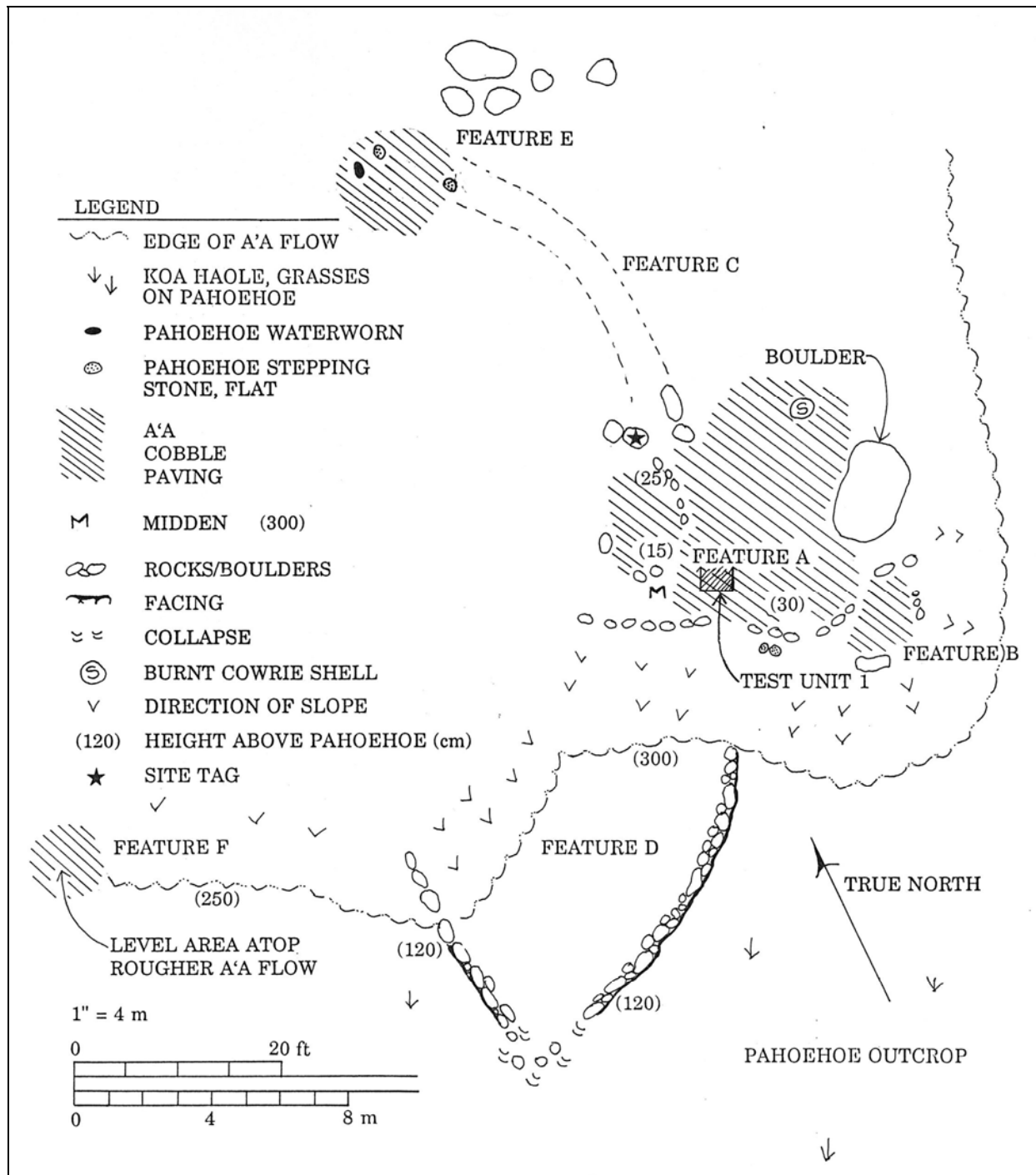


Figure 16. Site -20741 site complex; plan view

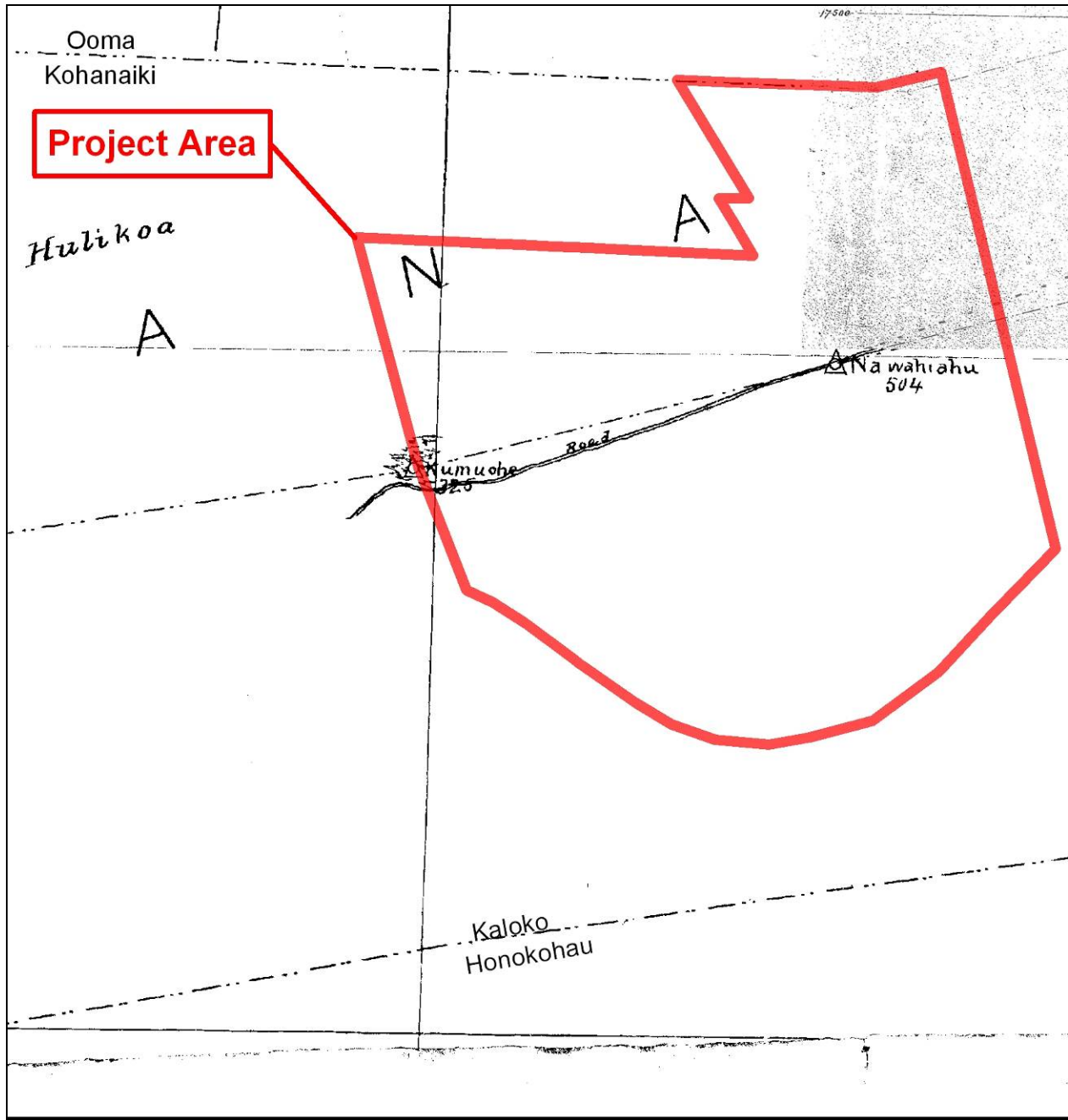


Figure 17. Portion of Emerson's RM 1449 (1888), showing the survey marker "Kumuohe"



Figure 18. Photograph of 'a'ā pu'u showing the modern and probable historic paint marking the datum



Figure 19. Site -20741, Feature A, paving, view to the south



Figure 20. Site -20741, Feature A, cowry shell octopus lure artifact, close-up view

Feature B is a small paved area located on the edge of the 'a'ā flow directly adjacent to the southern edge of Feature A (Figure 21). Feature B measures 2.3 m (7.5 ft) north/south by 2.0 m (6.6 ft) east/west. Construction consists of small to medium sized 'a'ā cobbles creating a level surface. Both Feature A and Feature B appear to be modification (leveling) of an area in association with temporary habitation.

Feature C is an 'a'ā cobble trail extending approximately 9.8 m (32.1 ft) from the northern corner of Feature A (Figure 22). The trail is 0.9 m (2.9 ft) at its widest and is constructed of small crushed 'a'ā cobbles. Larger 'a'ā boulders have been removed from the base of the path to create a semi-level surface. The cobbles do not appear extensively worn and there is no real discoloration of the trail; it is discernable primarily due to the clearing of larger stones and boulders from the path to create a semi-level surface. The feature functions as transportation over the rough 'a'ā.

Feature D is a C-shaped enclosure at the base of the 'a'ā flow which is located 4.1 m (13.4 ft) from Feature A (Figure 16 and Figure 23). The north/south running portion of the enclosure wall measures 5.1 m (16.7 ft) and is bi-faced except at the southern end where the wall has collapsed. The other wall segment extends eastward for 9.4 m (30.8 ft) until it connects with the steep 'a'ā flow which forms the whole northern side of the enclosure. The enclosure walls' maximum height is 1.2 m (3.9 ft), and it is generally 5-6 courses high. The interior is a depression that has been partially filled with 'a'ā rubble from the steep 'a'ā embankment to the north and contains exotic grasses and *koa haole*. The boulders forming the wall are heavily covered with lichen, indicating the absence of any recent disturbance or modification. The feature appears associated with agriculture and/or the penning of animals (animal husbandry).

Feature E is a pavement measuring 2.1 m (6.8 ft) north/south by 2.6 m (8.5 ft) east/west located at the northern end of Feature C (Figure 24). It consists of a level area that has been cleared of all existing large 'a'ā boulders and paved with 'a'ā cobbles. This pavement is not as evenly level as the pavement of Features A or B. An upright round *pāhoehoe* small boulder is located on the pavement. The boulder is not waterworn; it is a *pāhoehoe* toe from a surface flow. This upright feature is consistent with markers associated with fishing shrines and it was evidently carefully selected for its shape. Additionally, an octopus lure was found in the pavement of Feature A, supporting a fishing function for much of this complex. Based on the presence of this upright and the removed position of Feature E, it is believed this is a ceremonial fishing shrine. Though no evidence of historic or modern use of the site was noted, the relatively unstable placement of the upright hints that there is a chance of more recent reuse of the site.

Feature F is a pavement measuring 2.0 m (6.6 ft) north/south by 2.2 m (7.2 ft) east/west located 17.0 m (55.8 ft) west of the western edge of Feature A (Figure 25). The pavement is rather crude in comparison with the paving of the other site features. The paving is flat and comprised of larger cobbles than the other features and its paving is not as smooth. The feature appears to be associated with temporary habitation.



Figure 21. Site -20741, Feature B, paving, view to the south



Figure 22. Site -20741, Feature C, 'a 'ā trail, view to the north



Figure 23. Site -20741, Feature D, stone wall, view to the northwest



Figure 24. Site -20741, Feature E, upright stone, view to the east



Figure 25. Site -20741, Feature F, paving, view to the southeast

The function of site -20741 is interpreted as a temporary habitation complex containing agriculture, ceremonial, and transportation features. Features A, B, and F appear to be associated with temporary habitation based on their construction, and consist primarily of a leveling of the surface for the purpose of intermittent habitation. Feature C is clearly associated with transportation over the rough 'a'ā. Feature D may be associated with agriculture or animal husbandry, as it does not appear to be constructed to facilitate habitation. Feature E appears to be a fishing shrine (see discussion above). Excavation potential of the site is considered fair, given the potential for excavating the paved surfaces or within the enclosure, although there are no deep sediments present at the site. The only artifacts or midden observed consisted of the single marine shell at Feature A.

4.3.2.1 Testing Results

Subsurface testing was conducted at Feature A of site -20741 to aid in determining site function, to examine cultural deposits, and to attempt to collect datable charcoal for radiocarbon analysis.

A 1.0 m by 1.0 m (3.3 ft. x 3.3 ft.) test unit was placed in the northeast section of Feature A, on the surface of the 'a'ā cobble paved area. The unit was excavated to a maximum depth of 36 cmbs (1.2 ft.) and excavation was terminated upon encountering bedrock. The 'a'ā cobble fill, designated Stratum I, of the paved area extended to bedrock. There was no soil layer present within the unit.

Stratum I (0-36 cm / 0-1.2 ft.) consisted of angular 'a'ā cobble loosely compacted with little organic material present. The only material collected from the unit consists of 5.3 g of snakehead cowry (*lehokupu* or *Cypraea caputserpentis*). These minimal findings do generally support a habitation function for this site.

4.3.3 State Site # 50-10-27-26275

SIHP #	50-10-27-26275
FUNCTION:	Ceremonial
SITE TYPE:	Complex
TOTAL FEATURES:	3
DIMENSIONS:	9 m by 12 m (29.5 ft. by 39.3 ft.)
CONDITION:	Excellent
AGE:	Pre- contact
ELEVATION:	320 ft. a.m.s.l.

DESCRIPTION: Site -26275 is located against the edge of an 'a'ā flow where it drops steeply down to *pāhoehoe*; the edge trenching runs southeast/northwest. The site is located within the older *pāhoehoe* flow and consists of three features, Features A through C (Figure 26 and Figure 27).

Feature A is a natural void in the *pāhoehoe* flow that is half collapsed and forms a small lava tube (Figure 28). This tube is directly beneath a later 'a'ā flow. The interior of the tube measures 8 m by 3 m (26.3 ft by 9.5 ft) deep and then continues another 6 m (19.7 ft) with a 0.5 m (1.64 ft) ceiling. The natural tube entrance measures approximately 3.5 m (11.5 ft) wide by a maximum of 1.3 m (4.3 ft) high. The southeast side of the opening is constricted by a mound of *pāhoehoe* and 'a'ā that is part of the foundation of the Feature B platform. The resulting opening measures approximately 1.3 by 1.3 m (4.3 ft by 4.3 ft). The tube floor has some roof fall chunks, especially to the northwest of the entrance, and the entrance itself is strewn with cobbles and small boulders. Sedimentation, a maximum of 4 cm (0.13 ft.) thick, is on the floor near the center of the tube. The tube contains considerable moisture, and it is likely the 'a'ā flow over the *pāhoehoe* accelerates dew and rain percolation.

The floor along the tube's northeast wall contains approximately a half dozen *kukui* nuts (whole and endocarp). A large cowry, which is for the most part buried in sediment amongst the cobbles, is inside the entrance. Urchin shell and flecks of bivalve (medium small pearlescent, but not pearl shell, cf. *Isognomon* sp.) were also noted on the floor surface. Three small heads of branch coral were located towards the back of the tube, east of the entrance; they measure 10 cm by 2.5 cm (0.3 ft. by 0.8 ft.), 25 cm by 15 cm (0.8 ft. by 0.5 ft.) , and 10 cm by 10 cm (0.3 ft. by 0.3 ft.). Feature A contains strong evidence for ceremonial activity with presence of three heads of branch coral, which is often associated with ceremonial activities.

Feature B is a platform constructed across a portion of the Feature A tube entrance and extends to the northwest along the edge at the 'a'ā flow (Figure 29). The platform measures approximately 3 m by 3 m (9.5 ft by 9.5 ft) and is relatively level except for the top of the platform, which is slightly mounded. Construction is primarily 'a'ā boulders and cobbles. The boulders range in size from 1 m (3.3 ft) to 50 cm (1.6 ft.) and average 50 cm (1.6 ft.); the cobbles are 20 cm (0.6 ft.) on average, although on the pavement they are 10 cm (0.3 ft.) on average. The walls are neatly stacked except some are slumped and are not well faced.

The platform helps constrict the opening of Feature A at its southeast corner, where the tube extends approximately 4.5 m (14.76 ft) northwest. The lower southeast corner is primarily constructed of *pāhoehoe*. The platform's southeast side forms the northeast wall of Feature C (Figure 28). No midden is present; coral was found in the adjacent lava tube. Feature B is similar

in size and construction to burial platforms, however its location, adjacent to an enclosure and a lava tube with proximity to a water source makes burial function less likely. This platform rather functioned more as a primarily ceremonial platform. While there is no definitive evidence of two phases of construction, *pāhoehoe* was used as the platform's base and also to modify the tube entrance at the southeast.

Feature C is a low walled (two to three courses on average) enclosure approximately 2 m by 5 m (6.6 ft by 16.4 ft) (trenching northwest/southeast) and extending from the southwest edge of the platform, Feature B (Figure 29). The wall is also attached to the northeast wall of Feature B. Feature C is square shaped with 3 walls (southwest, northwest, northeast) comprised primarily of 'a'ā while the 4th wall (southeast) is comprised of 'a'ā and *pāhoehoe*. The square shaped enclosure is approximately 4.7 m by 2.4 m (15.42 ft by 7.9 ft) and contains a depression approximately 1 m (3.3 ft) deep with a fill of smaller *pāhoehoe* cobbles. The wall enclosure is located at the end of an 'a'ā covered *pāhoehoe* flow (the *pāhoehoe* flow is the original flow). The wall enclosure is located on a slope with the northwest portion at the high end of the slope and the southeast portion at the low end. The inside portion of the enclosure is filled with 'a'ā and *pāhoehoe* (Figure 26).

The site's function is interpreted as ceremonial based on multiple factors: in particular the presence of three small heads of branch coral. Feature B indicates that the site may have had ceremonial value. Usage as lookout or habitation appears to be unlikely since the location does not provide a good view of this region and is small to serve as a extensive habitation platform (Figure 27). The formality and height (1.6m) of the Feature B platform despite it's relatively small size further supports the argument of a ceremonial function for this site.

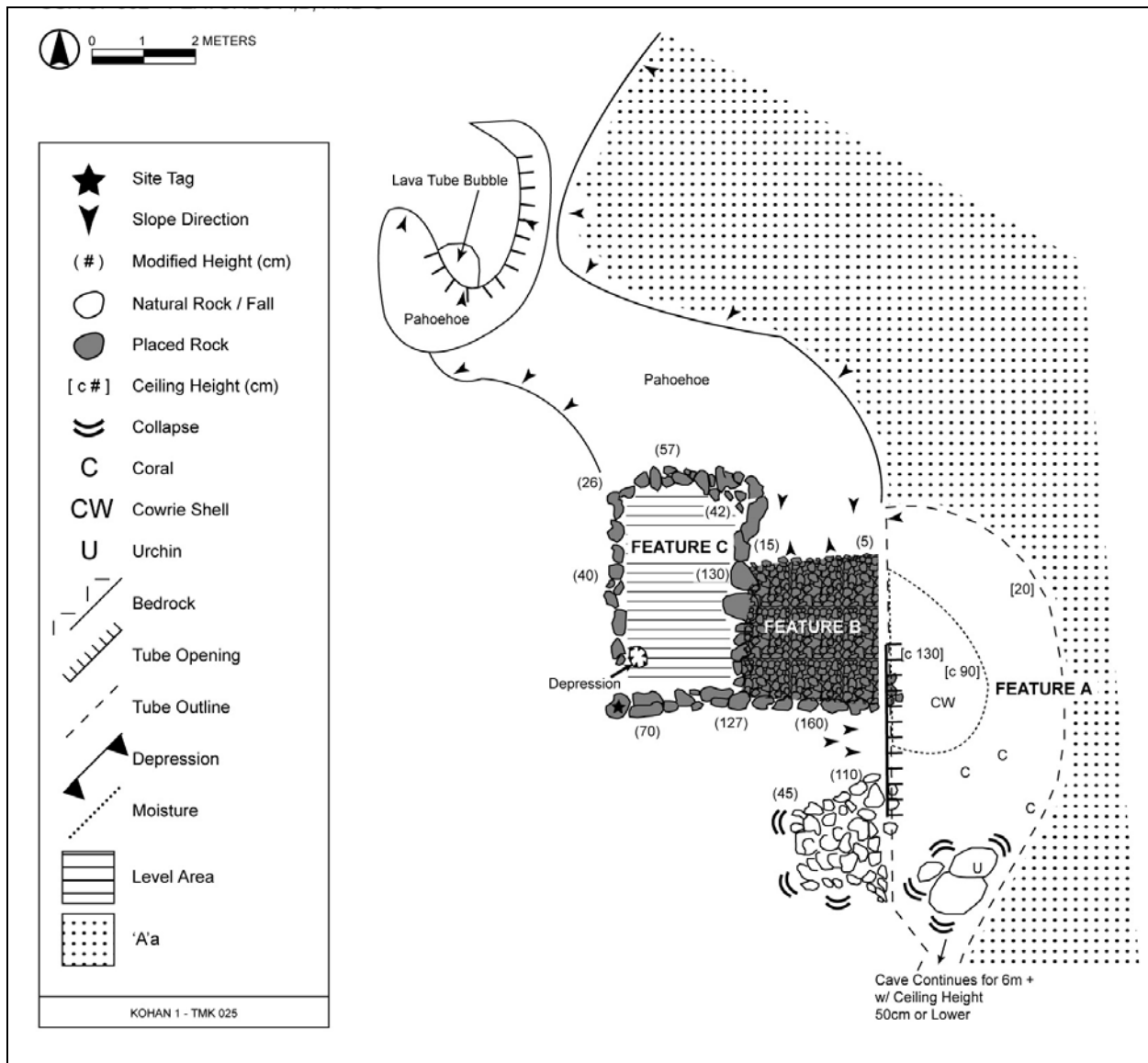


Figure 26. Site -26275, plan view

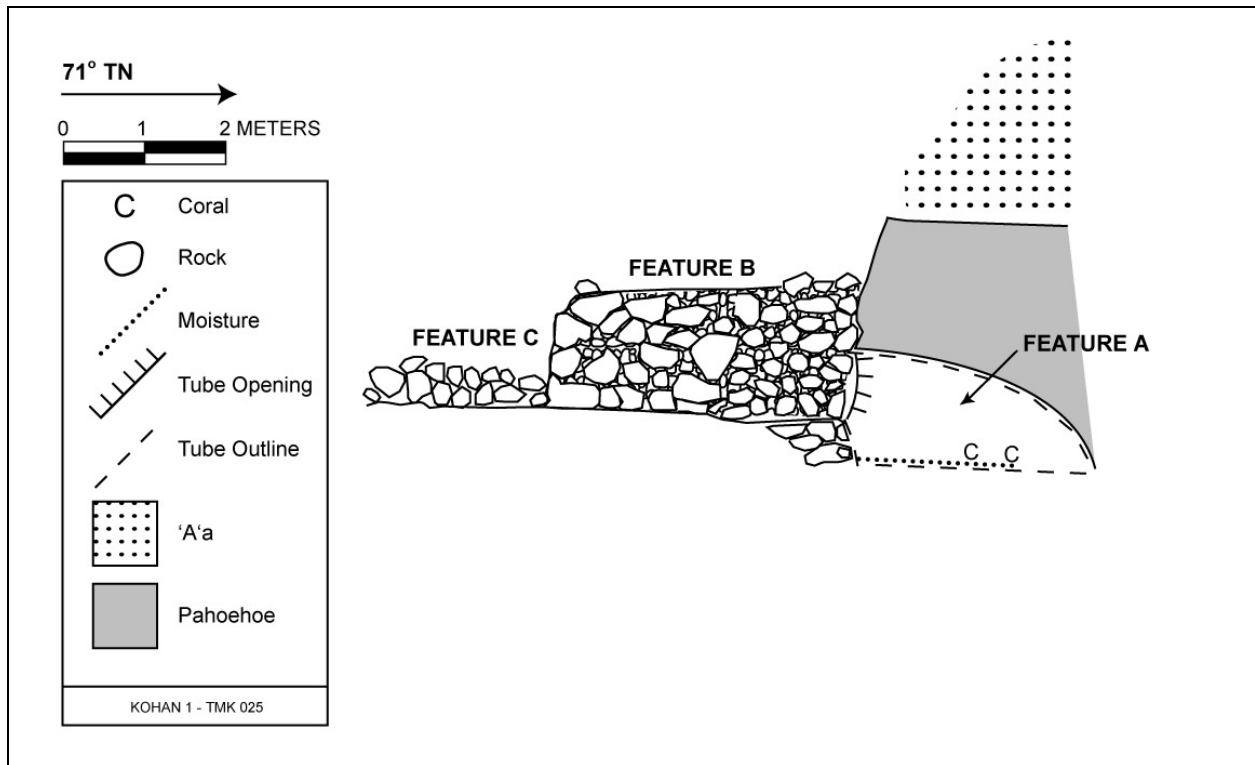


Figure 27. Site -26275, profile



Figure 28. Site -26275, entrance to Feature A, view to the northeast



Figure 29. Site -26275, overview of Features B and C, view to southeast

4.3.4 State Site # 50-10-27-26276

SIHP #	50-10-27-26276
FUNCTION:	Temporary Habitation
SITE TYPE:	Modified depression
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	3 m by 3.05 m (9.8 ft by 10.01 ft)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	325 ft. a.m.s.l.

DESCRIPTION: Site -26276 is an excavated depression in the 'a'a flow (Figure 30 and Figure 31). The depression lacks vegetation although a few patches of exotic grasses are in the immediate vicinity of the edge of the flow.

Boulders and larger cobbles have been removed to create the level smooth floor. One course of boulders rings the edge of the depression. The depression's central point, and its deepest, is approximately 95 cm (3.1 ft.) deep.

The site's function is interpreted as temporary habitation. This interpretation is based on the extent of modification; due to the lack of midden or cultural material, the site was a temporary habitation.

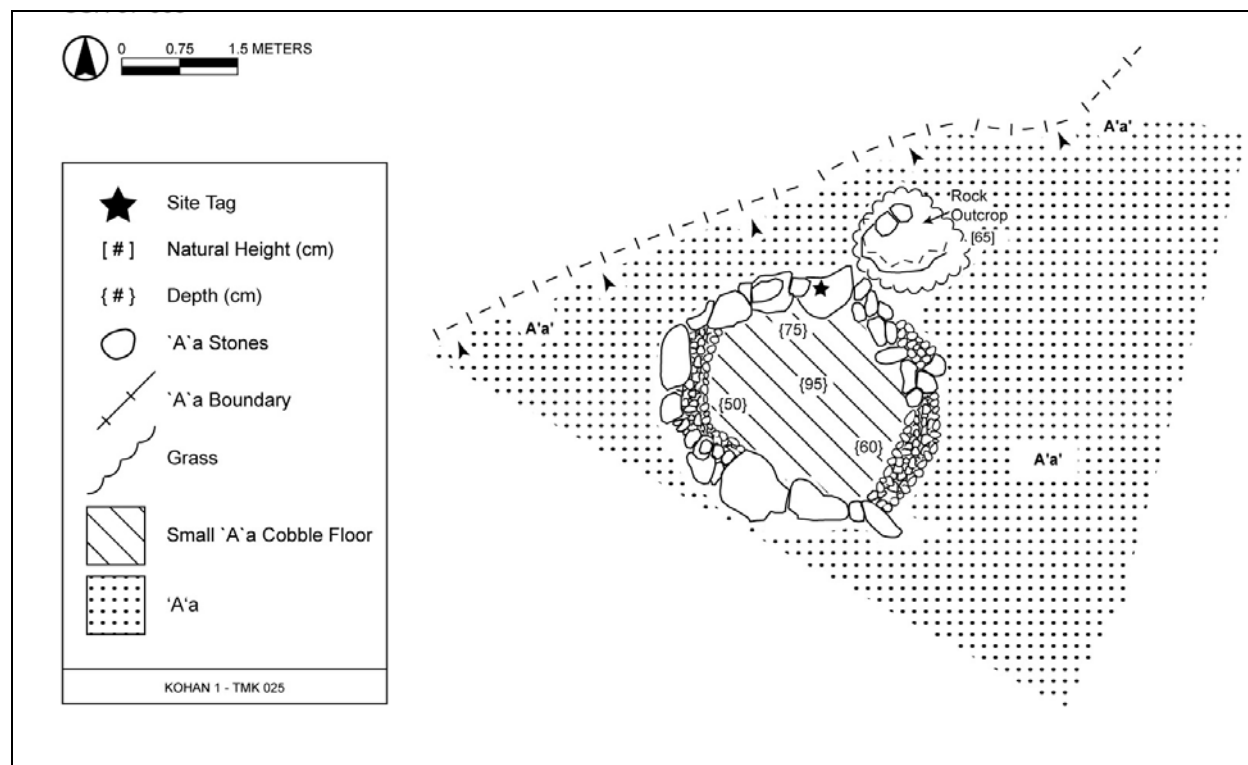


Figure 30. Site -26276, plan view



Figure 31. Site -26276, overview of modified depression, view to northwest

4.3.5 State Site # 50-10-27-26277

SIHP #	50-10-27-26277
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	2
DIMENSIONS:	5 m by 2 m (16.4 ft. by 6.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	480 ft a.m.s.l.

DESCRIPTION: Site -26277 is a temporary habitation complex consisting of two features; Feature A is a lava tube/blister, and Feature B is a level terrace (Figure 32). Vegetation within and in the immediate vicinity of the site consists of dense *koa haole* and grasses.

Feature A is a lava tube/blister with one entrance located on the southwest end of an undulating *pāhoehoe* flow (Figure 33 and Figure 34). The tube entrance measures 1 m (3.3 ft.) wide and 70 cm (2.30 ft.) high. West of the lava tube entrance is an area of collapse where the lava tube originally extended for approximately 2.30 m (7.55 ft.). The east end of the lava tube is currently well intact and measures 2.4 m (7.87 ft.) long east/west and 1.4 m (4.59 ft.) wide north/south. The lava tube has been cleared of all large boulders and it currently contains only several small to medium sized cobbles. A soil deposit that extends within most of the tube (excluding the north end) ranges from 3-9 cm (0.1-0.3 ft.) deep. A *kukui* endocarp and a small piece of coral were found on the south side of the tube. Two areas of the tube appear to be modified. One area is on the west end of the entrance; several medium sized cobbles have been used to prop up a large collapsed boulder creating a vertical wall. The second modified area is on the north side of the back portion of the tube.

Feature B is a terrace approximately 5 m (16.4 ft.) northwest/southeast by 2 m (6.6 ft.) northeast/southwest constructed on a tumulus (Figure 35) and adjacent to Feature A (Figure 33). The terrace is constructed of medium sized *pāhoehoe* slabs and boulders that create the faced walls of the terrace. The retaining wall ranges from one to two courses high and from 30 to 50 cm (.98-1.64 ft.) above the surrounding tumulus. The northwest and a portion of the northeast sides of the terrace surface are flush with the top of the tumulus. The terrace extends the level surface of the tumulus; the terrace's paved surface consists primarily of small cobbles and is very level and smooth. Approximately 2 m (6.6 ft.) northwest of Feature B is a small (1 m by 1.5 m / 3.3 ft. by 4.9 ft.) tumulus with an apparently natural level surface that has been enhanced and made smoother by breaking the natural tumulus.

The site's function is interpreted as temporary habitation, based on the size of the cleared lava tube, the presence of coral and *kukui*, and the adjacent terrace. Feature B is well constructed with small cobbles and has facing on all of the raised sides. The lack of cultural material and the amount of labor investment is indicative of a temporary habitation site. Excavation potential is good due to the soil deposit within Feature A, although there was only a small amount of midden observed.

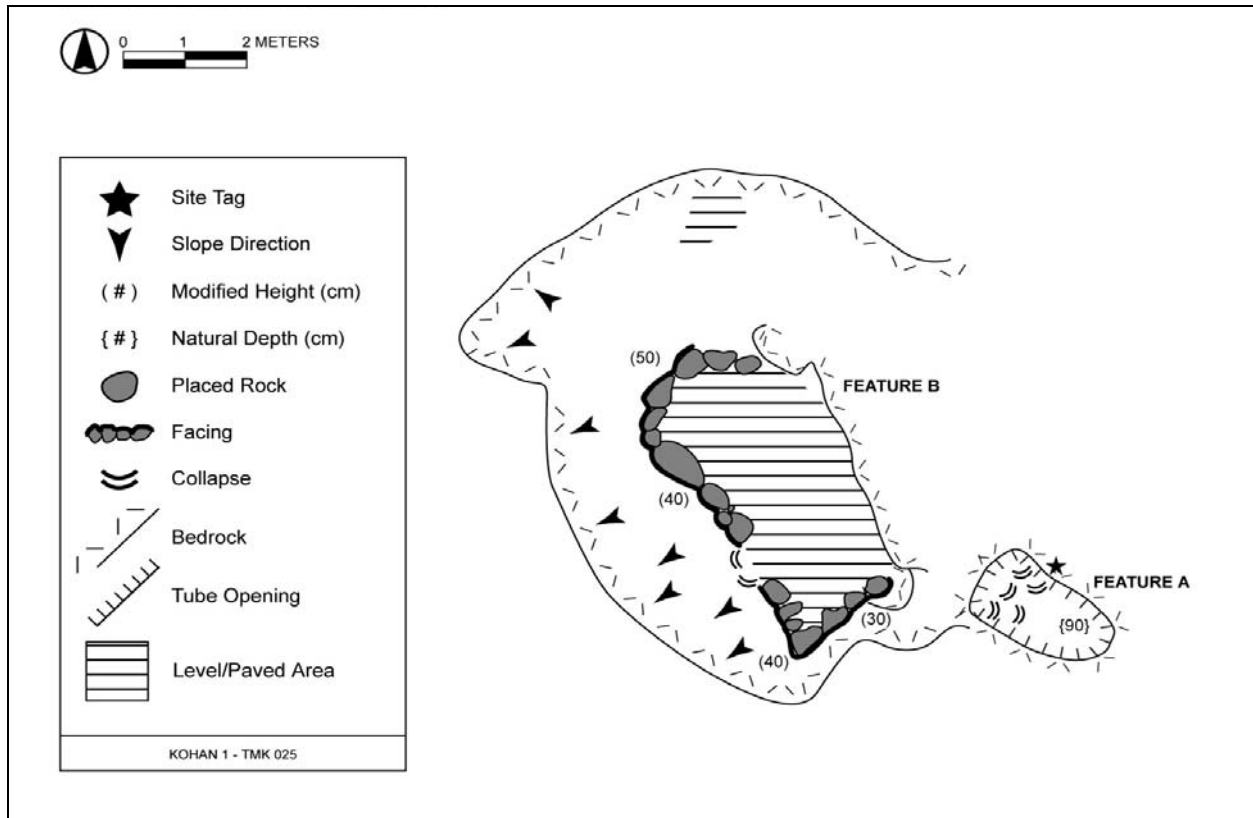


Figure 32. Site -26277, plan view of Feature A and Feature B

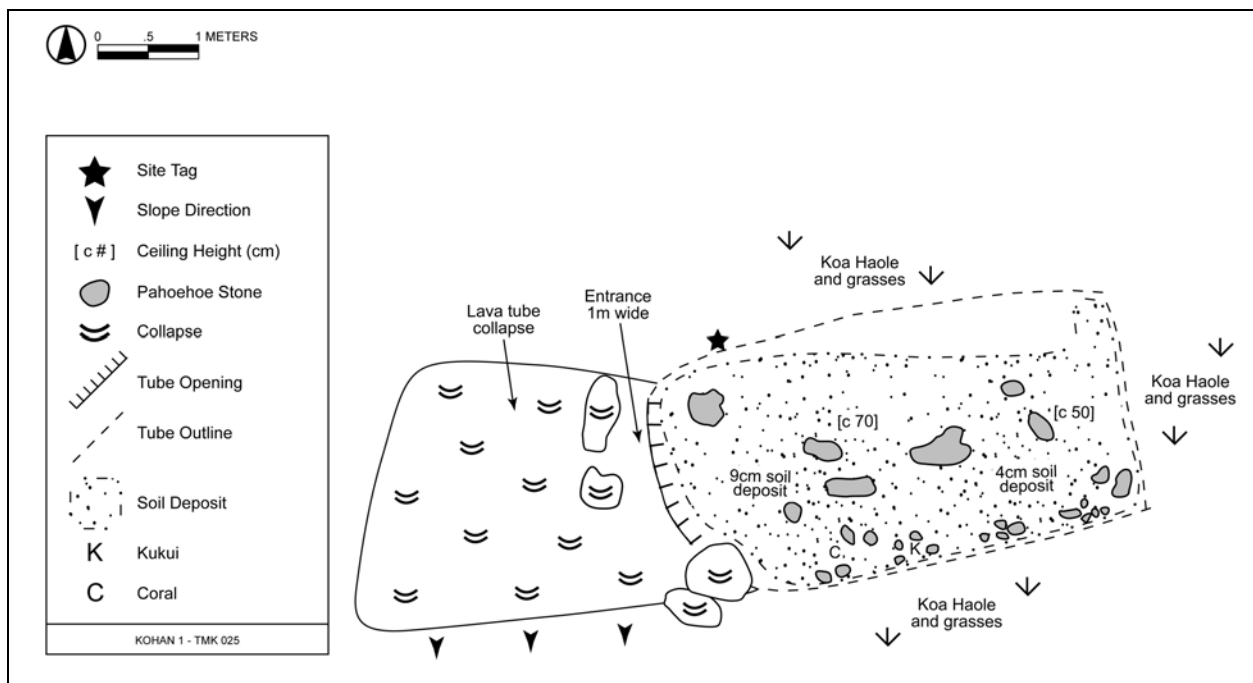


Figure 33. Site -26277, plan view of Feature A lava tube



Figure 34. Site -26277, Feature A, view to east



Figure 35. Site -26277, Feature B, view to southeast

4.3.6 State Site # 50-10-27-26278

SIHP #	50-10-27-26278
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	18 m by 0.5 m (59 ft. by 1.6 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	580 ft a.m.s.l.

DESCRIPTION: Site -26278 is a remnant *pāhoehoe* slab trail (Figure 36). The trail is not well defined despite the number of small *pāhoehoe* slab stepping stones that mark it. The trail runs approximately 18 m (59.1 ft.) at 210 degrees from its beginning at the north edge of the 'a'ā, until it is no longer discernable on top of the 'a'ā. The trail's path is not distinct since it was not constructed with large 'a'ā cobbles and boulders, and it is not marked by any discoloration. The trail consists of approximately 12 slabs, the majority of which (approximately 8) are located in the first 8-10 m (26.3-32.8 ft.) of the north portion of the trail and whose diameter measures approximately 0.5 m (1.6 ft.). The south half of the center portion of the trail remnant is very difficult to discern due to a large gap, approximately 6 m (19.7 ft.), between the *pāhoehoe* slabs.

The site's function is transportation, but only a portion of the trail remains. No artifacts or midden were observed at the site, and excavation potential is considered poor.



Figure 36. Site -26278, view to southwest

4.3.7 State Site # 50-10-27-26279

SIHP #	50-10-27-26279
FUNCTION:	Indeterminate
SITE TYPE:	Modified outcrop
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	1.8 m by 2.0 m (5.9 ft. by 6.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	538 ft a.m.s.l.

DESCRIPTION: Site -26279 is a modified tumulus that consists of a low mounded area of *pāhoehoe* cobbles/small boulders (Figure 37 and Figure 38). This mound measures approximately 1.8 m by 2.0 m (5.9 ft. by 6.6 ft.) and is approximately 60 m (197 ft.) high. The southeast side of the mound has some upright *pāhoehoe* slabs. Vegetation surrounding the site is *koa haole* and grasses. Along the eastern boundary there appears to be a bulldozed road. A cow metatarsal (foot bone) was located within the lava tube.

The function of site -26279 was initially interpreted as a burial since modified tumuli are often associated with burials. The mound does not appear to be level enough to be a habitation site. Additionally, there is no evidence of habitation or other activities within the site area. There is a small (2 m / 6.6 ft. north/south by 4 m / 13.2 ft. east/west) lava tube near the northwestern site boundary, however, the tube does not appear to have any modifications. Excavation results (see below) provided no information and the site's function is indeterminate. Excavation potential is poor due to the lack of soil deposit.

4.3.7.1 Testing Results

A test excavation was undertaken to determine if a burial was present. A small (55 cm by 60 cm / 1.8 ft. by 1.9 ft.) test unit was placed in the center of the modified tumulus (Figure 37). Stratum I consisted of *pāhoehoe* cobbles for approximately 3 courses before reaching the underlying *pāhoehoe* bedrock. No cultural materials or subsurface features were encountered during excavation. The lack of cultural materials or features confirms that the site did not function as a burial. Excavation, however, did not provide any additional indication of the site's function.

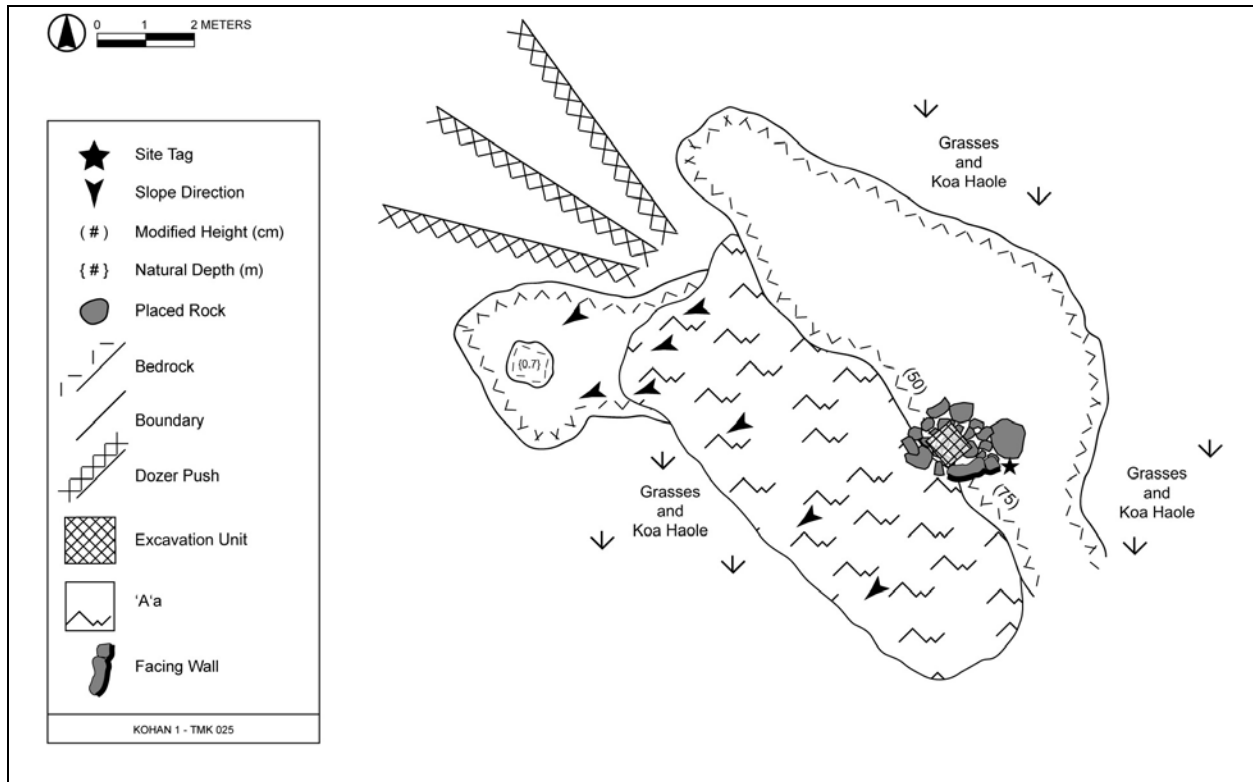


Figure 37. Site -26279, plan view

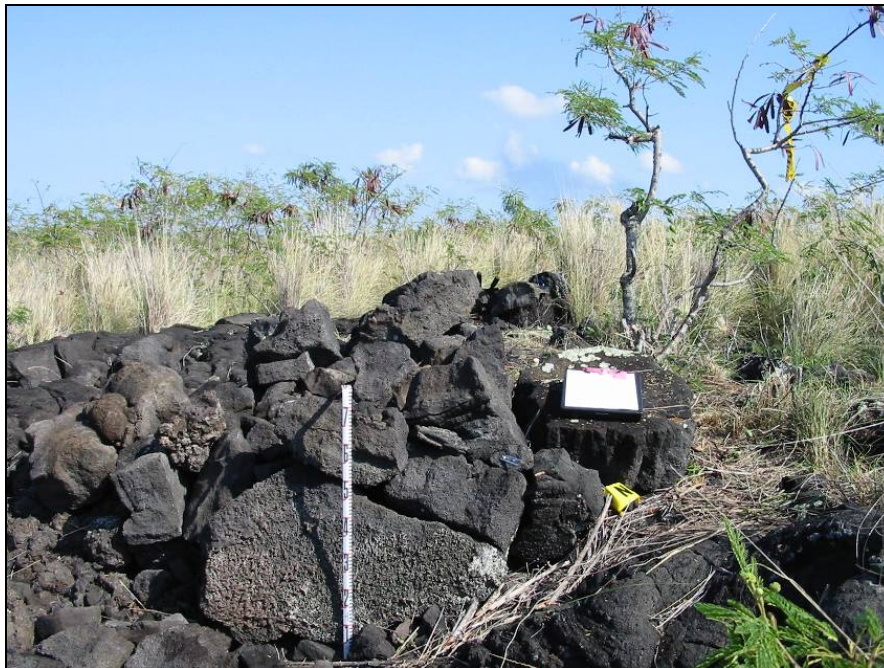


Figure 38. Site -26279, showing southeast side of mound with facing



Figure 39. Site -26279, pre-excitation, view to north

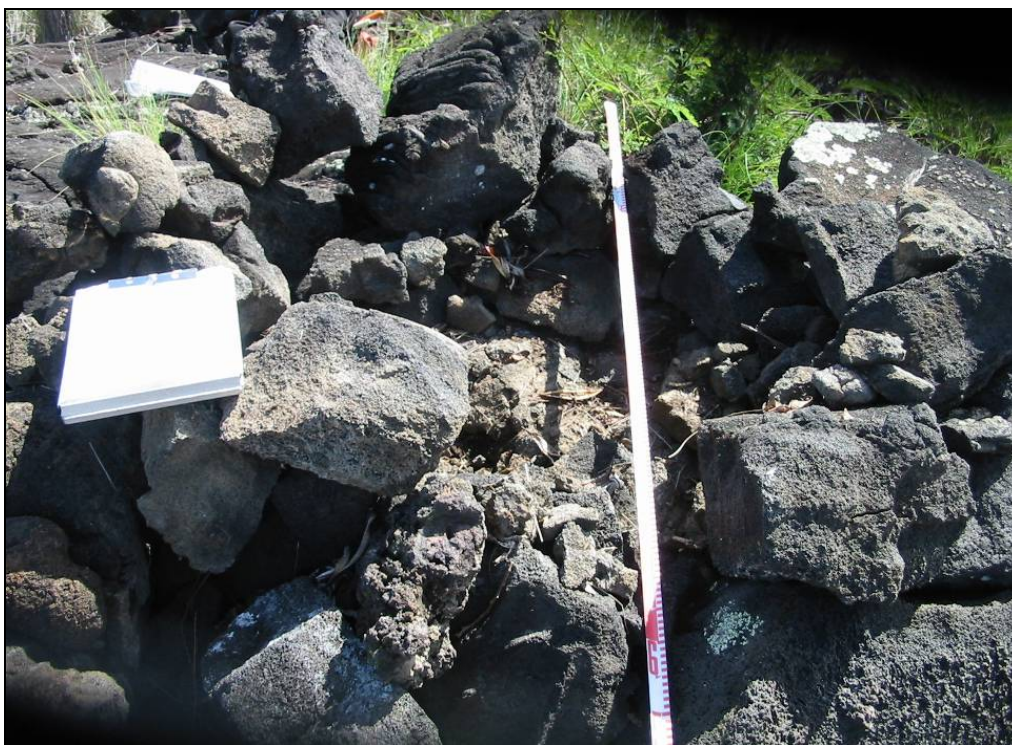


Figure 40. Site -26279, post-excitation, view to north

4.3.8 State Site # 50-10-27-26280

SIHP #	50-10-27-26280
FUNCTION:	Shelter
SITE TYPE:	Lava blister
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 5 m (32.8 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	510 ft a.m.s.l.

DESCRIPTION: Site -26280 consists of a large lava blister that has been modified to enhance its use as a shelter; it contains a small amount of midden. The blister opening is on the east side of an approximately 8 m by 2 m (26.3 ft. by 6.6 ft.) *pāhoehoe* bedrock exposure, and the tube runs underneath the bedrock exposure and is approximately the same size and shape (Figure 41 and Figure 42). The main opening to the tube is on the east side (north portion) and is 0.8 m (2.6 ft.) high; the height of most of the tube is also approximately 0.8 m (2.6 ft.).

Outside of the lava blister, on top of the bedrock exposure, there is a large crack that has been partially but not completely filled with medium and small size cobbles. The northern end of the crack remains open without fill, creating a small “skylight” in the middle chamber, just south of the shelter entrance. Boulders have been piled on the slope of the exposed bedrock down to the ground, partially covering an exposed crack in the bedrock near the ground at the tube entrance, and partially creating a small semi-level terrace that ramps up to the top of the bedrock exposure. The three large boulders (50-70 cm / 1.6-2.3 ft.) that form the terrace’s east wall were likely from the original blister collapse and were not moved away from the entrance. The remainder of the fill is comprised of 20-40 cm (0.66-1.3 ft.) size cobbles filling the gap between the three large boulders and the crack near the ground on the east side of the bedrock.

A pencil sea urchin spine, some small marine shell fragments, a large *‘opihi* shell, and *kukui* nut endocarp fragments were found spread throughout the lava blister interior in fairly low density. Soil depth is approximately 8 cm (0.26 ft.) in some areas, providing some excavation potential for this site, although the amount of midden is rather small.

The lava blister interior has also been modified by small (one course high) walls of medium size (20-30 cm / 0.66-1 ft.) cobbles that delineate separate areas of the tube. The first wall is on the north side of the entrance creating a north chamber, the second wall is on the south side of the entrance, and the third wall (two courses high in some areas), creates a middle chamber between the second and third wall, and a third chamber, that is at the south end of the cave. The ground is slightly depressed within these chambers, and may have been excavated. The walls are not formal and seem expediently placed; these may have been placed in order to prevent soil deposition in the excavated areas.

The site’s function is interpreted as a shelter used as for temporary habitation. Modification is not energy intensive enough to consider this a permanent habitation. No indication of use as a burial or other function was found. Additionally the lava blister is too small for any long term habitation or other uses. Site -26281, an agricultural complex, is spatially associated with this site.

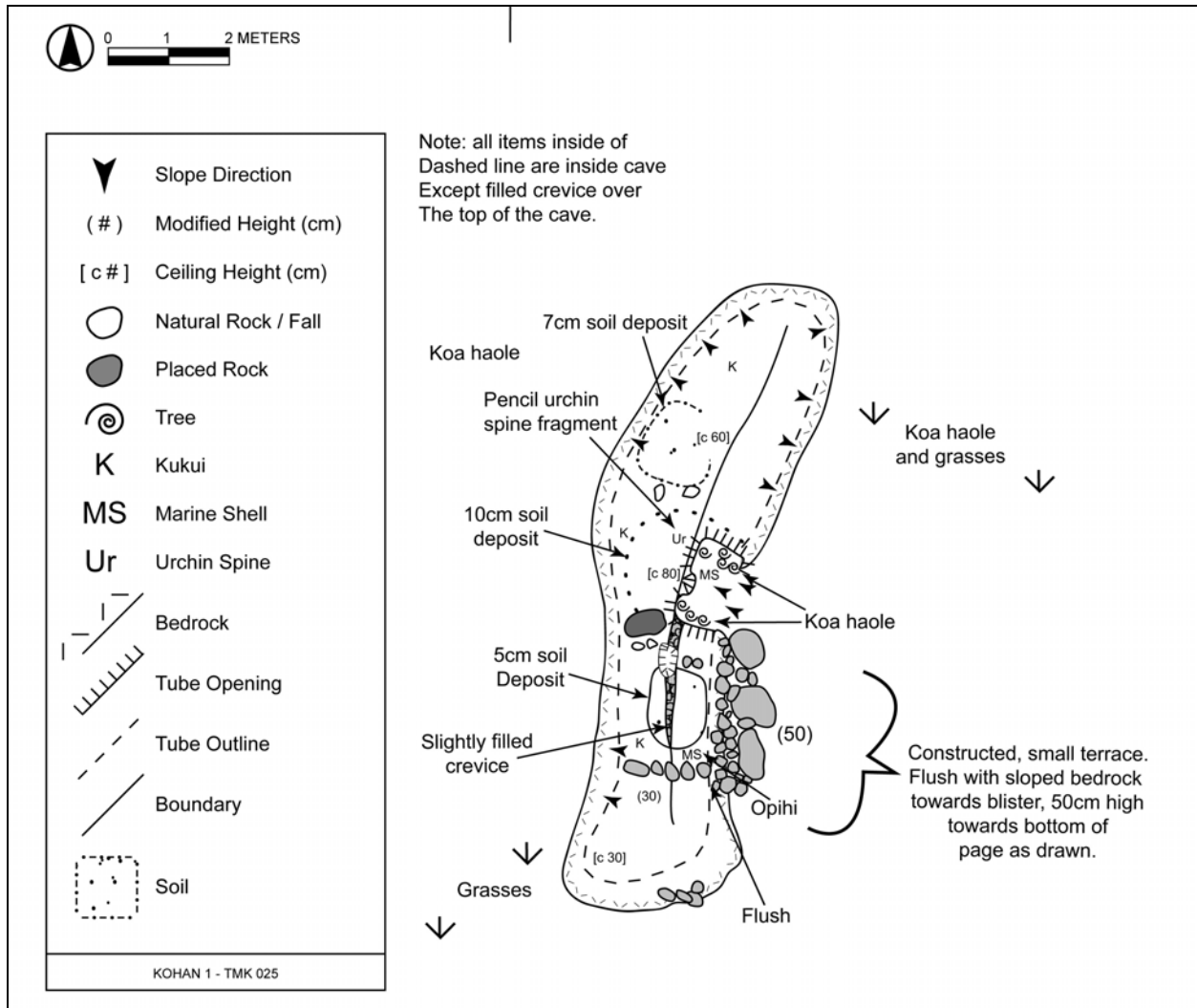


Figure 41. Site -26280, plan view



Figure 42. Site -26280, archaeologist on south end of exposure, view to southwest

4.3.9 State Site # 50-10-27-26281

SIHP #	50-10-27-26281
FUNCTION:	Agriculture
SITE TYPE:	Mound
TOTAL FEATURES:	37
DIMENSIONS:	200 m by 500 m (656.2 ft. by 1640.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	480 ft a.m.s.l. – 560 ft a.m.s.l.

DESCRIPTION: Site -26281 is a series of mounds concentrated in a low, linear “valley”; linear depressions run east/west from the general vicinity of the Huliko‘a water tank to site -26284 (Figure 43). The mounds range in size from 1.5 m (4.9 ft.) square to as small as 40 cm (1.3 ft.) in diameter (Figure 44 and Figure 45). They are generally composed of medium cobbles to medium boulders, but are usually large cobbles. The mounds are often stacked directly on bedrock or against the side of a bedrock exposure. None of the mounds exceeds three courses or about 40 cm (1.3 ft.) high, although most are usually lower, one to two courses or 10-30 cm (0.33-0.98 ft.) high. They are loosely structured; none of the mounds are formally constructed. Generally, the ground surface around these mounds is level and scattered with small to medium cobbles. This level surface is almost without exception the bottom of a linear depression and surrounded by a steep slope. In most cases, these depressions are between 2-3 m (6.6-9.8 ft.) below the area’s average terrain and are narrow, approximately 10 m (32.8 ft.) wide. The level floor usually contains leaf scatter and soil above exposed bedrock. Soil deposits (present-day) range between 5 and 15 cm (2-6 inches).

The scattered cobbles in the valley floors resemble bulldozer activity. However, they are not as dense, subangular, and weathered as typical bulldozer debris. Only a few bulldozer piles were found in the area, although more than 30 mounds within site -26280 were inspected. Most of the mounds also appear to be too small for bulldozer piles. Most of the clearing mounds are more or less neatly placed on small bedrock exposures in the valley floor or at its edges.

The site’s function is interpreted as agricultural clearing mounds and all available evidence suggests these mounds are pre-contact. Due to their shallowness and the variety of shapes and sizes, it is most plausible that these mounds are the result of clearing the “valley” floor. The valley depressions are also generally wetter and have better soil deposition (lack of bedrock exposure) as evidenced by the size of the *koa haole* within the in comparison to the immediate higher ground. The small and medium cobbles scattered on the ground are either remains from the clearing activity or are intentional mulching features.

The marked topography of the depressions and the proximity to the major habitation site -26348 complex (as well as sites -26284, -26285, etc.; see Figure 43) also supports the interpretation that these mounds are related to widespread agricultural activities. None of the mounds appear to be deep enough (nor horizontally large enough) to contain burials.

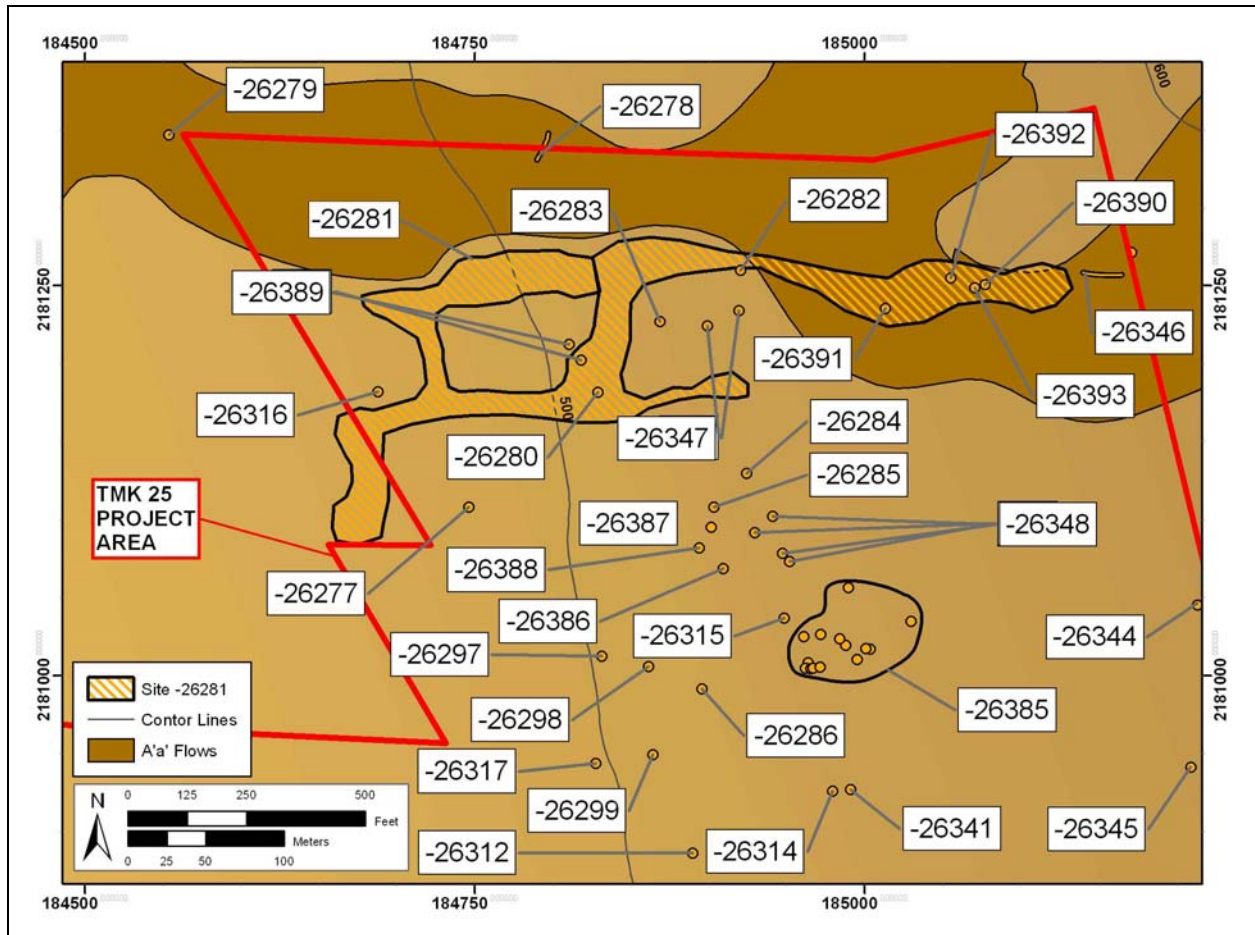


Figure 43. Site -26281, showing the extent of the site and other sites within the vicinity



Figure 44. Site -26281, typical agricultural mound, view to northwest



Figure 45. Site -26281, showing several mounds, view to northwest

4.3.10 State Site # 50-10-27-26282

SIHP #	50-10-27-26282
FUNCTION:	Shelter
SITE TYPE:	Blister
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	9 m by 4 m (29.5 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	525 ft a.m.s.l.

DESCRIPTION: Site -26282 is a small blister shelter (Figure 46 and Figure 47). The interior of the blister is approximately 9 m by 4 m (29.5 ft. by 13.1 ft.) with a ceiling height of approximately 1.15 m (3.8 ft.). A layer of soil covers almost the entire floor of the blister and averages a depth of 3-4 cm (0.12 ft.). Some scattered natural collapse is evident in the blister and there may have been some minimal effort to clear the center floor. No other modifications were apparent.

A very sparse midden scatter within the blister is comprised of some pieces of marine shell, including a piece of cowry, a few pieces of urchin and some *kukui* nut.

The site's function is interpreted as a temporary habitation shelter; the midden and slight clearing indicate utilization for intermittent shelter. The relatively small size of the blister and the small amount of midden and modification indicate that utilization was not intense enough to be considered a permanent habitation site.



Figure 46. Site -26282, view to west

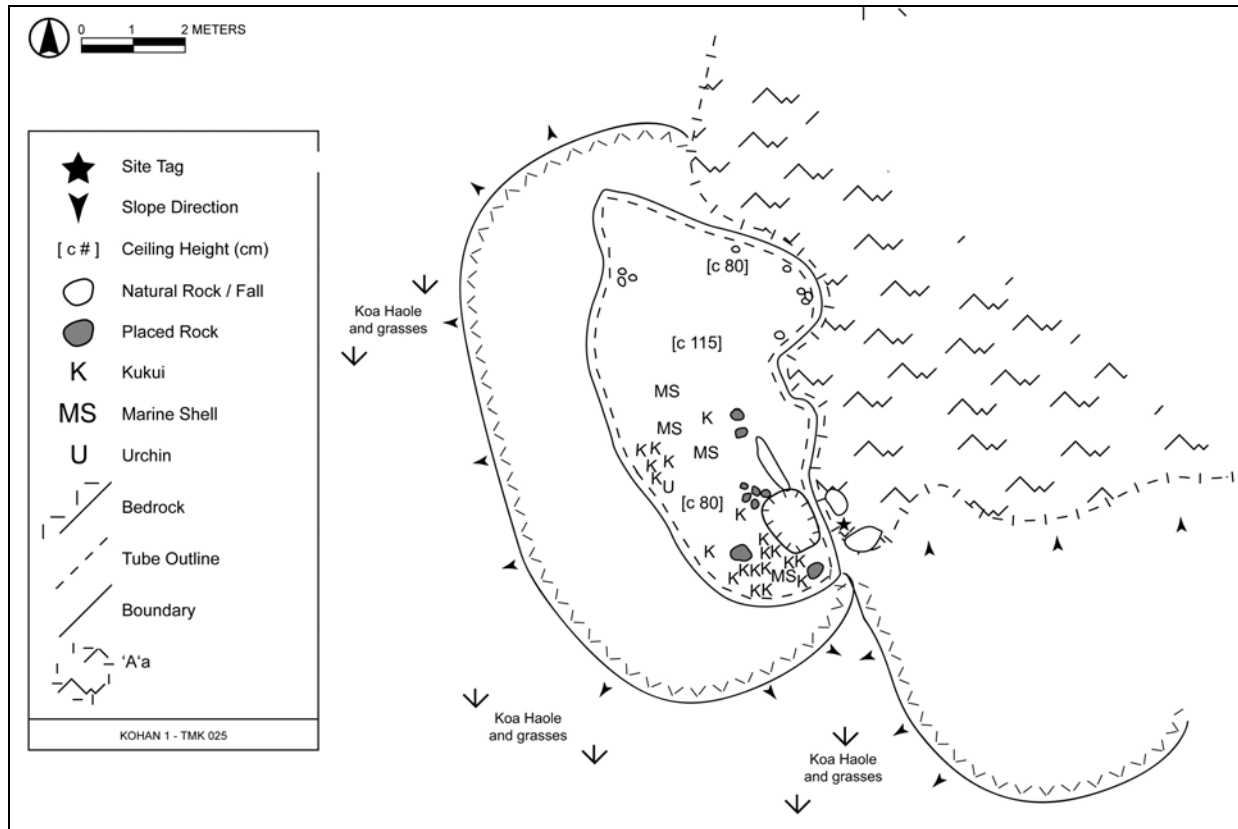


Figure 47. Site -26282, plan view

4.3.11 State Site # 50-10-27-26283

SIHP #	50-10-27-26283
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4 m by 3 m (13.1 ft. by 9.8 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	500 ft a.m.s.l.

DESCRIPTION: Site 26283 is an enclosure constructed with loosely piled *pāhoehoe* cobbles and boulders, measuring 4 m (13.1 ft.) northeast/southwest by 3 m (9.8 ft.) northwest/southeast with an average height of 30 cm (1 ft.) (Figure 48 and Figure 49). The enclosure is highly collapsed but appears to have been open to the north. It is constructed atop the northeast end of a pronounced tumulus. At the southeast end, the northeast end of a large crevice has been partially filled.

The site's function is interpreted as temporary habitation. The partially filled crevice was likely a leveled living area. The condition of the site is poor due to collapse on all sides of the enclosure. No artifacts or midden were observed at the site, and excavation potential of this site is poor due to the lack of soil.



Figure 48. Site -26283, view to southwest

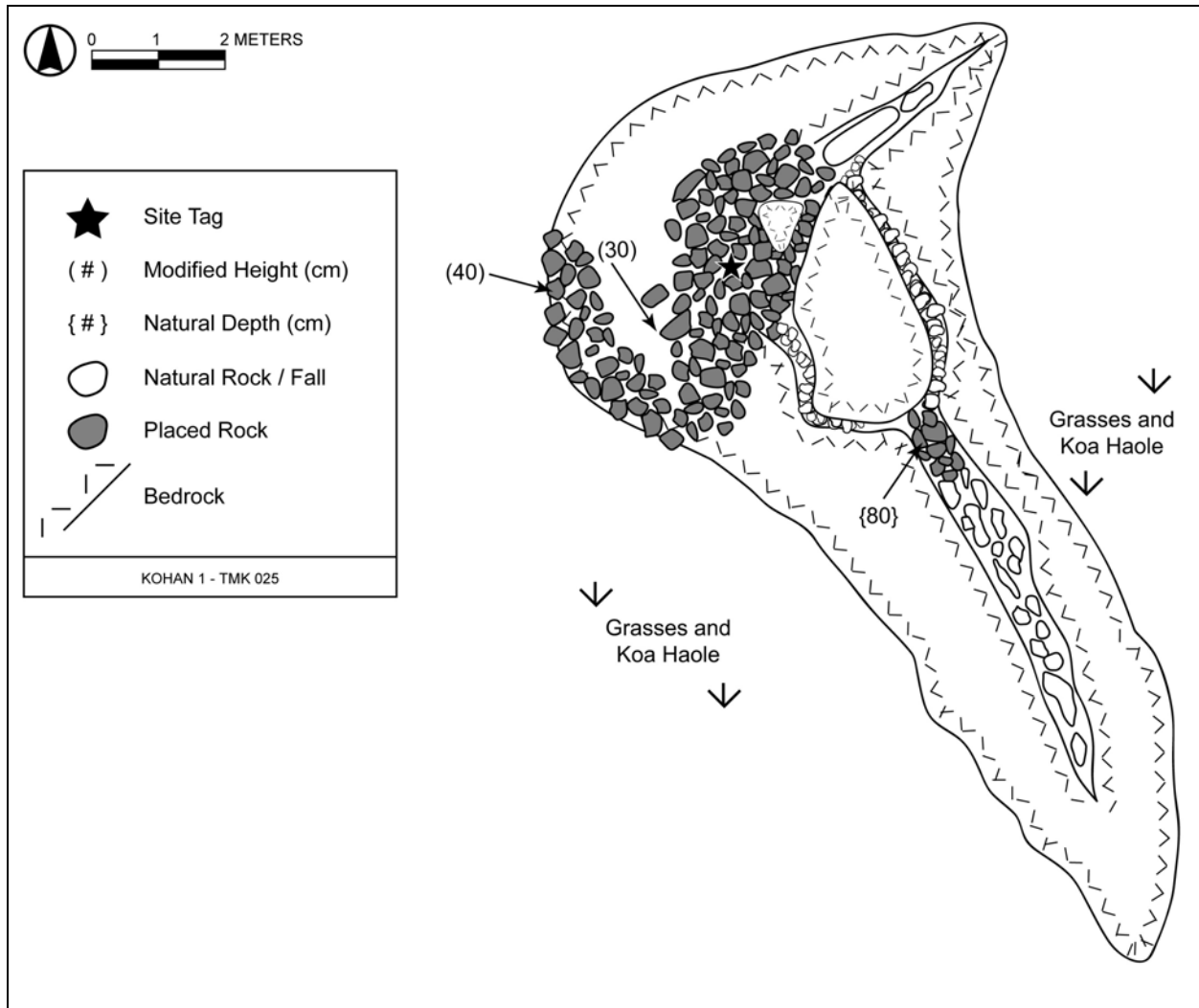


Figure 49. Site -26283, plan view

4.3.12 State Site # 50-10-27-26284

SIHP #	50-10-27-26284
FUNCTION:	Permanent Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	4
DIMENSIONS:	16 m by 13.5 m (52.5 ft. by 44.3 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	525 ft a.m.s.l.

DESCRIPTION: Site -26284 is a sloping area of *pāhoehoe* that has been modified to create three constructed terraces, a platform, and two small enclosures that form a hearth feature. The site consists of a total of four features (A through D; Figure 50). Additionally, a small boulder pile with no formal structure is located approximately 10 m (32.8 ft.) west of Feature D; the pile is similar to those found at nearby site -26285. An area that may have been an open agricultural area is to the east of the site. This area is cleared of larger cobbles and boulders, but it consists primarily of exposed bedrock with no soil deposit and no evidence of extensive mulching.

Feature A is a platform approximately 12 m (39.4 ft.) north/south by 4 m (13.1 ft.) east/west, constructed of *pāhoehoe* cobbles and small boulders and some small to medium sized *pāhoehoe* slabs. The platform is built directly atop a widespread area of gently undulating *pāhoehoe* outcrop. The remainder of the site (Features B, C, and D) is located immediately down slope of Feature A (Figure 50). The platform is built up above the surrounding *pāhoehoe* outcrop to an average height of 30 cm (1 ft.). The platform surface is relatively level with some inlaid slabs creating a paved surface. An area immediately adjacent to the platform is naturally level and has been enclosed with mounded boulders and cobbles; this is an extension of the living surface.

There is a modified cubby on the north half of the platform (Figure 51). The cubby is a natural hole in a small blister that has been modified. The cubby is relatively square, approximately 40 cm (1.3 ft.) across, and goes straight down into the platform fill. The bottom of the cubby has a single layer of loose, small *pāhoehoe* cobbles. These cobbles are not evenly spaced, and do not appear to be an intentional effort to pave the cubby floor. Modification includes adding stones around the cubby opening to deepen the cubby to approximately 65 cm (2.13 ft.) from the constructed surface to the cobble bottom. The cubby's most likely function was storage.

Feature B consists of two natural terraces (Figure 52) modified by placed and stacked large *pāhoehoe* cobbles, small boulders, and medium *pāhoehoe* slabs in an alignment across the slope that naturally separates the two natural terraces, and on alignments that bound the lower end of the second terrace. The upper terrace is immediately adjacent to, and begins at the west base of Feature A, the platform. Except for the two alignments, the terraces are clear of any large cobbles or boulders. Midden containing marine shell (cowry and *Nerita* sp. shell), was found on the south end of both terraces, although the majority of this shell is on the upper terrace. A broken piece of a small fine-grained basalt was also found near the marine shell at the south end of the lower terrace.

The naturally level surfaces of these two terraces are ideal for habitation sites. Although terraces can be associated with agricultural use, the lack of soil deposit or mulching does not

support that function. The marine shell midden scatter and the presence of a ground stone tool further support the interpretation of permanent habitation function.

Feature C contains two adjacent enclosures constructed by bedrock/blister modification, and stacked *pāhoehoe* slabs, cobbles, and boulders (Figure 53). The eastern most enclosure measures 1.5 m by 1.3 m (4.9 ft. by 4.3 ft.) with a well faced wall (30 cm / 1 ft.) on the east and north side. The south and west sides have been stacked with loose cobbles. A single *kukui* endocarp was found within the enclosure. The western most enclosure, measuring 1.5 m by 1.10 m (4.9 ft. by 3.6 ft.), has walls (30 cm / 1 ft.) of stacked *pāhoehoe* cobbles and boulders, and one 'a'ā boulder. Both enclosures utilize the naturally raised bedrock on the north end to maintain level ground on a moderate slope. The likely function of this feature is activity area/hearth. Given the small size of these enclosures and the low faced walls, this feature was likely cooking areas/hearths that may have been used individually by men and women, since traditionally men and women had separate cooking and waiting areas. The enclosures' interiors contain a thin soil layer and a recent detritus layer; excavation potential is fair.

Feature D is a well paved area constructed with small to medium *pāhoehoe* slabs (Figure 54). The paving is very level and smooth, and slabs are fitted tightly together. This pavement is flush with the surrounding ground, which is a slightly, naturally eroded bedrock outcrop. The entire level area, both the natural surface and the pavement, fills an area that is a natural terrace of sorts above the terrain to the west, although it is approximately 60 cm (2 ft.) lower than the natural terrace above it. Midden containing two pieces of cowry shell was found on the naturally level surface alongside the *pāhoehoe* slab pavement. This presence of marine shell midden is also indicative of habitation sites. The labor investment necessary to construct the fine paving of Feature D, in addition to the other site features support the permanent habitation function.

The site's function is interpreted as permanent habitation as indicated by each of the features. The four features are contiguous and create multiple living surfaces for permanent habitation. The labor investment required for this site, particularly the paved platform with the modified cubby (Feature A) and the very fine paving of Feature D, indicates intensive use of the site. The site's association with site -26348 (a large habitation complex, approximately 36 m south of site -26284) additionally supports the argument for permanent habitation.

It is also important to note that surface midden is generally rare within the project area. The surface midden indicates a more intensive utilization of this site than previously seen at the majority of the other surface sites, most of which are temporary habitation sites. The presence of surface midden additionally supports site -26284's function as permanent, rather than a temporary, habitation site.

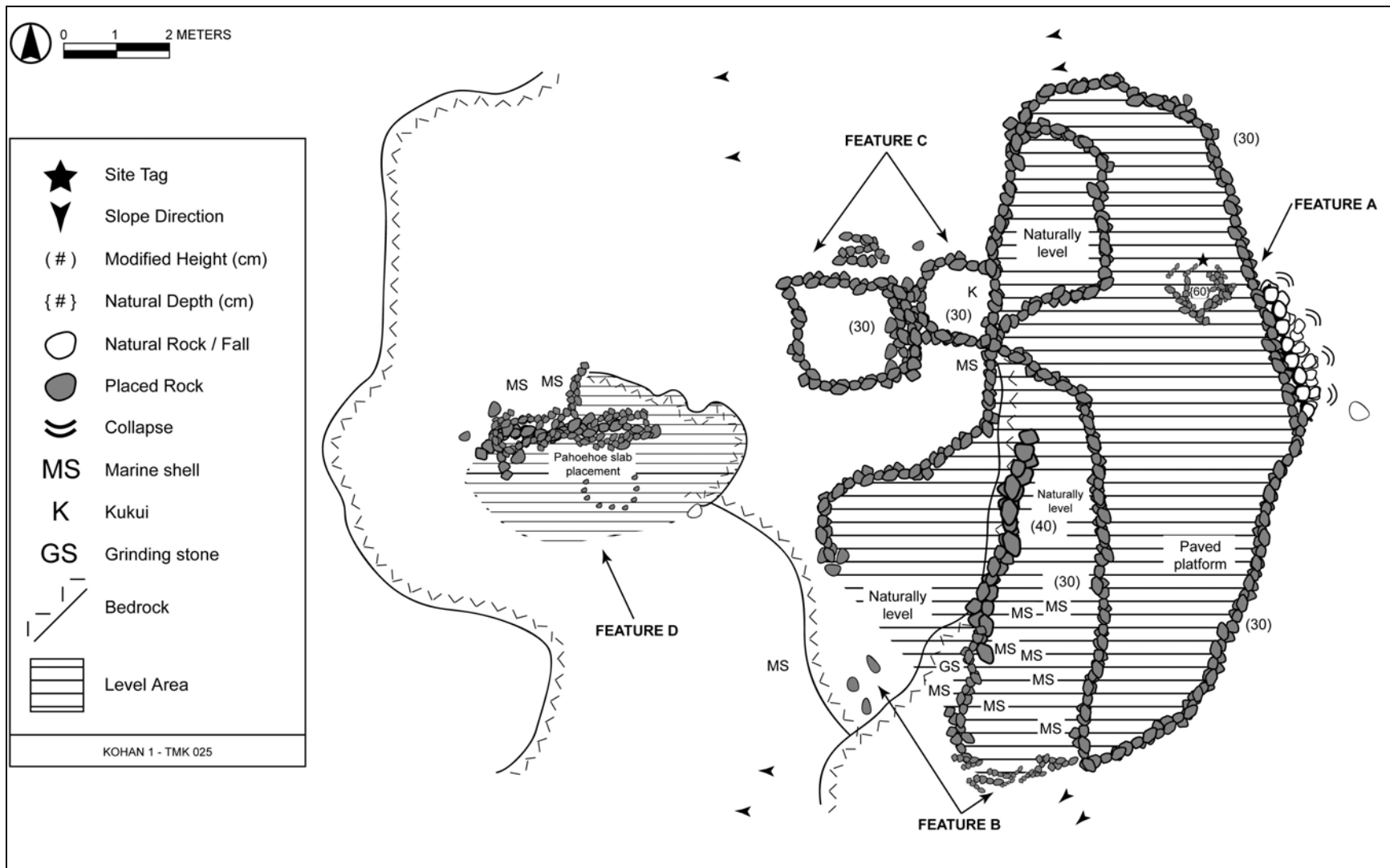


Figure 50. Site -26284, plan view



Figure 51. Site -26284, Feature A, showing detail of cubby area



Figure 52. Site -26284, Feature B terraces, view to south



Figure 53. Site -26284, Feature C enclosures, view to northeast



Figure 54. Site -26284, Feature D, showing *pāhoehoe* slab pavement, view to east

4.3.13 State Site # 50-10-27-26285

SIHP #	50-10-27-26285
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	8 m by 8 m (26.3 ft. by 26.3 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26285 is a circular enclosure comprised primarily of mounded *pāhoehoe* small slabs, boulders, and cobbles piled on *pāhoehoe* bedrock (Figure 55 and Figure 56). The location, in an area of natural depression with an elevated area of *pāhoehoe* bedrock along the eastern and southern edges of the site, provides a rather sheltered location.

Naturally occurring *pāhoehoe* bedrock is utilized along the eastern edge of the enclosure to form the feature. The enclosure walls are approximately 2 m (6.6 ft.) wide and range between 40-60 cm high (1.3-2 ft.); the highest point usually occurs in the middle of the wall. There are a few uprights within the enclosure walls. The center of the enclosure appears to be slightly leveled/paved with small cobbles. The southwest exterior corner appears to be slightly squared off and possibly faced.

Approximately 8 m (26.3 ft.) to the west of the site are two low linear mounds measuring approximately 2 m by 1 m (6.6 ft. by 3.3 ft.) and one smaller mound measuring 2 m (6.6 ft.) northwest of the site (1 m by 0.5 m) (3.3 ft. by 1.6 ft.), as well as another one similar in size 10 m (32.8 ft.) to the north (at the base of site -26284). The function of these small mounds is unknown since they are not uniform in size or form, but they are generally consistent with agricultural clearing mounds.

The site's function is interpreted as temporary habitation based on the site's location and form. The size of the enclosure and lack of adjacent features suggests this site was used for intermittent rather than permanent habitation. Excavation potential is fair, as the central portion of the site may contain cultural material (although none was observed on the surface); however, there is no evidence of extensive soil deposits within the enclosure.

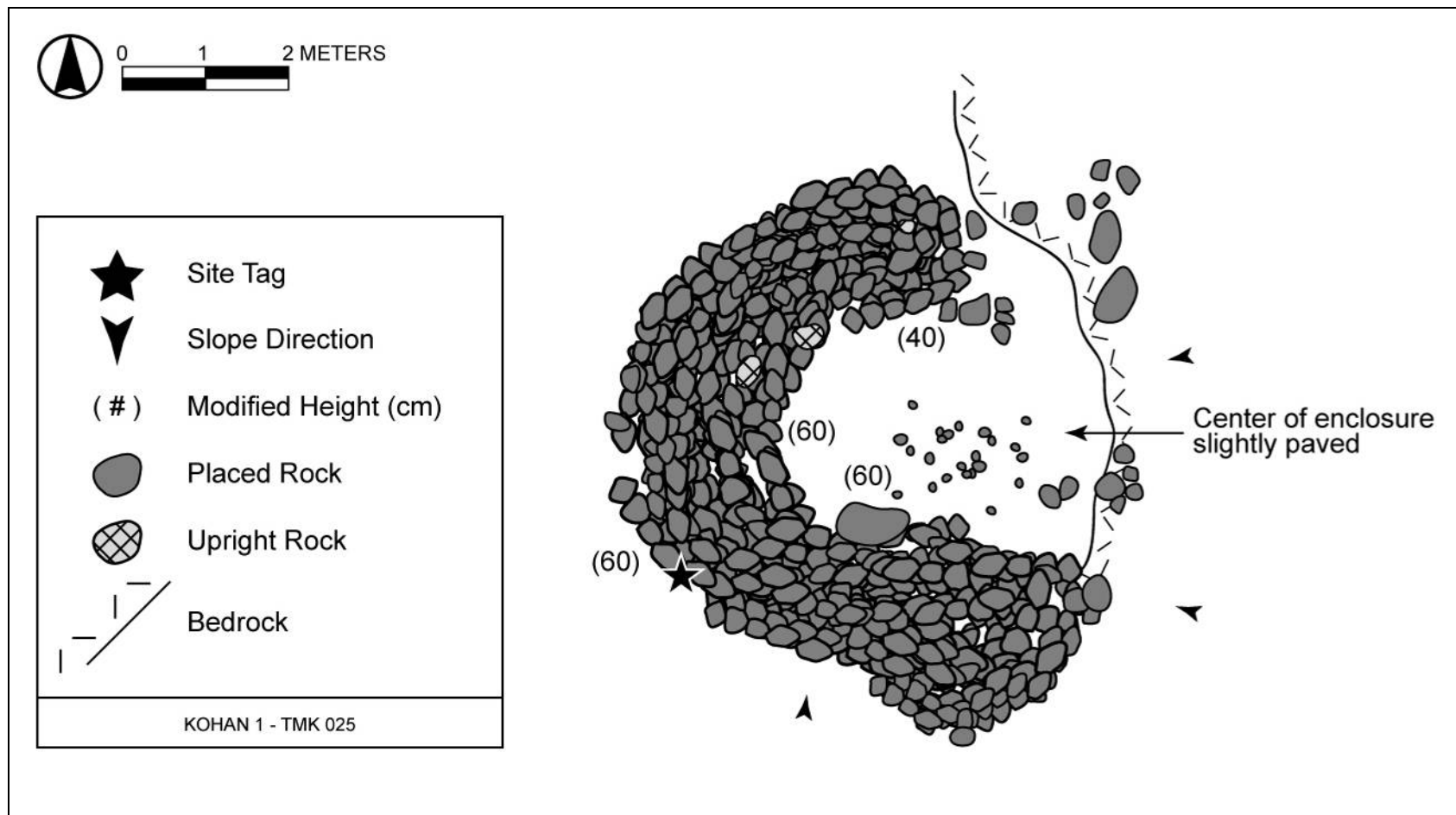


Figure 55. Site -26285, plan view



Figure 56. Site -26285, view to east

4.3.14 State Site # 50-10-27-26286

SIHP #	50-10-27-26286
FUNCTION:	Quarry
SITE TYPE:	Modified Outcrop
TOTAL FEATURES:	4
DIMENSIONS:	N/A (pervasive)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	480 ft a.m.s.l.

DESCRIPTION: Site -26286 consists of several isolated quarry areas (Features A through D) located throughout the project area (see Figure 13 for overview). The quarry features generally consist of *pāhoehoe* bedrock exposures that have been modified by the removal of stone for abraders or possibly for construction material. The quality of the basalt in some of the bedrock exposures is good to medium for the production of abraders; the basalt has minute vesicles that create a sandpaper-like surface. Generally, a 5 to 10 cm (2 to 4 inches) gaseous void or space is beneath the laminar surface that allows the bedrock to be easily fractured. Nearby or adjacent to some of the quarry areas, there are piles of small to large boulders that are presumably the remains of quarrying activities (Figure 57). The quarry areas also often have sections of bedrock that have been removed and were apparently transported elsewhere. No quarrying tools such as hammerstones were found with the features.

Feature A consists of mounded rejected material that appears to partially fill a crevice (Figure 57). The western edge of the exposure is still present although the remaining upper laminar flow appears relatively solid, which may have impeded material removal. The uppermost surface, containing the finest texture, has been removed from most of this surface.

Feature B is just west of Feature A and is similar in appearance although not as well stacked (Figure 57 and Figure 58). No evidence of bulldozer activity was found in the feature's vicinity.

Feature C has a diameter of approximately 5 m (16.4 ft.); the cobbles in Feature C are smaller than those found in Feature B. Feature C has a void of 10 to 15 cm (4 to 6 inches) between the first and second laminar flows of *pāhoehoe*; this space allows the bedrock to be easily fractured. Site -26287 is approximately 230 m (754.5 ft.) to the southeast.

Feature D and site -26288 are located on the same west facing slope of the hill; Feature D is approximately 10 m west of -26288, Feature G (Figure 59). The quarry is visible from a distance due to its position on the west face of a noticeable rise and its position higher than all of the land *makai* of it. Vegetation is also fairly cleared due to the extent of the rubble.

The site's function is interpreted as quarry activity area based on the apparent removal of basalt from bedrock exposures and the discarded, mounded remains. The site type and the quality of basalt are also indicative of the function.

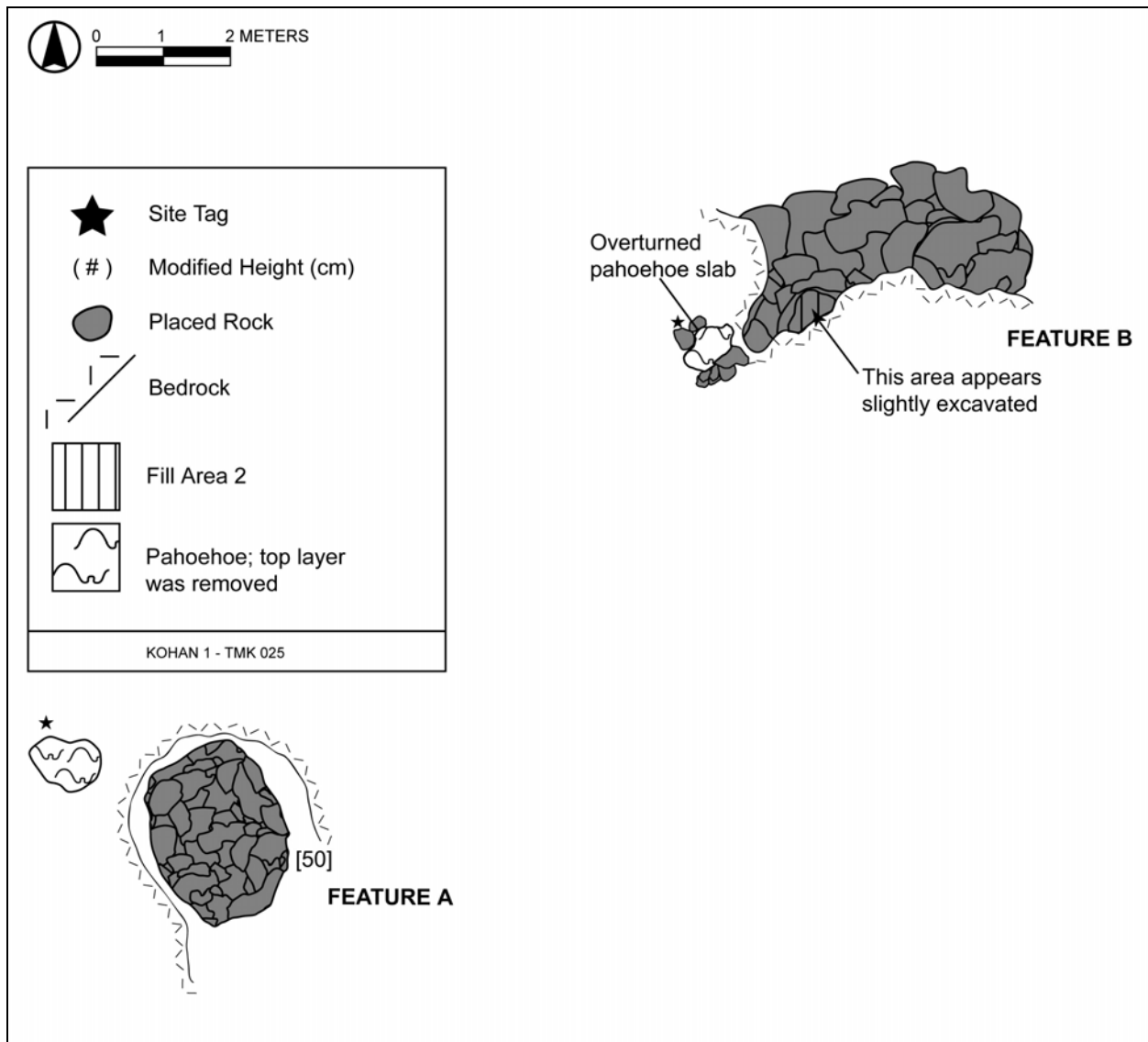


Figure 57. Site -26286, plan view of Features A and B



Figure 58. Site -26286, Feature B, overview of quarry area



Figure 59. Site -26286, Feature D, overview of quarry area

4.3.15 State Site # 50-10-27-26287

SIHP #	50-10-27-26287
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	25 m by 5 m (82 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	485 ft a.m.s.l.

DESCRIPTION: Site -26287 is a small lava tube located atop a slightly undulating *pāhoehoe* flow amongst tall grasses and fairly low *koa haole* in the northeast quadrant of the project area, near the end of Huliko‘a Street.

The site is in good condition and consists of slight modification in the form of some piling of *pāhoehoe* cobbles at the tube’s entrance and some placed *pāhoehoe* cobbles and slabs throughout the tube (Figure 60 and Figure 61). The entrance to the tube is very small, approximately 70 cm by 70 cm (2.3 ft. by 2.3 ft.). The surface exterior of the entrance has no modification but medium cobbles have been placed inside the entrance that form a mound, approximately 70 cm high (2.3 ft.), and a slight ramp down into the interior of the tube. A small soil deposit, approximately 3 cm (0.1 ft.) deep, is on the tube floor at the end of the ramp. The shallow soil deposit and mounded entrance suggest a fair excavation potential for this site.

The site’s function is interpreted as shelter. Since no midden is present in the tube, and no other indications of more intensive habitation are present, this site functioned as temporary habitation. Although the specific function of the placed cobbles is not implicit, a tool cache appears unlikely because the cobbles are not the necessary quality for tool construction. The site’s age is indicated by the absence of any historic artifacts.

A burial check was conducted on a small chamber behind the ramp of small cobbles at the entrance to this small tube. Approximately five cobbles were moved to allow enough access to the chamber to visually inspect all areas of the small chamber. No modification nor cultural materials or burial were found in the chamber.

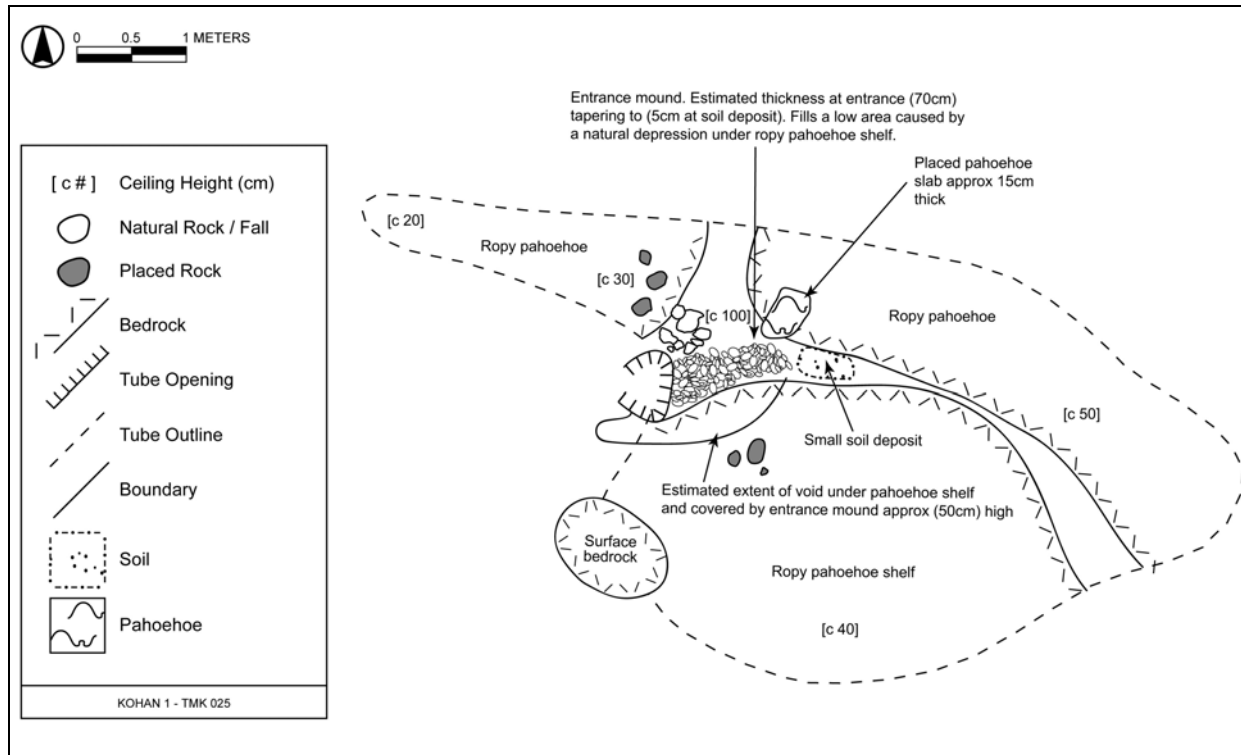


Figure 60. Site -26287, plan view



Figure 61. Site -26287 interior, showing mound and pāhoehoe slab in foreground

4.3.16 State Site # 50-10-27-26288

SIHP #	50-10-27-26288
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	8
DIMENSIONS:	12m by 40 m (39.3 ft. by 131.2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	470 ft a.m.s.l.

DESCRIPTION: Site -26288 is located atop a very noticeable rise of an undulating *pāhoehoe* flow in the southwest quadrant of the project area. The vegetation within and immediately surrounding the site consists of dense *koa haole* and air plant overhead.

This site features a large central sink, approximately 9 m in diameter and 2.2 m deep, with several lava tubes radiating out. The sink is partially enclosed on the surface by a surrounding wall (Figure 62).

A total of eight feature designations (Features A through H) have been assigned to the cultural modifications present at the site complex, both on the surface and underground. Feature A is the enclosing wall and is the site's sole surface feature. The remaining seven features (Features B through H) are lava tubes. Six of the seven lava tubes are accessed via entrances off the central sink. The Feature H lava tube is the only lava tube that is located outside of the central sink and enclosing wall.

The sink's center contains a large amount of natural boulder fall and is modified with a leveled area on its north side, immediately in front of the entrance to Feature B. On the west side of the sink, *pāhoehoe* cobbles and boulders are stacked 1.2 m (4 ft.) from the sink floor to create steps. The top step is approximately 1 m (3.3 ft.) below surface. These constructed steps are the only means of access from the surface into and out of the sink.

Features B and E, lava tubes, are temporary habitation features and exhibit more extensive modification than the other lava tubes (Figure 64). The five other lava tubes have minimal modification and cultural materials; they function as shelters. Feature A, the enclosing wall, likely had an agricultural function, although ceremonial function is a possibility.

Feature A is a walled enclosure that begins and ends at the large sink (Figure 62 and Figure 63). The enclosure wall is continuous, and meets the sink at the north and south surface ends, and encloses the surface of the entire west side of the sink. The wall is constructed of *pāhoehoe* boulders and ranges in width between 1 m (3.3 ft.) and 1.3 m (4.3 ft.). Small portions of the wall are collapsed in places but the majority of the wall is intact. The wall height ranges between 60 cm (2 ft.) at its lowest intact point and 1.7 m (5.6 ft.) at its highest. The wall height varies at any singular point between the interior face of the wall and the exterior face. This range is from as little as 20 cm (0.6 ft.) to as great as 60 cm (2 ft.), with the exterior always being taller because the interior surface is higher than the exterior surface. The wall's constructed courses range from three courses on the interior to seven courses on the exterior to accommodate the higher ground surface in the enclosure's interior. The wall is well-faced on the interior and exterior sides and has a well-defined northeast corner.

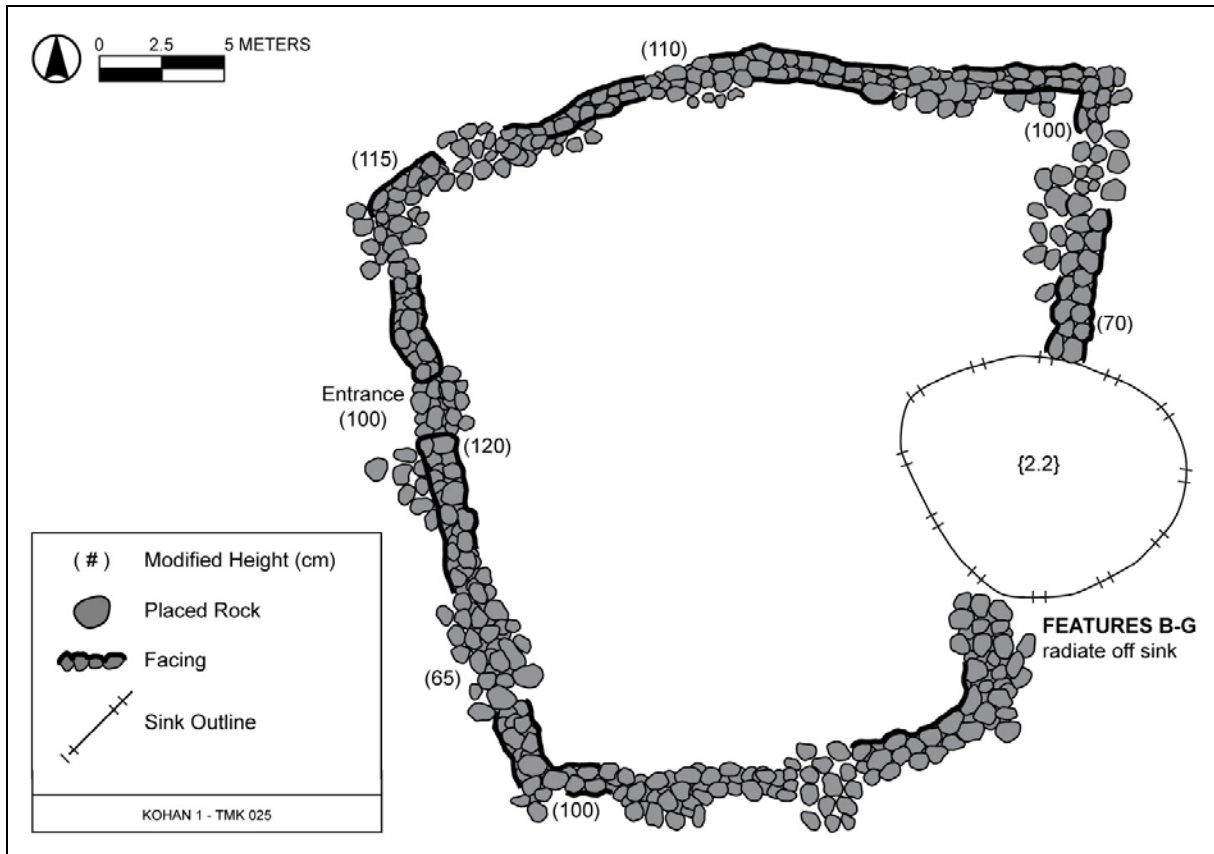


Figure 62. Site -26288, Feature A



Figure 63. Site -26288, Feature A, view to east

At one time, an entryway was present through the enclosing wall at 254 degrees from the west end of the sink. This entryway appears to have been filled in during a later phase of construction; it is discernable through a portion of the wall that is lower and has no facing on either the interior or exterior sides, yet is not significantly collapsed. Facing is, however, on the ends of the wall abutting this abnormal portion of the wall, indicating that this entryway was part of the original construction. The entryway measures approximately 2.5 m (8.2 ft.) wide and is off center with the west wall of the enclosure. It is within 10 m (32.8 ft.) of the northwest corner of the enclosure. The entryway construction is not highly formal; it is well faced but it is not higher or wider than the remainder of the wall. The entryway's base course is an upright *pāhoehoe* slab, unworked and roughly triangular on both sides, and in natural form. These slabs comprise approximately fifty percent of the entryway's height of 1.2 m (3.9 ft.). Relatively large, flat *pāhoehoe* slabs stacked horizontally account for the remainder of the height. The slabs are approximately three courses high on top of the uprights and 40 cm by 100 cm (1.3 ft. by 3.3 ft.) on average. They do not occur regularly in the remainder of the wall, which is primarily constructed with angular *pāhoehoe* boulders.

Feature A's function is agricultural with the possibility of a ceremonial function. The wall is clearly not historic, although its construction is indicative of the historic period since it bisects the sink, thus allowing livestock to fall in (which was a frequent occurrence). The soil within the wall is better developed than anywhere in the immediate area and is held and retained by the wall. This soil currently supports dense, 3 m (9.8 ft.) high, *koa haole* of a fairly consistent size, and very dense, 50-100 cm (1.6-3.3 ft.) tall, air plant. Soil deposits on the west interior of the enclosure may be as deep as 60 cm (2 ft.) (based on the wall's height difference). The interior soil is rocky, although nothing larger than a medium cobble was observed.

Due to the wall height and its unusual placement in relation to the sink, it is possible that this was a prominent ceremonial area. No definitive ceremonial modification or artifacts were observed, but the possibility of ceremonial function cannot be immediately discounted.

The feature's excavation potential is excellent and is recommended to aid in determining the function of this unusual site.

Feature B is a large lava tube measuring 41 m (34.5 ft.) northeast/southwest by 6 m (19.7 ft.) northwest/southeast with an average ceiling height of 2 m (6.7 ft.) (Figure 64). The tube's entrance is located on the northeast side of the site's large sink. The tube's entrance measures 10 m (32.8 ft.) wide and approximately 1.6 m (5.3 ft.) high. Feature C's entrance is located at the northwest end of Feature B's entrance. Feature B tube begins with a very large, open entrance chamber. This large open area extends 13 m (42.7 ft.) northeast from the entrance and has an average ceiling height of 2 m (6.6 ft.). A 5 cm (0.16 ft.) deep soil deposit covers the floor of this large entrance chamber; this soil deposit suggests this feature has a fair excavation potential. Many *pāhoehoe* cobbles, from the surface and not naturally from within the tube, are scattered throughout the entrance chamber floor. These cobbles are the remnants of a cobble pavement chamber floor that is no longer completely intact. This pavement covered and leveled the cave's natural 'a'ā floor. Approximately 2 m (6.6 ft.) north of the tube entrance, is a cleared and excavated 1 m by 2 m (3.3 ft. by 6.6 ft.) area of the cave floor. This may be the result of a previous formal excavation of this cave. No midden or any other cultural material is present in this entrance chamber. The tube continues beyond the entrance chamber, approximately 28 m (91.9 ft.). The floor is sharp, rough 'a'ā and the ceiling is low. There are no cultural materials or

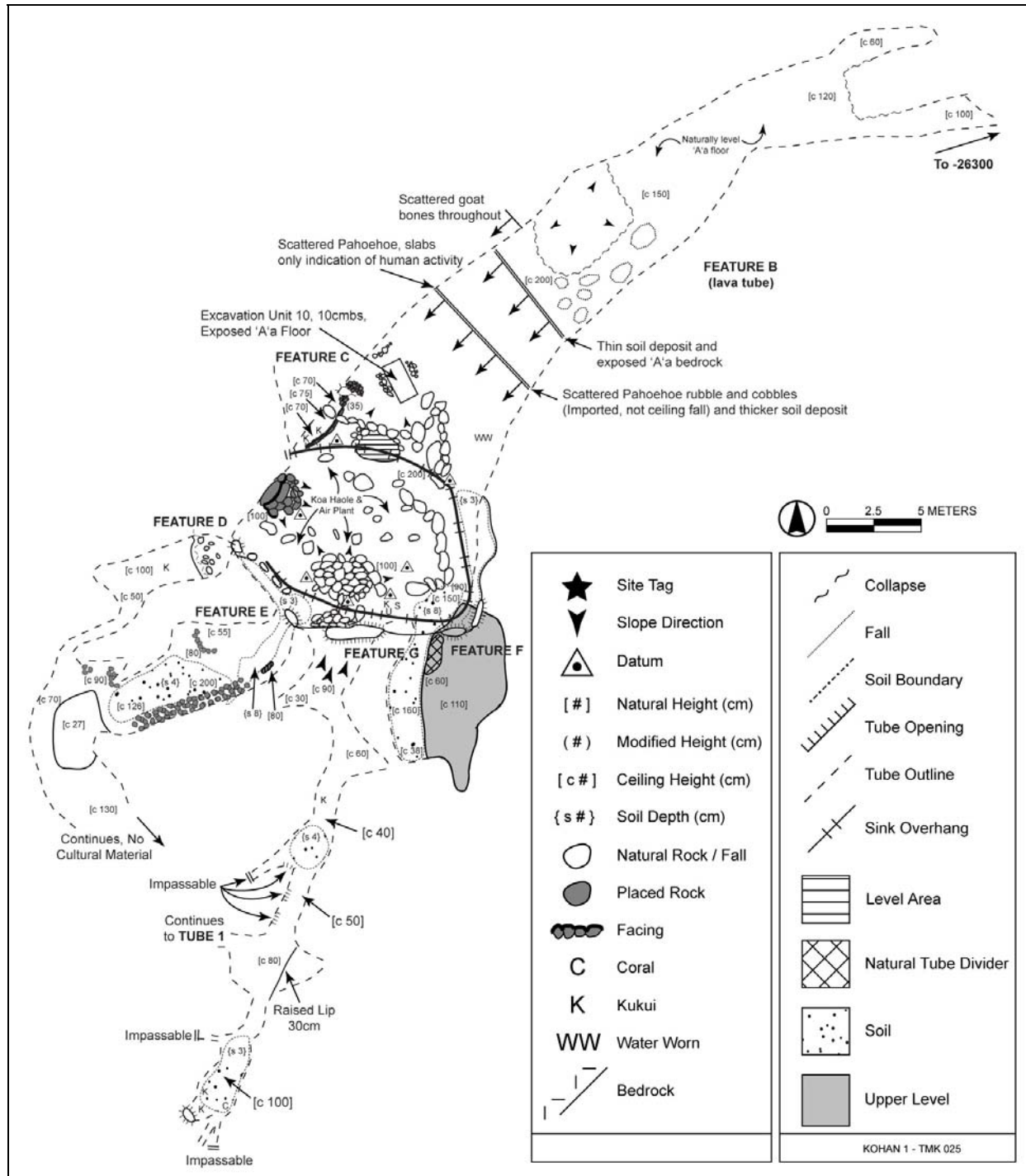


Figure 64. Site -26288, Features B through G with Sink 1, plan view

modifications in this portion of the tube. Beyond a large area of natural ceiling fall, which severely limits access, this tube connects to site -26300, Feature B.

Feature B's function is temporary habitation. Although no midden is present in the tube, the pavement modification and the large size of the entrance chamber are indicative of the more intensive utilization of temporary habitation (Figure 65).



Figure 65. Site -26288, Feature B in Tube 5, view to northeast

Feature C is a small, modified lava tube measuring 4 m (13.1 ft.) northeast/southwest by 1 m (3.3 ft.) northwest/southeast with an average ceiling height of 72 cm (Figure 66 and Figure 67). The entrance to the tube is located on the northwest end of the entrance to Feature B. Feature C's entrance is in the floor of the Feature B entrance, abutting the sidewall of the tube. A large *pāhoehoe* slab was placed on the northeast side of the entrance; this slab blocks access into Feature C from within Feature B tube. Immediately inside the entrance, on the southeast side of the tube, are small and medium *pāhoehoe* cobbles stacked to a height of 35 cm (1.1 ft.). Beyond these cobbles is a well-faced wall constructed two courses and 60 cm (2 ft.) high that runs along the southeast wall of the tube for approximately 3 m (9.8 ft.) until ending where the tube severely constricts and ends. The area between the facing of the constructed wall and the tube sidewall is full of small and medium *pāhoehoe* cobbles. The floor of the tube is covered with a 2 cm (0.07 ft.) deep salty soil deposit. Several *kukui* are scattered in the tube, concentrated primarily at the back of the tube. There is also a bone fishhook on the tube floor. The presence of the soil deposit, midden, and fishhook suggest a fair excavation potential for this feature.

Feature C's function is shelter. The entrance to the tube was modified to limit access and decrease the tube's visibility, indicating that this tube likely served as a refuge cave.

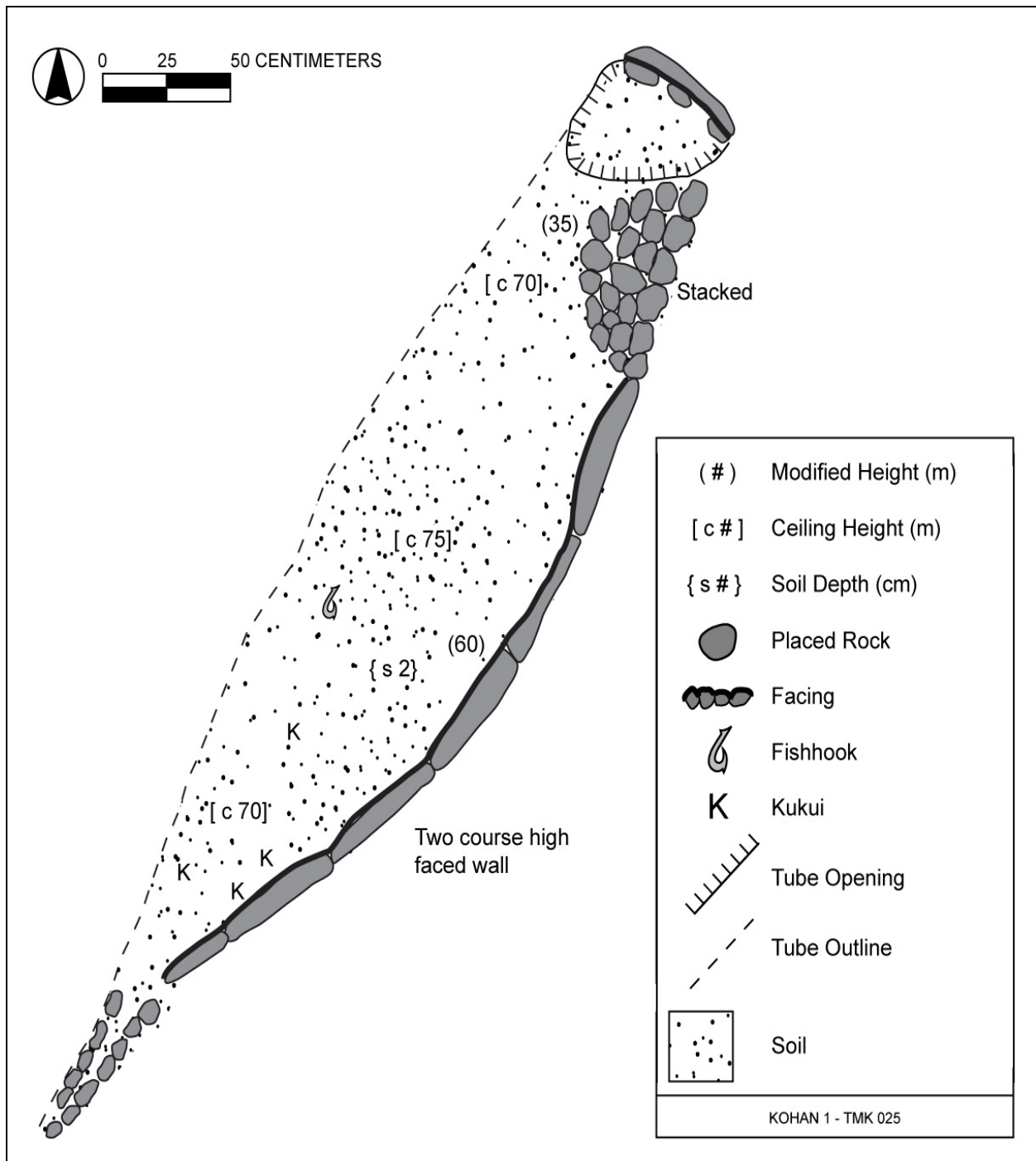


Figure 66. Site -26288, Feature C



Figure 67. Site -26288, Feature C, view to southwest

Feature D is a very small lava tube extending west from the major sink defining site -26288 (Figure 64). It is only approximately 7 m (23 ft.) long. The tube is notable for two prominent natural *pāhoehoe* benches creating ‘steps’ into the tube. One ‘step’ is a scatter of small to large *pāhoehoe* cobbles that do not appear to be in this position naturally. This may have been a terrace built on the shelf that is in very poor condition. The terrace’s purpose is unclear, since the ceiling would be quite low for habitation. At its southwest corner, the tube connects to another tube, Feature E, via a very low arch that is not passable. Only one major fall area is apparent and all but one small boulder from this fall have been relocated towards the sides of the chamber in an informal manner. No soil and only a small amount of *kukui* is present in the cave; the excavation potential for this feature is poor.

Feature D’s function is a shelter. The slight modification in the form of placed boulders and the small amount of midden indicates some utilization of the cave, but very little. The lack of more extensive utilizations precludes this tube from being considered anything other than a shelter.

Feature E is a lava tube in the southwest side of the site’s sink (Figure 64). The tube is completely below the sink’s floor level and its entrance has been altered to create a narrow, constricted entrance. A soil deposit, approximately 3 cm (0.1 ft.) deep, is immediately in front of the entrance, in the sink, and continues into the entrance tunnel. The east side of the entrance is faced. Inside and to the west of the cave entrance, on a natural shelf is a small boulder alignment consisting of approximately eight boulders in a semi-circular alignment. Beyond the entrance and the shelf with this alignment the floor of the cave drops down and opens into a chamber.

This first chamber has an extensive soil deposit that is approximately 4 cm (0.13 ft.) deep, and is spread over almost the entire floor. This soil deposit and the soil deposit in the entrance tunnel indicate this feature has a fair excavation potential. *Pāhoehoe* large cobbles and small boulders are along the entrance chamber's south wall, running approximately 5 m (16.4 ft.) from the tube entrance shelf. Beyond this entrance chamber, the ceiling lowers to create a crawl space that curves west and then to the south. At the beginning of this crawl space, along the curve from the north sidewall of the entrance chamber, is a small alignment of boulders; a small bird bone is among these placed boulders. Just beyond this alignment, there are three additional placed boulders and an entrance that connects Feature E to Feature D. The crawl space then curves around to the southeast and opens into a large chamber with extensive ceiling fall. This large chamber extends south approximately 25 m (82 ft.) and measures approximately 13 m (42.7 ft.) in width, east/west. No cultural materials or modification was observed in this chamber. At the southern end of this chamber the tube narrows again and continues in a southerly direction for 15 m (49.2 ft.). At this point the main tube splits into two branches. One branch continues roughly south while the second branch runs 5-7 m (16.4-23 ft.) west before opening up into a second large chamber with ceiling fall. The south branch continues for another 5 m (16.4 ft.) before curving in a westerly direction. Immediately before the westerly curve, multiple modifications were observed in this tube. A small, faced terrace measuring 1.25 m (4.1 ft.) in width and 50 cm (1.6 ft.) high is located along the west wall of the tube. The terrace is aligned with an area that accumulated a significant amount of moisture and was likely used for water collection. A few meters from this terrace is a second, though highly collapsed, terrace. This terrace is also near an area of significant moisture accumulation. A natural shelf with a large amount of water is located in this same area. As the tube curves to the west for approximately 5 m (16.4 ft.), two water catchments are located along the north and south walls of the tube. This branch of the tube also opens into the second large chamber. The second large chamber with ceiling fall measures 10 m (32.8 ft.) east/west by 27 m (88.6 ft.) north/south. No cultural materials or modification were present. Two tubes extend off this second large chamber. One tube extends off the north end of the chamber for approximately 20 m (65.6 ft.) before becoming impassable. No cultural materials or modification was present in this tube. A second tube extends off the south end of the large chamber. In this tube, approximately 10 m (32.8 ft.) south of the large chamber, there is another water catchment and another probable water collection terrace along the western wall of the tube. Some burned *kukui* and crab claws were also present.

Feature E's function is a temporary habitation and activity area for water collection. This interpretation is evident by the extensive modifications, such as the constructed entrance and multiple boulder alignments. The terraces require sufficient labor investment that supports both a temporary habitation function and water collection. The multiple water catchments are evidence of this feature's secondary function as an activity area for water collection.

Feature F is a small lava tube with a large, open entrance that extends 11 m (36.1 ft.) off the site's large sink (Figure 64 and Figure 68). A soil deposit, 8 cm (0.3 ft.) at its deepest, is at the entrance to the tube that extends into the tube. This soil deposit and its immediate association with the site's central sink indicate a fair excavation potential. No modification or cultural materials were present in this tube.

Feature F's function is a shelter. Despite the lack of any cultural materials or modification in this tube, its association with the sink, the other features, and its comfortable size, with an

average ceiling height of 1.5 m (4.9 ft.) and a relatively smooth floor, indicates its likely use as a shelter.



Figure 68. Site -26288, Feature F, upper level on left and lower level on right

Feature G is a lava tube measuring 30 m (98.4 ft.) northeast/southwest by 2 m (6.6 ft.) northwest/southeast with an average height of 70 cm (2.3 ft.) (Figure 64 and Figure 69). The tube's large entrance measures 3.5 m (11.5 ft.) east/west with a ceiling height of 1.75 m (5.7 ft.) and is located on the south side of the sink. Several *kukui* and sea urchin are present although modifications are absent. Two large soil deposit areas, ranging from 3-4 cm (0.98-0.1 ft.) in depth, are present in the tube. These shallow soil deposits suggest a fair excavation potential. Several side tubes radiate off the northwest side of the tube, however, they eventually end or become impassable and contain no signs of modification or cultural deposits. The tube ends after 30 m (98.4 ft.) at a second entrance to the tube from the surface; the tube measures 1 m (3.3 ft.) by 50 cm (1.6 ft.).

Feature G's function is a shelter as indicated by the presence of the small amount of midden and the feature's association with the site's other features.

Feature H is a lava tube extending northeast and north for approximately 80 m (262.5 ft.) (Figure 70). The tube has an average width of 1 m (3.3 ft.) and an average ceiling height of 1 m (3.3 ft.). It has two large entrances on the southwest end. The southwestern most entrance is 1.2 m (3.9 ft.) wide and 8 m (26.3 ft.) in length, northeast/southwest. This entrance allows access into the tube at an angle of 45 degrees. The second entrance is in the roof of the tube 1.5 m (4.9 ft.) north of the first entrance and measures 2 m by 1 m (6.7 ft. by 3.3 ft.). This second entrance is 1.9 m (6.2 ft.) above the floor of the tube. Cultural activity in the tube appears to have been concentrated close to these entrances, where there is an average ceiling height of 1.6 m (5.3 ft.). A midden concentration, consisting of *kukui* and marine shell, including cowry, is in this area. A

modified bird bone is located approximately 4 m (13.1 ft.) north of the second entrance. The small bone measures 5 cm (0.16 ft.) in length and has a fine hole drilled into its center. The midden scatter, the majority of which is *kukui*, and several crab claws continue 30 m (98.4 ft.) into the tube. Some of the midden may have been displaced and relocated by rodent activity since several rat bones were identified in various locations throughout the tube. A thin soil deposit, 3-5 cm deep (0.1-0.16 ft.), in conjunction with the scattered midden indicates a fair excavation potential.



Figure 69. Site -26288, Feature G, view to southwest

Feature H's function is a shelter. No modification is present that warrants a more intensive function than shelter. The midden is, however, more extensive than the other site features, and contains an artifact, the modified bird bone.

The site's function is interpreted as habitation and agriculture with the possibility of ceremonial function. Seven of the eight features are associated with habitation, temporary or shelter, based on the extent of modification and presence or lack of cultural materials. Features B and E are temporary habitation features and the five other lava tubes are shelters. Feature A, the enclosing wall, contains extensive soil deposits and is likely an agricultural function, although ceremonial function may be a possibility. Features A, C, F, G, and H exhibit excavation potential.

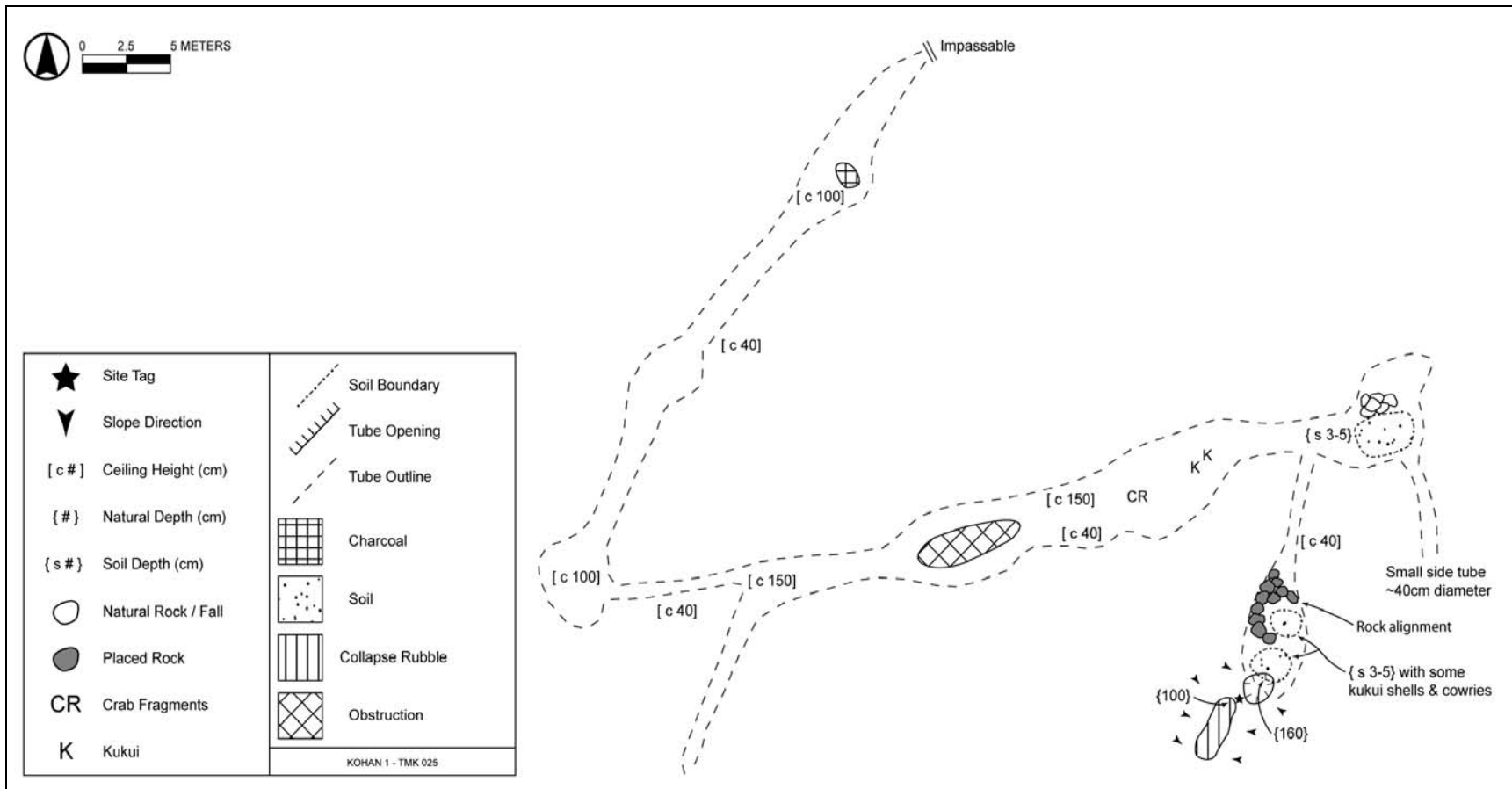


Figure 70. Site -26286, Feature H

4.3.17 State Site # 50-10-27-26289

SIHP #	50-10-27-26289
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	6
DIMENSIONS:	25 m by 5 m (82 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	430 ft a.m.s.l.

DESCRIPTION: Site -26289 consists of three sink holes with multiple lava tubes extending from the sinks, with six of the lava tubes containing cultural material. Tube 1 (extending from Sink 1) has Features A, B, and C; Tube 2 (extending from Sink 2) has Features E and F; Tube 7 (extending from Sink 3), has 2 features both identified as Feature D. The site is within an undulating *pāhoehoe* flow that contains *koa haole* and grasses.

Tube 1 is the only tube in **Sink 1**, and contains the most cultural material and modification in site -26289 (Figure 71). On the south side of the tube's entrance, a small water-worn stone; and approximately four pieces of coral, two are larger chunks and one was likely an abrader, were found. The small water-worn stone may have been utilized as a ground stone given the smoothed texture on one side. Within 10 m (32.8 ft.) of the tube entrance, there are multiple placed boulders, and a fairly abundant midden scatter that includes *kukui*, urchin, *Isognomon* sp., and *Nerita*. There are two shell concentrations as noted on Figure 71. Shell Concentration 1 consists of only *Isognomon* sp. shell with some *kukui*; Shell Concentration 2 consists of only *Nerita* shell.

A few scattered sea urchin are in the front portion of the cave and many more urchin, and no midden, is towards the back portion of the cave. There are a couple of scattered cowry shells and one piece of charcoal. Approximately 10 m (32.8 ft.) from the entrance, there is a constructed partial wall of four medium boulders. While this wall does not block access to the tube, it does slightly constrict the passageway. Beyond this wall, virtually no cultural material is present; there is a small urchin scatter, and no structural modification. An area of collapse is at the back of the tube, and although the tube branches off at the collapse, no cultural or structural modification was apparent in the side tubes.

Feature A is immediately within the entrance, on the north side, at the base of an area of collapse (Figure 73). Feature A is a small paved area (approximately 1 m by 1 m (3.3 ft. by 3.3 ft.) that is built up above the tube floor approximately 70 cm (2.3 ft.). A large hammer-stone was found on the edge of Feature A.

Feature B is a small (approximately 1 m by 1 m) circular alignment/enclosure (Figure 74). A few urchin pieces and more than 50 *kukui* were found within this alignment.

Feature C is a modified area of natural fall that has evidence of stacking, located in Sink 1 just southwest of the entrance to Tube 1 (Figure 72). The fall has been arranged to form a ramp, providing easier access into tube, as well as a wall that serves to demarcate the tube entrance.

The function of Tube 1 is a temporary habitation as indicated by the paved area, circular alignment, and partial wall, and the presence of the abundant midden, multiple pieces of coral, and the water-worn stone and hammer stone. The lack of extensive modifications and more

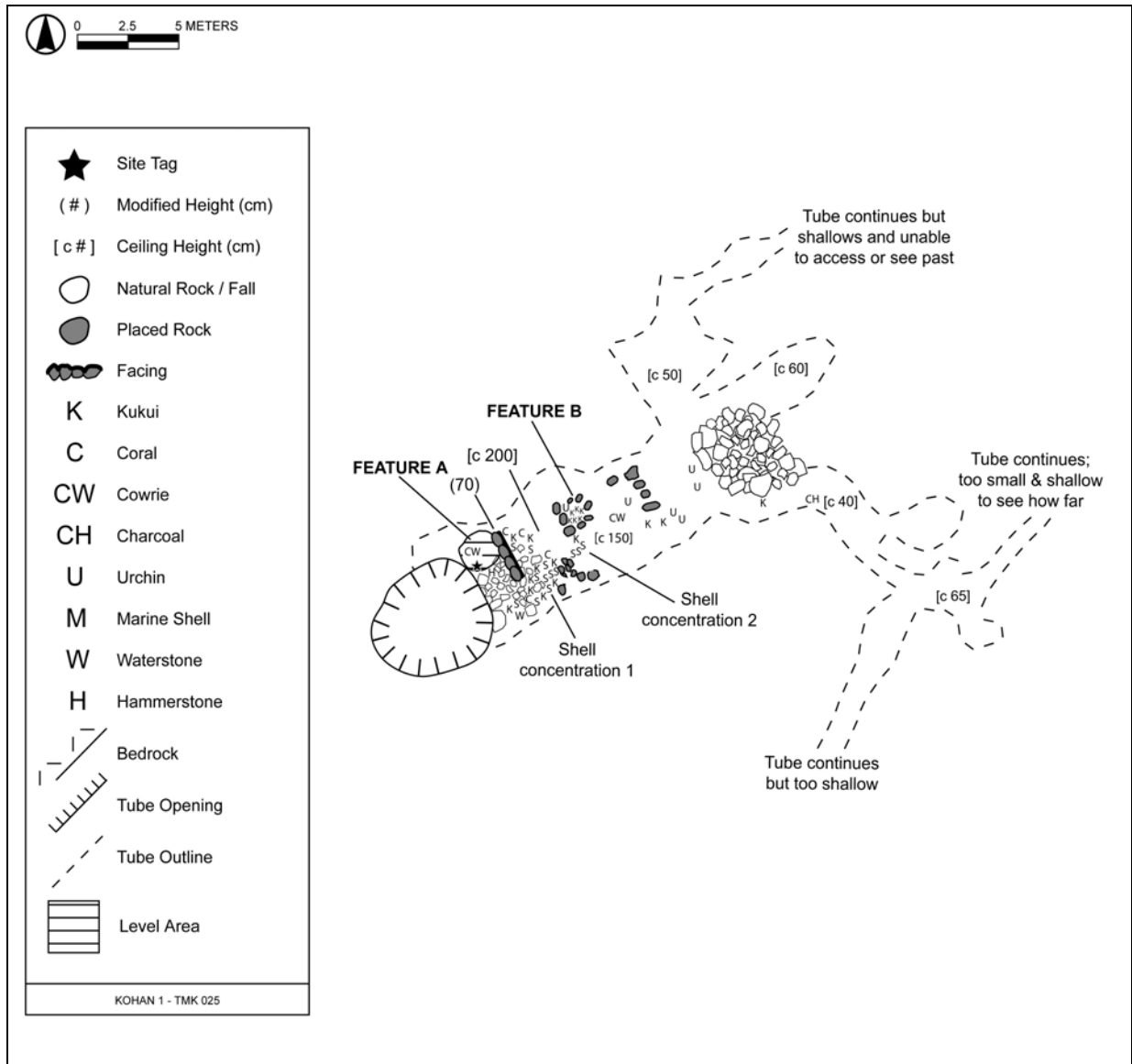


Figure 71. Site -26289, Tube 1 and Sink 1 interior plan view

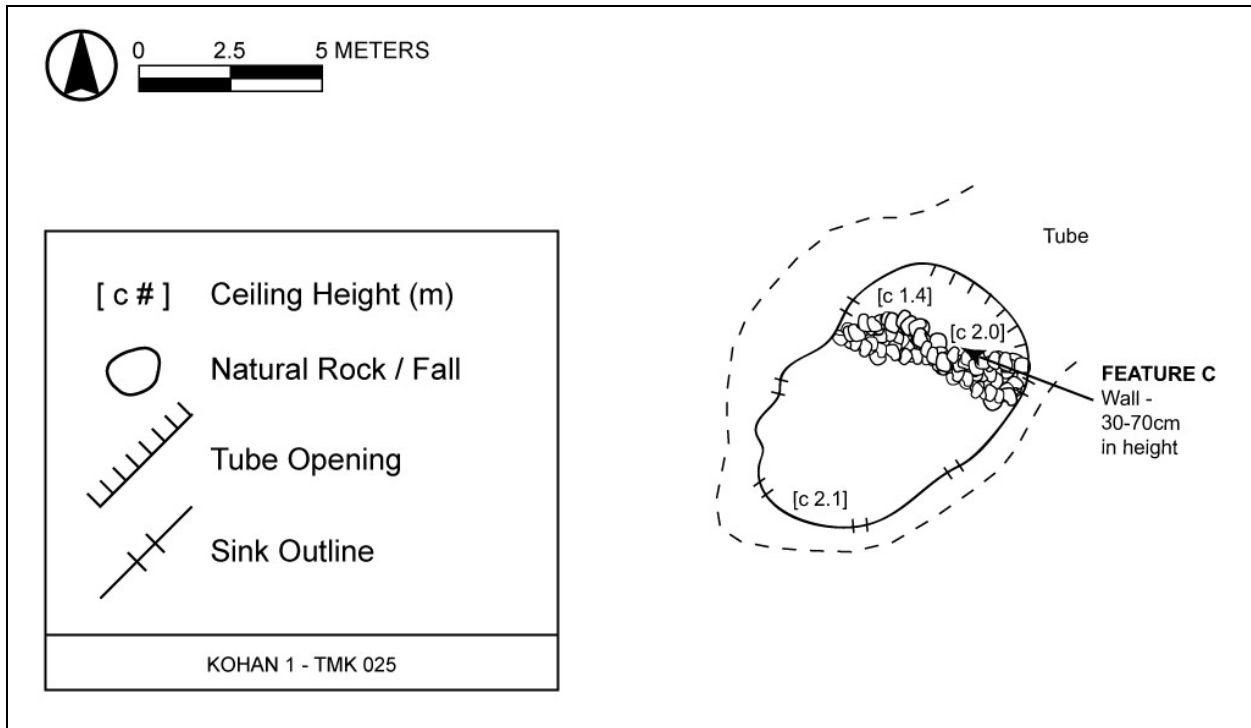


Figure 72. Site -26289, Sink 1 and Feature C plan view



Figure 73. Site -26289, Feature A in Tube 1, paved area with hammer stone in the foreground, view to northwest



Figure 74. Site -26289, Feature B in Tube 1, circular enclosure with *kukui* scatter, view to northwest

extensive midden precludes this tube from being considered a recurrent use site.

Sink 2 is a rather low sink area measuring approximately 10 m north /south and approximately 20 m east/west. Features E and F are within sink 2 (Figure 76 and Figure 77), and Tubes 2 through 5 extend from Sink 2. **Tube 3**, **Tube 4**, and **Tube 5** have no cultural material.

Feature E is a semi-circular boulder wall in the center of the sink that is approximately 12 m (39.4 ft.) in length, 50-80 cm in width, and 40 cm-1.5 m (4.9 ft.) in height. Feature E was likely constructed with boulders cleared from the center of the sink. Feature E contains a soil deposit that measures between 5-10 cm in depth. Along the northwest edge of the sink is a small arch that connects to a smaller sink (included as a part of Sink 2).

Feature F is a small mound, measuring approximately 1.5 m (4.9 ft.) in length and approximately 40 cm in height, located near the archway, at the entrance to Tube 3.

Tube 2 originates in -26289 Sink 2 and terminates at the north end of the northern most sink of site -26319, across the sink from the walled entrance to -26319 Tube 1 (Figure 75). Tube 2 of Site -26286 is a large tube that runs roughly north/south for approximately 40 m. A small offshoot branches off from the south end of Tube 2 and terminates shortly out an opening into the same -26319 sink. No other side tubes/branches are present. A large amount of collapse, none of which appears to have been modified, runs throughout the tube's length. A single piece of urchin is present at the south end of Tube 2; no midden or other cultural material is present in the tube.

Tube 2's function was likely a shelter. This interpretation is based on the tube's association with the surrounding tubes, such as -26319 Tube 1, and modified sinks, such as the northern most sink of site -26319. This association imparts more significance to this tube than it otherwise would have been given due to the presence of a single urchin and lack of any cultural material or modification.

Sink 2 does not appear to have been used for habitation due to the lack of midden. This area is also in close proximity to site 26324, a significant habitation site. Furthermore, this sink is not very deep and seems fairly exposed to the elements, so does not appear to be desirable as a shelter or burial area. The exposure and the extensive soil deposit within Feature E's interior indicate agriculture use. Feature F, the small boulder pile, appears to be the result of clearing the sink's interior for agricultural purposes.

Sink 3 is a large natural sink measuring 60 m (197 ft.) north/south by 10 m (32.8 ft.) average east/west (Figure 78). Sink 3 has five lava tubes, none of which are interconnected. **Tube 6**, **Tube 8** and **Tube 10** have no cultural modification or midden.

Tube 7 is a large tube measuring 34 m (111.6 ft.) northeast/southwest by 2.5 m (8.2 ft.) average northwest/southeast with an average height of 1.2 m (3.9 ft.). Tube 7's entrance is located at the northeast end of Sink 3 and measures 5 m (16.4 ft.) in length by 1 m (3.3 ft.) in height. A large whetstone is located at the entrance of the tube. The tube's entrance was initially blocked by many stacked large cobbles and boulders. To gain entry into the tube, several large cobbles and boulders were removed. The tube drops 2 m (6.6 ft.) into a large chamber. **Feature D**, a mound, is 0.5 m (1.6 ft.) northeast from this entrance (Figure 79 and Figure 80). The mound

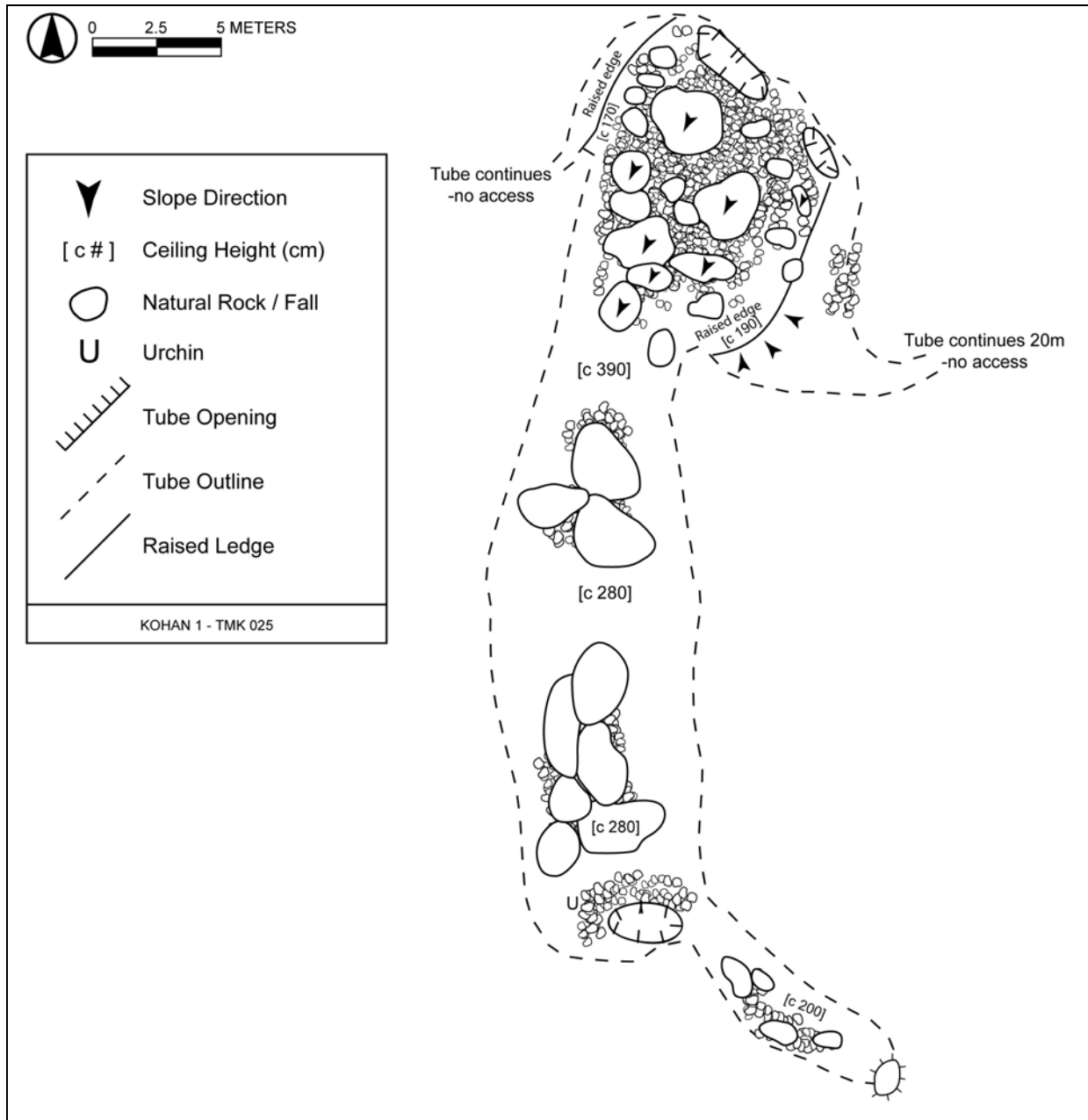


Figure 75. Site -26289, Tube 2, plan view

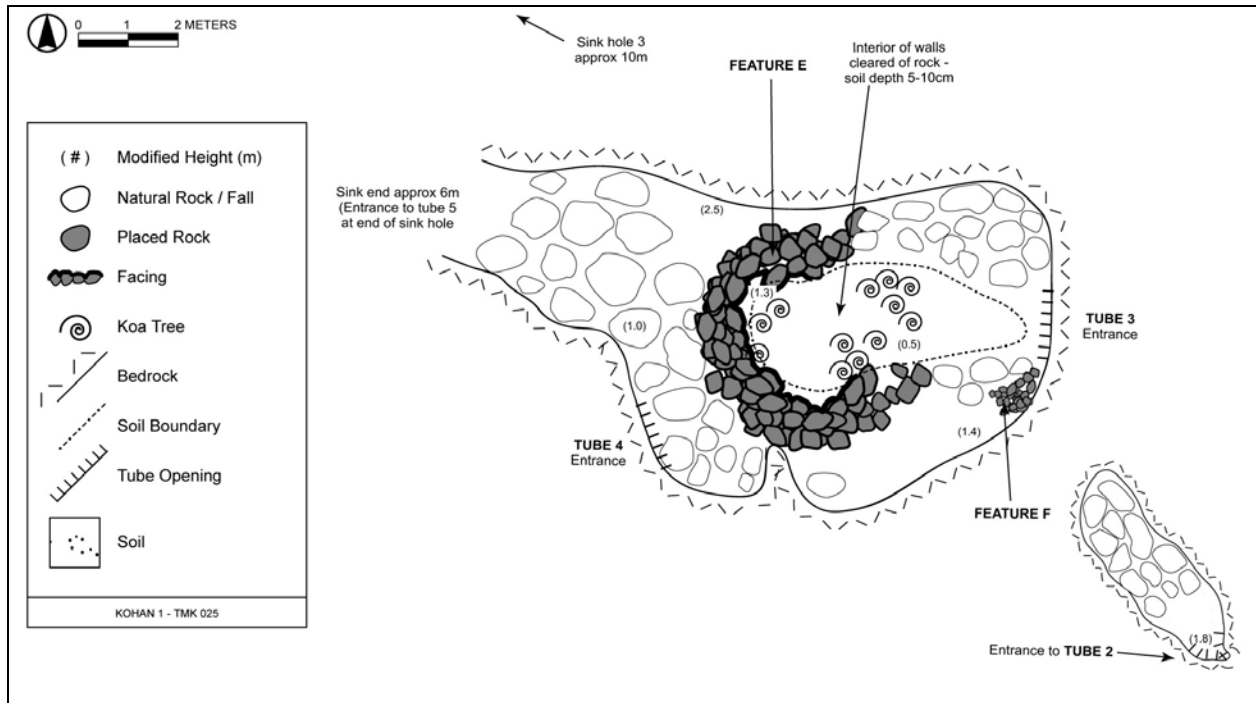


Figure 76. Site -26289, Sink 2, Feature E and Feature F plan view



Figure 77. Site -26289, Sink 2, Feature E wall section

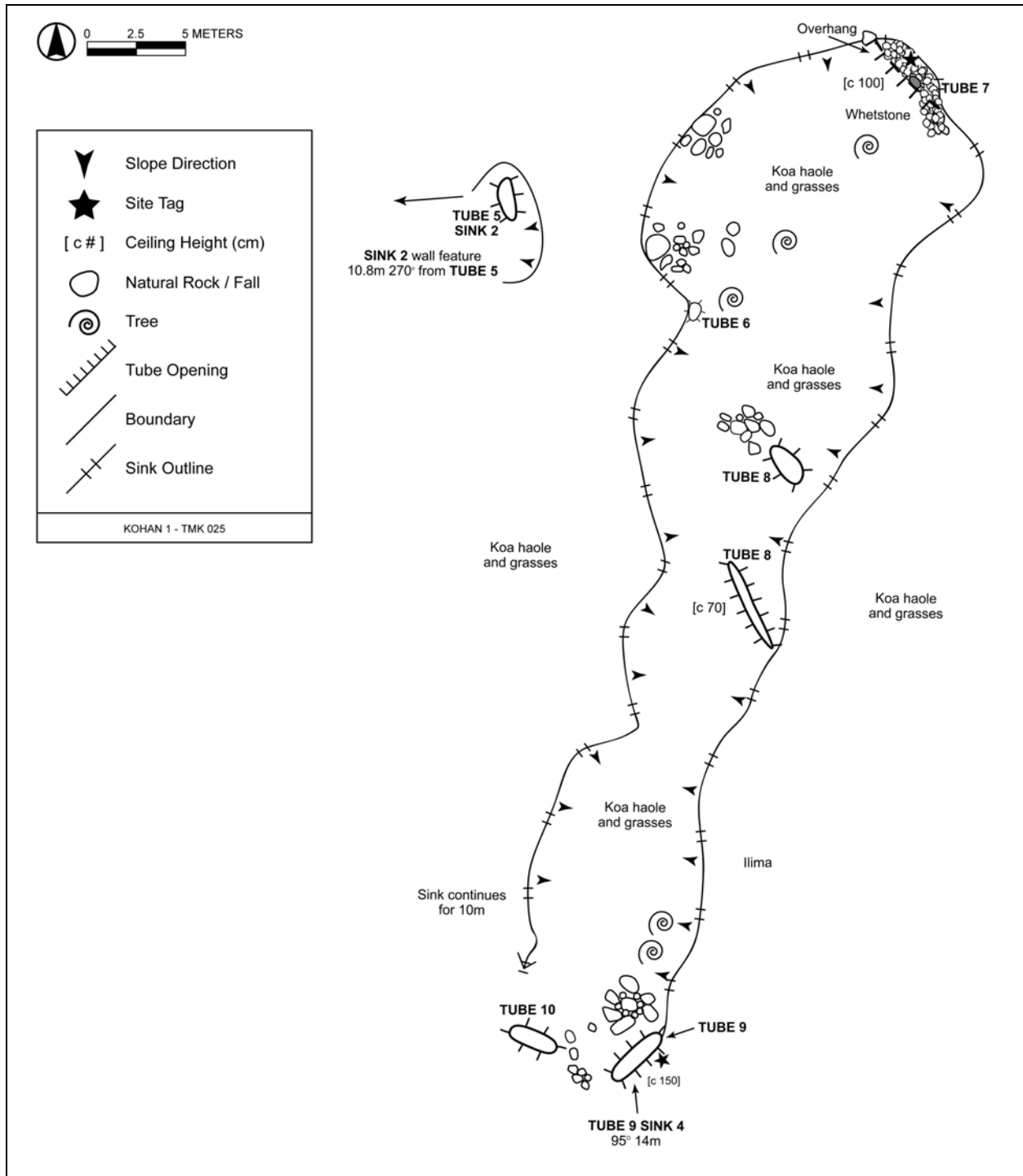


Figure 78. Site -26289, Sink 3 overview

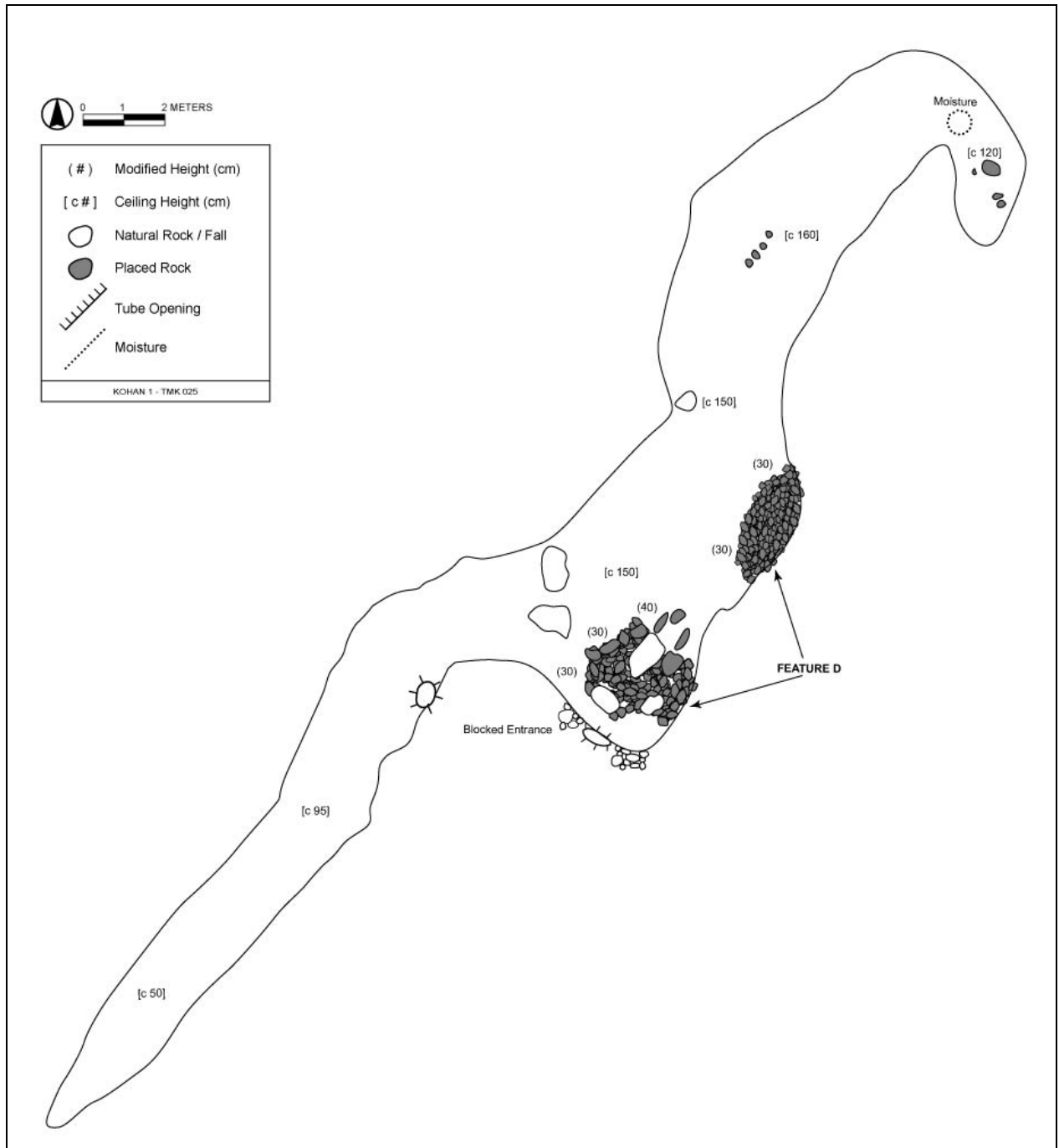


Figure 79. Site -26289, Tube 7 plan view



Figure 80. Site -26289, Sink 3, Tube 7, Feature D, view to east

was constructed of roof fall and *pāhoehoe* cobbles and measures 3 m (9.8 ft.) northeast/southwest by 2 m (6.6 ft.) northwest/southeast with a height of 30 cm. The northeast end of the mound has a three-piece *pāhoehoe* slab enclosure approximately 40 cm (1.3 ft.) in height. A terrace, also identified as **Feature D**, constructed of *pāhoehoe* cobbles is 2 m (6.6 ft.) to the northeast; it measures 3 m (9.8 ft.) northeast/southwest by 1 m (3.3 ft.) northwest/southeast with a height of 30 cm (1.0 ft.). The terrace and mound were investigated for potential burials; however, both appear to be too shallow. Several boulders were temporarily removed from both areas and yielded nothing but bedrock. A small boulder alignment of 4 *pāhoehoe* cobbles is 5 m (16.4 ft.) to the north. At the northeast ends of the tube, 3 *pāhoehoe* cobbles appear to be placed but with no obvious function. No other evidence of cultural modification or remains is apparent except for a small area of charcoal on the northwest side of the constructed terrace.

Tube 7 has two possible functions: pre-burial construction or water collection. Pre-burial construction is indicated based on the presence of the terrace and the beginnings of a mound. However, a thorough inspection of the tube found no burials. Water collection activity area is another possible function due to several areas of moisture and a built terrace that could have been used to hold bottle gourds. The *pāhoehoe* slab enclosure could also have been used for water storage. Although water collection is a good possibility, the blocked entrance suggests the tube had a more “significant” purpose. Due to the lack of midden, and the blocked entrance, habitation was not likely. Excavation potential is poor due to the lack of soil.

Tube 9 measures 34 m (111.6 ft.) northwest/southeast by 2 m (6.6 ft.) northeast/southwest with an average ceiling height of 1 m (3.3 ft.) (Figure 78, Figure 81 and Figure 82). Tube 9 has three openings. The largest opening is located at the south end of Sink 3 and measures 5 m (16.4 ft.) wide northeast/southwest by 1.2 m (3.9 ft.) in height. The second opening is 15 m (49.2 ft.) to the southeast in Sink 4 and measures 1 m by 1 m (3.3 ft. by 3.3 ft.). This tube opening has the only constructed modification found in Tube 9. The northwest end of the opening has a stacked pile of small boulders and cobbles measuring 90 cm (3 ft.) in height by 90 cm (3 ft.) wide. The third entrance is 10 m (32.8 ft.) to the east from the previous opening mentioned and measures 1 m by 1 m (3.3 ft. by 3.3 ft.). An area of marine shell midden was found 1 m (3.3 ft.) south from the third opening. This small area of midden is the only midden found throughout the tube excluding an isolated *kukui* endocarp found near the second entrance. Little activity within the tube is apparent given the small amount of midden and minor modifications.

Excavation potential is fair due to a 4 cm deep soil deposit located at the third tube opening at the southeast end. This soil deposit is adjacent to the marine shell midden deposit previously mentioned.

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

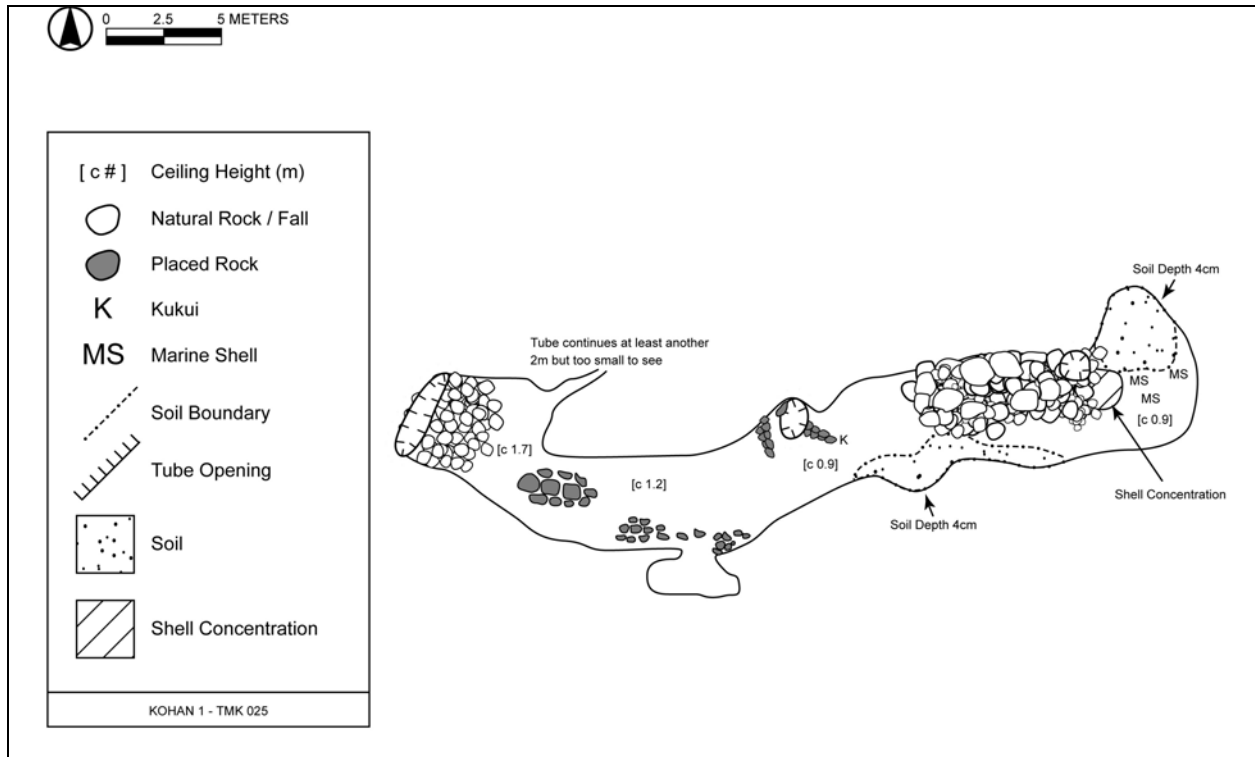


Figure 81. Site -26289, Tube 9, plan view



Figure 82. Site -26289, Tube 9 entrance, view to southeast

4.3.18 State Site # 50-10-27-26290

SIHP #	50-10-27-26290
FUNCTION:	Burial
SITE TYPE:	Lava Tube
TOTAL FEATURES:	4
DIMENSIONS:	55 m by 25 m (180.4 ft. by 82 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site 26290 is located within an undulating *pāhoehoe* flow with bulldozer activity in the immediate vicinity. Vegetation includes dense grasses and *koa haole*.

It is a complex site consisting of a network of radiating, interconnected lava tubes and sink holes (Figure 83). In an attempt to clarify this confusing site, only those lava tubes and sinks that exhibit cultural modifications have been assigned numerical designations and are described in detail. For descriptive purposes therefore, the site consists of two designated sinks, Sink 1 and Sink 2, two designated tubes, Tube 1 and Tube 2, and four designated features, Features A through D.

Sink 1 measures 6 m (19.7 ft.) in length north/south by 3.5m (11.5 ft.) in width east/west with an average depth of 2.5 m (8.2 ft.) (Figure 84). The two designated tubes of the site, Tube 1 and Tube 2 extend off of the sink. Sink 1 has two separated areas, one at the east end and another at the northeast end (where Tube 2 begins). The northeast chamber has an opening measuring 2.5 m (8.2 ft.) wide by 2 m (6.6 ft.) in height. This area has a ceiling height of 2 m (6.6 ft.) average and is approximately 6 m (19.7 ft.) in length northeast/southwest by 3 m (9.8 ft.) in width northwest/southeast. Modification in this area is a stacked wall at the west end of the chamber. A large amount of midden is present and includes urchin, marine shell (cowry, conch), *kukui* and charcoal. Three large pieces of coral were found and included 1 coral abrader. A sea urchin file, a broken fish hook, and 2 water worn stones were also found. A human right femur and 3 phalanges (referred to consistently in this report as “Burial 5”) were also located in this chamber. A stacked wall and piled cobble mound just to the east of the wall in the west side of the chamber likely contains the remainder of Burial 5.

The east chamber of Sink 1 is approximately 3 m (9.8 ft.) in length east/west by 5 m (16.4 ft.) in width west/south with an average height of 1.2 m (3.9 ft.). The opening of the chamber is located at the east end of the sink and measures 6 m (19.7 ft.) wide and 1.2 m (3.9 ft.) in height. The opening has a constructed terrace, identified as **Feature B**, and a “fire pit” located just east of the center (Figure 84). The terrace is stacked loosely with *pāhoehoe* cobbles and is semi-circular in shape; it is approximately 40 cm in height. The “firepit” is an area measuring 50 by 50 cm (1.6 ft. by 1.6 ft.) and is distinguished by a thick layer of ash, marine shell midden, and a large urchin spine.

The possible function of Sink 1 is temporary habitation based on the large amount of midden found in association with several artifacts and the extent of modification. Burial is also a function due to the presence of Burial 5. Excavation potential of both chambers is fair due to the shallow soil and ash deposits.

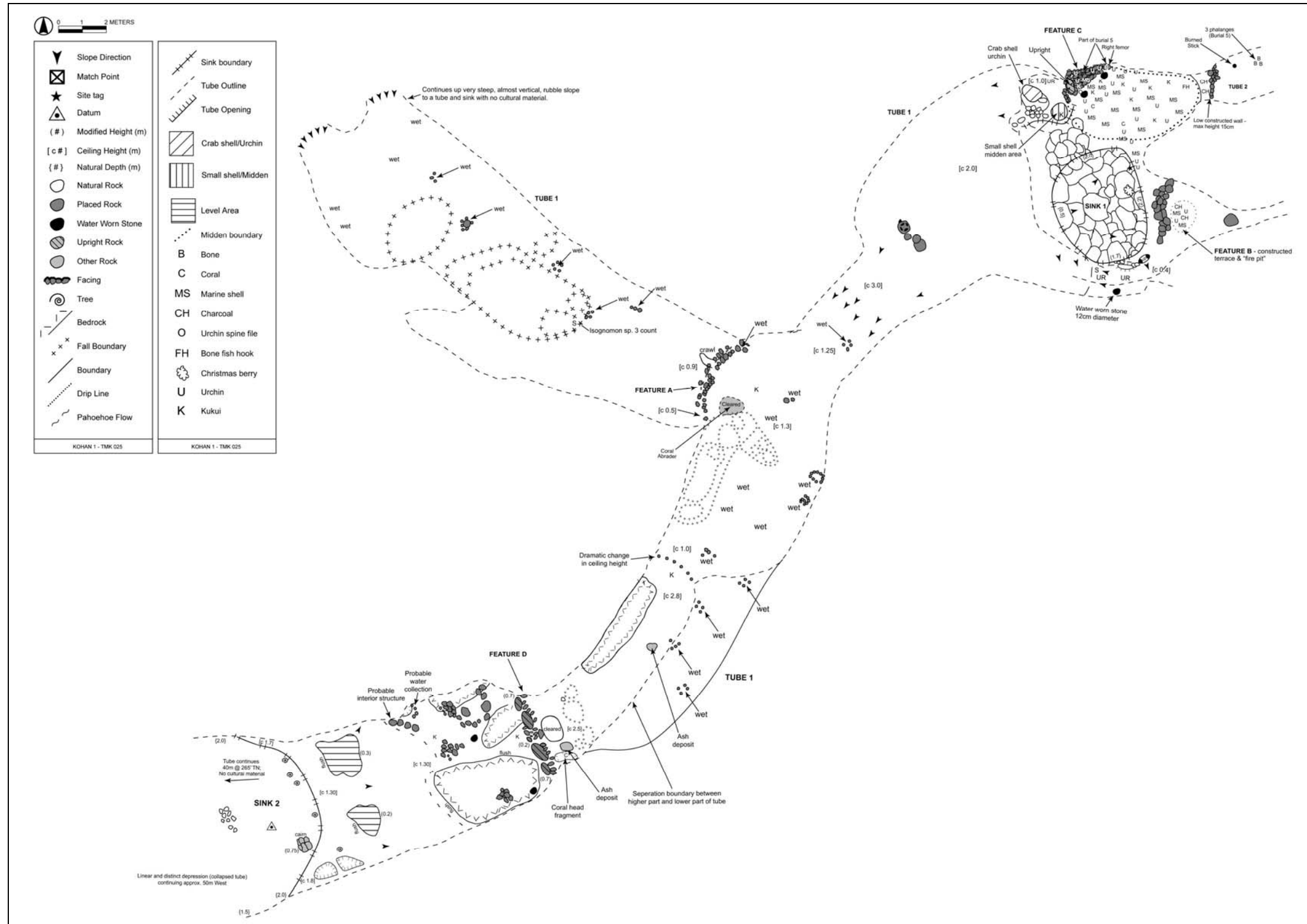


Figure 83. Site -26290 overview (see following figures for detail)

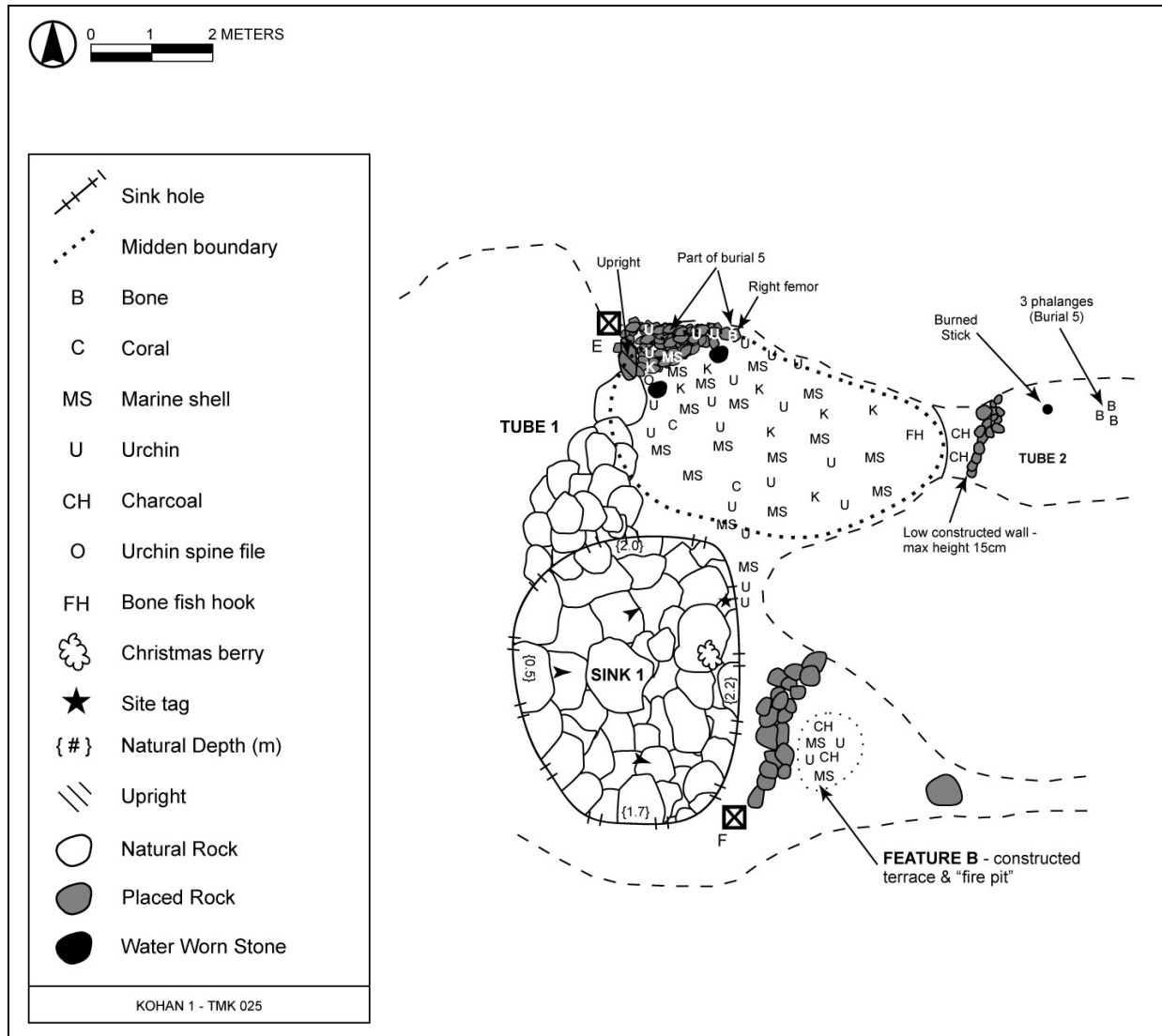


Figure 84. Site -26290, Sink 1 and Feature B, plan view

Tube 1 runs between Sink 1 and Sink 2 (Figure 84, Figure 85, Figure 86 and Figure 87). The entrance to Tube 1, extending off the east end of Sink 2 is an entrance chamber that is 7 m (23 ft.) across as its opening and 12 m (39.4 ft.) long. Modification in this entrance chamber includes a leveled area in the entrance, some placed boulders along the north side of the entrance chamber, a couple of small mounds, a semi C-shaped enclosure, and several other placed boulders and cobbles. Additionally, at the very front of the entrance is a cairn stacked approximately 3 courses high. Very sparse midden scattered throughout the entrance chamber includes *kukui*, urchin, cowry, and other marine shell. There are also two waterworn stones in this entrance chamber.

At the back (east end) of the entrance chamber, there is a constructed entrance, **Feature D**, limiting access to the remainder of the tube (Figure 85 and Figure 90). Immediately inside Feature D is a small cleared area with a chunk of coral, some charcoal pieces, and a small ash deposit. The tube continues northeast at a height of approximately 2.5 m (8.2 ft.) until it opens into a broader but lower (not as tall) room. Along the tube and into this front room are 8-10 water catchments. There is also an area of collapse in this front room.

Feature A, a constructed wall, is at the north end of the front room; it is approximately 5-6 m (16.4-19.7 ft.) in length and obstructs access to a back room (Figure 85 and Figure 88). There is a small access point through Feature A into the back room that contains a few more water catchments. From the front room heading east is a passageway that climbs up towards Sink 1. Near the opening of Tube 1 into Sink 1, there is some collapse and some modification.

Within the Tube 1 entrance chamber to Sink 1, there is a water catchment constructed on top of stacked boulders, approximately 50 cm high. A coral abrader was found in the front room approximately 1 m (3.3 ft.) south of Feature A wall, in the cleared rubble area (Figure 85). The back room has approximately 10 water catchments; at least two of the ten are constructed on the collapse in the center of the room. Aside from some widely scattered charcoal, which appears to have been washed in, there is no midden or other cultural materials present in this back room beyond the water catchments.

The Tube 1 entrance chamber to Sink 1 has two access points/openings into the sink, an east opening and a north opening. The east opening is full of collapse but has a small amount of midden, including urchin, *kukui*, marine shell, and a waterworn stone. The north opening passage-way exhibits both modification and extensive midden. The modification consists of the movement and placement of boulders and cobbles, including a small mound and a constructed entrance into Sink 1 that is designated as **Feature C** (Figure 87 and Figure 89). The construction of Feature C includes an upright, approximately 80 cm by 100 cm (2.6 ft. by 3.3 ft.). Immediately inside Feature C and outside (in Sink 1) is significant midden consisting of *kukui*, cowry, multiple types of urchin, *Conus* shell, *Nerita* shell, a large shell that appears to be clam, *Isognomon*, and other marine shells.

Tube 1's function is a temporary habitation and a water collection area. While water is an essential part of habitation, the high concentration of water catchments within the confines of a single tube indicates that Tube 1 was employed specifically for the purpose of water collection. This is also indicated by the lack of midden or other cultural materials in the immediate areas of the water catchments. Tube 1 also functioned as temporary habitation as is indicated by modifications including placed boulders and constructed entrances, and the extensive midden

present. The lack of extensive floor clearing especially in the immediate area of the midden precludes any more intensive habitation other than temporary. Burial 5 is also immediately outside of Feature C, in Sink 1 (Figure 84).

Tube 2 is a lower level tube, accessed by climbing down through collapse. This tube is only approximately 10 m (32.8 ft.) in length and predominately crawl space. The end of the tube was blocked off to prevent access through a small entrance that opens into a lava tube with no cultural materials or modifications. Just east of the blocked entrance from Tube 2 into Sink 1, there are three human phalanges, that together make up a single toe, a large piece of charcoal, and a small piece of sea urchin. A coral abrader and a piece of marine shell were also found in the raised side niche adjacent to the entrance to Tube 2. No other modifications or cultural materials were present in Tube 2.

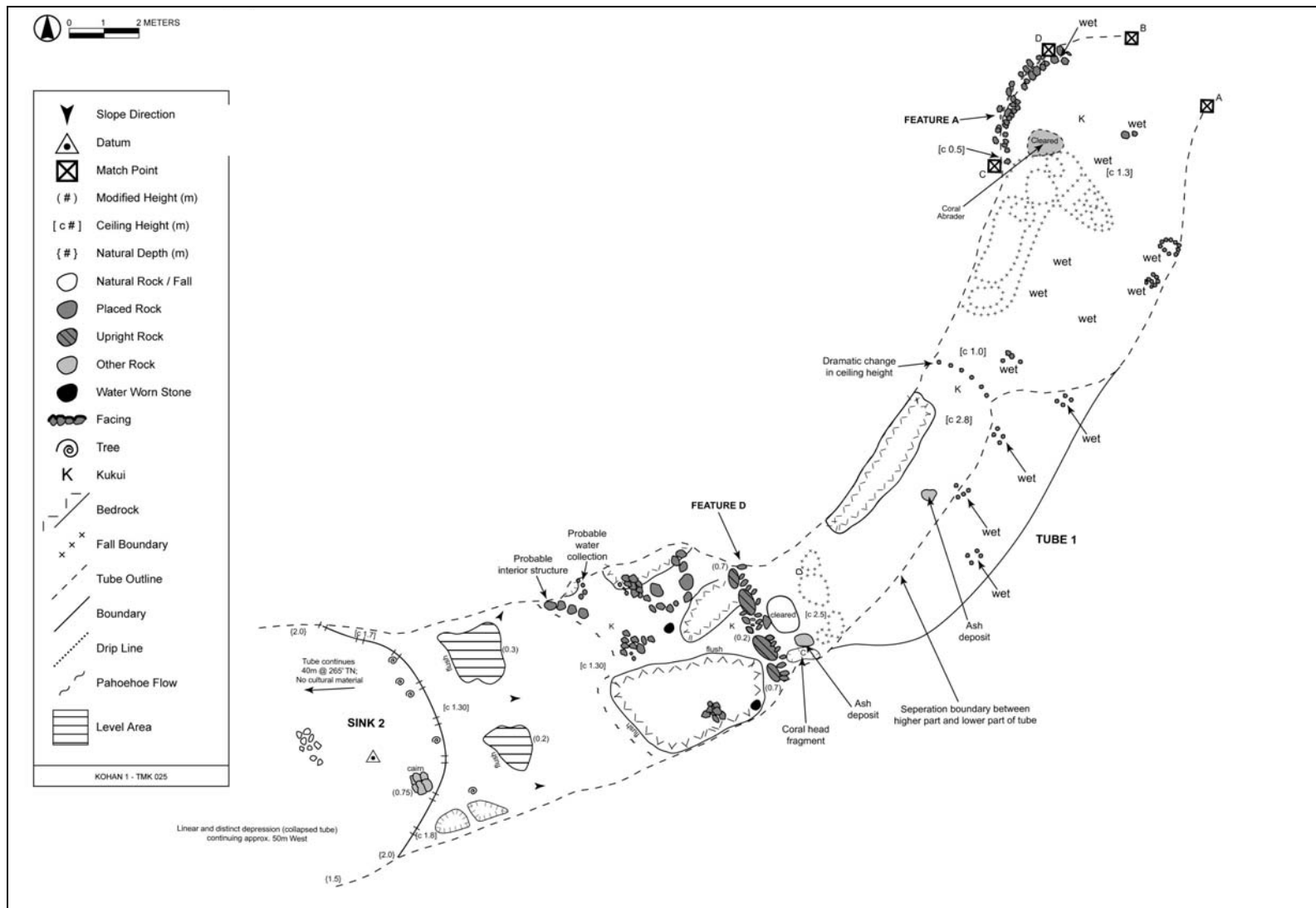


Figure 85. Site -26290, Tube 7, Feature A and Feature D, plan view (1 of 3)

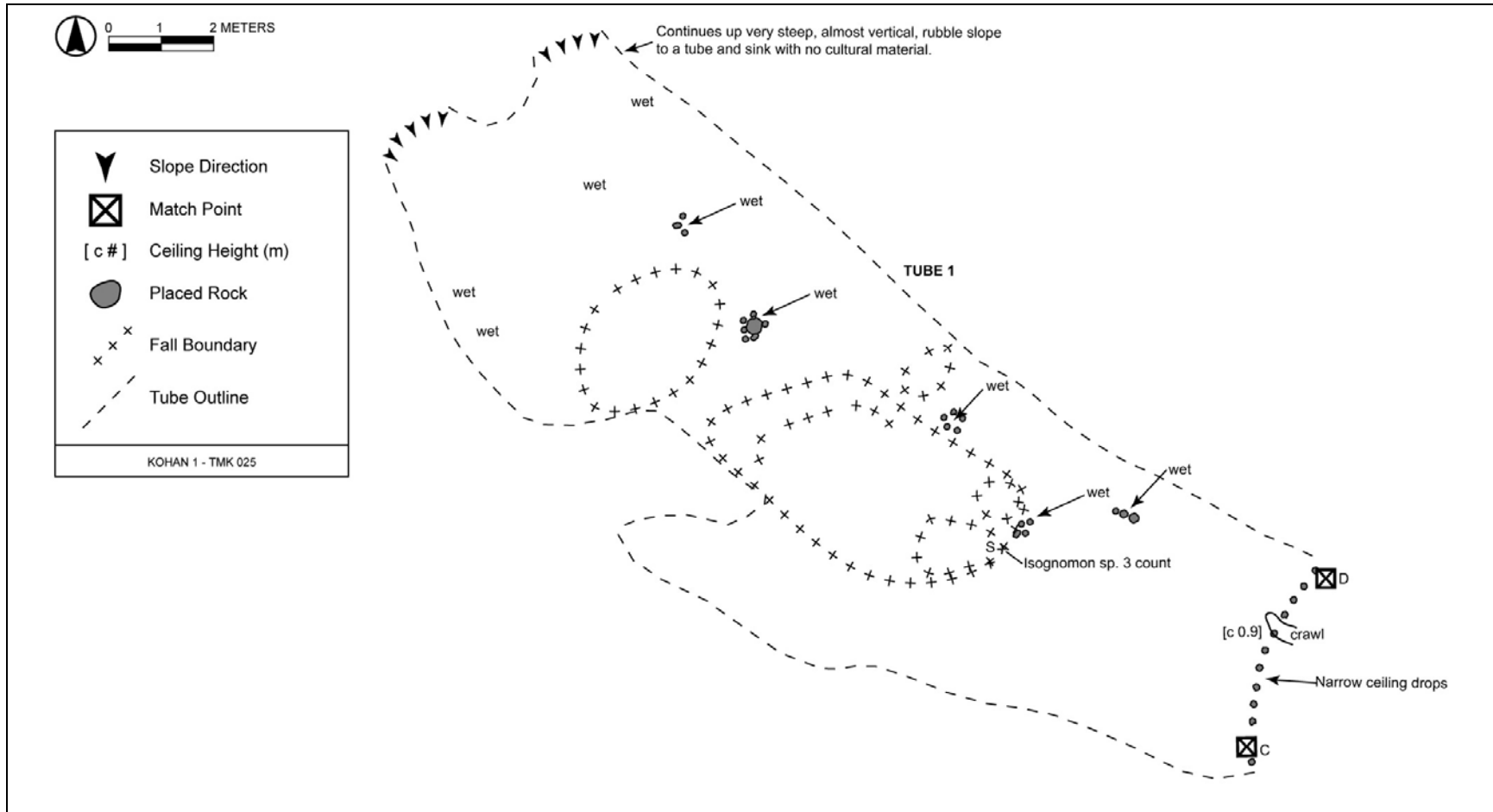


Figure 86. Site -26290, Tube 7, plan view (2 of 3)

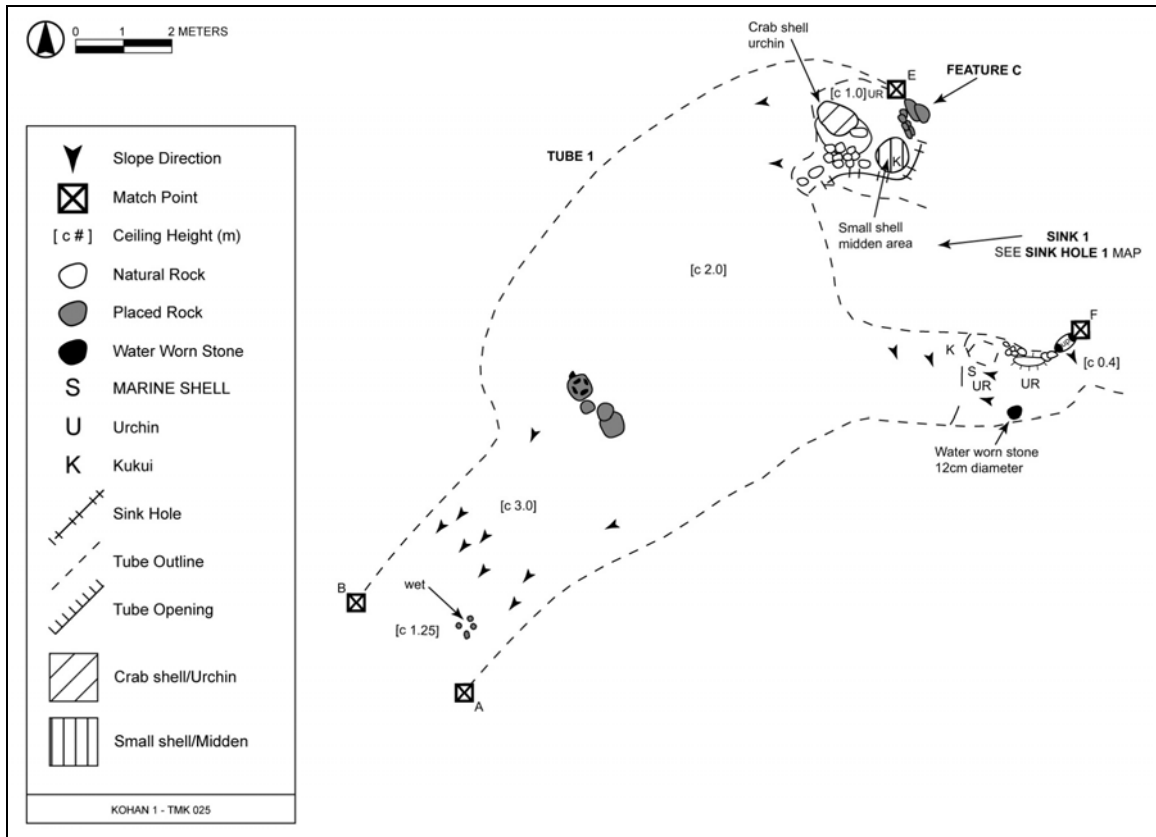


Figure 87. Site -26290, Tube 7 and Feature C, plan view (3 of 3)



Figure 88. Site -26290, Tube 1, Feature A, view to north



Figure 89. Site -26290, Tube 7, Feature C, view to west



Figure 90. Site -26290, Tube 7, Feature D, showing entrance to tube 7 view to northeast

Burial 5, the only burial at site -26290, consists of three phalanges of the foot found between the cracks in the rough, ropy 'a'ā floor 2 m (6.6 ft.) inside the entrance to the east of Tube 2's end at sink 2. Bones were spread out over a 1 m (3.3 ft.) radius.

A second location of human bone was identified under a major overhang of Sink 1, 6.5 m (21.3 ft.) due west of the three phalanges. The bone is a right adult femur. It was up against the north wall of the overhang on top of the backside of a loose and possibly shallow mound of small boulders and cobbles that do not immediately appear to be more than 2 courses high. A crevice may be covered by this low mound, although nearby bedrock floor exposures do not indicate as much. The low mound partially shields the femur from view from the center sink.

The femur shows one small localized area of deep abrasion that suggests a boulder was stacked directly on it. Only the femur shaft is present, no other particular ends were observed; the femur is in otherwise very good condition, and all present cancellous bone appears to be intact. This appears to be a secondary burial without grave goods, although shell and urchin are scattered in the vicinity.

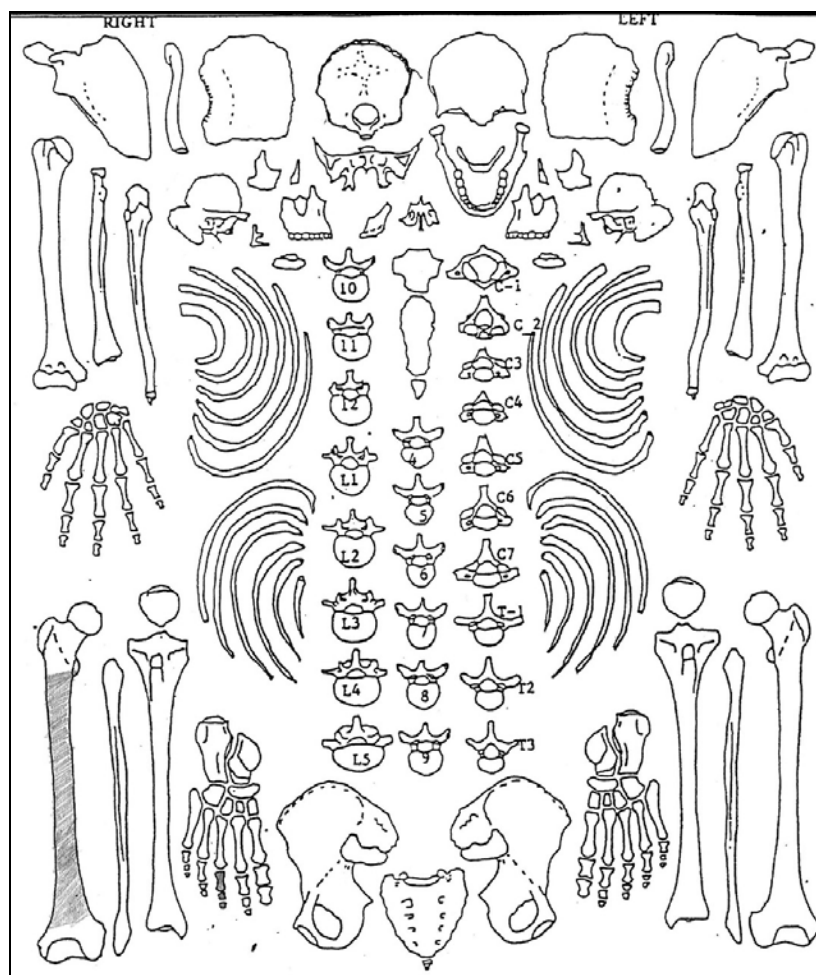


Figure 91. Burial 5, (Site -26290) skeletal inventory form (3 phalanges and femoral shaft)

4.3.19 State Site # 50-10-27-26291

SIHP #	50-10-27-26291
FUNCTION:	Shelter/Mining
SITE TYPE:	Lava Tube
TOTAL FEATURES:	3
DIMENSIONS:	80 m by 15 m (262.5 ft. by 49.2 ft.)
CONDITION:	Fair
AGE:	Pre-contact
ELEVATION:	425 ft a.m.s.l.

DESCRIPTION: Site -26291 is located in the southern half of TMK 25 on the undulating *pāhoehoe* flow just off the north edge of an 'a'ā flow. The vegetation on the site and within the immediate vicinity consists of dense grasses and *koa haole*, sparse patches of *ilima*, and a few Christmas berry. There is a bulldozer road running north/south through the site and some bulldozer activity runs through one of the sinks; some modern trash is present.

This site consists of a series of four sink holes (Sink 1-4) and associated archways (Figure 92). Features A and B are within Sink 1. Sink 2 contains no prominent features although a *pāhoehoe* slab, approximately 1 m square (3.3 ft.) and 20 cm (0.66 ft.) thick, appears to have been placed on a leveled area of *pāhoehoe* rubble. This slab is located at the southern edge of Sink 2 and is near a bulldozer road that runs through the sink. A water worn stone, 30 cm (1 ft.) by 15 cm (0.5 ft.) and 15 cm thick (0.5 ft.), was found under a *pāhoehoe* arch between Sink 2 and Sink 3. Sink 3 contains Feature C, a small refuge cave with quarrying areas. The *pāhoehoe* within Sink 3 is fairly abrasive and could have been used as medium grade abraders.

Another archway, unobstructed at both the east and west ends, is between Sink 3 and Sink 4. Within this archway is a flat smooth shelf that is approximately 1.5 m (4.9 ft.) above the archway floor and extends along the northern wall of the archway. A few large *pāhoehoe* cobbles were placed on the shelf to form a small chamber running towards the northwest. There is also an area of soil deposit that contains a *kukui* scatter within the archway. This area is approximately 1.5 m (4.9 ft.) in diameter and the soil is 2 cm (0.8 inches) in depth. The archway appears to be a very comfortable habitation although the only evidence of habitation is the *kukui* scatter. The archway is fairly exposed and there is modern trash throughout the area, which may indicate the area's potential for looting.

Feature A is a lava tube (Figure 93 and Figure 95). Piled *pāhoehoe* cobbles are in the tube's entrance and obscure much of the entrance. These cobbles also limit the entrance to approximately 50 cm (1.6 ft.). The tube's interior is approximately 5 m (16.4 ft.) wide; the tube extends in a northwesterly direction for approximately 15 m (49.2 ft.) before ending. A dense concentration of *kukui* is immediately inside the tube's entrance. Approximately fifty percent of the *kukui* is rat-gnawed, and no more than twenty percent are opened; this is a possible *kukui* cache. The lava tube also contains an area of soil deposit, 2 m (6.6 ft.) in diameter with a maximum depth of 10 cm. Some bird bone and an infant pig mandible fragment are present although no shell midden is present. The function of Feature A is a refuge cave that served as a shelter.

Feature B is a partially collapsed arch formed into a terrace (Figure 94 and Figure 96). The majority of the arch's west opening is closed off by fall. Along the eastern entrance beneath the arch is a small, sloping, *pāhoehoe* terrace approximately 30-40 cm (1-1.3 ft.) high. The terrace is

along the northern side of the arch and slopes gradually from east to west. It extends approximately 1 m (3.3 ft.) south from the northern wall and is approximately 1.5 m (4.9 ft.) across, from east to west. Approximately 1 m (3.3 ft.) south of this terrace is a mounded area that is 2-3 m (6.7-9.8 ft.) in diameter. This mound slopes gradually from the southern edge of the east entrance towards the northern edge of the west side of the arch. The constructed height of the north end of the mound is 40 cm (1.3 ft.) and rises to 75 cm (2.5 ft.) at the southern end. An informally modified natural terrace is beneath the arch. Some cobbles and small boulders are stacked on top of the naturally flat *pāhoehoe* slab terrace, likely to level this area. Some midden is visible in the crevices of this modified natural terrace. The function of Feature B is an activity area related to quarrying based on the presence of the mounding of likely quarrying materials.

Feature C is a small refuge cave concealed by placed boulders and cobbles (Figure 97). The entrance is a narrow 1 m (3.3 ft.) slot that drops down approximately 2 m (6.6 ft.) into the tube. The tube opens to 2 m (6.6 ft.) in width and is 75 cm high. The tube extends approximately 5 m (16.4 ft.) at a bearing of 282°, and narrows significantly at the west due to rubble. The only modification is the boulders piled at the cave's surface entrance, likely constructed to conceal the entrance. No modification is visible in the interior of the cave. Feature C's function is a refuge cave used as a shelter.

The small soil deposit in the archway between Sink 3 and Sink 4 and the soil deposit in Feature A indicate fair excavation potential.

The site's function is interpreted as a shelter and mining activity area. Features A and C, lava tubes whose entrances are extremely small and not readily visible from the surface, exhibit no modification or significant cultural materials. Features A and C appear to be refuge caves that served as shelters. Despite the Feature B modifications, there is minimal evidence at site 26291 for habitation utilization. The site contains very little midden.

The site's second function is mining (quarrying) based on the presence of large amounts of unnaturally broken cobbles and boulders across the site. Additionally, surface *pāhoehoe* has been quarried. Based on the site's proximity to a habitation site, 26303, that contains clear evidence of habitation, including midden and the presence of a water source, this site was a shelter and mining area.

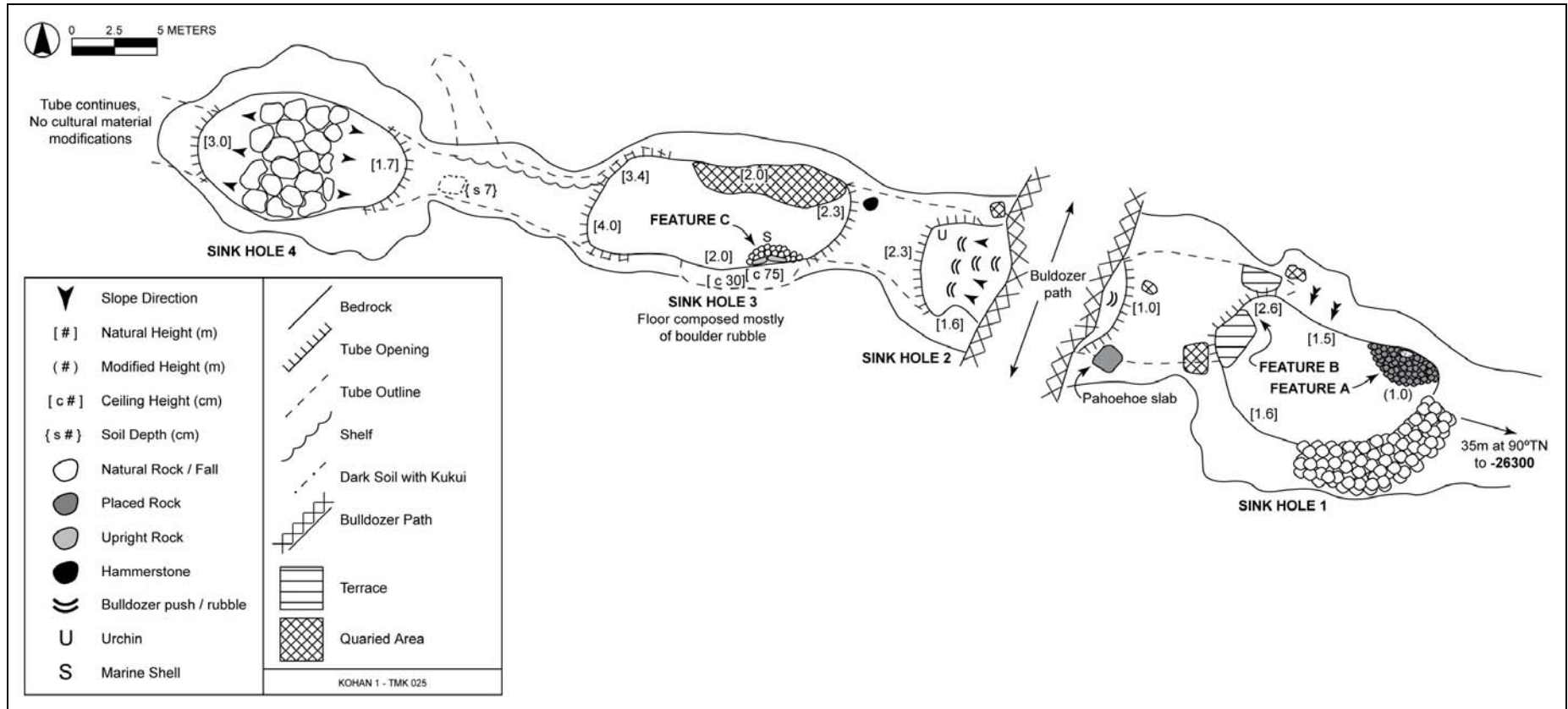


Figure 92. Site -26291, plan view of surface (Sink 1-4)

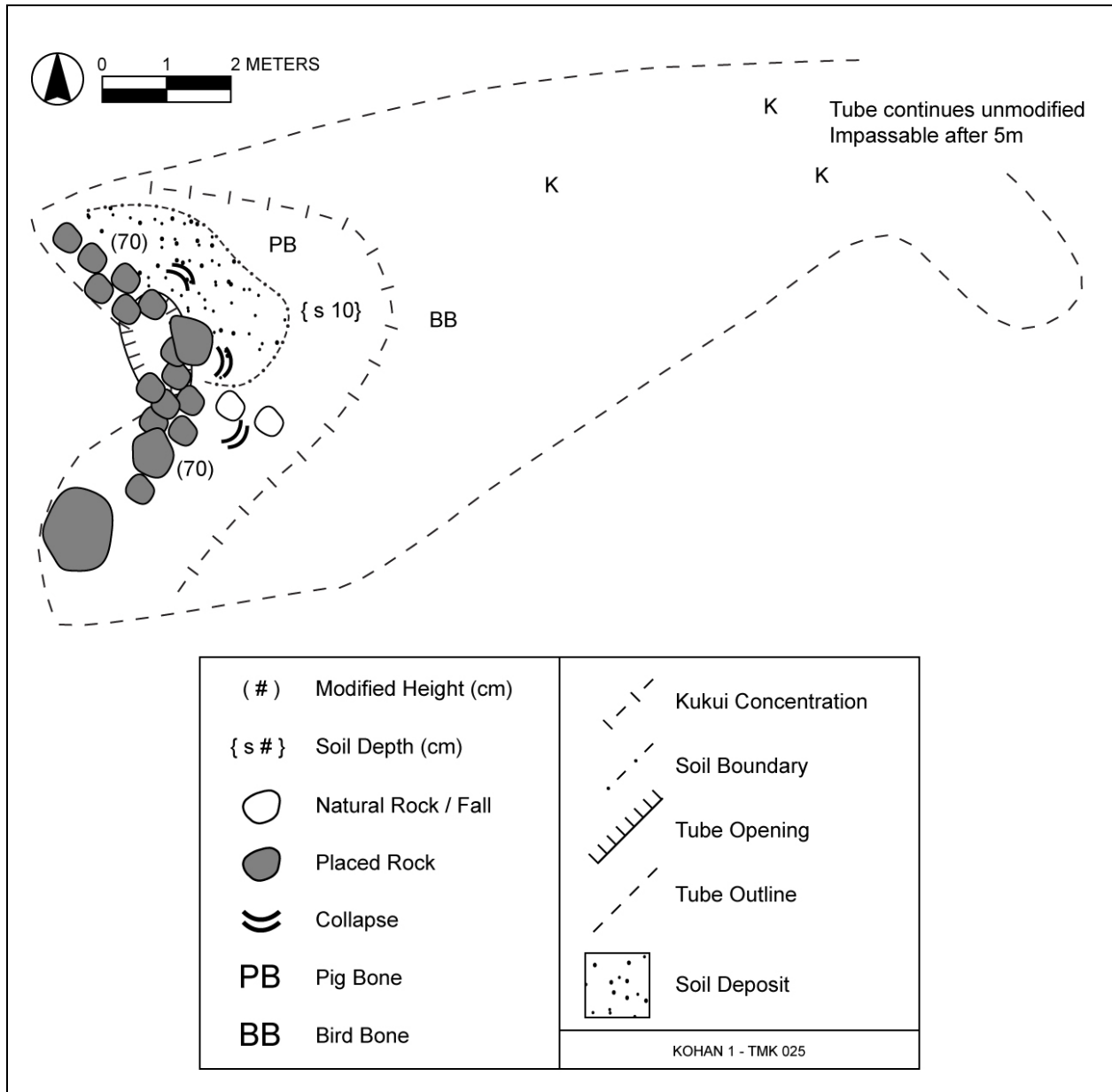


Figure 93. Site -26291, Feature A, plan view

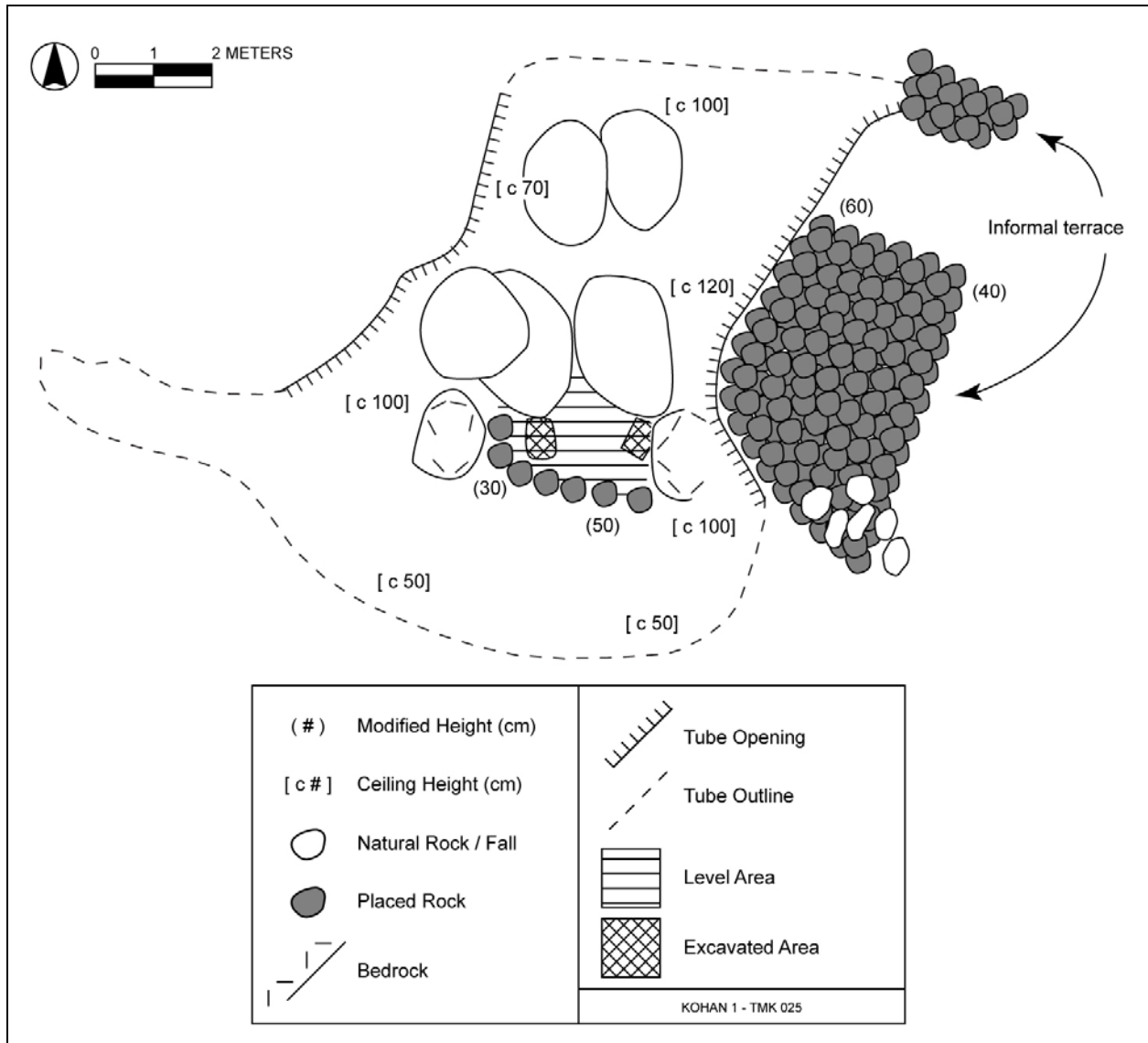


Figure 94. Site -26291, Feature B, plan view



Figure 95. Site -26291 Feature A interior, *kukui* scatter in foreground, view to south



Figure 96. Site -26291 Feature B, showing informal terrace adjacent to archway, view to west



Figure 97. Site -26291 Feature C, showing view to east

4.3.20 State Site # 50-10-27-26292

SIHP #	50-10-27-26292
FUNCTION:	Shelter
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 1-2 m (32.8 ft. by 3.3-6.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	430 ft a.m.s.l.

DESCRIPTION: Site -26292 (Figure 98 and Figure 99) is a lava tube measuring 13 m (32.7 ft.) in length north/south by 1-2 m (3.3-6.6 ft.) width east/west with an average ceiling height of 80 cm (2.6 ft.) (Figure 98). A bulldozed road is approximately 10 m (32.8 ft.) from the overhang to the southwest and runs northwest/southeast. The largest portion of the tube is an overhang measuring 5 m (16.4 ft.) in length. The tube continues beyond the overhang to the south for approximately 4 m (13.1 ft.). No artifacts or midden were found in either the overhang or the tube, however, the overhang has approximately 50 *pāhoehoe* cobbles placed in the far (east) corners of the overhang that were likely from outside of the tube. Ceiling fall also appears to have been cleared from the center of the overhang. The north end of the tube appears to be blocked by several placed boulders. Several cracks have been filled in on the surface of this area of the tube. A paved level surface is also above the tube on the surface and measures 2 m by 1.5 m (6.6 ft. by 4.9 ft.). The paved surface is level and constructed of small cobbles.

The site's function is interpreted as shelter. This interpretation is based on the blocking of the tube's north end and the paved area above the tube. All entries, including cracks and holes, leading into the tube have been blocked to prohibit access. Burial function was initially determined to be a possibility, however, excavation results (see below) proved that a burial was not present. Function as a shelter is indicated by the overhang with its cleared center and placed boulders. The tube's south end does not appear to have been utilized, which is likely due to the tube's small size. Excavation potential of the site is fair due to the presence of several 4 cm (0.13 ft.) deep soil deposits in the overhang.

4.3.20.1 Testing Results

Excavation was conducted to determine whether the platform concealed a burial or the entrance to a lava tube (Figure 101). Stratum I was excavated to a maximum depth of 60 cmbs (1.9 ft.); it is composed primarily of small and medium *pāhoehoe* cobbles (Figure 100). A very small amount of sediment (10YR 3/2 silty loam), from vegetation falling between the cobbles, was present. Bedrock was encountered at 60 cmbs (1.9 ft.) and no cultural materials or subsurface features were found (Figure 102).

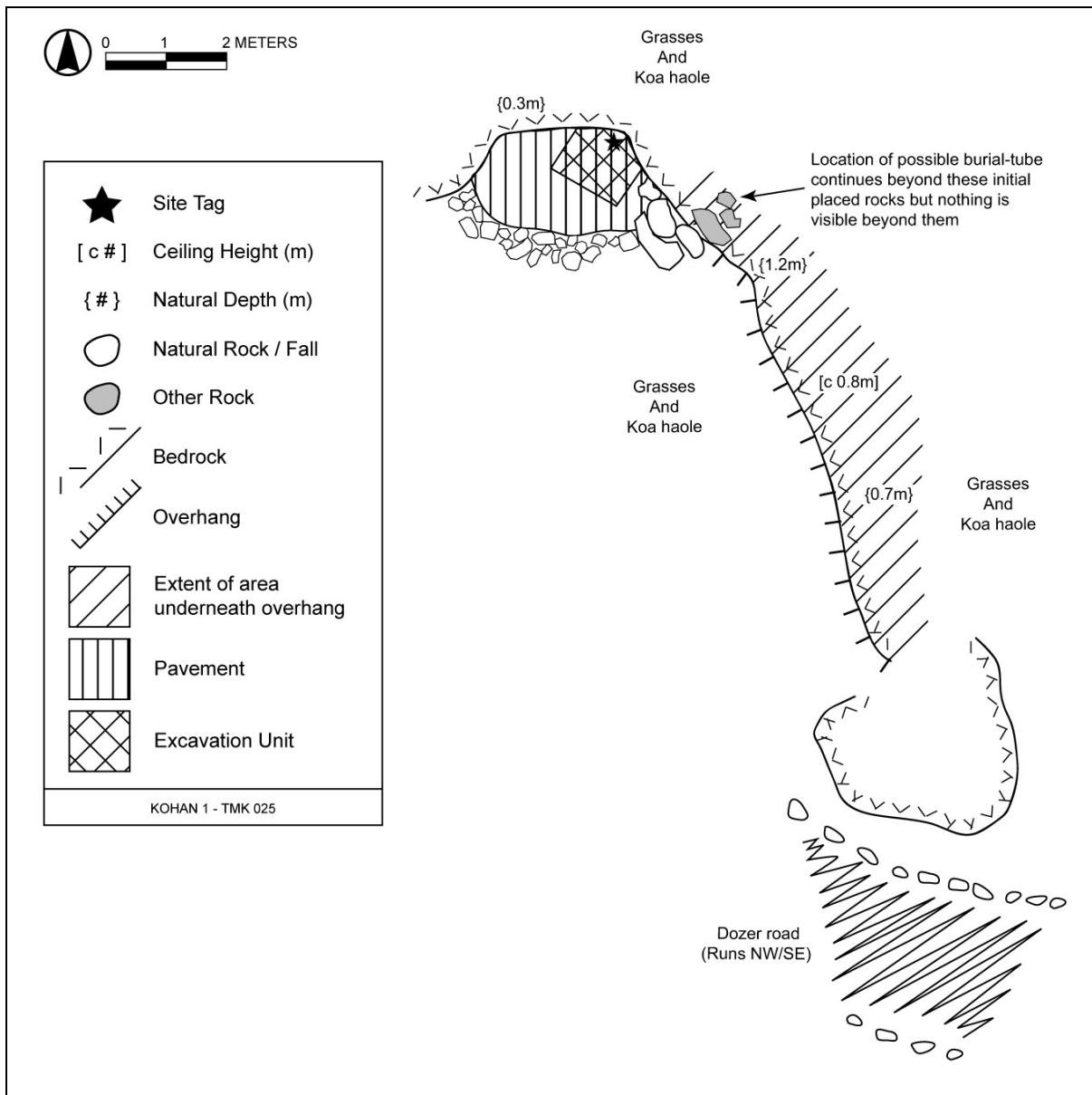


Figure 98. Site -26292, plan view



Figure 99. Site -26292, overview of shelter overhang

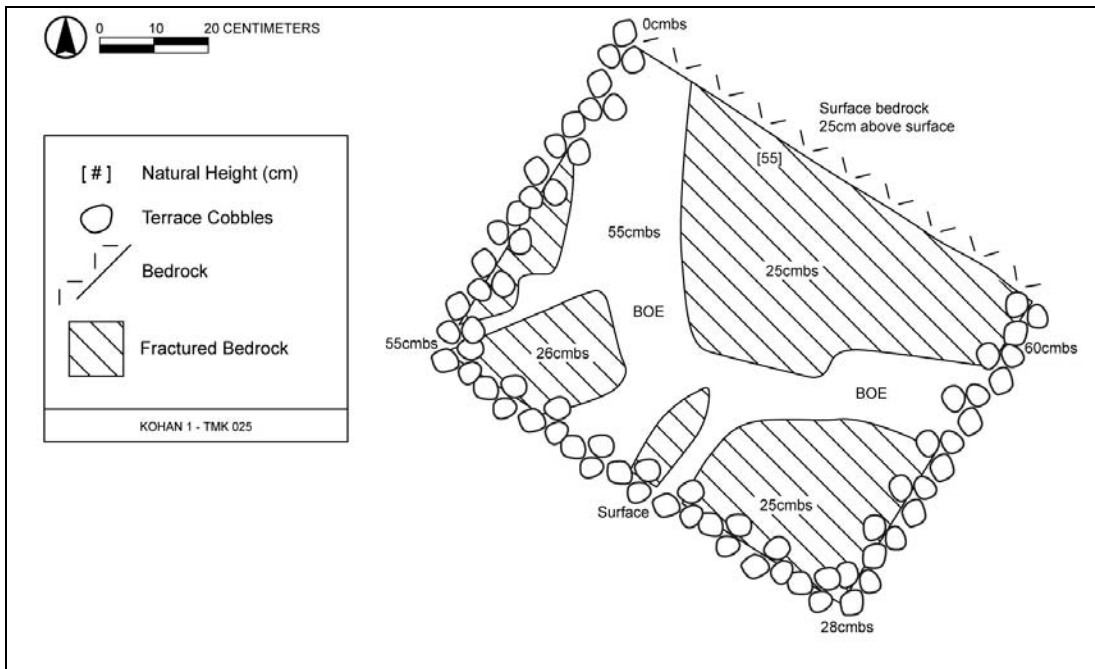


Figure 100. Site -26292, excavation plan view



Figure 101. Site -26292, paved surface prior to excavation



Figure 102. Site -26292, paved surface after excavation

4.3.21 State Site # 50-10-27-26293

SIHP #	50-10-27-26293
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 4 m (32.8 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre- \contact
ELEVATION:	440 ft a.m.s.l.

DESCRIPTION: Site -26293 is a small lava tube with a central soil deposit (approximately 3 cm / 0.1 ft. deep), a relatively localized midden concentration with a little scatter, and some modification in the form of one partially constructed entrance and a faced wall (Figure 103 and Figure 104). There is some bulldozer activity in the area and the vegetation is dominated by *koa haole* and grasses (Figure 105). The midden includes *kukui*, urchin, a small amount of charcoal, marine shell, including *Nerita*, *Conus*, and cowry shell. The partially constructed entrance is at the tube's southwest opening (the tube has two openings - a southwest and a northeast) and consists of a large faced upright that slightly obstructs access to the tube and directs any entrance to the center of the tube. The faced wall is located atop some natural ceiling collapse. It is stacked one course high, consists of four stones, and is well-faced. This wall appears to have been constructed to limit access to the collapse area behind the wall and therefore limit activity to the center of the tube (in the area of the soil deposit).

The site's function is interpreted as temporary habitation based on the fair amount of midden present, and the modifications of the partially constructed entrance and the faced wall. The relatively small size of the tube and the lack of more extensive modifications habitation site is indicative of temporary habitation rather than recurrent habitation.



Figure 103. Site -26293, faced wall within tube, view to southeast

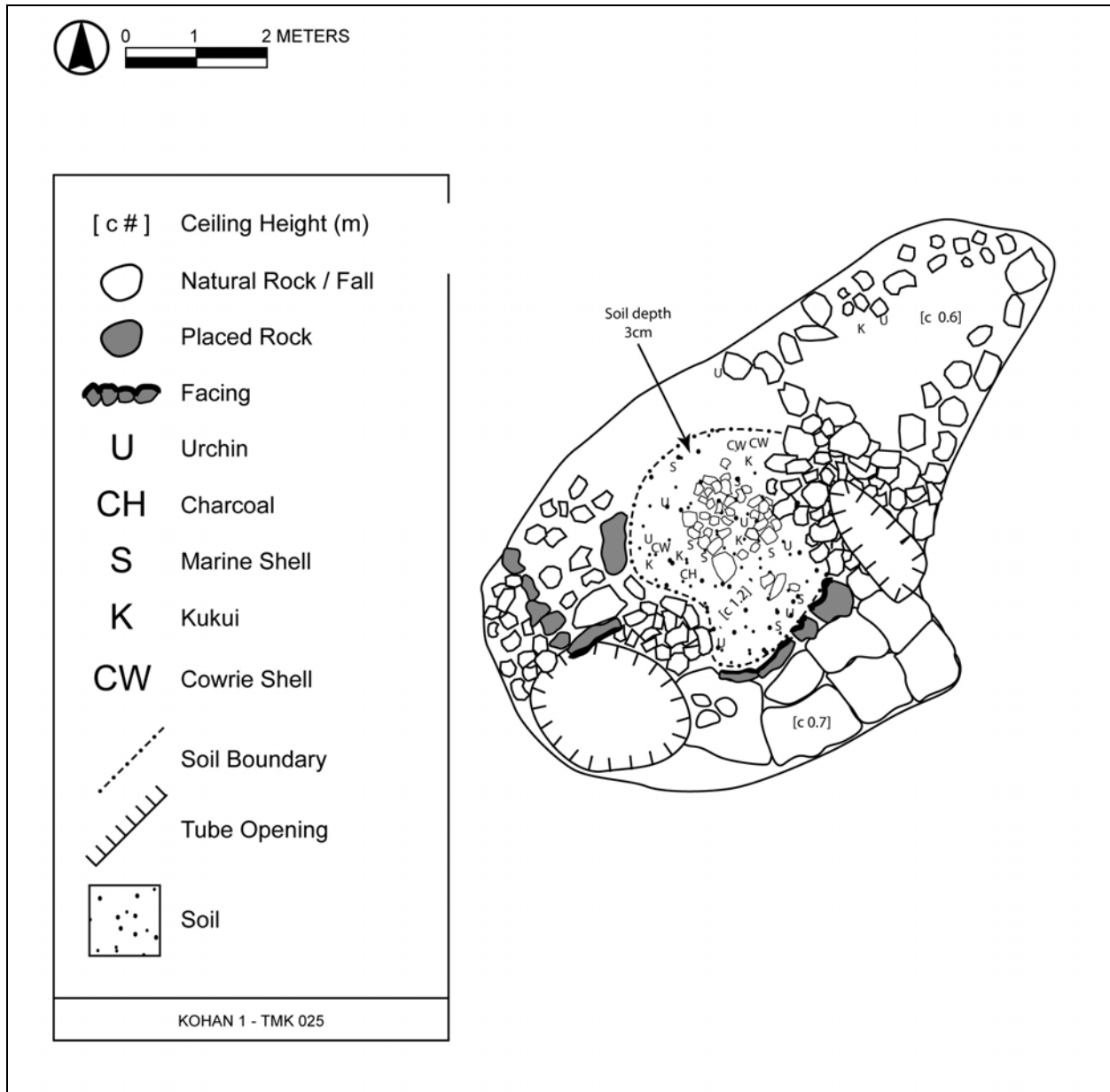


Figure 104. Site -26293, interior plan view

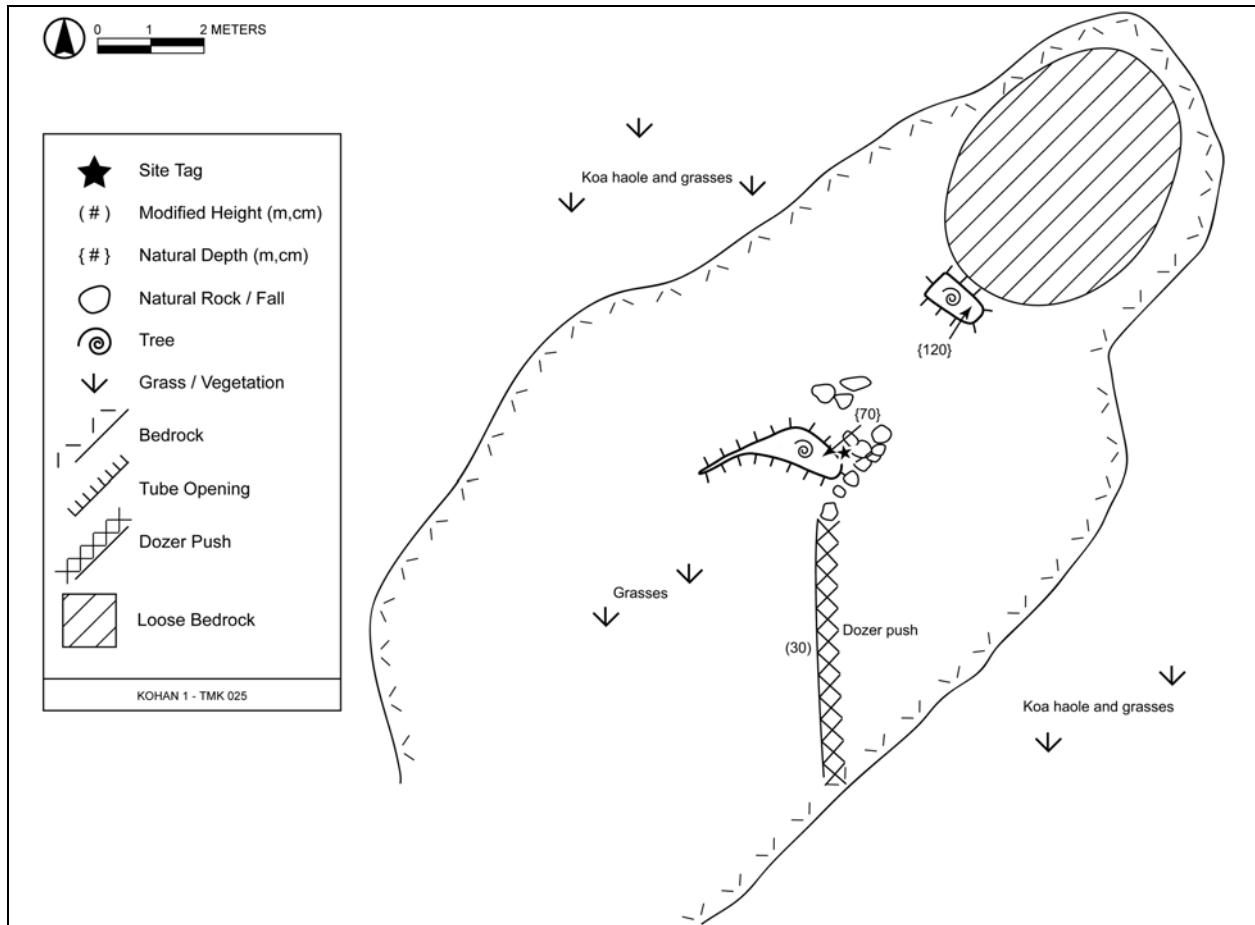


Figure 105. Site -26293, exterior plan view

4.3.22 State Site # 50-10-27-26294

SIHP #	50-10-27-26294
FUNCTION:	Indeterminate
SITE TYPE:	Wall
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	45 m by 3.2 m (147.6 by 10.5 ft.)
CONDITION:	Good
AGE:	Pre-contact / Historic
ELEVATION:	450 ft a.m.s.l.

DESCRIPTION: Site 26294 consists of two parallel linear boulder alignments/low walls (Figure 106). The walls are oriented in a north/south direction. From the southern end of the feature, the walls extended approximately 45 m (147.6 ft.) at a bearing of 352 degrees. The *mauka* alignment averages about 60 cm (2 ft.) in width and ranges between 30-45 cm (1.1-1.3 ft.) in height. The *makai* alignment also averages about 60 cm (2 ft.) in width and ranges between 20-50 cm (0.65-1.6 ft.) in height. The distance between the parallel alignments is approximately 2 m (6.6 ft.). A wooden fence post is located approximately 10 m (32.8 ft.) northeast of the northern end of the feature.

The site's function is interpreted as indeterminate. Due to the lack of associated cultural materials, it is not possible to determine the age of the site. Since the site may have been used during the pre-contact or historic periods, both ages have been assigned.



Figure 106. Site -26294, showing area between the two parallel linear alignments, view to east

4.3.23 State Site # 50-10-27-26295

SIHP #	50-10-27-26295
FUNCTION:	Marker
SITE TYPE:	Cairn
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	24 m by 1.6 m (78.7 ft. by 5.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	470 ft a.m.s.l.

DESCRIPTION: Site -26295 consists of a small low mound in front of medium-large *pāhoehoe* cobble/ medium *pāhoehoe* slabs piled on top of bedrock (Figure 107 and Figure 108). The mound measures 24 m (78.7 ft.) southeast/northwest and has a maximum height of 50 cm (1.6 ft.). There is a small collapsed lava blister to the southwest of the mound that contains no cultural material within or adjacent to the blister or the small mound.

The site's function is interpreted as cairn, since it is the typical marker or cairn form. No evidence of habitation, burial, or other activities associated with the small mound is present.



Figure 107. Site -26295, view to west

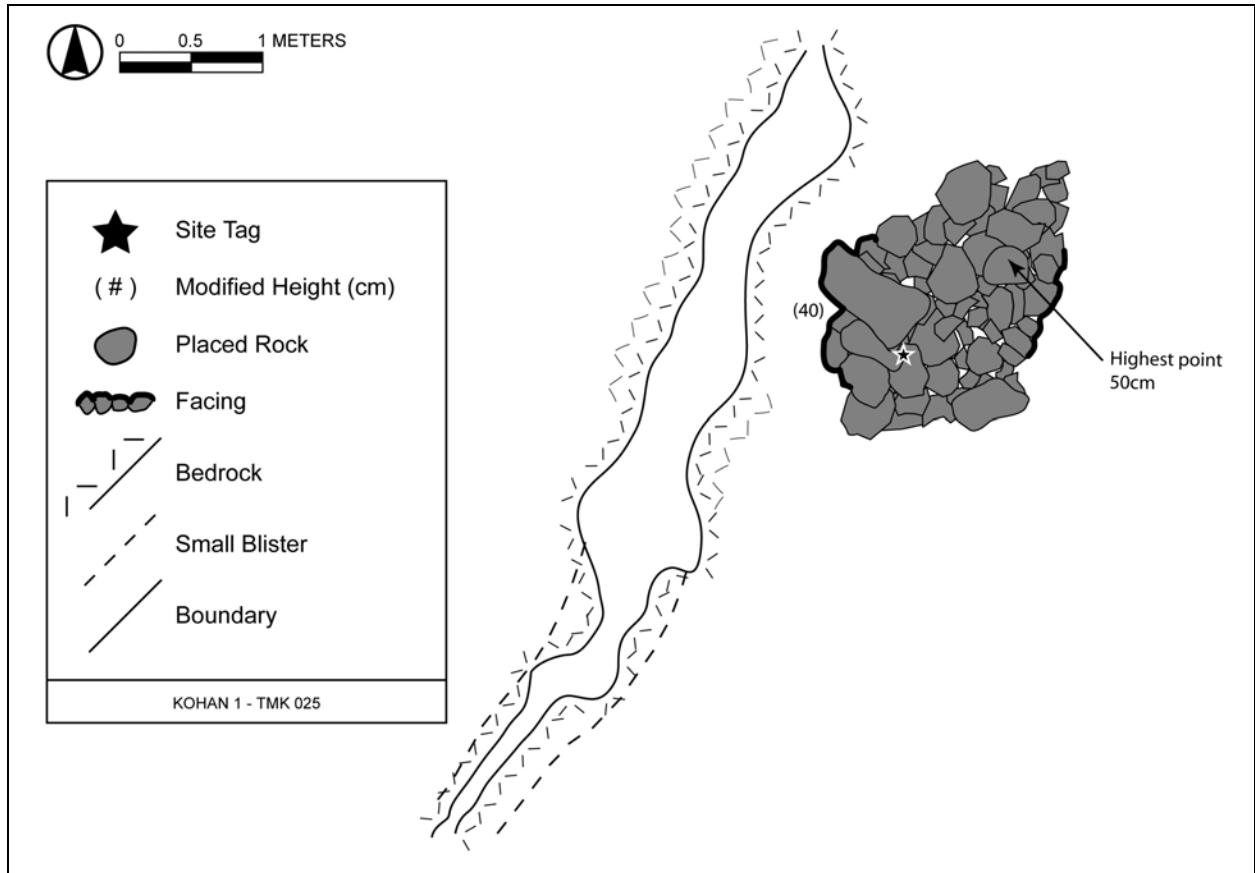


Figure 108. Site -26295, plan view

4.3.24 State Site # 50-10-27-26296

SIHP #	50-10-27-26296
FUNCTION:	Permanent Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	2
DIMENSIONS:	6 m by 3.9 m (19.7 ft. by 12.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	490 ft a.m.s.l.

DESCRIPTION: Site -26296 is a complex consisting of two walled features: Feature A is a habitation enclosure and Feature B is an animal husbandry enclosure (Figure 109). The site is surrounded by thick vegetation consisting of *koa haole* and various grasses.

Feature A is a square enclosure constructed of stacks of large *pāhoehoe* cobbles and small to medium *pāhoehoe* boulders (Figure 110). The enclosure measures 6 m (19.7 ft.) in length north/south by 3.9 m (12.8 ft.) in width east/west with an average height of 1.4 m (4.6 ft.). The enclosure is located on a smooth and relatively level *pāhoehoe* flow.

The structure walls vary in height from 3-5 m (9.8-16.4 ft.) depending on boulder/cobbles size and areas of collapse. The northeast, southeast, and southwest sides of the structure are in relatively good condition with little collapse. The northwest side, however, shows sign of moderate collapse and areas of structural weakness. Most of the collapse can be seen on the exterior of the enclosure, however, several collapsed boulders are within the interior. Excluding the collapsed boulders, the interior of the structure is level and clear of anything larger than a small cobble.

A doorway appears to be centrally located on the southwest side and was constructed of two flat *pāhoehoe* boulders on either side, however; both *pāhoehoe* slabs have given way to the collapse. The condition of this feature in relationship to the historic *ahupua'a* wall, 60-70 m (196.9-229.7 ft.) to the south and southeast, suggest this site was at least potentially maintained after contact, however, the site lacks both historic and pre-contact artifacts and/or midden and therefore, can not be confirmed as solely a historic structure. Excavation potential is considered fair due to the loose soil deposit (3 cm / 0.1 ft.) within the structure's interior where *koa haole* and grasses thrive. Ninety percent of this sediment can be attributed to detritus from the population. Feature B is approximately 2.5 m (8.2 ft.) to the northwest.

Feature B is an open-square enclosure constructed of stacked *pāhoehoe* small-large cobbles and small boulders (Figure 111). Feature B is located on a moderately smooth *pāhoehoe* flow with several un-level interior portions. The enclosure walls are constructed with small boulders at the base, medium-large sized cobbles are stacked above the base, and small cobbles fill the top and interior of the walls. Small cobbles are also used to fill in voids. On average, the wall is constructed of three courses. The wall's average thickness is 50 cm (1.6 ft.) with an average height of 50 cm (1.6 ft.). The feature extends 14 m (45.9 ft.) in length northeast by 9 m (29.5 ft.) in width to the southwest. Several areas of the wall have experienced moderate collapse therefore the feature's condition is considered to be fair. The southeast portion of the enclosure is open with no evidence of a wall. Feature A (enclosure/habitation) is located approximately 2.5 m (8.2 ft.) from this opening.

Site -10712, the historic wall that marks the *ahupua'a* boundary, is 65-75 m (212.3-346.1 ft.) to the south-southeast of Feature B, and is similarly constructed. The interior and exterior portions of Feature B are surrounded by thick vegetation including *koa haole* and various grasses. No cultural material or midden were found within or adjacent to the feature. There are several pockets of soil that can be attributed to vegetation detritus.

The site's function is interpreted as a permanent habitation site with a habitation enclosure and an animal husbandry enclosure. Based on the labor investment necessary to construct the enclosures, the site was a permanent habitation. Excavation potential of the site is fair based on the presence of soil deposits within both features.

Due to the fine construction, the possibility that this site dates the historic period was considered. However, based on the construction style, location, and lack of historic material, site -26296 was determined to be pre-contact. While the historic *ahupua'a* wall is nearby and is similarly constructed to Feature B, the wall was built with the same technology and materials as the pre-contact enclosure, hence the similarity in construction. Boulders within the vicinity of the two sites are similar and historic technology of animal husbandry walls was based on pre-contact construction.

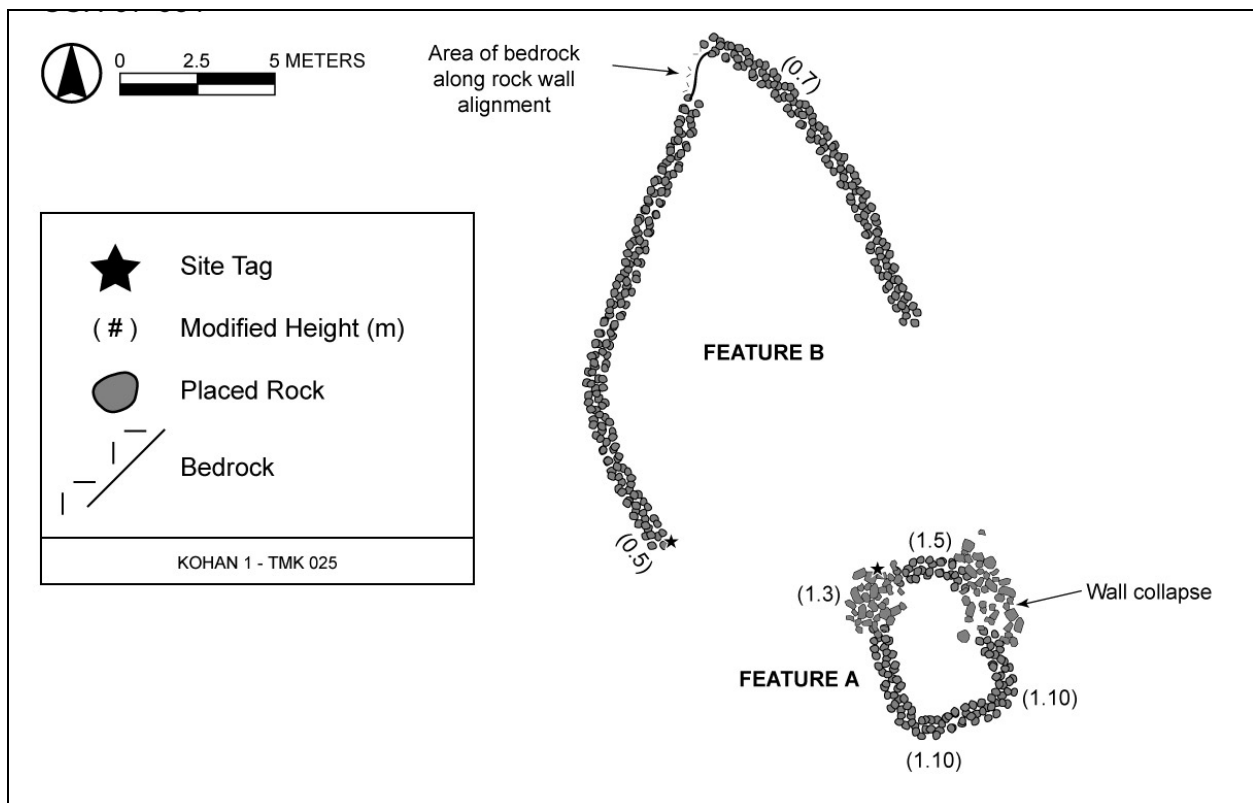


Figure 109. Site -26296, plan view



Figure 110. Site -26296, Feature A's east wall at the southeast corner, view to west



Figure 111. Site -26296, Feature B's west wall, view to east

4.3.25 State Site # 50-10-27-26297

SIHP #	50-10-27-26297
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	6 m by 2.5 m (19.7 ft. by 8.2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	500 ft a.m.s.l.

DESCRIPTION: Site -26297 is a *pāhoehoe* tumulus that contains a small lava tube (Figure 112 and Figure 113). A terraced area of 'a'ā cobbles/small boulders runs along the southern edge of the tumulus; the terracing may be natural. A green *ti* plant is approximately 4 m (13.1 ft.) west of the tumulus.

The tumulus interior measures approximately 6 m (19.7 ft.) east/west by 2.5 m (8.2 ft.) north/south, with an average height of 1.5 m (4.9 ft.). The slightly excavated/terraced area of 'a'ā near the southern edge of the tumulus measures about 1 m by 1 m (3.3 ft. by 3.3 ft.).

The tumulus interior contains a relatively deep soil deposit (approximately 10 cm / 0.33 ft.), some *kukui* nut, and most of an urchin shell. Forty percent of the soil deposit surface is covered with small to medium cobbles; it is, however, not a pavement. The entrance area may have been cleared to allow easier access since cobbles and small boulders are scattered around the periphery of the tube, and some are stacked near the entrance. A small area of stacked cobbles along the eastern interior boundary may have been used as a cache (Figure 112)

The site's function is interpreted as a temporary shelter based on the presence of *kukui* and shell in the lava tube and the modifications within the tube. The slightly excavated area of 'a'ā and the presence of the *ti* plant indicate the possibility that the site functioned as a religious shrine. However, evidence is not definitive, particularly since the excavated area may be natural.

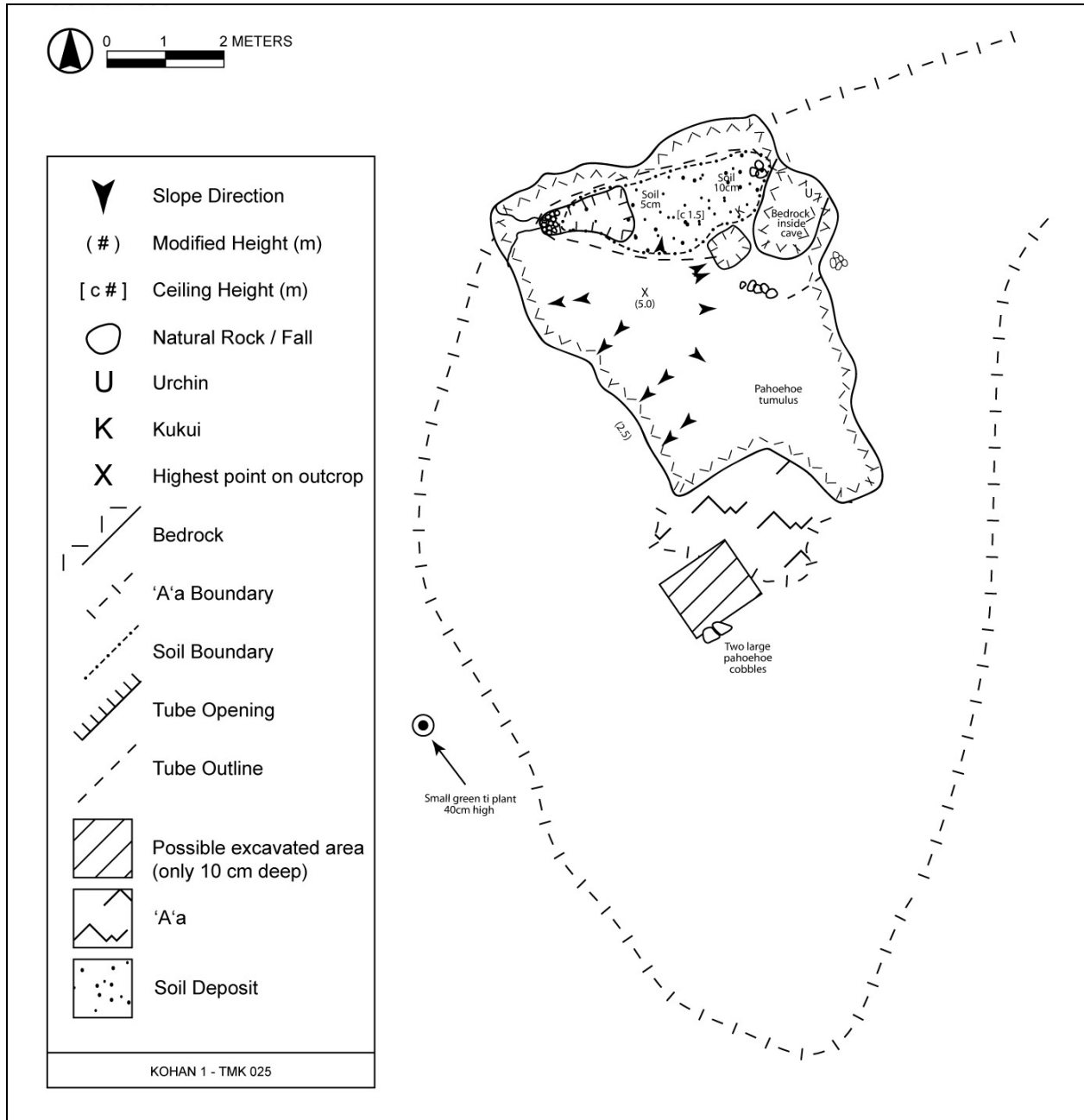


Figure 112. Site -26297, plan view



Figure 113. Site -26297, view to east

4.3.26 State Site # 50-10-27-26298

SIHP #	50-10-27-26298
FUNCTION:	Temporary Habitation
SITE TYPE:	Platform
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4 m by 4 m (13.1 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	510 ft a.m.s.l.

DESCRIPTION: Site -26298 (Figure 114 and Figure 115) is a platform on the edge of an 'a'ā flow. The vegetation on the 'a'ā and within the immediate vicinity consists of sparse *koa haole* and a few sparse patches of grass adjacent to the edge of the flow. Approximately 5 m (16.4 ft.) west and 8 m (26.3 ft.) south of the site the vegetation consists of dense *koa haole* and grasses.

The platform measures approximately 4 m (13.1 ft.) north/south by 4 m (13.1 ft.) east/west. The platform is circular and raised between 40 cm and 80 cm above the surrounding 'a'ā surface and it is constructed of 'a'ā cobbles and small boulders. The platform has a level, roughly even surface. The north side of the platform surface is raised 30-40 cm (1-1.3 ft.) above the surrounding leveled surface. Atop the level surface is a rough alignment of approximately a dozen *pāhoehoe* slabs, the largest of which measure approximately 50 cm by 60 cm (1.6 ft. by 1.6 ft.), that runs roughly north/south across the leveled surface and down the slope to the 'a'ā edge.

The site's function is interpreted as temporary habitation based on the site's location and characteristics. The labor investment in the creation of the leveled platform is more indicative of a temporary habitation site. The site's location at the crest of the 'a'ā creates a lookout spot that could be an asset for a temporary habitation site. Ceremonial function was considered, however, there is no direct evidence, such as the presence of coral or any marine shell, indicating ceremonial use. The placement of the *pāhoehoe* slabs, in a somewhat circular arrangement in one area and overlapping each other, is not consistent with stepping-stone slabs on trails across the 'a'ā. There is also no evidence of a trail between the site and the 'a'ā boundary or continuing on across the 'a'ā from the site.

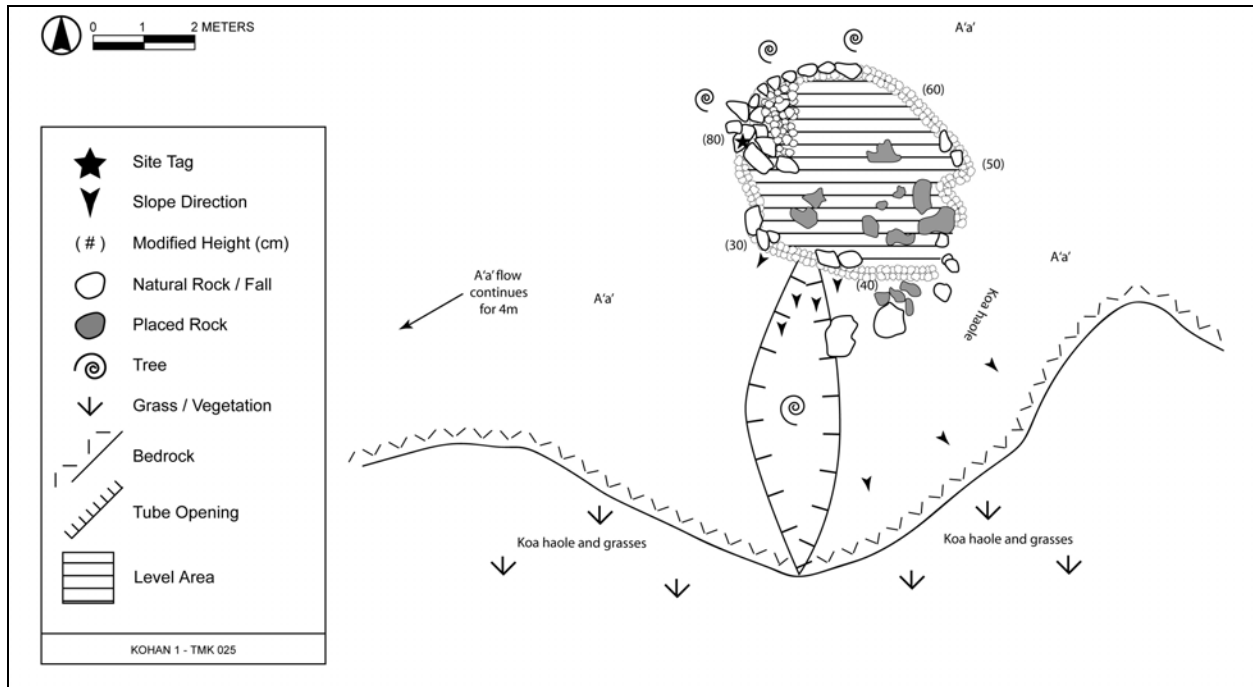


Figure 114. Site -26298, plan view



Figure 115. Site -26298, southwest portion of site, view to northeast

4.3.27 State Site # 50-10-27-26299

SIHP #	50-10-27-26299
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	85 m by 10 m (278.9 ft. by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	505 ft a.m.s.l.

DESCRIPTION: Site -26299 is located in TMK 25 on the southwest end of an undulating *pāhoehoe* flow. The vegetation around the site consists of *koa haole* and various grasses.

The site is a lava tube that runs approximately 9 m (29.5 ft.) almost directly east (Figure 116, Figure 117 and Figure 118). At its widest point the cave is approximately 4 m (13.1 ft.) across, and at its tallest point it is 70 cm (2.3 ft.) high. There are approximately six placed small boulders in the cave. Three of these boulders are placed adjacent to each other along the cave's south wall; the three other boulders are in no particular alignment. Two soil deposits, one at the entrance to the cave, which is 6 cm (0.2 ft.) deep, and one west of a natural divider in the cave, are present. The second soil deposit is the larger of the two deposits and is approximately 12 cm (0.39 ft.) deep. A scatter of goat bones is also present on the surface of this second soil deposit. These two soil deposits indicate fair excavation potential. There is a very thin layer of soil, 1 cm (0.03 ft.) deep at its deepest, that lightly covers a strip of the cave floor between the soil deposits. This soil is actually more like a soil lens than a layer.

The site's function is interpreted as a pre-contact shelter. The cave's only modification is the placed boulders and the lack of any historic artifacts indicates the shelter's age. Based on the lack of extensive modifications, the lack of midden, and the relatively small size and low height of the cave, the site is a shelter rather than a temporary habitation.



Figure 116. Site -26299, showing tube interior, view to east

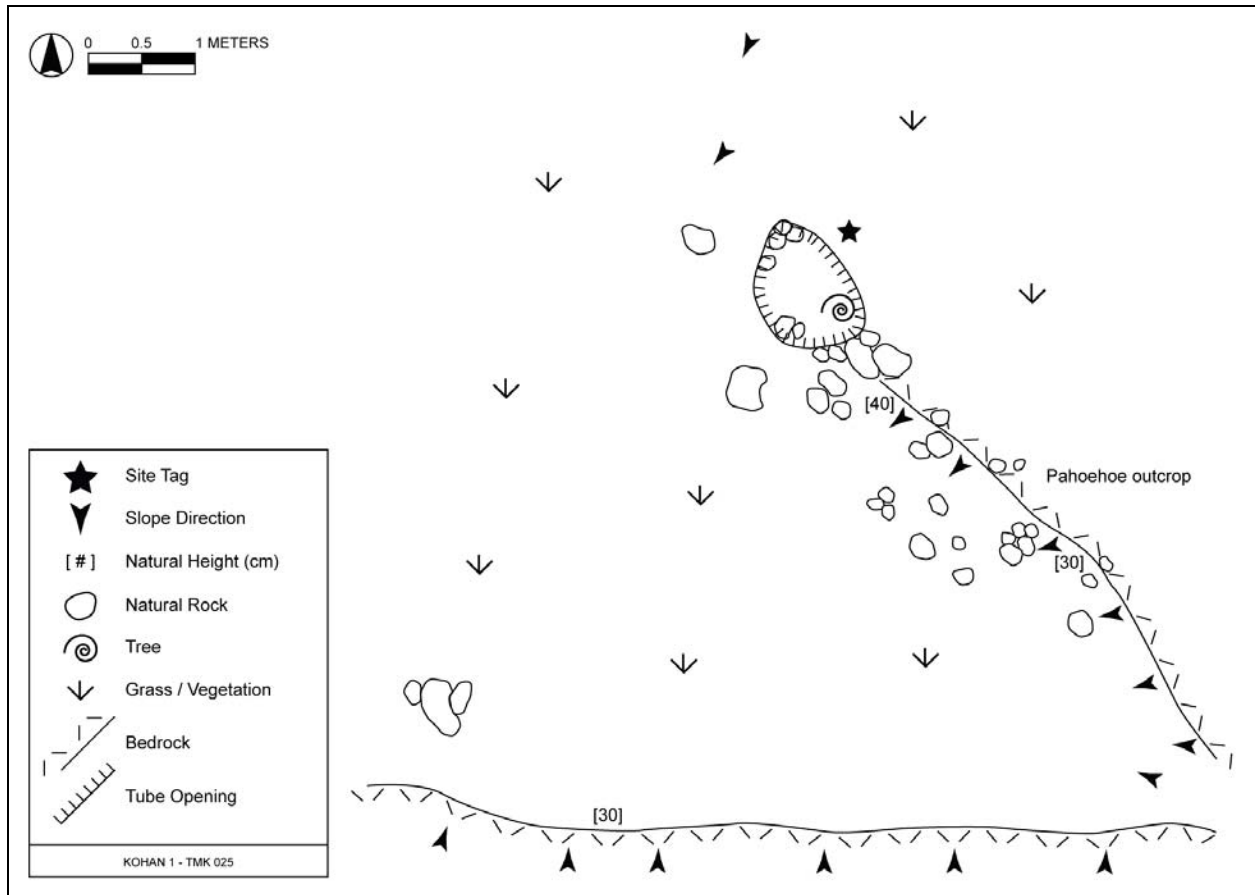


Figure 117. Site -26299, exterior plan view

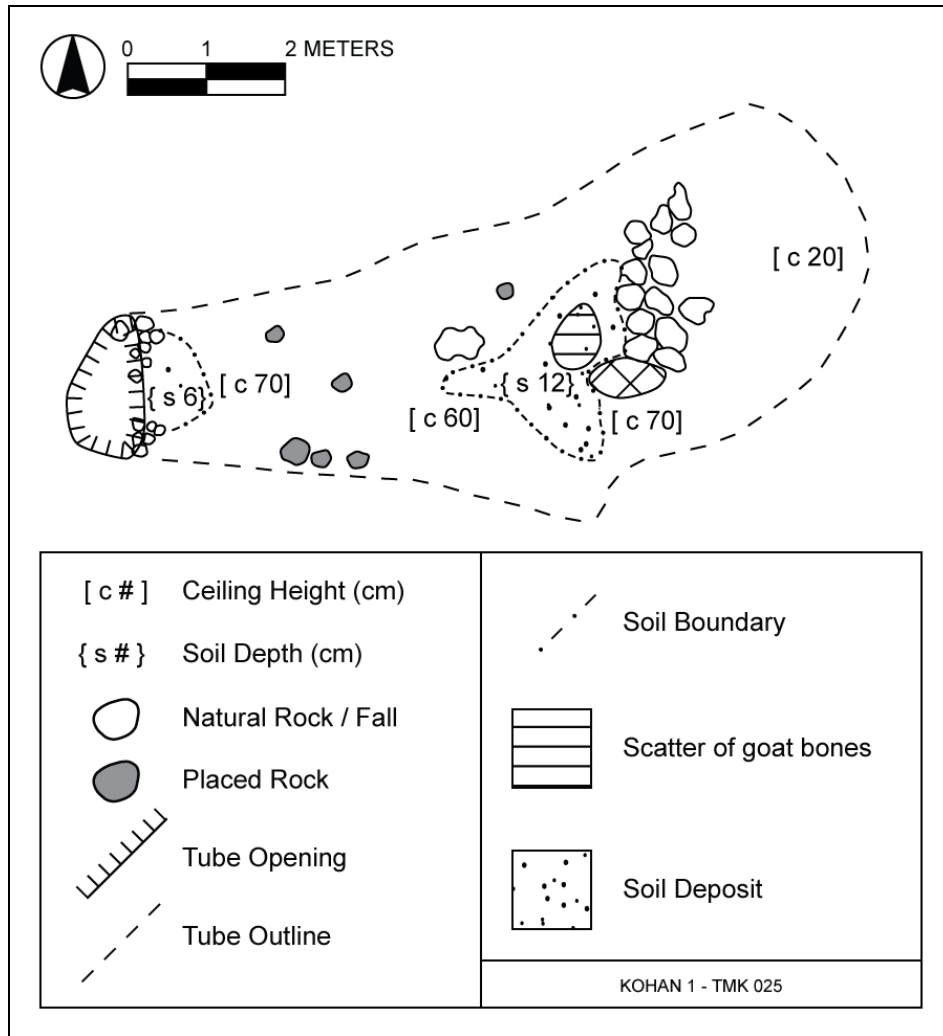


Figure 118. Site -26299, interior plan view

4.3.28 State Site # 50-10-27-26300

SIHP #	50-10-27-26300
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	3
DIMENSIONS:	45 m by 8 m (147.7 ft. by 26.3 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	490 ft a.m.s.l.

DESCRIPTION: Site -26300 is a series of lava tubes that branch out from and contour two sink holes (Figure 119). The complex contains three features. Feature A was used for temporary habitation based on the extent of modification and the midden present; Feature B has sparse midden and cleared activity areas indicating temporary habitation. Feature C contains five water catchments and little midden; it is an activity area and shelter.

Feature A is an extensive lava tube that joins with the large sink hole of Feature B (Figure 119, Figure 120, Figure 121, and Figure 124). Feature A's main entrance is approximately 10 m (32.8 ft.) south of Feature B. The tube's north extension (from the tube opening) contains extensive ceiling fall. Midden, including abundant *kukui*, a few urchin shells, and abundant goat bones, is mixed within this fall. A small cleared area in front of a small tube extension in the west wall of the north extension contains *kukui* and charcoal. Immediately inside the tube's entrance, in the south extension, is a thin soil deposit (approximately 1 cm / 0.03 ft. deep), with midden that contains a volcanic glass flake, marine shell, urchin shell, and a piece of burnt driftwood alongside a large cache of *kukui*. As the tube turns west, there is extensive ceiling fall containing more midden that consists of *kukui* and urchin. The tube then opens into a larger chamber with approximately 10 pieces of placed *pāhoehoe* ceiling fall. Along these placed stones are *kukui*, urchin, and marine shell. The tube continues on with multiple extensions (Figure 120) but no modification was present beyond this point. The tube was surveyed for approximately 45 m (147.7 ft.) until it was no longer passable. No cultural modification or midden was found on the northwest side of the tube opening; on the exterior surface is a constructed wall. A possible agricultural activity area with a dark tree growing in its center is approximately 8 m (26.3 ft.) northwest of this wall.

Feature B consists of a large sink hole approximately 8 m by 6 m (26.3 ft. by 19.7 ft.) with two tube extensions running roughly east and southwest (Figure 119, Figure 121 and Figure 125). The sink is full of natural fall and *koa haole* trees. There is a single entrance to Feature B through which both the east-heading and west-heading extensions are accessed. Ceiling fall covers the tube entrance floor, the initial portion of the east extension, and most of the west extension. Midden including urchin and *kukui* is sparsely scattered throughout the west tube. A side chamber/tube runs parallel to and is accessed through the main west extension. It is approximately 1.6 m (5.3 ft.) lower than the main tube, has less ceiling fall, and more midden including some crab claws. The east extension has two cleared areas that are the main activity areas. The midden found in these areas includes *kukui*, urchin, marine shell, and a small amount of charcoal. No soil deposits are present in Feature B.

Feature C contains two sink holes (Figure 122, Figure 123 and Figure 127). The *mauka* sink hole measures approximately 5 m by 7 m (16.4 ft. by 22.9 ft.), and the *makai* sink hole measures approximately 2.5 m (8.2 ft.) in diameter. **Tube 1**, a large lava tube, extends from the *mauka* sink hole at a bearing of 68 degrees. About 20 m (65.6 ft.) from the small entrance, the tube opens up significantly, measuring 5 m (16.4 ft.) wide and 4.5 m (14.8 ft.) high. The tube's length is approximately 45 m (147.6 ft.), then narrows into a smaller chamber that measures approximately 1-2 m (3.3-6.6 ft.) by 9 m (29.5 ft.) and about 1 m (3.3 ft.) high. The presence of water in the lava tube is its most important attribute. Little modification was observed; one water feature was noted (Figure 122) and little other evidence of human activity was found. Minimal soil deposit is present in this tube that consists primarily of *pāhoehoe* bedrock with some 'a'ā toward the back of the tube. From the entrance to Tube 1, there are small offshoot tubes that essentially contour the sink hole, leading to an "amphitheater" like chamber at the *makai* end of this first sink hole. The only evidence of modification in the "amphitheater" is a placed pile of large cobbles stones in a small chamber area that connected the amphitheater and offshoot tunnel B; an area that appeared to have been leveled was also present (Figure 122). A short tube connects the amphitheater area to Sink 2. This sink has the most significant modification observed throughout this feature. Along the northern edge of the sink hole is a slightly excavated area of *pāhoehoe* small boulders and large cobbles. This area measures approximately 2 m (6.6 ft. - north/south) and 2.5 m (8.2 ft. - east/west); the boulder placement measures about 40 cm high (1.3 ft.) on average. From Sink 2, another lava tube branches off in a southwest direction. Two *kukui* shells were observed within 10 m (32.8 ft.) of the tube entrance. As the tube narrows, a few placed boulders were discovered. A tube extends up above Sink 2 (Figure 123) just beyond this narrowing and contains approximately five water catchments at the tube entrance. The tube continued approximately 85 m (278.9 ft.) northeast; no additional cultural material was observed.

The site's function is interpreted as a temporary habitation complex. Feature A lacks significant modification or standing structures that are found at permanent habitations. However, the extensive midden found deep within the cave, the constructed wall at the tube opening, and the possible small agricultural area indicate that this feature may have been used more intensively than a temporary habitation. Feature B has cleared activity areas and sparse midden. The lack of any soil deposits or more extensive modification indicates that this tube was not likely used more extensively than as temporary habitation. Feature C contains minimal evidence of human activity other than water catchments and appears to have been used as shelter.

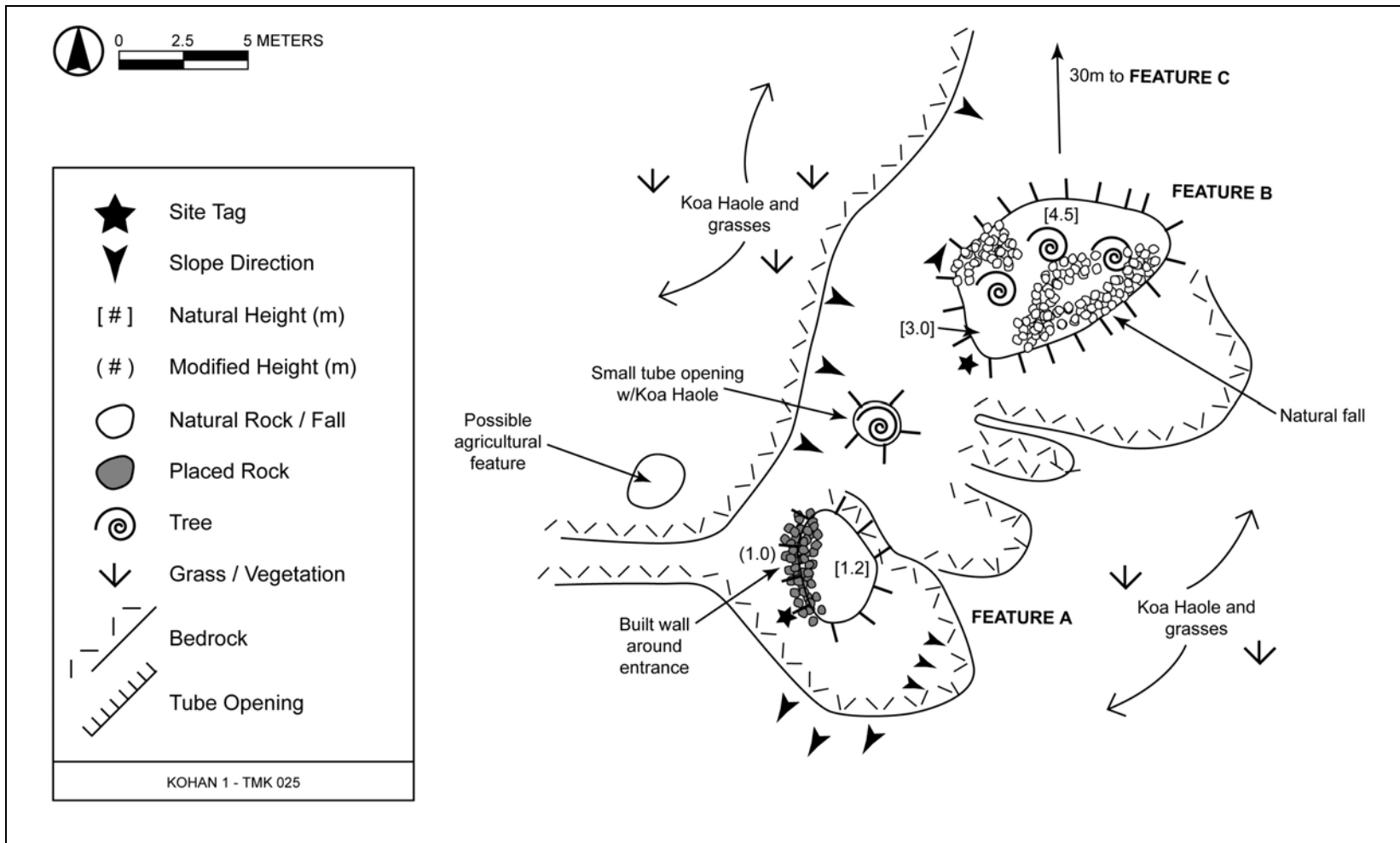


Figure 119. Site -26300, Features A and B, plan view

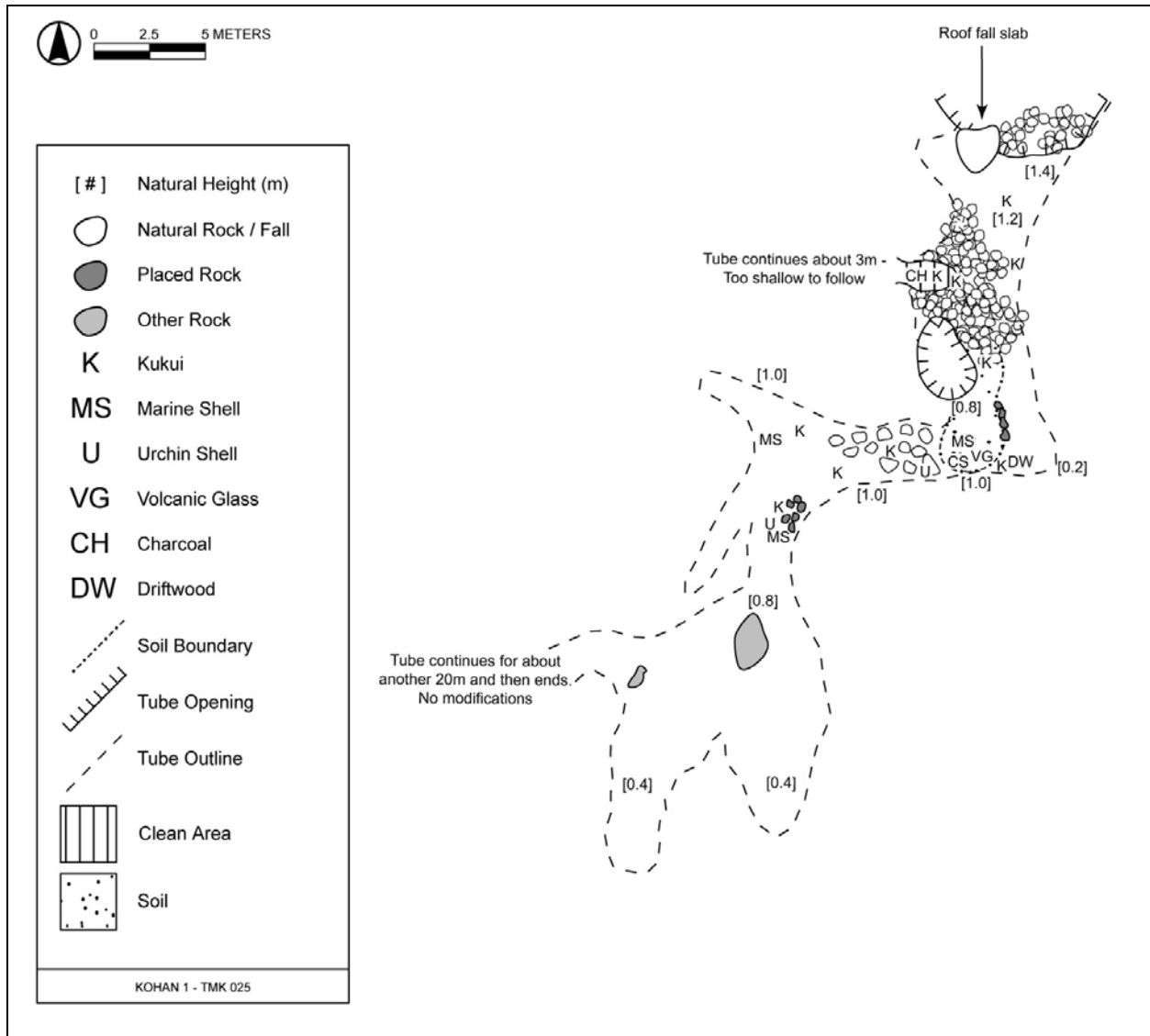


Figure 120. Site -26300, Feature A plan view

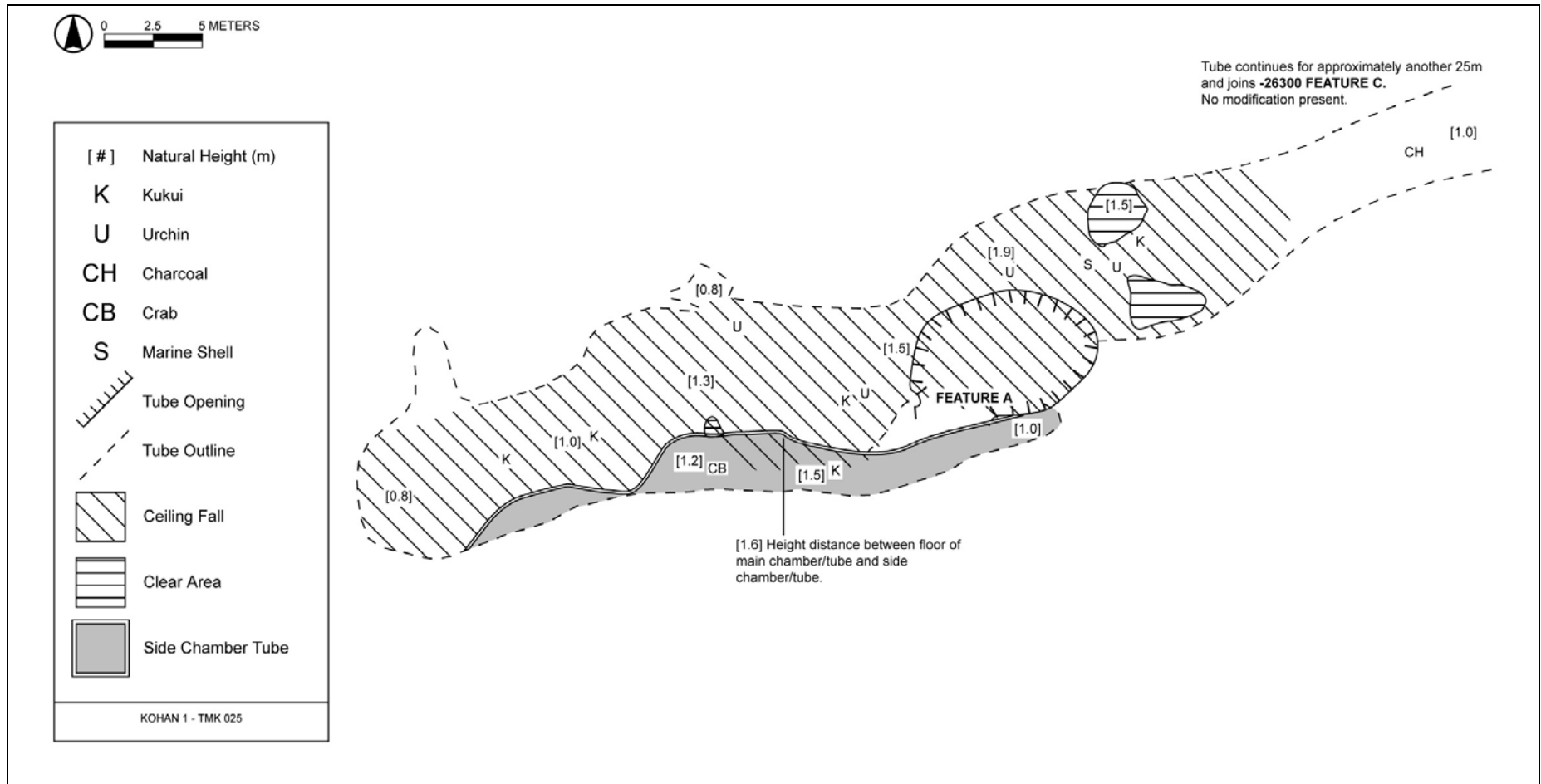


Figure 121. Site -26300, Feature B, plan view

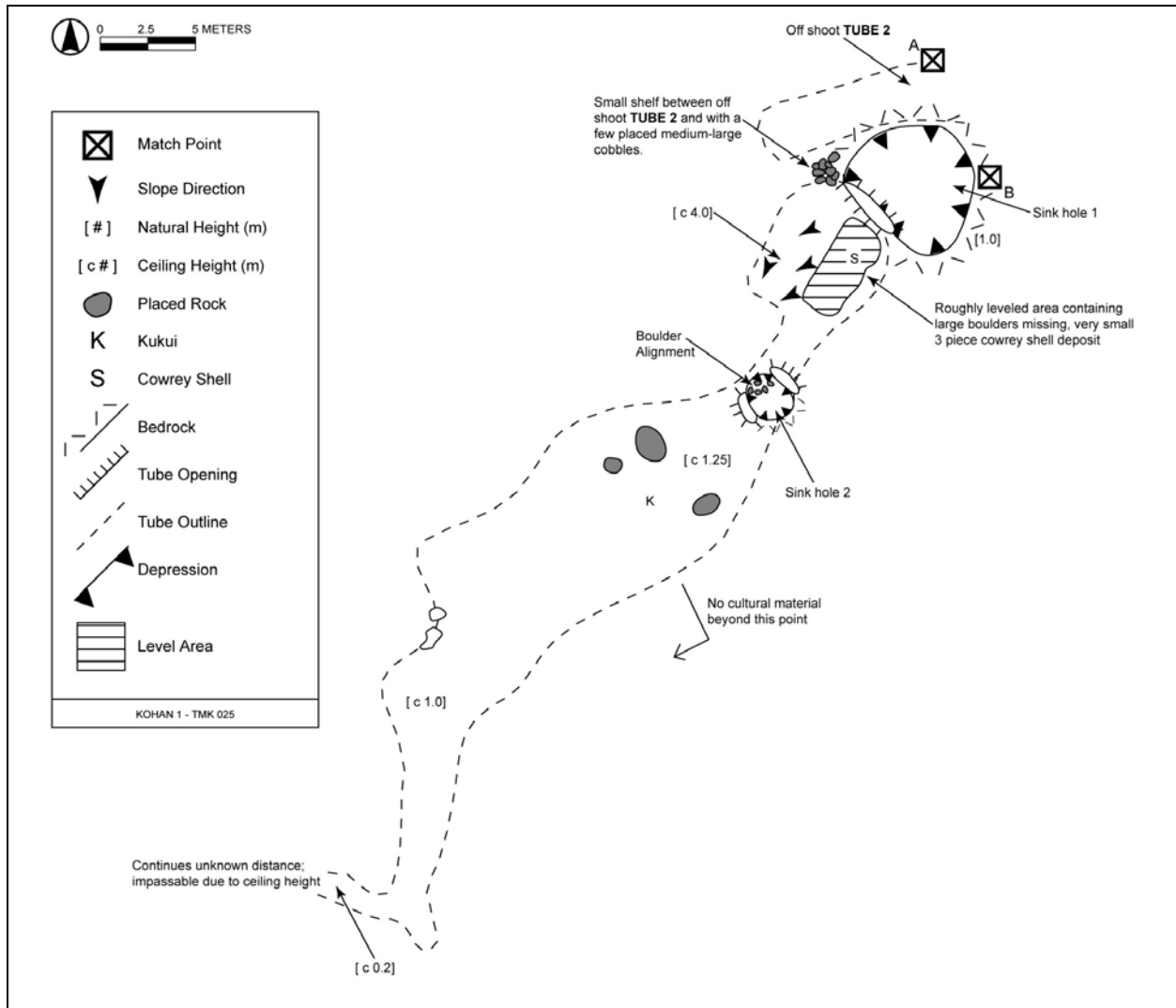


Figure 122. Site -26300, Feature C, plan view (1 of 2)

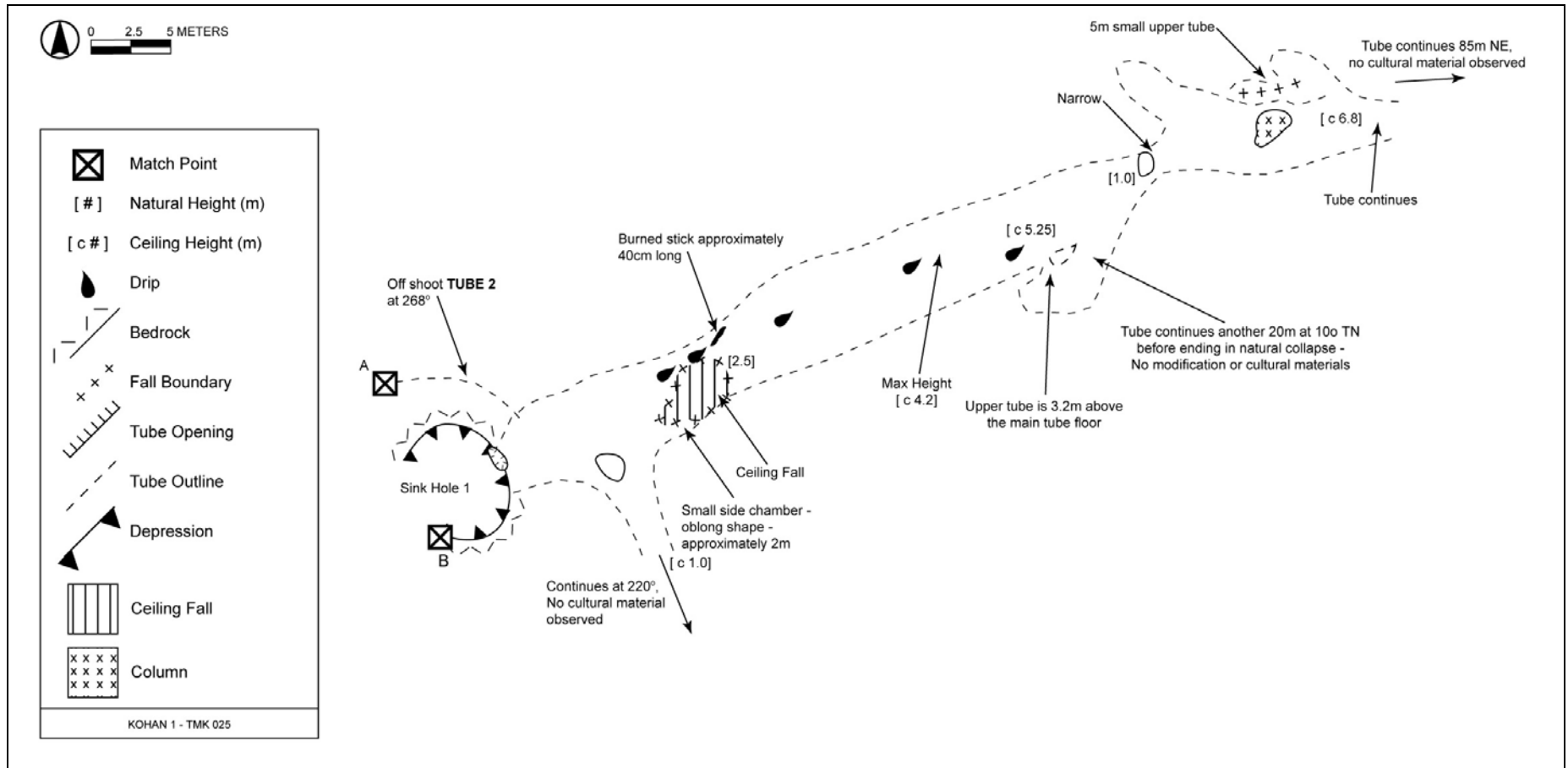


Figure 123. Site -26300, Feature C, plan view (2 of 2)



Figure 124. Site -26300, inside main activity area, view to south



Figure 125. Site -26300, Feature A showing wall around entrance, view to northeast



Figure 126. Site -26300, Feature B showing entrance, view to northeast



Figure 127. Site -26300, Feature C, view to east

4.3.29 State Site # 50-10-27-26301

SIHP #	50-10-27-26301
FUNCTION:	Temporary Habitation
SITE TYPE:	Terrace
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	5.5 m by 2.5 m (18 ft. by 8.2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	440 ft a.m.s.l.

DESCRIPTION: Site -26301 is a terraced/leveled area located at the northern boundary of 'a 'ā outcrop (Figure 128 and Figure 129). Larger cobbles appear to have been piled along the terrace's edges. Vegetation within the vicinity of the site include clumps of *koa haole* and various grasses

The site's function is interpreted as habitation. The dimensions of the terrace are similar to previously recorded temporary habitation area within 'a 'ā flows. The naturally leveled area and its modification make it a generally comfortable platform that provides an optimal spot to observe the terrain. The site does not appear to have been used as an activity area, such as quarrying or used for agricultural purposes, since no cultural material is present and the site does not have characteristics similar to activity or agricultural sites.



Figure 128. Site -26301, view to northeast

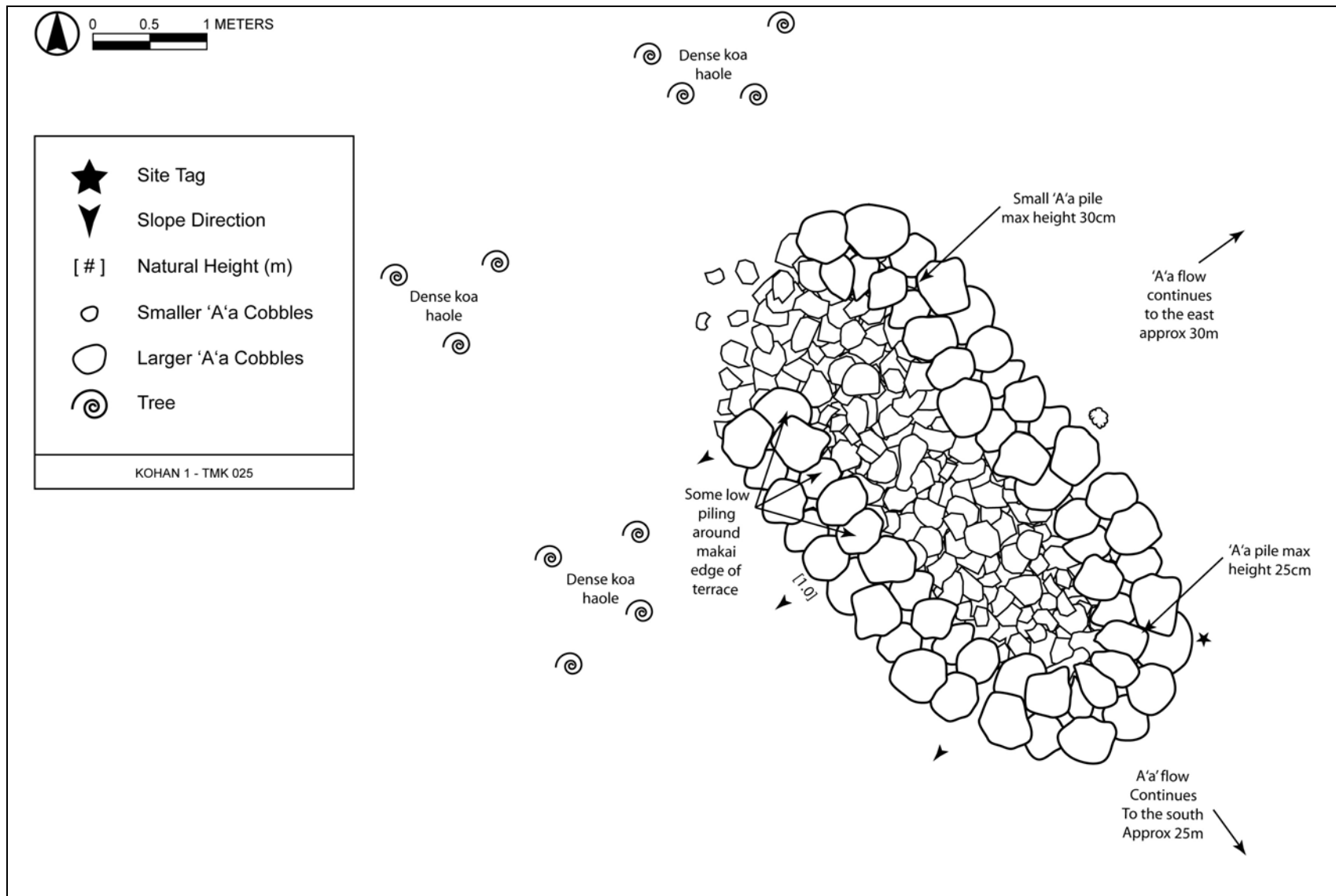


Figure 129. Site -26301, plan view

4.3.30 State Site # 50-10-27-26302

SIHP #	50-10-27-26302
FUNCTION:	Marker
SITE TYPE:	Cairn
TOTAL FEATURES:	2
DIMENSIONS:	7 m by 5 m (23 ft. by 16.4 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	430 ft a.m.s.l.

DESCRIPTION: Site -26302 consists of two small cairns (Features A and B) that are located at the northern edge of an 'a'ā flow where it borders *pāhoehoe* bedrock (Figure 130 and Figure 131). **Feature A** primarily consists of a stack of large cobbles/small boulders; it measures approximately 2 m by 2 m (6.6 ft. by 6.6 ft.) with a maximum height of 60 cm (2 ft.). **Feature B** is similarly constructed and measures 2 m by 1.5 m (6.6 ft. by 4.9 ft.) with a maximum height of 40 cm (1.3 ft.).

The site's function is interpreted as two markers. This interpretation is based on the fact that the mounds do not have the dimensions that are typically associated with a burial mound.

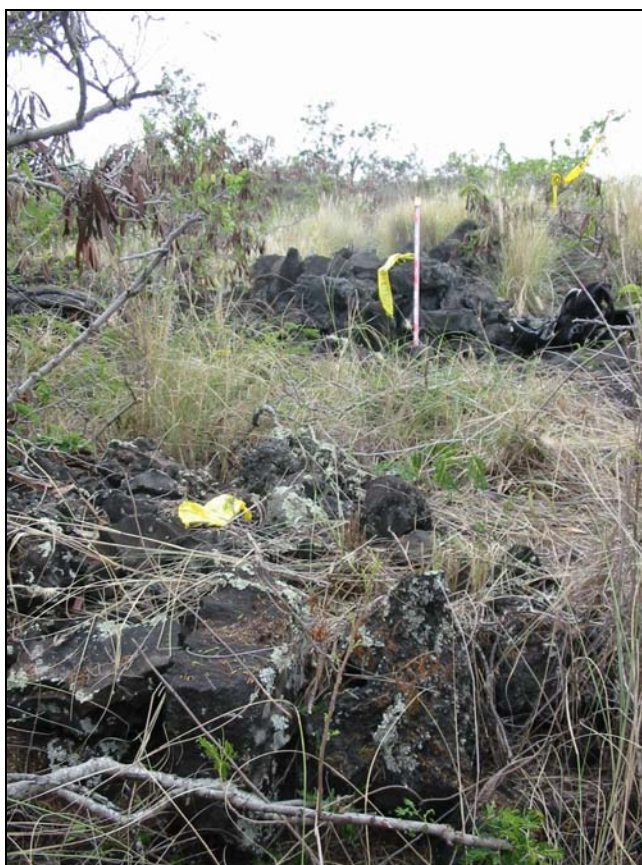


Figure 130. Site -26302, Feature A in background, Feature B in foreground

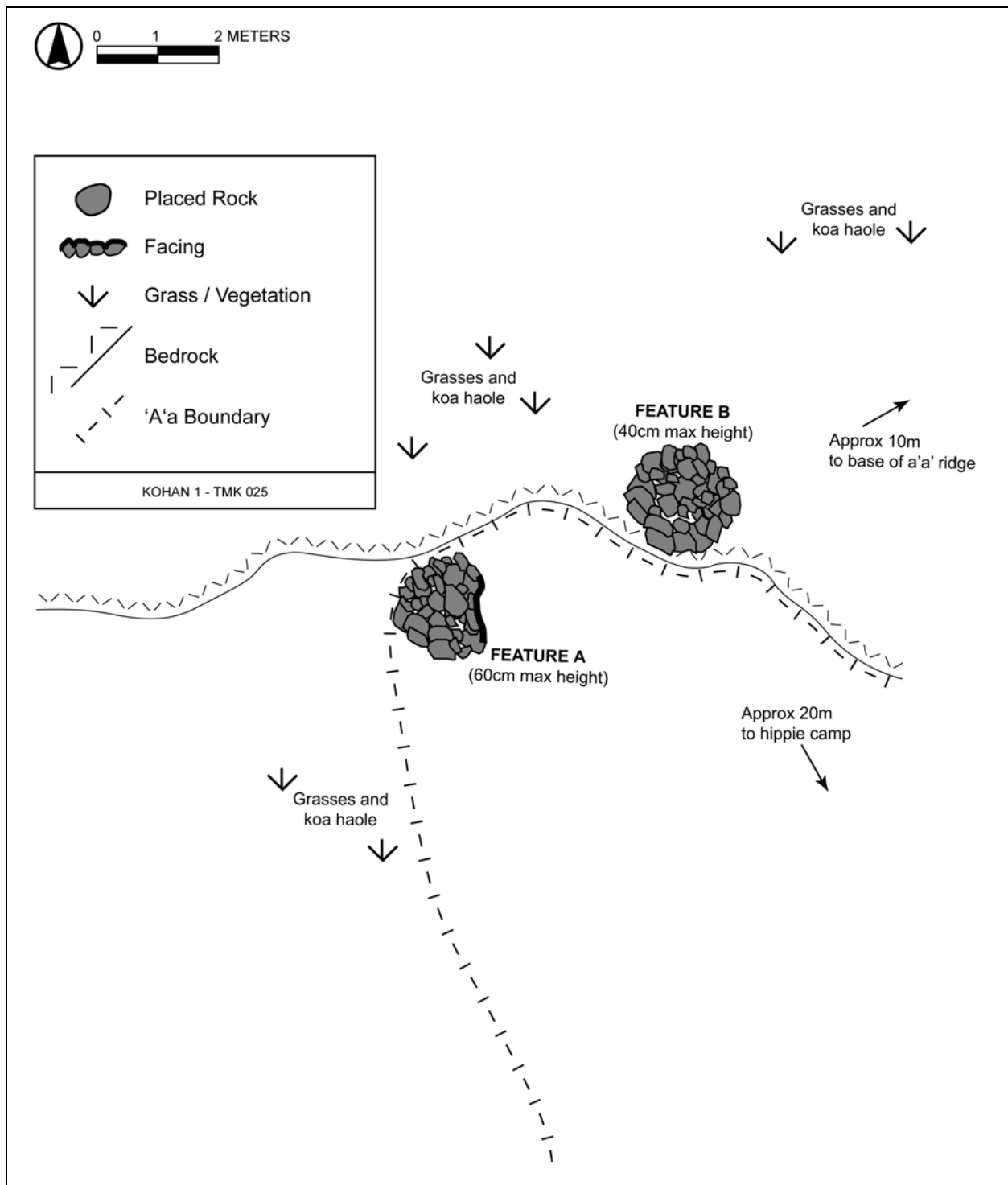


Figure 131. Site -26302, plan view

4.3.31 State Site # 50-10-27-26303

SIHP #	50-10-27-26303
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	3
DIMENSIONS:	35 m by 20 m (115 ft. by 65.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	435 ft a.m.s.l.

DESCRIPTION: Site -26303 consists of a temporary habitation cave approximately 8 m (26.2 ft.) wide and 1-2 m (3.3 ft. by 6.6 ft.) deep with two lava tube segments. Feature A extends to the west, Feature B extends to the east, and Feature C, a small tube, extends approximately 3 m (9.8 ft.) at 310 degrees (Figure 133).

Feature A is a lava tube; most of the first 22 m (72.2 ft.) of the tube is approximately 6 m (19.7 ft.) wide and 1.2 m (3.9 ft.) high (Figure 133). The tube extends from the entrance 19 m (62.3 ft.) at a 245 degree bearing then continues from that point at 305 degrees bearing. At the 25 m (82 ft.) mark there is a *kukui* but scatter. At approximately 6 m (19.7 ft.) from the entrance there is a constructed partition. At 4 m (13.1 ft.) a small boulder pile is along the northern wall of the tube. The tube is impassable at the 29 m (95.1 ft.) mark.

Feature B is a lava tube measuring 3 m by 1.25 m (9.8 ft. by 4.1 ft.) high (Figure 132, Figure 133 and Figure 134). The entrance is 11 m (36.1 ft.) east of the Feature A entrance. An approximately 3 m by 4 m (9.8 ft. by 13.1 ft.) area inside the entrance contains *kukui* and shell with midden-shell species including *Isognomon* sp., *C. mauritiana*, urchin shell, *Theodoxus*, and *Cariosus*. Within the first 10 m (32.8 ft.) of the entrance, there is also a small jaw bone fragment, probably pig, and a small basalt manuport that is approximately 13 m (42.7 ft.) from the drip line.

At 9 m (29.5 ft.) the tube constricts significantly, then the tube opens up again; past the constriction water, marine shell, and *kukui* are present. From entrance the tube extends 21.2 m (70 ft.) at the 65 degree bearing from this point the tube curves at a bearing of 12 degrees and extended 17.5 m (57.4 ft.). At the 21.2 mark five *kukui* nuts were observed. Around the 20 m (65.6 ft.) point there is a 4 m (13.1 ft.) in diameter mound of 'a 'ā with several crab claws on top. There appears to be construction consisting of stacked small boulders and cobbles along the northern and southern sides of the tube entrance. The entrance of this tube is 5 m wide by 1.2 m (16.4 ft. by 3.9 ft.) in height; the soil floor near the entrance is approximately 4 m by 3 m (13.1 ft by 9.8 ft.) and shows evidence of occasional runoff in filling. Modern trash is located at the entrance. The site lies approximately 5 m (16.4 ft.) north of a northwest corner of a pronounced 'a 'ā flow. A possible trail is up an 'a 'ā flow east of Feature B.

Feature C is a small tube-entrance, approximately 1 m by 0.5 m (3.3 ft. by 1.6 ft.) high (Figure 133). It appears that some of the collapsed rubble has been slightly excavated from the tubes interior and stacked up along the tubes entrance. The tube extends approximately 2-3 m (6.6-9.8 ft.) from the entrance and narrows down to about 10-20 cm (0.33-0.66 ft.) in height and 40-50 cm (1.3-1.6 ft.) in width. The tube extends at a 310 degree bearing.

A possible trail is 64 degrees from the center of the collapse area/site beginning at the base of the 'a'ā flow. The trail is composed of small loose 'a'ā cobbles and lacks any larger cobbles and boulder. The trail ranges in width from approximately 40 cm (1.3 ft.) at the base to approximately 1 m (3.3 ft.) at the overhang. It is primarily discernable due to its red/darker coloration in comparison to the surrounding 'a'ā.

The trail runs approximately 8 m (26.3 ft.) northeast up the 'a'ā to a small natural overhang. The overhang could serve as both a small shelter and an outlook point from atop the overhang. The overhang is composed of a large chunk of 'a'ā and is approximately 1 m (3.3 ft.) across and 60-70 cm (2-2.3 ft.) high. The overhang is approximately 2 m (6.6 ft.) below the top of the 'a'ā flow. A small *koa haole* tree is directly in front of the overhang.

The site's function is interpreted as temporary habitation based on the extent of modification and the amount of midden present. The site's proximity to the possible trail also indicates temporary habitation.



Figure 132. Site -26303, Feature B, showing back of the cave beyond the 'a'ā flow, view to southeast

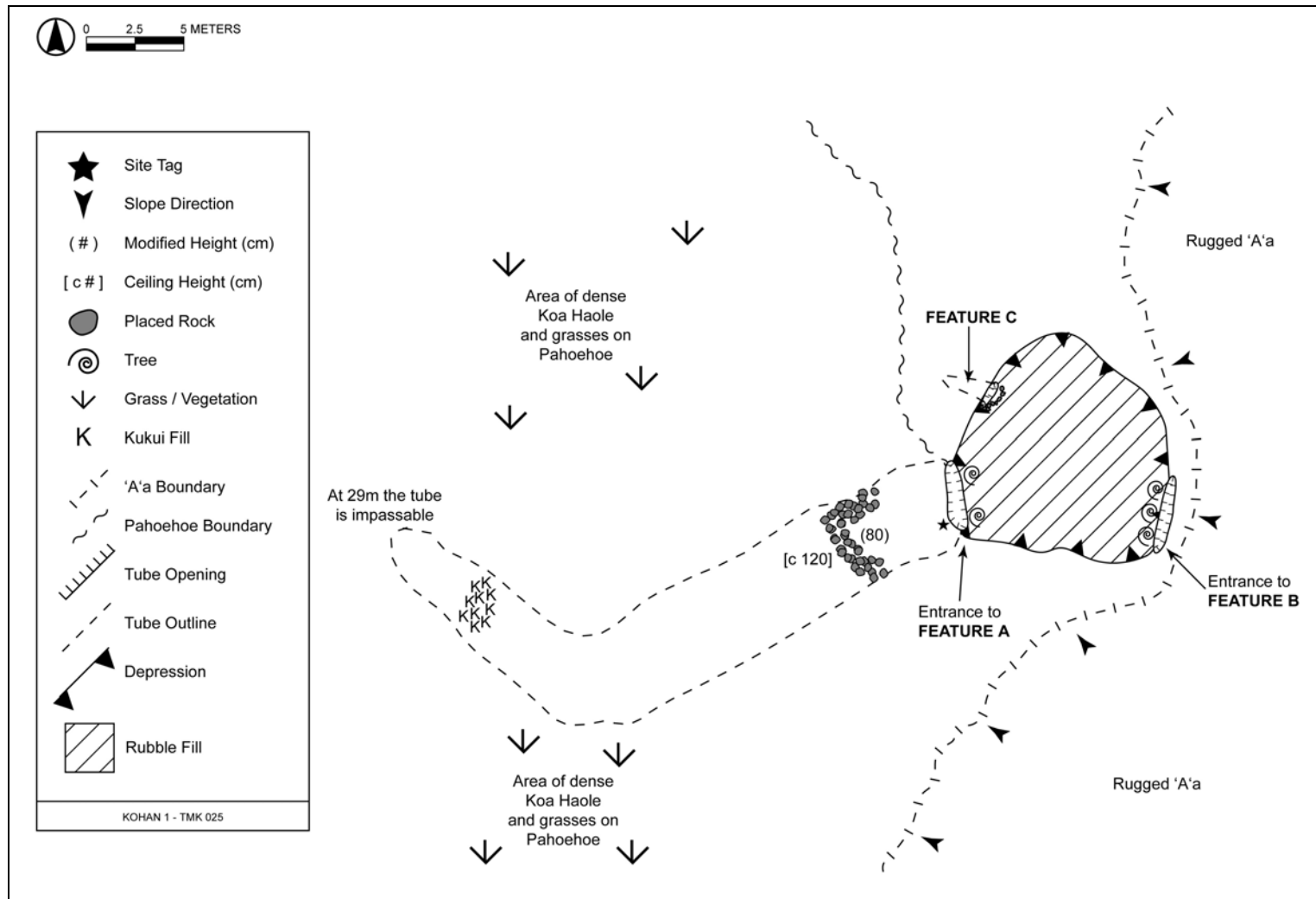


Figure 133. Site -26303, plan view

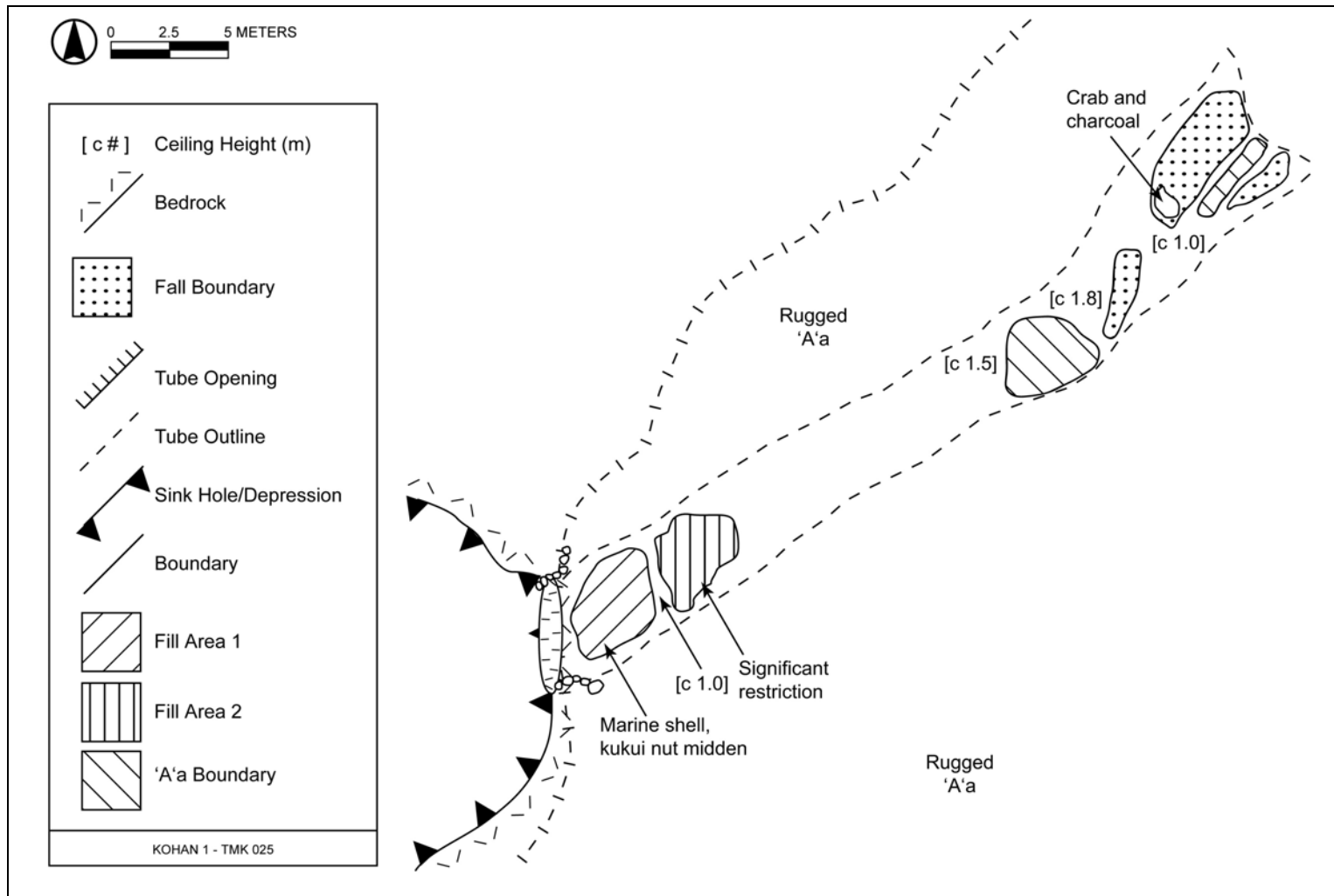


Figure 134. Site -26303, Feature B plan view

4.3.32 State Site # 50-10-27-26304

SIHP #	50-10-27-26304
FUNCTION:	Complex
SITE TYPE:	Lava tube
TOTAL FEATURES:	3
DIMENSIONS:	22 m by 2.5 m (72.2 ft. by 8.2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	485 ft a.m.s.l.

DESCRIPTION: Site -26304 is a complex consisting of two lava tubes that contain three features. Feature A is temporary habitation; Features B and C are temporary shelters. The area surrounding the two tube openings contains thick vegetation consisting of *koa haole* and various grasses.

Feature A is a lava tube extending more than 22 m (72.2 ft.) to the northeast with an average width of 2.5 m (8.2 ft.) and an average ceiling height of 1 m (3.3 ft.) (Figure 135, Figure 136 and Figure 139). The lava tube is located on a *pāhoehoe* flow with a gentle slope heading toward the southwest. The largest tube opening is located on the southwestern most end of the *pāhoehoe* flow and is 1.5 m (4.9 ft.) wide northwest/southeast by 2 m (6.6 ft.) long northeast/southwest with a height of 1.10 m (3.6 ft.). To the southwest of this opening is a filled crevice, extending 2 m (6.6 ft.) with a width of 1.10 m (3.6 ft.), which leads to the tube below. The crevice consists of a mound that has been filled and stacked with large cobbles and small to medium sized boulders. After entering the large tube opening, the mound/modified crevice extends into the tube. The tube extends 2 m (6.6 ft.) to the southwest, at which point it is blocked by a stacked wall of small to large cobbles. Small cracks in the stacked wall allow visibility into the tube, which continues on the other side of the stacked wall.

On the west side of the 2 m (6.6 ft.) tube extension, a wall, 2 m (6.6 ft.) in length and with faced portions, supports the mound/filled crevice above. A water-worn stone, approximately 10 cm by 5 cm (0.33 by 0.16 ft.), was found adjacent to the area of the mound wall facing inside the tube. Based on the assumption that the mound/filled crevice is a burial, approximately 2 m (7 ft.) of boulders and cobbles were removed from the exterior/top surface of the fill crevice. The boulders and cobbles were still densely packed and small so this method of access was abandoned. During the second attempt at access, a portion of the stacked wall was removed. However, the entry was still blocked and only approximately 1 m (3.3 ft.) more of the tube was exposed.

The removal of boulders allowed better visibility into the blocked tube; the southwest portion of the tube ends approximately 2 m (6.6 ft.) beyond the filled crevice mound but continues for an undeterminable distance to the northwest. The mound is at least 1 m (3.3 ft.) wide (northwest/southeast) at the tube's ceiling. All of the boulders used for the stacked wall and the mound are placed fill; none are natural fall. This mound/filled crevice's function was initially interpreted as a burial based on the placed fill blocking access to the tube's entrance and, the filling of the crevice above the tube. However, excavation (see below) found no burial and a subsurface chamber.

The northeast portion of the tube extends unobstructed for 22 m (72.2 ft.). An area of midden, consisting of *kukui* endocarp, marine shell, and urchin, extends 2.5 m (8.2 ft.) from the large tube opening to the smaller tube opening. There is also a 3 cm (0.1 ft.) deep soil deposit in this

location. The second and smaller tube opening is located beyond the last area mentioned in the tube ceiling and measures 1 m by 1 m (3.3 ft. by 3.3 ft.). A medium cobble-size coral chunk was found 2 m (6.6 ft.) farther in the tube from the second opening; a side chamber goes off to the north from this location. The side chamber's entryway is very narrow (30 cm / 1 ft.), although approximately 1 m (3.3 ft.) into the side chamber, the ceiling rises to approximately 50 cm (1.6 ft.). Several *kukui* endocarps and urchin shell were found. A soil deposit 3 cm (1 ft.) deep is located at the rear of the chamber; charcoal was found on the surface of the deposit. The main tube continues to extend from the side chamber entrance 4 m (13 ft.) to the southeast where the tube splits to the east and southwest. Both tubes continue for at least 20 m (65.6 ft.), however, no cultural remains were found. The tube's function is interpreted as temporary habitation based on the lack of modification and amount of midden located in the tube. Excavation potential is fair due to the presence of several areas of soil deposits.

Feature B is a lava tube running approximately 24 m (78.7 ft.) at 200 degrees (Figure 137 and Figure 140). Aside from a natural sink hole, the tube height is no greater than 60 cm (2 ft.). No midden is present and the only cultural modification consists of a few placed stones.

Feature C is a lava tube with a small boulder alignment immediately inside the cave entrance; this small alignment consists of approximately five stones (Figure 138 and Figure 141). A few *kukui* pieces were observed within 15 m (49.2 ft.) of the lava tube's entrance. No cultural material or other modifications were present. Approximately 50 m (164 ft.) of Tube 1 was surveyed and approximately 30 m (98.4 ft.) Tube 2 was surveyed. Both tubes continued, however, based on the lack of cultural material or modifications for 50 m and 30 m respectively (164 ft. and 98.4 ft.), the surveys were terminated.

The site's function is interpreted as habitation complex based on several factors. Feature A contains midden, consisting of *kukui* endocarp, marine shell, and urchin, and a well-built wall. The possibility that the wall prevented access to a burial was tested (see below) and no burial was present; the wall, therefore, was likely built to prevent boulders and cobbles from falling into the lava tube. Feature B and Feature C lack extensive cultural modification. Based on the extent of modification, Feature A was a temporary habitation and Feature B and C were temporary shelters.

4.3.32.1 Testing Results

Excavation was conducted to determine if a burial was within the filled crevice in Feature A (Figure 136) and to assist in determining the site's function. Stratum I consisted of *pāhoehoe* cobbles and small to medium boulders; it was excavated to 35 cmbs when a subsurface chamber was found (Figure 142, Figure 143, and Figure 144).

The chamber continues for approximately 2 m (6.6 ft.) and then forks into two tubes that merge into a chamber. The natural ceiling height throughout is 50 cm (1.6 ft.). Approximately 4 cm (1.5 inches) of soil is present within both of the tubes; the chamber does not contain any soil or cultural material or modifications. The north tube is approximately 6 m (19.7 ft.) long and 1.6 m wide (5.2 ft.); it contains one piece of *kukui*, two small piles of placed boulders, and goat bone that appears to be natural and not butchered. The northeast tube is a maximum of 7 m (22.9 ft.) long and 3.8 m (12.5 ft.) at its widest and contains a coral *ulu maika*. The chamber is approximately 5 m long by 4 m (16.4 ft. by 13.1 ft.) wide and slopes down from both of the tubes (Figure 142).

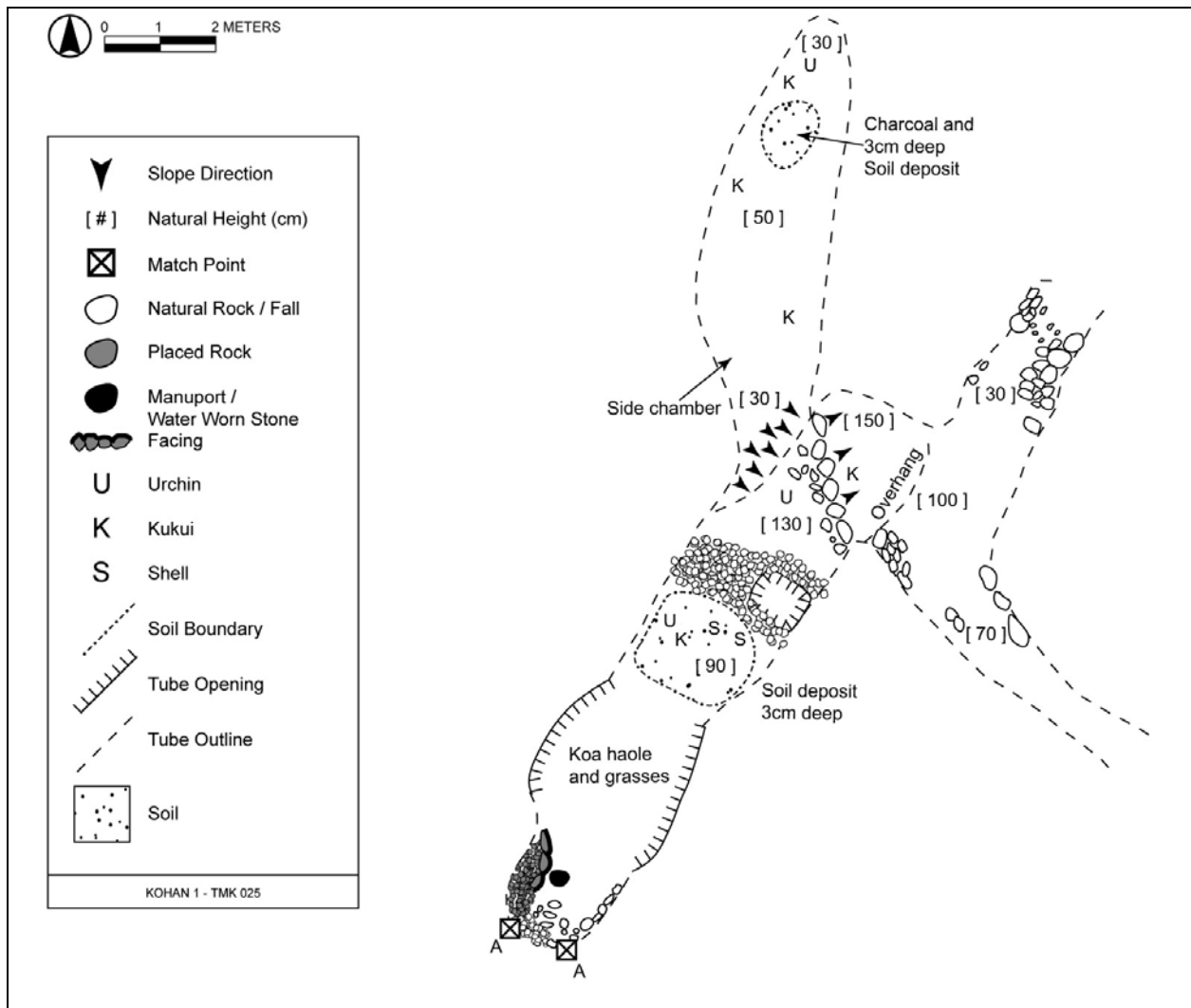


Figure 135. Site -26304, Feature A interior plan view (see Figure 142 for match point relating to the rest of Feature A)

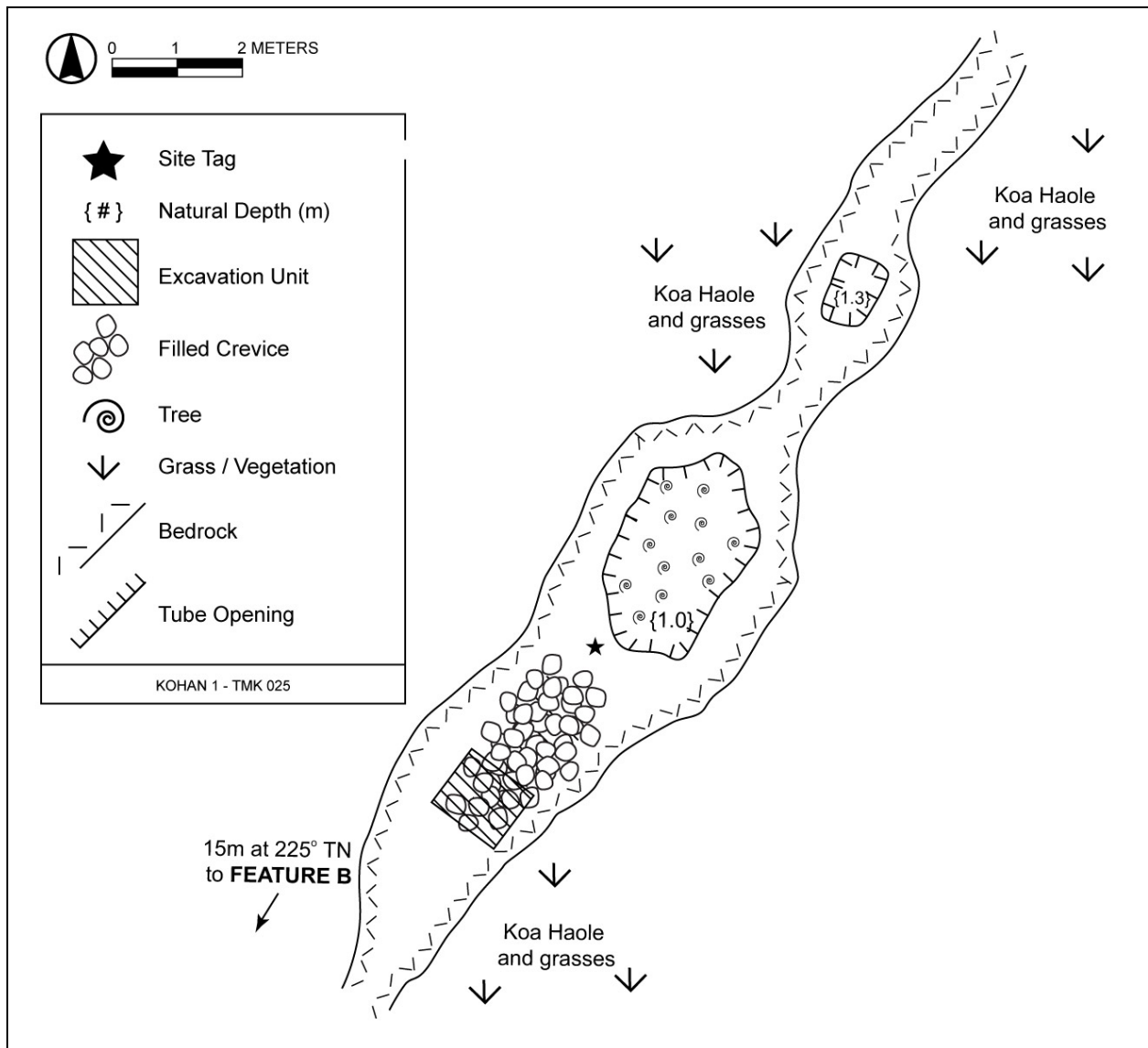


Figure 136. Site -26304, Feature A exterior plan view

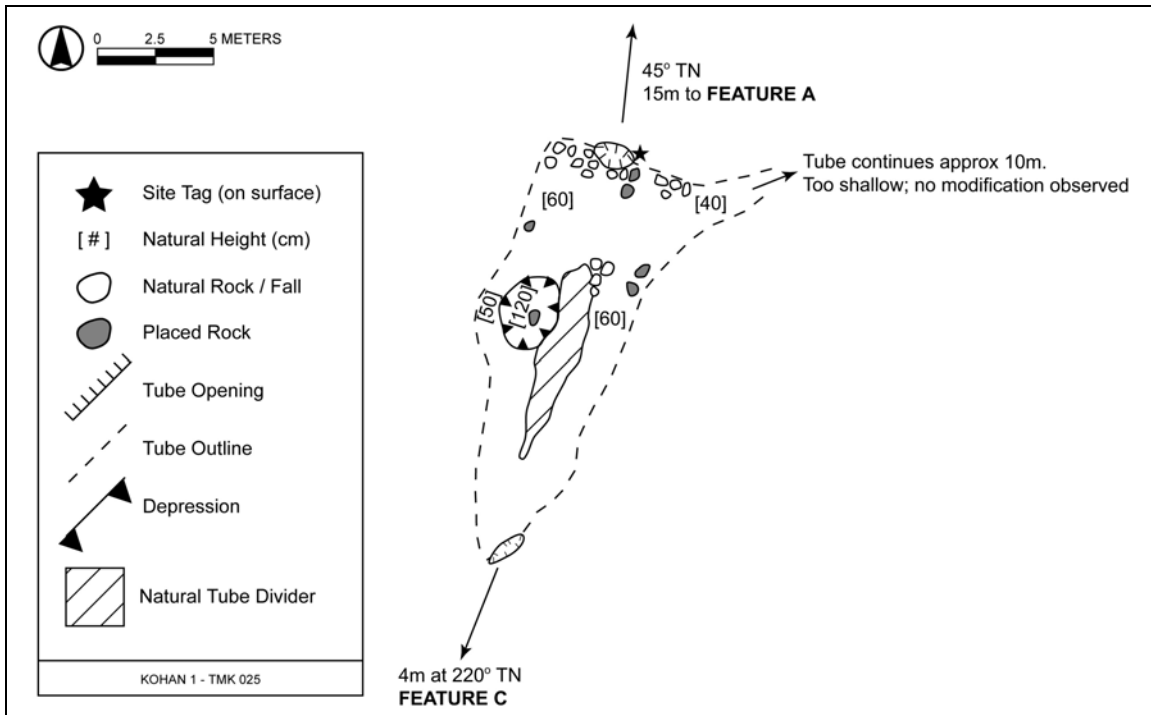


Figure 137. Site -26304, Feature B plan view

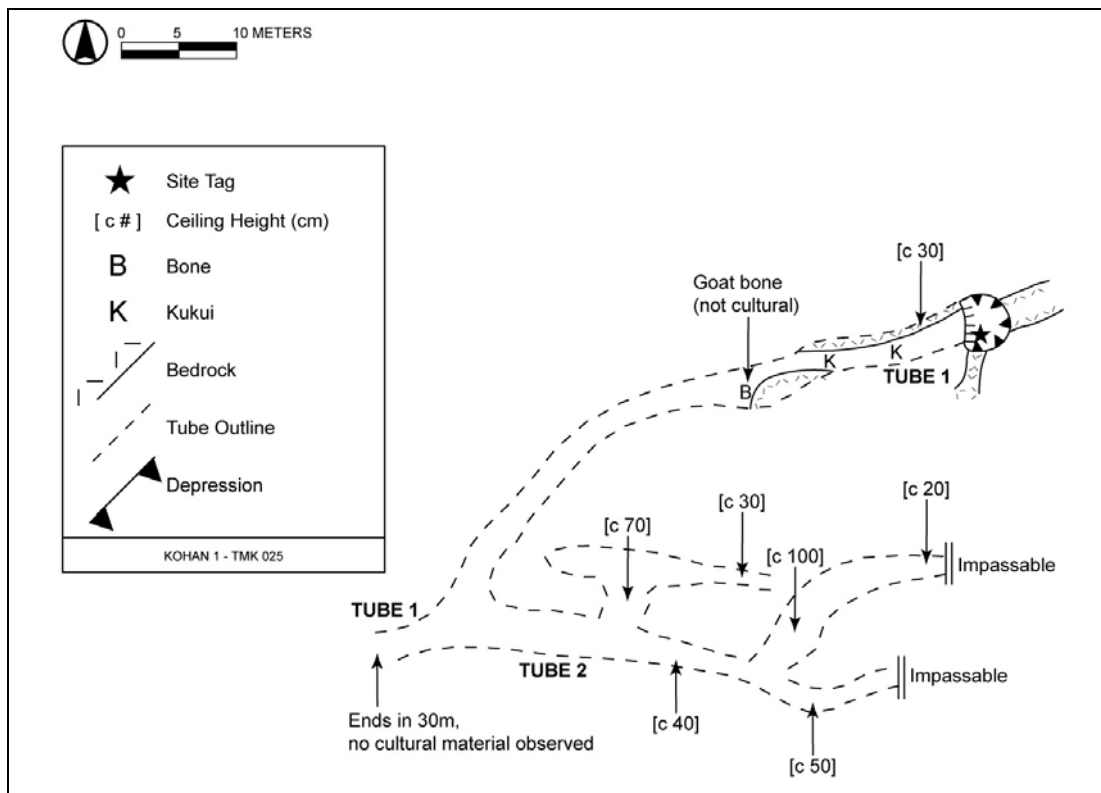


Figure 138. Site -26304, Feature C plan view



Figure 139. Site -26304, exterior view of entrance to Feature A, view to northeast



Figure 140. Site -26304, exterior view of entrance to Feature B, view to southwest



Figure 141. Site -26304, exterior view of entrance to Feature C, view to southwest

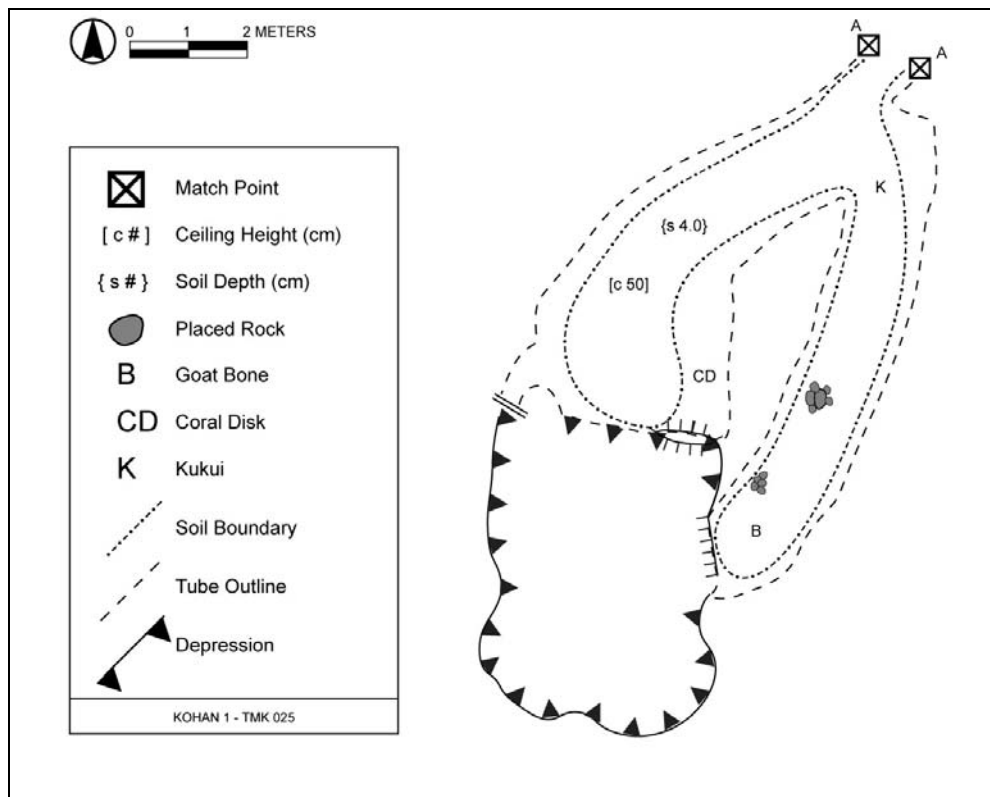


Figure 142. Site -26304, section of Feature A found during excavation, plan view (see Figure 135 for match points relating to the rest of Feature A)



Figure 143. Site -26304, Feature A, prior to excavation



Figure 144. Site -26304, Feature A, post excavation

4.3.33 State Site # 50-10-27-26305

SIHP #	50-10-27-26305
FUNCTION:	Temporary habitation
SITE TYPE:	Modified outcrop
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	2 m by 1.5 m (6.6 ft. by 4.9 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	510 ft a.m.s.l.

DESCRIPTION: Site -263005 is a modified outcrop located in the vicinity of multiple naturally raised *pāhoehoe* outcrops/tumuli (Figure 145). Vegetation in the immediate area consists of dense *koa haole* and grasses.

This small outcrop is to some extent naturally eroded but exhibits some modification; the crevice in the top surface has been filled in to create a leveled surface with an alignment of approximately six small boulders running lengthwise northwest/southeast on top of the leveled surface along the southwest side. The fill consists of small to medium *pāhoehoe* cobbles.

The site's function was initially interpreted as a burial based on the fact that filled crevices are characteristic of burials. However, the site was excavated (see below) and no burial was present. Based on excavation results, the site's function is temporary habitation due to its location; it is constructed perpendicular to the line of sight from the site to the ocean. The filled crevice forms a relatively flat surface, and although no cultural material is present, the large boulder in the north corner may have been used as a seat or small altar.

4.3.33.1 Testing results

Excavation was conducted to determine whether a burial was present and to aid in determining the site's function (Figure 145 and Figure 146). A 40 by 50 cm (1.3 to 1.6 ft.) unit was placed in the center of the modified tumulus. Stratum I consists of a layer of small cobbles and appears to be a 10 cm (0.33 ft.) layer of paving over Stratum II, the natural underlying formation of the *pāhoehoe* tumulus. Stratum II was composed of fitted *pāhoehoe* slabs and cobbles, and was excavated from 10 cmbs (0.3 ft.) to a maximum of 28 cmbs (0.9 ft.). Naturally eroding bedrock was found at 28 cmbs (0.9 ft.). No subsurface features or cultural materials or human remains were found.

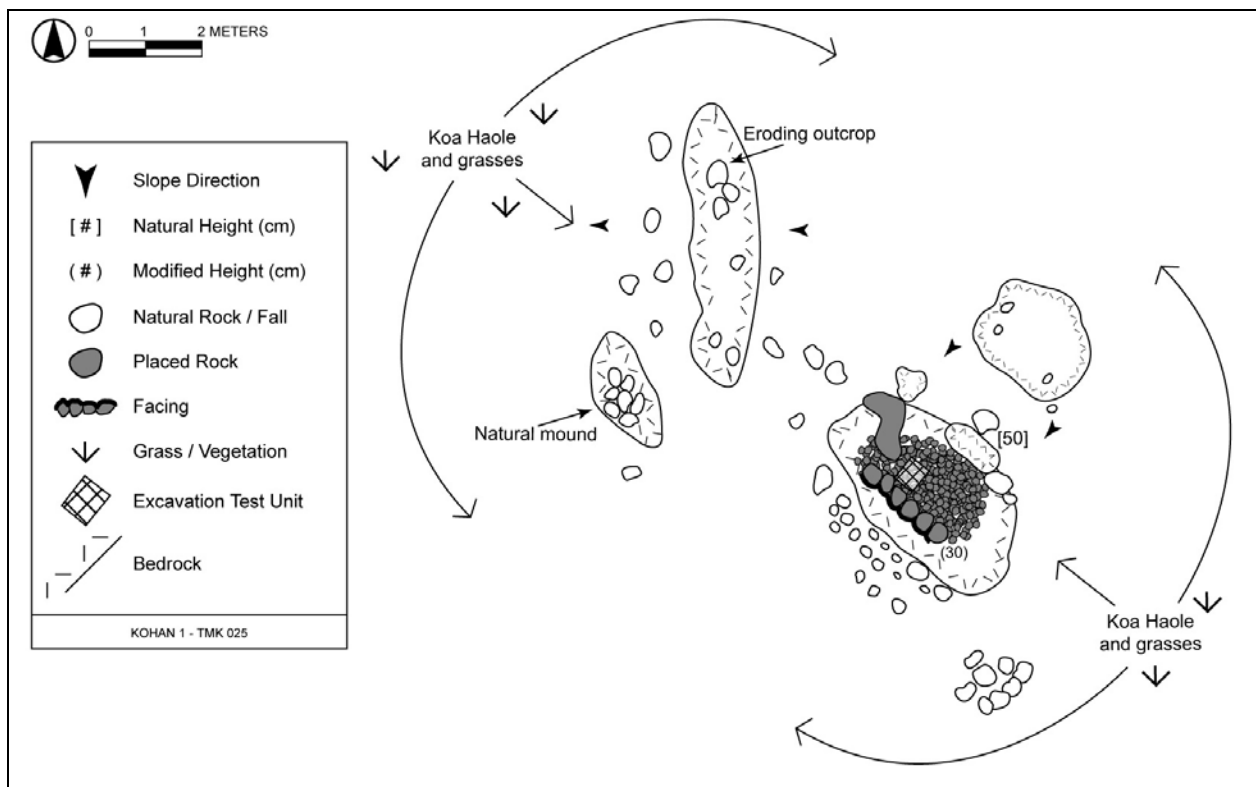


Figure 145. Site -26305, plan view



Figure 146. Site -26305, pre-excitation (left) and post-excitation (right), view to northwest

4.3.34 State Site # 50-10-27-26306

SIHP #	50-10-27-26306
FUNCTION:	Indeterminate
SITE TYPE:	Modified outcrop
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	6 m by 1 m (19.7 ft. by 3.3 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	460 ft a.m.s.l.

DESCRIPTION: Site -26306 is a modified outcrop located on the south face of a *pāhoehoe* tumulus (Figure 147 and Figure 148). The outcrop is located on a moderately sloped face with a southerly direction. The outcrop is naturally composed of two raised (30 cm / 0.98 ft.) parallel *pāhoehoe* flows (6m / 19.7 ft. in length) that have created a 1 m (3.3 ft.) wide depression between the two. The depression has been filled with small to large *pāhoehoe* cobbles with the larger sized cobbles overlaying the small cobbles. The top (north end) portion of the crevice suggests that the crevice is at least 50 cm (1.6 ft.) deep. An 'a'ā flow is located 80 m (262.5 ft.) to the south. Vegetation in the area consists of thick *koa haole* and grasses.

The site's function was initially interpreted as burial due to the unevenness of the fill (making it unlikely for habitation), its isolation from surrounding sites, and the deep nature (50 cm / 1.6 ft.) of the crevice. Excavation potential is poor due to the lack of soil deposit. However, an excavation was conducted (see testing results below) and no burial was present. Additionally, no subsurface features or cultural materials were encountered; therefore, the site's function is indeterminate.

4.3.34.1 Testing Results

Excavation was conducted to determine whether a burial was present within the modified outcrop and to aid in determining the site's function (Figure 147). A 1 m by 1 m (3.3 ft. by 3.3 ft.) test unit was placed in the north portion of the crevice. The unit was excavated to a maximum depth of 38 cmbs (1.2 ft.) (Figure 149). Stratum I consisted of *pāhoehoe* cobbles averaging approximately 5-10 cm (2-4 inches) in size. A thin stratum of 10 YR 3/3 silt loam (37-38 cmbs / 1.21-1.24 ft.) was encountered at the bottom of the unit and Stratum II was screened through 1/8 inch mesh screen; no cultural material was present. No subsurface features or cultural materials were encountered during excavation. Since no burial was present, the site's function is indeterminate.

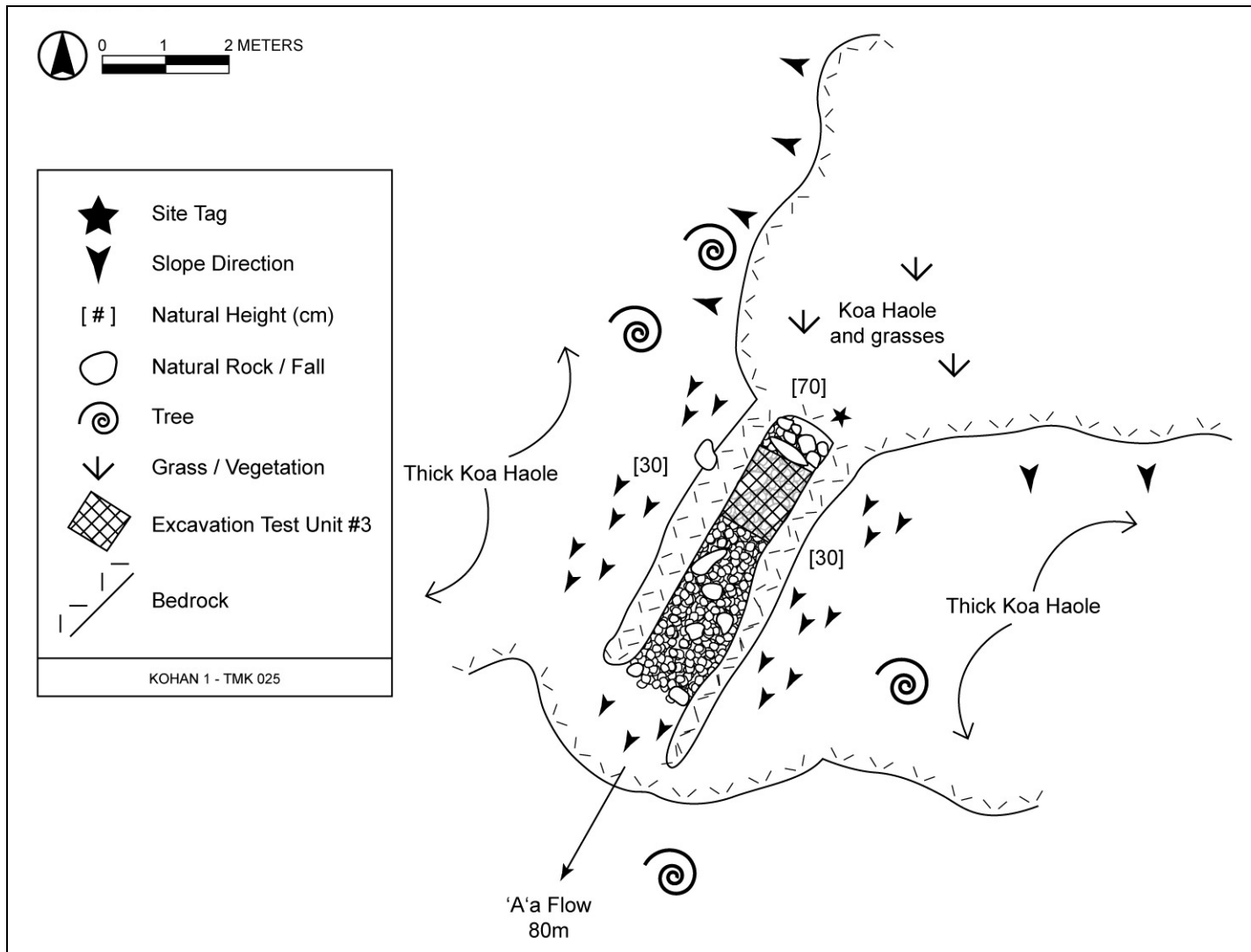


Figure 147. Site -26306, plan view



Figure 148. Site -26306, view to north



Figure 149. Site -26306, post-excavation, view to north

4.3.35 State Site # 50-10-27-26307

SIHP #	50-10-27-26307
FUNCTION:	Ceremonial
SITE TYPE:	Complex
TOTAL FEATURES:	4
DIMENSIONS:	7 m by 7 m (23 ft. by 23 ft.)
CONDITION:	Excellent
AGE:	Pre-contact
ELEVATION:	450 ft a.m.s.l.

DESCRIPTION: Site -26307 is a modified natural depression in an undulating 'a'ā flow (Figure 150). The depression measures approximately 7 m east/west by 7 m north/south (23 ft. by 23 ft.). The depression center, a naturally relatively-level area, is not modified and is almost entirely filled with *koa haole* and Christmas berry. It was necessary to significantly cut back vegetation to expose features, especially Feature A. The site consists of four features (A-D), some intermediate stacked cobble and small boulder walls, and a small cobble and rubble paving immediately to the southwest of Feature B (as shown on Figure 150). These features are built upon the depression's slope, covering most of the eastern half. They are generally arranged with the natural topography in a crescent from the south side of the depression to the north.

There is a clear and level walkway that leads to and abuts Feature C, the excavated pit, and then extends to the northwest, skirting the edge of Feature B. The walkway ends at the northwest end of Feature B and evidence of its continuation to Feature A was not found. The walkway therefore may be a bi-product of the construction of Features B and C.

Feature A is a modified 'a'ā slope into a depression from a low *pu'u* in the 'a'ā (Figure 151). The slope and *pu'u* trend northwest/southeast. The modified area measures approximately 5 m (16.4 ft.) in this direction (length) by approximately 3 m (9.8 ft.) wide (northeast/southwest). The modified area consists of, from northwest to southeast, a cobble paved area with no formal edge on three sides that measures 2 m (6.6 ft. - northeast/southwest). Directly (to the southeast) abutting this paved area are two 'a'ā cobble paved terraces. The larger terrace is separated from the northwest-most paved area by a formal, but small wall, constructed of medium to small 'a'ā cobbles, two courses high. This wall is approximately 30 cm (0.98 ft.) higher than the paved area and 20 cm (0.66 ft.) above the paved surface of the larger terrace. This wall curves around the west corner of the larger terrace and becomes level with the terrace, one course high at the end of the terrace to the southwest. This larger terrace measures 2 m (6.6 ft.) north/south by 2 m (6.6 ft.) west/east. Along its width (north/south), the small terrace almost completely bisects the larger terrace (dividing it into half) by running 1.5 m (4.9 ft.) west and ending 0.5 m (1.6 ft.) from the low enclosing wall to the west. The small terrace forms a "shelf" about 25 cm (0.82 ft.) high off of the surrounding terrace. Feature A also contains a small (0.6 m by 0.6 m / 2 ft. by 2 ft.) cupboard with a small cobble and rubble paved floor, immediately adjacent to (and to the east of) the northeast corner of the double terraced area. The cupboard was constructed by excavation of 'a'ā cobbles to form an uncovered cupboard (or nook) approximately 60 cm (2 ft.) deep. The excavated cobbles appear to have been reused to enclose the northeast corner (back) of the cupboard; cobbles are stacked on the surrounding 'a'ā.

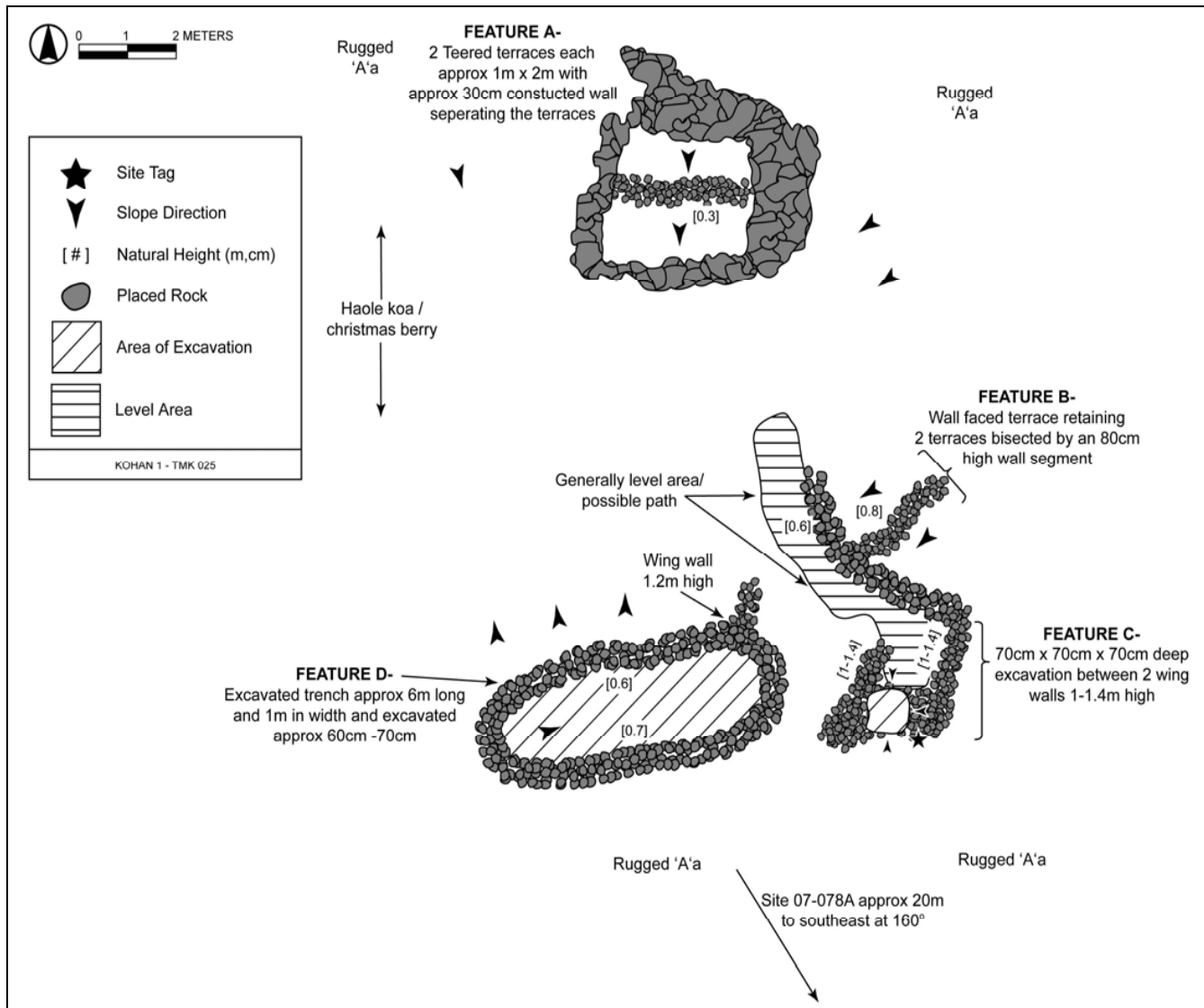


Figure 150. Site -26307, plan view



Figure 151. Site -26307, overview of Feature A terrace showing north/south running wall, view to east

Feature A's function is interpreted as ceremonial based on the size of the terraces; they are too small for habitation or agriculture. The cupboard and upper (smaller) terrace are highly visible and the level area appears ideal for ceremonial items. The terrace is also too small for a burial, and the construction type is not consistent with a burial function.

Feature B is a wall and faced terrace bisected by an 80 cm (2.6 ft.) high wall segment (Figure 152). The faced terrace is a maximum of 1 m (3.3 ft.) tall at its center and 50 cm (1.6 ft.) high at each end (southeast and northwest). The terrace wall was likely faced at one time, although currently only a one-meter portion of the northwest end remains, the remainder has collapsed. The total length of the curved terrace wall is approximately 4 m (13 ft.). The terrace retaining wall is constructed of large and medium 'a'ā cobbles, between 3 and 6 courses high. The top of the terrace measures a maximum of 0.8 m (2.6 ft.) deep (back from the wall) and is paved with rubble. The top of the terrace is neatly bisected by an 80 cm (2.6 ft.) tall 'a'ā small cobble, large cobble and small boulder wall, approximately 70 cm (2.3 ft.) wide. This wall may post date the terrace's construction due to variation in style, the formality of construction (the wall is not faced), and the similarity in height and shared retaining wall of the two bisected terrace areas (Figure 150). The wall extends to the northeast, approximately 2 m (6.6 ft), and ends.

Feature C is a 70 cm by 70 cm by 70 cm (2.3 ft by 2.3 ft. by 2.3 ft.) deep modified depression between two wing walls, 1.0 to 1.1 m (3.3 ft. to 3.6 ft.) high (Figure 153). The west wing wall is 2.3 m (7.6 ft.) long northeast/southwest by 1.0 m (3.3 ft.) high and 0.70 m (2.3 ft.)

wide, constructed by piling 4-6 courses of circular basalt 'a'ā cobbles and boulders. The relatively flat path area just west of Feature B is adjacent to the northeast end of the wall to the northeast. The east wing wall is 2.2 m (7.2 ft.) long by 1.4 m (4.6 ft.) high by 1.0 m (3.3 ft.) wide, constructed by piling angular 'a'ā boulders and cobbles. The pathway to the west of Feature B leads to the modified depression. The south side of the depression appears to be a natural sloping 'a'ā flow. Feature C's function is interpreted as ceremonial storage for small items based on the secluded (between the walls) location of the modified depression.



Figure 152. Site -26307, overview of Feature B, showing bench and wall bisecting the bench, view to west

Feature D is a modified depression approximately 6 m (19.7 ft.) east/west in length and 1 m (3.3 ft.) north/south wide (Figure 154). The depression is modified to approximately 60-70 cm (2-2.3 ft.) in depth below the surrounding 'a'ā flow with 'a'ā rubble pilings on the north and south sides. The west end has a floor of relatively well sorted small 'a'ā boulders. The east end is not well sorted or cleared and consists of 'a'ā boulders ranging in size from small to large. A wing wall extends approximately 1.8 m (5.9 ft.) northeast from the northeast corner of the trench. This wing wall is constructed approximately 1.2 m (3.9 ft.) above the surrounding 'a'ā. Feature D's function is interpreted as storage, and based on its size, it may have been used for pole storage. Based on its association with the other three features, Feature D is also ceremonial.

The site's function is interpreted as ceremonial based on the features' construction and association. Features A and B appear to be relatively small shelves used for the placing of an offering. They are too small for temporary or permanent habitation activities including sitting. Additionally, the stones used for construction are too small to support the weight of an adult. Feature C's storage area is secluded and small, but formal, also suggesting ritual use of the site. Feature D's function is not as clear, however, based on its association with the other ceremonial features, it is also ceremonial function. None of the site's features are the style or construction type that usually contains a burial, or is a habitation. The features are all small and the 'a'ā appears to be young since it contains no soil, which precludes agricultural function.



Figure 153. Site -26307, Feature C, showing pit and the west constructed wall, view to west



Figure 154. Site -26307, overview of Feature D, view to northeast

4.3.36 State Site # 50-10-27-26308

SIHP #	50-10-27-26308
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	2
DIMENSIONS:	11 m by 6 m (36.1 ft. by 19.7 ft.)
CONDITION:	Good
AGE:	Historic
ELEVATION:	445 ft a.m.s.l.

DESCRIPTION: Site -26308 is a temporary habitation consisting of two enclosures (Figure 155 and Figure 156). Within approximately 10 m (32.8 ft.) in all directions the vegetation is sparse and consists of an 'ōhi'a tree, morning glory, *noni*, *koa haole*.

Feature A is a walled enclosure within an 'a'ā flow (Figure 155 and Figure 157). The enclosure utilized a natural *pu'u* in the 'a'ā flow that has vertical sides approximately 2-3 m (6.6-9.8 ft.) high that form the north, south, and west sides of the enclosure. Stacked boulders and cobbles utilizing the natural bedrock outcrop is the extent of modification. The western wall is 30 m (98.4 ft.) long (north/south) and approximately 70 cm (2.3 ft.) high. The north/south wall is approximately 2.7 m (8.9 ft.) long and 1.1 m (3.61 ft.) high; the wall's east side declines. The south side of the eastern entrance is defined by a 3.3 m (10.8 ft.) long winged wall.

The eastern center of the interior of the enclosure contains a large 'ōhi'a. *Kupu* ferns and some scattered *koa haole* exist near the feature's perimeter, but the area near the feature is mostly barren.

This 'a'ā flow area has been highly disturbed and dozer activity is evident. A gravel road is located approximately 25 m (82 ft.) to the south of Feature A. This road extends from the main road (Hina Lani Street) through this 'a'ā flow. Plastic, paper, wire, and other refuse are within the site and surrounding area. Feature A demonstrates reuse of an older temporary habitation or an animal pen site, but the earliest age of this feature is unknown.

Feature B is a walled enclosure with a terrace-like feature at its west end (Figure 156 and Figure 158). The enclosure measures 12 m by 6 m (39.4 ft. by 19.7 ft.). A small tree is in the center of the feature and a large dead tree trunk makes up the southeast portion of the enclosure. A scatter of shells and coral, superficially similar to *kuahu*, is in the north center of the feature on a small constructed platform that is approximately 30-40 cm (0.98-1.4 ft.) above the surrounding pavement. This scatter includes approximately six pieces of branch coral, six water worn coral pebbles, 50 pieces of shell, and six water worn basalt pebbles. Based on the presence of beach glass, coloring on coral and shells, the fact that most if not all of the shells were collected as beach specimens, the lack of midden, and the majority of manuports are water worn shells, the scatter is modern. The shell and coral scatter is likely not more than 30 years old although it is a clear attempt to replicate a traditional Hawaiian sacred site. Trash is scattered throughout the enclosure and includes car stereo parts, plastic, a candle holder, and CDs. The terrace-like feature is likely modern construction since lawn furniture appears to be buried within the terrace. A highly mounded area/terrace is also along the enclosure's south wall that consists of small 'a'ā boulders with a buried purple velvet blanket. Non-human mammal bone was also observed on the floor of the enclosure near the coral and shell scatter. A plastic bag of *kūpe'e* shells (*Nerita polita*) is within a modern cache approximately 12 m (39.4 ft.) west of Feature B.

The site's function is interpreted as modern reuse of a temporary habitation. Aspects of the enclosure, such as the inclusion of a large upright in the south wall structures, suggest that Feature B is a historic property. The materials surrounding the feature are solely historic trash, and the imitation *kuahu* which is clearly a recent modification; it is a modern imitation of traditional Hawaiian culture. The terrace/mound-like structure contains more historic trash so that it appears to be bulldozer push. Given this function as likely modern, no further work is recommended. Given the extent of historic impact and the uncertainty as to whether it is a pre-contact feature at all this Feature B has no significance.

Feature A could have been a corral for mules or goats. Based on the type of construction and proximity to Feature B, Feature A appears to be in association with that habitation feature.

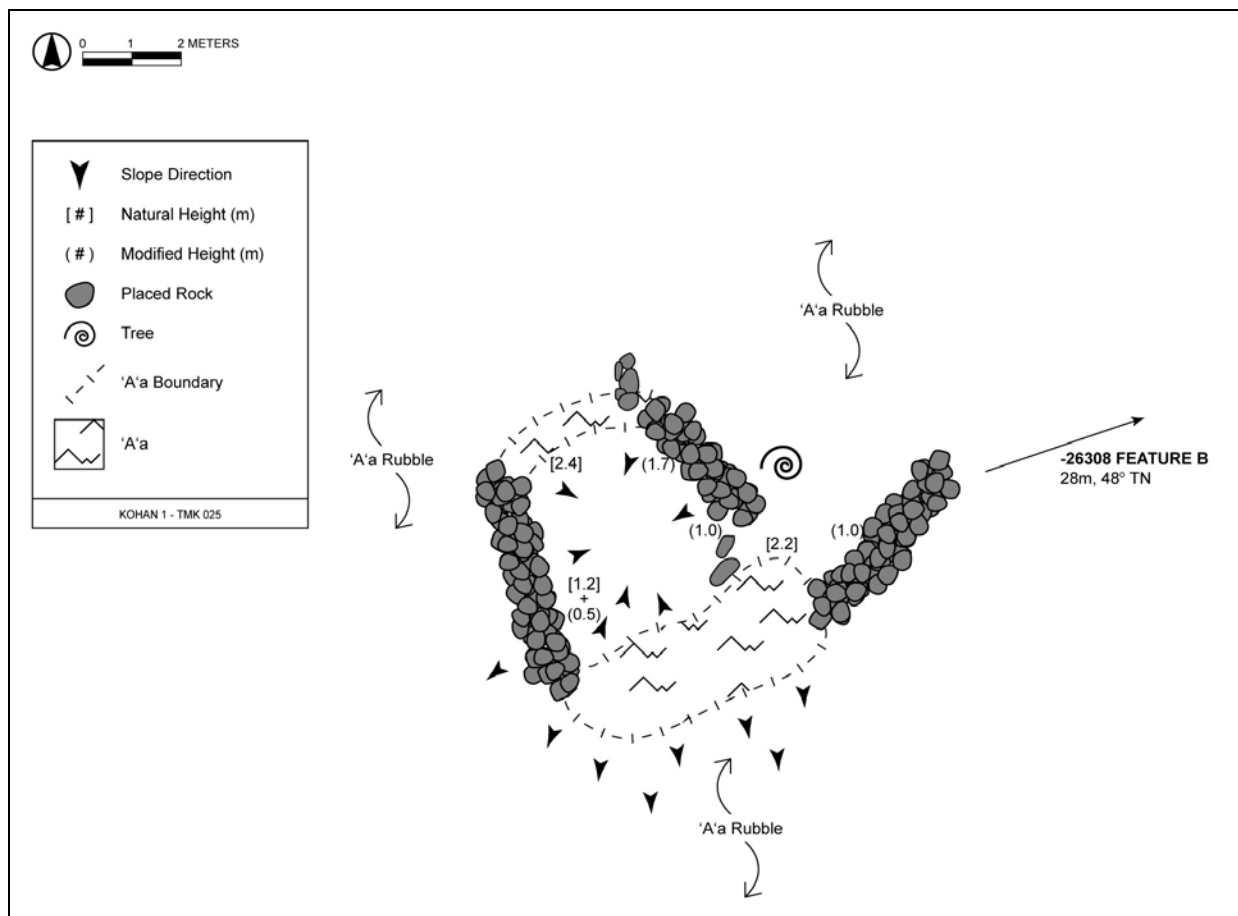


Figure 155. Site -26308, Feature A plan view

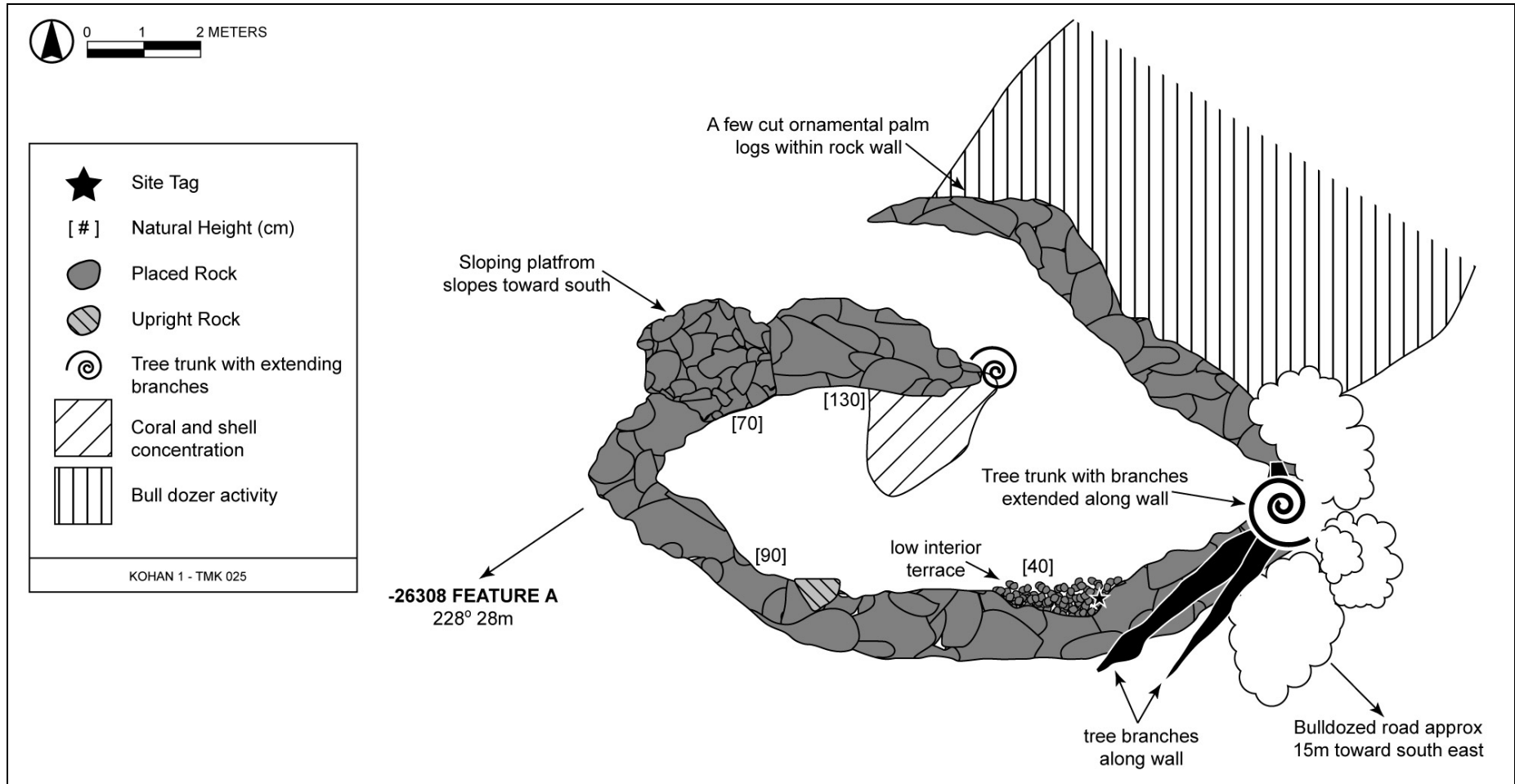


Figure 156. Site -26308, Feature B plan view



Figure 157. Site -26308, Feature A overview, showing constructed wall in foreground, entrance, and second constructed wall in background, view to east



Figure 158. Site -26308, Feature B overview, showing site tag in background, view to west

4.3.37 State Site # 50-10-27-26309

SIHP #	50-10-27-26309
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	2
DIMENSIONS:	5 m by 4 m (16.4 ft. by 13.1 ft.)
CONDITION:	Poor/Remnant
AGE:	Pre-contact
ELEVATION:	480 ft a.m.s.l.

DESCRIPTION: Site -26309 is a habitation complex consisting of two features (Figure 159). Very thick vegetation including *koa haole* and grasses surround the site.

Feature A is a walled enclosure measuring 5 m (16.4 ft.) north/south by 4 m (13.1 ft.) east/west. The feature is located on top of an undulating *pāhoehoe* flow on an apparently naturally level surface. The walled enclosure is in poor to remnant condition, however, several partially intact areas clearly indicate the presence of a wall. The intact areas consist of a small, medium *pāhoehoe* boulder slab that is placed upright on ground surface; medium to large cobbles are stacked above and between slabs. Although sections of the wall are remnant and have areas of collapse extending 1 m (3.3 ft.) outside of the enclosure, the components necessary for walled enclosures are still present. Many of the *pāhoehoe* cobbles appear to have come from cave ceiling fall, likely from site -26310, 34 m (111.6 ft.) east. Feature A's function is interpreted as habitation due to the naturally level surface and lack of soil found within the enclosure.

Feature B is a natural depression that has been modified by clearing. The feature is located at the southern edge of an undulating *pāhoehoe* flow. The depression is 1 m (3.28 ft.) in depth and measures 4 m (13.1 ft.) north/south by 5 m (16.4 ft.) east/west. The depression is devoid of anything larger than small cobbles; this is the only modification. Feature A is approximately 1 m (3.3 ft.) north.

The site's function is interpreted as temporary habitation based on the extent of modification, including the level, clear surface and the wind protection created by the depression walls, and the lack of midden. Agriculture function is unlikely due to the shallow soil. Excavation potential of the site is fair due to shallow soil deposits.

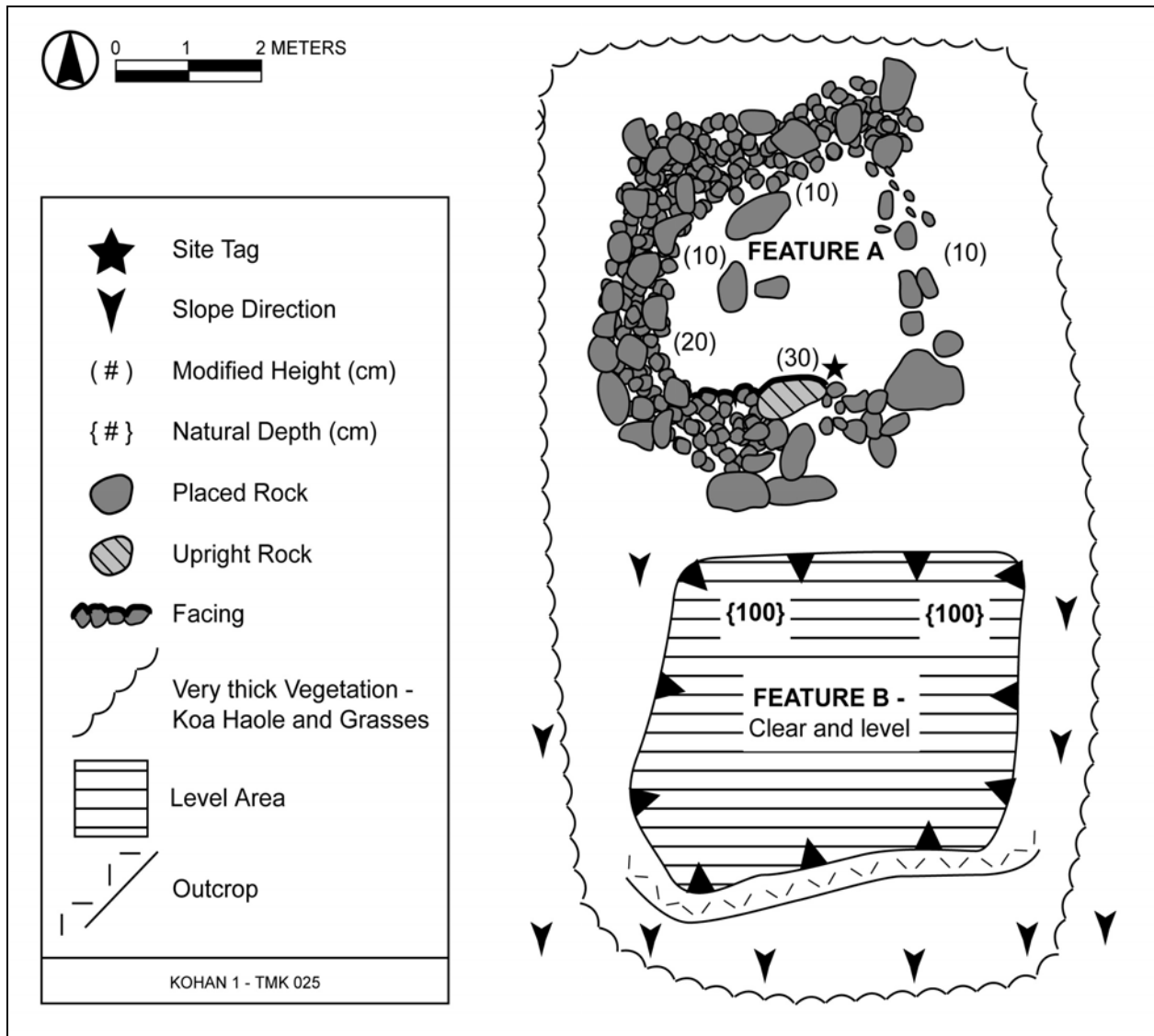


Figure 159. Site -26309, plan view



Figure 160. Site -26309, Feature A, view to southeast



Figure 161. Site -26309, Feature B, view to east

4.3.38 State Site # 50-10-27-26310

SIHP #	50-10-27-26310
FUNCTION:	Temporary Habitation and Burial
SITE TYPE:	Lava tubes
TOTAL FEATURES:	4
DIMENSIONS:	110 m north-south by 100 m east-west
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	500 ft a.m.s.l.

DESCRIPTION: Site -26310 is a large complex of several lava tubes (Figure 162-Figure 165). The southwestern portion of this complex consists of a medium sized sink hole with an archway from which approximately ten lava tubes branch off to the north and east, often interconnecting as well as occasionally opening to the surface through smaller sink holes (Figure 166 and Figure 167). The majority of the tubes in this complex contain small, shallow soil deposits, ranging in depth from 1 cm to 4 cm (0.03-0.13 ft.), and small midden scatters, which generally include *kukui*, various marine shells, and small amounts of charcoal. One small tube on the southwest side of the sink contains a single piece of coral measuring 15 cm (0.49 ft.) long. The majority of these tubes also exhibit either only very slight modification in the form of a few placed boulders or small cleared areas or no modification at all. These tubes functioned as temporary habitations based on the small amount of midden and extremely ephemeral modifications. Only three of these tubes contain features, Features A, B, and C. Feature A contains human remains referred to consistently in this report as “Burial 1” in an area of collapse. Feature B contains a second burial of this site, referred to consistently in this report as “Burial 2”, and Feature C is a temporary habitation tube. Feature D is a quarrying activity area and has a few scattered pieces of marine shell; a few pieces of coral are also on the surface.

The site is located on a relatively level area atop a small rise in a moderately undulating *pāhoehoe* flow in the southwest quadrant of the project area. Vegetation in the immediate vicinity of the site consists of head-high *koa haole* and patches of grasses.

Feature A is a segment of the site’s large lava tube system (Figure 164). This feature includes midden deposits and one human burial, Burial 1. The tube has two entrances; all of the findings in this feature, including the burial, are close to the east entrance. The tube’s east entrance is approximately 2.5 m (8.2 ft.) east of the west entrance. This entrance is the larger of the two, measuring 1.5 m (4.9 ft.) wide by 50 cm (1.6 ft.) tall. This east entrance is located on a relatively large *pāhoehoe* bedrock exposure approximately 7 m (23 ft.) in diameter and surrounded by tall but sparse grass and head-high *koa haole*. Burial 1 is located in a mound of boulders and cobbles immediately inside the north edge of this east entrance. See below for a discussion of Burial 1. In the immediate vicinity of, but not clearly associated with the burial, is a relatively dense midden deposit with *Nerita* shells and approximately 20 pieces of 3 cm (0.1 ft.) long *Isognomonidae* (likely *I. californicum* or *I. perna*). No clear modification of these shells was evident. Soil at the east side of this entrance is relatively deep and, with the shell midden, creates a good excavation potential. The tube’s west entrance is approximately 2 m (6.6 ft.) wide but very low, approximately 30 cm (0.98 ft.) tall, making access difficult.

Feature A's function is interpreted as shelter and burial. The shelter is concentrated immediately within the east entrance area. An informal mound, also immediately inside the entrance, contains the burial.

Feature B is a lava tube measuring approximately 60 m (196.9 ft.) in length with an average width of 3 m (9.8 ft.) and an average height of 1 m (3.3 ft.) (Figure 165). Several tubes interconnect with Feature B, however, the tube's easiest access is through an entrance measuring 1.5 m (4.9 ft.) wide and 1 m (3.3 ft.) tall on the tube's east end, adjacent to Feature C. Feature B's highest concentration of midden is in the tube's east entrance area. This midden concentration consists of marine shell, including cowry and *Nerita*, and *kukui*. A 5 cm (0.16 ft.) deep soil deposit is in this area that also suggests good excavation potential. Approximately 6 m (19.7 ft.) from the east entrance is a large area of ceiling fall. The south end of this fall shields a small tube opening that leads to Feature A. The northwest end of the ceiling fall exhibits possible modification in the form of piled small to large *pāhoehoe* cobbles. The cobble pile was checked and no burial was present. Approximately 4 m (13.1 ft.) east, is an isolated bone fragment that is Burial 2. See below for a discussion of Burial 2. A small concentration of *kukui* and urchin scatter is also in this area. No other midden, artifacts, or cultural modification was found beyond this point. The tube continues west for 56 m (183.7 ft.) with several branches that either quickly end or connect back to the main tube.

Feature B's function is interpreted as a burial based on the presence of Burial 2, with a secondary function of shelter. The absence of modification, other than the possible piling of cobbles, and the presence of a fair amount of midden indicates that while this space was not utilized extensively enough to warrant a habitation designation, it likely served as a shelter. The possible piled cobbles may contain additional human remains.

Feature C is a lava tube that shares its main entrance with the east entrance of Feature B (Figure 165). It is an extensive tube network with two main activity areas. The first area is immediately inside the tube entrance. Directly inside this entrance is a shallow soil deposit with a midden scatter that includes charcoal, cowry, urchin, and *kukui*. Seven bone fragments that are currently identified as medium mammal bones are also present and include a rib fragment. Extending from the entrance for approximately 3 m (9.8 ft.), each sidewall is lined with placed boulders piled 2 courses high, at the highest. Within the next 8 m (26.2 ft.) into the tube, both east and north of the entrance tube are two additional soil deposits. Both of these deposits are shallow and contain only *kukui*. These soil deposits, along with the deposit in the entrance suggest only a fair excavation potential for this feature.

Two large areas of fall are present in Feature C. The first area is natural and shows no distinct signs of modification. The second fall area is also the second main activity area of the feature. This fall is in the center of a large chamber. While the majority of this fall is natural, the south portion of the fall has been modified. An area of ceiling fall has been cleared and stacked atop of the central area of the fall. Some placed boulders are also along the sidewall near this cleared area. A constructed mound is positioned so that it partially obstructs the path between the tube sidewall and the fall. In this chamber, there are multiple pieces of scattered *kukui* and two pieces of marine shell placed atop the central fall near the cleared area. A bird bone was also observed along the north edge of the fall. This large chamber connects to site -26374, which has an extremely high concentration of shell midden.

Feature C's function is interpreted as temporary habitation. The tube is extensive, although its average height, even in the main activity areas, is not very high. The amount of midden present, which is scattered throughout the two main activity areas, and the relatively slight amount of modification to both the entrance and the natural fall are all indicative of temporary habitation.

Feature D is an area of relatively level *pāhoehoe* exposure with distinct signs of quarrying. The feature encompasses a total area of 20 m (65.6 ft.) north/south by 10 m (32.8 ft.) east/west. The area of quarrying is not contiguous but rather demarcated by several areas of raised *pāhoehoe*, with one *pāhoehoe* layer, approximately 6 cm (0.2 ft.) thick, removed. The majority of the *pāhoehoe* quarried has been completely removed and there is relatively little quarry-resulting rubble left in this area. Based on the absence of rubble and the lack of soil, this feature has a poor excavation potential. This quarry area is located directly between the east entrance to Feature A and the entrance shared by Feature B and Feature C. It is possible that the quarried *pāhoehoe* from this feature was brought into these tubes for burials and other modifications. Features A, B, and C all contain *pāhoehoe* cobbles that appear to have come from the surface.

Feature D's function is interpreted as an activity area for quarrying.

The site's function is interpreted as a complex that contains shelters with burials and quarry activity. The shelter interpretation is based on the presence of midden and modification evidence. Burial 1 is present within Feature A, and Burial 2 is within Feature B. Quarrying activity occurred in Feature D.

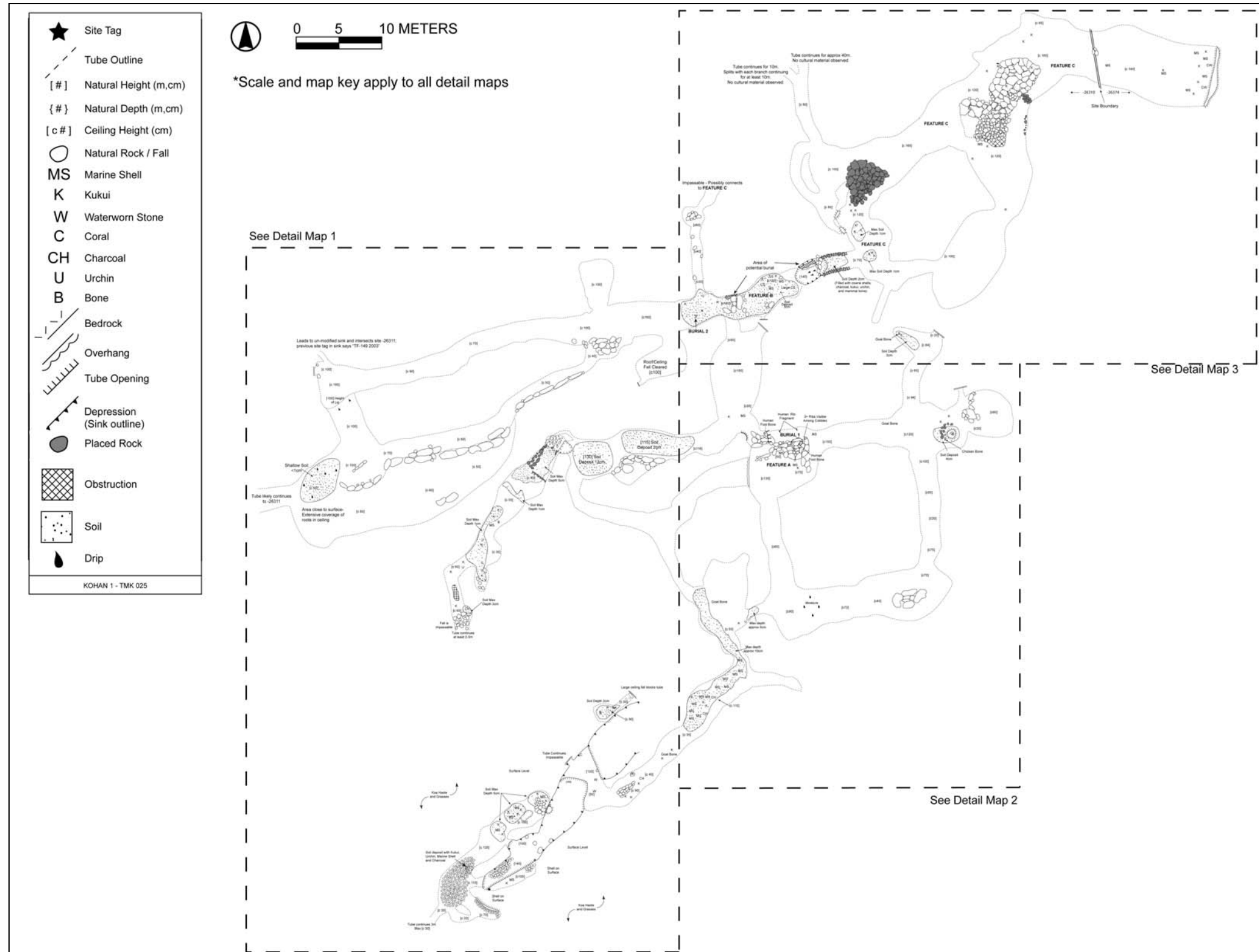


Figure 162. Site -26310, overview plan view of lava tube system; see detail maps below (Figure 163 - Figure 165)



Figure 164. Site -26310, Detail Map 2, Feature A and Burial 1 (see overview map Figure 162 for key)



Figure 165. Site -26310, Detail Map 3, Feature B, Feature C and Burial 2 (see overview map Figure 162 for key)



Figure 166. Site -26310, southwest sink archway, showing tube entrance on right side under overhang, view to northwest



Figure 167. Site -26310, southwest sink, entrance to tube is in background, view to southeast

Burial 1 is likely a primary burial in good condition that was discovered immediately inside of Feature A's east entrance, an eastward trending lava tube. There is a partially collapsed mound constructed against natural ceiling fall in the tube. Approximately three rib fragments were found on the tube floor within 50 cm (1.6 ft.) of the mound. Gaps in the mound reveal more than three nearly whole ribs. In a shallow gap between the boulders and cobbles on the top of the mound, a right human calcaneus was clearly visible and positively identified. Another bone, resting exposed next to the calcaneus, is in poor condition but is most likely the corresponding right talus. Another bone, likely a human second or third cuneiform (tarsal) was located approximately 2-3 m (6.6-9.8 ft.) from the primary internment. Some of the rib bones, especially those exposed in the mound itself, appear to have been rat gnawed. The presence of rodent activity may explain the dispersal of the cuneiform and some rib fragments (Figure 168).

The mound of small to large cobbles that conceals the burial appears to be a modification of the natural fall immediately inside the tube entrance. The mound is informal; only one vertically placed small boulder forms a partial foundation for the mound. The cobbles do not appear to have ever been well stacked, but some mound collapse may have further exposed rib bones within the mound. It is unclear how the two large foot bones at the top of the mound became so exposed. Evidence of modern access to connecting tubes is present (sunglasses), so some modern disturbance or relocation of bones is a possibility.

The total area of the natural fall that appears to be modified for the purpose of burial is approximately 1.5 m (4.9 ft.) east/west by 1 m (3.3 ft.) north/south. The mound is 60-70 cm (2-2.3 ft.) high at its tallest. The size of the exposed ribs and the calcaneus bone indicate this individual was a large adolescent or adult. Based on the size of the modification, an adult-size individual would need to be partially or fully flexed to be buried. Flexed burial positioning and the lava tube burial location are consistent with pre-contact practices, therefore, this burial is believed to be a native Hawaiian burial.

Burial 2 was discovered approximately 10 m (32.8 ft.) inside Feature B's entrance. The burial consists of a single isolated human second phalange (Figure 169). The phalange is located 2 m (6.6 ft.) beyond a large area of natural ceiling fall and a possibly-constructed small cobble mound, located on the north end of the natural fall. This mound was investigated but no additional bones were observed. Feature B connects to Feature A, the location of Burial 1. Therefore, there is a possibility that the phalange was originally part of Burial 1 and has been relocated by rodent or other animal activity. Since Burial 2 only consists of a single phalange, its position and condition were disturbed prior to this project. No other bones, human or nonhuman, were found in Feature B. A small midden scatter near the phalange includes *kukui* and urchin. No other signs of modification, artifacts, or additional midden were found beyond this area.

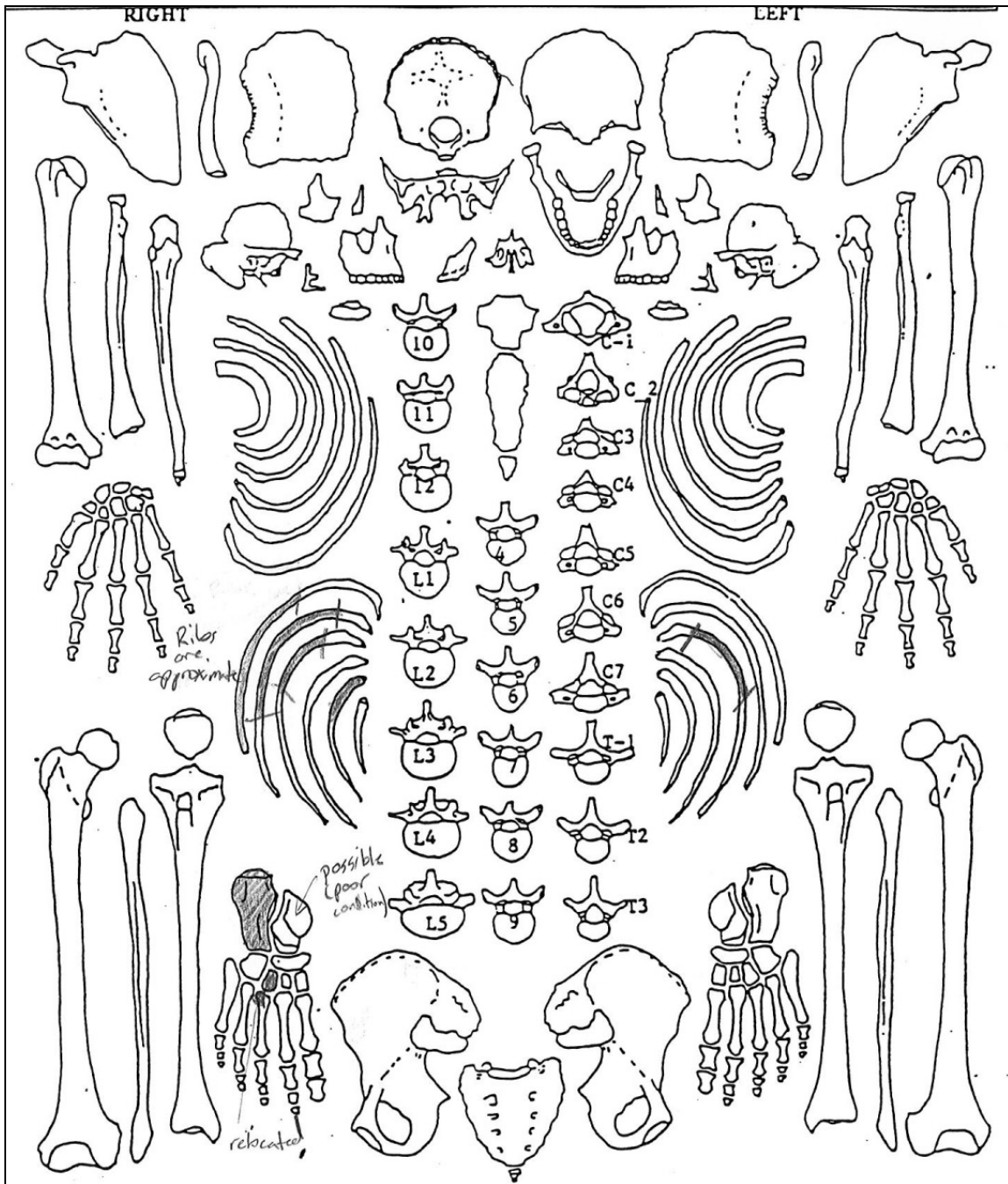


Figure 168. Burial 1, (Site 26310 Feature A) skeletal inventory form (rib fragment and calcaneus)

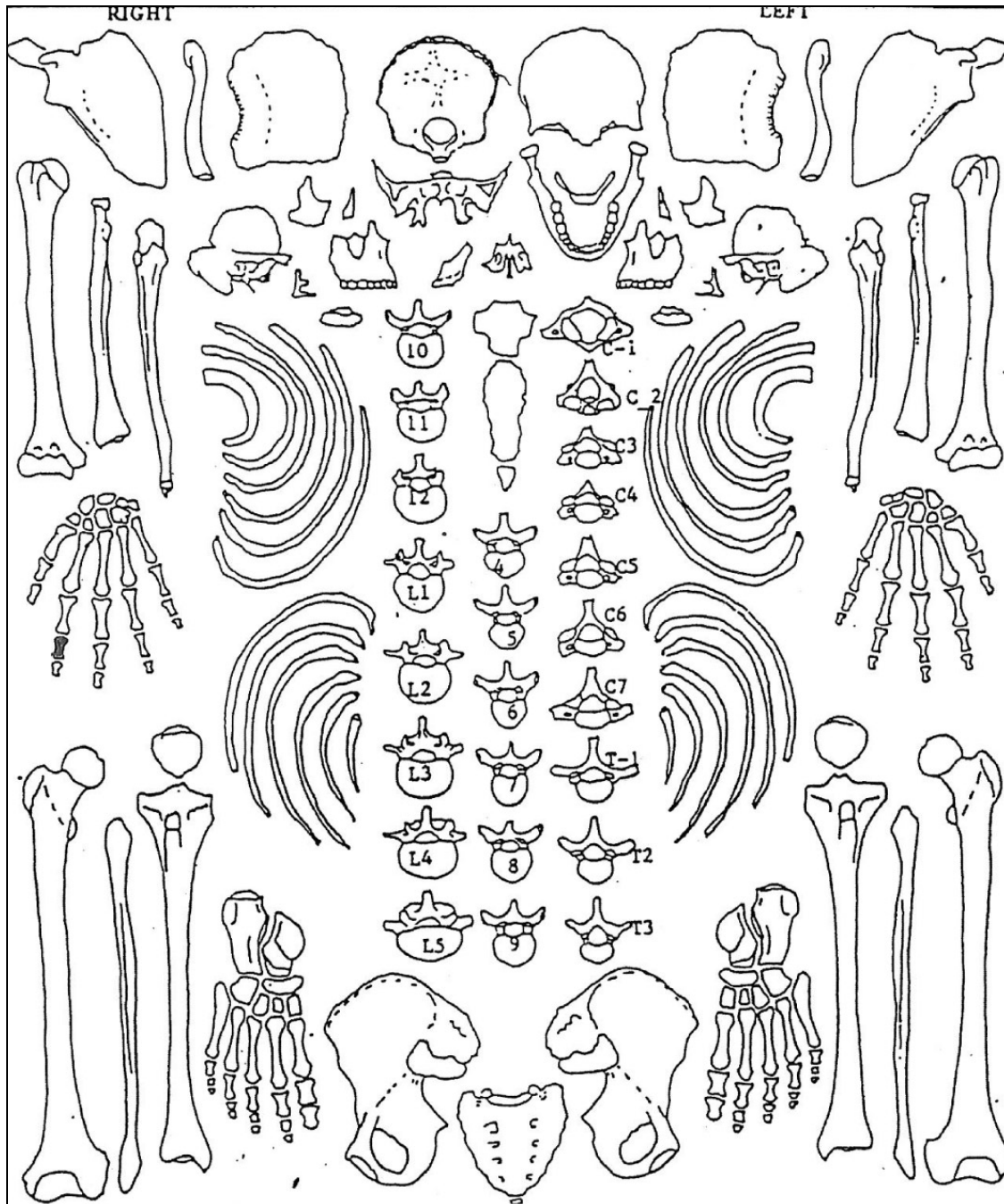


Figure 169. Burial 2, (Site 26310 Feature A) skeletal inventory form (single finger bone)

4.3.39 State Site # 50-10-27-26311

SIHP #	50-10-27-26311
FUNCTION:	Burial
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	8 m by 7 m (26.2 ft. by 23 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	490 ft a.m.s.l.

DESCRIPTION: Site -26311 is a lava tube with a very small (1 m / 3.3 ft. north/south by 0.4 m / 1.3 ft. east/west) opening; a modified entrance; and a single burial, referred to consistently in this report as "Burial 4", with an associated wall.

There are three lava tube openings that run approximately east/west (Figure 171). The first opening is to the east and is a small sink hole with a 5 m (16.4 ft.) diameter that is approximately 1 to 1.5 m deep (3.3 to 4.9 ft.). This sink hole has two tubes; one tube extends to the south and connects with -26310, Feature B. There were no findings in this portion of the lava tube. The center opening is the primary opening and is the site's east boundary (the eastern most sink had no findings). The center opening is very small (1 m / 3.3 ft. north/south by 0.4 m / 1.3 ft. east/west) and drops into the center of a major chamber of the tube. On the surface, the entrance is not modified and is difficult to see; it is located on a small exposure of bedrock that is being overtaken by vegetation (Figure 170). Immediately below the opening, within the chamber, is a modified "step", a small stack of approximately six small boulders allowing entry into the tube (Figure 172). The modification is informal and no other chamber modification was observed. The tube continues to the west from this center (main) entrance. No midden was observed. A final, very small opening caused by the collapse of the tube is approximately 30 m (98.4 ft.) west of the modification and admits a small amount of light; this collapse ends the lava tube.

A well-constructed wall, consisting of small boulders and cobbles from the collapse, is close to the collapse. The wall is 2 m (6.6 ft.) long and partially blocks a small forking tube. The north half of the wall is highly collapsed. The south half (1 m / 3.3 ft.) of the wall measures approximately 0.6 m (2 ft.) high by 0.4 m (1.3 ft.) wide.

Burial 4 was discovered in an east/west trending lava tube approximately 30 m (98.4 ft.) west of the central entrance (Figure 171 and Figure 173). Burial 4 is located in a crevice in the lava tube floor and is in relatively poor condition. Only a few ribs, part of the os coxae (ilium and sacrum), and vertebrae were identifiable. No burial goods were associated with the burial. The burial was placed in a small forking extension of the main tube, near the tube's end. It is placed in a very shallow crevice formed by a sloping tube wall and central roof collapse. A wall constructed by a highly collapsed wall (for half the total length) extends across most of the tube fork containing the burial and rises 0.6m (1.9 ft.), approximately half of the tubes height. Only one burial was observed; no further burials were seen beyond Burial 4 to the west in the small tube nor in an adjacent, similarly sized fork.

The burial is in a poor state of preservation and much of the bone is small (3-5 cm / 0.1-0.16 ft.) pieces of unidentifiable cancellous bone. No cranial or long bone fragments were identified although it is possible they are highly eroded and have settled under the large adjacent roof fall slabs.

The site's function is interpreted as burial based on the presence of Burial 4. No midden or artifacts were found and the narrow central opening with informal modification is indicative of a one-time access to inter the burial.



Figure 170. Site -26311, showing primary entrance and vegetation surrounding entrance, view to east

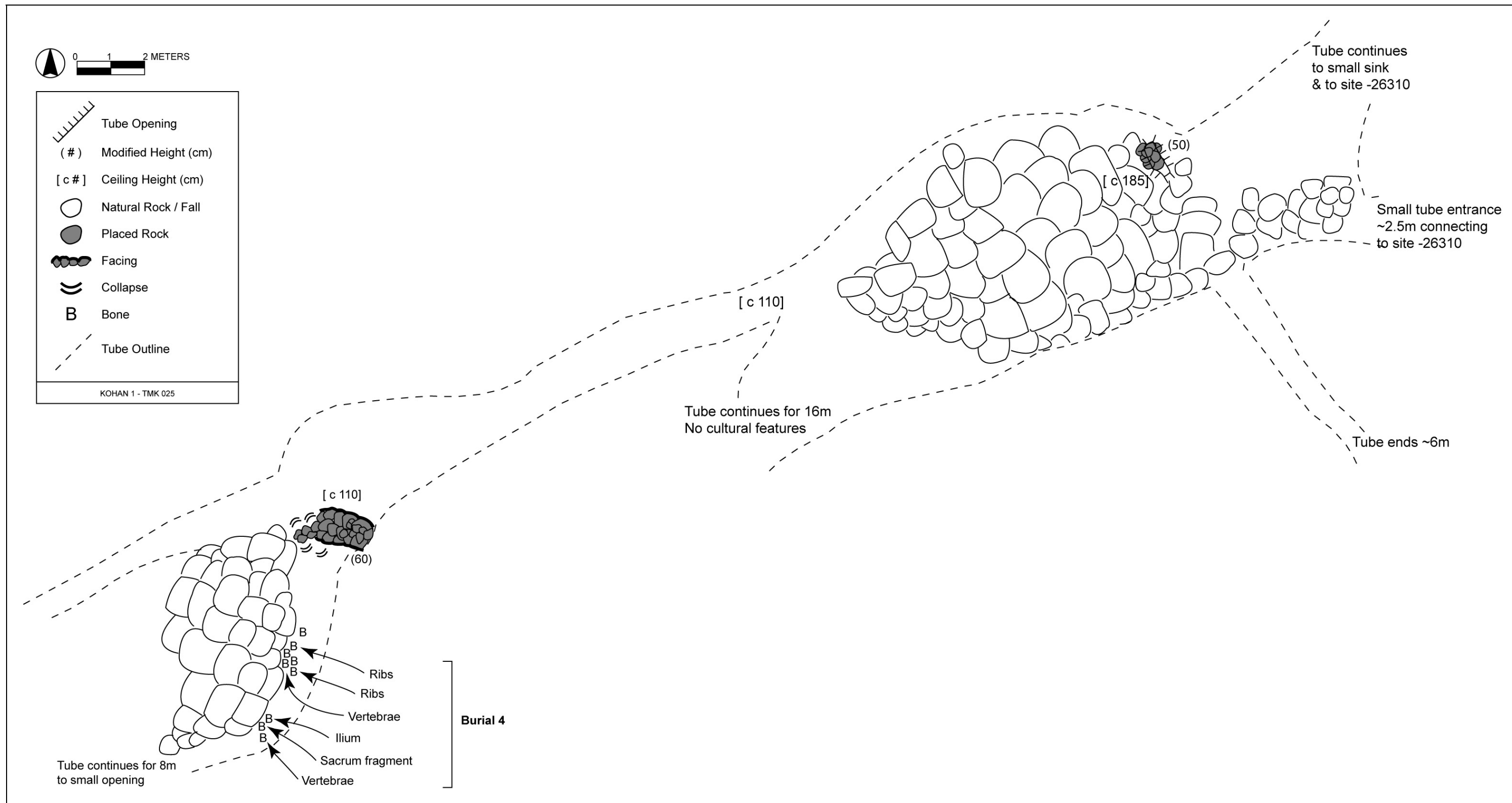


Figure 171. Site -26311, plan view



Figure 172. Site -26311, showing main lava tube entrance; modified “step” to access entrance is adjacent to yellow site tag, view to east

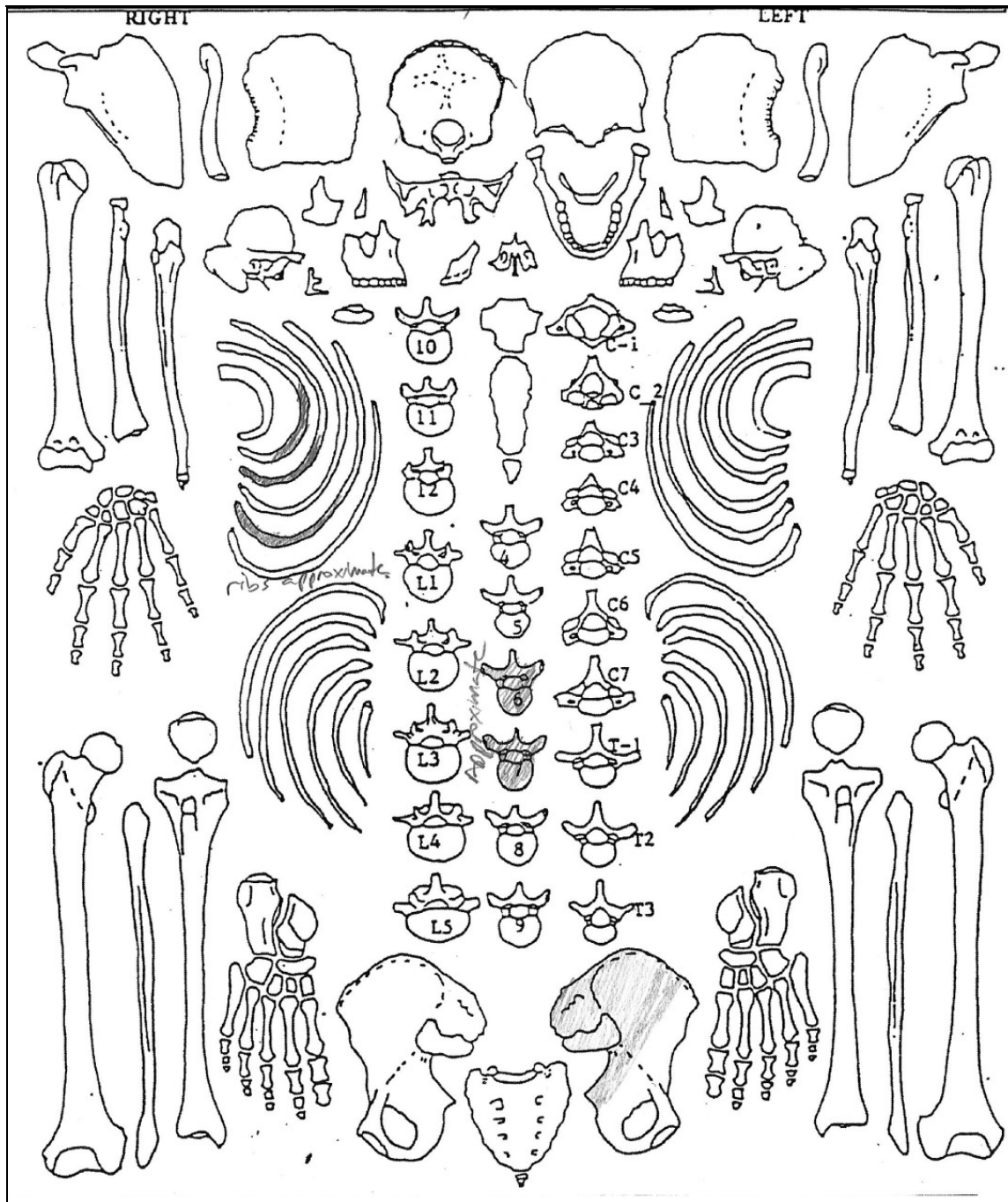


Figure 173. Burial 4, (Site 26311) skeletal inventory form (vertebrae, ribs, ilium fragment)

4.3.40 State Site # 50-10-27-26312

SIHP #	50-10-27-26312
FUNCTION:	Marker
SITE TYPE:	Cairn
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	90 cm by 80 cm (3 ft. by 2.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	510 ft a.m.s.l.

DESCRIPTION: Site -26312 consists of a cairn constructed of very light, thin (5 cm / 0.16 ft. thick) *pāhoehoe* slabs (Figure 174 and Figure 175) The cairn measures approximately 60 cm (2 ft.) high at its tallest and is stacked between 6 and 8 course high. The cairn is located atop a naturally fractured *pāhoehoe* outcrop that is extensively broken up and elevated above the surrounding ground. The vegetation in the immediate area consists of dense grasses and *koa haole*.

The site's function is interpreted as a marker. The fractured outcrop immediately surrounding the cairn (approximately 20 cm / 0.67 ft. on all sides) appears to have been cleared of all larger *pāhoehoe* slabs. This has the effect of making the cairn's appearance more pronounced from the surrounding outcrop.



Figure 174. Site -26312, view to north

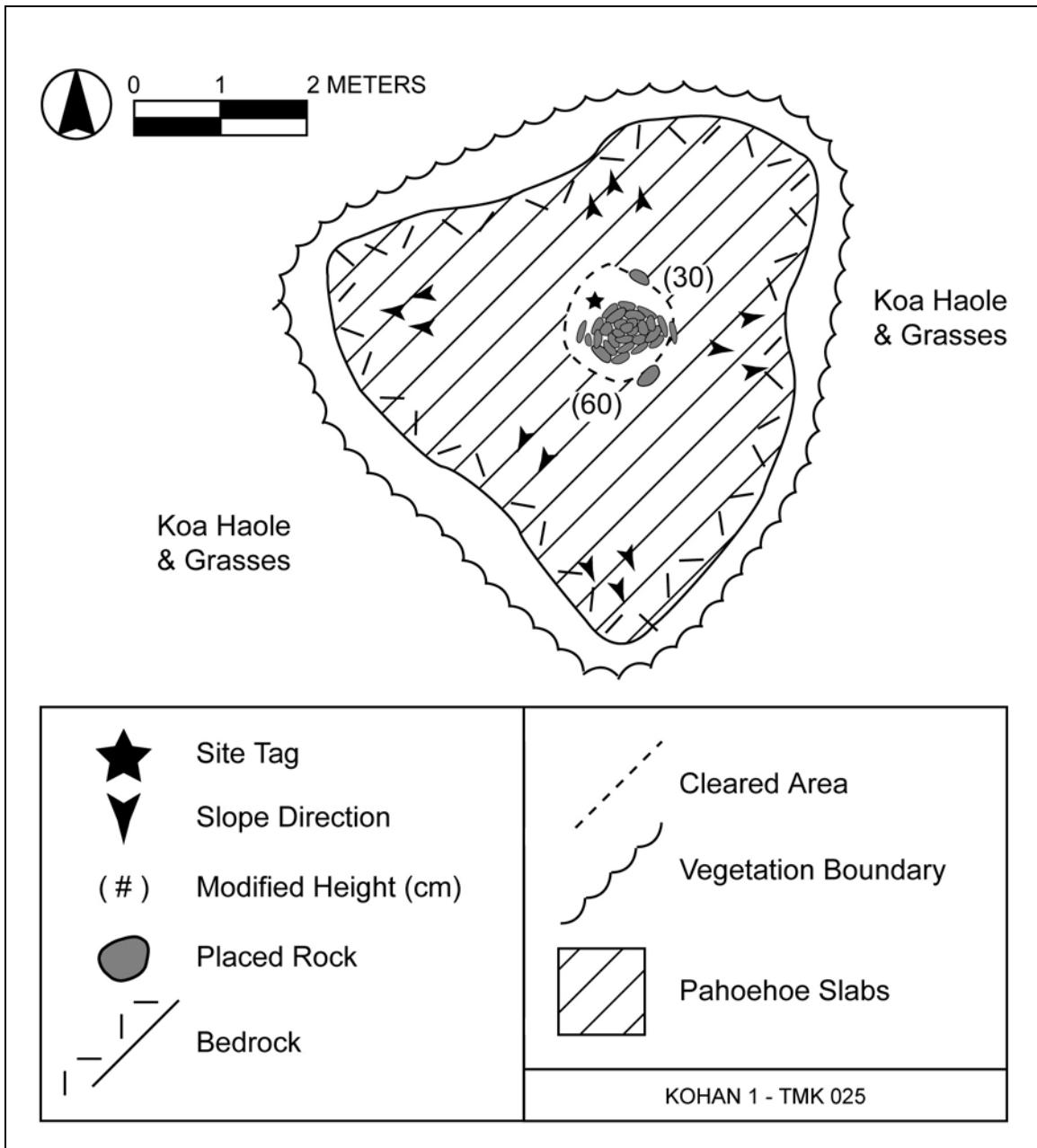


Figure 175. Site -26312, plan view

4.3.41 State Site # 50-10-27-26313

SIHP #	50-10-27-26313
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4.6 m by 4 m (15.1 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26313 is a temporary habitation semi-circular enclosure constructed of stacked and piled *pāhoehoe* cobbles (Figure 176 and Figure 177). The enclosure is located on naturally level *pāhoehoe* bedrock and measures 4.6 m (15.1 ft.) east/west by 4 m (13.1 ft.) north/south. The enclosure's east end has a well-faced interior measuring 60 cm (2 ft.) in height. The west end is open and is the likely entryway. The enclosure's north and south ends are constructed of piled *pāhoehoe* cobbles. The most extensive damage to this site can be found at the north and south ends where minor collapse and fall extend approximately 30 to 40 cm (0.98 to 1.3 ft.) to the north and south respectively. Despite the damage, the site is in good condition.

The site's function is interpreted as temporary habitation based on the style of construction, the open enclosure, and the lack of artifacts and midden.



Figure 176. Site -26313, view to east

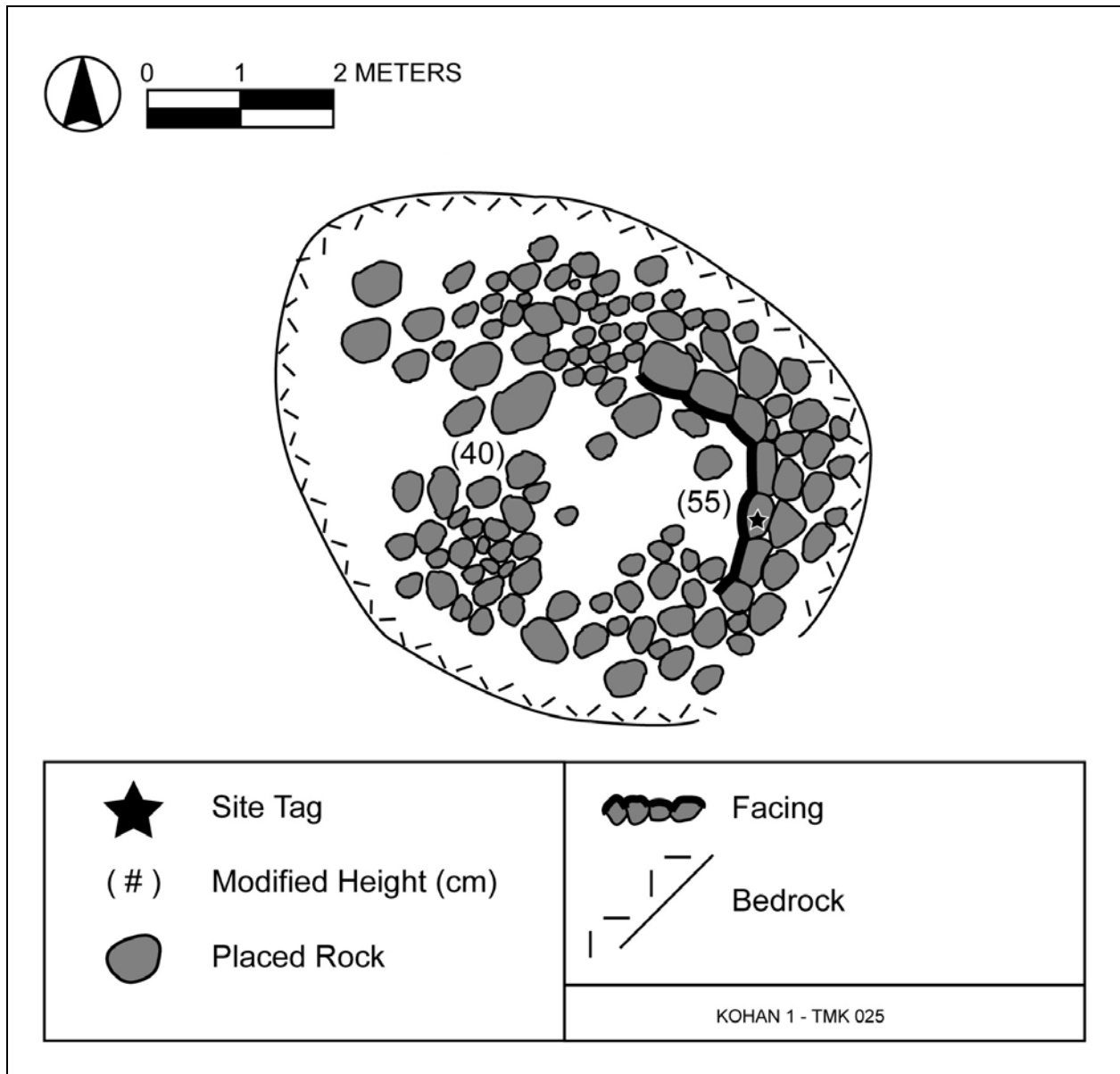


Figure 177. Site -26313, plan view

4.3.42 State Site # 50-10-27-26314

SIHP #	50-10-27-26314
FUNCTION:	Permanent Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7 m by 7 m (23 ft. by 23 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26314 is a circular enclosure that measures approximately 5 m (16.4 ft.) in diameter (Figure 178 and Figure 179). The enclosure is situated on top of a naturally level *pāhoehoe* flow that is slightly elevated from the surrounding area so it provides a good vantage point of the surrounding area. The natural *pāhoehoe* bedrock was used as the enclosure's foundation. Larger *pāhoehoe* cobbles and slabs were used for the enclosure "walls", and smaller cobbles were used to level out the enclosure's surface. The enclosure's western side is the location of the *pāhoehoe* flow's greatest slope; it is also the highest "wall" of the enclosure, measuring about 65 cm (2.1 ft.) in height and about 3-4 courses high. The enclosure's east side has an "entrance" of sorts, a gap in the construction, measuring approximately 1 m (3.3 ft.) wide. Both the south and north walls appear to be faced on the exterior. These walls are 2-3 courses high and average 30-40 cm (0.98-1.3 ft.) in height. The enclosure was previously recorded and has a previous site tag that says "TF 126 12-02-03". Cobb et al. (2003) identified this site as a platform whose function was permanent habitation or burial.

The site's function is interpreted as a permanent habitation based on its style and construction, including in particular the constructed entry into the enclosure which is more characteristic of permanent rather than temporary habitation.



Figure 178. Site -26314, east entrance in foreground, view to west

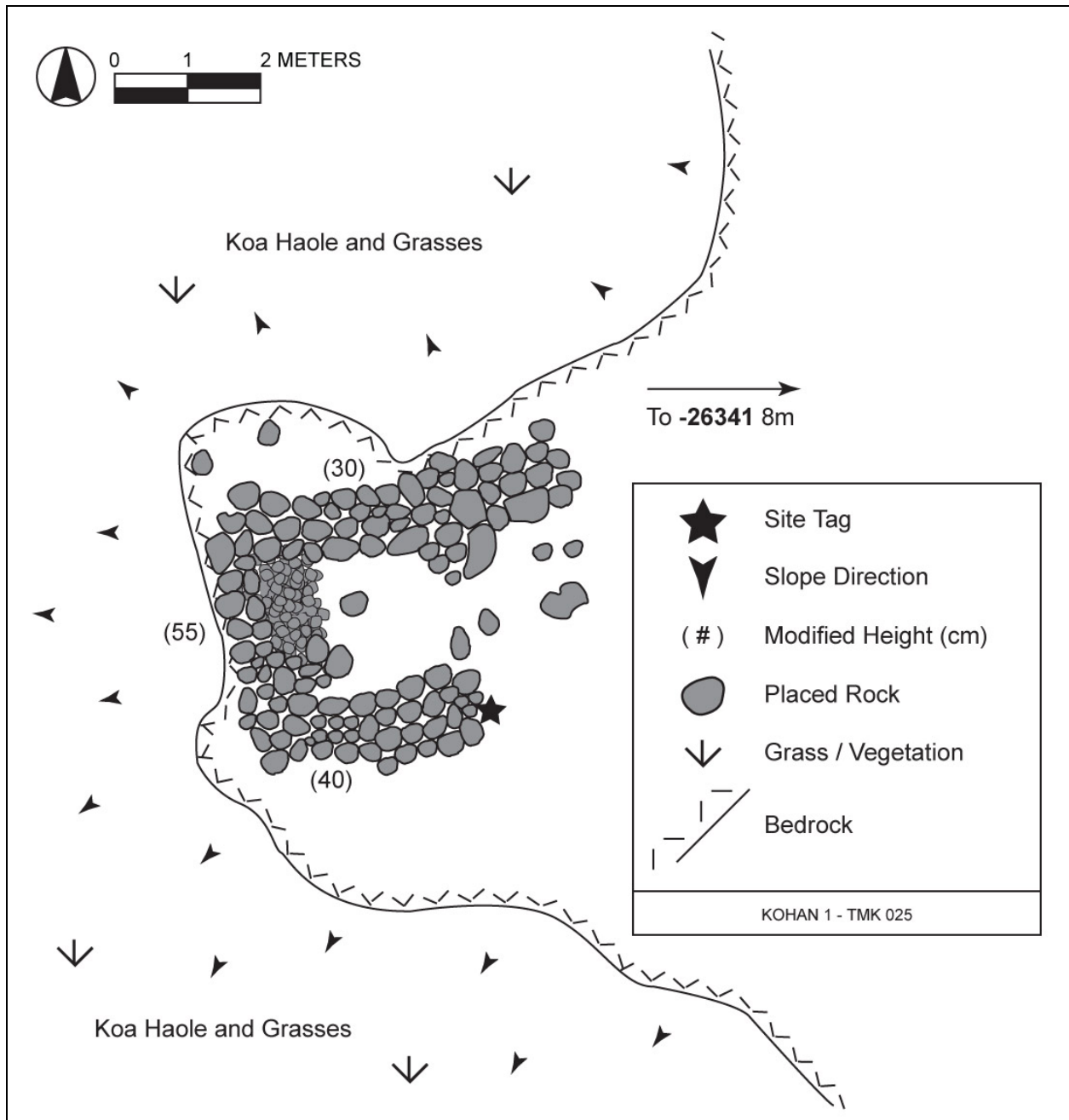


Figure 179. Site -26314, plan view

4.3.43 State Site # 50-10-27-26315

SIHP #	50-10-27-26315
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	2
DIMENSIONS:	12 m by 9 m (39.4 ft. by 29.6 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	525 ft a.m.s.l.

DESCRIPTION: Site -26315 (Figure 180) is a temporary habitation complex with two features (Figure 180). Feature A is a C-shaped enclosure, and Feature B is a constructed terrace.

Feature A is a C-shaped enclosure; the enclosure is open to the west (Figure 181). Some collapse is present on all sides, however, based on the number of *pāhoehoe* large cobbles and small boulders in and around the enclosure that were used to construct the enclosure, this structure was not very tall and not very formal in comparison to the site -26331 enclosure.

The interior's first course is constructed primarily of *pāhoehoe* slabs that show evidence of some facing. This facing is evident only for the first course of the enclosure's interior due to collapse. The original number of courses is also unknown due to collapse. Only two courses are evident in a few areas of the enclosure. No evidence of exterior facing is apparent, and the collapse makes it impossible to determine if facing was ever present. The enclosure's interior is clear of any boulders or cobbles, aside from some small collapse. The enclosure is centered so that its interior is located on top of a tiny natural depression in the bedrock's surface. The enclosure is also positioned so that its open side, the west side, faces Feature B.

Feature B is a constructed terrace built extending from and on top of the west facing slope of an exposed *pāhoehoe* rise (Figure 182). The terrace's north side is roughly flush with the exposed bedrock slope. The terrace is constructed on top of the slope so that it extends to the side. It is constructed with small *pāhoehoe* slabs, large *pāhoehoe* cobbles, and some large 'a'ā cobbles. An opening in the top of the terrace that is in partially exposed bedrock, opens into a small blister approximately 45 cm (1.5 ft.) deep. This opening has been partially constructed by the placement of some surrounding slabs and a small slab set upright into the opening. The terrace has suffered collapse but it is evident that at least portions of the south and west sides of the terrace were stacked at least three courses high and have some facing. Although collapse is present on all sides of the terrace, the majority of the collapse is on the east side. The terrace's top surface is exposed bedrock and 'a'ā slabs and cobbles. Placed slabs form a roughly level area on the north end of this surface.

The site's function is interpreted as a temporary habitation complex. Although no midden is present at the site, the labor investment required to construct the features indicates that this site served a much more intensive function than merely a shelter. C-shaped enclosures are also characteristic of a habitation site. The informality of the enclosure, evidenced by its low height and absence of extensive facing precludes this feature from being considered a more intensive habitation such as a permanent habitation. The presence of the partially constructed cupboard at Feature B and the use of the larger sized cobbles and slabs preclude this feature from being considered an agricultural terrace. The absence of any ceremonially related artifacts, such as coral, and the informality of the structure (particularly evident in the mixed use of both 'a'ā and

'a'a cobbles) also preclude Feature B from being considered a ceremonial site. This use of 'a'a cobbles and the relatively small size of the terrace also preclude this feature from being considered a permanent habitation. The location of the site atop a west facing rise with exposure to the breeze and a view of everything *makai*, is also ideal for habitation.

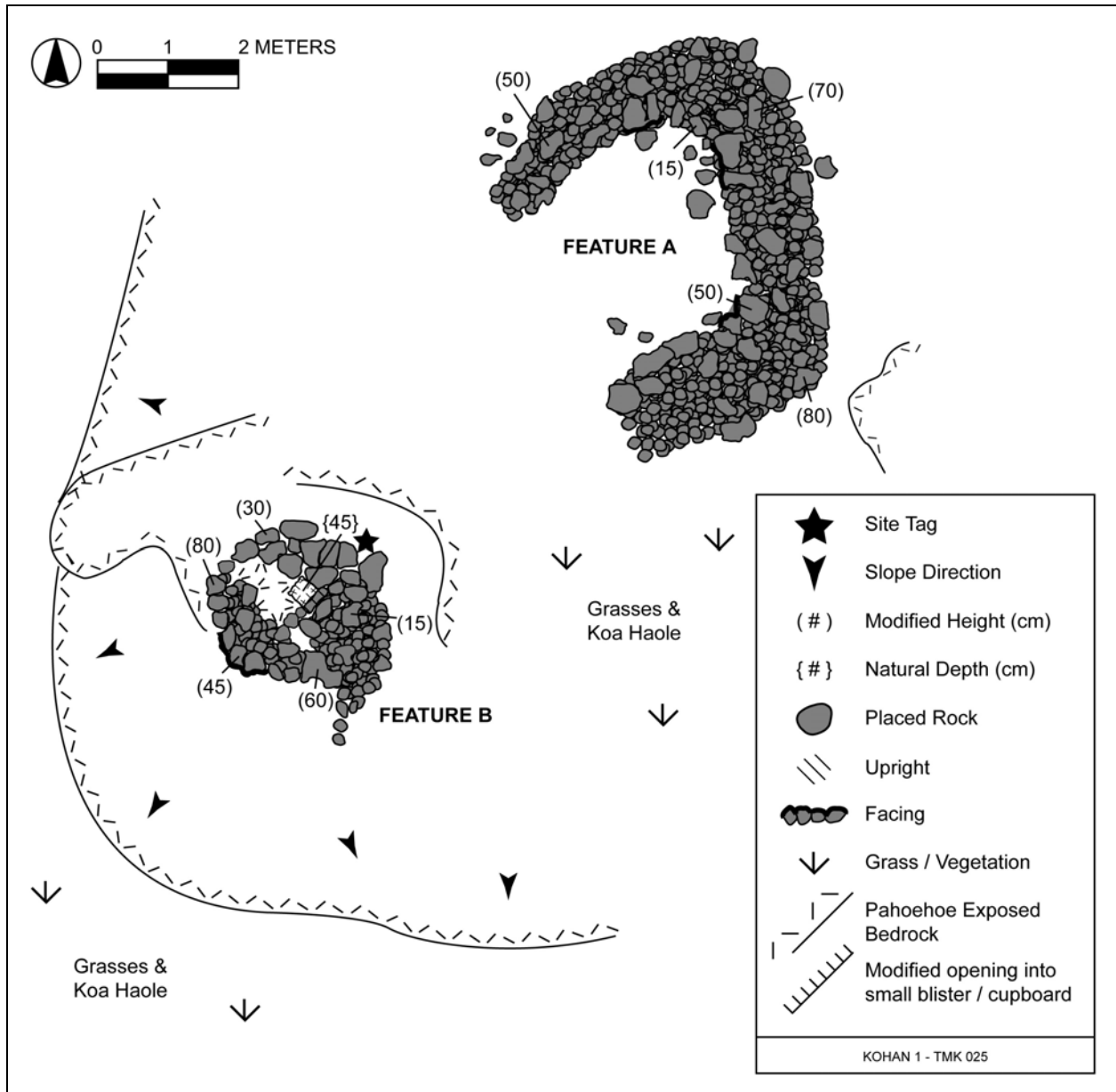


Figure 180. Site -26315, plan view



Figure 181. Site -26315, Feature A in foreground, Feature B in background, view to west



Figure 182. Site -26315, Feature B, showing *puka* in top of terrace, view to east

4.3.44 State Site # 50-10-27-26316

SIHP #	50-10-27-26316
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	14 m by 6 m (45.9 ft. by 19.7 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	480 ft a.m.s.l.

DESCRIPTION: Site -26316 is a lava tube with two entrances located on top of a *pāhoehoe* outcrop (Figure 183, Figure 184 and Figure 185). The largest entrance measures 1.5 m (4.9 ft.) east/west by 1 m (3.3 ft.) north/south and opens to two separated lava tube sections. The second entrance (located on the southwest end of the outcrop) is small and measures 40 by 30 cm (1.3 by 0.98 ft.), and opens into the larger of the two lava tube sections (west end). The smallest lava tube section is located on the east side of the outcrop and measures 4.5 m (14.8 ft.) east/west by 1 m (3.3 ft.) north/south. No modification or cultural deposits were found. The largest section of lava tube, measuring 14 m (45.9 ft.) northwest/southeast by 6 m (19.7 ft.) southwest/northeast, is located at the west end of the *pāhoehoe* outcrop. The lava tube has a soil deposit ranging from 3-4 cm (0.98-1.3 ft.) throughout. Two *kukui* endocarps were found near both entrances. No other artifacts or midden were located. An area of moisture was found close to the smaller of the two entrances and may be an important water source.

The site's function is interpreted as temporary habitation based on the water source, lack of modification, and the presence of *kukui* endocarps. The soil deposit found throughout the tube (both sections) indicates good potential for future excavation.



Figure 183. Site -26316, showing northern portion of tube, ceiling fall in left foreground, view to northwest

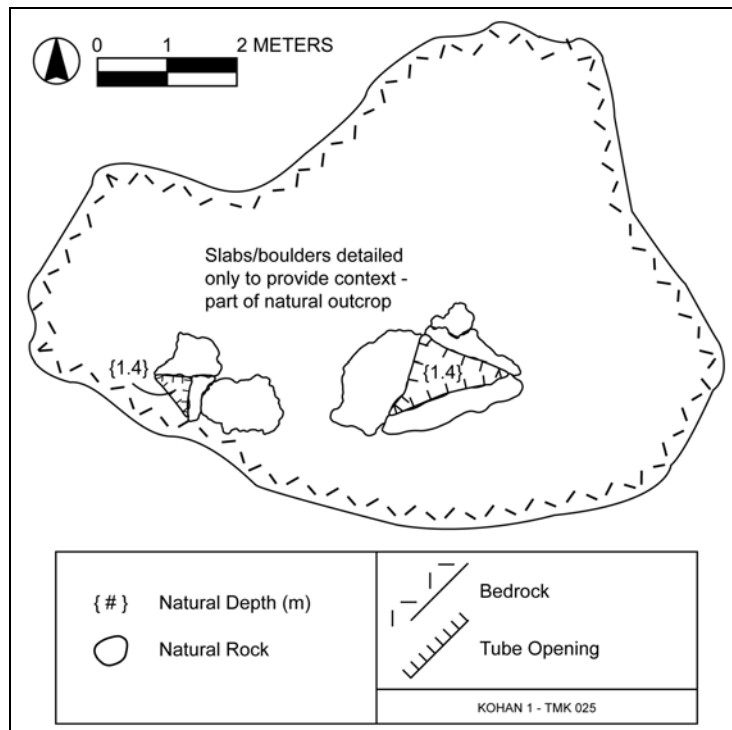


Figure 184. Site -26316, exterior plan view

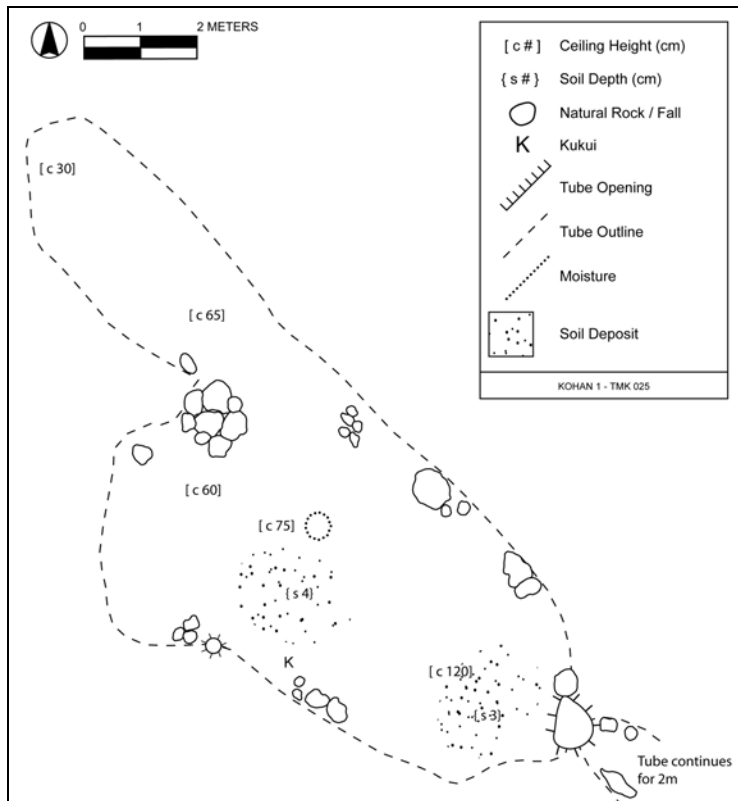


Figure 185. Site -26316, interior plan view

4.3.45 State Site # 50-10-27-26317

SIHP #	50-10-27-26317
FUNCTION:	Shelter/Mining
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7 m by 4 m (30 ft. by 13 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	500 ft a.m.s.l.

DESCRIPTION: Site -26317 is a small lava tube extending to the west from a small opening on the west side of an area of exposed bedrock and large fall (Figure 186 and Figure 187). The lava tube measures approximately 7 m (23 ft.) to the east at the opening and 4 m (13.1 ft.) north/south. The interior of the lava tube is short (not over 0.8 m / 2.6 ft. high) and no longer than 7 m (23 ft.). It is bifurcated by a shorter tube running west and a slightly longer tube running northwest. Some piled cobbles and boulders (small and informal) are also in the vicinity and indicate small mining activities. They are located 114 degrees and 10 m (32.8 ft.), 4 m by 5 m (13.1 ft. by 16.4 ft.) north/south; 212 degrees and 12 m (39.4 ft.), 3 m (9.8 ft.) east/west 2 m (6.6 ft.) north/south from the entrance.

The west trending tube is lined with a substantial soil deposit, approximately 10 cm (0.33 ft.) deep. Very little midden was observed, although heavy sedimentation may hide its presence. Approximately half a dozen cowry and fragments were observed as indicated on Figure 187, just inside the entrance. Inside the northwest trending tube, a small fragment of a coral abrader was found. It is worn smooth on two sides that are perpendicular to each other.

The site's function is interpreted as shelter. The small interior is not indicative of extended habitation, although the presence of a likely prospecting area nearby gives the lava tube more appeal.



Figure 186. Site -26317, view to west

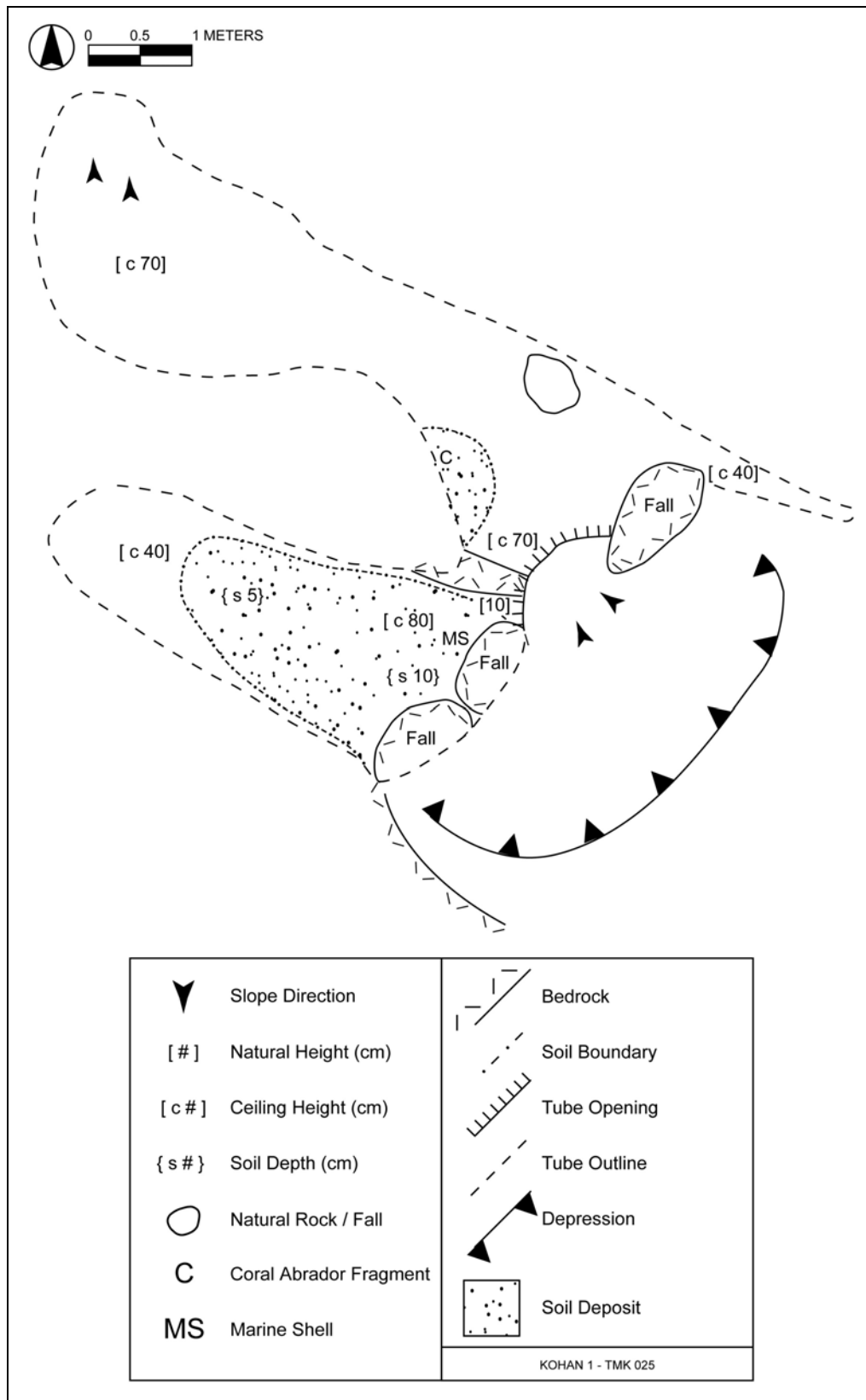


Figure 187. Site -26317, plan view

4.3.46 State Site # 50-10-27-26318

SIHP #	50-10-27-26318
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	17.3 m by 4 m (56.8 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	380 ft a.m.s.l.

DESCRIPTION: Site -26318 is a small lava tube temporary habitation site (Figure 188 and Figure 189). The entry is a round sink only 1.6 m (5.3 ft.) across and 1.5 m (4.9 ft.) deep. The top of the tube on the surface is not visible as exposed bedrock except in the 1 m (3.3 ft.) radius directly surrounding the sink. The center of the sink has a “ramp” of rubble sloping from the east to west side of the sink. There is no evidence this “ramp” is constructed; it appears to be the result of colluvial movement of eroding bedrock. There is a good possibility that bulldozer activity also caused some of this rubble.

Immediately west of the rubble mound “ramp” is a well-made hearth constructed of thin (>5 cm / 1.6 ft. thick) *pāhoehoe* slabs measuring 25 cm (0.82 ft.) long and 15 cm (0.49 ft.) tall (upright height) that are placed upright. The interior of the hearth contains 5 cm (0.16 ft.) of soil but midden was not observed.

The area inside the cave’s naturally lit entrance has been cleared of larger stones, leaving mostly rubble. Some *pāhoehoe* slabs have also been integrated into this living surface. At the tube’s center, approximately 2 m (6.6 ft.) from the closest drip line of the sink, is a concentration of taller (approximately 20 cm / 0.66 ft.) cobbles surrounding a single *pāhoehoe* slab upright measuring approximately 15 cm (0.49 ft.) wide by 40 cm (1.3 ft.) tall. This area also contains rough alignments near both cave walls that are further evidence of floor cleaning. A possible water collection feature consisting of approximately 6 small slab cobbles was also found in the cave.

A small (~8 cm / 0.26 ft. long) husk of a palm tree that is likely an immature coconut was found; the husk has been opened and may have been rat-gnawed. No other cultural material was found. The only midden found was two or three sea urchins (Figure 188).

The site’s function is interpreted as temporary habitation. Although the site has a hearth, it is difficult to find. The cave’s small size is not conducive to extended stays, and therefore the site does not seem likely to be a more permanent habitation.

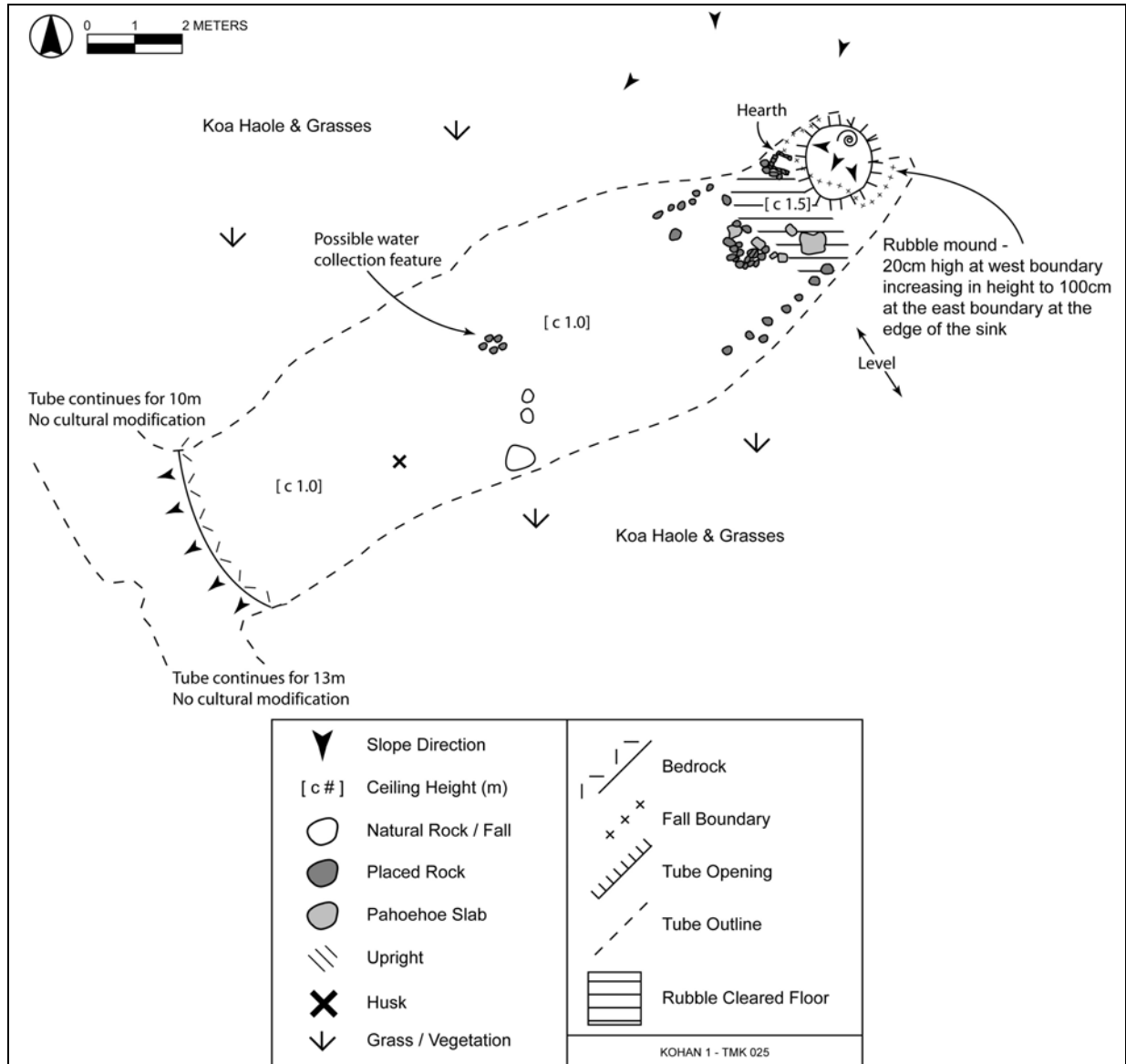


Figure 188. Site -26318, plan view



Figure 189. Site -26318, view to southwest

4.3.47 State Site # 50-10-27-26319

SIHP #	50-10-27-26319
FUNCTION:	Activity areas
SITE TYPE:	Lava tube
TOTAL FEATURES:	4
DIMENSIONS:	50 m by 50 m (164 ft. by 164 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	420 ft a.m.s.l.

DESCRIPTION: Site -26319 consists of two sink holes, Sink 1 and Sink 2, that are connected by Tube 1 and an offshoot tube (Figure 190). This site was identified by Kennedy (1983:59) within his temporary site numbering system as "Site 24". Sink 1 is the *mauka* most sink of the site. It measures approximately 14 m north/south and 8 m east/west with a maximum depth of 3.4 m (11.5 ft.). At the *makai* end of the sink is the entrance to Tube 1 and an offshoot tube. The entrance to Tube 1 has a double faced, stacked boulders well (Feature A) that covers most of the entrance. The lowest section of the wall is approximately 80 cm (2.6 ft.) in height, and the highest section is 1.75 m (5.7 ft.) high. Three informal terraced level areas (Feature B) appear to extend from this entrance wall into Sink 1. An excavated area with boulders and cobbles piled around it is also present; this excavated area is located within the sink hole a few meters southwest of center. Two possible ramped areas (Feature B) are within the sink hole that slopes down to the entrance of Tube 2 and the offshoot tube. Beyond the constructed wall (Feature A), approximately 0.25 m (0.82 ft.), there are two sections of a boulder wall (Feature C) covering most of the entrance to tube 2. One section of this wall measures 80 cm (2.6 ft.) in height, the other 95 cm (3.1 ft.) in height. Tube 2 has water collection features that extend approximately 14 m (45.9 ft.) behind the wall (Feature C). A number of these water collection features, small informal concentrations of imported small cobbles, are found throughout the first 14 m (45.9 ft.) of the tube. Numerous ceiling drips are present and the room created by Feature B has extremely high humidity.

Sink 2 also contains some modification, none of which are designated as features. Modification appears to be similar to Feature B; an excavated pit is in the center of the sink now supporting a large *koa haole* tree and a possible filling of the natural boulder slope, creating a crude ramp. This sink also has a leveled area underneath the drip line near the entrance to Tube 1 that is crudely paved with *pāhoehoe* slabs. No midden was observed within this leveled area and it seems most likely it simply facilitates access to nearby tube 1 and subsequently Feature C.

Feature A is a wall that partially encloses the *mauka* entrance of Tube 1 (Figure 191). It measures 80 to 175 cm (2.6 to 5.7 ft.) high and averages 80 cm (2.6 ft.) thick. It is constructed of small to medium boulders that are very white on the outside wall face. Kennedy (1984) previously interpreted the coloring as calcite, however, this white tone appears to be lichen since it occurs only on the sunny side, has organic boundaries, and matches some small patches on the sink walls; this also suggests little disturbance to the wall. It is possible the wall was constructed with a gap as an entrance to allow access to the cave. Due to the relatively exposed nature of sink 1 and sink 2 and their east/west orientation onshore, offshore breezes would have blown through the tube prior to the construction of Feature A. The wall was likely constructed to block the wind, increasing humidity inside Tube 1 for water collection. No other cultural material was present.

Feature B includes three informal terraces, a pit excavated into the stone terrace, and two possible ramps modify Sink 1 (Figure 192). The terraces are low, and relatively formal for the area. The terrace closest to Feature A rises the most, approximately 40 cm (1.3 ft.), while the others rise approximately 10 cm (0.33 ft.). These terraces are primarily constructed of small to large cobbles, although some boulders (natural fall) are incorporated as well. The terraces likely facilitated access to the tubes for water collection. Because of the higher concentration of moisture in the area, they may also be agricultural. The excavated area in the center of the terrace appears to support agriculture since it is currently supporting a very large *koa haole* tree. The ramps are approximately 1 m (3.3 ft.) wide and are informally modified natural slope into the tube. The modification consists of minor filling and leveling of the boulder floor with cobbles.

Feature C is a low wall measuring 80-95 cm (2.6-3.1 ft.) in height and 40 cm (1.3 ft.) thick (Figure 193). The wall more or less encloses Tube 2, a small tube. It has a nicely faced crawl way for access into Tube 2. The cave is extremely humid and several water drips are evident on the ceiling. Small cobbles have been imported into the cave, and arranged for water collection. The cave's function is an activity area for water collection. The tube continues 140 m (459.3 ft.) beyond the first, moist chamber; no cultural material was found.

Feature D is a low wall measuring approximately 30 cm (0.98 ft.) in height and 30 cm (0.98 ft.) thick (Figure 194). It is informal and closes a natural opening/gap in a small lava blister on the floor of tube 2. Feature D has a 40 cm (1.3 ft.) wide crawl way. The wall creates a largely enclosed space measuring approximately 2 m by 2 m (6.6 ft. by 6.6 ft.) with a ceiling height of 50 cm (1.6 ft.). No midden or *kukui* was observed and no moisture was observed inside the blister. The feature's function is interpreted as an activity area for storage.

The site's function is interpreted as activity area for water collection based on the presence of water collections features, the ramp for easy access, and the wall to prevent dry winds from accessing the tubes. The site is also directly related to the permanent habitation site -26324 (petroglyph cave). No modification or midden was found that suggests temporary habitation of these sinks and cave.

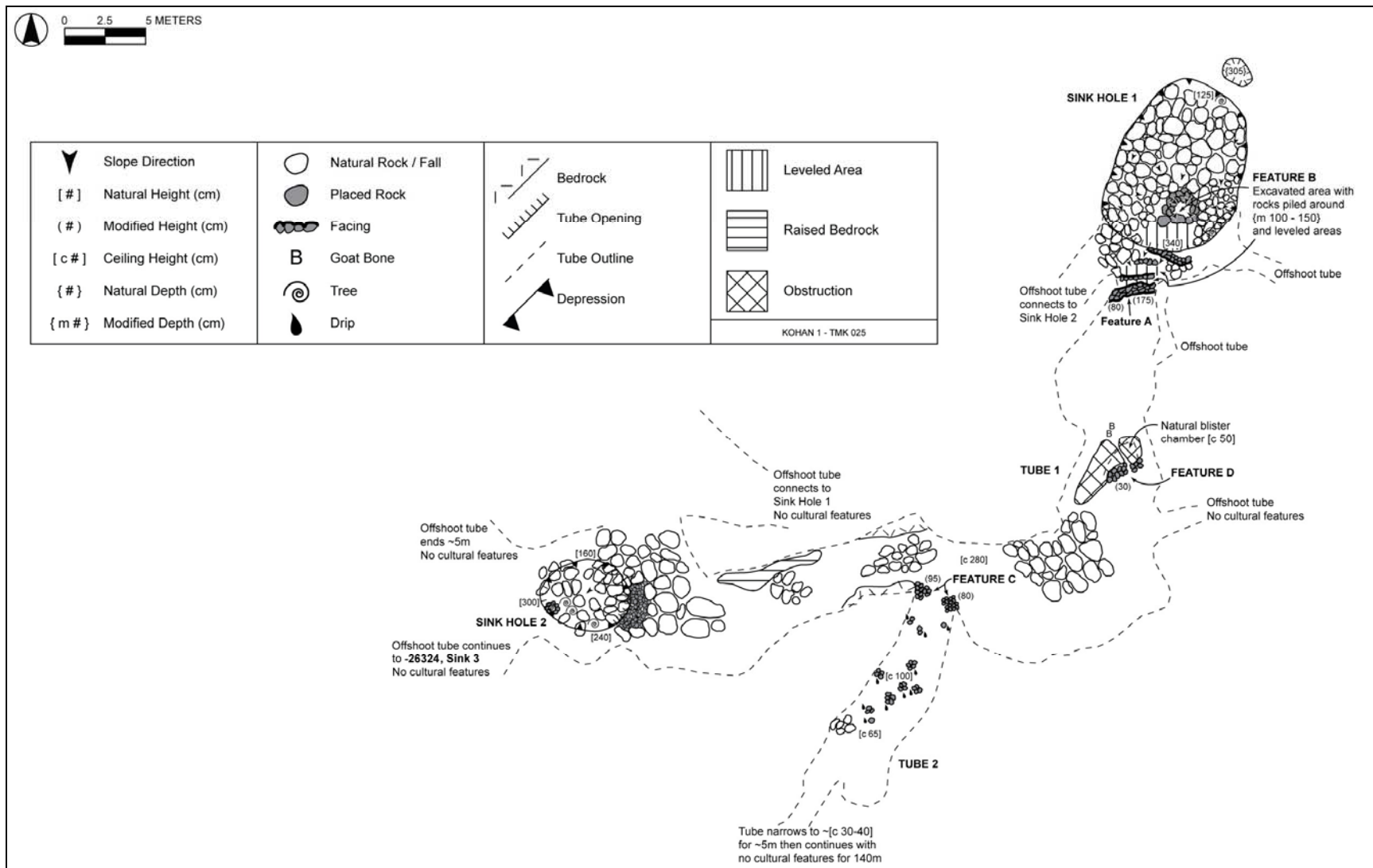


Figure 190. Site -26319, plan view



Figure 191. Site -26319, Feature A, view to south



Figure 192. Site -26319, Feature B, view to southeast

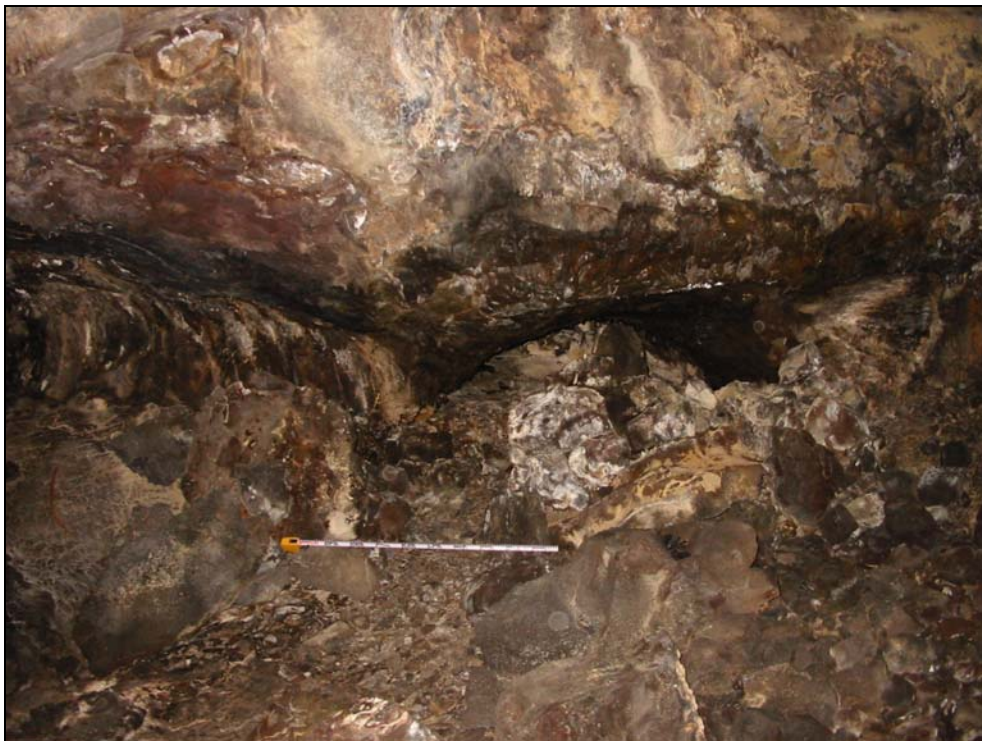


Figure 193. Site -26319, Feature C, view to south



Figure 194. Site -26319, Feature D, view to northwest

4.3.48 State Site # 50-10-27-26320

SIHP #	50-10-27-26320
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 7 m (32.8 ft. by 23 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	420 ft a.m.s.l.

DESCRIPTION: Site -26320 is a lava tube measuring 10 m (32.8 ft.) northeast/southwest by 7 m (23 ft.) northwest/southeast with an average height of 1 m (3.3 ft.) (Figure 195, Figure 196 and Figure 197). The main/only tube entrance is located on the northeast end ceiling. The northeast end of the tube only extends for 0.5 m (1.6 ft.), however, just to the east is an area with small cobble fill measuring approximately 0.5 m by 0.5 m (1.6 ft. by 1.6 ft.). It is unknown whether this fill is blocking a tube entrance/continuation, although it is possible. A small coral cobble is also located in this area. The tube's southwest end is the main chamber area measuring 8 m by 7 m (26.3 ft. by 23 ft.) with ceiling heights ranging from 30 cm to 100 cm (0.98 ft. to 3.3 ft.). Approximately 30 *kukui* endocarps, and urchin were found. A single piece of coconut was also identified. A small area of charcoal was found approximately 2.5 m (8.2 ft.) from the back of the tube. The back of the tube has two small entrances that lead to a narrow chamber, 3 m (9.8 ft.) to the west. No evidence of cultural activity was found so the entrances were not depicted on Figure 197.

The site's function is interpreted as temporary habitation based on the amount of midden present and the lack of cultural modification. The small cobble filled area in the northeast end of the tube is curious and should be further tested. Excavation potential is fair due to the 4 cm (0.13 ft.) deep soil deposit.



Figure 195. Site -26320, view to south

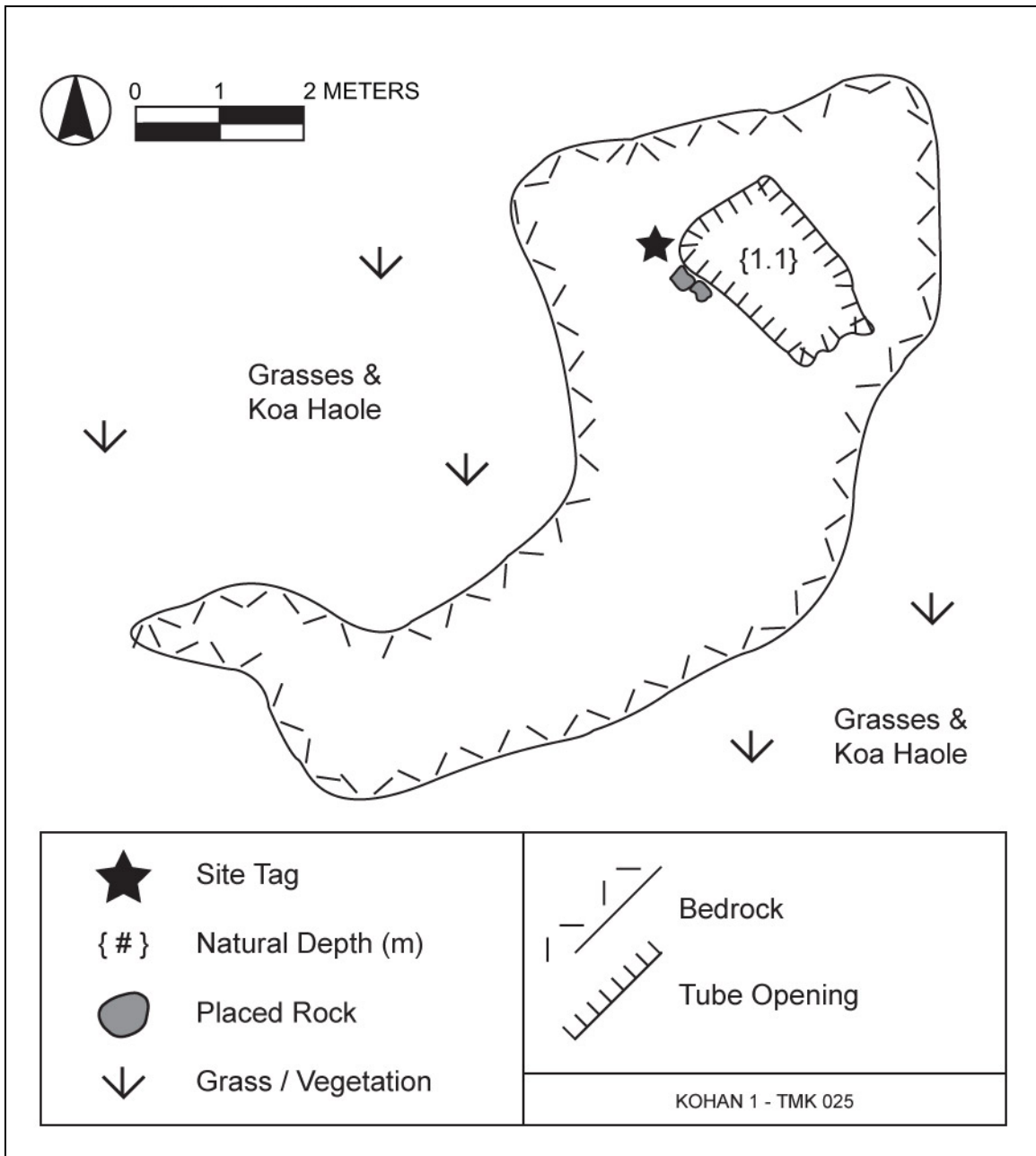


Figure 196. Site -26320, exterior plan view

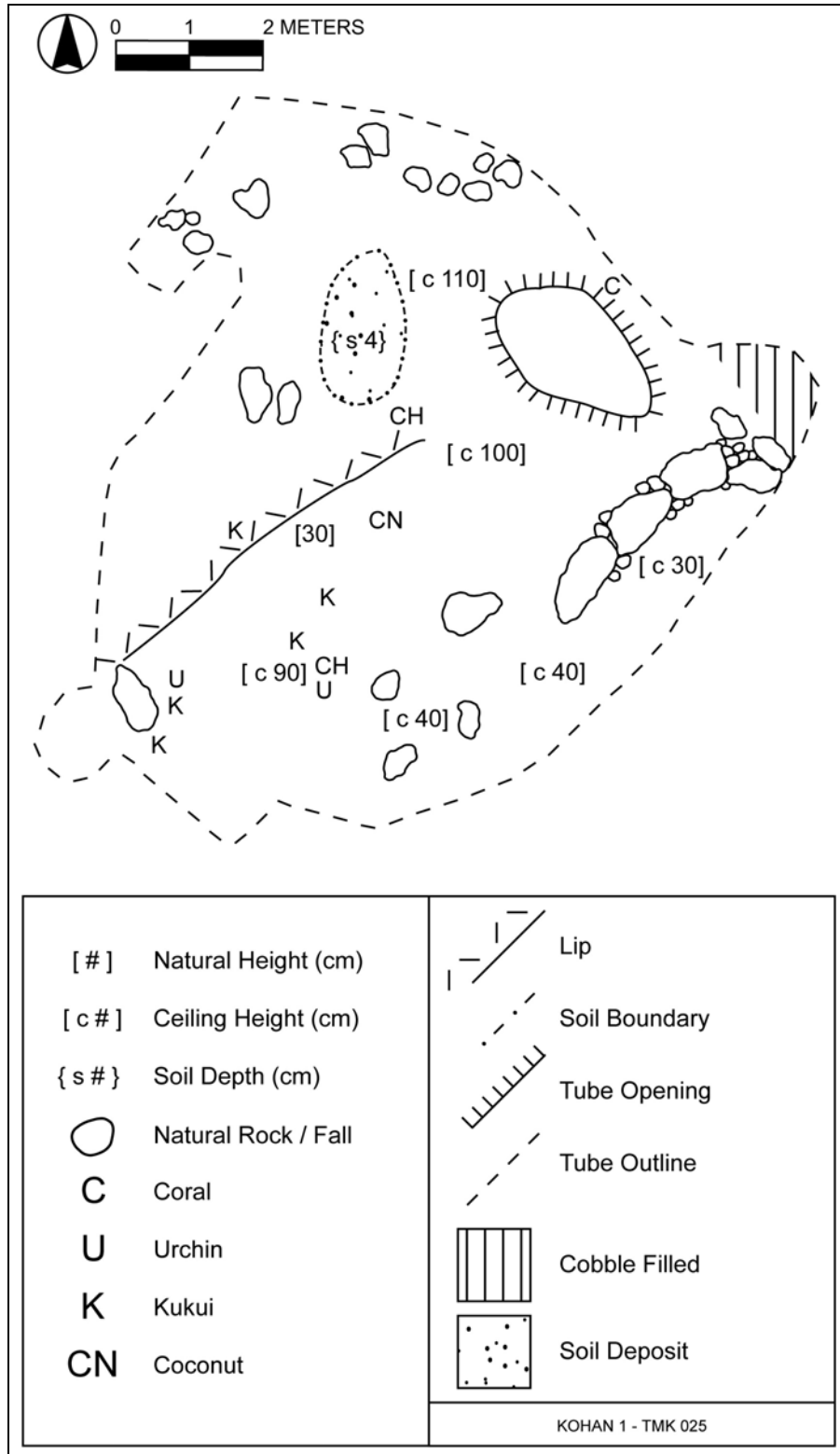


Figure 197. Site -26320, interior plan view

4.3.49 State Site # 50-10-27-26321

SIHP #	50-10-27-26321
FUNCTION:	Complex
SITE TYPE:	Lava tube
TOTAL FEATURES:	2
DIMENSIONS:	30 m by 6 m (98.4 ft. by 19.7 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	365 ft a.m.s.l.

DESCRIPTION: Site -26321 is a complex consisting of two lava tube habitations (Figure 199). Feature A contains significant amounts of midden and some modification and was likely a temporary habitation. Feature B is smaller than Feature A, contains little midden or modifications and was likely a shelter. *Koa haole* and various grasses are within the site's vicinity.

Feature A (Figure 200) is a lava tube measuring 30 m (98.4 ft.) in length northeast/southwest by 6 m (19.7 ft.) in width northwest/southeast with an average ceiling height of 1 m (3.3 ft.). The entrance to the tube is a large sky light measuring 4 m (13.1 ft.) northeast/southwest by 4 m (13.1 ft.) northwest/southeast. The skylight separates the tube into two sections: the northeast and the southwest. The tube's northeast end measures 6 m (19.7 ft.) in length northeast/southwest by 5-6 m (16.4-19.7 ft.) in width northwest/southeast. The tube's southeast side has a large filled area measuring approximately (4 m by 2.5 m) (13.1 ft. by 8.2 ft.).

Three large ceiling fall boulders have been placed upright on the exterior of the mound in the tube's northeast section. The large boulders measure 80 cm (2.6 ft.) in height and have allowed the interior portion to be filled with medium to large cobbles from the upright ceiling fall to the cave wall. Four water worn stones and one hammer stone are on top of the mound. A very small linear boulder and cobble pile measuring 0.2 m (0.66 ft.) in height is 0.5 m (1.3 ft.) northeast of the mound. The northeast end of the tube also contains a significant amount of *kukui* and a large amount of urchin and marine shell. The tube's entrance area contains a large amount of natural fall. A possible area of modification is on the southeast side where boulders may have been stacked for easy access.

The tube's southwest section has a 2-3 course stacked wall measuring 2.5 m (8.2 ft.) northeast/southwest with an average height of 60 cm (2 ft.) (Figure 198). The wall leads to the entrance of the cave/tube, which has more stacking on the west side that blocks entry into the tube (Figure 198). This wall does not continue on the south side of the tube and allows access into the tube. However, it appears that the wall originally blocked the entire entrance and has since been removed.

The tube continues beyond this area for 9 m (29.6 ft.); few modification or signs of cultural use are present. The area beyond the 9 m (29.6 ft.) contains a large area of ceiling collapse; the tube then continues for another 12.5 m (41 ft.). This area measures 3-5 m (9.8-16.4 ft.) wide and 70 cm (2.3 ft.) in height and has been cleared of most roof fall. One placed boulder is in the otherwise empty chamber. The southwestern most end of the tube is too narrow to access and the placed boulder may have blocked this small tube at one time. No midden or artifacts were found beyond the walled area. Areas of goat bone were found within the tube's southwest portion; the northeast portion has a very large quantity of rodent bone, likely the result of owl activity.

Feature B is a small lava tube (Figure 201) approximately 22 m (72.2 ft.) long, although only approximately 14 m (46 ft.) of the tube is large enough to survey. Very sparse midden is scattered throughout a portion of the tube and consists of two small cowry shell pieces and approximately 10 pieces of *kukui*. Feature B has been slightly modified by the movement of a number of medium sized boulders. These slightly larger stones appear to have been cleared rather than placed.

The site's function is interpreted as temporary habitation complex. Feature A was initially interpreted as burial function based on the presence of the large mound, however, excavation results (see below) indicate that no burial is present. Based on the presence of an extensive amount of midden and lack of extensive modifications in Feature A, it is a habitation area. Feature B is a shelter; the small size of this tube, the limited amount of midden, and the boulder and cobble clearing are consistent with less intensive usage and are indicative of a shelter.

4.3.49.1 Testing Results

Excavation was conducted to test for the presence of human remains within the large mound in the northeast portion of Feature A (Figure 200 and Figure 202). Stratum I consisted of loose, very angular small boulders and large cobble fill. Stratum I ranged from 0 to 60 cm (1.9 ft.); 2.1 g of small bone fragments were found within the cobbles and were determined to be goat. Numerous *Isognomon* shells (6.2 g) and an abrader blank (14.5 g) were also found (Figure 202). Stratum 2 ranged from 60 to 62 cm (1.9 to 2.0 ft) and consisted of silt that had fallen through Stratum I. Marine shell, consisting of 4.0 g *Isognomon*, 2.1 g cowry, and 0.6 g urchin, was found. Natural bedrock was reached at 62 cm (2.0 ft.) and no burial was present (Figure 203).



Figure 198. Site -26321, Feature A showing 2 - 3 course wall that limits entrance to lava tube in background, view to southwest

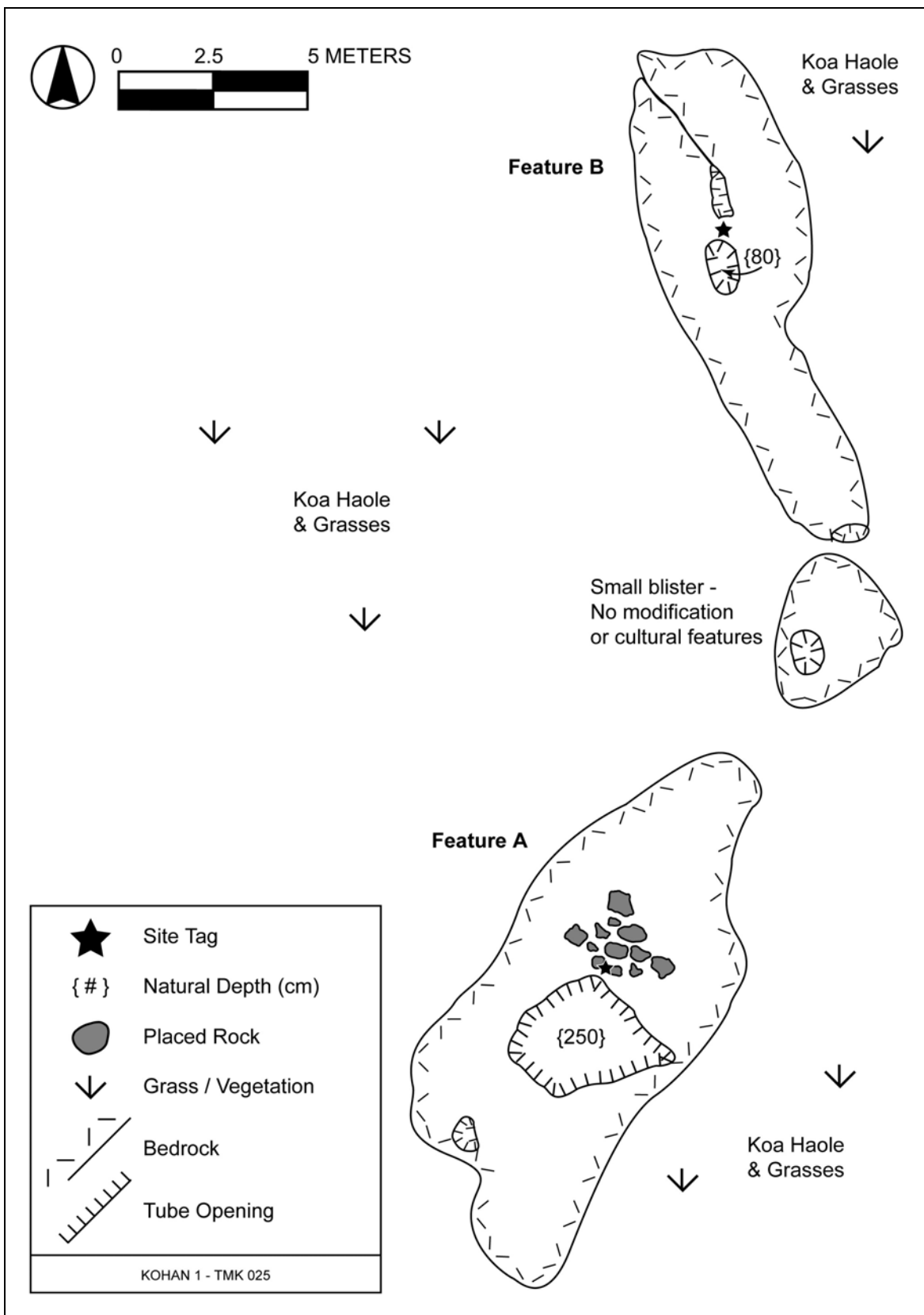


Figure 199. Site -26321, exterior plan view

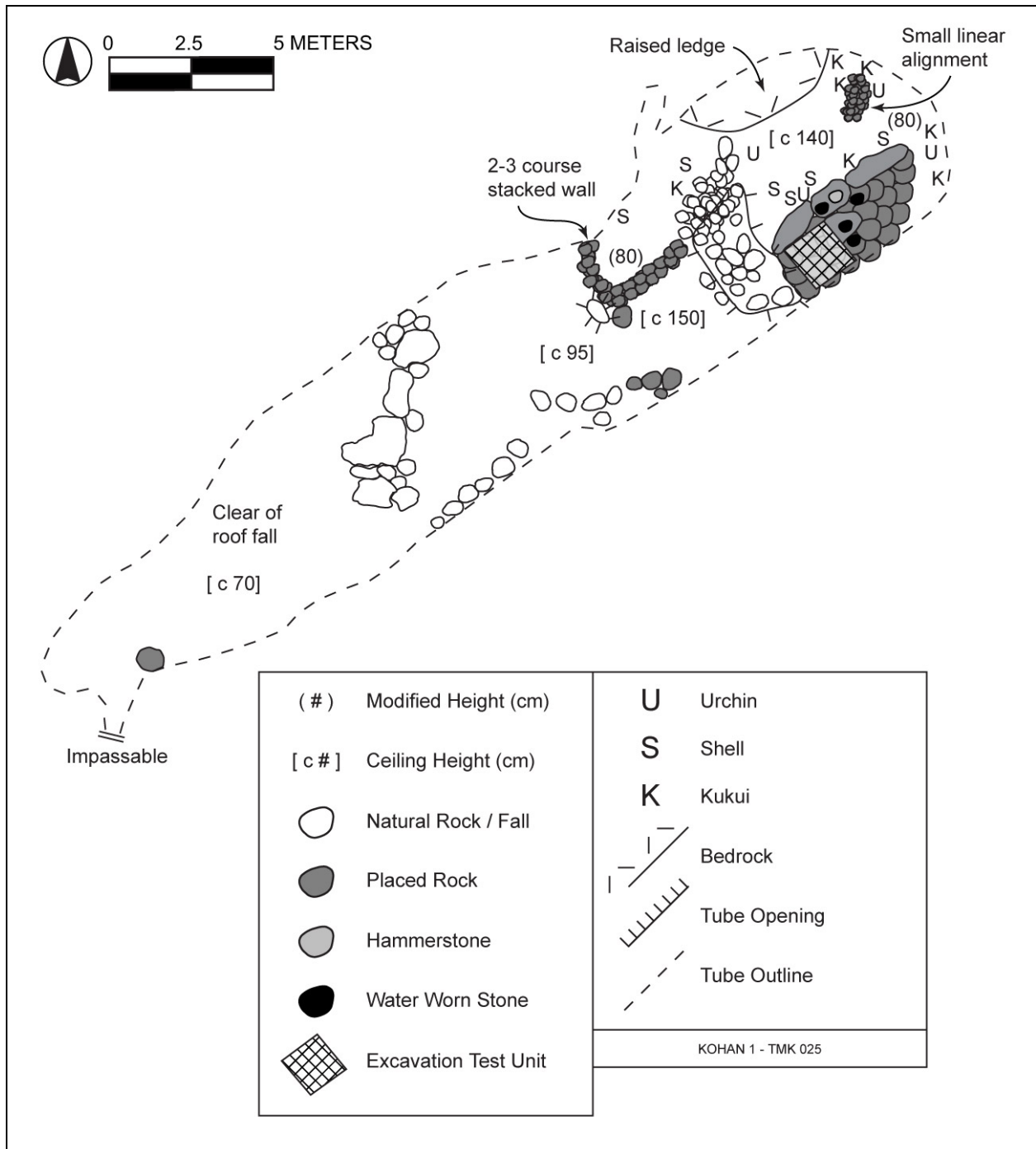


Figure 200. Site -26321, Feature A plan view

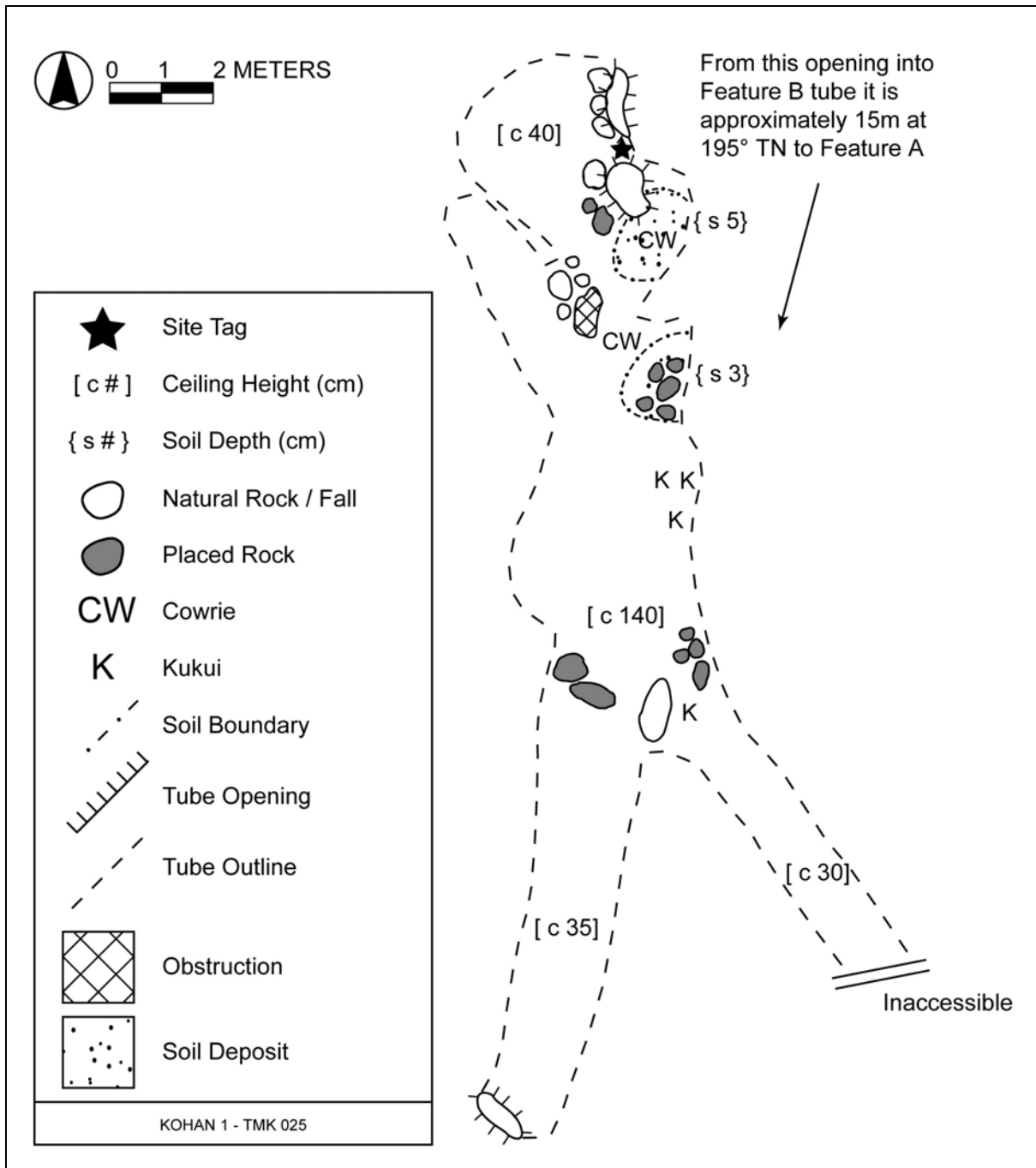


Figure 201. Site -26321, Feature B plan view

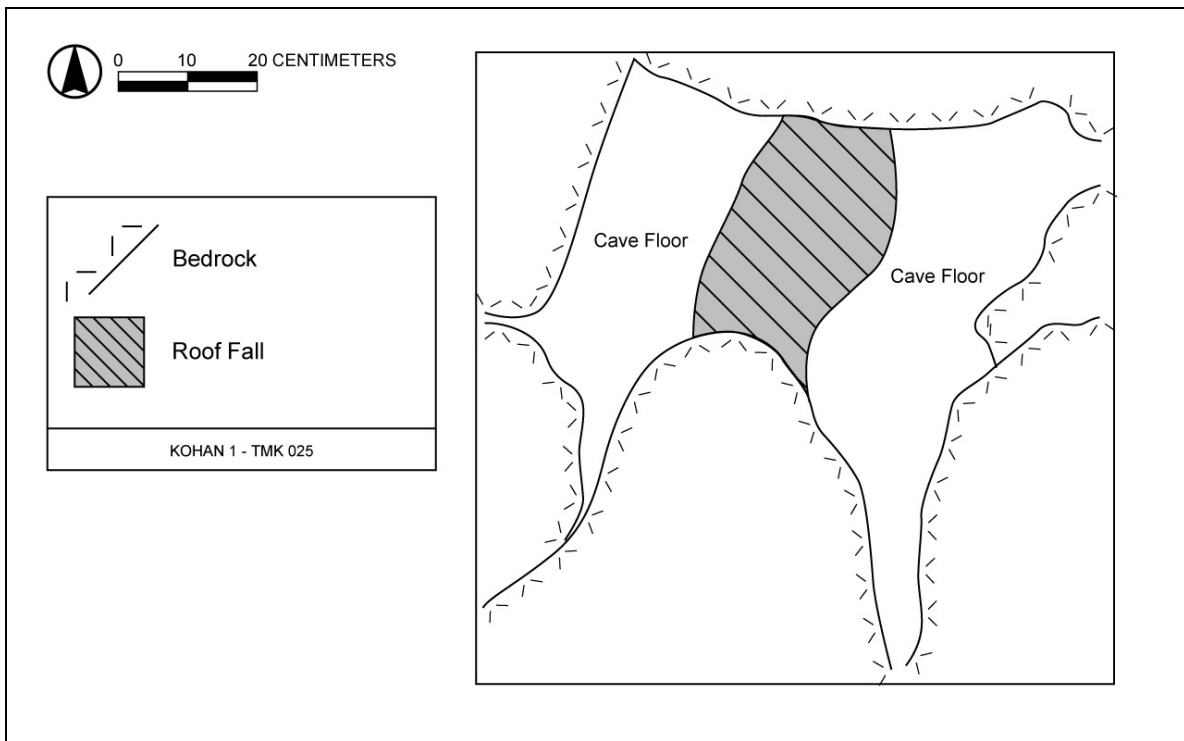


Figure 202. Site -26321, Feature A, excavation plan view



Figure 203. Site -26321, Feature A, post excavation

4.3.50 State Site # 50-10-27-26322

SIHP #	50-10-27-26322
FUNCTION:	Marker
SITE TYPE:	Cairn
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4 m by 5 m (13.1 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	360 ft a.m.s.l.

DESCRIPTION: Site -26322 is a distinct marker cairn. It is constructed on a natural *pāhoehoe* terrace that faces south (Figure 204 and Figure 205). This terrace was formed by a low *pāhoehoe* tumulus descending from up slope (northeast) and stopping over a small depression between the site and the nearby 'a'ā flow to the south. The cairn is visually quite distinct from the west, south, and east, but not particularly from the north because of the relatively gradual local elevation change in that direction. This tumulus is approximately 1.5 m (4.9 ft.) maximum higher than the surrounding terrain to the south, and slightly down slope from the terrain to the north.

The cairn is situated on the east end of the tumulus exposure. It is constructed with angular *pāhoehoe* small boulders and one large *pāhoehoe* slab on top. The cairn measures approximately 155 cm (5.1 ft.) east/west, 115 cm (5.1 ft.) north/south, and is 40 cm (1.3 ft.) high. The *pāhoehoe* slab is located on the east half of the top of the cairn. The west half of the top is partially collapsed. The cairn is constructed of two to four courses; the top course is a *pāhoehoe* slab measuring 60 cm (2 ft.) by 45 cm (1.5 ft.) and 5 cm (0.16 ft.) thick.

A small mound of large *pāhoehoe* cobbles and small boulders (approximately 1 dozen stones) is informally and loosely stacked on the west end of the tumulus. This mound measures 40 cm (1.3 ft.) high by 60 cm (2 ft.) in diameter.

The site's function is interpreted as a marker that likely indicates the cave habitation nearby, site -26321 (within 40 m / 131.1 ft.); it is generally on the alignment of the cairn and the mound. The cairn is similar in size and prominence to -26352, 200 m *mauka*. Presently, it seems likely the two cairns, -26322 and -26352, indicate a trail of some sort. No further work is recommended.

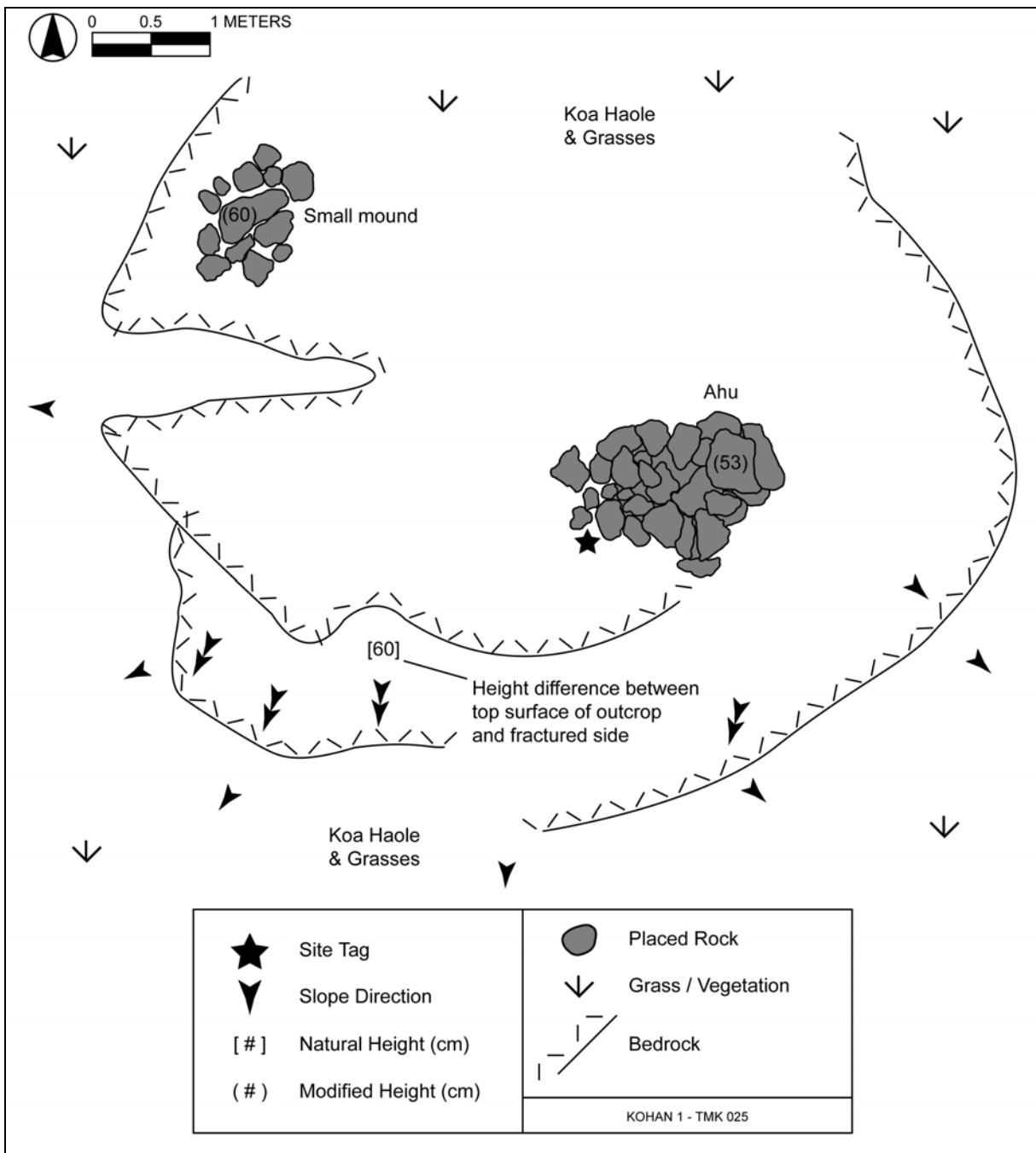


Figure 204. Site -26322, plan view



Figure 205. Site -26322 overview, view to east

4.3.51 State Site # 50-10-27-26323

SIHP #	50-10-27-26323
FUNCTION:	Shelter
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	3 m by 3 m (9.8 ft. by 9.8 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	350 ft a.m.s.l.

DESCRIPTION: Site -26323 is a small shelter inside of the remnant of a northeast/southwest trending surface tube in a relatively new tongue of *pāhoehoe* (surrounded by older grass covered *pāhoehoe*) (Figure 206 and Figure 207). The entire tube has collapsed except for the very southwest end, where the shelter is located. The collapse has created a number of very small nodes around the flow, although only this shelter was modified. The shelter consists of a 3.0 m (9.8 ft.) deep tube, approximately 2 m (6.6 ft.) wide. Two large cobbles have been moved aside and a dozen *kukui* shells (fractured) are visible. The entry way has been narrowed with the placement of five large cobbles and small boulders around the entrance. No midden was observed.

The site's function is interpreted as a shelter based on the extent of modification and the lack of midden. This shelter is comfortable for one person. No further work is recommended for this site.

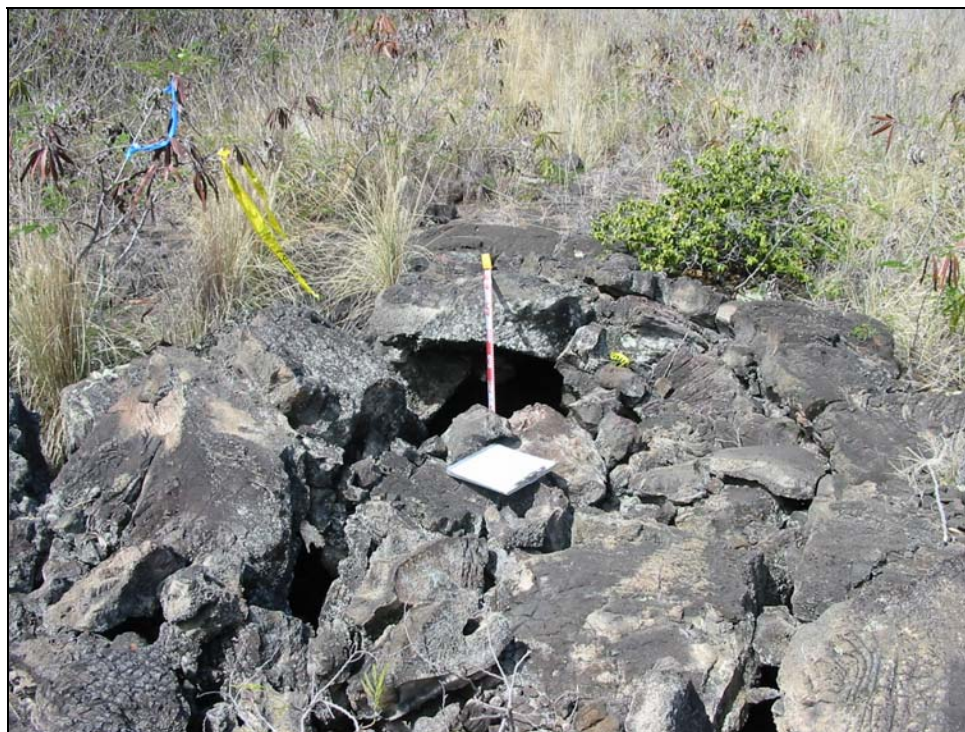


Figure 206. Site -26323, overview of shelter entrance and surrounding area, view to southwest

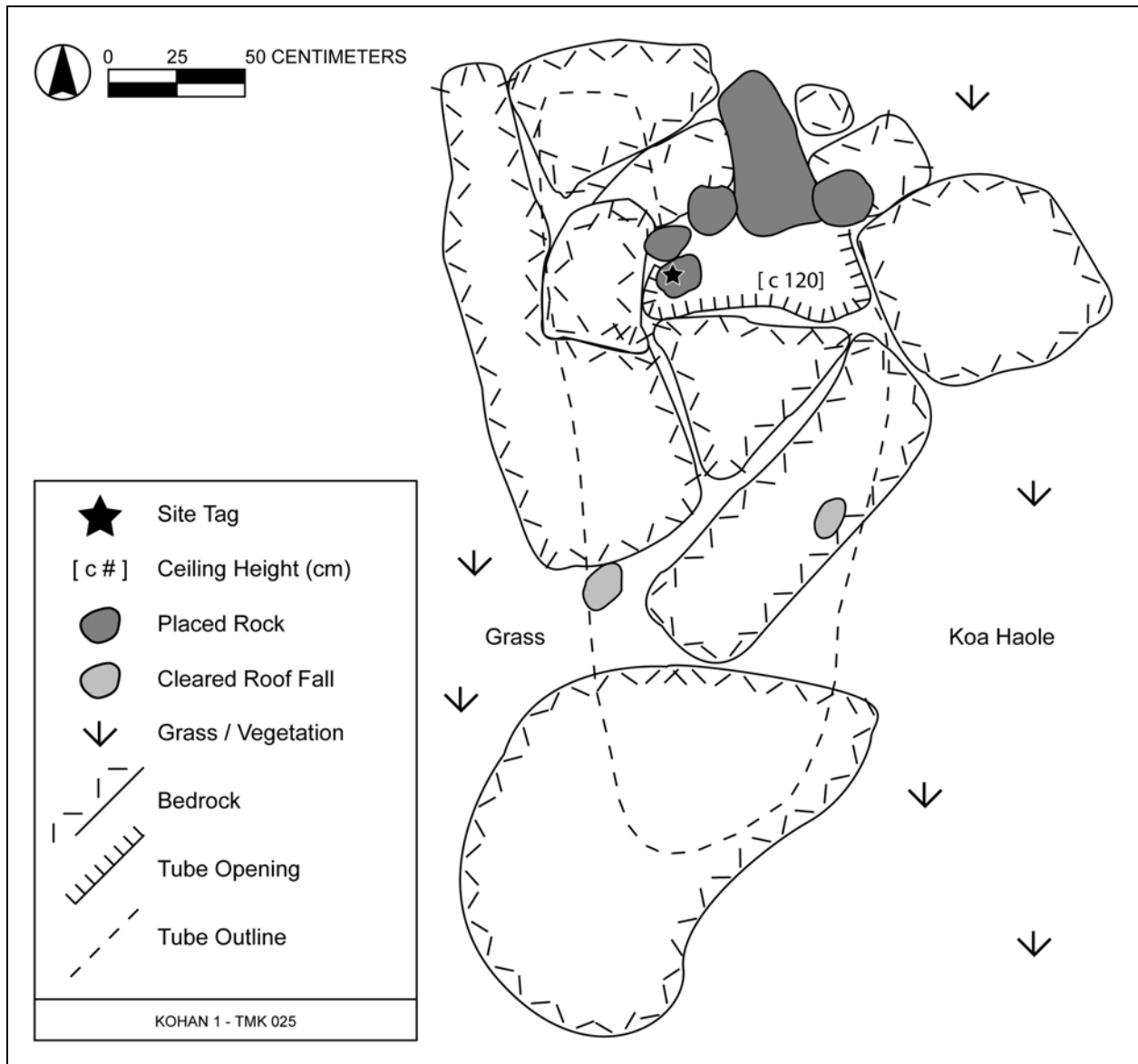


Figure 207. Site -26323 plan view

4.3.52 State Site # 50-10-27-26324

SIHP #	50-10-27-26324
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	3
DIMENSIONS:	160 m by 5 m (524.9 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site -26324 consists of two extensive lava tubes and three sinks (Figure 208), two petroglyph panels (Features A and B), and a C-shaped mound (Feature C). The site is located on a noticeable rise in an undulating *pāhoehoe* flow in the southwest quadrant of TMK 25. The vegetation surrounding the site consists of overhead-high *koa haole* and grasses.

This site comprises the lava tubes referred to as caves 21 and 22 by Kennedy (1983:26-58), and was the major focus of the research reported in the Kennedy 1984 study (1984:28-58). Of particular note are the two tableau of petroglyphs, the largest of which has more than 34 impressions (Figure 212). Kennedy conducted excavations in three areas of this cave and includes photos of artifacts and midden recovered in his study (see testing results below). Human remains are reported from this site (Kennedy 1984:50, 57) but were not observed during a 2005 field check (Shideler and Hammatt 2005) or during the current survey (see further discussion below). Kennedy also reported several triangular platforms on the surface above the main sink, but despite extensive scouting, these platforms were not located during the current inventory survey. However, there is extensive bulldozing in the immediate area and it is possible these surface structures were destroyed. A ¹⁴C radiocarbon date of c. 1790 was reported and Kennedy recommended that this site be preserved in its entirety.

The site was split into designated sinks and lava tubes for descriptive purposes (Figure 208). Sink 1 is a small, approximately 10 m (32.8 ft.) long northeast/southwest depression with a maximum depth of 1 m (3.3 ft.). The sink does not contain visible modification except some mounding near the entrance to Tube 2. The southwest end of Sink 1 opens into **Tube 1** (Figure 209). The overhang immediately in front of the tube's entrance (Figure 211) contains relatively extensive midden including *kukui*, marine shell, a piece of coral, a water worn stone, and pencil urchin spines. Tube 1 is Kennedy's (1983:26) cave 21 and is the westernmost of the tubes. It runs 160 m (525 ft.) down slope where it opens into an area of modern dumping. The tube is quite large with an average width of 5 m (16.4 ft.) and average height of 2 m (6.6 ft.). The tube opens into a couple of large chambers with ceiling heights reaching 3 m (9.8 ft.). Walking upright is possible through at least 120 m (393.7 ft.), which is the majority of this tube. Within the tube's two main chambers, there are large midden scatters including several concentrations of charcoal. Tube 1 modifications consist of placed rocks including large boulders. The tube has several entrances from the surface, some of which are blocked by placed boulders. The southwestern most entrance to the tube (where modern trash is present) appears to have been opened by a bulldozer.

Sink 2 opens directly into the roof of **Tube 2** (Figure 210). Kennedy notes that this tube entrance was disturbed by looters prior to 1984. Feature A (a large petroglyph panel) is just

inside the entrance to Tube 2. This tube is the main habitation area of site -26324, and is Kennedy's (1984:28-58) cave 22. It features a number of small portable artifacts (pandanus brushes, urchin spine files, coral and basalt abraders), two petroglyph panels (Features A and B), basalt cobble and rubble mounds and disturbed pavements, and a C-shaped mound (previously mapped in Kennedy 1984:32), Feature C. The amount of rubble in Tube 2 indicates that much of the cave was paved at one time, but is now highly disturbed. This tube contains a thick layer of silt deposit with little soil formation; the silt is gray and very ashy. A pavement would be very helpful to keep this dusty sediment from constantly covering the cave inhabitants.

Sink 3 is the northeastern most sink of the site and the end of Tube 2 (Figure 210); a side tube continues but does not contain cultural materials or modification. The sink itself does not contain modification, but the entrance to Tube 2 from sink 3 has been slightly cleared and there is some mounding of boulders and cobbles. A piece of coral (abrader material) was found but no midden is present on this end of Tube 2.

Feature A is a large shelf of petroglyphs immediately inside the southwest entrance of Tube 2 (Figure 210). Figure 212 is an overview adapted from the original Kennedy (1984) sketch, and Figure 213 is an overview photograph showing the context of the petroglyph panel. Figure 214 through Figure 217 are detail photos of Feature A, showing several of the individual petroglyphs and clusters of them. Kennedy (1983) and Shideler and Hammatt (2005:56) previously reported on the petroglyphs. The panel features twenty-one human figures with two heads in profile. It also contains at least four separate inscriptions of presumably Hawaiian words in Roman lettering; some letters and words are written backwards. Kennedy (1984:38) quite reasonably suggests that the "KAHIKO" petroglyph may relate to a person of that name listed as a tax payer in Kohanaiki in 1860. See Kennedy (1984:33-40) for further details and original drawing.

Updated panel drawings include a few less distinct petroglyphs in the main part of the panel that may be unfinished and were not previously recorded. Previously recorded "KE" appears to have an incomplete and damaged "O" or similar Roman character associated with it; the "O" follows "KE", possibly spelling "KEO" (Figure 212 and Figure 214). Kennedy (1983:30) conducted test excavations near this feature (see testing results below).

Feature B is a small lava tube extending to the southwest from the Sink 2 chamber of Tube 2 (Figure 210 and Figure 218). Kennedy (1983:38-40) also previously reported on the feature. Feature B encompasses a small knob on the floor of the tube on which petroglyphs were etched; a disturbed pavement in the tube's entrance; a filled low spot, possibly a crevice; and an adjoining small chamber that is blocked by a small mound.

It seems very likely that either the filled low area behind, or north of, the petroglyphs and/or the blocked small side chamber, north of the filled low area, contains a burial. This likelihood is based on the presence of modifications that are generally indicative of the presence of a burial and the feature's isolation from Feature A, the other petroglyph panel.

Feature C is a squared, C-shaped mound, approximately 50 cm (1.6 ft.) high and 2 m (6.6 ft.) wide (Figure 210). The foundation and top course are large cobbles that are mounded around the bottom with rubble. Very little cultural material is directly associated with this mound and Feature C's function is not clear. Kennedy (1983:33, 57) reports on his excavation within and adjacent to the feature. Cultural material found by Kennedy included *kukui*, a cowry shell, shark

vertebrae, petrel bone, a dog tooth, a volcanic glass fragment, a fragment of coconut shell, an *Isognomon* fishhook blank, and a bone fishhook.

Kennedy (1983:58) reports radiocarbon dating results for charcoal found at the bottom of a fire pit in an area approximately 4.5 m (15 ft.) from Feature C. The results from Beta Analytic, Lab number: Beta 9203, are: ^{14}C age: 140 B P; $^{13}\text{C}/^{12}\text{C}$ ratio: -23.97; Adjusted Age: 160±50 BP. Kennedy (1983:58) did not calibrate the date; the calibrated 2-sigma date range is 1661 to 1953 AD.

The site's function is interpreted as temporary habitation based on the presence of small craft items and tools, the evidence of repeated fires, and food remains. It also appears very likely that a burial is associated with Feature B. Preservation is recommended.

4.3.52.1 Testing Results

Considerable excavation was undertaken by Archaeological Consultants of Hawai'i (ACH), (see Kennedy 1984), at SIHP -26324 (ACH Site 22). Kennedy (1983:30) conducted test excavations near the large petroglyph panel (Feature A) and found little soil present. During the excavation, twelve human teeth and a human skull fragment that were presumed to be from the same young adult were recovered from the site, presumably from the entrance to the tube near the large petroglyph panel (Kennedy 1984:50, 57). Human remains were found "in a cache". Cultural material on the surface was recovered and included dog, pig, pufferfish, petrel, and shark bones, and a large amount of cultural material including cowry shells, coral, basalt abraders, a cache of black and white gaming stones, *kukui* endocarps, and a drilled cone shell. Additionally, See Appendix A for photographs from the Kennedy (1984) report related to this excavation. Neither the cultural material or burial were found during the current survey or during an earlier CSH field check (Shideler and Hammatt 2005:56).

Cultural Surveys Hawai'i contacted Mr. Joseph Kennedy, Principal Investigator of Archaeological Consultants of the Pacific (formerly ACH), in an effort to determine the whereabouts of the human remains and other materials documented in the Kennedy 1984 Kaloko/Kohanaiki work. Mr. Kennedy replied to CSH by phone on February 27, 2008 and informed us that all material from the area corresponding to the present project area was stolen from his O'ahu office years ago. As far as Cultural Surveys Hawai'i knows, these remains are no longer in the project area and there were no further remains identified at SIHP 50-10-27-26324 (ACH Site 22).

Given the previous testing conducted by ACH, as well as evidence of previous looting and modern disturbance, Cultural Surveys Hawai'i did not conduct any further test excavations of this site.

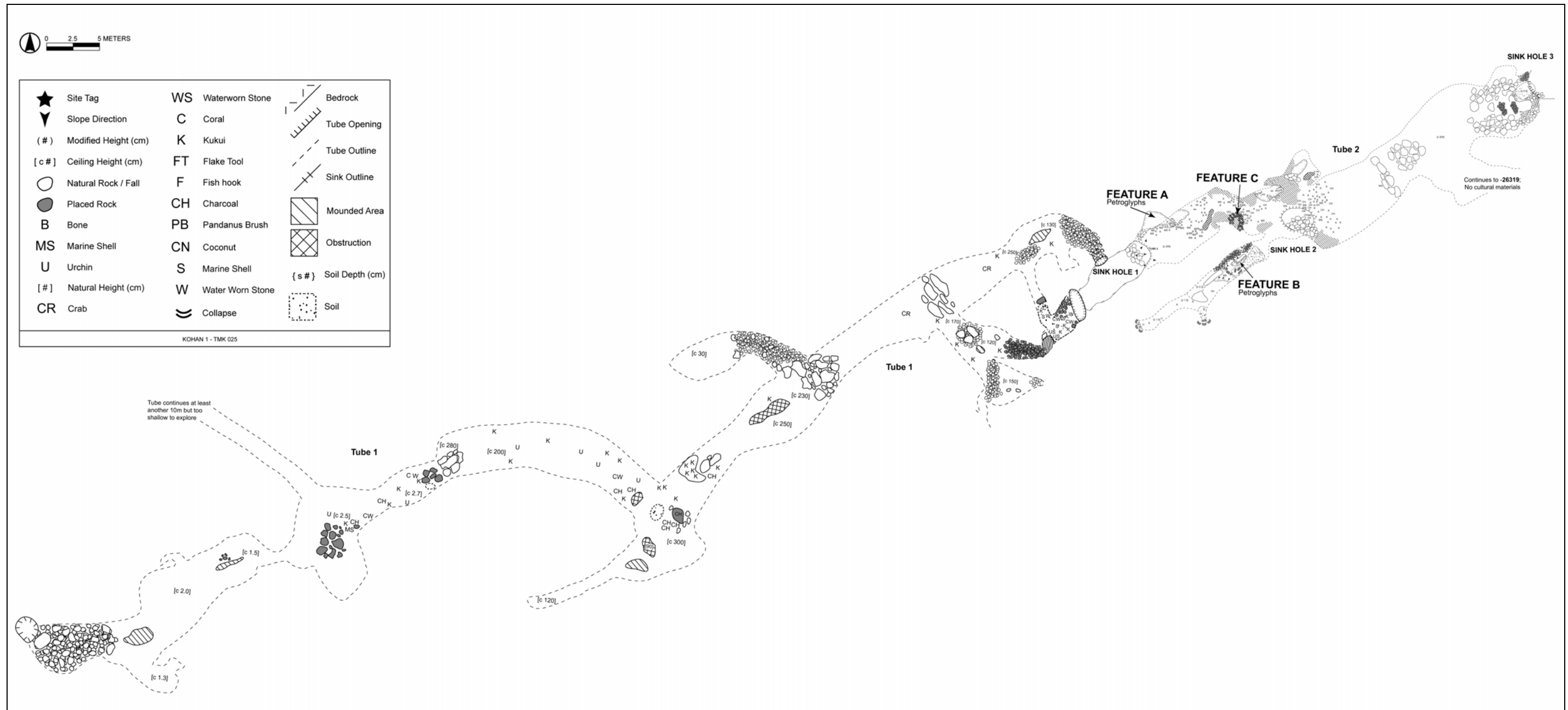


Figure 208. Site -26324, overview plan view map (see Figure 209 and Figure 210 for detail maps)

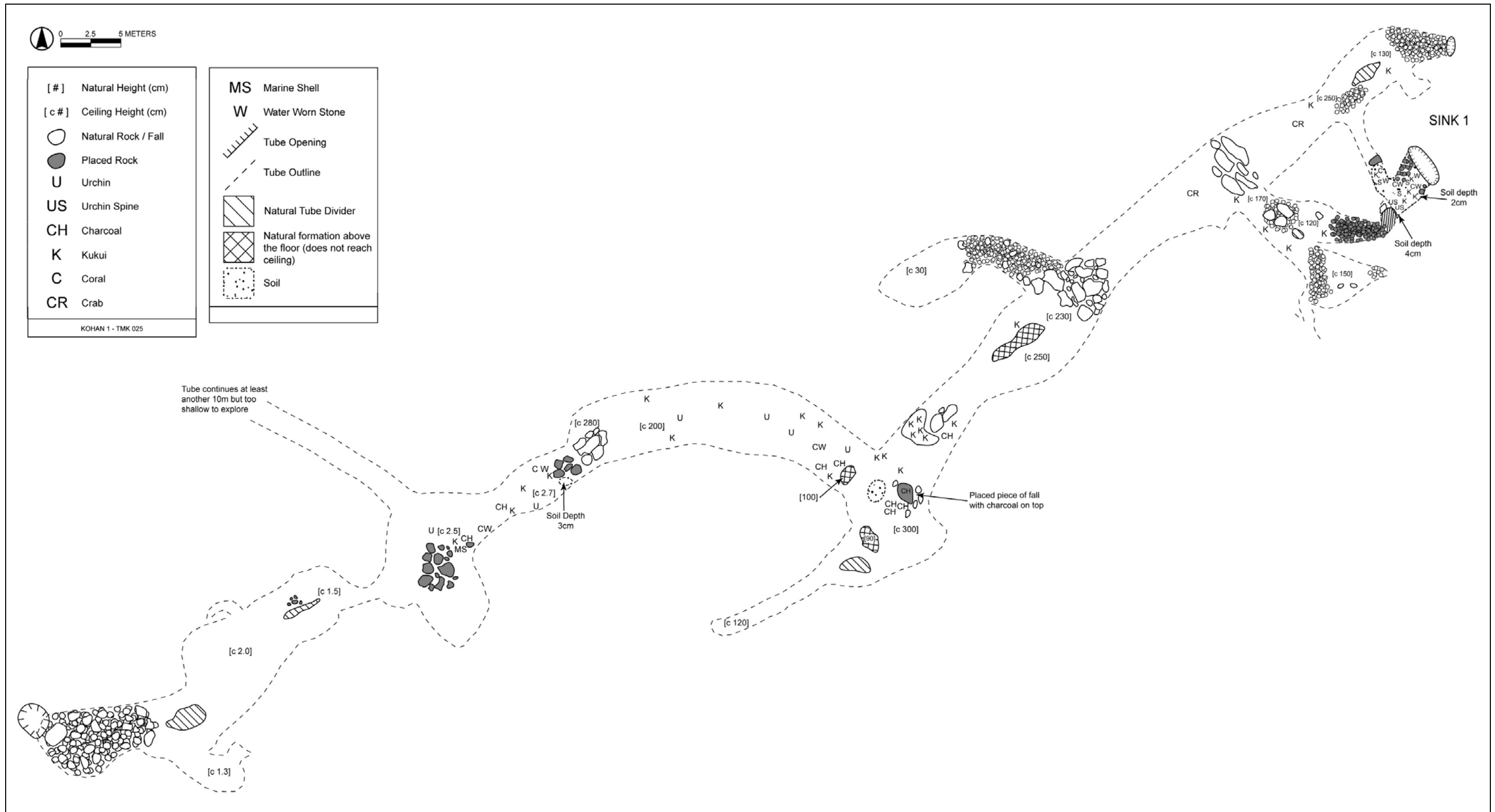


Figure 209. Site -26324, Tube 1, plan view

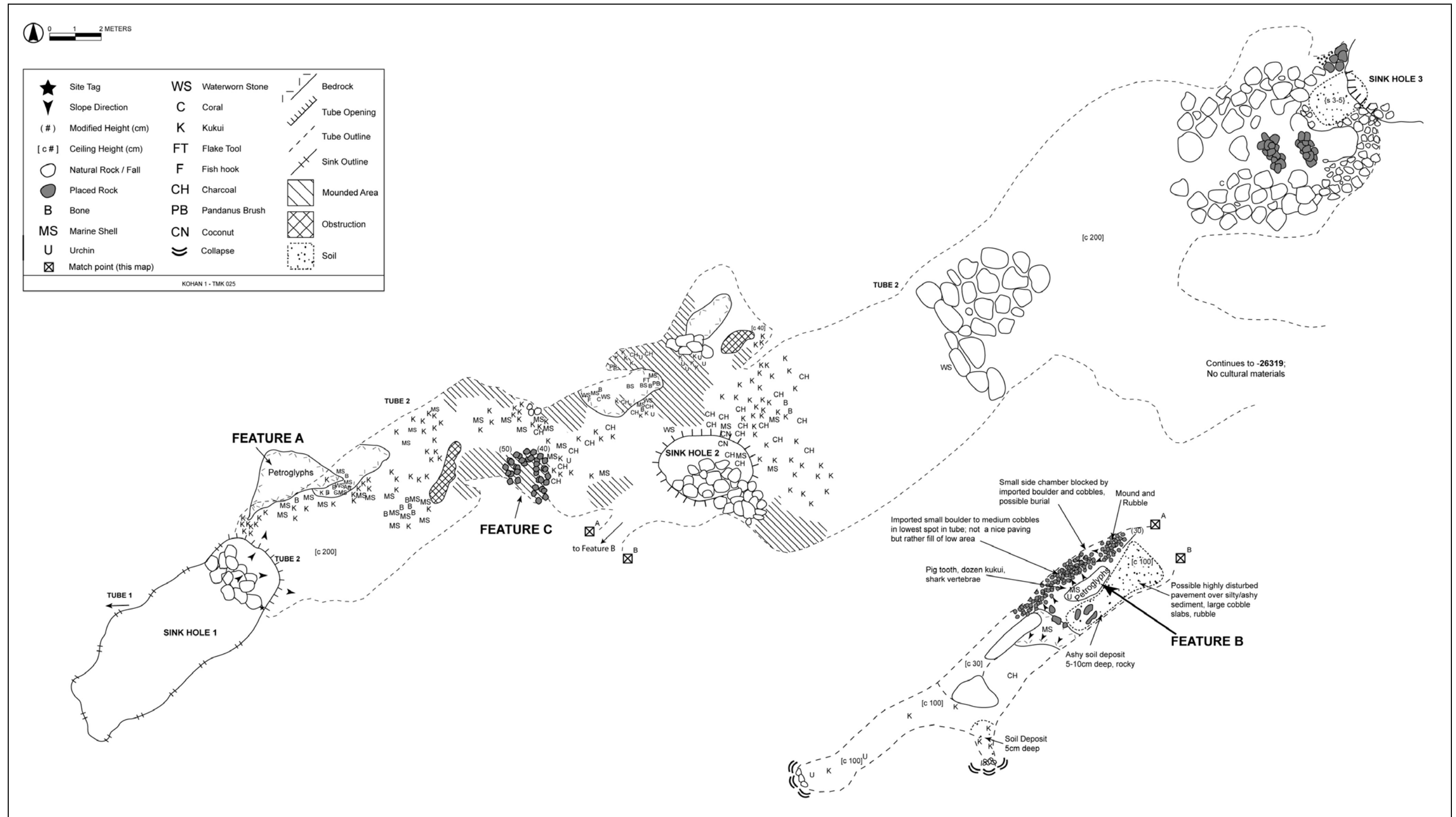


Figure 210. Site -26324, Tube 2 plan view



Figure 211. Site -26324, Sink 1, entrance to tube 1 at left, entrance to tube 2 at right

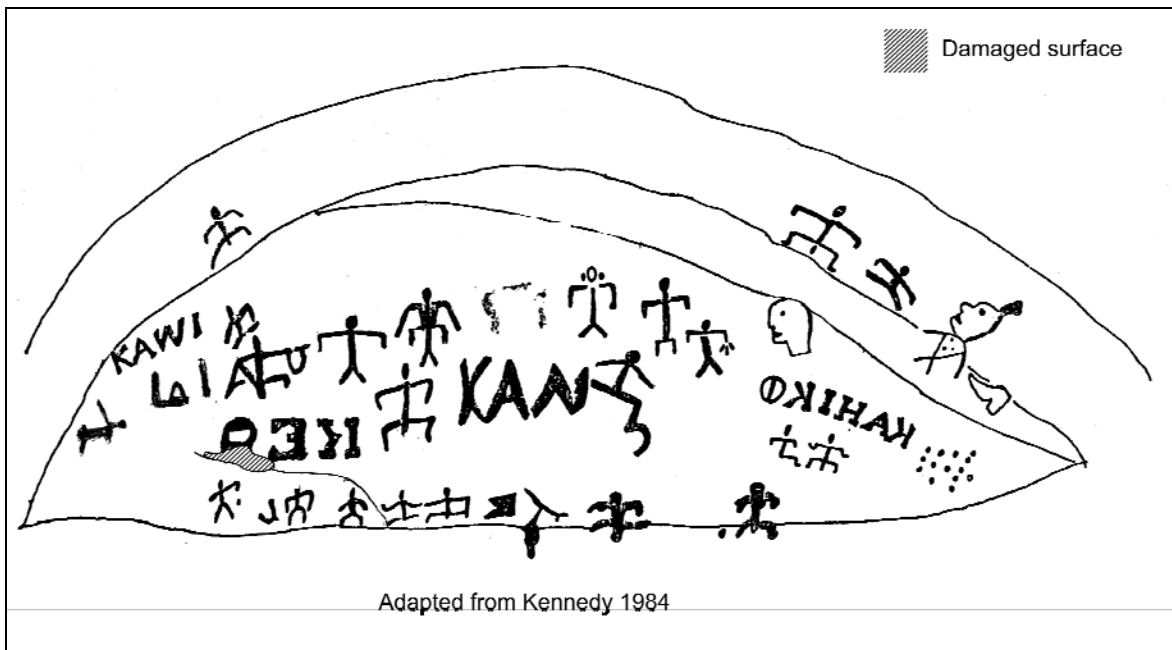


Figure 212. Site -26324, Feature A, panel drawing showing petroglyphs



Figure 213. Site -26324, Feature A, overview of petroglyph panel



Figure 214. Site -26324, Feature A overview with “KEO” petroglyph, view to northeast



Figure 215. Site -26324, Feature A, detail of human figure, view to north



Figure 216. Site -26324, Feature A, detail of human figure and head in profile (left), with probable shoe petroglyph (right)



Figure 217. Site -26324, Feature A, detail of human head in profile



Figure 218. Site -26324, Feature B petroglyphs

4.3.53 State Site # 50-10-27-26325

SIHP #	50-10-27-26325
FUNCTION:	Shelter
SITE TYPE:	Lava tube
TOTAL FEATURES:	2
DIMENSIONS:	12 m by 3.5 m (39.4 ft. by 11.5 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site -26325 consists of two lava tube shelters, Features A and B. Vegetation within the vicinity of the site is *koa haole* and various grasses.

Feature A is an east/west trending lava tube approximately 12 m (39.4 ft.) long and averages approximately 3.5 m (11.5 ft.) wide (Figure 219 and Figure 220). Immediately inside the tube entrance is a small shallow soil deposit that consists of a very sparse scattered midden including *kukui* and a few *Isognomon*. In addition to this small midden deposit, a few placed small boulders are alongside the soil deposit. Beyond this deposit, there are a number of placed *pāhoehoe* slabs. Two of the slabs are next to each other and immediately adjacent to the soil deposit; all the other slabs are piled across the tube. The piled slabs partially restrict access to the back of the tube but do not block it completely. Beyond the piled slabs there are no modifications or culture. Given the relatively small size of the tube, including its relatively low height and the very sparse midden, this tube likely functioned as a shelter.

Feature B is a small lava tube measuring 15 m (49.2 ft.) east/west by 2 m (6.6 ft.) north/south with ceiling heights ranging from 40-55 cm (1.3-1.8 ft.) (Figure 221). The entrance to Feature B is located at the east end of a small depression; Feature A is located at the west end. The tube opens into a chamber measuring 2 m (6.6 ft.) north/south by 4 m (13.1 ft.) east/west with a ceiling height of 55 cm (1.8 ft.). All evidence of cultural activity was found within this chamber. A total of three *kukui*, 1 whole urchin, and three pieces of cowry shell were identified. Three boulders appear to have been placed 3 m (9.8 ft.) from the entrance on the south side. The tube continues to the northeast for an additional 11 m (36.1 ft.), however, no cultural material or modifications were observed; the floor becomes rough 'a 'ā at this point.

The site's function is interpreted as shelter based on the small amount of midden, the small nature of the tubes, and little modification. Excavation potential is fair due to the presence of the 3 cm (0.1 ft.) soil deposit in Feature B's main chamber.

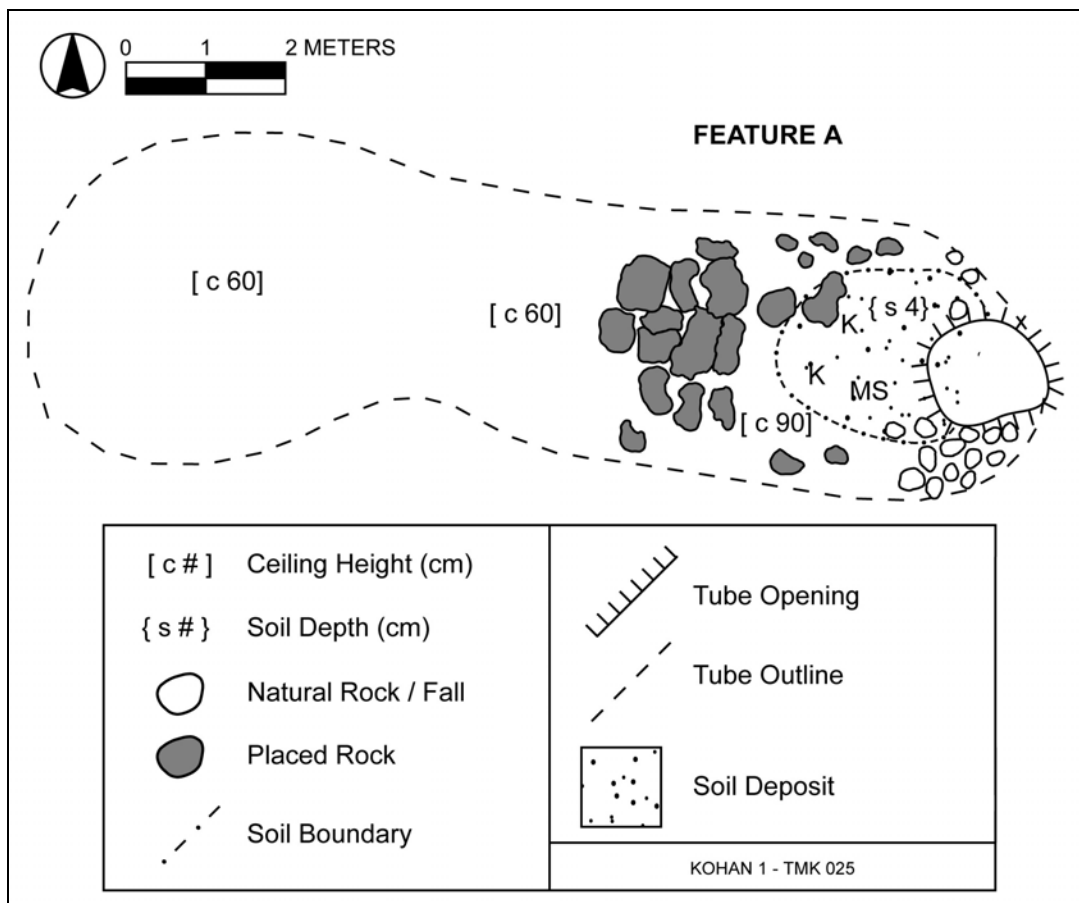


Figure 219. Site -26325, Feature A plan view



Figure 220. Site -26325, Feature A, showing placed boulders, view to west

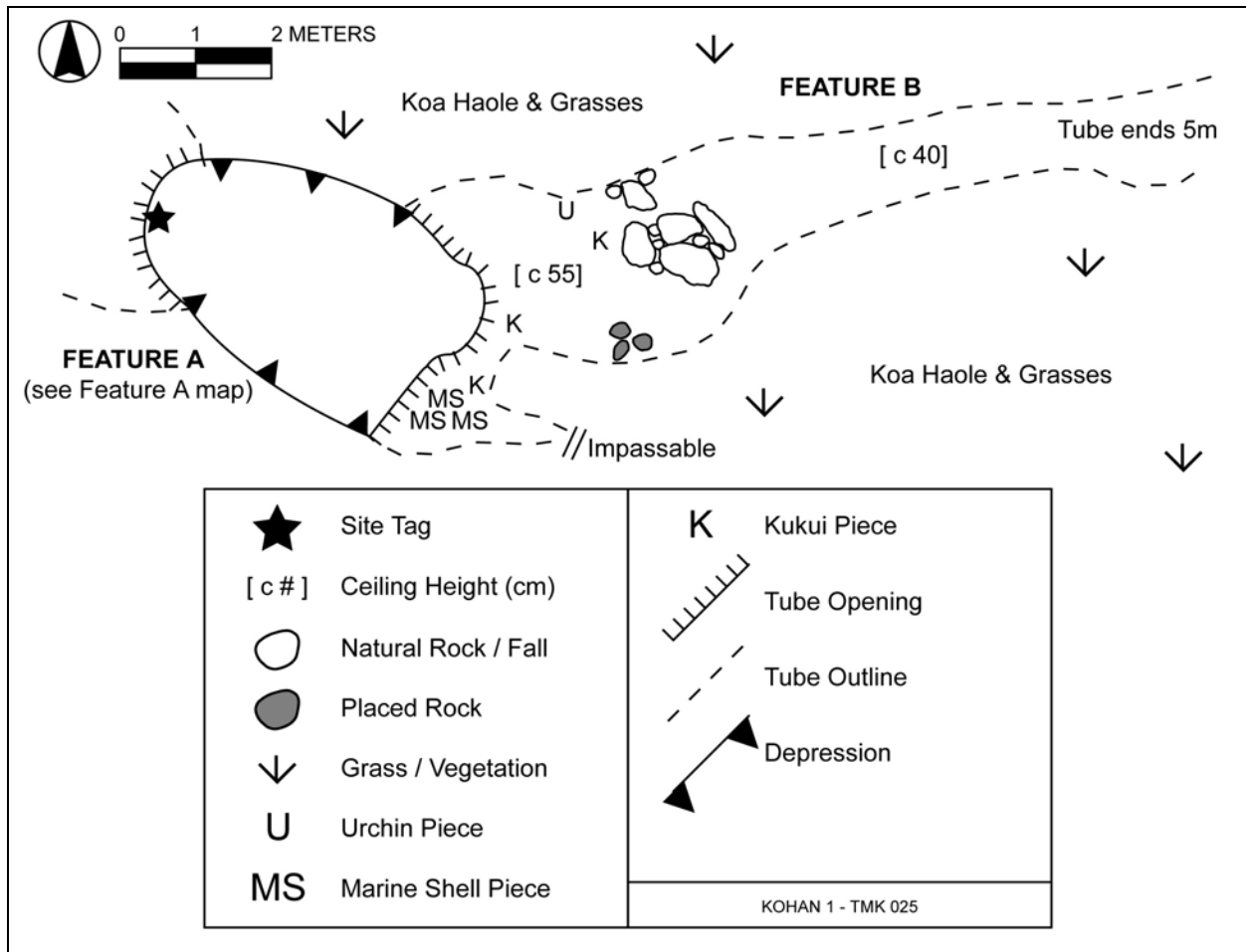


Figure 221. Site -26325, Feature B plan view

4.3.54 State Site # 50-10-27-26326

SIHP #	50-10-27-26326
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	4
DIMENSIONS:	10 m by 4 m (32.8 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	480 ft a.m.s.l.

DESCRIPTION: Site -26326 has no external or surface modifications. The site consists of four features/tubes (Features A-D) that are accessed from the surface by two sink holes/tube openings (Figure 222). *Kukui*, charcoal, and marine shell scatter are present in all features and there are a few instances of placed boulders, particularly in constructed tube entrances. A water worn stone is present on the surface outside the largest of the two sink holes. Based on the fair amount of midden within the tubes, the presence of the water worn stone, and some slight rock modifications, this site likely functioned as temporary habitation. The absence of any extensive modification indicates that the site was temporary habitation.

Feature A (Figure 222 and Figure 224) is a northeast trending lava tube that runs for approximately 15 m (49.2 ft.). The entrance to the tube itself has been constructed. No cultural material is present beyond 6 m (19.7 ft.) into the tube. The midden is primarily in the soil deposit at the entrance to the tube. This midden consists of *kukui*, urchin shells, charcoal, and various types of marine shell, including *Nerita*. Approximately 10 *Nerita* shells were observed; all the tops of the shells had puncture holes in the same general location. Feature A's function is interpreted as temporary habitation based on minimal modifications to the tube itself and the small amount of midden.

Feature B is a lava tube that extends approximately 28 m (91.7 ft.) in a northeast direction (Figure 222 and Figure 225). Linear boulder placements are around the tube's entrance. At the tube's entrance is a soil deposit with a maximum depth of 5 cm (0.16 ft.). This area also contains some charcoal, and a medium density of *kukui* and marine shell. Another, lighter density area of *kukui*, marine shell, and some charcoal is 3-4 m (9.8-13.1 ft.) from the caves entrance. *Kukui* was located in the tube for another 12-14 m (39.4-45.9 ft.), but at a very low density.

Feature C is a lava tube approximately 10 m (32.8 ft.) in a southwest direction (Figure 222 and Figure 226). Like Feature B, this tube has a soil deposit, *kukui*, marine shell, and some charcoal at the cave's entrance. Additionally, boulder alignments are placed around the cave's entrance. This tube also has a small density of *kukui* scattered throughout the length of the cave.

Feature D is a lava tube that extends for approximately 14 m (45.9 ft.) in a southwest direction (Figure 222 and Figure 227). This tube also has a soil deposit, boulder alignments, *kukui*, marine shell, and some charcoal around the tube's entrance. There is an area of piled boulders, some soil deposit, *kukui*, and marine shell are approximately 7 m (23 ft.) from the entrance.

The site's function is interpreted as temporary habitation. Based on the presence of midden and charcoal, and the absence of any extensive modifications, the site was utilized as temporary habitation.

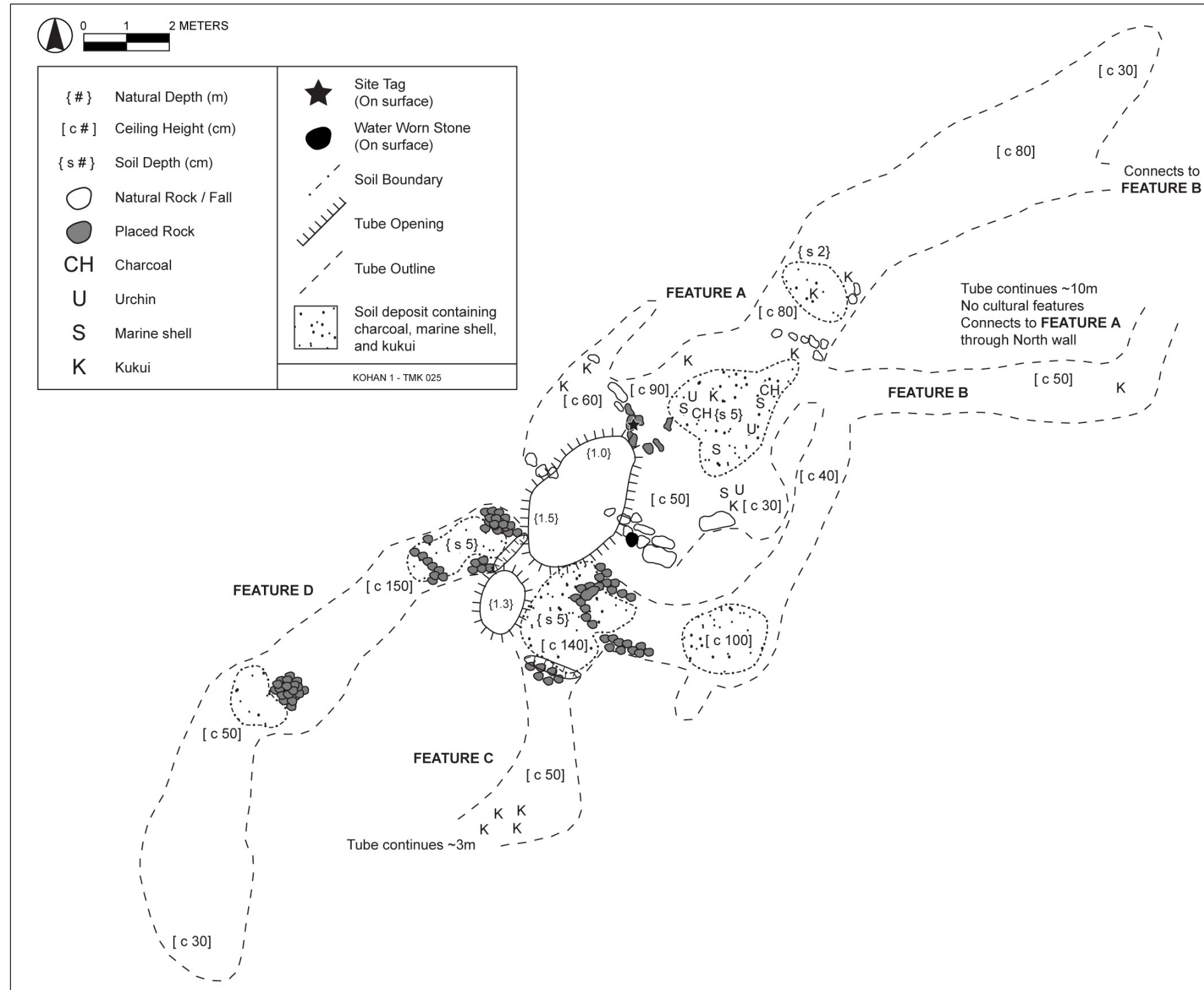


Figure 222. Site -26326, overview



Figure 223. Site -26326, overview of large tube opening with water worn stone in the foreground, view to northwest



Figure 224. Site -26326, Feature A, just inside the entrance, view to northeast



Figure 225. Site -26326, Feature B, entrance, view to southeast



Figure 226. Site -26326, Feature C, entrance, view to southwest



Figure 227. Site -26326, Feature D, entrance, view to west

4.3.55 State Site # 50-10-27-26327

SIHP #	50-10-27-26327
FUNCTION:	Shelter
SITE TYPE:	Cave
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7.5 m by 5 m (80.7 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	480 ft a.m.s.l.

DESCRIPTION: Site -26327 is a lava tube measuring 7.5 m (24.6 ft.) east/west by 5 m (16.4 ft.) north/south with an average height of 70 cm (2.3 ft.) (Figure 228, Figure 229, and Figure 230). The tube entrance is located on the west end of a moderate depression and measures 3 m (9.8 ft.) in width by 90 cm (3 ft.) in height. The tube opens immediately into a chamber measuring 7.5 m by 5m (24.6 ft. by 16.4 ft.) and has a rather large scatter (100+) of *kukui* endocarps (Figure 230). Multiple large cobbles to small boulders have been placed near the sides of the tube. While the tube is accessible at both the north and south ends of its opening, the north end is blocked by natural fall of several large cobbles and boulders. The tube continues for a short distance beyond this blockage but is inaccessible due to the natural fall. The south end tube continues for 10 m (32.8 ft.) with various scatters of *kukui*. The tube eventually narrows after 10 m (32.8 ft.) and is no longer passable.

The site's function is interpreted as shelter based on presence of the *kukui* scatters and modified boulder placement. Excavation potential is poor due to a lack of soil deposit.



Figure 228. Site -26327, main entrance of cave, view to west

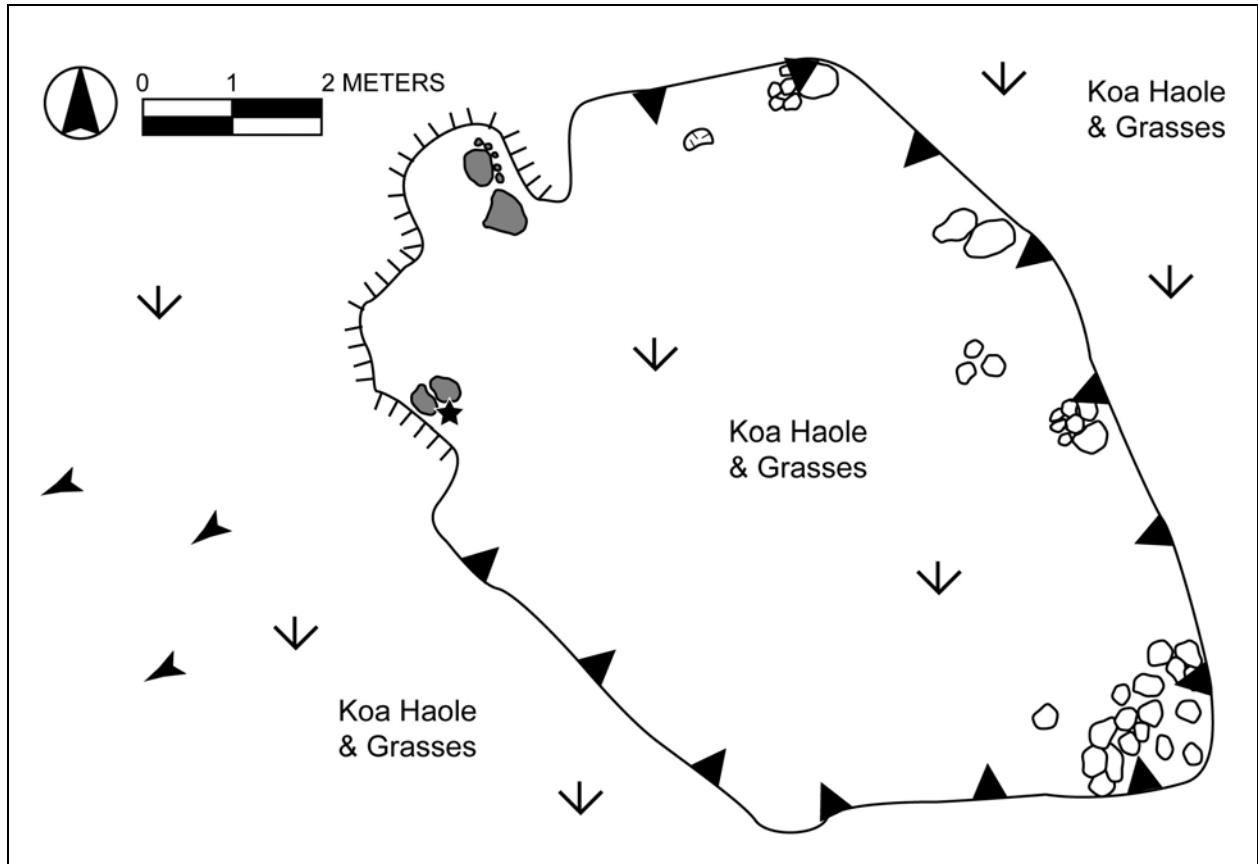


Figure 229. Site -26327, exterior plan view

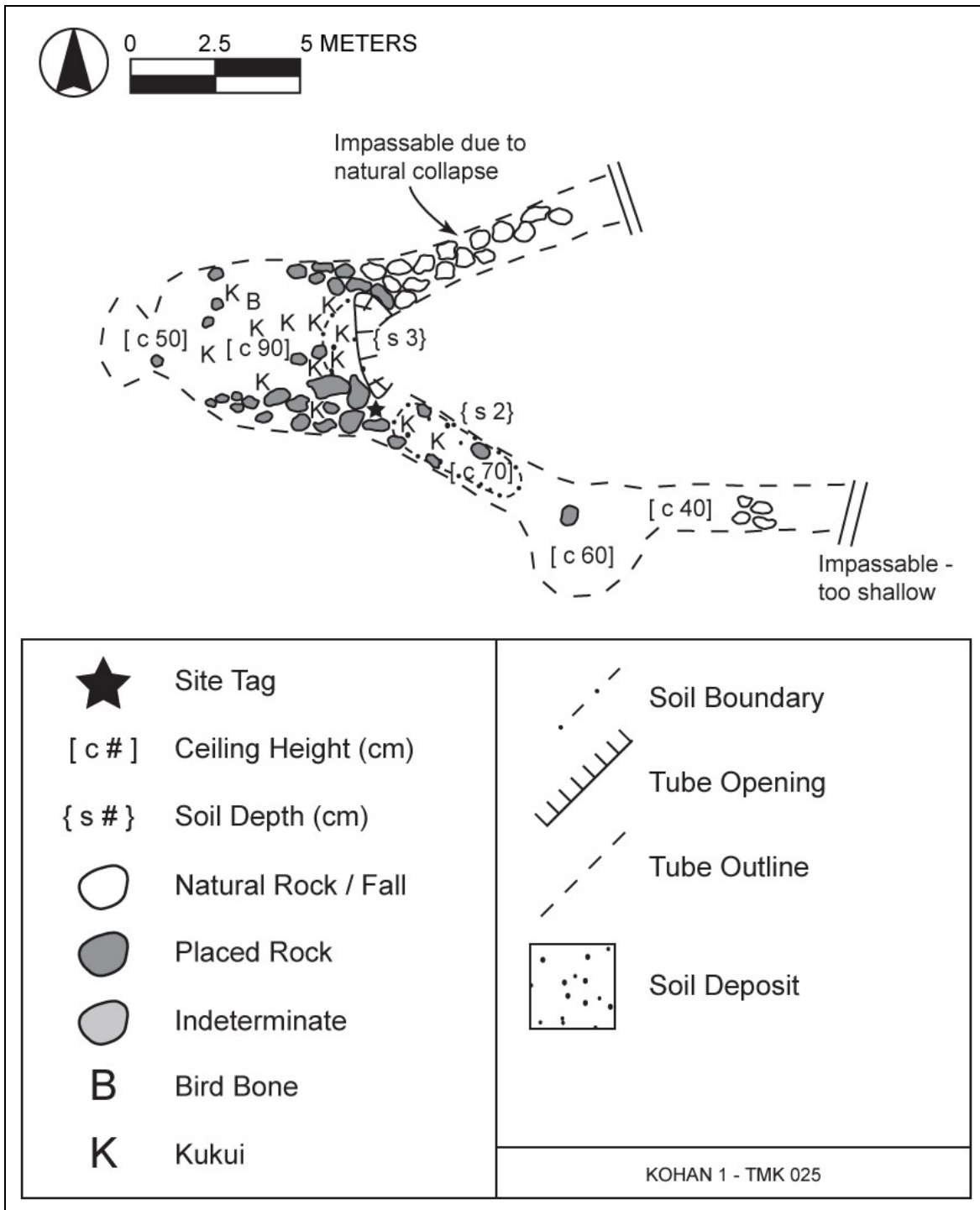


Figure 230. Site -26327, interior plan view

4.3.56 State Site # 50-10-27-26328

SIHP #	50-10-27-26328
FUNCTION:	Temporary Habitation
SITE TYPE:	Platform
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4.5 m by 4.5 m (14.8 ft. by 14.8 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	450 ft a.m.s.l.

DESCRIPTION: Site -26328 is a platform built on top of a bedrock outcrop (Figure 231 and Figure 232). The platform measures approximately 4.5 m by 4.5 m (14.8 ft. by 14.8 ft.) and is flush with the bedrock on the southeast side. All the other sides of the platform have been built up to create a leveled area. The southwest side is the highest above the bedrock, where the *pāhoehoe* slabs and cobbles are approximately 60 cm (2 ft.) above the bedrock. The platform's built-up sides have no facing and slope down gently until they become flush with the surrounding bedrock making the platform similar to a leveled mound. The platform surface is very flat, level, and smooth and is comprised of *pāhoehoe* cobbles and small inlaid *pāhoehoe* slabs. No cultural material is present on the surface.

This site's function is interpreted as temporary habitation. The site's location is favorable; it is on the face of a slope above most of the terrain to the south and west, and has a clear view of the 'a'ā. The amount of modification and the required labor investment to construct this platform indicates more intensive utilization than a shelter site. The platform slabs and boulders that comprise the surface's fine paving do not indicate a burial site. Based on the absence of any midden, other cultural materials, or a constructed hearth preclude this site from being considered a recurrent use or permanent habitation site, however, the construction style and paving are characteristic of habitation sites.



Figure 231. Site -26328, overview of platform, site -10712 wall visible in background, view to south

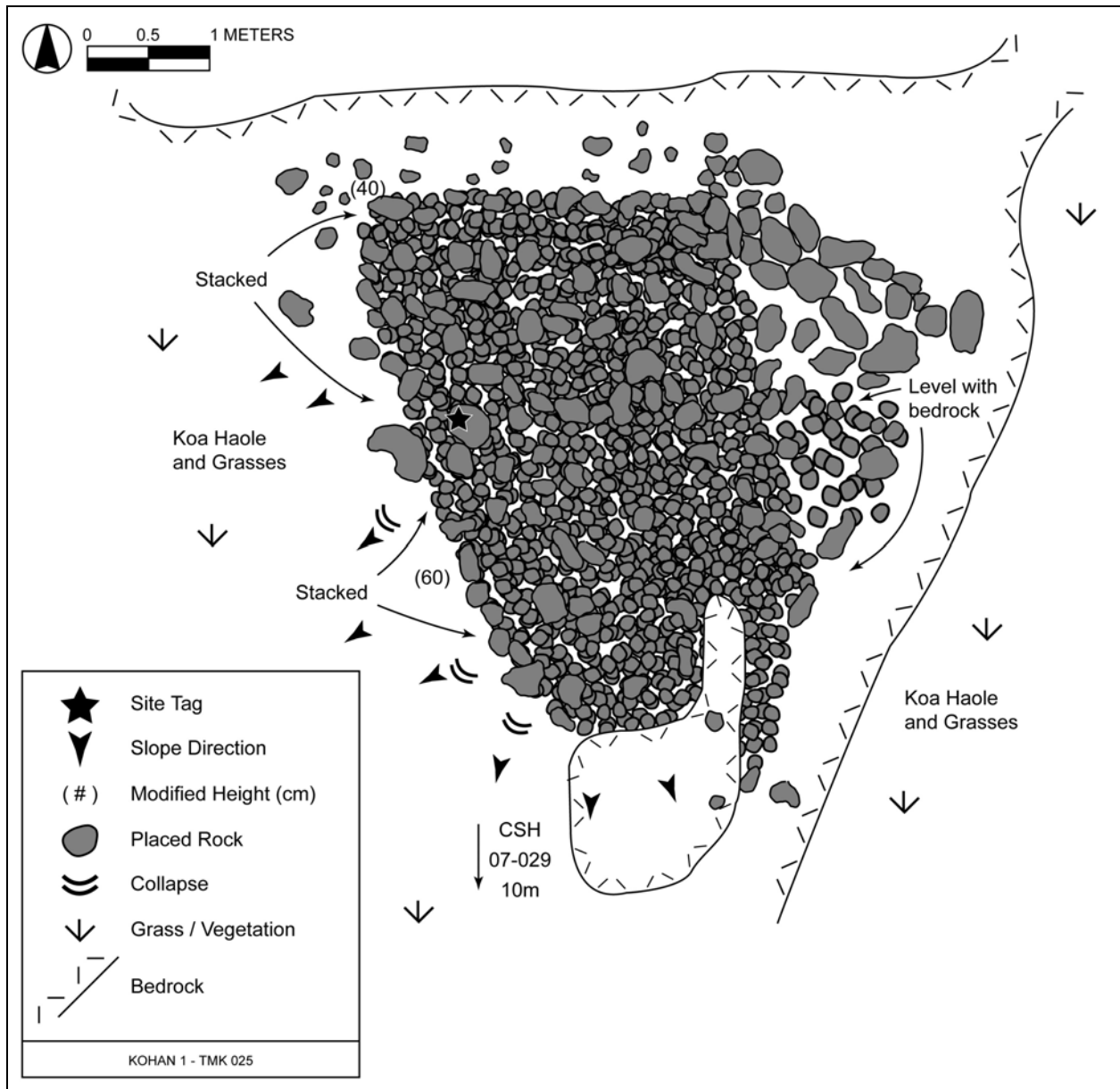


Figure 232. Site -26328, plan view

4.3.57 State Site # 50-10-27-26329

SIHP #	50-10-27-26329
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	3.5 m by 3.5 m (11.5 ft. by 11.5 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	440 ft a.m.s.l.

DESCRIPTION: Site -26329 is a single C-shaped enclosure (Figure 234 and Figure 233). The enclosure is open to the west; the natural bedrock outcrop is raised approximately 50 cm (1.6 ft.) above the floor of the enclosure. The enclosure's interior measures approximately 1.5 m (4.9 ft.) north/south by 1.5 m (4.9 ft.) east/west and is faced on all three interior sides (north, east, south). The base of the east face consists of two uprights. A small hollow space is behind the larger of the two uprights. The stacked construction style prevents access to this hollow space; removal of the larger upright would allow access, although it would also result in the collapse of the enclosure's east side. The enclosure's interior has a *pāhoehoe* slab / cobble floor. Although the floor is not very smooth, it is relatively flat and level. Some collapse appears to have fallen down onto the enclosure floor. The enclosure is built into a natural small depression. The exterior of the enclosure slopes slightly down from the interior facing (approximately 10-15 cm / 0.33-.5 ft.) and is roughly flush with the surrounding ground surface. The enclosure interior is stacked 4-5 courses high and 70 cm (2.3 ft.) high.

The site's function is interpreted as temporary habitation. The lack of any formal hearth feature and absence of exterior facing of the enclosure walls suggest temporary rather than permanent habitation. The small size of the C-shape enclosure is also more indicative of temporary rather than permanent habitation. The paucity of such structures previously found during this survey of TMK 25, and the site's relative proximity to site -26331 (approximately 80 m / 262.5 ft.), indicates a possible association with the permanent habitation site complex.

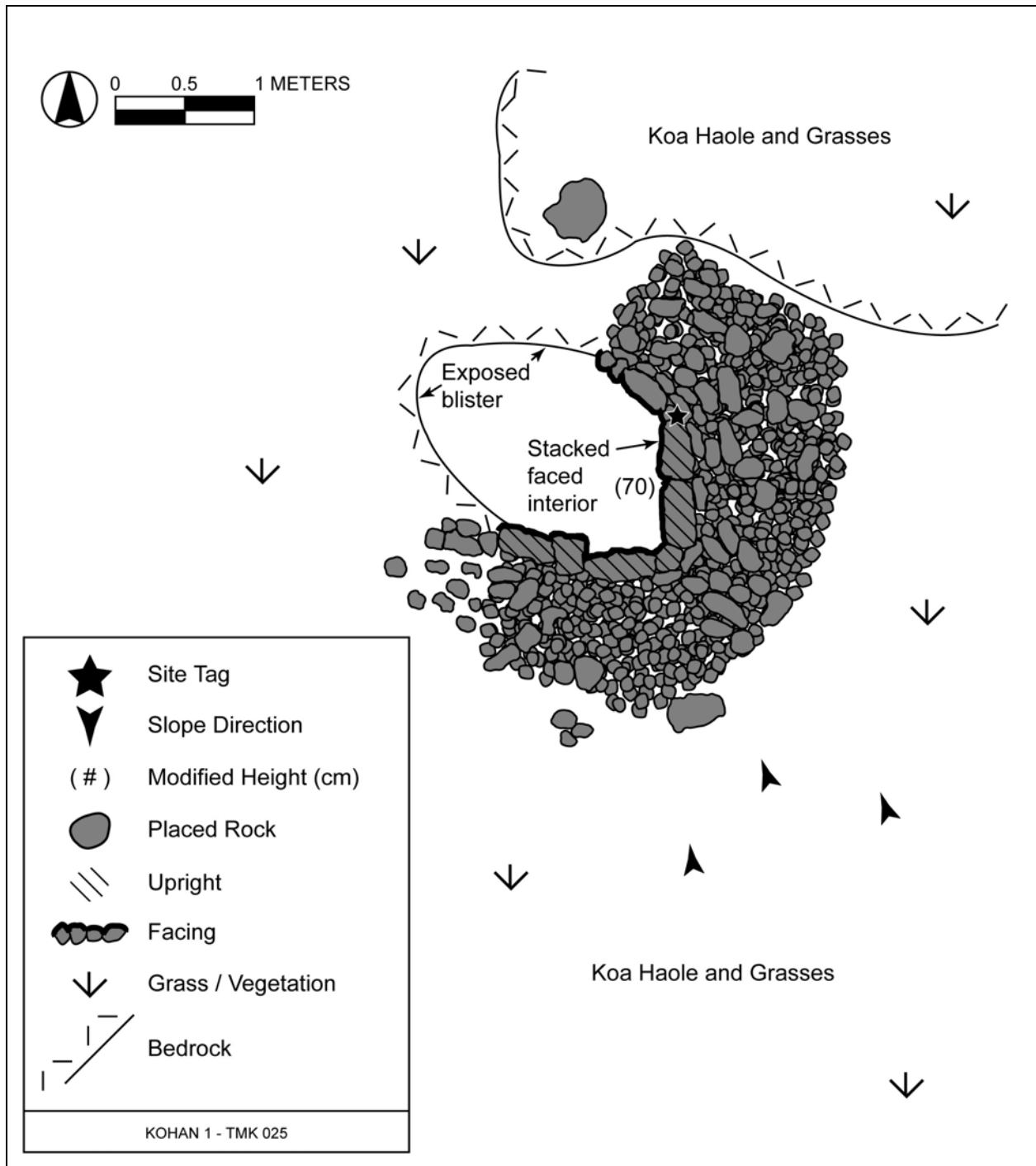


Figure 233. Site -26329, plan view



Figure 234. Site -26329 overview, view to east

4.3.58 State Site # 50-10-27-26330

SIHP #	50-10-27-26330
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	8 m by 5 m (26.3 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	460 ft a.m.s.l.

DESCRIPTION: Site -26330 consists of an area of exposed bedrock that has partially collapsed to create two habitation areas (see Figure 235 and Figure 236). The outcrop's west end is small, approximately 3 m by 3 m (9.8 ft. by 9.8 ft.), and contains no midden or cultural materials but has a single placed small boulder. The northeastern-most area is the larger of the two; it is approximately 5 m (9.8 ft.) long, and has a concentration of piled boulders and cobbles at its north end. The piled boulders and cobbles may be from clearing the floor. A constructed wall is at the southwest end of the second blister shelter. This wall extends from the shelter floor to the blister ceiling and appears to have been constructed to create a more sheltered, restricted area by blocking access into the habitation from a crack in the blisters top exterior surface. Additionally, this southwest portion of the second habitation area has an upright that creates a partially constructed entrance. Immediately inside this entrance, and continuing along the southwest side, is a soil deposit approximately 3 m (9.8 ft.) long and approximately 5 cm (0.16 ft.) deep. A small amount of scattered midden including *kukui*, urchin, cowry, and other marine shell, is on the surface of this soil deposit and on the floor around the deposit.

The site's function is interpreted as temporary habitation based on the small size of the two habitation areas and the sparse midden. Both factors indicate that the site was not an intensively utilized habitation, such as a recurrent-use site. The labor investment required for modifications including multiple placed boulders, floor clearing, the partially constructed entrance, and the constructed wall indicate that the site was more intensively used than a single use shelter. Therefore, the site is temporary habitation.



Figure 235. Site -26330, showing constructed wall inside of blister shelter, view to southwest

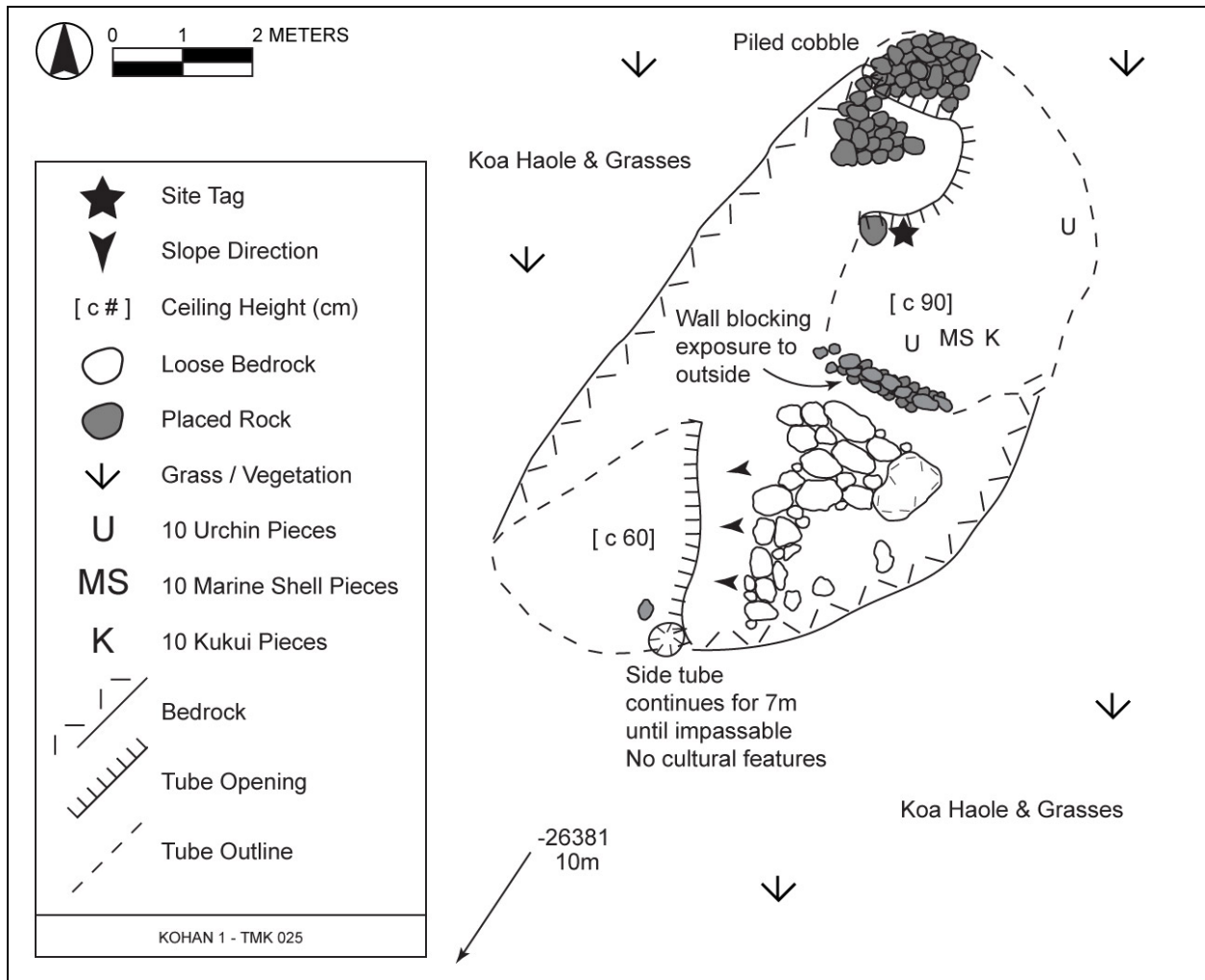


Figure 236. Site -26330, plan view

4.3.59 State Site # 50-10-27-26331

SIHP #	50-10-27-26331
FUNCTION:	Permanent Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	5
DIMENSIONS:	7 m by 11 m (22.9 ft. by 36 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	445 ft a.m.s.l.

DESCRIPTION: Site -26331 is a habitation complex consisting of five features (Figure 237). Features A and B are enclosures; Feature C is a cairn; Feature D is a paved area; and Feature E is a terrace. Vegetation within and adjacent to the site is thick grass with scattered *koa haole*.

Feature A is an oval enclosure that measures 3.6 m by 3.3 m (11.8 ft. by 10.8 ft.); the interior measures 1.85 m by 2.1 m (6 ft. by 6.8 ft.) (Figure 237 and Figure 238). The enclosure walls are constructed of subangular basalt boulders and cobbles (Figure 238). The interior is 2 to 3 courses high (30-55 cm / 0.98-1.8 ft.) and the exterior is 4 courses (80 cm / 2.6 ft. maximum height). The walls are typically 60 cm thick. The interior wall is mostly cobbles and the northwest portion of the interior wall is leveled with cobbles. The probable entrance is on the east side where the wall is narrower and lower. The northeast edge is wide and forms a raised platform that measures 1.1 m by 1.3 m and is 35 cm above (3.3 ft. by 4.3 ft. and 1.1 ft. above) the interior surface. A horizontal slab lies on the top of the middle of the *makai* wall.

Feature B is an enclosure that is roughly J-shaped with the north wall being the longest at 7.2 m long (23.6 ft.), 90 cm wide (2.9 ft.), and 30 cm (0.98 ft.) high (Figure 237, Figure 239, and Figure 241). The wall is 8 m (26.2 ft.) southeast of Feature A; it bends around the *makai* side running south for a length of 4.1 m, 80 cm wide and 30 cm high (1.2 ft., 2.6 ft. and 0.98 ft.), and then turns east (the hook of the backward J) for a length of 3.2 m, 30 cm high and 30-80 cm wide (10.4 ft., 0.98 ft., 0.98-2.6 ft.). The interior is mostly soil with scattered basalt boulders and *koa haole* and grasses. Feature B occupies the brow of a small bluff with good views of the coast to the north and south and catches a good breeze. The interior is level and with cobbles and boulders in the northeast corner so as to form an interior pavement 1.2 m by 2 m (3.9 ft. by 6.6 ft.). Wall construction is primarily of piled basalt boulders. The interior is approximately 2 m by 5 m (6.6 ft. by 16.4 ft.) with the long axis *mauka/makai*. A possible path leading down to Feature A abuts the outside of the southwest corner.

Feature C is a cairn located 3 m south of the southwest corner of Feature B, and is constructed at a high point on the low knoll with a good view *makai* (Figure 237 and Figure 240). The cairn is roughly square, 1.1 m (3.6 ft.) on each side, and comprised of approximately 30 subangular basalt cobbles and boulders with a height of 50 cm (1.6 ft.). An upright *pāhoehoe* slab forms the northwest corner. The cairn's interior is similar to a collapsed cupboard and reddish *pāhoehoe* large cobbles may have been selected for the interior. The reddish interior cobbles may indicate the cairn was a *kuahu* or ritual cairn based on its proximity to the Feature D habitation pavement.

Feature D lies immediately *mauka* of Feature C (Figure 237 and Figure 240) and has the appearance of a very rough, slightly concave, paved area approximately 3.4 m by 3.4 m (11.1 ft.

by 11.1 ft.) and is roughly square. The paving is of subangular boulders and cobbles and may have been a habitation surface. The feature is bound on all sides by low *pāhoehoe* bedrock. Noni and *koa haole* grow in the interior. No internal features could be discerned.

Feature E is a *makai* terrace immediately adjacent to Feature C (Figure 241). The terrace is retained by a mounded wall on the *makai* side 3.2 m long north/south by 1.3 m wide east/west (10.5 ft. by 4.2 ft.) retaining a relatively level area 2.6 m wide on the *makai* side (8.5 ft.), 2.6 m long east/west (8.5 ft.), and 1.6 wide (5.2 ft.) at the *mauka* side (immediately west of Feature C, the cairn). Cobbles and boulders appear to have been used to create the western half of the relatively level terrace surface. Soil and bedrock compose the east half. The north side of the terrace is delineated by an alignment of four boulders parallel to and 1 m (3.3 ft.) south of Feature B.

The site's function is interpreted as a permanent habitation complex. Excavation potential appears poor to fair, however since these features may constitute a pre-contact permanent habitation or *kauhale*, preservation or data recovery may be appropriate.

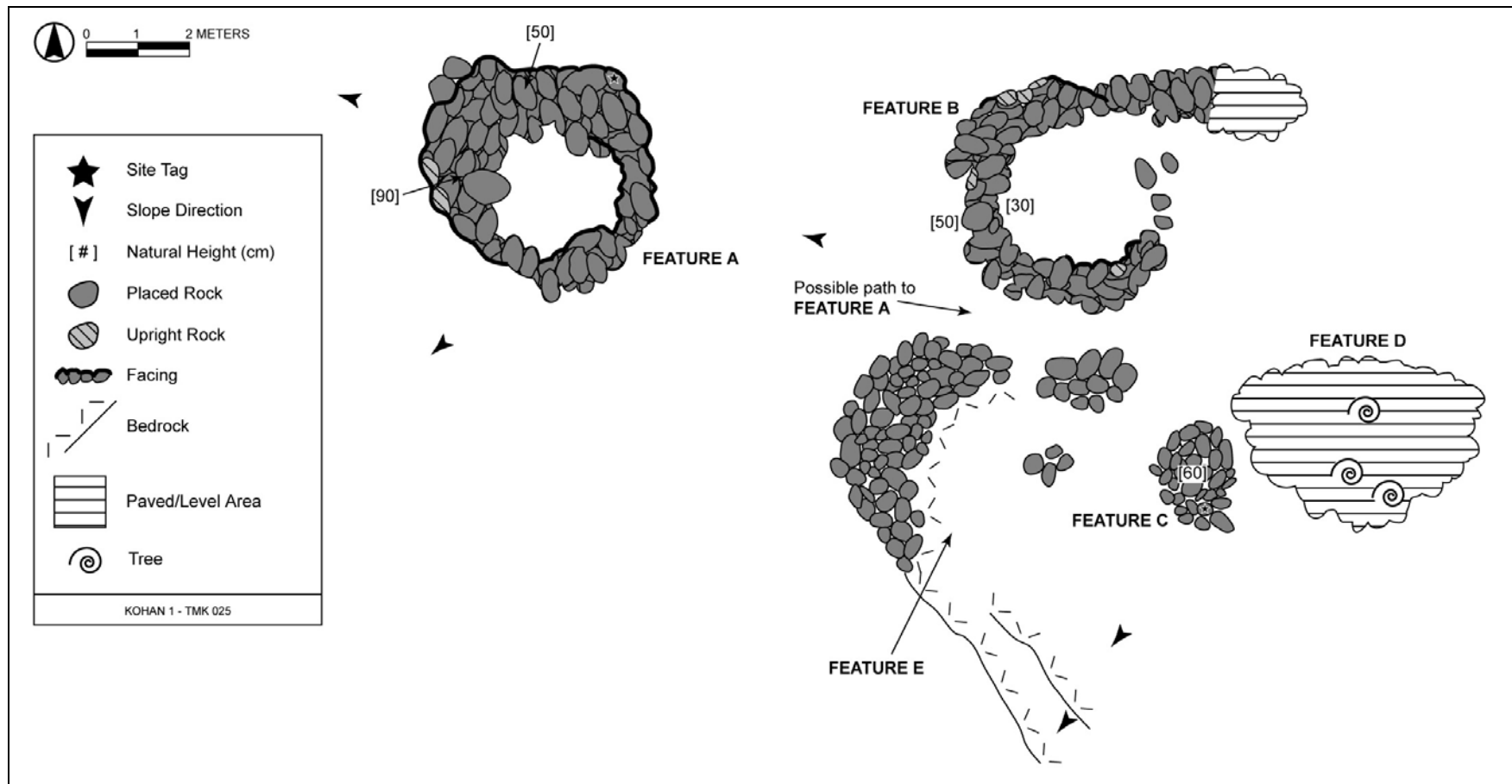


Figure 237. Site -26331, plan view



Figure 238. Site -26331, Feature A, view to southeast



Figure 239. Site -26331, Feature B, view to southeast

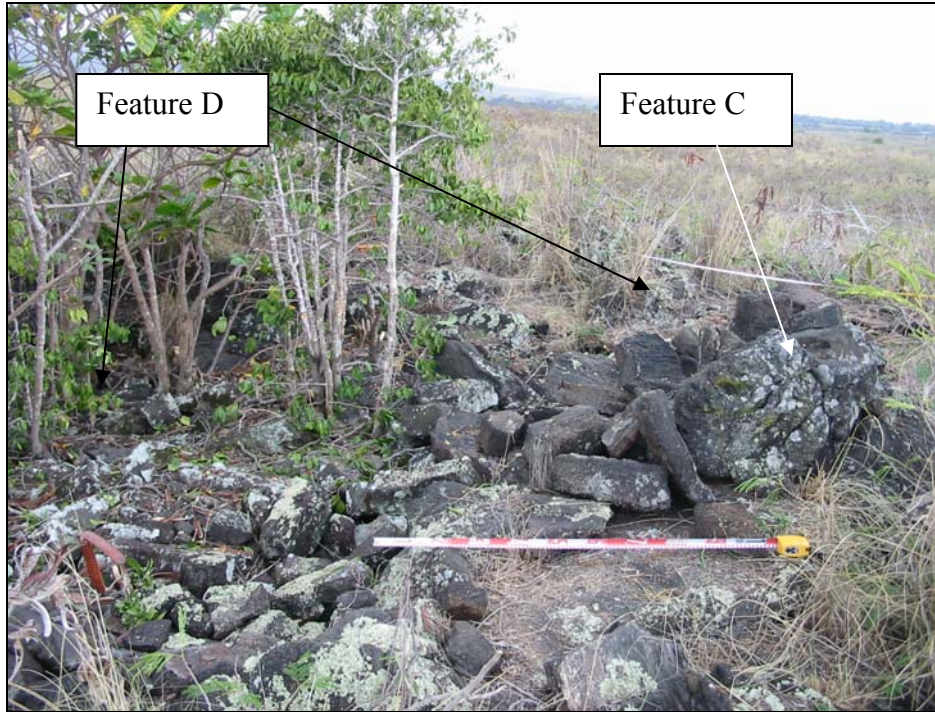


Figure 240. Site -26331, Feature D and Feature C, view to southeast

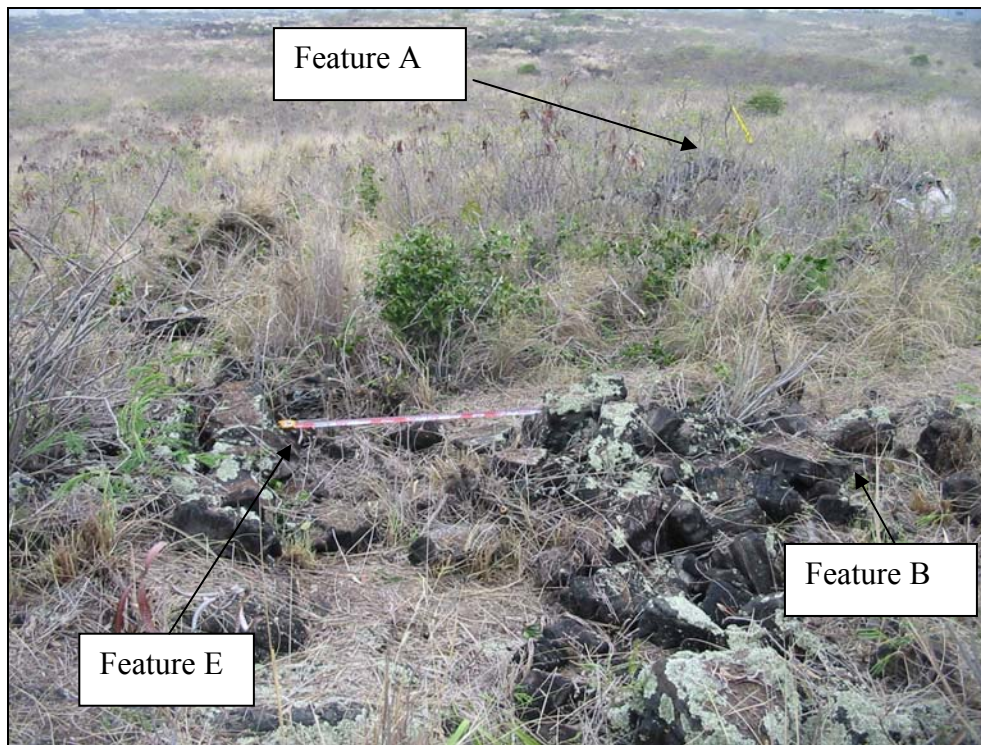


Figure 241. Site -26331, showing pathway between Feature E and B heading toward Feature A in background, view to west

4.3.60 State Site # 50-10-27-26332

SIHP #	50-10-27-26332
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4 m by 4 m (13.1 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	440 ft a.m.s.l.

DESCRIPTION: Site -26332 (Figure 242 and Figure 243) is a semi-circular enclosure constructed on top of an exposed bedrock outcrop. The enclosure measures approximately 4 m by 4 m (13.1 ft. x 13.1 ft.). It is open/ not enclosed on the southwest side. The enclosure's interior includes two uprights. The enclosure's north face has some facing; the height of this faced portion is 60 cm (2 ft.). The faced portion of the exterior shows no collapse and is stacked approximately 3-4 courses high. The remainder of the enclosure is partially collapsed, particularly on the northwest side. The ground surface inside of the enclosure is exposed bedrock and is naturally level.

The site's function is interpreted as temporary habitation. The lack of soil and the enclosure's placement directly on top of exposed bedrock indicates the site was not used for agricultural purposes. The enclosure's relatively small size and the labor investment to construct the enclosure's faced portion indicate temporary habitation. The enclosure's size also precludes recurrent use or animal husbandry site functions.



Figure 242. Site -26332, overview of enclosure, view to northeast

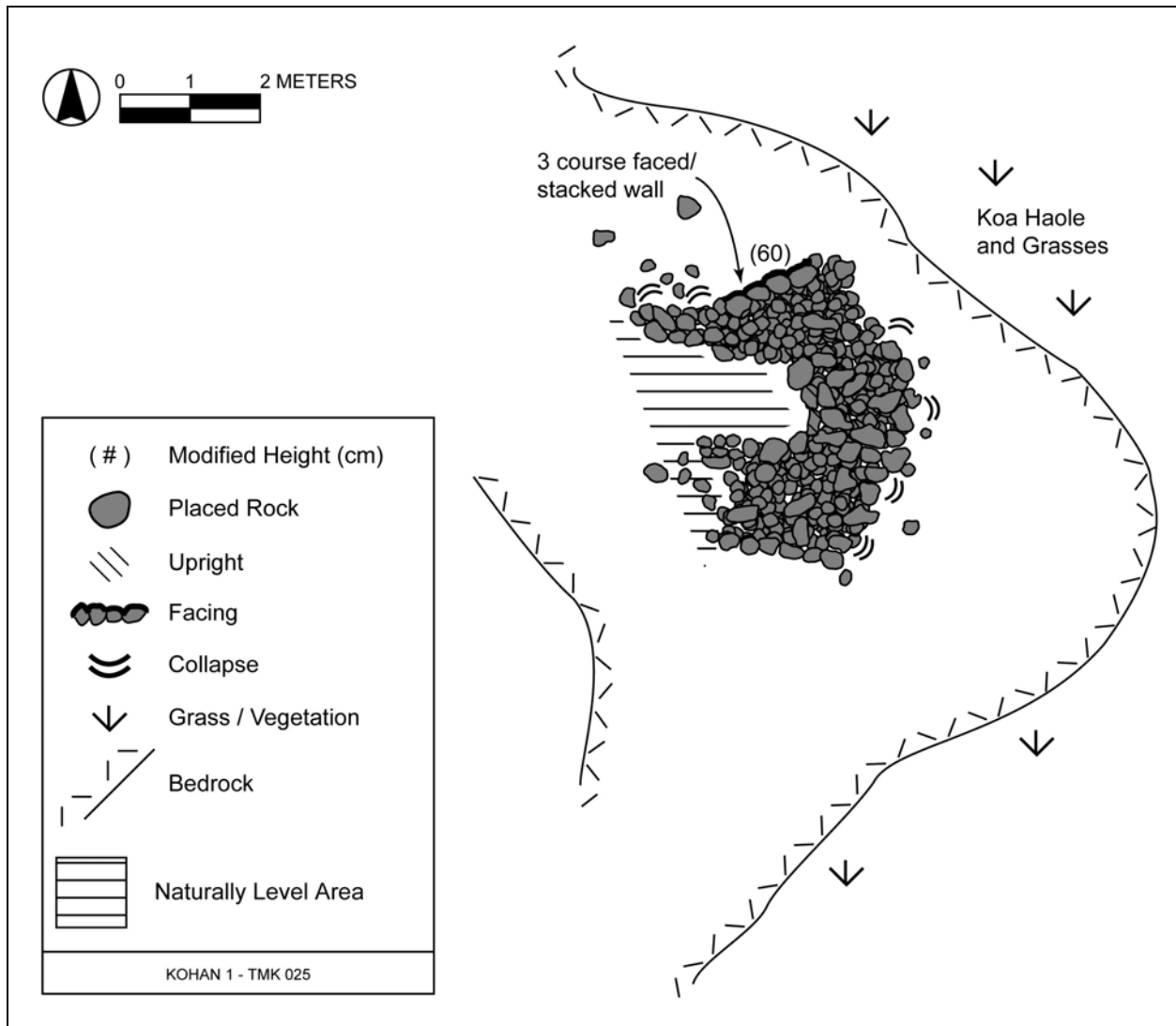


Figure 243. Site -26332, plan view

4.3.61 State Site # 50-10-27-26333

SIHP #	50-10-27-26333
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	4
DIMENSIONS:	80 m by 1-10 m (262.5 ft. by 3.3-32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	420 ft a.m.s.l.

DESCRIPTION: Site -26333 consists of a 2.5 m by 3.2 m (8.2 ft. by 10.5 ft.) sink that opens into a lava tube (Figure 244 and Figure 245). The tube itself is oriented east-west and is approximately 60 m (196.9 ft.) in length and 1-8 m (3.3-26.3 ft.) in width. The site consists of four features (A-D).

Feature A (Figure 244 and Figure 246) consists of two leveled/terraced areas near the tube's entrance; it appears that some collapsed boulders have been removed to produce a level surface. **Feature B** (Figure 244) consists of small boulders that have been placed near the entrance, along the northern wall of the tube where there is a small area of midden consisting of charcoal, *kukui*, marine shell, urchin, with some mongoose and goat bone. **Feature C** (Figure 245) is another area of linear boulder placement, located approximately 20 m (65.6 ft.) into the tube's interior. **Feature D** (Figure 245), a small boulder and cobble pile, is located approximately 7 m (23 ft.) from Feature C.

Approximately 30 m (98.4 ft.) *makai* of the tube's entrance is another small opening, measuring approximately 1 m by 0.80 m (3.3 ft. by 2.6 ft.). This smaller entrance has a soil deposit measuring 3-5 cm (0.1-.16 ft.) in depth with *kukui*, charcoal, marine shell, and urchin scattered throughout. The tube continues for approximately 20 m (65.6 ft.) past the small opening and ends at site -26334, where the opening is too small to access.

The site's function is interpreted as shelter based on the midden evidence and the surface leveling. Both factors indicate that the site was not an intensively utilized habitation. The labor investment required for modifications including terraces, multiple placed boulders and cobbles, and floor clearing, is low and indicate that the site was used for shelter.

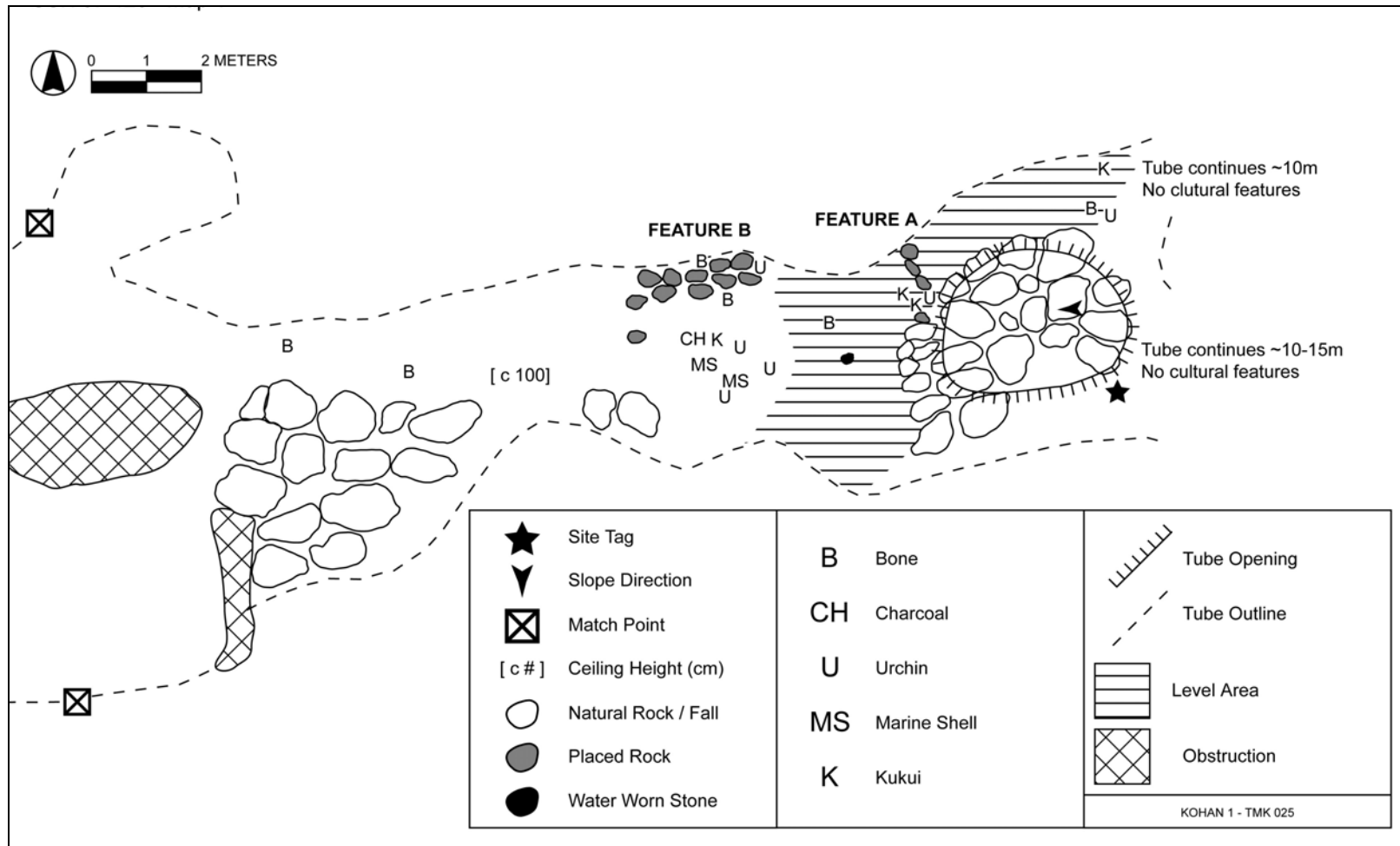


Figure 244. Site -26333, plan view (1 of 2, match points relate to Figure 245)

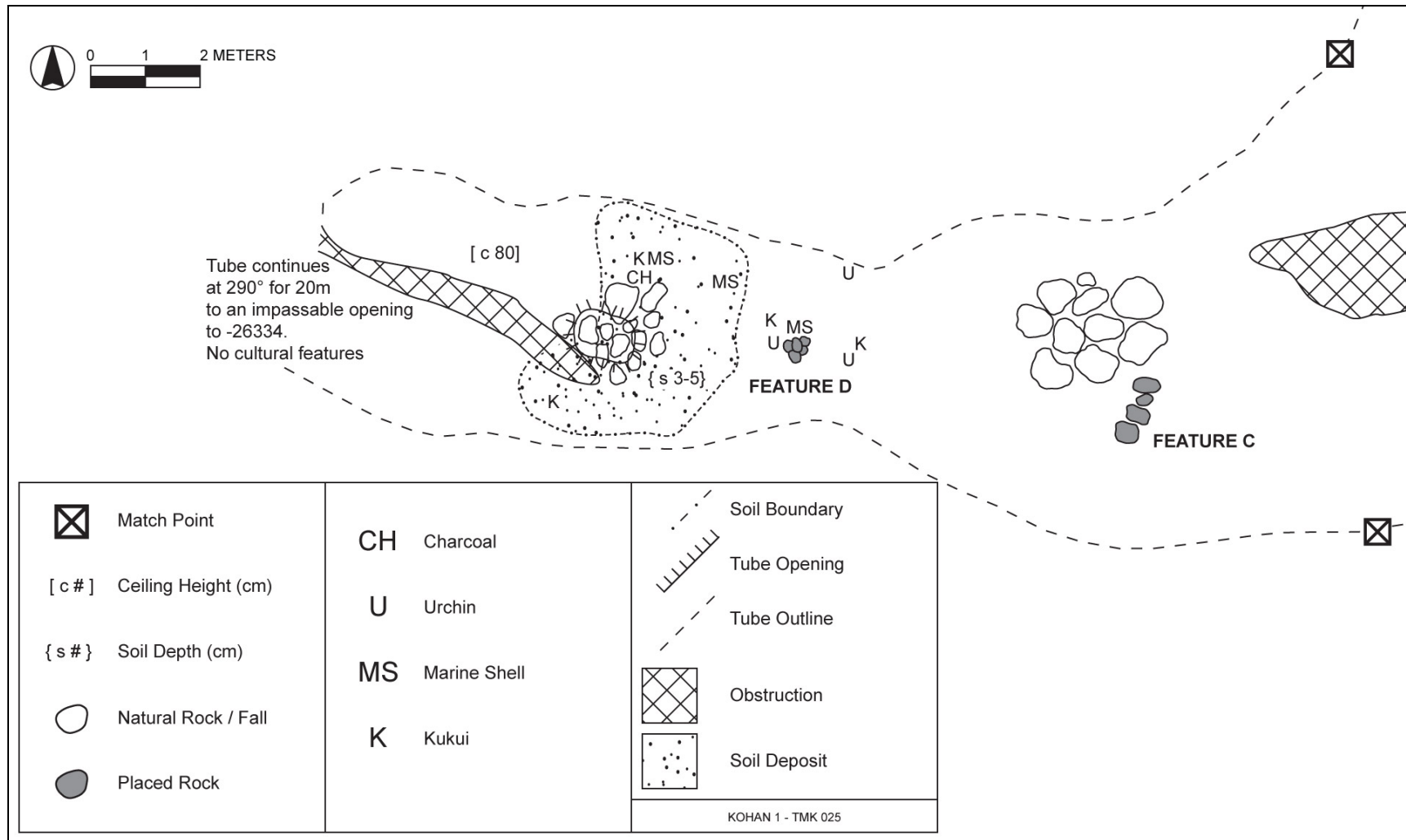


Figure 245. Site -26333, plan view (2 of 2, match points relate to Figure 244)



Figure 246. Site -26333, showing paved/terraced area (Feature A), view to east

4.3.62 State Site # 50-10-27-26334

SIHP #	50-10-27-26334
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	5
DIMENSIONS:	36 m by 40 m (118.1 ft. by 131.2 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	410 ft a.m.s.l.

DESCRIPTION: CSH -26334 is a braided lava tube system segment and surface modification located just south of the current end of Huliko'a road. The site consists of four sinks and five features (A-E), two of which (Feature B and Feature D) are surface features and the rest of which are within lava tubes. Vegetation within the vicinity of the site consists of *koa haole* and various grasses.

Sink 1 is not attached by lava tubes to the other sinks, and has a single lava tube (Tube 1, Feature A) extending off of it (Figure 247). **Sink 2** is a small low sink with several small lava tubes radiating from it, and the sink measures approximately 4 m (13.1 ft.) southeast/northwest. Sink 2 is adjacent to Feature C, Feature B is located just to the northwest, and Feature D is located just to the southeast (Figure 248). **Sink 3** is a small triangular skylight (approximately 1.2 m diameter), 1.5 m (4.9 ft.) deep. **Sink 4** is the largest of the four sinks, and consists of a large collapse approximately 8 m (26.2 ft.) long northwest/southeast. Tube 2 and Feature E extend west off Sink 4 (Figure 249). A small blister (Tube 3) extends east off the sink and has a small amount of marine shell in it.

Feature A (Figure 247 and Figure 250) consists of modification to the lava tube (Tube 1) that extends west from Sink 1. This temporary habitation lava tube extends 10 m (32.8 ft.), and then splits into 2 tubes, each of which are accessible for another 4 m (13.1 ft.). Abundant midden is present in the light zone at the entrance, and there are placed cobbles roughly piled along the south edge of the tube. This stone alignment just inside the entrance creates a work area along the south edge of the tube. A coral hammer stone cobble was also found just inside the entrance to the west. The entrance is typically 0.5-1.15 m (1.6-3.77 ft.) high and 3 m (9.8 ft.) wide. The midden scatter present in the entrance's interior, primarily on the west side, consists of *Cypraea caputserpentis*, *Nerita polita*, *Theodoxus* sp., *Isognomon* sp., *kukui*, and sea urchin.

Feature B (Figure 248 and Figure 251) is a triangular paving (or very low platform) on the surface, located northwest side of Sink 2 (northeast of Sink 4). The paving is about 2 m by 4 m across and is fairly rough and informal, consisting of the clearing of large debris to create a more level surface.

Feature C (Figure 248 and Figure 252) is a filled crevice on the southeast side of the sink that closes the *makai* most tube of site -26333. The modification is primarily small to large angular *pāhoehoe* cobbles and restricts the small natural access tube to site -26333.

Feature D (Figure 248 and Figure 253) is a small cairn to the southeast of Sink 2. The cairn is about 75 cm high and 50-70 cm in diameter, and is constructed of small to large angular *pāhoehoe* cobbles.

Feature E (Figure 249 and Figure 254) is a constructed entrance at the northwest end of Sink 4, where it leads to Tube 2. The construction consists of a partial wall ranging from 75 cm to 115 cm in height, and between 4 and 6 courses tall. It is primarily built from large angular *pāhoehoe* cobbles and small boulders.

The site's function is interpreted as temporary habitation based on the presence of midden and small portable artifacts, and the lack of any highly formal modification to the cave interiors. The site modifications and midden deposits are more extensive than short-term shelter, suggesting intermittent habitation at least, although the modification of the tubes and sinks and the low ceiling height within the tubes does not suggest more recurrent habitation. Excavation potential is fair, although there are no major soil deposits. The ashy soil areas could be dated, and excavating Feature B, paving/platform, is recommended to date the structure.

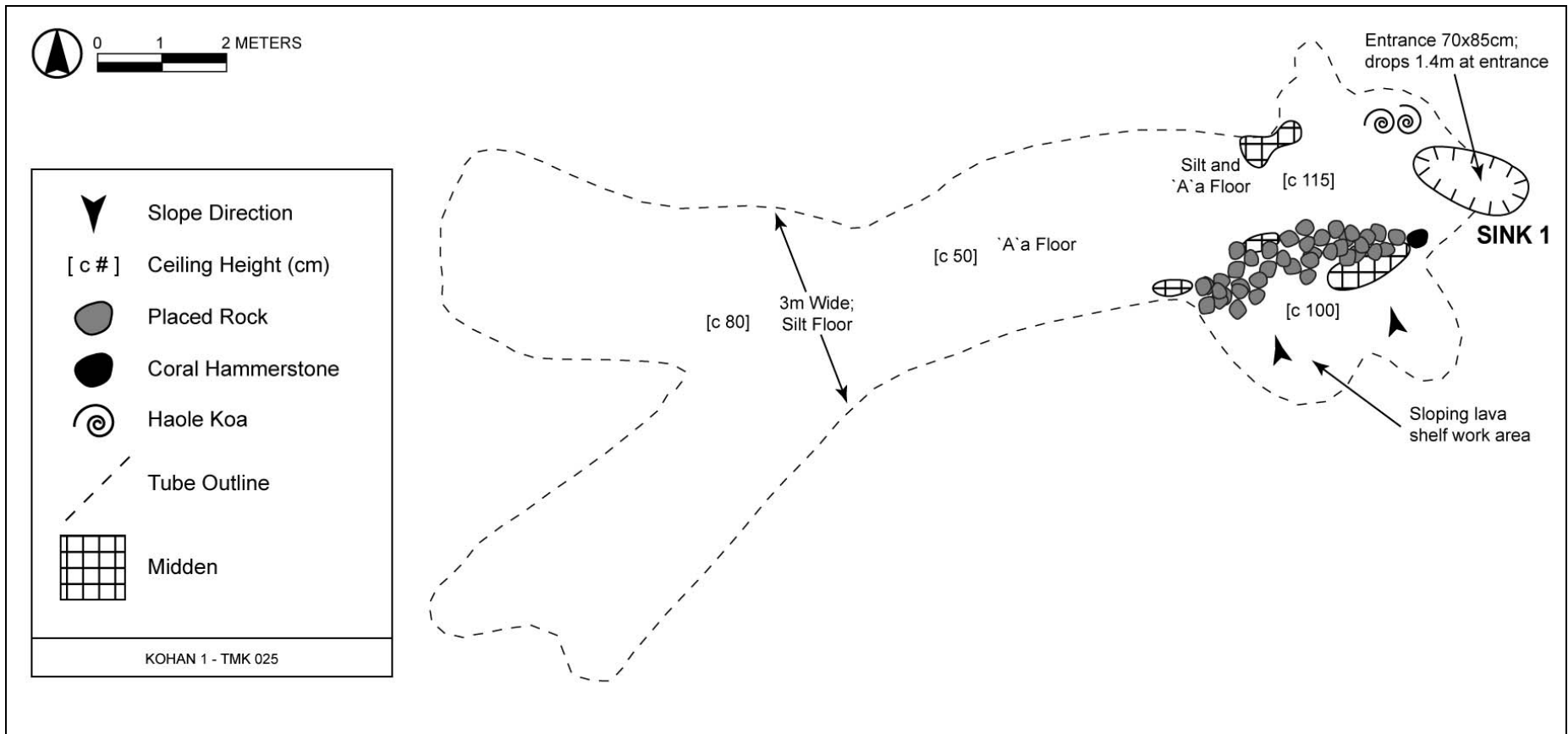


Figure 247. Site -26334, Tube 1 and Feature A, modified lava tube extending west from Sink 1, plan view

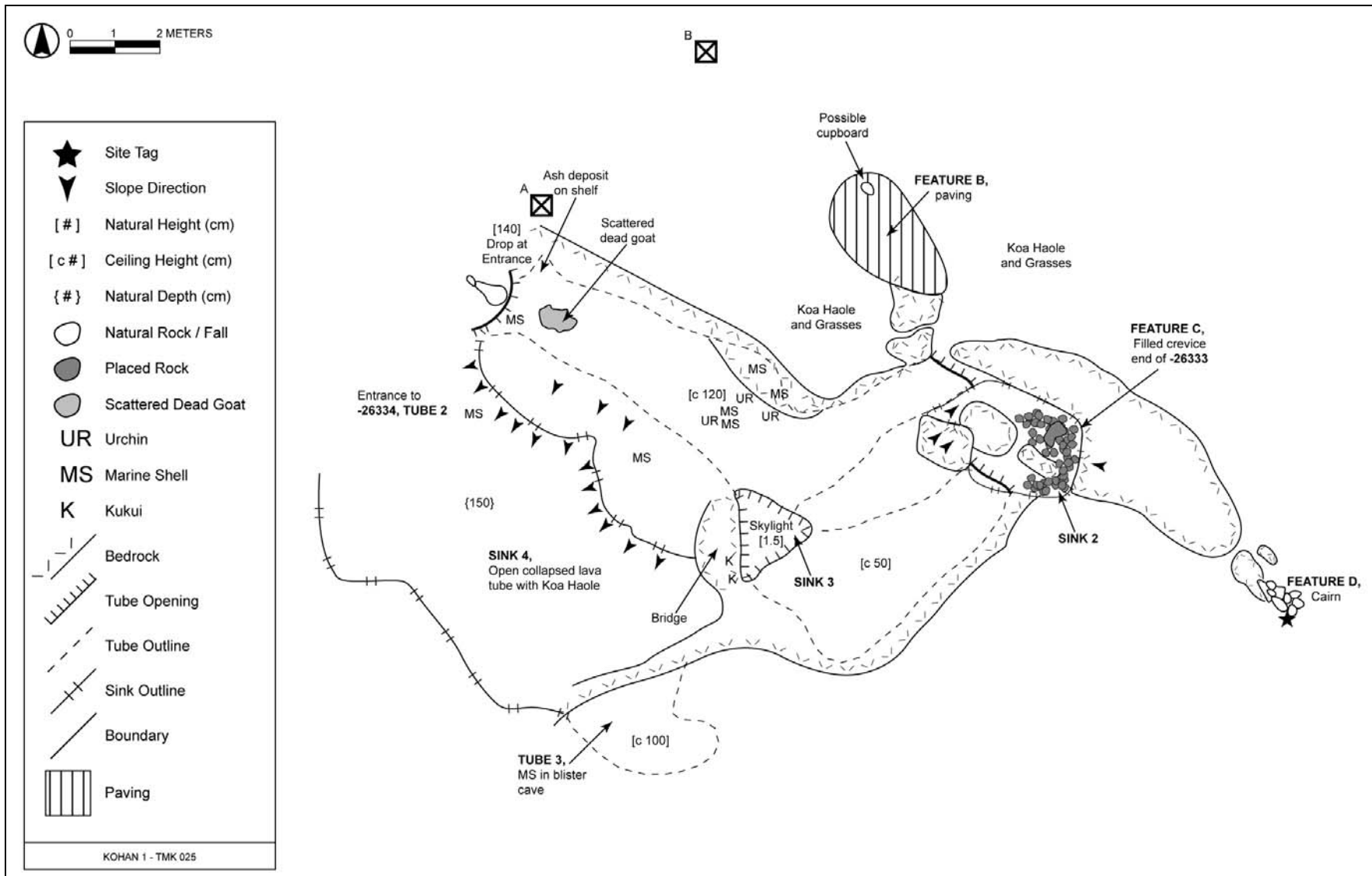


Figure 248. Site -26334, plan view, Tube 2 (1 of 2), Features B-D; see match points on Figure 249

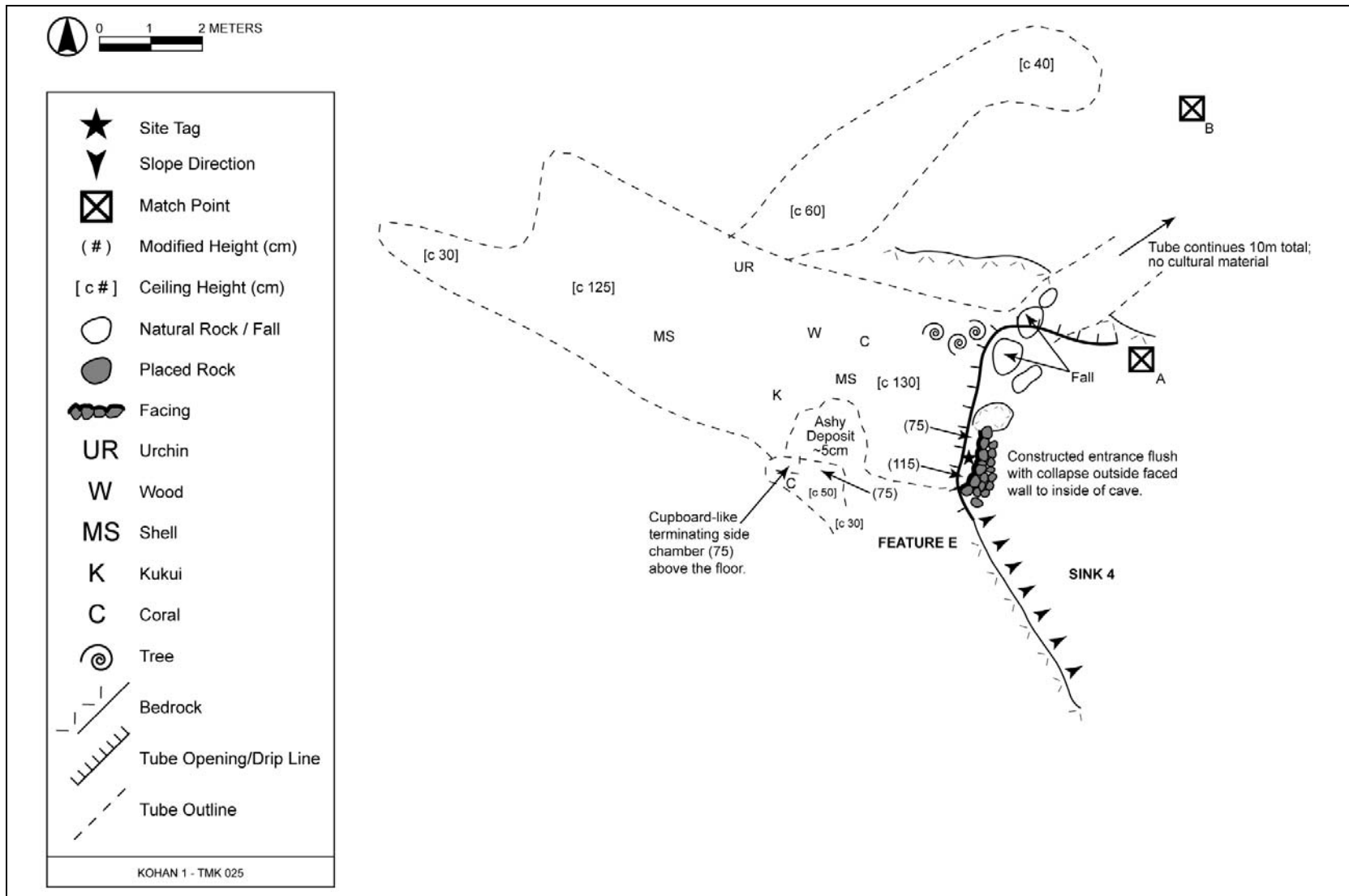


Figure 249. Site -26334. plan view, Tube 2 (2 of 2) extending west from Sink 4, and Feature E; see match points on Figure 248



Figure 250. Site -26334, Feature A interior and alignment, view to west



Figure 251. Site -26334, Feature B, showing paving, view to north



Figure 252. Site -26334, Feature C, filled crevice, view to southeast



Figure 253. Site -26334, Feature D, view to east



Figure 254. Site -26334, Feature E, showing entrance modification, view to east

4.3.63 State Site # 50-10-27-26335

SIHP #	50-10-27-26335
FUNCTION:	Permanent Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7.5 m by 6.5 m (24.6 ft by 21.3 ft)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	410 ft a.m.s.l.

DESCRIPTION: Site -26335 (Figure 255 and Figure 256) is a circular enclosure on top of a low (approximately 1 m / 3.3 ft. high) east/west trending *pāhoehoe* bedrock exposure. It is located approximately 10 m (32.8 ft.) north of a small (30 m / 98.4 ft. diameter) 'a'ā flow dominated by large cobbles. Kaloko Fishpond is visible to the west.

The enclosure is characterized by a well-faced interior wall of small *pāhoehoe* boulders that is particularly visible to the south and west. Each cardinal face of the wall's exterior is different. The north wall is highly collapsed, forming a gradual slope from the ground up the side of the bedrock exposure. Most of the north wall sits on top of a small cobble and rubble pavement; the pavement levels out the sloping north edge of the exposure. The west wall exterior consists of slightly modified bedrock and a single, tall alignment of upright *pāhoehoe* slab boulders. The south wall is in the best condition and is faced on both sides.

The exterior height of the south wall is 90 cm (3 ft.); the interior is 50 cm (1.6 ft.). The south wall foundation does not contain very many uprights, and, unlike the other walls, it is composed of approximately 1/3 'a'ā cobbles and small boulders. The southern wall is not rubble filled; it has a core of 'a'ā and *pāhoehoe* cobbles. A prominent, although not long, adjoining wall is at the east end of the south wall. The wall's construction is distinctive; two very large (90 cm by 50 cm / 3 ft. by 1.6 ft.) 'a'ā slabs, approximately 2 *pāhoehoe* courses high or about 40 cm (1.3 ft.) high maximum, were used. The southeast slab is placed horizontally for a height of 50 cm (1.6 ft.); the southeast slab is placed vertically for a height of 90 cm (3 ft.).

The adjoining wall juts out from the circular enclosure to create a plan view that is suggestive of a 'Q'. The angle it makes appears to be a complement of the *pāhoehoe* bedrock exposure west of the structure. This exposure has a small, 50 cm (1.6 ft.) north/south, 1.5 m (4.9 ft.) east/west crevice that may have been partially filled but is otherwise unmodified.

The east wall is low (25 cm / 0.82 ft.) and does not appear to be highly collapsed like the north. The center of the east wall has a 90 cm (3 ft.) wide "gap" or entrance that is roughly paved with small boulder *pāhoehoe* slabs.

The site's function is interpreted as permanent habitation. This interpretation is based on the level interior, formal wall, size, and site location. The view of the fishponds is good, although not as good as -26331. The view of -26331 and -26288 upslope is also very good.

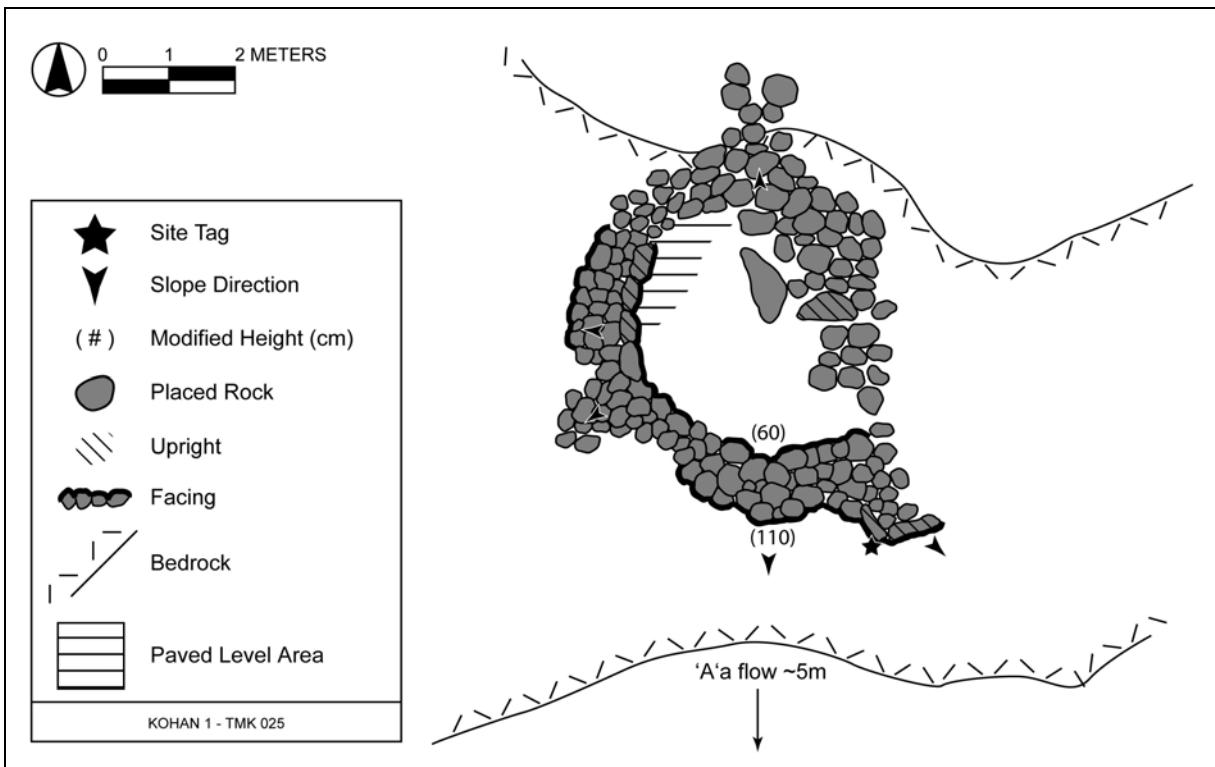


Figure 255. Site -26335, plan view



Figure 256. Site -26335, overview looking towards Kaloko Fishpond, view to west

4.3.64 State Site # 50-10-27-26336

SIHP #	50-10-27-26336
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	approximately 30 m (98.4 ft.) by 50-100 cm
CONDITION:	Remnant
AGE:	Pre- contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site -26336 (Figure 257) is a *pāhoehoe* slab trail running *mauka/makai* through an 'a'ā flow and extending for approximately 30 m (98.4 ft.). A collapsed *ahu*, consisting of half a dozen 'a'ā cobbles, is at the *makai* most end of the trail. The trail ranges from approximately 50 cm (1.6 ft.) to 1 (3.3 ft.) m wide and is made up primarily of *pāhoehoe* slabs ranging from 40-80 cm (1.3-2.6 ft.).

The site's function is interpreted as transportation.



Figure 257. Site -26336, *mauka* end of trail with collapsed *ahu*, view to southeast

4.3.65 State Site # 50-10-27-26337

SIHP #	50-10-27-26337
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	3
DIMENSIONS:	20 m by 16 m (65.6 ft. by 52.5 ft.)
CONDITION:	Good
AGE:	Pre- contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site -26337 (Figure 258 and Figure 259) is a complex of a lava tube with multiple activity areas (Feature A), a modified depression and lava blister (Feature B), and a paved area (Feature C) that connects the two temporary habitation areas. Vegetation within the vicinity of the site consists of *koa haole*, various grasses, and Christmas berry trees.

Feature A is a relatively small lava tube measuring approximately 12 m by 2.5 m (39.4 ft. by 8.2 ft.) (Figure 259 and

Figure 260). The majority of the tube's area is immediately inside the drip line. The tube consists of three main activity areas. The first activity area (**Area 1**) has a cleared area with a few scattered pieces of *kukui*. Placed boulders are adjacent to this cleared area and were placed during the clearing of the activity area. The second activity area (**Area 2**) contains more extensive midden, including *kukui*, and multiple pieces of cowry shell and marine shell than Area 1. The area has been cleared of collapse, and has also been partially paved. The third activity area (**Area 3**) also has extensive midden; urchin is present and midden within Area 3 contains much more *kukui* than the other activity areas. Area 3 has not been significantly cleared, although there are some placed boulders.

Feature B is a modified depression measuring 7.5 m (24.6 ft.) north/south by 6 m (19.7 ft.) east/west with a lava blister on the southeast side (Figure 261). The lava blister forms an overhang and measures 2 m (6.7 ft.) north/south by 2.3 m (7.5 ft.) east/west with a ceiling height of 70 cm (2.3 ft.) and is located at the west end of the depression. At the overhang's northwest corner, natural fall consisting of *pāhoehoe* cobbles is present, however, the tube ends just beyond the fall and no modifications, cultural materials, or features are present beyond the natural fall. More than 40 *kukui* pieces, more than 20 marine shells, and less than 10 urchin shells were found within the overhang. The bottom of the overhang appears to have been completely filled with cobbles and is not natural fall. The depression that surrounds the overhang is primarily constructed with stacked *pāhoehoe* cobbles and boulders; the overhang and southeast end are natural bedrock. The constructed walls vary in height from 70 - 100 cm (2.3 - 3.3 ft.). The northwest end of the depression has a completely cleared area with an 8 cm (0.26 ft.) deep soil deposit that was likely utilized for agriculture. A *ti* plant is located approximately 2 m (6.7 ft.) from the northeast end of the depression

Feature C is a large roughly paved area measuring approximately 6 m by 5 m (19.7 ft. by 16.4 ft.) (Figure 262). The surface is relatively level. The pavement consists of small to large *pāhoehoe* cobbles, a few small boulders, and some small to medium *pāhoehoe* slabs. A slight step in the paved area is formed by a natural bedrock outcrop. The paving material was used to level out the surface between small areas of exposed bedrock. There are some placed boulders in the southwest corner of the pavement.

The site's function is interpreted as temporary habitation complex based on the extent of modification and presence of midden. Feature A has multiple activity areas, an extensive amount of midden, and placed boulders and cleared and paved area modifications. While the amount of midden present and the extent of modification are too intensive to have simply served as a temporary shelter, they are not intensive enough to indicate a greater utilization such as for permanent use. Feature B served as a shelter based on the amount of midden found and the small size of the overhang. The presence of the soil deposit on the northwest end of the depression indicates the feature was likely used for agricultural purposes. Feature C abuts Feature A and Feature B and connects them. Feature C likely functioned, in association with Features A and B as a temporary habitation. Although only a single cowry shell was found on the surface, the labor investment required to create this pavement indicates temporary habitation rather than shelter. Based on the lack of midden or a hearth permanent habitation is not indicated.

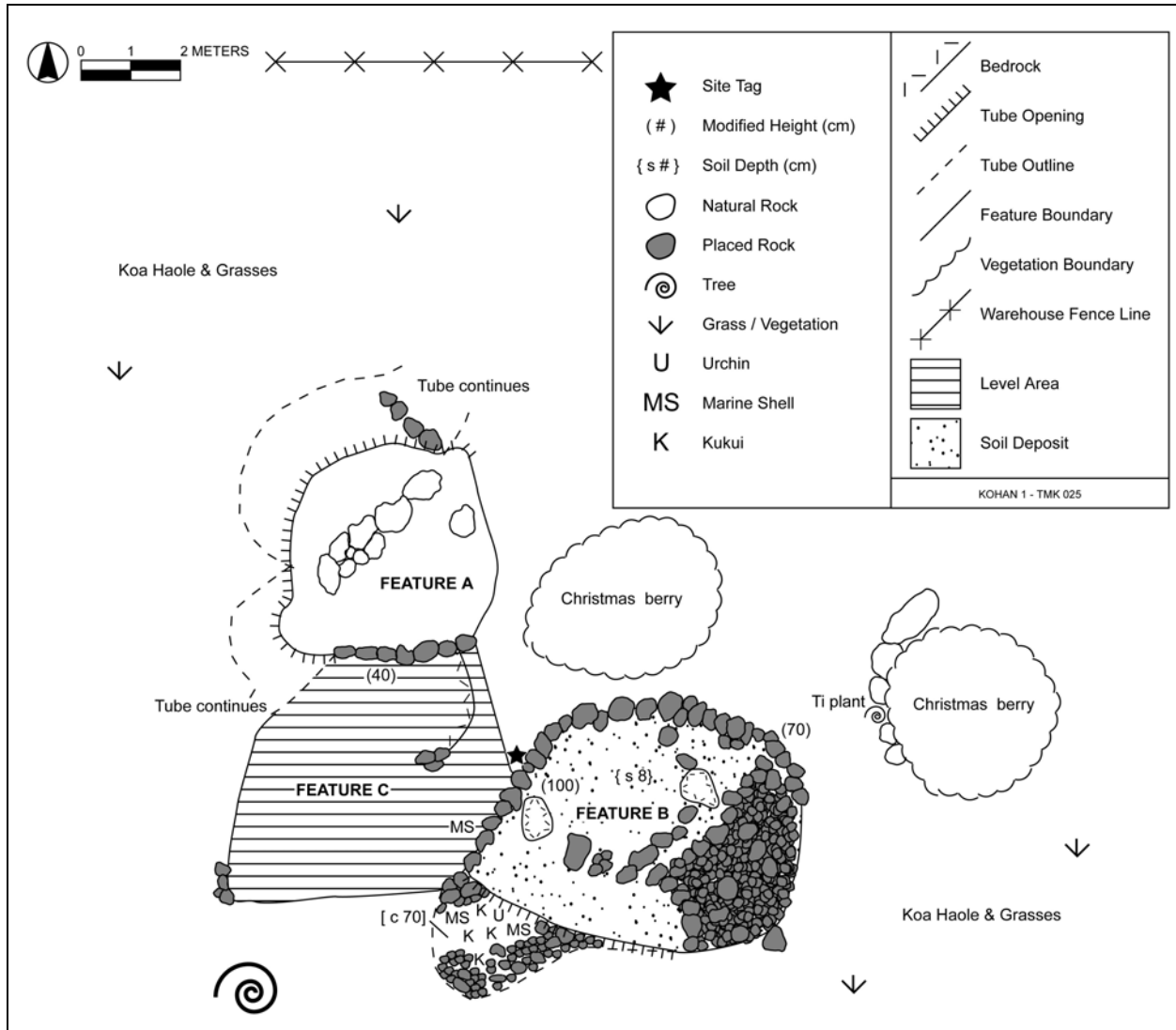


Figure 258. Site -26337, exterior plan view

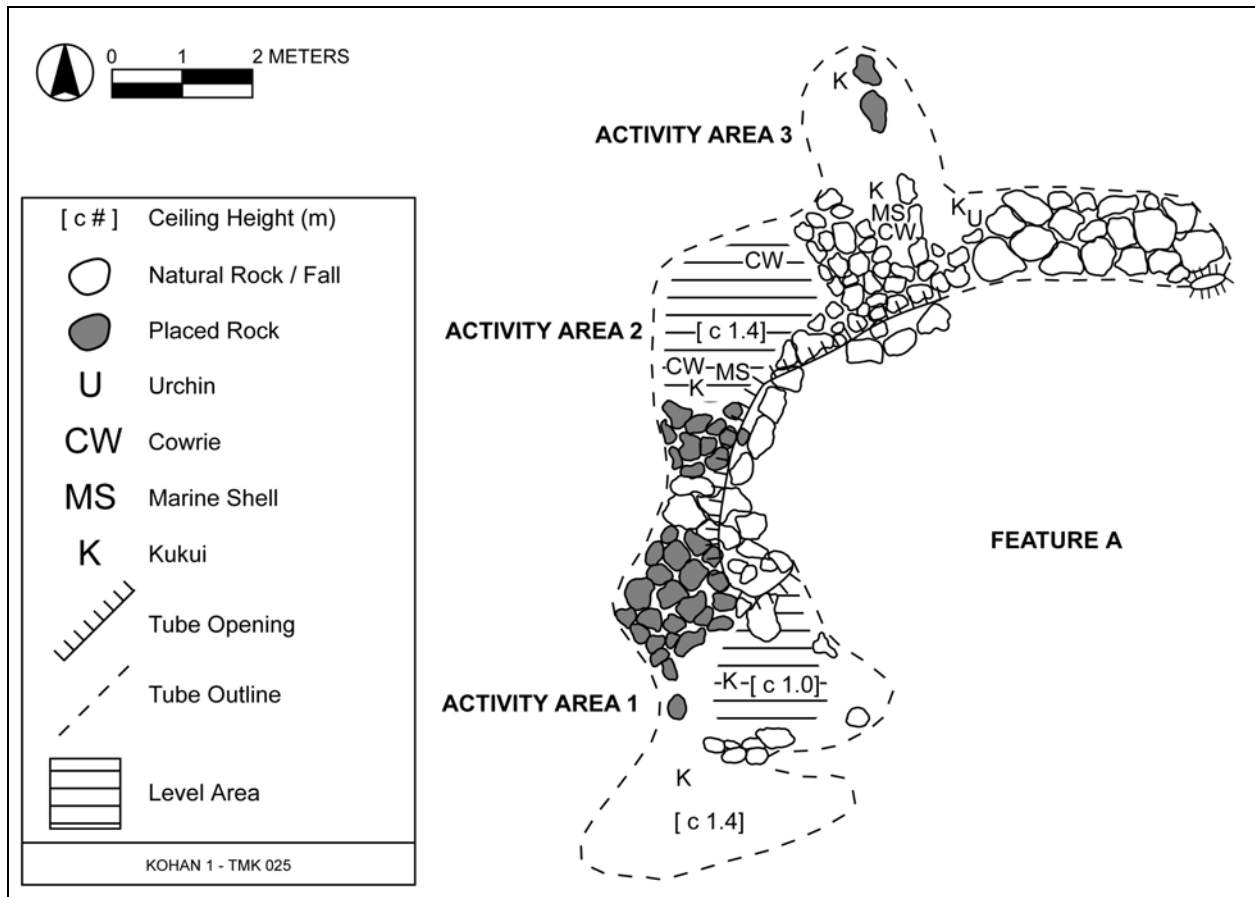


Figure 259. Site -26337, Feature A interior plan view



Figure 260. Site -26337, Feature A entrance, view to northwest



Figure 261. Site -26337, Feature B northeast wall, view to northeast



Figure 262. Site -26337, Feature C, paved level area, view to southwest

4.3.66 State Site # 50-10-27-26338

SIHP #	50-10-27-26338
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	2
DIMENSIONS:	16 m by 2.5 m (52.5 ft. by 8.2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site -26338 consists of two lava tube temporary habitations. The two small lava tubes, designated as Feature A and Feature B are located approximately 5 m apart from each other. Both the Feature A tube, the smaller of the two tubes, and Feature B tube contain extensive midden and modest modifications.

Feature A is an east/west trending lava tube located approximately 5 m (16.4 ft.) east of the *mauka* entrance to Feature B. Feature A consists of three separate soil deposits, scattered midden, and modification in the form of placed small boulders, including a small upright. The midden consists of *kukui*, cowry, urchin, a large urchin spine, and marine shell including *Nerita*. The majority of the midden is within 2 m (6.7 ft.) of the entrance. Placed boulders appear to partially block access to the cave's back chamber; they include the upright immediately inside the entrance and another concentration of placed boulders at the east end of the tube. The chamber is shallow in height (approximately 40 cm / 1.3 ft.), and there is no evident motive for the restricted access.

Feature B is a lava tube measuring 30 m (98.4 ft.) east/west by 3 m (9.8 ft.) average north/south with ceiling heights ranging from 50 cm to 180 cm (1.6 ft. to 5.9 ft.). The tube has five openings. The east end opening measures 4 m (13.1 ft.) wide and modification include stacked boulders and cobbles in both corners of the opening. A large chamber measuring 6 m (19.7 ft.) east/west by 4 m (13.1 ft.) north/south opens up beyond the opening. This chamber contains the most cultural activity found throughout the tube. A large amount of marine shell including cowry and conch, *kukui*, urchin, and a single volcanic glass flake are present. Multiple boulders were found throughout the chamber. The tube continues another 4.5 m (14.8 ft.) to the second opening. No cultural activity was found in this vicinity. However, the third opening is 5 m (16.4 ft.) to the west and contains a large area of *kukui* close to the entrance. Directly to the west of the opening is a small chamber measuring 2.5 m (8.2 ft.) east/west by 5 m (16.4 ft.) north/south.

This chamber has a small wall on both the northeast and southeast ends. Behind the southeast end wall is a very small tube headed down slope that has a large amount of *kukui* endocarps. *Kukui* was also found within the chamber. The next opening, approximately 2.5 m (8.2 ft.) west of the last chamber monitored, measures 5 m (16.4 ft.) wide and opens to a large chamber measuring 6 m (19.7 ft.) east/west by 10 m (32.8 ft.) north/south. The chamber contained many placed small boulders and leveled areas. Marine shell and *kukui* were also found throughout. The southeast end of the chamber has a tube that connects to the previous chamber mentioned by the small tube used as a refuse chute.

The site's function is interpreted as temporary habitation. The extensive scattered midden throughout the tube, in addition to the placed boulders, is indicative of utilization more intensive than shelter but not intensive enough to indicate a recurrent-use site.

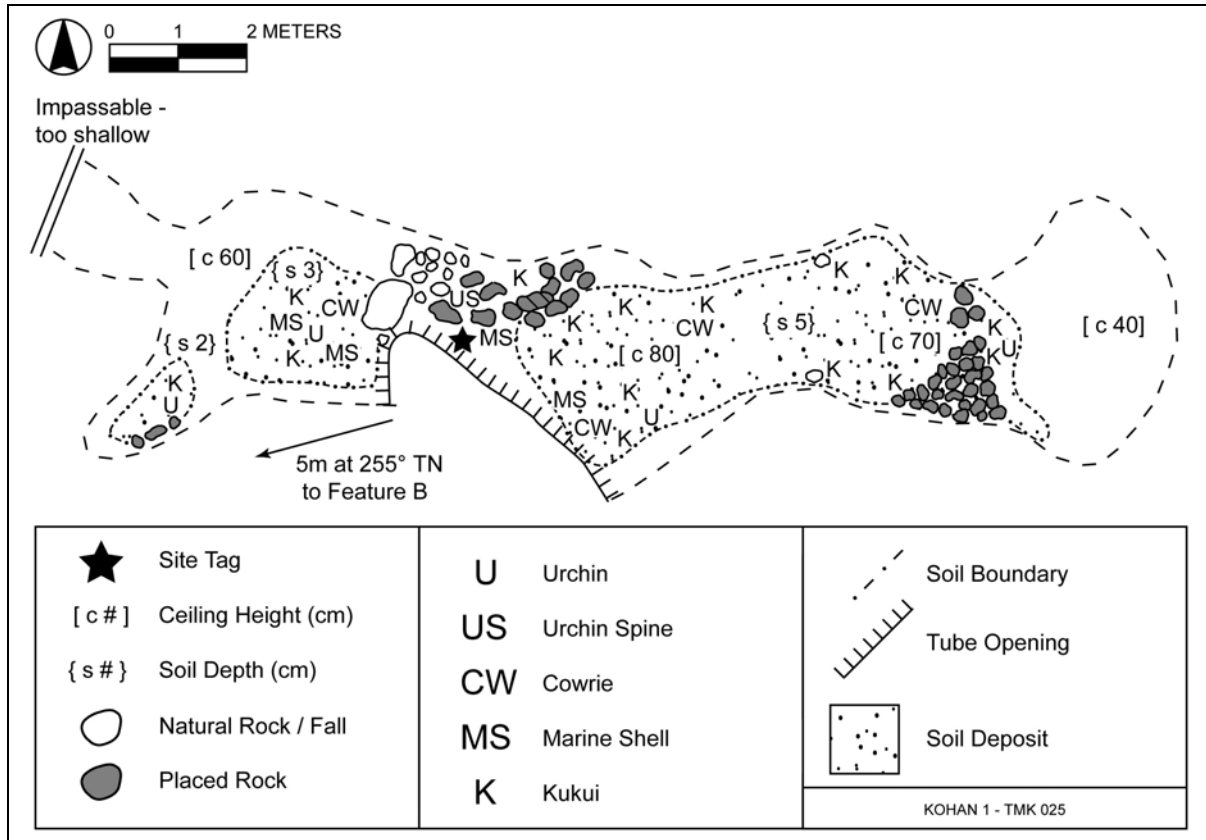


Figure 263. Site -26338, Feature A plan view

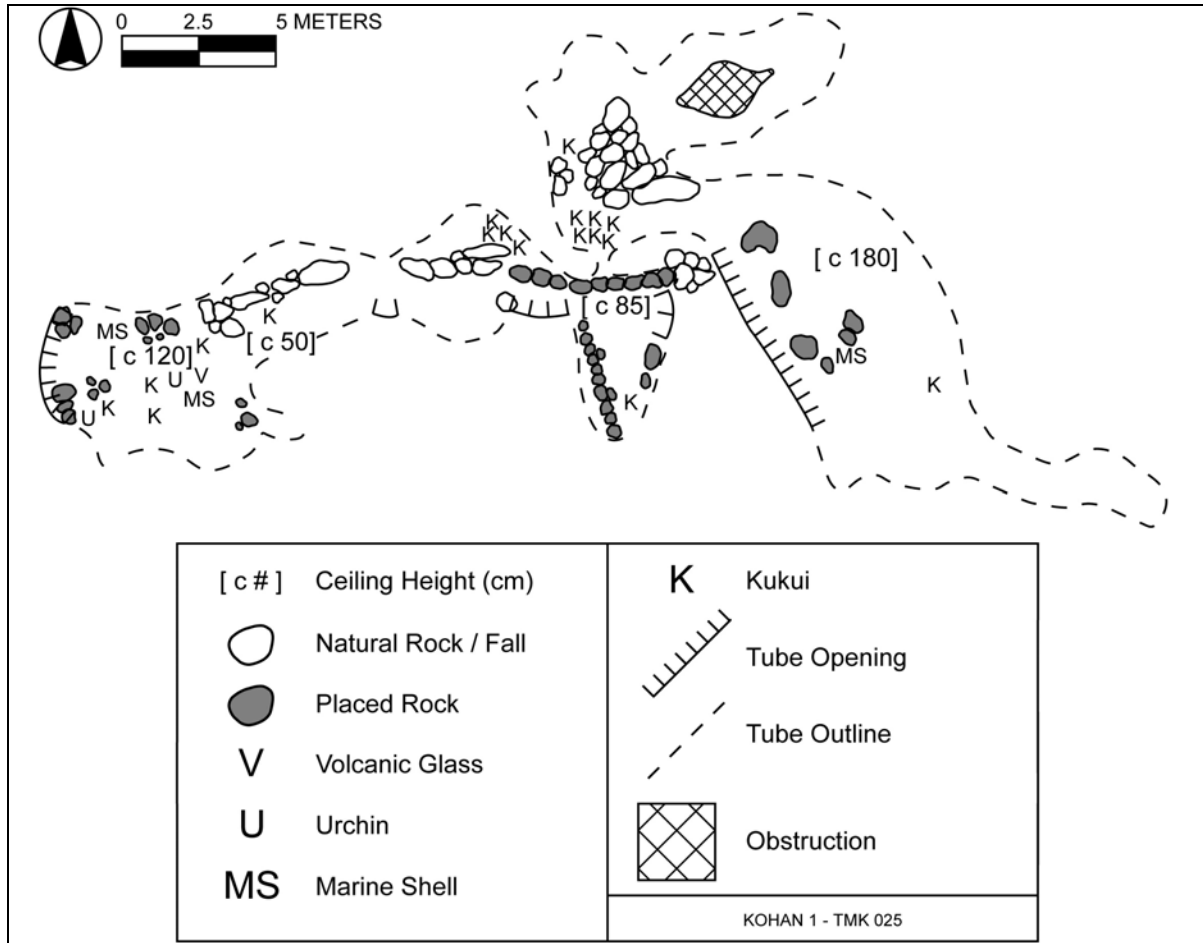


Figure 264. Site -26338, Feature B plan view



Figure 265. Site -26338, Feature A, showing small upright, view to northeast



Figure 266. Site -26338, Feature B entrance chamber, view to west

4.3.67 State Site # 50-10-27-26339

SIHP #	50-10-27-26339
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	14 m by 4 m (46 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	400 ft a.m.s.l.

DESCRIPTION: Site -26339 is a small lava tube containing very sparse scattered midden that includes a few scattered *kukui*, a single very small piece of *Isognomon*, and some cowry. The lava tube has been modified; multiple placed boulders are within 3 m (9.8 ft.) of the entrance (Figure 267 and Figure 268).

The very small midden scatter is concentrated within the first 4 m (13 ft.) of the cave entrance. A very thin layer of soil (no more than 1 cm / 0.03 ft. deep at its deepest) extends down the center of the cave floor approximately 8 m (26.3 ft.) back from the entrance. The only modification to the tube is the placed boulders.

The tube that extends to the north from the entrance is impassable due to the narrowing of the tube and not solely due to the presence of the placed boulders. The tube could not be explored much beyond the 2 m (6.6 ft.) or so that are visible from the placed boulders even if the placed boulders were removed.

The site's function is interpreted as shelter based on the very sparse midden and the relatively small size of the cave. Although the cave's height increases to approximately 1.4 m (4.6 ft.) at the back of the cave, this area does not appear to have been intensively utilized, based on the absence of midden and the lack of modifications. The lack of extensive midden or modification precludes this site from being considered for more intensive use such as temporary habitation.



Figure 267. Site -26339, cave entrance, view to east

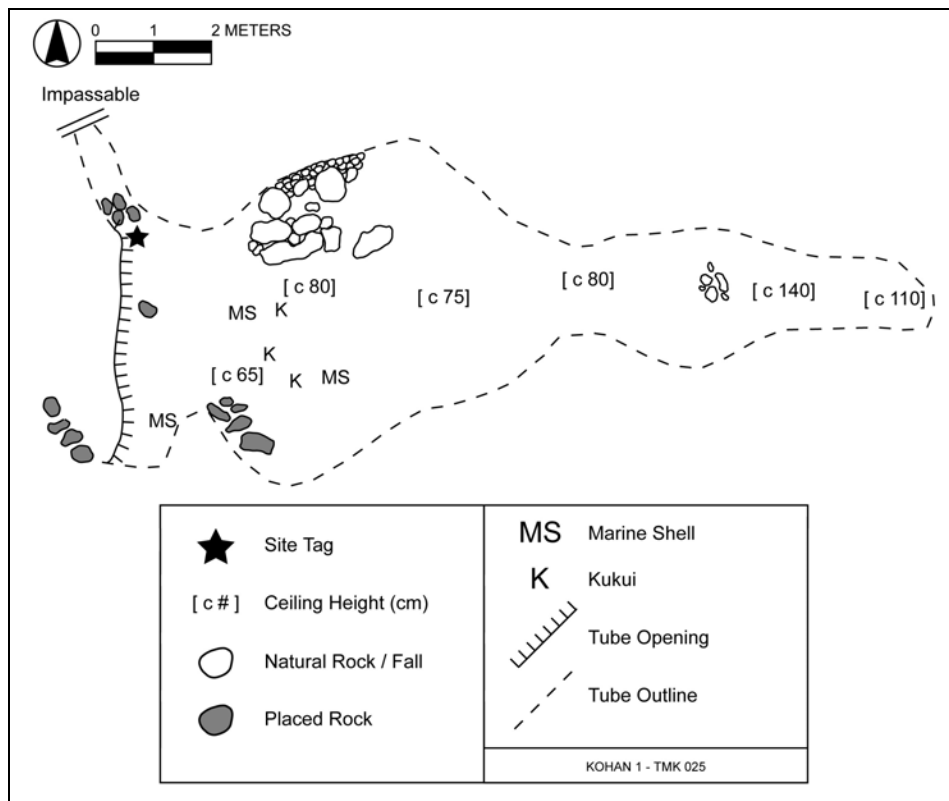


Figure 268. Site -26339, plan view

4.3.68 State Site # 50-10-27-26340

SIHP #	50-10-27-26340
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	70 m by 40-80 m (229.7 ft. by 131.2-262.5 ft.)
CONDITION:	Good
AGE	Pre-contact
ELEVATION:	380 ft a.m.s.l.

DESCRIPTION: Site -26340 (Figure 269) is a *pāhoehoe* slab trail extending approximately 70 m (229.7 ft.) in a north to south direction through an 'a 'ā flow. Approximately 40-50% of the trail consists of *pāhoehoe* slabs ranging from 20 cm to 60 cm (0.66 ft. to 2 ft.). The width of the trail ranges between about 40 cm - 80 cm (1.3 ft. – 2.6 ft.).

The site's function is interpreted as transportation over the rough 'a 'ā.



Figure 269. Site -26340, view to south

4.3.69 State Site # 50-10-27-26341

SIHP #	50-10-27-26341
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	17 m by 10 m (55.8 ft. by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	525 ft a.m.s.l.

DESCRIPTION: Site -26341 (Figure 270 and Figure 271) is a large depression with a series of four tubes used for temporary habitation and water collection. The depression measures 17 m (55.8 ft.) east/west by 10 m (32.8 ft.) north/south with a depth of approximately 2 m (6.6 ft.). Tube 1 is located at the northwest end of the depression and contains the most cultural modification and material within the site. Tube 1 is a habitation area based on the presence of a large amount of midden, several artifacts, and a water catchment terrace. Tube 2 is located at the west end of the depression; it is a large tube with several water collection boulder alignments. Only one urchin shell was found in tube 2. Tube 3, located at the southwest end of the depression, is a small tube used as a shelter based on the presence of several placed boulders and a small midden scatter. Tube 4 is located at the northeast end of the tube and is the largest of the four tubes. This tube is devoid of any midden and contains only a few boulder alignments used for water collection. Vegetation within the site vicinity includes *koa haole* and various grasses. Tube 1 contains a tag that identifies the site as TF-30, indicating that it has been previously investigated.

Tube 1 (Figure 272 and Figure 277) measures 17 m (55.8 ft.) northwest/southeast by 4-8 m (13.1-26.3 ft.) northeast/southwest with ceiling heights ranging from 100 to 190 cm (3.3 to 6.2 ft.). Tube 1's opening is located at the northwest end of a large depression (with three other tubes). The tube opening is approximately 8 m (26.3 ft.) wide with a height of 140 cm (4.6 ft.). The opening has been modified in several places with the placement of large boulders to create a semi-level entryway. The northeast end of the opening contains the most modification; there is a large faced boulder with several large cobbles placed above it. Midden and artifacts were found 2 m (6.6 ft.) beyond the entry and include more than 100 marine shell pieces, 150+ *kukui* pieces, 40+ urchin pieces, 3 medium sized coral pieces and 1 urchin spine file. One meter (3.3 ft.) beyond this area is a 3 by 4 m (9.8 by 13.1 ft.) section that has been cleared and surrounded by piled cobbles. The feature's age and function are unknown; it is possible that this area was cleared for excavation by one of the previous investigators. Beyond the cleared area is a boulder alignment approximately 4 m (13.1 ft.) long in a northwest/southeast direction. The southeast end of the alignment runs into a large water catchment feature that measures 2 m by 3 m (6.6 ft. by 9.8 ft.). The feature is approximately 40 cm (1.3 ft.) in height, and consists of stacked large cobbles with *pāhoehoe* slabs placed on the top. Only the northeast portion of the feature contained a large *kukui* scatter.

The feature's function is interpreted as temporary habitation based on the amount of midden and *kukui* present, and the extent of modification. The water catchment feature also supports temporary habitation. Site -26314, located 8 m (26.3 ft.) southeast, is a habitation enclosure and it very likely associated with -26341.

Excavation potential of this feature is fair based on the presence of a 3 cm (0.1 ft.) deep soil deposit. This feature may have been previously excavated; it is cross-listed as TF-30. The Cobb et al. (2003) assessment determined that the tube was used as temporary habitation

Tube 2 (Figure 273 and Figure 274) has a few side chambers and is very maze-like. The lava tube is approximately 50 m by 24 m (164 ft. by 78.7 ft.). The entrance to the tube slopes steeply and descends approximately 3 m (9.8 ft.) within a distance of 7 m (23 ft.). The first interior chamber contains extensive rubble and tube collapse. **Side chamber 1** is a few meters from the dripline near the entrance - 10 pieces of *kukui* and one marine shell was found in this chamber. **Side chamber 2** opens into the main interior chamber at both ends. No cultural material was found inside side chamber 2. From the main interior chamber, the tube continues in a southeast direction for approximately 40 m (131.1 ft.); the tube is rather maze-like and circles around on itself a few times. Tube 2 is very damp and humid and has several areas of stacked or placed boulders in an alignment, likely for water collection. These apparent water collection features appear to be the only modification in tube 2 and indicate this feature was primarily used for water collection.

Tube 3 (Figure 270) is a lava tube measuring 4 m (13.1 ft.) northwest/southeast by 6 m (19.7 ft.) northeast/southwest with ceiling heights ranging 70-140 cm (2.3-4.6 ft.). The tube opening is located at the southwest end of a large depression and measures 1 m (3.3 ft.) wide by 1 m (3.3 ft.) in height. Just beyond the tube opening is the main chamber measuring 2 by 4 m (6.6 by 13.1 ft.) with a ceiling height of 140 cm (4.6 ft.). The chamber's center has been cleared of most ceiling fall and has been stacked at the north and east ends, creating a naturally level area. Just beyond the main chamber to the north is a chamber measuring 3 by 6 m (9.8 by 19.7 ft.) with a ceiling height of 70 cm (2.3 ft.). Fifteen *kukui* pieces and six marine shell pieces were found in this area. A 5 cm (0.13 ft.) deep soil deposit is also present throughout this chamber. Tube 3's function is interpreted as temporary habitation or shelter based on the small amount of midden identified and the minimal modification observed.

Tube 4 (Figure 275 and Figure 276) is located at the eastern edge of the site's sink hole. Tube 4 is oriented in an east/west direction and is approximately 60 m (196.9 ft.) in length by approximately 14 m (45.9 ft.) wide. A few side chambers are present. Only one side chamber has any evidence of use; approximately 10 m from the tube entrance is the entrance to this side chamber. Tube 4 extends south for a few meters then curves back to the east. Water is present throughout this tube and it is fairly damp and humid. Boulder alignments and/or stacks are also present throughout the tube. These boulder alignments appear to be the only evidence of human activity within the tube and are interpreted as water collection features.

The site's function is interpreted as temporary habitation and water collection based on the presence of midden in tubes 1 and 3, and water catchment features in tubes 1, 2, and 4. Tube 1 contains midden and *kukui*, has some constructed modification, and a water catchment features. Tubes 2 and 4 contain water catchment features and no evidence of midden. The small amount of midden present in tube 3 indicates the tube was used for temporary habitation or shelter. Excavation potential is fair for tubes 1 and 3; both tubes have shallow soil deposits.

Site -26314 (habitation enclosure) is 8 m (26.3 ft.) to the west and is very likely associated with this site. Excavation potential is fair and is only possible in tubes 1 and 3 since both tubes have shallow soil deposits.



Figure 270. Site -26341 overview of sink and tubes 1 -4

Archaeological Inventory Survey of a 360.131-Acre Parcel within Kohanaiki and Kaloko, North Kona, Hawai'i Island

TMK: [3] 7-3-009:025

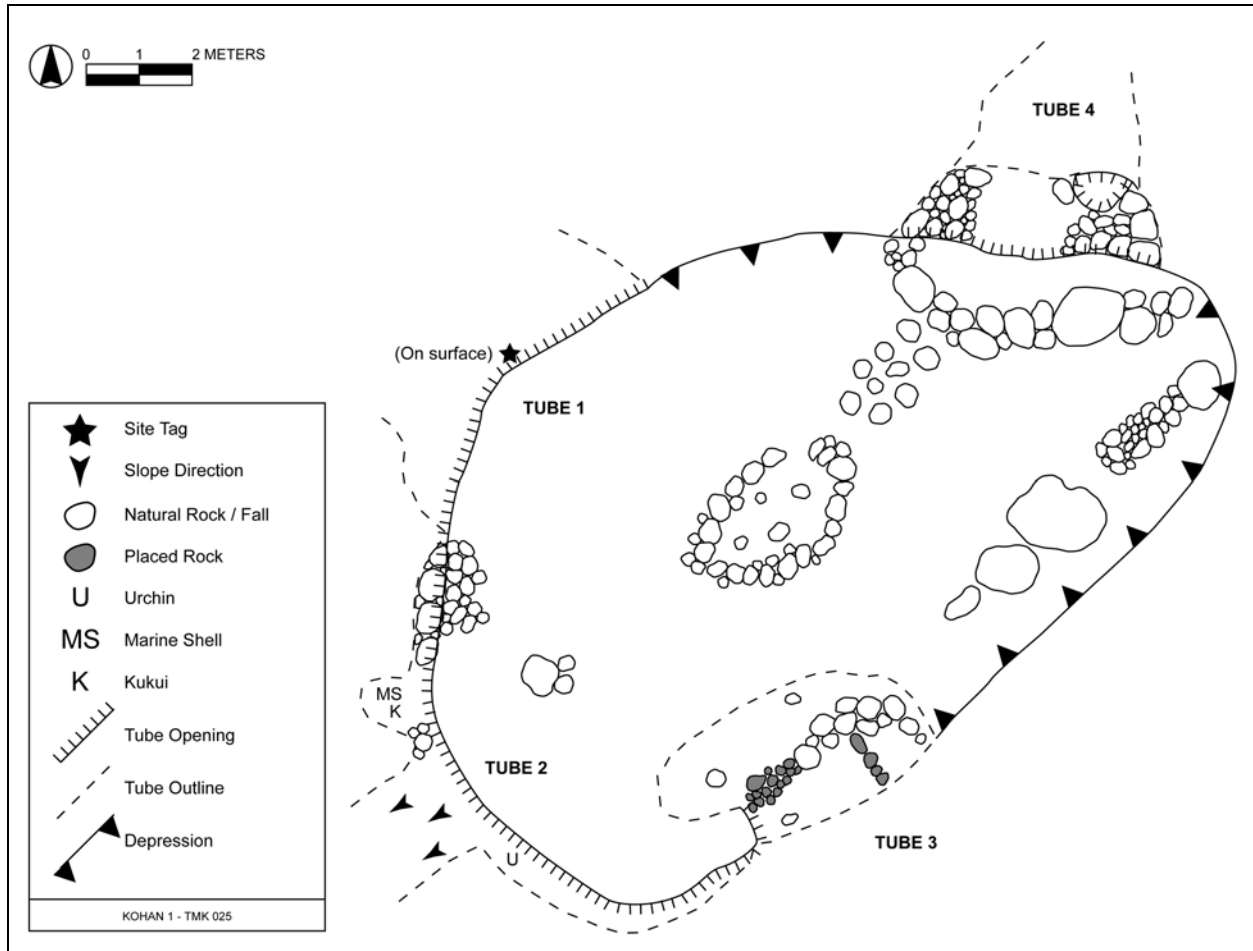


Figure 271. Site -26341, close-up view of sink with 4 radiating lava tubes, exterior plan view

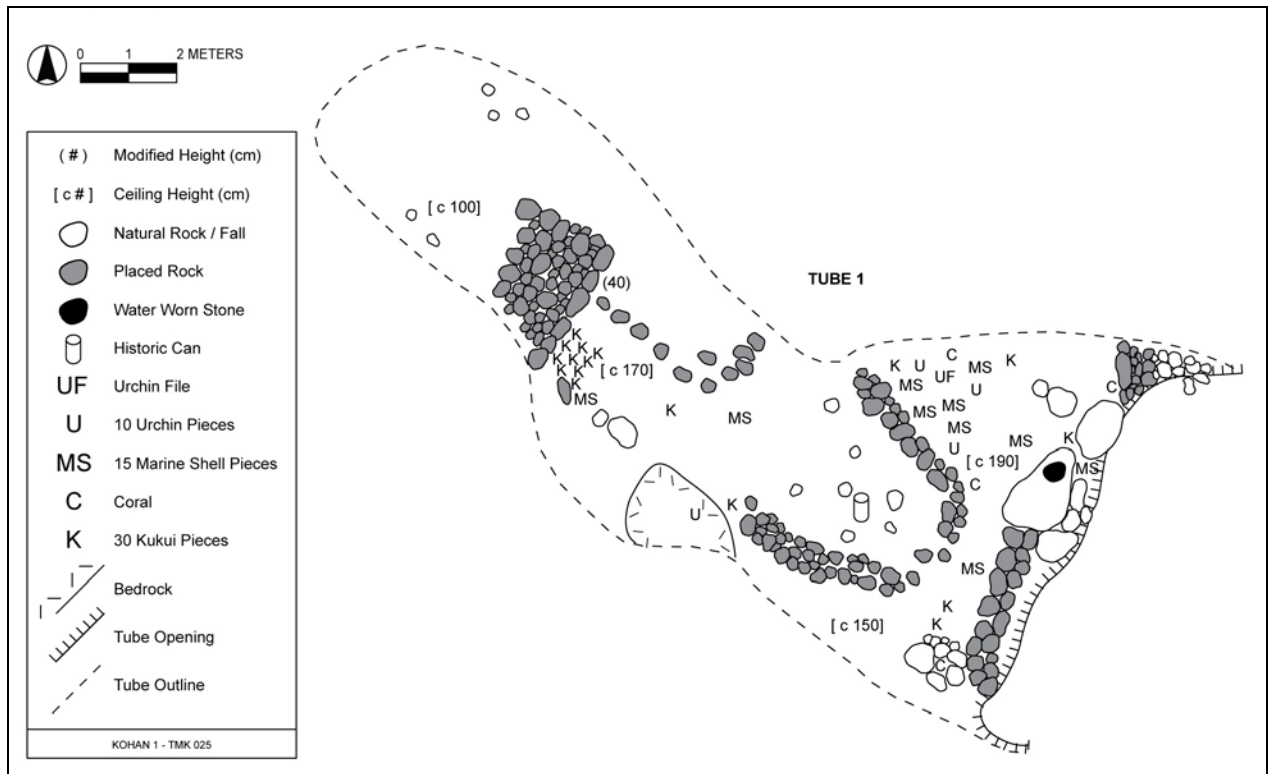


Figure 272. Site -26341, Tube 1, extending off northwest side of sink, plan view

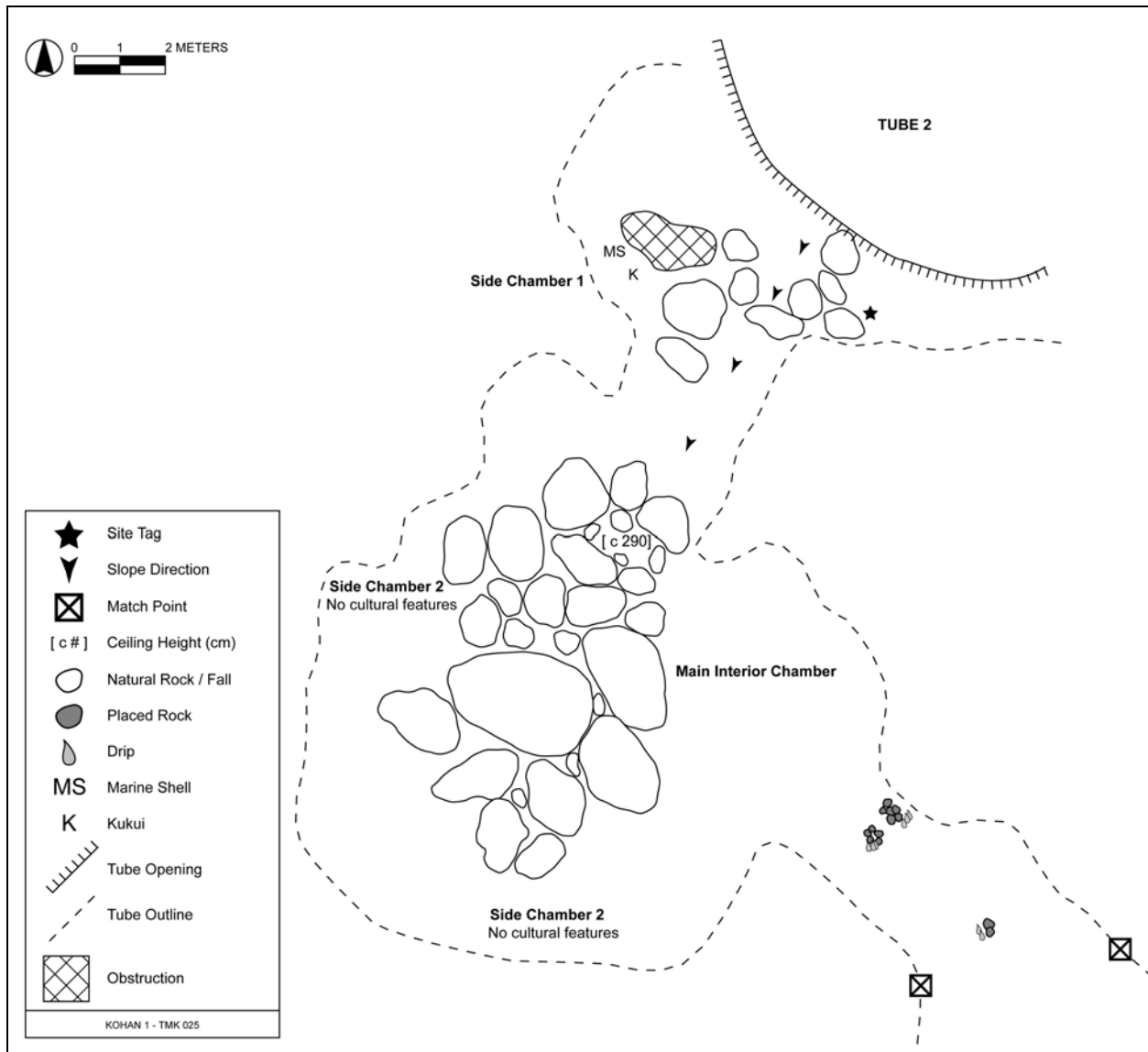


Figure 273. Site -26341, northwest portion of Tube 2, extending of southwest side of sink, plan view (1 of 2, match points relate to Figure 274)

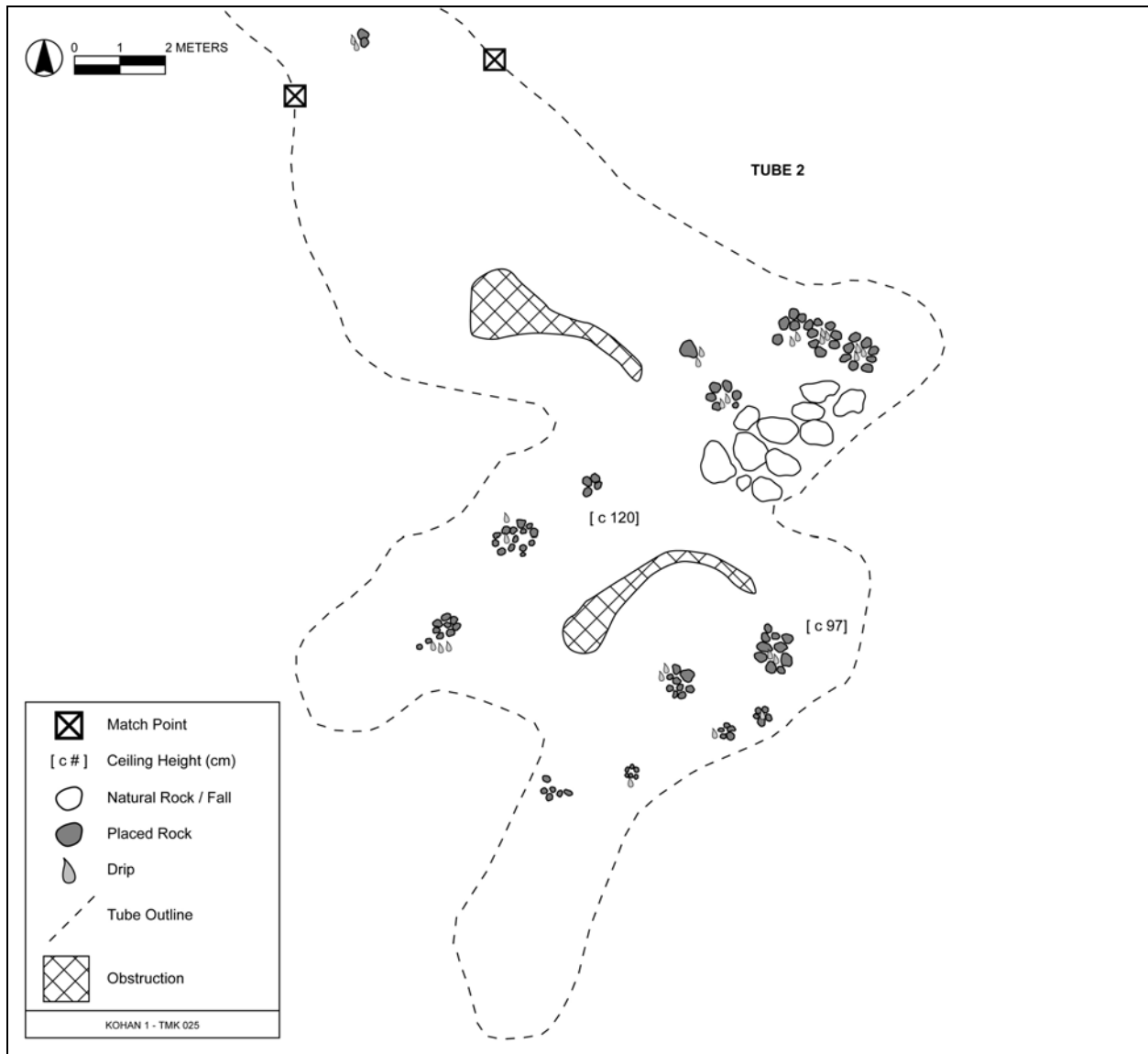


Figure 274. Site -26341, southeast portion of Tube 2, plan view (2 of 2, match points relate to Figure 273)

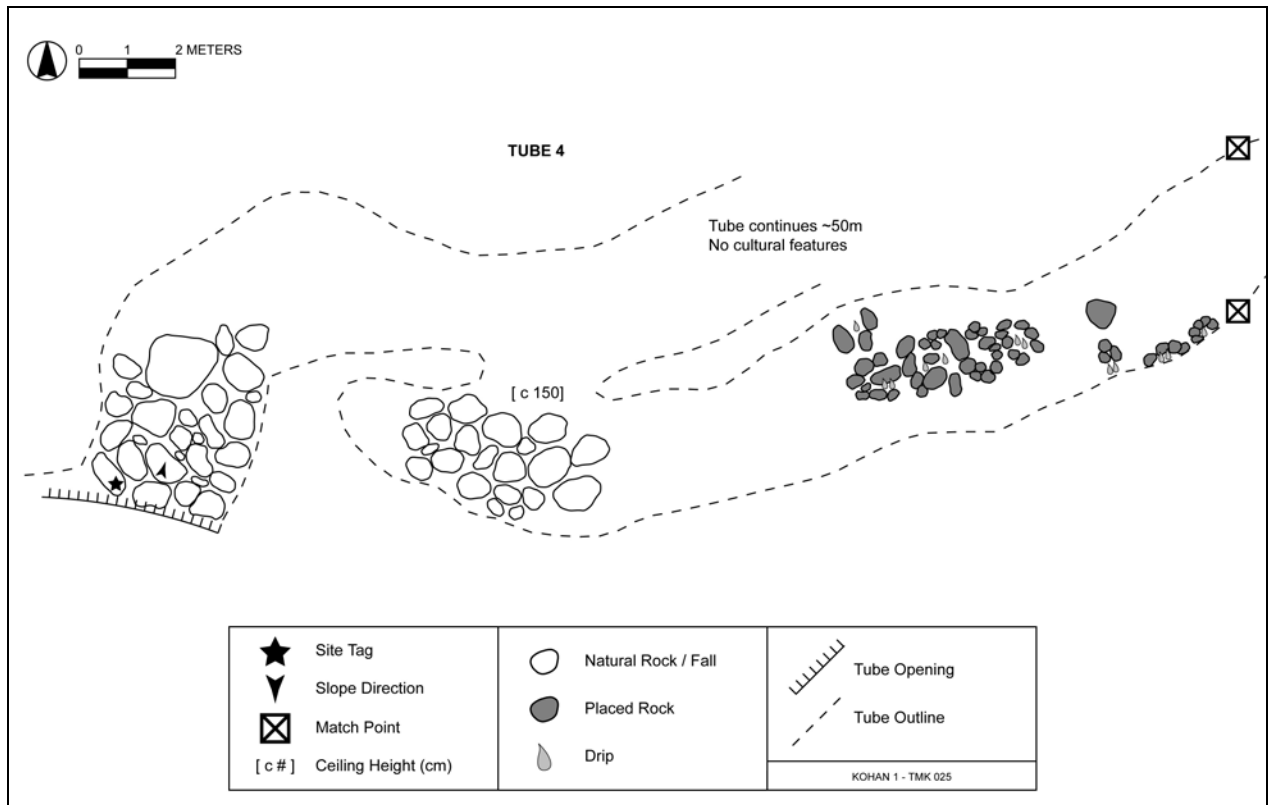


Figure 275. Site -26341, west portion of Tube 4, extending off the northeast side of sink, plan view (1 of 2, match points relate to Figure 276)

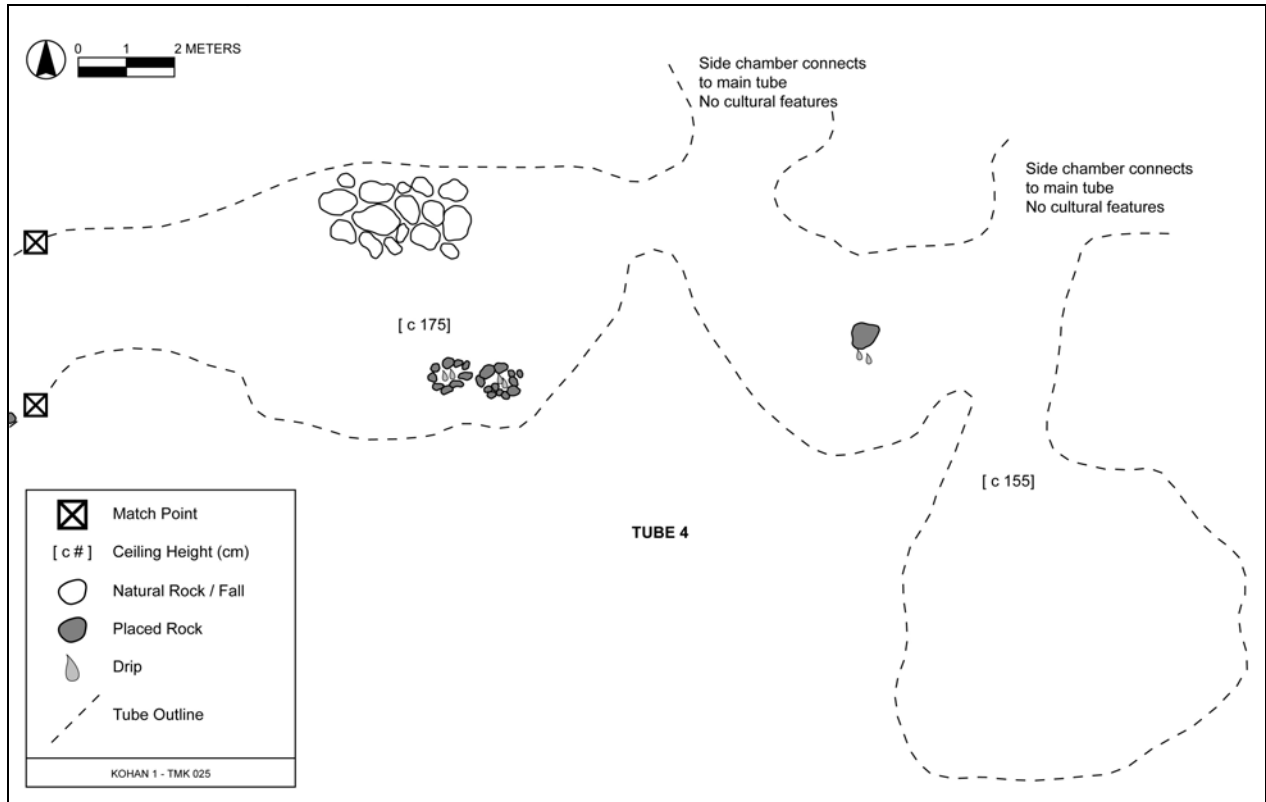


Figure 276. Site -26341, east portion of Tube 4 plan view (2 of 2, match points relate to Figure 275)



Figure 277. Site -26341, Tube 1, showing water catchment terrace, view to northwest

4.3.70 State Site # 50-10-27-26342

SIHP #	50-10-27-26342
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	3
DIMENSIONS:	30 m by 20 m (98.4 ft. by 65.6 ft.)
CONDITION:	Good
AGE:	Pre-contact / Historic
ELEVATION:	525 ft a.m.s.l.

DESCRIPTION: Site -26342 (Figure 278) has three lava tube features used for temporary habitation and shelter. Feature A, located at the site's southeast end, is a temporary habitation lava tube with a fair amount of midden and a hammerstone, water worn stone, digging stick, historic bottle from the Nodashoyu Company (glass), and three pieces of coral. Feature B is a lava tube with several *kukui* endocarps and marine shell that was a shelter. Feature B connects to a lava tube with no cultural modification or material. Feature C, also a lava tube, is just south of Feature B and is shelter. A fair amount of midden, including *kukui* and marine shell, was identified. The Kaloko/Kohanaiki Ahupua'a wall runs east/west above Feature A's entrance. Vegetation consists of *koa haole* and various grasses.

Feature A is a lava tube measuring 14 m (45.9 ft.) northwest/southeast by 3-5 m (9.8-16.4 ft.) northeast/southwest with ceiling heights ranging from 60 to 120 cm (2 to 3.9 ft.) (Figure 279 and Figure 281). The tube opening (5 m / 16.4 ft. wide, 1.4 m / 4.6 ft. in height) is located at the southeast end of a small depression. The ahupua'a wall runs east/west directly above the tube opening. Just beyond the large opening, the tube opens up into a chamber measuring 6 by 8 m (19.7 by 26.3 ft.).

This chamber contains several pre-contact artifacts including a hammerstone, digging stick, water worn stone, and one piece of coral. Approximately 30 marine shell pieces, 20 urchin pieces, and more than 10 *kukui* pieces were identified. Just beyond this chamber (hidden behind several placed boulders) are two small openings that lead to a chamber measuring 3 by 4 m (9.8 by 13.1 ft.) with a ceiling height of 100 cm (3.3 ft.). This chamber contains approximately 50 *kukui* pieces, 20 marine shell pieces and 2 pieces of branch coral. Several boulders have been placed. This tube continues for approximately 13 m (42.7 ft.) until the tube ends at a small chamber with an impassable opening. This small chamber has a significant amount of fall at the southeast end and modern garbage that may be related to bulldozer activity. The tube may continue past this currently impassable area. The feature's function is interpreted as pre-contact temporary habitation based on the amount of midden present, the constructed modification, and the artifacts present, including the hammerstone and digging stick. A Nodashoyu Company glass bottle was also present indicating historic usage. Site tag TF-40 was found within this feature; it was also identified by Cobb et al. (2003) as a temporary habitation. Excavation potential is good based on the presence of the 5 cm (0.13 ft.) deep soil deposit.

Feature B is a maze-like tube with a few side chambers (Figure 280 and Figure 282). One side chamber dead ends within approximately 10 m (32.8 ft.); one is impassable; and one side chamber connects to a lava tube with no cultural material. One cowry shell was located near the tube's entrance, but no other shell was observed throughout the tube. A few fragments of *kukui* were seen throughout the tube, but no other evidence of cultural materials was observed. The

tube's function is interpreted as pre-contact shelter based on the lack of modification and the absence of midden, the proximity to Features A and C, which are more intensively inhabited areas, and the lack of evidence of prolonged habitation.

Feature C is a small lava tube that connects to both Features A and B (Figure 280 and Figure 283). The tube is approximately 10 m (32.8 ft.) long, oriented north/south, and approximately 4 m (13.1 ft.) wide. A soil deposit, with a maximum depth of approximately 3 cm (0.1 ft.), is near the entrance. In and around the soil deposit are *kukui* endocarps with some marine shell. Charcoal and rodent bones are also present. This tube's function is interpreted as shelter based on the presence of the soil deposit containing *kukui*, marine shell, and charcoal.

The site's function is interpreted as temporary habitation based on the presence of midden in each of the three features/lava tubes; Features B and C are interpreted as shelter. Feature A also contains a hammerstone, water worn stone, digging stick, a historic bottle from the Nodashoyu Company (glass), and three pieces of coral. Feature B has several *kukui* endocarps and marine shell. Feature C also contains *kukui* and marine shell.

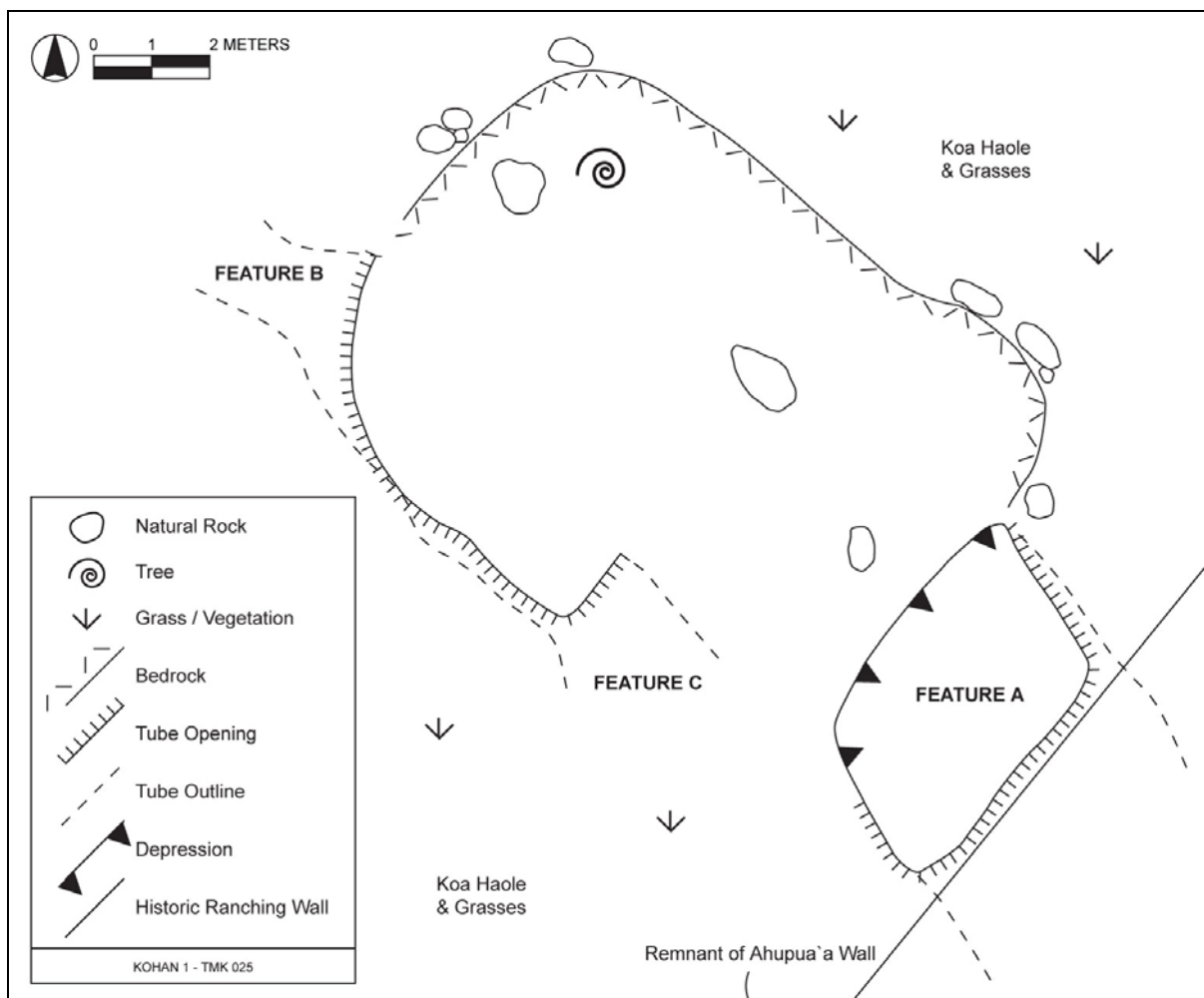


Figure 278. Site -26342, exterior plan view

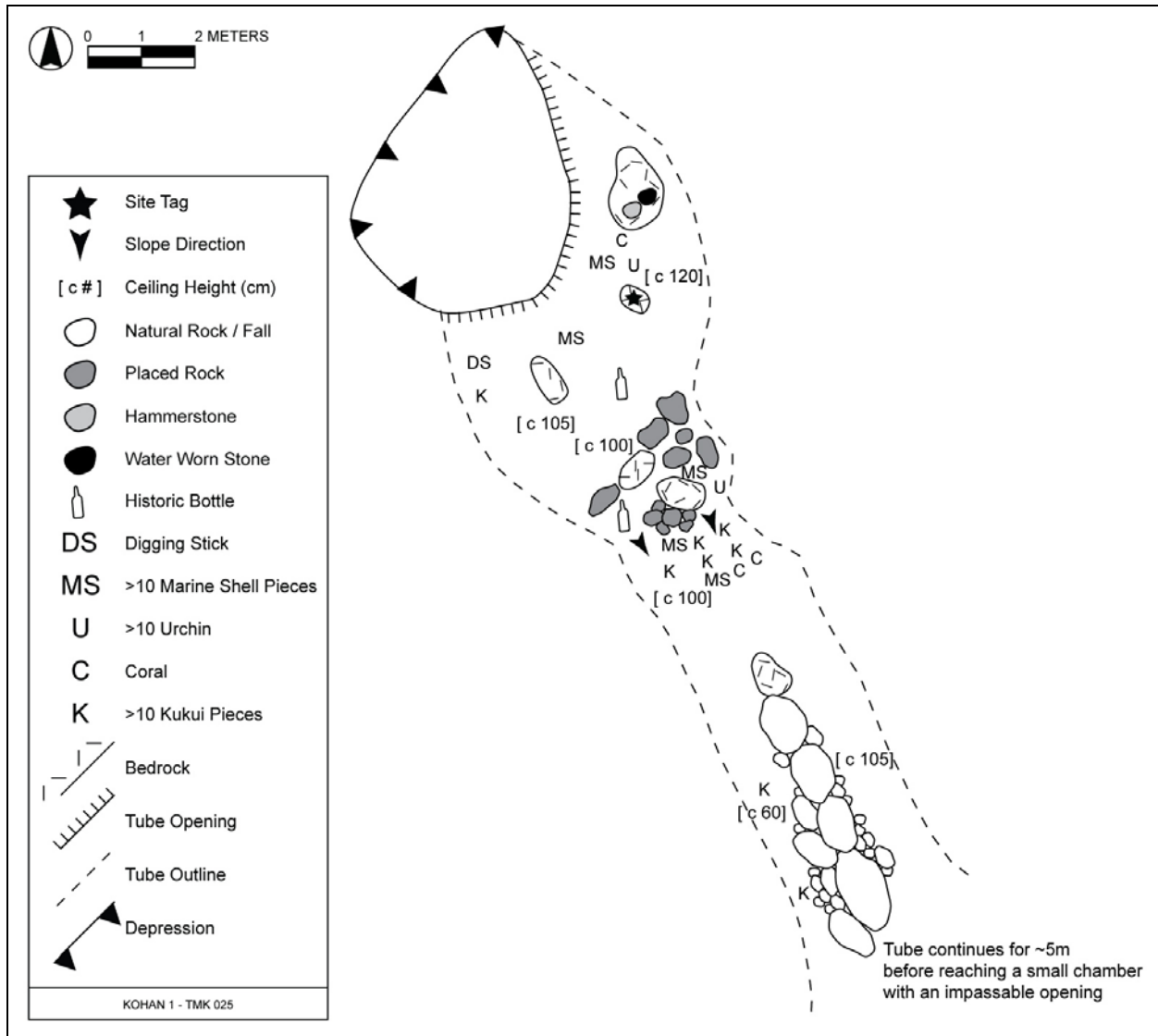


Figure 279. Site -26342, Feature A. lava tube extending off southeast side of sink, interior plan view

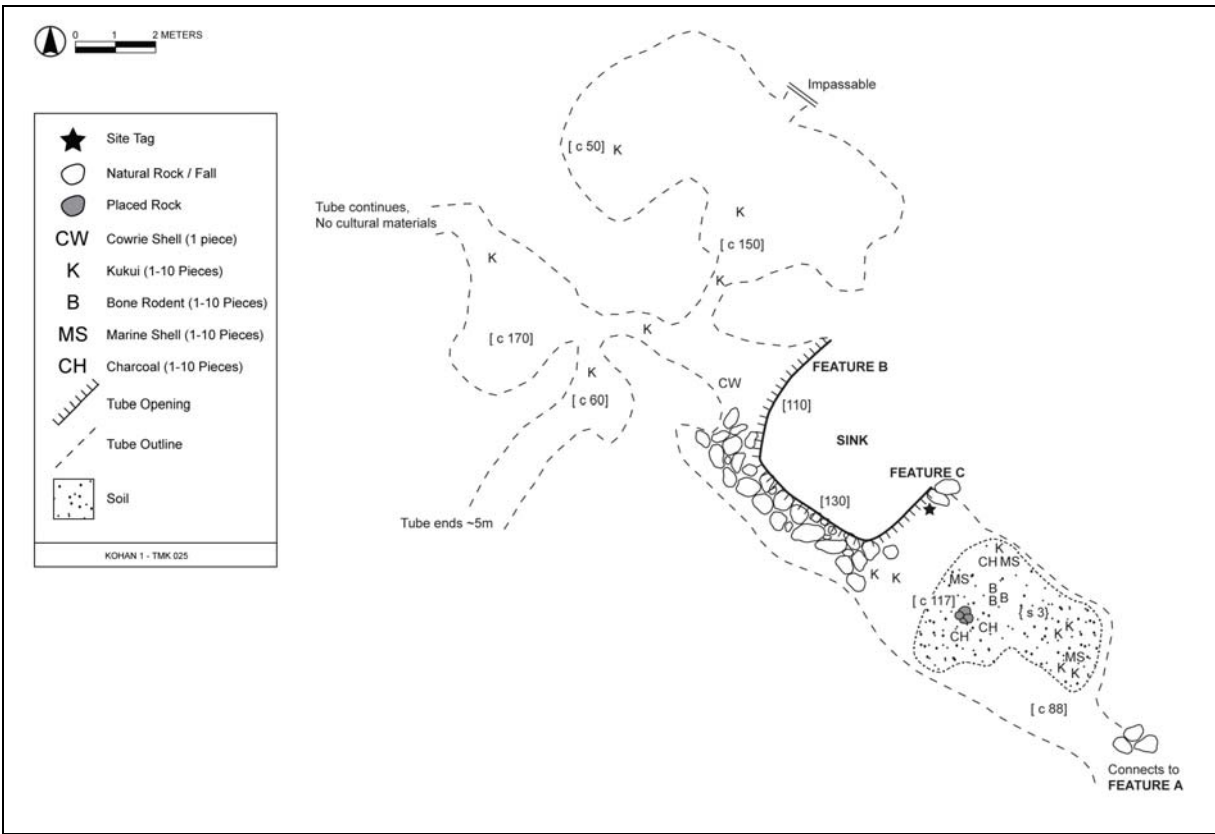


Figure 280. Site -26342, Feature B, lava tube extending off northwest side of sink, and Feature C, extending off southeast side of sink, interior plan view



Figure 281. Site -26342, Feature A, view to southeast



Figure 282. Site -26342, entrance to Feature B, lava tube extending off northwest side of sink, view to north



Figure 283. Site -26342, entrance to Feature C, lava tube extending off southeast side of sink, view to south

4.3.71 State Site # 50-10-27-26343

SIHP #	50-10-27-26343
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava tube
TOTAL FEATURES:	2
DIMENSIONS:	30 m by 12 m (98.4 ft. by 39.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	540 ft a.m.s.l.

DESCRIPTION: Site -26343 is located in a large collapsed lava tube that is approximately 30 m (98.4 ft.) long and runs northeast/southwest (Figure 284 and Figure 285). The collapsed tube is approximately 2-3 m (6.6-9.8 ft.) deep and 6-8 m (19.7-26.3 ft.) in width. The collapsed tube contains two walls (Feature A and Feature B) and caves at both ends of the collapse. The surrounding area is relatively level. Vegetation, consisting of *koa haole* and grass, is relatively sparse in the vicinity of the site, undoubtedly due to bulldozer activity in the area. Bulldozer push piles are on both sides of the site, and a bulldozer road runs approximately east/west on the southeast side of the site.

Feature A (Figure 284 and Figure 286) is a low wall built perpendicular to the length of the collapsed tube. The wall runs northwest/southeast and is approximately 60 cm (1.97ft.) high except near the center where it is collapsed. The wall runs from one side of the collapsed tube to the other side, and is approximately 10 m (32.8 ft.) from the cave on the southwest end. The wall is partially faced with more intact facing on the southwest side of the wall; an upright is on the south end. The wall is constructed of 10 cm - 30 cm (0.33 ft. - 0.98 ft.) size basalt cobbles and small boulders, and is relatively intact on the southwest side.

Feature B (Figure 285 and Figure 287) is a wall approximately 110 cm (3.6 ft.) in height and 2 m (6.6 ft.) wide consisting of stacked boulders from the collapse. It also runs northwest/southeast and extends to the sides of the collapsed tube. The basalt rocks range in size from 10 cm-50 cm (0.33 ft.-1.6 ft.); the majority are large. The boulders and cobbles in the southwest portion are well-stacked and then gradually slope downward toward the northeast cave. Feature B is larger than Feature A, although it is not as well constructed as Feature A and it has no facing. Foliage was cleared to uncover Feature B and there is evidence of sidewall collapse on top of Feature B.

The cave on the southwest end of the site is approximately 50 cm (1.6 ft.) high and 1.5 m (4.9 ft.) across, and continues approximately 2.5m (8.2 ft.) back curving slightly to the south, before ending in a natural collapse. This small cave contains a few *kukui* nut fragments and no other cultural material.

The cave on the northwest end of the site is approximately 5 m (16.4 ft.) northeast/southwest, 3 m (9.8 ft.) northwest/southeast with an average height of approximately 1 m (3.3 ft.). The entrance is approximately 2 m (6.6 ft.) high and slopes downward to about 50 cm (1.6 ft.) in height before ending. The very low ceiling opening (less than 30 cm / 0.98 ft. in height) continues from the back of the cave and runs to the north and to the east although these are too low to explore. The cave's entrance contains several "shelves" where partial collapses or air pockets have left small caves 20-50 cm (0.66-1.6 ft.) in height. The first "shelf" opening is at the westernmost edge of the cave, just outside of the cave's entrance. It is approximately 1 m (3.3

ft.) wide, and contains a few *kukui* nut fragments, a small amount of charcoal, and a few small fragments of sea urchin. The second shelf is approximately 3 m (9.8 ft.) wide; a ground basalt tool was found on the ledge. This artifact is fine-grained basalt with two very finely ground edges. The tool is broken and although the original tool type is unknown, it has an angular grinding edge. The tool is approximately 4 by 4 cm (0.13 by 0.13 ft.) and angles so that the thicker end is 1 cm (0.03 ft.) and the thinner is approximately 0.25 cm (0.02 ft.). The third and fourth “shelves” are approximately 1 m (3.3 ft.) wide each and contain no artifacts.

Within the main portion of the cave (on the north side), there is a small amount of midden containing *kukui* nut fragments, sea urchin, cowry shell, and bird bone (radius and tarsometatarsus, from a fairly large seabird, probably petrel), as well as goat bones spread around the back of the cave. The southeast end of the entrance also has sea urchin and *kukui* nut fragments. Along the northern side of the cave, some ceiling collapse has created a small tunnel running west/east, which is somewhat accessible on the eastern side. This tunnel contains sea urchin and *kukui* nut, and a small amount of charcoal. Soil within the cave ranges from approximately 10 cm (0.33 ft.) deep at the front of the cave to 1-5 cm (0.03-0.16 ft.) deep near the center and back of the cave.

The uppermost layer of *pāhoehoe* is clearly missing from a 2 m (6.6 ft.) diameter semi-circle on the southeast side of the site, just outside of the collapsed tube. Although bulldozer activity possibly caused this removal, it appears unlikely since the area does not contain any rubble. It appears that there was a space between laminar flows that caused the area to crumble, and the rubble may have been removed to create a level, partially protected area.

The site's function is interpreted as temporary habitation based on the presence of midden in the caves and the modification of the collapsed tube. The presence of midden is consistent with pre-contact use. The modification of both walls suggests a higher labor investment than is typically found in shelters. The possibility that the two walls were used for animal husbandry appears unlikely since the walls are not tall enough for animal pens and they are also sloped. The goat bones are likely present due to natural causes.

A site tag identifies the site as: ACP 2-14-03 77-37. Although ACP did conduct an archaeological assessment (Cobb et al. 2003) of the project area, their identification system prefaced the site number with “TF” for temporary field number. It appears likely that the number on the tag faded since TF37 was also identified as a temporary habitation; Cobb et al.'s (2003) site location map does not identify site numbers.

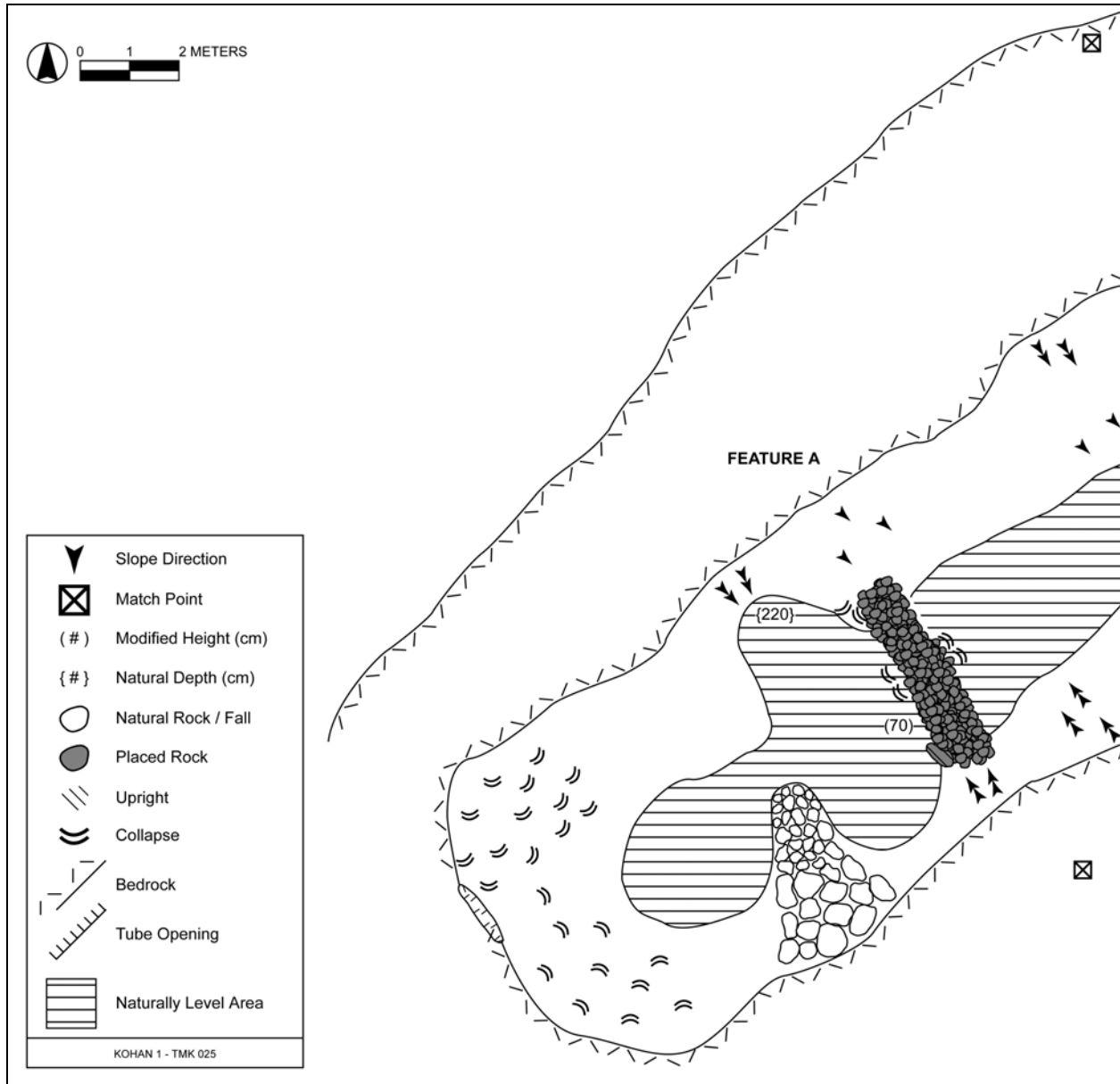


Figure 284. Site -26343, Feature A, plan view (1 of 2, match points relate to Figure 285)

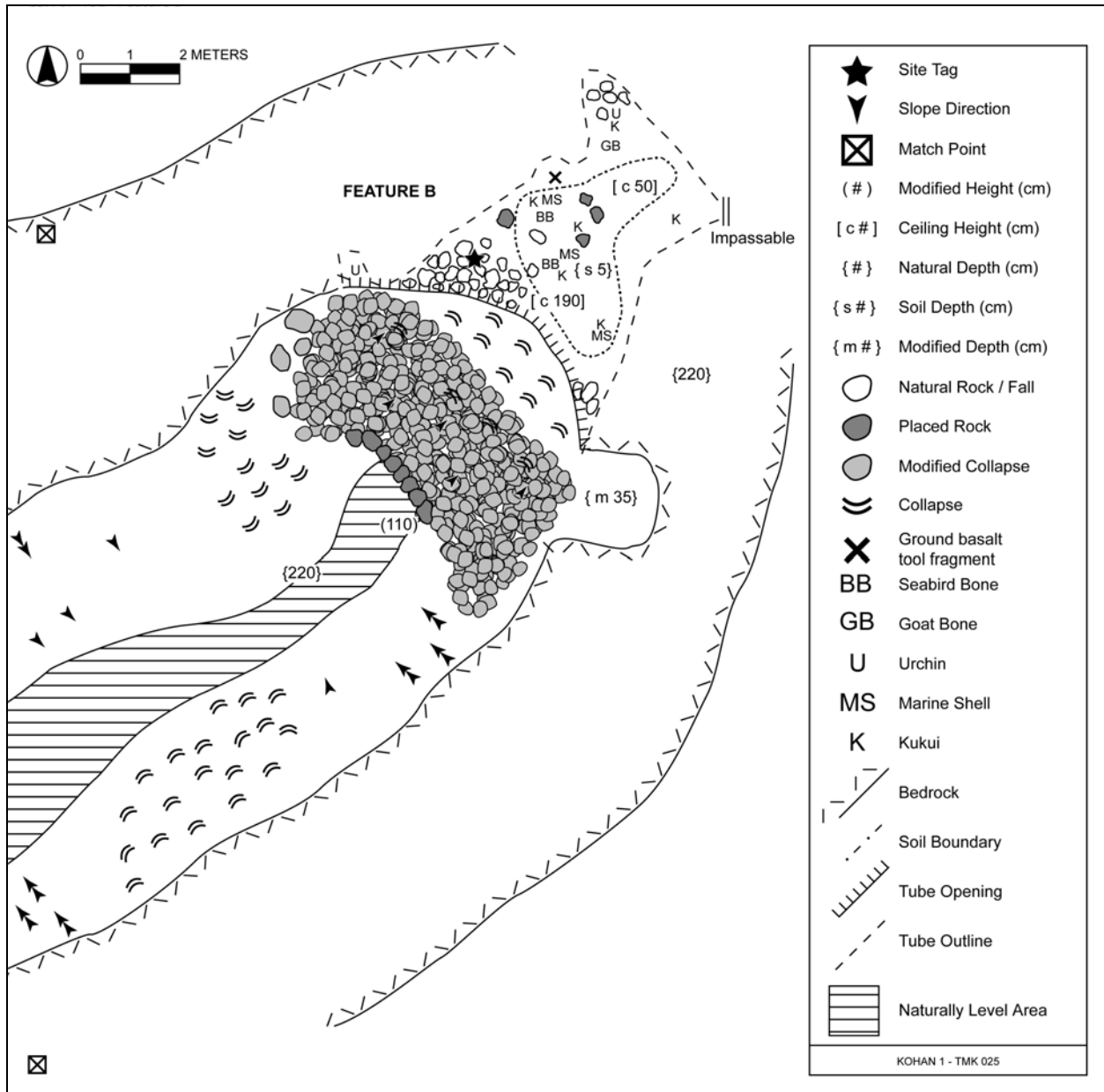


Figure 285. Site -26343, Feature B, plan view (2 of 2, match points relate to Figure 284)



Figure 286. Site -26343, Feature A, view to northwest



Figure 287. Site -26343, Feature B, view to northeast

4.3.72 State Site # 50-10-27-26344

SIHP #	50-10-27-26344
FUNCTION:	Permanent Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	6
DIMENSIONS:	50 m by 50 m (164.0 ft by 164.0 ft)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	570 ft a.m.s.l.

DESCRIPTION: Site -26344 is located just west of the eastern project area boundary and is almost due east of Huliko'a Street. It is located on a relatively level *pāhoehoe* flow with a good view of the slopes of Hualālai and a limited view of the coast (from O'oma to Keāhole).

The site is a permanent habitation complex comprised of six features. The most distinctive are Features C, D, and E, which are platforms constructed of angular *pāhoehoe* cobbles and boulders. Feature C is the largest and tallest, rising above the surrounding terrain. Features D and E are similar low platforms partially built over low bedrock exposures. These three platform features appear to be arranged geometrically, forming an L-shape of points with one leg to the north and one to the east (Figure 288).

Features A and B are related lava blisters, located immediately east of Feature C. Feature A is a very small shelter. Feature B is an unusual blister with a low ceiling containing imported cobbles and small boulders to form multiple alignments.

Feature F is quarried, eroded bedrock of a type that would have been used in the construction of Features C, D, and E platforms.

Feature A is a shelter located on a fairly level area with thick *koa haole* and grass growth (Figure 289 and Figure 290). The feature consists of three large slabs pushed upright into a triangular shelter as the result of a natural *pāhoehoe* upheaval. The angular slabs rest against one another at a single point creating a shelter with two openings (one to the east and one to the west) that is located in a slight depression (that runs east/west and is approximately 5 m / 16.4 ft.) long that is adjacent to a flat area of *pāhoehoe* to the north. The slabs create a sheltered area approximately 1.5 m (4.9 ft.) in diameter and approximately 90 cm (3 ft.) in height. On the north and south sides of the shelter, small and medium size cobbles are piled against the upright slabs to fill in crevices and create a covered shelter. Inside the shelter, cobbles have been cleared from the ground surface except for two small paving stones (flat *pāhoehoe* slabs) and an informal one-course wall at the east entrance. A single cowry shell was found and no other midden was observed. The soil inside the shelter is 3-10 cm (0.1-0.33 ft.) deep and possibly deeper in some areas. This suggests this feature has some excavation potential, however, there is only one piece of midden on the surface and at least some of the soil depth is due to recent plant material. Since this shelter is in a depression where sediment settles, it is possible midden is present beneath the top layer.

The area surrounding the shelter has several small (less than 40 cm / 1.3 ft. high) blister openings. The shelter's north corner is adjacent to one of these openings (which are caves that

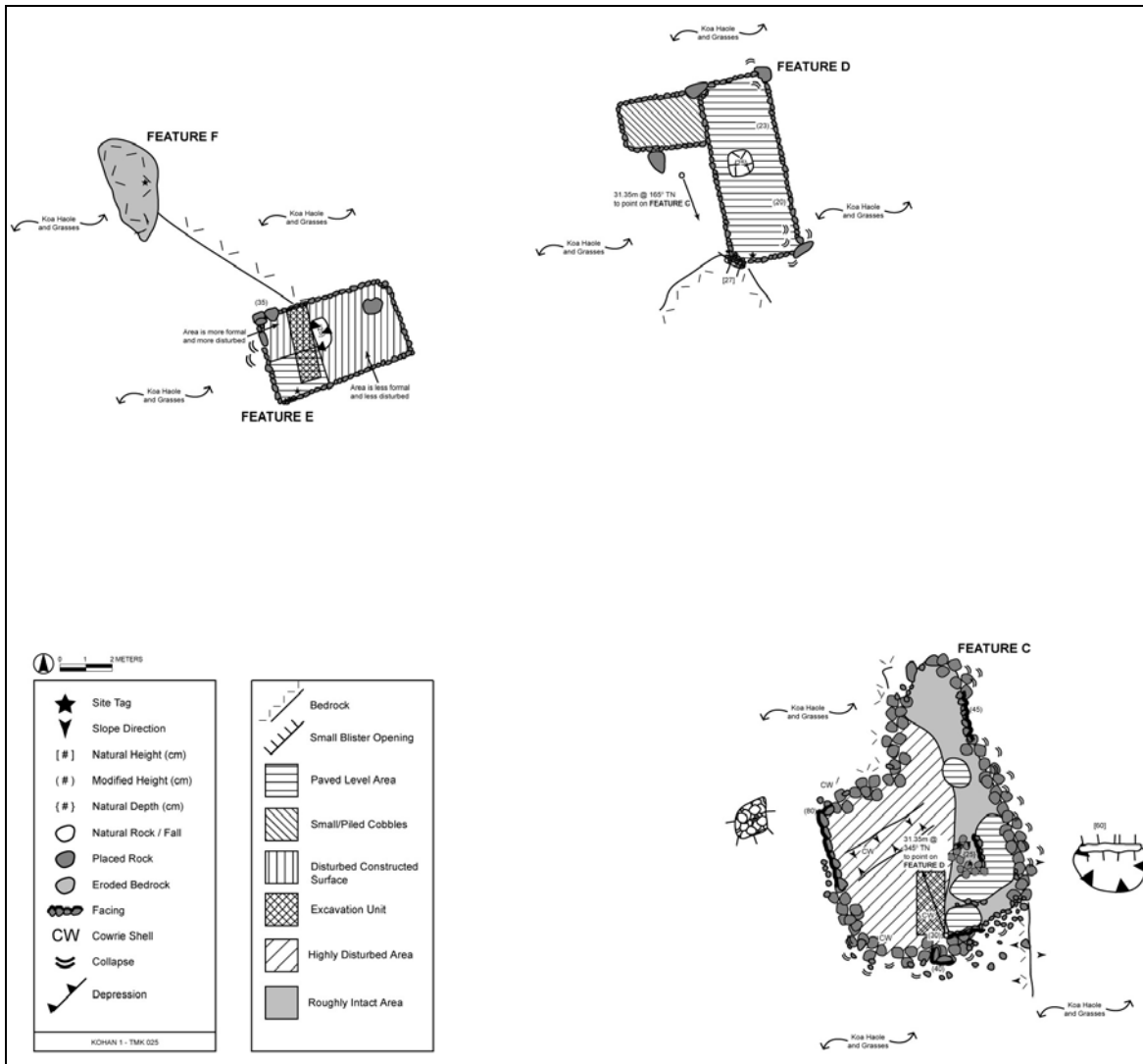


Figure 288. Site -26344, Features C, D, E, and F overview

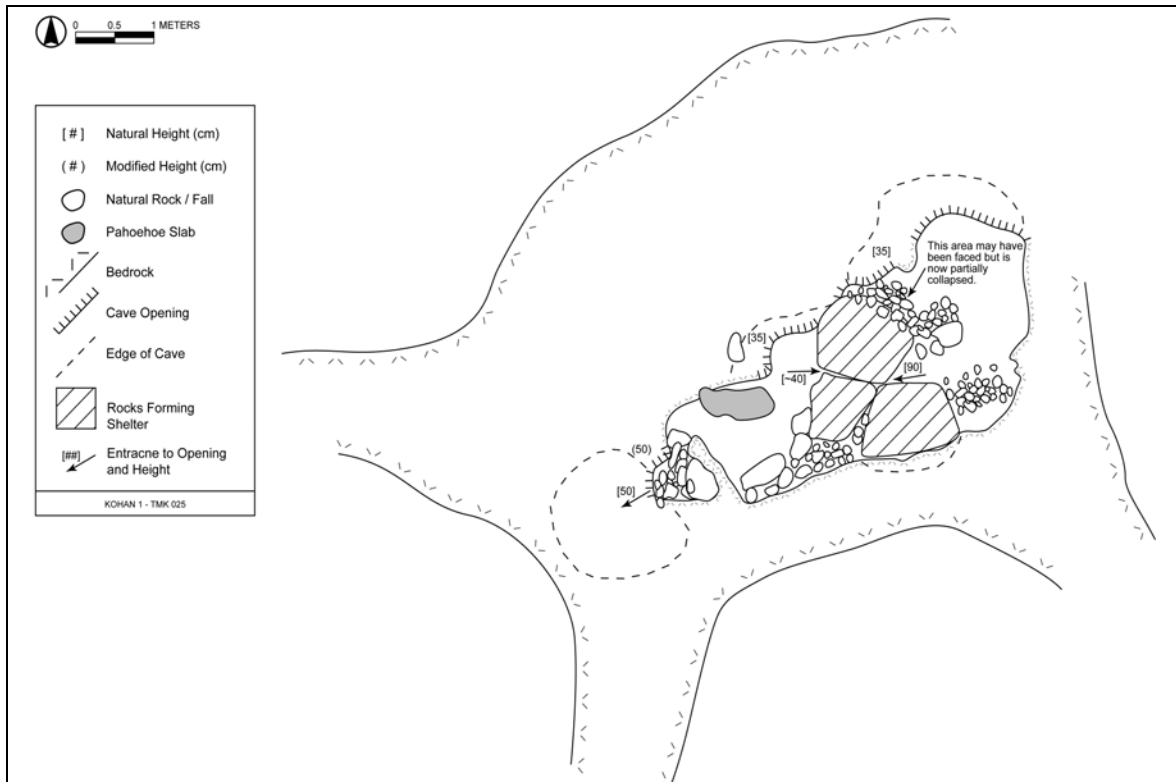


Figure 289. Site -26344, Feature A



Figure 290. Site -26344, Feature A, showing the alignment on the opposite side of the shelter from the photo scale, view to east

extend under the flat *pāhoehoe* area to the northwest of the shelter), and small cobbles (10-20 cm / 0.66 ft.) are stacked three to four courses high along the shelter edge partially to cover a gap at the bottom of the shelter and partially to create an entranceway to the blister opening. This cobble pile may have been more formally stacked at one time, but is currently partially collapsed. At the southwest end of this depression, there is a large flat *pāhoehoe* slab lying at an angle; it is partially sitting on the flat *pāhoehoe* bedrock to the north, and partially lying in the depression. At the far southwest end of the depression is a collapsed blister cave that extends approximately 1.5 m (4.9 ft.) to the southwest and is approximately 55 cm (1.8 ft.) high. Medium to large size boulders (25-50 cm / 0.82-1.6 ft.) are stacked at the entrance of this blister cave, partially blocking the entrance. No internal modification or midden was observed in this blister cave.

Feature A's function is interpreted as shelter. The naturally upheaved *pāhoehoe* slabs create a covered area for resting/eating, but it is not large enough to be a habitation. It is possible that the adjacent blister caves were used as storage, since they are partially modified. Additionally, this feature displays only minimal modification, which is not consistent with longer term habitation. No other functions are consistent with this feature. This area was likely chosen as a shelter due to the natural formation that provides cover, the flat *pāhoehoe* area to the north, and its proximity to the other features within this site.

Feature B is a small lava tube that measures approximately 4.7 m (15.4 ft.) north/south by 4.5 m (14.8 ft.) east/west and reaches a maximum height of 80 cm (2.6 ft.) (Figure 291 and Figure 292). There is a very thin soil deposit between 1 cm (0.03 ft.) and 2cm (0.07 ft.) deep that covers most of the blister floor. The lack of significant soil suggests a poor excavation potential for this feature. There is a very small amount of midden consisting of a few pieces of scattered *kukui*. Feature B exhibits modification in the form of placed boulders, including one upright. The boulders at the north end of the blister are natural collapse that has been moved to increase the blockage at the blister's collapsed north opening. The south entrance to the blister, the only access point into the blister, is partially restricted by placed boulders. These placed boulders fork into a northwest-heading and north-heading branches. None of the boulders at the south end originate from natural collapse of this blister.

Feature B's function is interpreted as a shelter. The small size of the blister, the presence of a small *kukui* midden scatter, and the relatively limited modification suggest temporary shelter as a function. The boulder alignments that extend approximately 1 m (3.3 ft.) from the partially blocked entrance into the center of the blister, in addition to the presence of a small upright at the north end of one of the alignments, are consistent with the minimal amount of modification that would be expected of a shelter.

Feature C is a large platform measuring approximately 9 m (42.7 ft.) north/south by 6.5 m (32.8 ft.) east/west with a constructed height of approximately 1 m (3.3 ft.) (Figure 288, Figure 293 and Figure 295). The platform is constructed of *pāhoehoe* cobbles and boulders, and *pāhoehoe* slabs. Most of the platform's west half has been highly disturbed; the surface is extremely uneven and contains a trench running northeast/southwest across this west half. The *pāhoehoe* cobbles, boulders, and slabs are unsorted and extremely loose. The cause of this disturbance is not evident, although the loose, unsorted arrangement of the boulders is similar to bulldozer activity. Some bulldozer activity is evident in the vicinity (alongside site -26344 Feature B), however, there is no direct evidence of bulldozer activity on this structure. Although

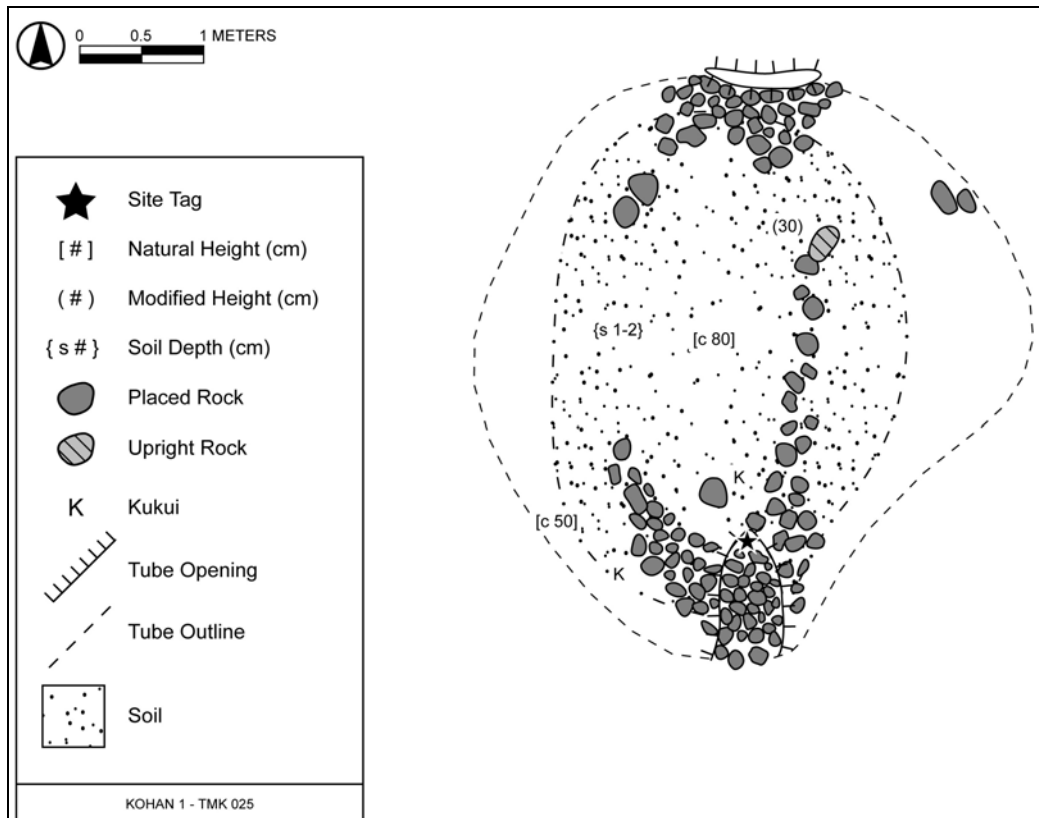


Figure 291. Site -26344, Feature B



Figure 292. Site -26344, Feature B showing view of entrance to blister shelter, view to north

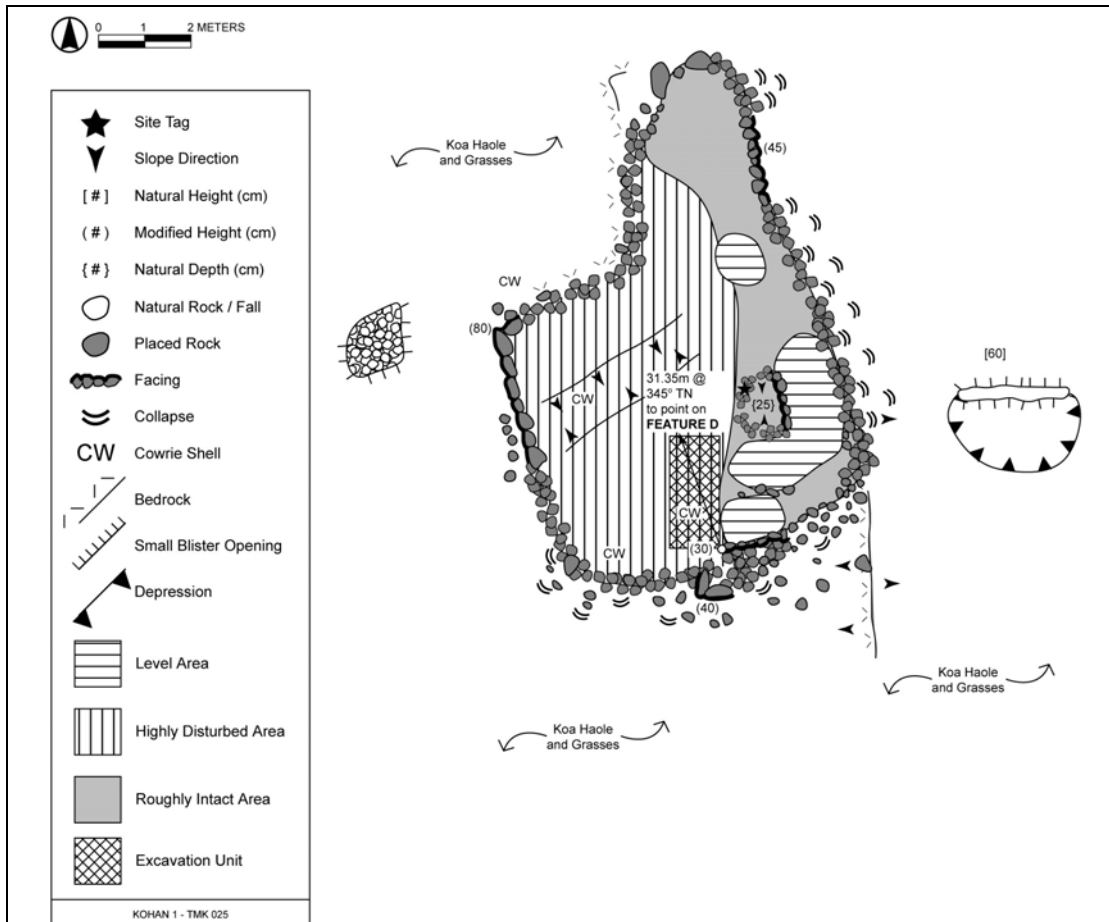


Figure 293. Site -26344, Feature C



Figure 294. Site -26344, Feature C, overview showing highly disturbed west half (right) and roughly intact east half (left), view to south

portions of the Feature C platform walls are partially collapsed, the walls around the disturbed west half remain more or less intact. An approximately 3 m (9.8 ft.) portion of the west wall exhibits facing, and a well defined and faced northwest corner. The surface of the west half of the platform may have been informally excavated, which would account for the trench. A few pieces of cowry shell were found on top of some of the boulders in the disturbed west portion, suggesting that the disturbance occurred prior to the abandonment of the site or that the pieces were placed there, although unintentionally, in the process of the disturbance.

The east half of the platform remains relatively intact, although, there are some scattered boulders and slabs that are loosely tossed on the surface's east half, likely as part of the disturbance. Significant collapse is evident on nearly all of the sides of the platform, particularly along the east side, which lacks facing and where the original edge of the structure is difficult to discern with the collapse. The platform's southeast corner is discernable and some facing remains on the northeast side of the north wing of the platform. The east half of the platform's surface is roughly intact and exhibits the small cobble paving that comprises the intact upper surface of the platform. This surface is relatively flat with multiple areas that are more noticeably level and smooth. A constructed depression or pit (approximately 25 cm / 0.82 ft. deep) is in this east half of the platform surface. This depression has clear facing on its east side and its other three sides are somewhat collapsed.

A portion of the platform along its south side is well faced with smaller horizontally stacked slabs three courses high. The top surface of this faced portion is well paved with small cobbles. Additional facing, constructed with uprights that create a side terrace below the horizontally stacked portion, is immediately south of this faced portion. The side terrace is also partially collapsed but extends west until it becomes flush with a ridge of exposed bedrock. A north wing of the platform also extends from the platform's main portion. It is built upon the northeast side of the platform's main portion and is flush with the continuation of the bedrock ridge on its west side. This wing creates an extended level surface for the platform.

The midden on Feature C consists of approximately ten scattered pieces of cowry that are located on both the disturbed and undisturbed portions of the platform surface. This surface midden, in addition to the constructed height of the platform, suggests a fair excavation potential for this feature. A small entrance to a small tube is north of the platform; the tube runs underneath the structure. Some crushed *kukui* that may have washed in from the surface is immediately inside this north entrance and two other small openings into this tube. A few *Nerita* shells and one approximately 15 cm by 15 cm (0.49 ft. by 0.49 ft.) triangular upright are also present in the tube. These are the tube's only modifications or cultural material.

Feature C's function is interpreted as permanent habitation based on testing (see below). Although the small shell midden scatter on the platform suggests the possibility of habitation, the platform is quite large in comparison with the other habitation sites found in the project area. The platform's original construction consists of fine facing, a well paved surface, and platform, which rises at least 1 m (3.3 ft.) above the western bedrock surface, are indicative of a permanent habitation, particularly since there are two other platforms, Features D and E, in association with Feature C. Testing found abundant marine shell midden and *kukui* within the platform, no internal constructed chambers, and no human remains. The feature's function is interpreted as permanent habitation based on the abundance of midden, the extent of modification, and the lack of subsurface chambers or burials.

Feature D is located along a ridgeline just north of, and slightly lower than Feature C (Figure 288, Figure 295 and Figure 297). Feature E is located approximately 10 m (32.8 ft.) down slope (west) of Feature D. From Feature D the coastline is visible between 254-331 degrees (roughly west to northwest). The natural environment is characterized by dense, low (chest to head high) *koa haole* and grasses. An eroding, underlying *pāhoehoe* exposure that runs north/south is on the south end of Feature D.

The construction Feature D and Feature E is similar. Large (30-45 cm / 0.98-1.5 ft.) and medium (15-30 cm / 0.49-0.98 ft.) cobbles were used to construct the basic form of the 7 m (23 ft.) by 3 m (9.8 ft.) rectangular platform. Small cobbles were then used as fill, creating a level surface. Small cobbles were also used to fill a small (27 cm / 0.89 ft. height) blister at the southwest corner of the platform. The southeast, northeast, and northwest corners of the platform are marked by boulders. Off the northwest corner, there is an area of scattered medium and large cobbles that do not appear to be part of Feature D. The construction of Feature D appears fairly formal, although some collapse has obscured distinct edges. The east side of the platform structure, towards the north end, has flat, medium to large cobbles stacked 2-courses high that form a flat facing to the platform edge; this construction was likely on all sides of the platform. A small depression (approximately 1 m by 1 m / 3.3 ft. by 3.3 ft. and 25 cm / 0.82 ft. deep) in the center of the platform seems deliberate. There are no facing stones or other clear indications that it was part of the original platform construction, but areas around the depression are intact and in good condition. This intact area of the platform, although not very deep, represents a fair excavation potential.

Feature D's function is interpreted as permanent habitation based on its size, and association with the other site features. Feature D's size required a fair amount of energy investment and the height of this platform (20-30 cm / 0.66-0.98 ft.) is unlikely to represent a burial feature. The lack of midden and cultural material was considered; little midden was evident within Feature C until testing excavations indicated otherwise. Feature D's association by alignment and proximity to other site -26344 features, particularly Features C and E, support permanent habitation function.

Feature E is a permanent habitation feature located on a gentle slope to the west, approximately 10 m (32.8 ft.) below the ridgeline that Features C and D are on (Figure 288, Figure 296, and Figure 298). The area is characterized by fairly dense but relatively low *koa haole* and thick grass.

Feature E is located on a *pāhoehoe* bedrock exposure that runs east/west and then partially curves to the northwest, where the bedrock exposure intersects with Feature F. Feature E is a rectangular platform made by modifying the natural bedrock exposure; it measures approximately 6 m (19.7 ft.) by 3 m (9.8 ft.) and approximately 35-40 cm (1.1-1.3 ft.) in height. Construction consists of large (30-45 cm / 0.98-1.5 ft.) and medium (15-30 cm / 0.49-0.98 ft.) cobbles. Small cobbles were then used as fill for the top of the structure to create a leveled structure. Due to the extent of disturbance to this structure, formal construction is only evident in some areas. One such area is the northwest corner of the platform; it has a sharp 90 degree corner and large *pāhoehoe* slabs stacked three to four courses high to create a nice face. The north wall continues to be fairly sharply delineated as it continues east although formal construction either ceases or is too disturbed to recognize. The east half of the platform appears to be less formally constructed; it is close to the natural bedrock, and has minimal stacking consisting of one to two

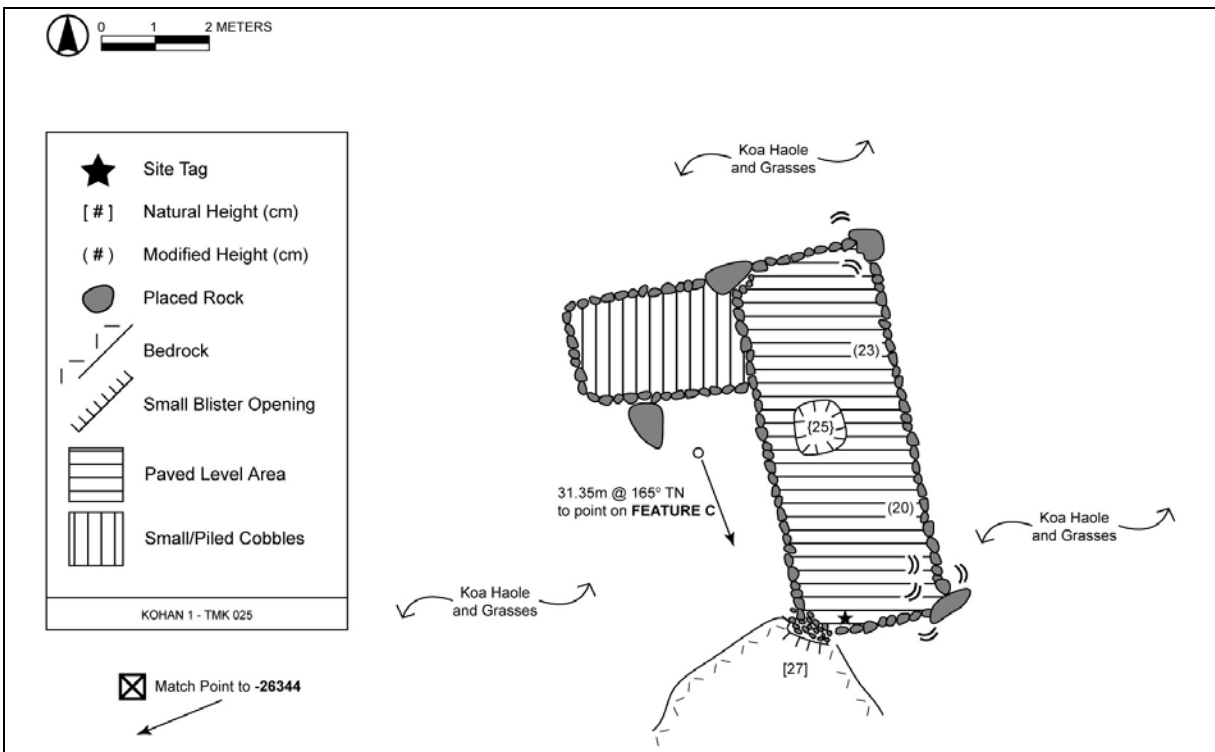


Figure 295. Site -26344, Feature D

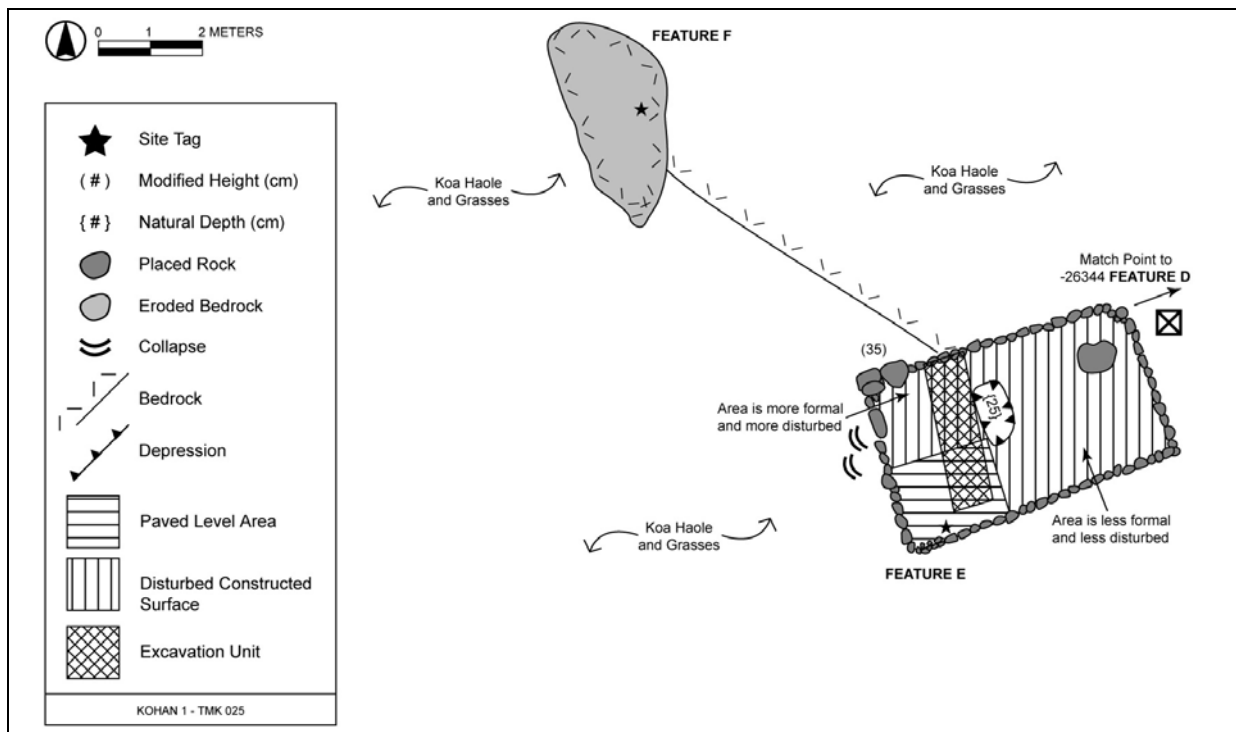


Figure 296. Site -26344, Features E and F



Figure 297. Site -26344, Feature D overview



Figure 298. Site -26344, Feature E, partially quarried area is in foreground, view to northeast

courses of stacking, and smaller, medium size cobbles used for construction. Construction appears to be more formal on the west end with the well defined northwest corner and a more formally leveled area that is paved with small cobbles to create a flat surface. This intact portion of the platform represents a fair excavation potential. The structure slopes downward slightly to the west, although the western half has been made level. The small fill cobbles may have been quarried from Feature F or from nearby eroding bedrock. Feature E, like Features C and D, also appears to have a small depression in the center of the structure; it is approximately 75 cm (2.5 ft.) by 75 cm (2.5 ft.) and 10-20 cm (0.33-0.66 ft.) deep. Disturbance in this general area make it difficult to confirm whether the depression was part of the original construction, or whether it is related to the disturbances. However, there are a few partially upright slabs in the vicinity of the depression that would suggest that the depression was a formal part of the original structure. Although Feature E was constructed to follow the natural bedrock, particularly at the east end, the natural bedrock angles off to the northwest about halfway down the structure and eventually intersects with Feature F. The platform does not follow the bedrock as it curves, but rather continues to the west to create a straight wall that is on the same bearing as the small east/west north wing of Feature D.

The west half of Feature E is the only area that is undisturbed. The northwest corner is collapsing, and most of the structure's edges are collapsed and dispersed. Disturbances could have been caused by bulldozer activity in the area since a large bulldozer road is to the east, however, bulldozer activity would create a more uniform disturbance. Structural collapse can be partially attributed to natural weathering and plant activity. However, at the northwest top portion and most of the feature's east end, medium and large cobbles appear to have been tossed around, disturbing the original construction but not completely destroying its shape. This disturbance is similar to the disturbance at Feature C. While the south side is more or less intact and contains small cobble fill, the north side has medium to large cobbles piled haphazardly with small cobbles tossed around. Since bulldozer activity seems unlikely, these disturbances may have been caused by human activity, either for stone re-use (although not many stones appear to have been removed), or stone removal to determine the contents of the platform, or vandalism.

Feature E's function is interpreted as permanent habitation based on the extent of modification and construction that is similar to Feature D. It is a large platform that required a fair amount of energy investment to construct the formal corner and fill, which suggests that it was not used for agriculture or as an expedient shelter. Although burials can be associated with platforms, it is relatively shallow and likely could not accommodate a burial. Additionally, any burial or cultural items that may have been associated with this feature were likely removed during the structure's disturbance; the disturbance targeted the structure's most developed area. Due to size, formal construction, and association with other features, Feature E appears to be permanent habitation function. The platform also has a fair view, although not as good as Features C and D.

Feature F is located approximately 10 m (32.8 ft.) northwest of Feature E, on a relatively flat area with *koa haole*, grasses, and a Christmas berry tree in the surrounding area (Figure 288 and Figure 296). The feature consists of a modified *pāhoehoe* bedrock exposure, approximately 4 m (13.1 ft.) north/south by 2 m (6.6 ft.) east/west, that is heavily eroding, causing many small cobbles to erode off the exposure's surface. The feature is irregular and no formal or informal construction is apparent, although the surface does appear to be somewhat leveled with small cobbles. Some boulders appear to have been removed in the exposure's southern portion.

Feature F's function is interpreted as quarry activity area for cobble fill for the nearby platforms (Features C, D, and E). While some leveling of the surface is evident, the feature is too small to be a platform or even an agricultural terrace, and is also very irregular. Therefore, this minimally modified feature likely functioned as a small quarry. Another exposure, 20 m (65.6 ft.) to the south, appears to have been used for a similar purpose. There are many exposures in the general area of site -26344 that were likely used to quarry stone for platform construction (Features C, D, and E).

The site's function is interpreted as permanent habitation complex. This site represents a permanent habitation complex (*kauhale*), although some of the formal architectural elements of Feature C, such as the south terrace and the wing to the north, are unusual. Preservation is recommended for this site based on function and the unusual nature of the configuration of the key features, C, D, and E.

Testing Results

Excavation was undertaken within Feature C and Feature E to aid in determining their functions and to check for burials.

Feature C: A 2.3 cm by 1.2 cm (Figure 293) test unit was excavated within the platform to a maximum depth of 82 cmbs (Figure 299). Stratum I reached a maximum depth of 75 cmbs and consisted of stacked rubble, various sized cobbles, and small boulders. Within this fill layer, marine shell (209.5), and charcoal (5.3 g) were present. *Cypraea* sp. shells (192.0 g) were scattered throughout. Other marine shell species present within Stratum I include: *Conus* sp. (8.0 g), *Isognomon* (3.6 g), *Strombus* (1.9 g), coral (1.7 g) and unidentified (2.3 g); 183.5 g of *kukui* was also present. A worked basalt fragment was also found in this stratum. Based on the fragment's size and shape it may be a piece of an octopus sinker lure or possibly a portion of a kahuna cup. Bedrock was encountered at 40 cmbs at the north end of the trench.

Stratum II ranged from 40 to 41 cmbs at the north end of the trench and from 75 to 82 cm within the remainder of the trench. Stratum II consisted of very dark grayish brown (10 YR 3/2) silt loam that contained numerous *Cypraea* shell fragments (242.9 g), other marine shell fragments (22.7), four volcanic glass flakes (1.7 g), *kukui* (217.2 g) and charcoal. The charcoal, however, does not have good provenience. Marine shell fragments include *Isognomon* (7.0 g), *Strombus* (4.9 g), *Conus* sp. (2.1 g), *Drupa* (1.3 g), sea urchin (3.4 g), and unidentified (4.0 g); 0.1 g of rodent bone was also present. Stratum I and II appeared to be very similar and the majority of the sediment in Stratum II filtered through Stratum I; no distinct stratigraphic changes were found.

Feature E: A 250 cm by 70 trench was excavated 90% of the across the west portion of Feature E (Figure 296 and Figure 300). The trench was placed in the west portion; this was the most intact portion of the feature and showing the greatest potential to yield informative results. Stratum I consisted of *pāhoehoe* cobbles and is the constructed portion of the feature. No cultural materials or subsurface features were encountered within Stratum I.

Stratum II is a layer of 10 YR 2/2 silt with some small *pāhoehoe* cobbles and pebbles that is generally about 12 cm thick. Stratum II was screened through 1/16 inch mesh screen and a single small flake of volcanic glass (0.5 g) was found. No subsurface features or other cultural materials were found. In the north portion of the trench, Stratum II seems to be a sediment deposit

underlying the constructed feature, although it is difficult to discern how much of the sediment predates construction and how much has been deposited through the gaps between the cobbles of Stratum I. No human remains or other culturally deposited materials or subsurface features were found to indicate burial function. The single volcanic glass flake does not provide significant insight into the site's function. Construction of the feature below the surface is consistent with the piled *pāhoehoe* cobbles observed at the surface. Permanent habitation function interpretation appears the most appropriate based on excavation results.

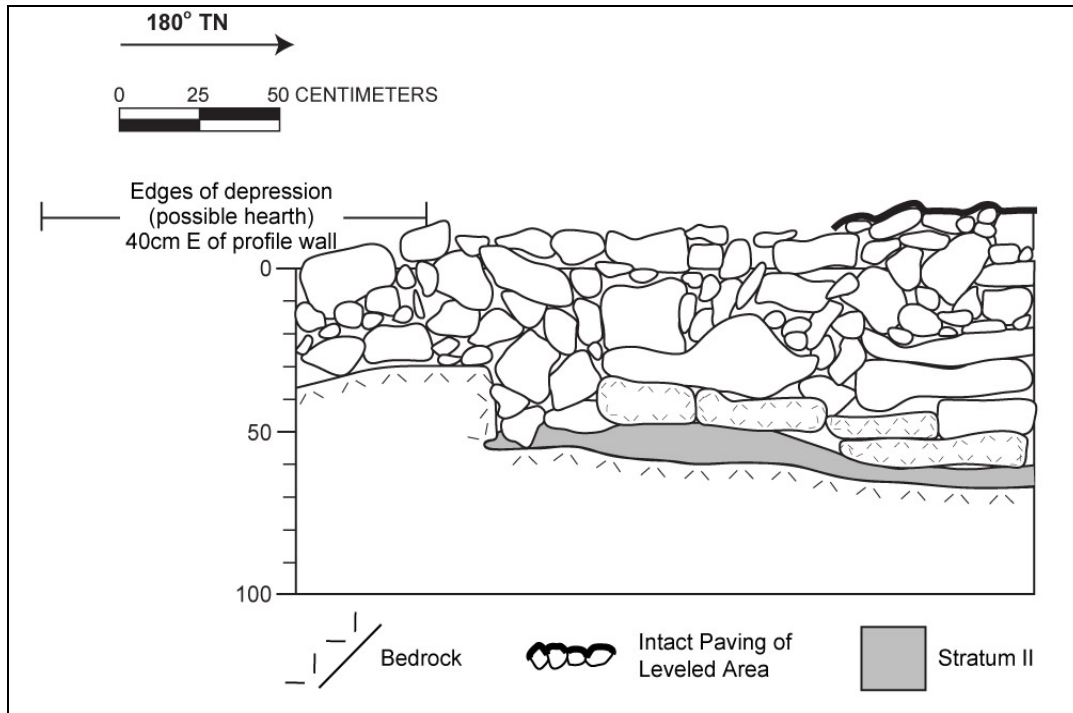


Figure 299. Site -26344, Feature C excavation profile

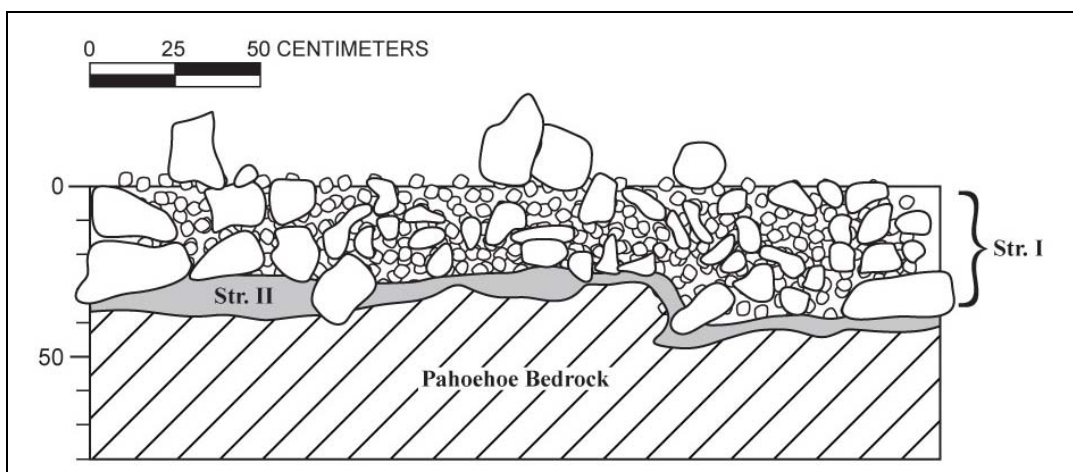


Figure 300. Site -26344, Feature E, west wall profile

4.3.73 State Site # 50-10-27-26345

SIHP #	50-10-27-26345
FUNCTION:	Quarry
SITE TYPE:	Modified outcrop/Lava Tube
TOTAL FEATURES:	2
DIMENSIONS:	8 m by 4 m (26.3 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	560 ft a.m.s.l.

DESCRIPTION: Site -26345 (Figure 301) consists of a quarrying area (Feature A) and a cave whose function is indeterminate (Feature B). The site is located near a depression that lacks vegetation. A bulldozer road is on the northwest side of the site; the bulldozer road runs approximately southwest/northeast above the depression on the northwest side. The depression was likely caused by the collapse of a lava tube or blister, and the *pāhoehoe* within the depression is very fragmented, consisting primarily of smaller cobbles with small large boulders.

Feature A is a quarrying area. Above the depression at its northern edge are several flat *pāhoehoe* formations that are the correct texture for abraders (Figure 302). This area extends from above the cave in the depression (Feature B), approximately 3 m (9.8 ft.) to the north, and then runs approximately 7 m (23 ft.) to the east. There is considerably less vegetation in this area, and the area that lacks vegetation is 1-2 m (3.3-6.6 ft.) wide. The majority of this bare area has small cobbles, approximately 5-20 cm (0.16-0.66 ft.) in diameter. The area closest to the cave (Feature B), has an approximately 1 by 2 m (3.3 by 6.6 ft.) area with a flat *pāhoehoe* formation that has evenly spaced fine vascular holes (the type of vascular basalt that is often used for abraders). These formations are relatively thin (1-3 cm / 0.03-0.1 ft. thick) and easily break off of the main slab. The rubble near the intact flat *pāhoehoe* consists of many small broken pieces of the *pāhoehoe* that is ideal for abraders. A few large *pāhoehoe* slabs (approximately 40 cm / 1.3 ft.) that are on top of the flat *pāhoehoe* may have been used to break up the flat areas to make abraders. The area lacking vegetation turns to the east, with areas of the flat *pāhoehoe* continuing that were also likely used as abraded material, although these areas are smaller and more fragmentary.

The presence of the correct material type is evidence that this site was utilized as an abraded quarry. Surrounding areas have a similar type of *pāhoehoe* (with smaller vascular holes creating a file-like surface) but in other areas the *pāhoehoe* breaks off in larger, less uniform pieces (smaller abraded surface) and the surface that would be used for abrasion is far more undulating and not as flat. Although no functional association is apparent, no other function appears likely for Feature A. A bulldozer road is nearby, raising the possibility that the site is actually the result of bulldozer disturbance, however, none of our observations of the flat *pāhoehoe* area is consistent with bulldozer activity.

Feature B is a lava tube and the area immediately adjacent to the tube entrance (Figure 303). A site tag identifying the feature as TF-146 was found. Cobb et al. (2003:n.p.) identified this cave with a small opening as indeterminate function. The lava tube was inaccessible until boulders in front of the entrance were removed.

The modified area immediately in front of and partially blocking the cave area is approximately 1.5 m by 1.5 m (4.9 by 4.9 ft.). This area consists of rubble collapse that is

relatively level and is retained by an upright that more or less prevents access. This area abuts a vertical face of naturally collapsed *pāhoehoe*. This level area is unique; it is located at the base of the vertical face and at a very steep slope below Feature A, quarry. Generally, this location would naturally accumulate collapse, however, the level surface area in front of the cave, exhibits no rubble collapse or naturally mounded collapse. The upright in the cave entrance that retains the rubble, and a second upright that appears to be placed (discovered upon removal of some rubble from the entrance), indicate that the entrance has been intentionally constructed to prohibit access to the cave.

The level surface area surrounding the cave has been modified by removal of natural collapse material that should be present, based on its location. The surface was then leveled so it is relatively flush with the natural depression created by natural collapse of a former large blister or tube. The cave itself likely runs for approximately 5-6 m (16.4-19.7 ft.). The first approximately 2 m (6.6 ft.) directly inside the entrance is partially blocked with collapse. It is likely that this collapse is partially natural, however, it is impossible to determine at this time if the collapse has been modified without excavation.

Feature B's function was initially interpreted as a possible burial based on the elimination of other possible functions, however, testing (see below) found that no burial was present. Based on the size of the rubble in the natural depression and the lack of any agricultural modifications on this same outcrop, this was not agricultural. Since collapse restricts access to this cave and additional modifications were made to block the entrance, this cave was not habitation or shelter. Based on the elimination of other possible functions and the apparent intentional blocked access, the cave's function is indeterminate.

The site's function is interpreted as a complex with an abrader quarry and indeterminate. Both interpretations are based on eliminating other possible functions, although the type of vascular basalt present within Feature A is often used for abraders. Feature B appears to have been intentionally blocked, and intentionally blocked lava tubes are usually characteristic of possible burials, although that possibility has been eliminated (see below).

4.3.73.1 Testing Results

Test excavation was conducted to determine if Feature B, lava tube, contained a burial. Small and medium cobbles around the *pāhoehoe* upright slab in front of the tube's entrance and the slab were removed to enter the lava tube (Figure 304). A Steinlager bottle and a pack of matches were found approximately 1 m (3.3 ft.) behind the slab. Goat bones were also found, however, no human remains or cultural materials were found within the tube. Small to medium sized *pāhoehoe* cobbles were present. The tube does connect with another tube that contains no modifications or cultural material.

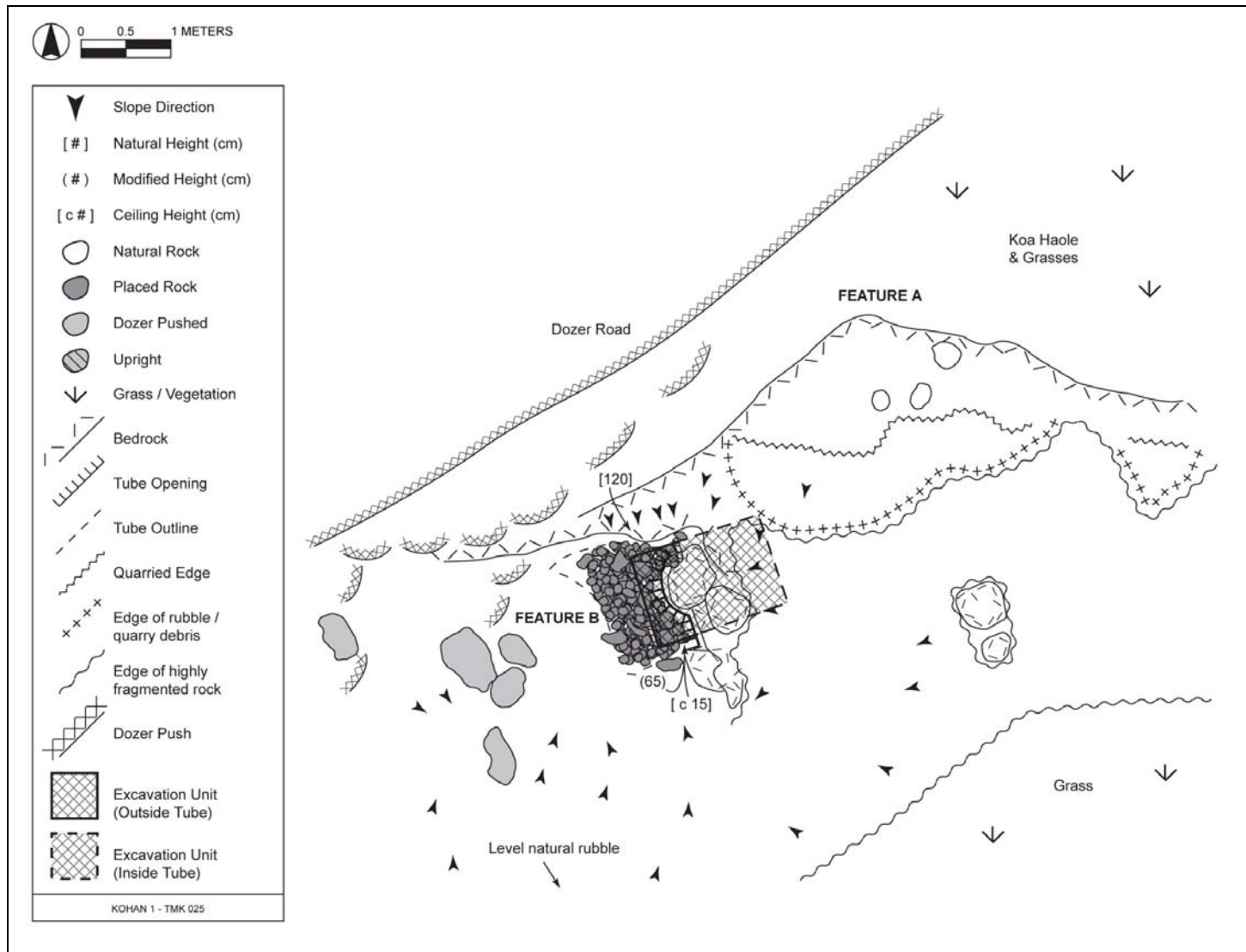


Figure 301. Site -26345, plan view



Figure 302. Site -26345, Feature A, view to northeast



Figure 303. Site -26345, Feature B, showing partially constructed opening, view to north

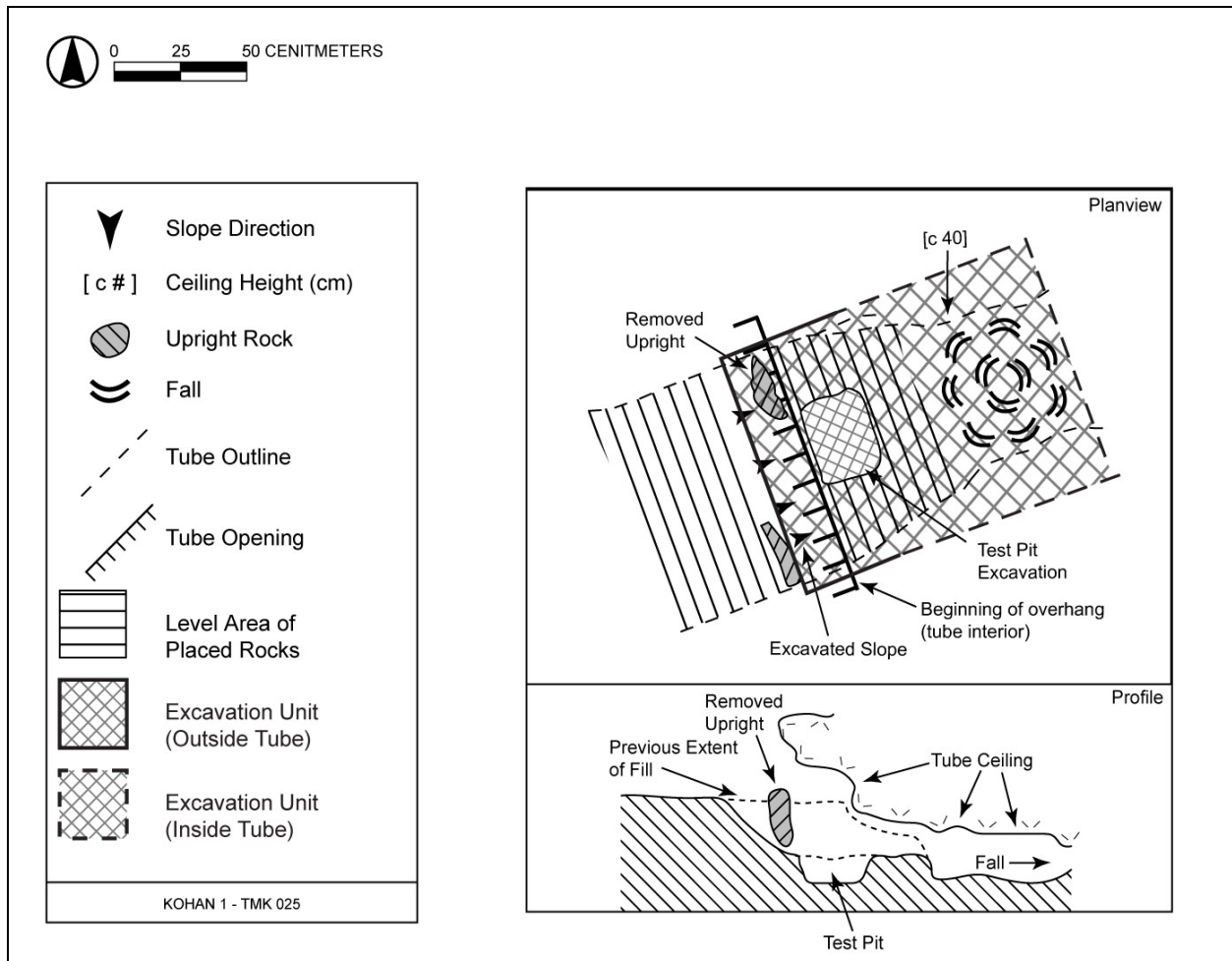


Figure 304. Site -26345, excavation plan view and north wall profile

4.3.74 State Site # 50-10-27-26346

SIHP #	50-10-27-26346
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	24 m by 45 cm (78.7 ft. by 1.5 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	560 ft a.m.s.l.

DESCRIPTION: Site -26346 (Figure 305) is a trail of *pāhoehoe* slabs that runs approximately east/west over an exposed 'a'ā flow for approximately 24 m (78.7 ft.). The trail is constructed with flat *pāhoehoe* slabs measuring approximately 30-45 cm (0.98-1.5 ft.) in diameter. The slabs are set into the 'a'ā approximately 80 cm (2.6 cm.) apart.

A small natural blister was found in the 'a'ā approximately 5 m (16.4 ft.) to the southeast; no midden or cultural materials was found within the blister, although some goat bone was present. The trail begins at the bottom of an 'a'ā exposure and follows the 'a'ā exposure upslope to the east. Dense vegetation covers the west side of the trail, and it was not possible to determine the extent of the west side. Portions of the trail's east side have no vegetation and are intermittently visible to the end.

The site's function is interpreted as transportation.



Figure 305. Site -26346, view to east

4.3.75 State Site # 50-10-27-26347

SIHP #	50-10-27-26347
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	2
DIMENSIONS:	20 m by 8 m (65.6 ft. by 26.2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26347 is a lava tube in an undulating *pāhoehoe* flow. Vegetation within and adjacent to the site consists of sparse *koa haole* and thick grasses. The site contains two features; Feature A has several chambers with extensive soil and midden deposits. Feature B is an overhang shelter that also contains a soil deposit.

Feature A is a large lava tube (Figure 307). Immediately inside of Entrance 1, a natural narrow crack that drops directly down into the main chamber from the surface of the tumulus, is a relatively large chamber that is naturally divided down the middle by the collapse that also created the Entrance 1 crack. The entrance drops down into the northwest half of this divided chamber directly along the collapse. This large chamber, including the dividing collapse, measures approximately 12 m by 9 m (39.4 ft. by 29.5 ft.). The divider does not completely separate the two halves of the chamber from each other. The chamber is clear at the southwest end. An extensive soil deposit and abundant midden scatter is present throughout the chamber although significantly more is present in the northwest half. This midden includes *kukui*, urchin, cowry, 'opihi, *Isognomon*, and other marine shell. A whole cowry portion of an octopus lure was also found in the northwest half, within a meter of the entrance. The soil deposit is noticeably deep in some areas, approximately 10 cm (0.33 ft.), especially in the southwest end of the northwest half. At the northeast end of the southeast half of this large divided chamber the tube turns and heads roughly south. Along this portion of the tube there is a second small, vertical shaft entrance, Entrance 2. This entrance also opens to the top surface of the tumulus. The tube continues south and after a short stretch, approximately 2.5 m (8.2 ft.), of lower ceiling height (approximately 60 cm / 2 ft.) the tube opens back up to a final chamber. There is some scattered midden in the Entrance 2 chamber (the low ceiling section) and the north end of this final chamber, but noticeably less than the amount in the divided chamber. The soil deposit continued from the divided chamber into the Entrance 2 chamber. Although soil is absent within the low ceiling section, it is present again in the final chamber. A shallow tube continues south from this final chamber but quickly becomes too shallow to explore. Beyond the relatively sparse midden in the north end of the final chamber, no modification or additional cultural material is present. There is some slight clearing of central areas throughout this blister/tube but no other modifications to the natural collapse. Although no water catchments are present, there is water in this blister. Feature A appears to have good potential for excavation due to the presence of soil, which is relatively deep in some areas, and midden. These soil deposits are some of the deepest found in this project area to date.

Feature B is a lava tube/overhang shelter with an exterior circular enclosure constructed of stacked *pāhoehoe* boulders (Figure 306 and Figure 308). Feature B is located at the southwest end of a large 'a'ā flow and is a large sunken lava blister that has created an overhang shelter at the northeast end. The collapse at the southwest end of the blister has been excavated and reused

to construct the stacked semi-circular wall (30-80 cm / 0.98 -2.6 ft. in height). The wall is in line with the semi-circular blister bedrock and creates a circular enclosure. A 1 m (3.3 ft.) opening is at the south end where there appears to be no stacking (entryway). The stacked wall continues beyond the enclosure in a southwest direction for approximately 10 m (32.8) with an average height of 30 cm (0.98 ft.). Entrance 1 of Feature A is approximately 8 m (26.2 ft.) southwest from the end of the wall.

The overhang shelter measures 8 m (26.2 ft.) northwest/southeast by 2 m (6.6 ft.) northeast/southwest with a maximum ceiling height of 115 cm (3.8 ft.). There are several placed cobbles inside the shelter which have created a linear alignment. Several marine shell pieces along with several *kukui* and urchin pieces were identified, along with a piece of modified marine shell (mother of pearl) which was located near the overhang entrance under a thin layer of grass and soil (see photo). A 4-5 cm (0.13-0.16 ft.) soil deposit is present and if any additional cultural material is present, it is covered.

Feature B's function is interpreted as temporary habitation based on the constructed modification of the enclosure/wall and the presence of midden. The enclosure may have been the foundation of a habitation structure; however, the single course boulder wall suggests it was utilized as a "wall" rather than a support system for a structure. The extension of the wall also suggests that this wall was utilized for non-structural purposes. Excavation potential of this feature is good due to the presence of the 4-5 cm (0.13-0.16 ft.) soil deposit that contains some midden.

The site's function is interpreted as a temporary habitation based on the amount of midden that is present, the octopus lure, the slight clearing, and the smooth, soft soil floor. The lack of more extensive modifications and the absence of abundant midden preclude extended habitation function.



Figure 306. Site -26347, Feature B showing entrance, view to northeast

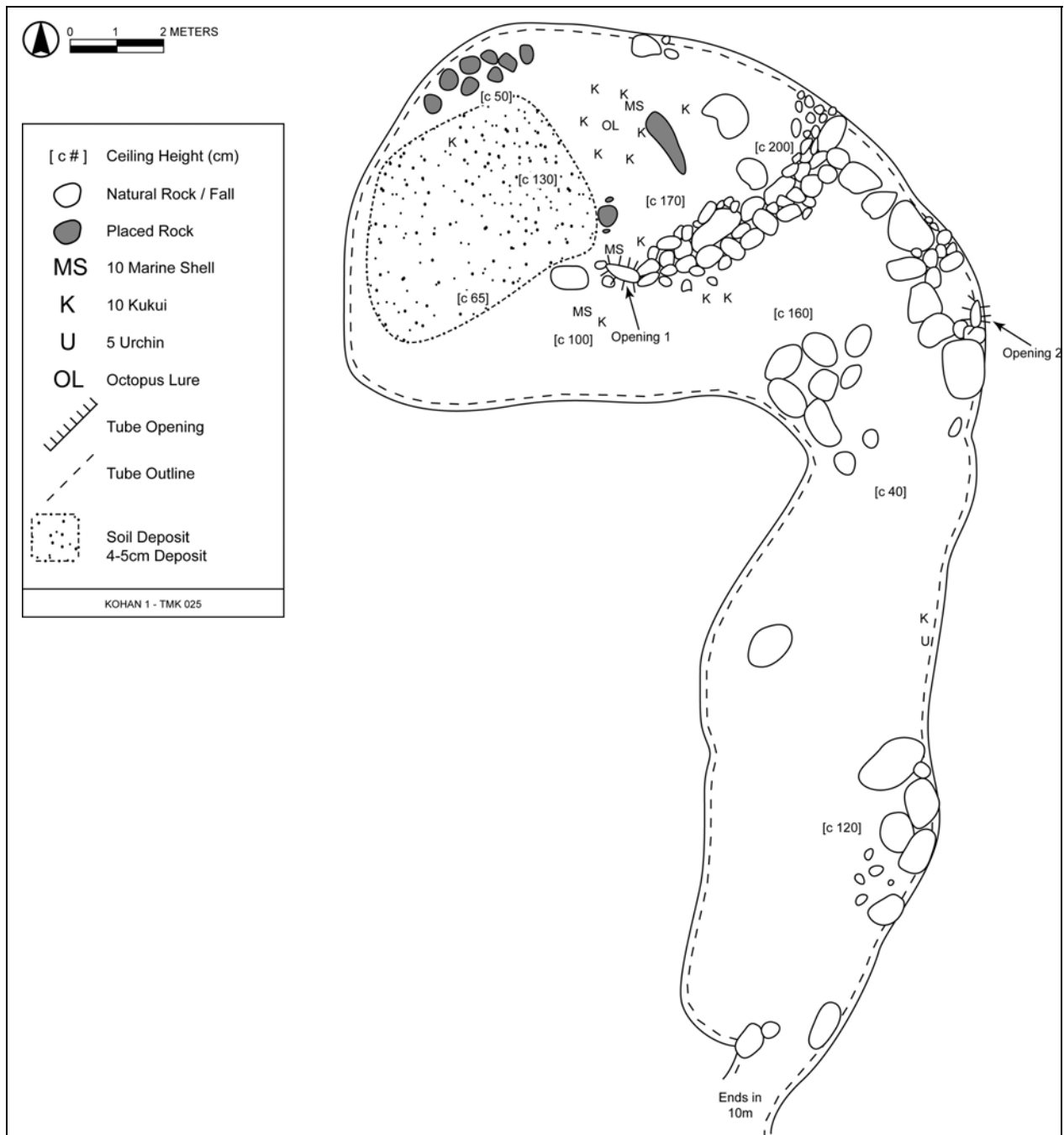


Figure 307. Site -26347, Feature A, plan view

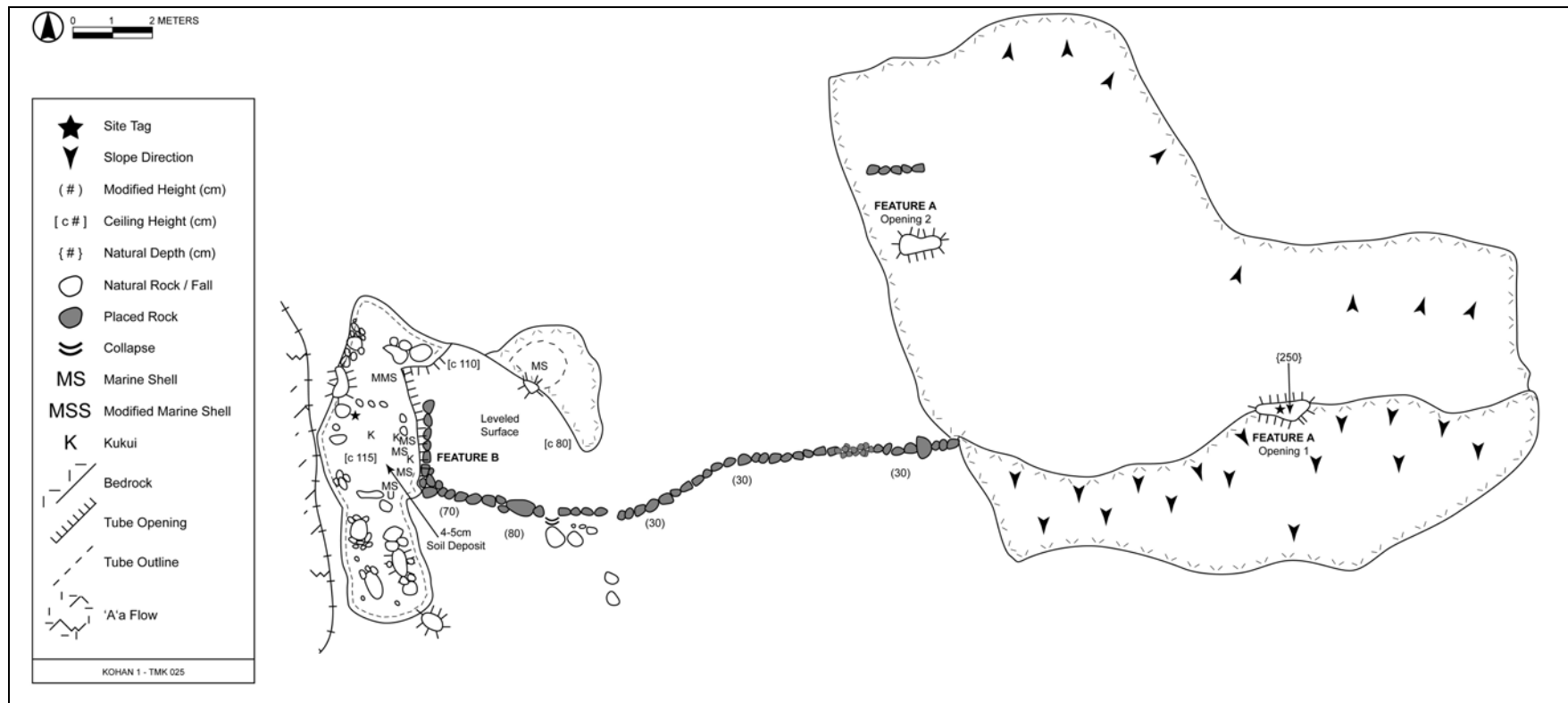


Figure 308. Site -26347, Feature B, plan view

4.3.76 State Site # 50-10-27-26348

SIHP #	50-10-27-26348
FUNCTION:	Permanent Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	5
DIMENSIONS:	46 m by 39 m (150.9 ft. by 128 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	525 ft a.m.s.l.

DESCRIPTION: Site -26348 (Figure 309) is a complex comprised of five features (A, B, C, D, and E); Feature D is a diffuse feature consisting of seven different components (D1-D7). The site complex's primary function is permanent habitation with a secondary ceremonial function.

Feature A is a triangular enclosure measuring approximately 20 m (65.6 ft.) north/south by 22.5 m (73.8 ft.) east/west (Figure 311). Naturally occurring elevated areas of *pāhoehoe* bedrock and 'a'ā outcrops were utilized to form parts of the enclosure's walls. The enclosure consists of constructed wall segments of stacked *pāhoehoe* slabs, small boulders, and cobbles. The western boundary is the enclosure's longest wall segment. This segment connects two *pāhoehoe* tumulus at the north end of the wall, extends south for approximately 30 m (98.4 ft.), terminating at a point where 'a'ā outcrop and *pāhoehoe* flow meet. One of the *pāhoehoe* tumuli along this alignment has a *pāhoehoe* slab upright measuring 65 cm (2.1 ft.) in height and 30 cm (0.98 ft.) in width. Along the enclosure's northeast boundary, another significant wall segment extends from the northernmost tumuli south-easterly approximately 10 m (32.8 ft.) to an elevated *pāhoehoe* bedrock outcrop. This elevated *pāhoehoe* outcrop comprises a large portion of the enclosure; it extends from the northeast wall segment approximately 20 m (65.6 ft.) west to the west wall segment, completing the enclosure. The stacked wall segments average approximately 60 cm (2 ft.) in height and 60-80 cm (2-2.6 ft.) in width. Within the enclosure's interior, there are a few depressions, some of which appear to be modified and may even form smaller interior enclosures.

At the enclosure's west end, a depression has been modified by removing cobbles from the center and from an alignment at the east end. At the southwest end of this depression, a 1 by 1 m (3.3 by 3.3 ft.) area between two raised *pāhoehoe* outcrops has been filled with small to medium cobbles and is level with the surrounding edge of the enclosure. A filled crevice measuring 2 m by 0.4 m (6.6 ft. by 1.3 ft.) is located in the center of Feature A; the crevice consists of small cobbles and appears to be constructed for leveling purposes, due to the shallow nature of the crevice. A leveled area is 7.5 m (24.6 ft.) south of the crevice and measures 2.5 m by 2 m (8.2 ft. by 6.6 ft.). The area has been leveled by placement of several *pāhoehoe* cobbles along the southern edge with small cobble in the interior.

Feature B (Figure 310 and Figure 312) is located on a flat ridge just upslope (to the east) of Feature A. This flat ridge is approximately 3.4 m (11.2 ft.) wide and the northeast end consists of a natural 'a'ā outcrop. Feature C is slightly further upslope from Feature B (to the southeast, approximately 10 m (32.8 ft.)). Vegetation in the vicinity is thick groves of *koa haole* and grass.

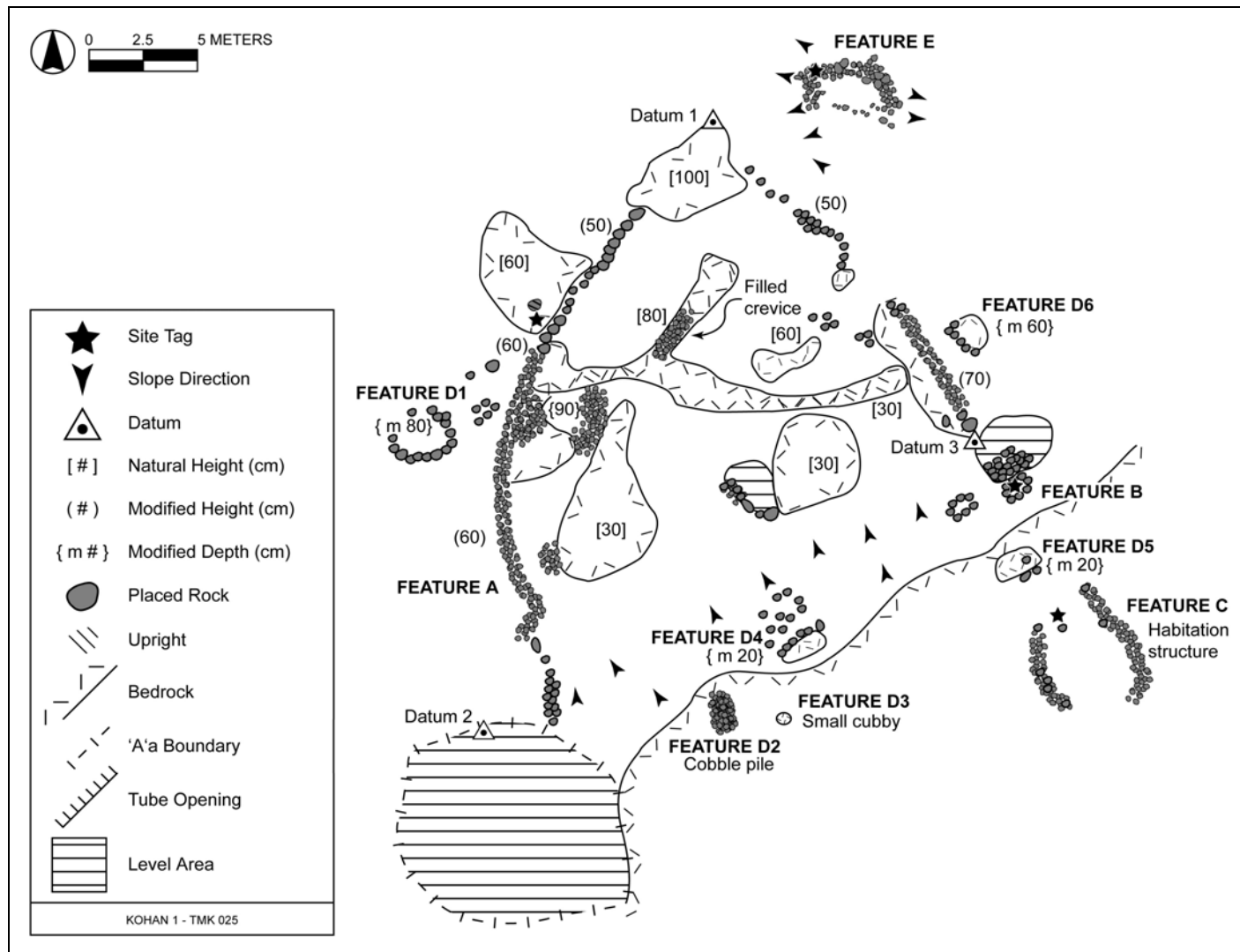


Figure 309. Site -26348, plan view, overview of Features A – E

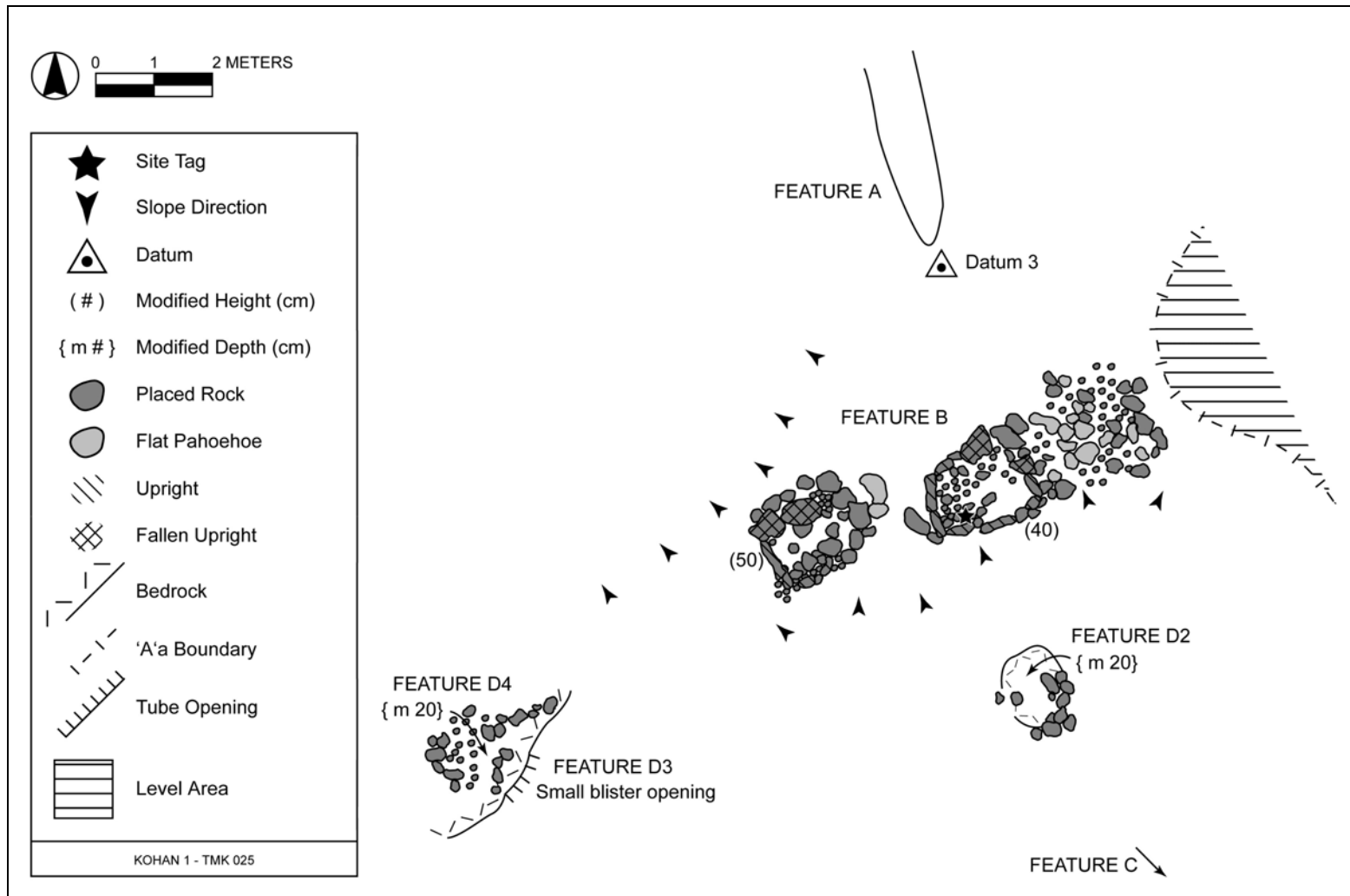


Figure 310. Site -26348, Feature B plan view



Figure 311. Site -26348, Feature A overview, view to southwest



Figure 312. Site -26348, Feature B showing *pāhoehoe* pavement and constructed rectangular depression in background, view to west

Feature B consists of two rectangular constructed depressions and *pāhoehoe* pavement measuring 7 m by 2.5 m (23 ft by 8.2 ft.). The two rectangular features were created by utilizing a natural depression or excavating an area of approximately 1.5 m by 1.0 m by 0.5 m (4.9 ft. by 3.3 ft. by 1.6 ft.) deep. Pāhoehoe slabs and large stacked boulders and cobbles were then used to construct the sides of the rectangular depressions. Some of the upright slabs are still intact, but several have fallen over, likely due to disturbance caused by vegetation. A large amount of plant material (leaves, pods, etc) has collected, obscuring the bottom of the rectangular depressions. Additionally, several trees are growing within the depressions, which may have moved any original cobble fill. In both depressions, there does seem to be some cobble fill, in areas without cobbles, a test probe shows the soil to be more than 10 cm (0.33 ft.) in depth.

The function of the Feature B small pavement and rectangular depressions is most likely a large hearth feature. The depressions are too small for shelter or animal pens, and are not consistent with agricultural use. These modified rectangular depressions may have been used as a large *imu*. Feature B's location is also consistent with a hearth/working feature since the small ridge is upraised but not elevated enough to be used as an outlook (the view is partially obstructed). This feature may be a good candidate for data recovery since there is a soil depth of at least 10 cm (0.33 ft.), however, much of that "soil" may be recent plant material.

Feature C is an enclosure consisting of two roughly parallel running walls that are approximately 3.5 m (11.5 ft.) apart (Figure 313). The walls are each approximately 4 m (13.1 ft.) long and average 60 cm (2 ft.) mounded height; the feature is 4 m by 5.5 m (13.1 ft by 18 ft.). The walls are not perfectly straight, and they curve in slightly towards each other at the northwest end. All larger boulders and cobbles have been cleared from the ground surface between the mounded walls. The ground is naturally very flat, smooth, and level with only small cobbles on the surface. The mounded walls are constructed of *pāhoehoe* large cobbles and boulders. The feature's structure appears to have been a sheltered living space that was open on both ends, or it was originally a C-shaped enclosure from which the cobbles and boulders that would have formed the northwest end of the C-shape were removed to be utilized elsewhere. Feature C therefore functioned as permanent habitation. Although no midden is present, the feature's association with the site's other features, makes it more significant. Feature C may be the base of a thatched structure of a partially deconstructed C-shape enclosure, indicative of a habitation site. A-frame thatched huts are also commonly found in ceremonial sites, and therefore a ceremonial function cannot be completely ruled out. Preservation is recommended for this feature; it is the only feature containing two parallel running mounded walls that has been encountered thus far in both TMK 17 and 25.

Feature D is a series of seven individual modifications that include three modified depressions, three modified blisters, and a cobble pile (Figure 314). These modifications surround Feature A and are outside of the enclosure. Feature D1 is a modified depression measuring 1 m by 2 m (3.3 ft. by 6.6 ft.) and is located 2 m (6.6 ft.) west from Feature A's western most wall. Feature D1 modifications include the removal of large boulders from its center and replacing them along the outer edge. The replaced boulders create a circular shape. Feature D2 is a 1 m by 1.5 m (3.3 ft. by 4.9 ft.) pile of small *pāhoehoe* cobbles. The pile is located atop a large tumulus at the southwest end of the site. Feature D3, a modified blister, is 2 m (6.6 ft.) to the east of Feature D2. The blister is very small and measures 0.90 by 0.60 m (3 ft by 2 ft.) with a depth of 26 cm (.85 ft.); Feature D3 modification is the removal of all *pāhoehoe* from its interior. Feature D4 is located 2 m (6.6 ft.) north of Feature D3 and is a modified

depression measuring 2 m by 1 m (6.6 ft. by 3.3 ft.). Boulders from depression's center have been removed and realigned around its exterior. Feature D5 is a modified depression / blister measuring 1 by 1.5 m (3.3 by 4.9 ft.) and is located approximately 2 m (6.6 ft.) south of Feature B. The blister's interior has been excavated and several cobbles have been stacked on its south end. Feature D6 is a modified depression measuring 1 by 1 m (3.3 by 3.3 ft.) and is located on the east end of the eastern most part of Feature A's wall. The modification to the depression is the removal of *pāhoehoe* cobbles from its center; the cobbles are placed along the exterior. Feature D7 is a blister tube with a small chamber measuring 2 by 3 m (6.6 by 9.8 ft.) with a maximum ceiling height of 45 cm (1.5 ft.). The blister opening is located 20 m (65.6 ft.) east of Feature D6 and measures 0.60 by 0.40m (2 ft. by 1.3 ft.). The blister contains several *kukui* endocarps at the north end of the tube; modification is the removal of cobbles from ceiling fall. The components of Feature D's were likely used for storage, although some of the depressions are rather indeterminate and may not be associated with storage. Excavation potential is poor due to a lack of soil.

Feature E is a C-shaped structure that is informally constructed and seems to have suffered degradation due to heavy vegetation in the area; it measures 5 m by 2.5 m (16.4 ft. by 8.2 ft.) (Figure 315). The feature is located on the northern side of this site, about 5 m to the north of Feature A, on a naturally level *pāhoehoe* outcrop that is slightly more elevated than the nearby wall of Feature A. Feature E is constructed of a few large (approximately 40-50 cm / 1.3-1.6 ft.) boulders, medium size cobbles (approximately 20-30 cm / .66-.98 ft.) and small cobble fill (approximately 10 cm / .33 ft.) with the surrounding area cleared of large stones. It is no more than 1-2 courses high, although some collapse seems to have occurred. Although generally C-shaped, Feature E's original shape is difficult to discern because of the collapse; the largest boulders are at the corners of the structure, so it appears to be an open-sided rectangle. Feature E's function is habitation, based on the feature type (C-shape) and location (within a larger site complex, on a cleared flat area). No midden was found, only shallow soil.

The site's function is interpreted as permanent habitation with possible ceremonial elements. Feature B contains two large hearths with faced interiors measuring approximately 1 by 1.2 m (3.3 by 3.9 ft.) each; a well paved area is just to the north of the hearths. Feature C contains two parallel cobble pile alignments that likely supported an A-frame style habitation. The amount of labor required to construct all the features of this complex is indicative of a permanent habitation complex.

Site 26348 is one of the most unique sites located within the project area. The site's size is unsurpassed in the project area, and its triangular/circular shape comprised of both natural and constructed features is unique and appears well planned. Additionally, there are faced walls and several modified depressions which have been cleared and leveled. These details and the site's associated features suggest this site may have been utilized for habitation by an important individual such as an *ali'i*. Ceremonial activities are often associated with permanent habitation complexes, especially those whose inhabitants may be of a higher rank, therefore it should be noted that it is likely that some ceremonial activities took place in this site complex.

The complex is located on top of a naturally undulating surface with multiple natural depressions and rises. Within the complex's immediate vicinity is naturally level terrain and is more suitable for an extensive habitation site. While the construction of some of the features, such as portions of the Feature A enclosing wall, appear to have been built somewhat informally,

the complex layout and the multiple features are quite formal. Feature B, with its very smooth, level pavement and two very well defined and constructed hearth features is very formal and unique. The presence of two such large hearth features in immediate proximity is unusual even for a permanent habitation. Additionally, the site is unique in terms of its size and multi-component features. Excavation potential of this site is poor due to a lack of soil deposit.



Figure 313. Site -26348, Feature C overview, view to west



Figure 314. Site -26348, Feature D overview, view to west



Figure 315. Site -26348, Feature E overview, view to northeast

4.3.77 State Site # 50-10-27-26349

SIHP #	50-10-27-26349
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	4
DIMENSIONS:	20 m by 10 m (65.6 ft. by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site 26349 (Figure 316 and Figure 317) is a temporary habitation complex with a small sink hole measuring 4.5 m (14.8 ft.) east/west by 3 m (9.8 ft.) north/south with a small lava tube (**Feature A**) at the *mauka* end of the sink and a lava blister (**Feature D**) at the *makai* end of the sink. Within the entrance, a linear boulder alignment is along the northern wall; it is approximately 1.5 m (4.9 ft.) in length, 0.50 cm (0.01 ft.) wide, and one course high. Collapse has been cleared from the tube entrance and there is a soil deposit of 3-5 cm (0.1-0.13 ft.) with charcoal, and a small amount of *kukui*. A single volcanic glass flake was also located within this entrance area. The tube itself is divided by collapse and an obstruction. The northern section has a placed upright approximately 4 m (13.1 ft.) from the entrance. No cultural material is present within the southern section. The cleared section at the entrance appears to have been used as a hearth (**Feature C**) based on the presence of an ash and charcoal deposit. The middle of the sink appears to have been partially cleared and the boulders were piled along the northern and southern *makai* edge of the sink to form a wall, **Feature B**. The lava blister (Feature D) at the *makai* end of the sink also appears to have been partially cleared of collapse. A small linear boulder and cobble pile is within the blister.

The site's function is interpreted as temporary habitation based on the size of the site, the extent of modifications, and the presence of a small amount of charcoal and *kukui*, and the one artifact.



Figure 316. Site -26349, showing entrance into modified lava tube, view to east

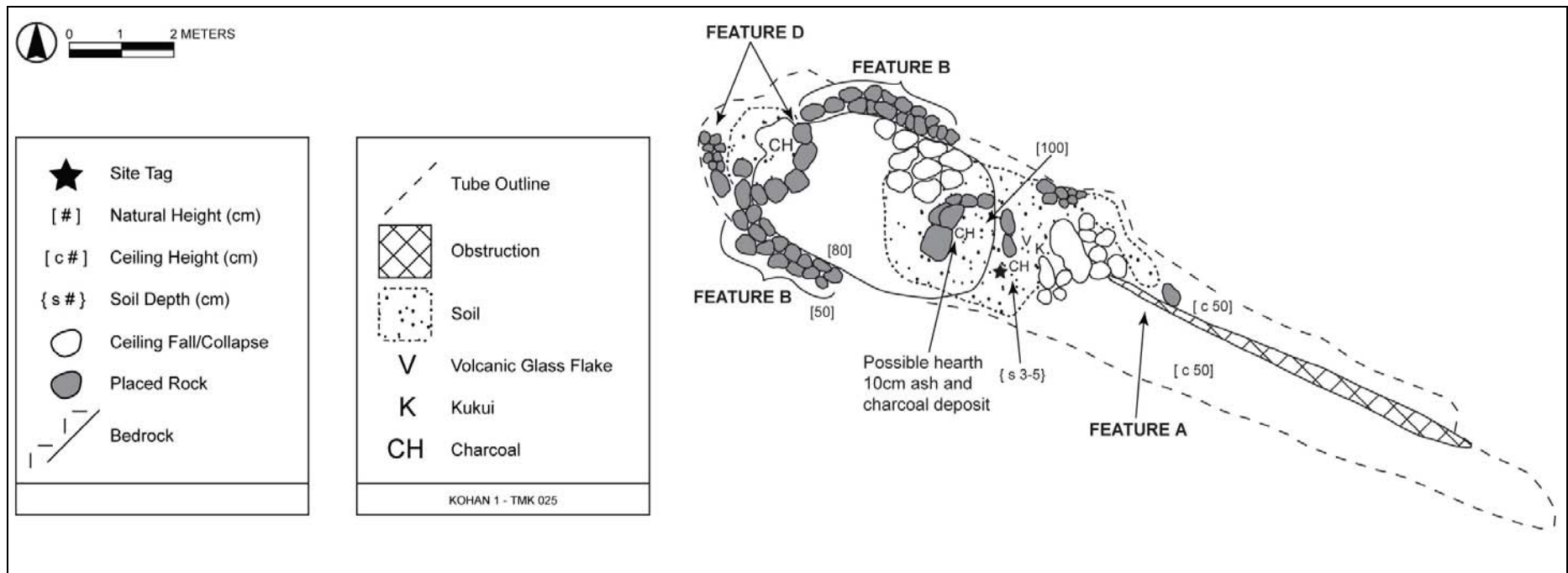


Figure 317. Site -26349, plan view

4.3.78 State Site # 50-10-27-26350

SIHP #	50-10-27-26350
FUNCTION:	Permanent Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	4
DIMENSIONS:	10 m by 22 m (32.8 ft. by 72.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site -26350 (Figure 319) is situated on a roughly east/west trending ridge in an undulating *pāhoehoe* flow in the northwestern quadrant of the project area. The vegetation at the site consists of thick tufts of foxtail grass and occasional dense clumps of shoulder-high *koa haole* and Christmas berry.

The site is a linear complex trending roughly east/west along the northern edge of a low, approximately 3-4 m (9.8-13.1 ft.) in height, *pāhoehoe* ridge. The north edge of this ridge is particularly prominent due to a marked depression between the ridge, and the site, and Hulikoa Road. The site consists of four features (Features A- D). Feature A is a formal terrace. Feature B is a formal pavement consisting of areas of *pāhoehoe* slab and *pāhoehoe* cobble paving with a formal hearth and a low linear mound that is likely a collapsed wall. Feature C is a collapsed enclosure and an adjacent small pavement. Feature D is a short curving formal wall.

All of the features appear to have been aligned since most of the feature's walls are oriented to the north, and they are on the northern edge of the ridge. Although the north ridge is prominent, the elevation continues to rise on the south side of the ridge, particularly at a large 'a'ā flow. Due to this positioning, this site has a relatively good view of the surrounding terrain, including the sea to the west, and to the north and east. Relatively flat terrain covers the entire top of the ridge; its highest point is on the south side. Apparently, despite its slightly higher elevation and additional flat terrain, the south side of the ridge was not favored for habitation.

The ridge top may have been utilized for habitation but has been completely disturbed; a bulldozer trail runs down from the top of the ridge and continues west. The west end of Feature A is within 3 m (9.8 ft.) of the bulldozer road; it is the closest point to the complex. This central, flat portion of the ridge likely contained archaeological remains prior to bulldozing activity. However, there is no clear evidence of bulldozer damage directly on the existing features and the only collapse of the site appears to be weathering induced.

Feature A is a formal terrace measuring 6 m by 1.7 m (19.7 ft. by 5.6 ft.) (Figure 319 and Figure 318). It is constructed of rough *pāhoehoe* angular basalt boulders measuring approximately 40 cm (1.3 ft.) square on average. They are generally cube-shaped and angular; few slabs are present in the wall. No uprights are used in the foundation, but bedrock is utilized, especially on the east end of the wall. The terrace wall rises approximately 1.5 m (4.9 ft.) or six courses. The top of the wall retains a maximum area of about 1.3 m (4.3 ft.) of small *pāhoehoe* cobbles. A few *pāhoehoe* slabs are integrated into the cobble surface at irregular intervals.

The terrace decreases in height as the natural topography rises slightly to the west where the terrace turns southwest. The wall then runs back 1.75 m (5.7 ft.) to where the terrace ends on a small natural bedrock exposure. This southwest running leg of the terrace wall is short, only

approximately 60 cm (2 ft.) high, and a *pāhoehoe* slab forms a step to access the top surface of the terrace. A second large *pāhoehoe* slab is also set into the terrace cobble fill above this step as what appears to be a 'top step.'

Feature A's function is interpreted as permanent habitation, possibly as an outdoor area. The steps also indicate that the feature served as an entrance/exit to the site.

Feature B is the central feature of Site -26350 and the main habitation area (Figure 319, Figure 320 and Figure 321). It consists of a rectangular *pāhoehoe* cobble pavement measuring approximately 8 m by 5 m (26.3 ft. by 16.4 ft.). The western half of the cobble paving is topped with large, approximately 60 cm (2 ft.), *pāhoehoe* slabs and makes for a nice, relatively formal living surface. The eastern half of the cobble paving is not topped with *pāhoehoe* slabs, but contains a formal hearth in its center. The hearth is square and constructed of three *pāhoehoe* slab uprights. The slabs measure 30 cm (0.98 ft.) long, 20 cm (0.66 ft.) tall (upright), and 5 cm (0.13 ft.) thick. It is open to the north. The hearth measures approximately 50 cm (1.6 ft.) square and is about 20 cm (0.66 ft.) deep. The bottom is lined with *pāhoehoe* rubble. Although no midden or food remains are visible, the hearth suggests a good excavation potential for this feature.

To the north of the *pāhoehoe* slab pavement, approximately the western half of the feature, is a low linear east/west trending mound that appears to be a collapsed wall. Its function is likely structural to support a wooden structure employed to reduce exposure when the habitation area was in use.

Feature C is a collapsed enclosure that utilizes a natural bedrock exposure as its east wall (Figure 319). This enclosure creates a somewhat level area, open to the south, measuring 2 m (6.7 ft.) square. The west wall is the tallest and constructed of large, angular *pāhoehoe* cobbles and small boulders. The structure is so collapsed that it has lost most of its form. The northern wall is almost reduced to ground level, measuring only approximately 15 cm (0.49 ft.) high, and is mostly constructed of cobbles. West of the west wall is a small paved area that adjoins Feature B's southeast corner. This paved area measures 2.8 m (9.2 ft.) north/south by 1.45 m (4.8 ft.) east/west and is constructed of small to medium *pāhoehoe* cobbles one course high. In the southwest corner, the paving is slightly terraced, constructed two courses high.

Feature D is a formal arcing wall (Figure 319 and Figure 318). It is constructed of five small *pāhoehoe* boulders on each side of the wall arranged in a gentle curve on each face. The center of the wall is filled with 'a'ā cobbles. The total length of the wall is 3.25 m (10.7 ft.). The interior of the wall, the concave side, appears paved with small *pāhoehoe* cobbles. There is no modification north of the wall. This feature appears to be a solid foundation for a wooden structure as part of a *kau hale*.

The site's function is interpreted as permanent habitation based on the arrangement and types of site features, consisting of enclosures, a terrace, and pavement with a good view and exposure to a breeze; the structure's arrangement represents a pre-contact *kauhale*. The site is highly visible from the north and the remnants of a *mauka/makai* trail, SIHP -15324, is present to the west. This location is ideal for habitation, and despite the site's lack of surface midden, the presence of a formal hearth inlaid in the formal pavement of Feature B is indicative of a permanent habitation site.



Figure 318. Site -26350 overview, Feature A terrace in the foreground with Feature B pavement and Feature D wall visible in the background, view to east

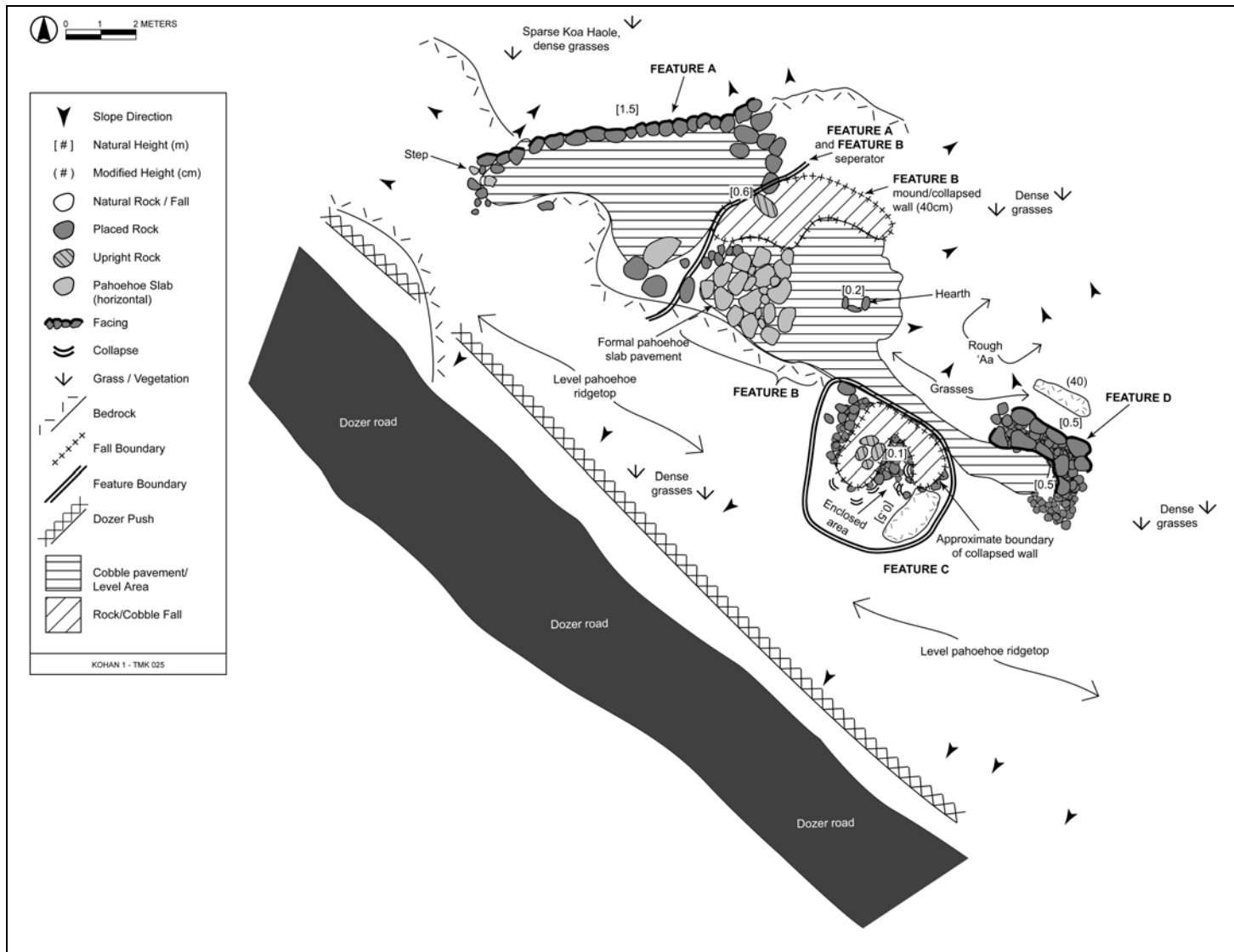


Figure 319. Site -26350, plan view



Figure 320. Site -26350, Feature B formal slab pavement



Figure 321. Site -26350, Feature B close-up view looking down onto inset hearth

4.3.79 State Site # 50-10-27-26351

SIHP #	50-10-27-26351
FUNCTION:	Shelter
SITE TYPE:	Lava blister
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 10 m (32.8 by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site -26351 (Figure 322 and Figure 323) is a lava blister within a slightly undulating *pāhoehoe* flow. Vegetation within and adjacent to the site consists of *koa haole*, grasses and some *kiawe*.

The site contains a small scatter of *kukui* and cowry. The site's interior measures approximately 5.4 m (58.1 ft.) east/west by 4.7 m (15.4 ft.) north/south and about 100 cm (3.3 ft.) in height. No other cultural materials were observed within the blister or on the surface around the site.

The site's function is interpreted as shelter based on the lack of modification and the small scatter of *kukui* and cowry.



Figure 322. Site -26351, view to west

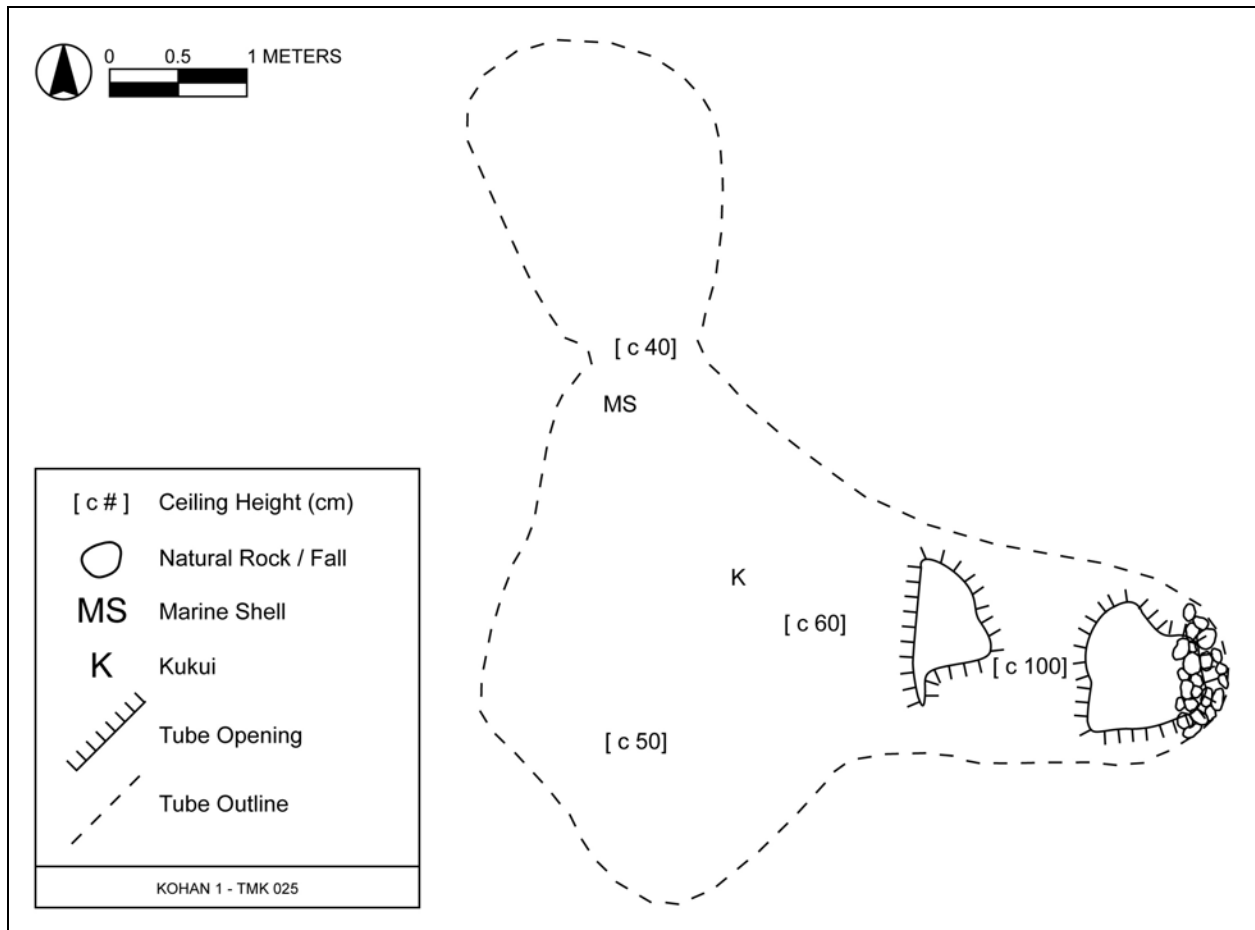


Figure 323. Site -26351, plan view

4.3.80 State Site # 50-10-27-26352

SIHP #	50-10-27-26352
FUNCTION:	Marker
SITE TYPE:	Cairn
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	2 m by 1 m (6.6 ft. by 3.3 ft.)
CONDITION:	Remnant
AGE:	Historic
ELEVATION:	3440 ft a.m.s.l.

DESCRIPTION: Site -26352 (Figure 324 and Figure 325) is a cairn remnant measuring 2 m (6.6 ft.) north/south by 1 m (3.3 ft.) east/west with a current height of 90 cm (3 ft.). The cairn is located on top of a raised, thin 'a'ā flow that borders the southwest edge of a raised *pāhoehoe* outcrop. The cairn appears to have been constructed of 17 *pāhoehoe* slabs and 10 *pāhoehoe* cobbles. Currently, only two to possibly five slabs remain stacked, while most of the remains are located on the northeast, east, and southeast sides.

The site's function is interpreted as marker and is likely a historic road marker since historic maps indicate roads in the vicinity of the site. The cairn is similar in size and prominence to site 26322, 200 m *makai*. Presently, it seems likely the two cairns, 26352 and 26322, indicate a trail of some sort. Excavation potential is poor due to a lack of soil.



Figure 324. Site -26352, view to west

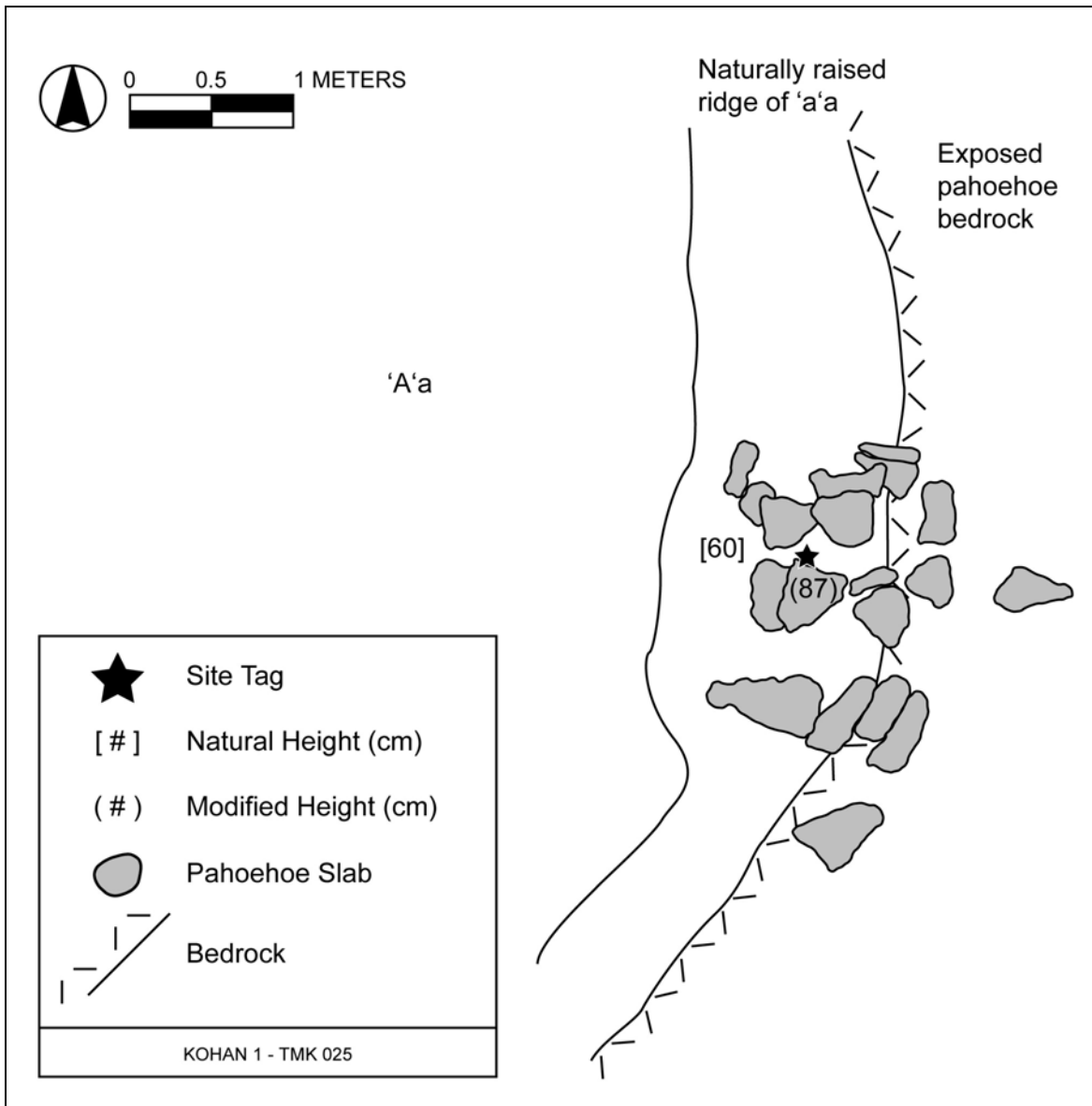


Figure 325. Site -26352, plan view

4.3.81 State Site # 50-10-27-26353

SIHP #	50-10-27-26353
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	2 m by 1 m (6.6 ft. by 3.3 ft.)
CONDITION:	Remnant
AGE:	Historic
ELEVATION:	3440 ft a.m.s.l.

Description: Site -26353 is a fairly long *pāhoehoe* slab trail located just west of the center of the project area (Figure 326) in Kaloko Ahupua'a, south of the *ahupua'a* wall. The trail traverses an 'a'ā flow as well as a very smooth exposure crossing a rough and undulating area of *pāhoehoe*. Vegetation on the 'a'ā flow is sparse, but thick grass and dense *koa haole* dominate the surrounding area. The trail runs roughly *mauka/makai* (east/west) for approximately 150 meters before becoming impossible to follow both *mauka* and *makai*.

The most distinct portion of the trail runs the entire east/west (*mauka/makai*) distance across a major 'a'ā "island" (Figure 326). It is constructed of *pāhoehoe* slabs for the entirety of its length and is at times very densely paved (Figure 328). The slabs in the trail become sparse within 10 m of the *makai* end of the 'a'ā flow. The trail descends a slope towards a very large *pāhoehoe* tumulus nestled up against the 'a'ā. No modification was found on this tumulus, but bulldozing was found around the bottom of the flow and the tumulus. It seems likely the trail skirted the tumulus, and this area is further evidence that its route was disturbed. There is also a bulldozer road running north/south that cuts a wide perpendicular path through the slab trail approximately 15 meters from this *makai* end.

On its *mauka* end, the slab trail continues off the 'a'ā on a very linear *pāhoehoe* exposure, which eventually intersects the *ahupua'a* wall. The primary indication that the *pāhoehoe* exposure is a portion of the trail is a cairn that was located on a linear *pāhoehoe* flow where it meets the 'a'ā. The exposure is extremely flat and easy to walk, and leads to the *ahupua'a* wall (Figure 329 and Figure 330). The exposure's width is unusual in the project area as are its length and suitability as a trail. This exposure showed little other sign of markers and the only other modification found was some light pecking of one surface (Figure 331). If, at one time, there was more modification of the exposure, there is some chance it has been destroyed as the bedrock shows signs of intermittent bulldozer activity across its width. The relatively vegetation free surface of the flow is, however, naturally caused by the density of the rock in this small local flow, not bulldozing.

Though the *pāhoehoe* exposure extends beyond the *ahupua'a* wall at roughly the same angle, it is not nearly as nice on the Kohanaiki side. It does not appear that the trail crossed the wall, but rather turned and paralleled it. There are two low points in the wall near the *pāhoehoe* exposure's intersection with the wall, but these are not believed to be crossings (refer to Figure 326). Both appear to be livestock breaches.

There is good evidence this trail was part of a major *mauka/makai* route. Archaeologically, there are numerous other sites that have a relationship to -26353 that support a higher profile for this site. *Makai* of where the trail disappears at the flow's *makai* edge are a number of north-south trending trails, both to the north and south of where site -26353 would continue (refer to

Figure 326). The southern set of trails are in Kaloko and cross a very narrow 'a'ā tongue, are roughly parallel and are quite close together. They appear to be converging on both the -26353 trail and site -26354, a prominently perched enclosure and upright that would have overlooked the route of the trail. The upright of -26354 is of particular interest as it is highly visible from this southern set of trails (**Error! Not a valid bookmark self-reference.**) and even from as far away as present day Hina Lani Street. The high perch of -26354 and the north-south trails converging at this point give weight to site -26353 as a major *mauka-makai* trail. A single 70 m long slab trail from Kohanaiki, Site -26340, crosses much of the 'a'ā flow, passing by the enclosure, -26354, and descending to the *pāhoehoe*. It is highly probable that this trail is also converging with the *mauka/makai* trail -26253.

Site -26353 likely continued *mauka* and based on what was observed, likely along the *ahupua'a* wall. Bulldozing activity here and the difficulty of identifying trails over *pāhoehoe* made the trail impossible to follow any further than is shown on Figure 326. There is no archaeological evidence that Site -26253 is the same as a trail running largely parallel to the wall identified over 1 kilometer upslope outside of the project area. This trail, site -10714 is a well developed curbstone trail with considerably different investment and suitability for higher volume traffic. Site -10714 was identified in the adjacent *mauka* parcel (TMK: [3] 7-3-009: 026, also part of the CSH KOHAN 1 project) and in the parcel above that was surveyed by SCS (TMK: [3] 7-3-009: 032, see Wolforth et al. 2005). As both trails parallel the wall there is some archaeological correlation in the route of the two trails, but historic maps provide more insight into their probable relationship.

Historic maps suggest that the slab trail and *pāhoehoe* exposure, site -26353, is a longer *mauka/makai* route than has been identified in the present project area. The distance of the trail from the *ahupua'a* boundary and orientation are good match for Emerson's 1888 Registered Map (RM) 1449 and many years subsequent, the 1928 USGS/Territory of Hawaii Quadrangles. This makes site -26353 the best candidate identified in the project area for "Kohanaiki Road" as indicated on RM 1449.

From what is presently known, the combination of this site (site -26353) with the route represented by a much more intensively modified curbstone trail (Site -10714 in TMK: [3] 7-3-009:026, 32 upslope) and their close proximity to the *ahupua'a* boundary are reasonably consistent with historic maps showing a trail/road running in this alignment from the Kohanaiki Homesteads. The survey marker identified at site -20741 (see description in this report) and a wooden gate in a barbed wire fence below it also match details of these maps. In the case of the trails, given the dramatic difference in trail width and extent of modification between these two sites, and the great distance in between, it seems likely that the trail segment identified here (-26353 in TMK: [3] 7-3-009:025) is a pre-contact remnant of a route otherwise converted, and likely realigned in some places, for historic use. In this scenario, the narrow slab trail may have become less used and the route adjusted south to skirt the 'a'ā flow and improve suitability for pack animals or horses. No other trail was located immediately south of the flow, but bulldozing is extensive and prevents confirmation of this scenario. The other possibility is that there were no small realignments but a singular route, which includes the identified slab trail and *pāhoehoe* exposure. In this case it would be expected that the "Kohanaiki Road" grew less distinct as it moved *makai*, and was less necessary due to the decreased vegetation (i.e., narrow slab trail, no identified curbstones in the present project area). However the route becoming less distinct when moving *makai* is contradicted by the 1928 series USGS/Territory of Hawai'i quads, which show

a complete route but are not particularly detailed, and thus would be unlikely to include a small slab trail.

An important aspect of the trail indicated in historic maps is that it crossed the *ahupua'a* boundary from Kohanaiki to Kaloko. No clear crossing was identified, however a different site (the converging slab trail -26340) does appear to make a crossing from Kohanaiki, and the enclosure and upright a -26354 may mark the *ahupua'a* boundary. No sites were located where one might expect the crossing of -26353 to take place, such as a series of *ahu* (cairns) suggested by the survey control station "Nawahiahu" on RM 1449 (see Figure 9 in the Background Research section of this report). A significant length of both sides of the *ahupua'a* wall, from its end near the 400 foot contour to site - 26342 near the 525 foot contour, were re-scouted after survey to search for the crossing shown on the maps. The survey revealed several insignificant collapsed or low areas and constructed gaps which do reasonably match the crossing location indicated on historic maps. Near the 500 foot contour, there is a constructed gap in the wall closed by a gate made of wood and corrugated steel sheet. It is most likely that this gate was placed in this particular spot because a trail crossed here before the wall was built, and the point of crossing was preserved. There does not appear to be anything ceremonial about the gate or the ranching wall itself at this point. Notably, there is a very large, heavily modified lava tube just south of this gate (-26288) and a historic habitation (-26296) just north of this gate.

This gate is located over 250 meters *mauka* of the end of the identified -26253 *pāhoehoe* exposure. No trail was identified on either side of the wall (though the historic maps suggest it should be evident on the Kaloko side) for this stretch. There is extensive bulldozing in the low-lying terrain between these two points. There is some evidence of disturbance just *mauka* of the gate in Kohanaiki. Bulldozing is extensive *mauka* of the lava tube -26342 near the 525 foot contour, where the ranching wall is only a remnant, literally flattened by bulldozing. It is very unlikely any sign of a trail paralleling the wall could be located here.

Function of site -26353 is *mauka-makai* transportation, with reasonable evidence that it was a pre-contact *mauka/makai* route that was of some importance. It also seems reasonable that the identified portion of this route discussed here was superseded by historic realignment, though some pedestrian use might still be expected on this trail because of the better view of the surrounding terrain offered by the 'a 'ā flow. The probable match of this trail with the route drawn by Emerson on RM 1449 suggests that the trail did continue east after crossing the *ahupua'a* wall, converging trails here and a gate and survey datum at Site -20741 support this. It is likely that -26353 is the same route, but not necessarily the same trail that has been designated -10714 in the adjacent eastern parcels (TMK: [3] 7-3-009: 026 and 032).

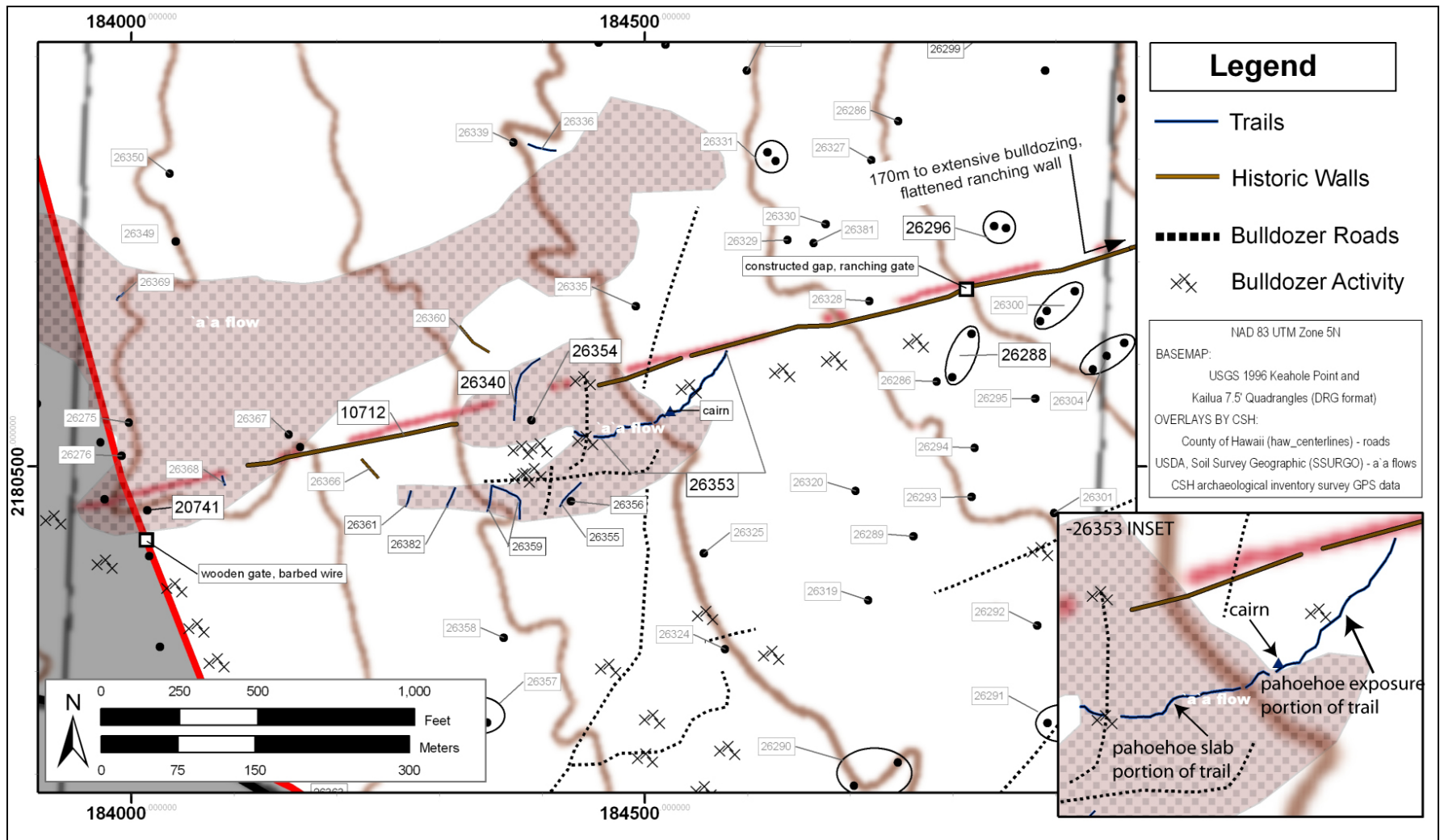


Figure 326. Site -26353, detail of trail and points of interest believed to be part of the site or directly related to the site.



Figure 327. Overview of -26353 route over the 'a 'ā towards the ocean. Taken from “-26353 Cairn” point on detail map (Figure 326) looking west.



Figure 328. High density alignment of *pāhoehoe* slabs used to construct the trail over 'a 'ā, view to west.



Figure 329. Site -26353, overview of *pāhoehoe* exposure running towards *ahupua'a* wall. Taken midway down trail segment labeled “*pāhoehoe* exposure” on Figure 326.



Figure 330. Site -26353, Distinct cairn marking the *pāhoehoe* exposure where it ends at the east (*mauka*) edge of the ‘*a*’ *ā* flow and the beginning of the *pāhoehoe* slab trail, view to the northeast. “Cairn” point on detail map (Figure 326).



Figure 331. Light pecking along the side of the *pāhoehoe* exposure portion of the trail. This was the only instance of modification on the *pāhoehoe* other than the cairn observed during survey.



Figure 332. View of -26354 upright slab as seen from a lower trail. This slab is visible from as far away as present day Hina Lani Street.

4.3.82 State Site # 50-10-27-26354

SIHP #	50-10-27-26354
FUNCTION:	Temporary Habitation
SITE TYPE:	Complex
TOTAL FEATURES:	2
DIMENSIONS:	6.25 m by 5.5 m (20.5 ft. by 18 ft.)
CONDITION:	Excellent
AGE:	Pre-contact
ELEVATION:	380 ft a.m.s.l.

DESCRIPTION: Site 26354 (Figure 333) is a C-shaped enclosure open to the west with a level natural terrace and an upright. The site is located on a relatively level, but very rough 'a'ā flow and is perched on the west edge of the flow overlooking the coast. Site -26340, a *pāhoehoe* slab trail begins nearby and continues to the northeast.

This enclosure, Feature A, comprises the majority of the site. **Feature B** (Figure 335) is the upright 'a'ā slab 150 cm (4.9 ft.) high, 125 cm (4.1 ft.) wide, and 5-10 cm (0.16-0.33 ft.) thick, 7 m (23 ft.) east of Feature A. This slab is near the southern edge of the 'a'ā and is very visible along the elevation contour to the south all the way to Hina Lani Street (see also site -26353).

Feature A measures approximately 6.25 m (20.5 ft.) north/south by 5.5 m (18 ft.) east/west. Its walls are constructed of 'a'ā small boulders and cobbles (Figure 334). Some natural 'a'ā boulder/bedrock form a foundation. Since most of the walls are gently sloping, the structure appears to be natural and is difficult to see from a distance; some of the interior walls show more facing. The enclosure's interior has been leveled by the removal of larger cobbles and some in filling with rubble. A rectangular excavated area and measuring 40 by 40 cm (1.3 by 1.3 ft.), 70 cm (2.3 ft.) deep is in the center of the structure. It is excavated around some exposed cracked bedrock. Based on the excavation's location it appears to be a hearth, however, it contained no cultural material or charcoal. While occasional heavy rain carried charcoal or cultural material deep into the 'a'ā cinder, some remnant should be observable if the structure was used as a hearth. The excavation also resembles a cupboard, but its central location is more indicative of a hearth.

The site's function is interpreted as temporary habitation. Its location near the trail site -26340 suggests it was an easy place to rest while traveling along the trail. The 'a'ā upright, which is highly visible from the south, also suggests that the site may have been approached from a southerly direction. Thus, the upright was a cairn that marked the site's location. The site does not appear to be formal enough to be a ceremonial site nor is any other function apparent.

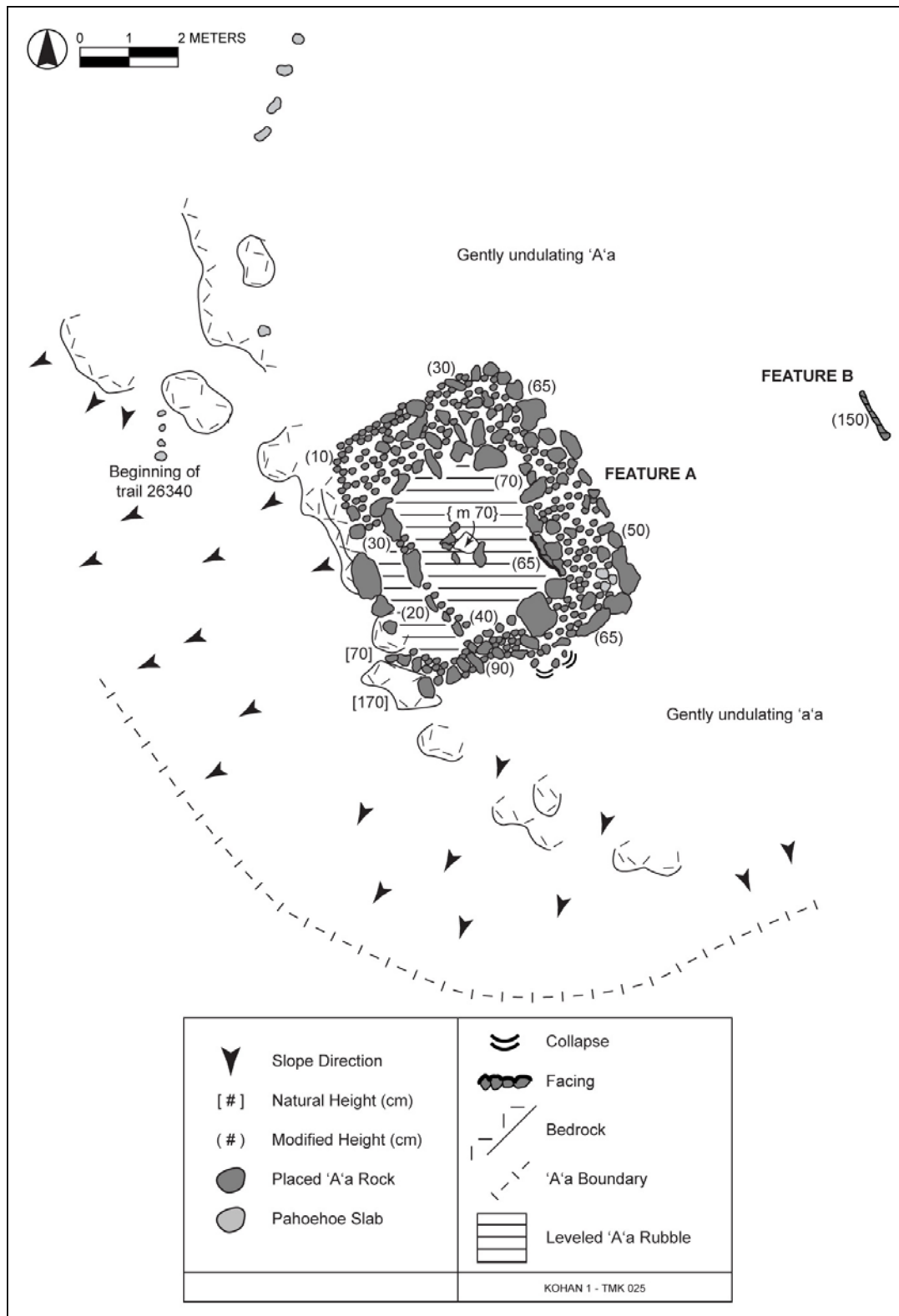


Figure 333. Site -26354, plan view



Figure 334. Site -26354, Feature A, view to southeast



Figure 335. Site -26354, Feature B, view to east

4.3.83 State Site # 50-10-27-26355

SIHP #	50-10-27-26355
FUNCTION:	Transportation
SITE TYPE:	Wall / Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	38 m (124.7 ft.) by 50 c m
CONDITION:	Good
AGE:	Historic
ELEVATION:	380 ft a.m.s.l.

DESCRIPTION: Site 26355 (Figure 336 and Figure 337) consists of an 'a'ā wall and a trail that runs along side of it. The wall is approximately 38 m (124.7 ft.) long. From the northeast end of the wall, after approximately 25 m (82 ft.), the wall angles from its previous 220 degrees bearing to 200 degrees for another 13 m (42.7 ft.) before it ends. The wall is comprised of stacked 'a'ā boulders stacked approximately 5-6 courses high. The wall has no facing and it is slightly wider at the base than at the top. The wall ranges between one and three boulders in width depending on the boulder size; it is only one boulder wide at the top. The wall appears more formal on the southeast face that separates the 'a'ā flow (on which the wall is built) from a sloping *pāhoehoe* flow area. The wall is collapsed in a few places but is intact for the most part. The trail that runs alongside the wall runs approximately the length of the wall and is not discernable beyond the extent of the wall, possibly due to the increase in vegetation beyond the wall. The trail is marked by the discoloration of the 'a'ā cobbles. The majority of large boulders have been cleared from the trail and no slabs are present on the trail, which is approximately 50 cm (1.6 ft.) wide.

The site's function is interpreted as transportation. The wall is not formal enough to have been a ranching wall. It may have served to designate the trail and prevent access into portions of a steeply sloped *pāhoehoe* depression. The trail itself is evidence of the transportation function of this site.

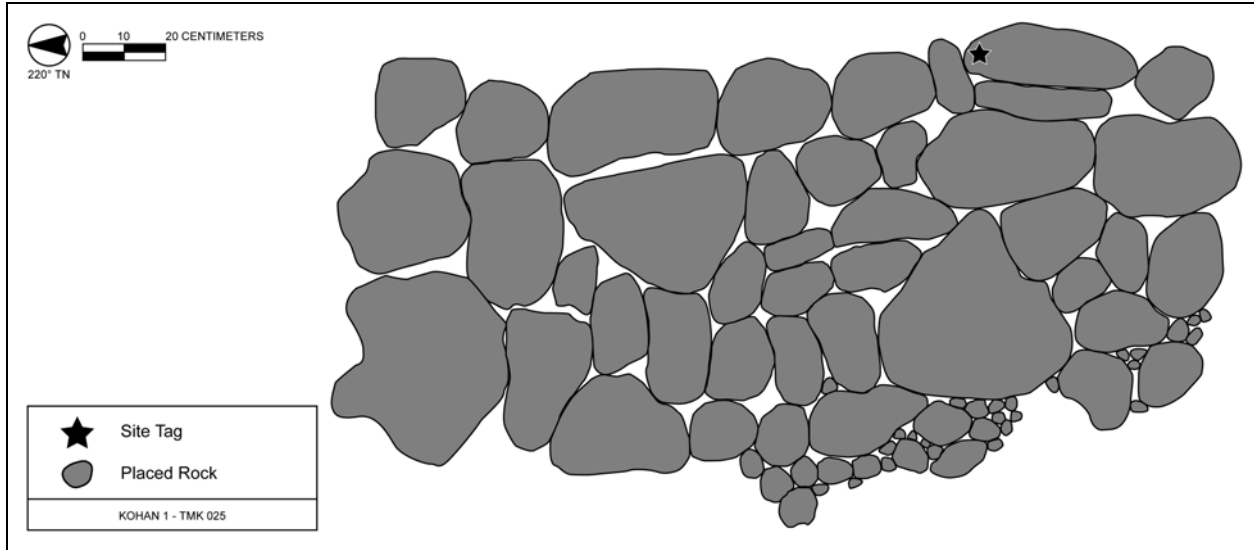


Figure 336. Site -26355, profile



Figure 337. Site -26355 overview, view to southwest

4.3.84 State Site # 50-10-27-26356

SIHP #	50-10-27-26356
FUNCTION:	Shelter
SITE TYPE:	Lava blister
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	3 m by 4 m (9.8 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	380 ft a.m.s.l.

DESCRIPTION: Site 26356 (Figure 338 and Figure 339) is a lava blister measuring 3 m (9.8 ft.) north/south by 4 m (13.1 ft.) east/west with a ceiling height of 90 cm (3 ft.). The tube entrance is located at the top of the blister and measures 38 cm by 30 cm (1.2 ft. by 0.98 ft.). The interior of the blister contains very little cultural modification although two *pāhoehoe* cobbles appear to have been brought in from the outside. Approximately 45 pieces of *kukui* were found scattered within the blister.

The site's function is interpreted as shelter based on the small size of the blister and the *kukui* scatter. Excavation potential is fair due to a 3 cm (0.1 ft.) soil deposit found throughout the shelter.



Figure 338. Site -26356, entrance to cave, view to west

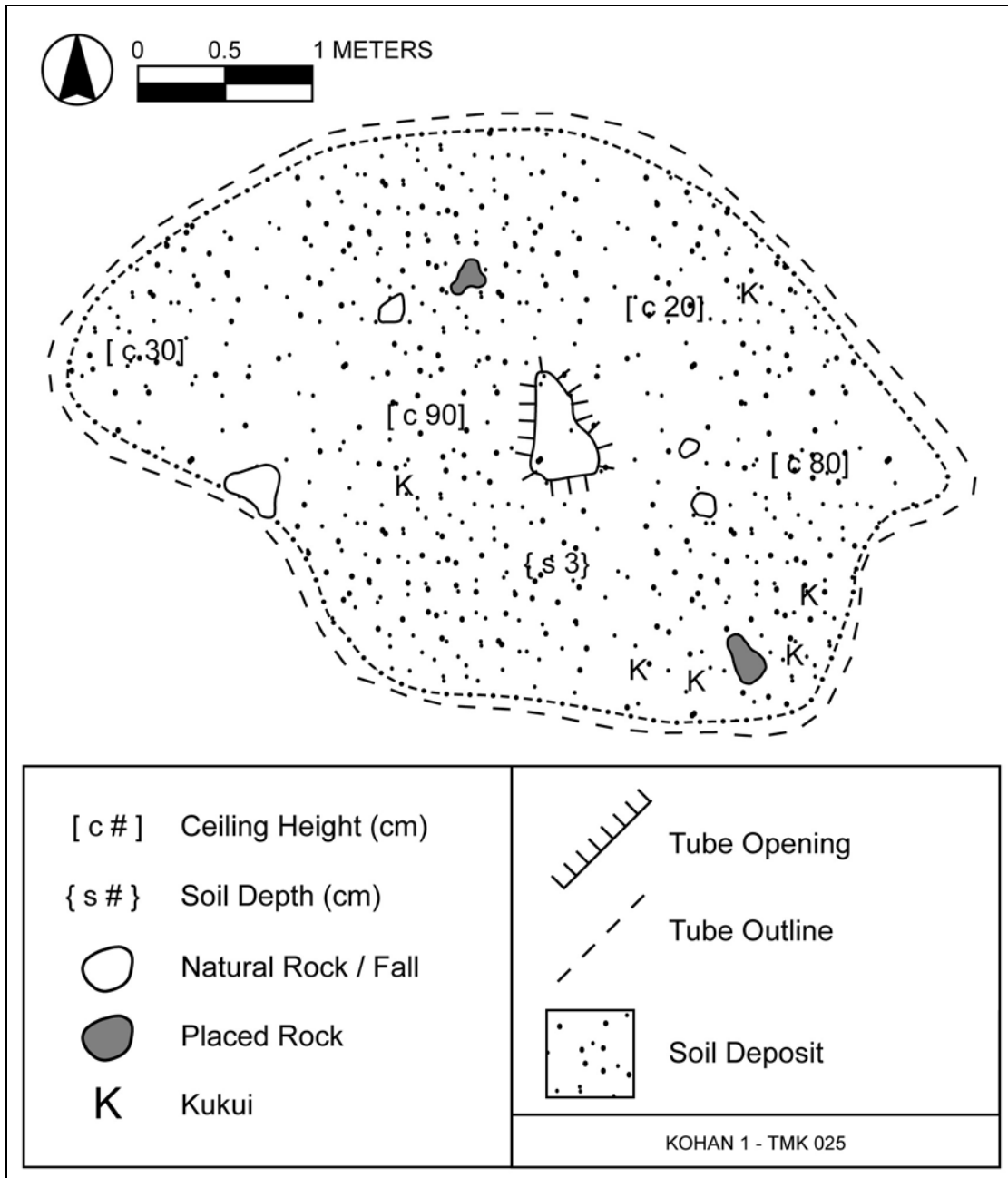


Figure 339. Site -26356, plan view

4.3.85 State Site # 50-10-27-26357

SIHP #	50-10-27-26357
FUNCTION:	Shelter
SITE TYPE:	Lava tube
TOTAL FEATURES:	2
DIMENSIONS:	6 m by 7 m (19.7 ft. by 23 ft.)
CONDITION:	Good / Poor
AGE:	Pre-contact
ELEVATION:	340 ft a.m.s.l.

DESCRIPTION: Site 26357 is a lava tube with two features that contain evidence of habitation. Feature A is a chamber with a *pāhoehoe* alignment and pieces of cowry shell. Feature B is a small tube shelter used as a seasonal camp that is located approximately 25 m (82 ft.) at 116 degrees from Feature A. Koa hale and various grasses surround the site, which is within an area containing extensive bulldozer activity.

Feature A is a lava tube measuring 6 m (19.7 ft.) northwest/southeast by 7 m (23 ft.) northeast/southwest with ceiling heights ranging from 40 - 105 cm (1.3 - 3.4 ft.). The tube entrance is located on the northwest portion of a large depression (

Figure 340. and Figure 341). The large depression and surrounding surface have been subjected to a significant amount of bulldozer activity, although the interior of the tube does not appear to be damaged by the bulldozer activity. Beyond the opening, the tube opens into a main chamber measuring 6 by 7 m (9.8 by 23 ft.). The tube does not extend beyond this chamber. The main cultural activity area is on the southwest end where several *pāhoehoe* boulders have been placed in an alignment. A total of six cowry shell pieces were found in this area. No other cultural modification or materials were observed.

Feature A's function is interpreted as shelter based on the small amount of midden observed and the relatively minor boulder modification. Two additional tubes are at the southeast and southwest ends of the depression. Both tubes lack cultural material and modification but each contains a soil deposit that indicates a fair potential for future excavation.

Feature B is a lava tube measuring 12 m (39.4 ft.) east/west by 8 m (26.3 ft.) north/south with a maximum ceiling height of 1.2 m (4 ft.) (Figure 342 and Figure 343). Beyond the initial chamber, the tube continues maze-like to the east for at least 50 m (164 ft.). This area was intensely checked and no cultural material was found. The tube contains a soil deposit of approximately 2 to 3 cm (0.8 to 1.2 inches) in depth. Marine shell and urchin shell were found throughout the soil deposit area and one *kukui* shell was also identifiable. Approximately 50 pieces of marine shell and 30 pieces of urchin shell were found within the tube, indicating this tube was used for habitation, possibly as a seasonal camp.

The site's function is interpreted as habitation based on the presence of cultural material. Since modifications to the lava tubes are minimal, the site appears to have been used as shelter. Due to the presence of marine and urchin shell within Feature B, it may have been used repeatedly and was a seasonal camp.

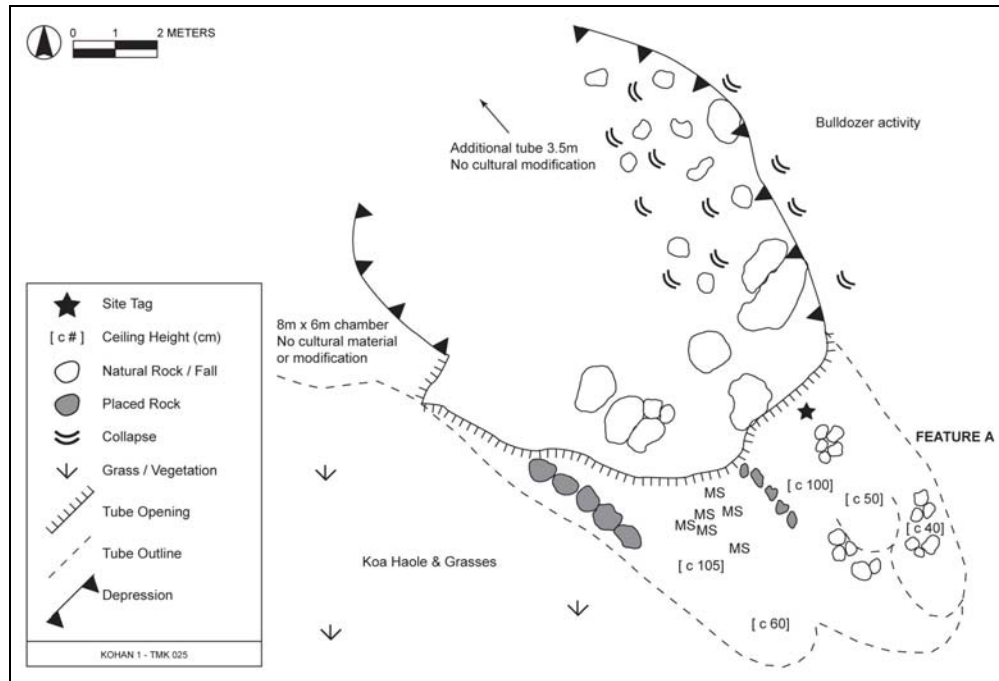


Figure 340. Site -26357, Feature A plan view



Figure 341. Site -26357, Feature A, showing just inside entrance, view to southeast

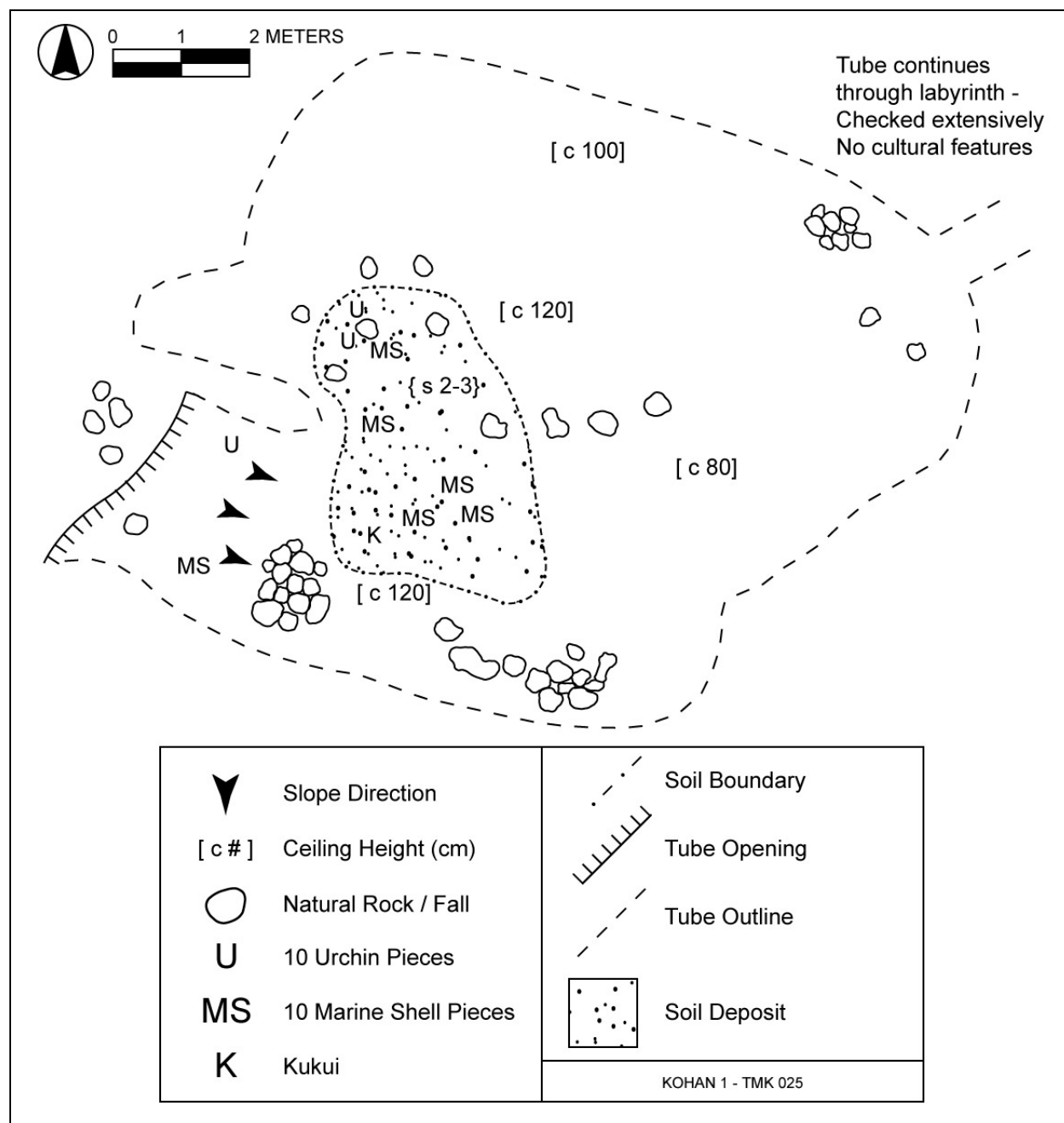


Figure 342. Site -26357, Feature B plan view



Figure 343. Site -26357, Feature B, view to east

4.3.86 State Site # 50-10-27-26358

SIHP #	50-10-27-26358
FUNCTION:	Habitation / Indeterminate
SITE TYPE:	Unknown/bulldozed
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	3.5 m by 2 m (11.5 ft. by 6.6 ft.)
CONDITION:	Remnant
AGE:	Pre-contact
ELEVATION:	360 ft a.m.s.l.

DESCRIPTION: Site 26358 was likely a temporary habitation site that has been completely bulldozed. The site is in a clearing and measures approximately 3.5 m (11.5 ft.) northwest/southeast by 2 m (6.6 ft.) northeast/southwest with a fairly extensive midden scatter. The midden includes several species of marine shell including *Nerita* and *Conus*, an extensive number of urchin, and multiple cowry shells. Bulldozing scars are evident and the site and its vicinity have been leveled.

The site's function is indeterminate. Based on the amount of midden present, this was likely a temporary habitation site, however, since the site has been so thoroughly destroyed, it is not possible to determine function. The site was not photographed nor was it mapped.

4.3.87 State Site # 50-10-27-26359

SIHP #	50-10-27-26359
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	2
DIMENSIONS:	35 m by 50-60 cm (114.8 ft. by 1.6-2 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	360 ft a.m.s.l.

DESCRIPTION: Site 26359 consists of two *pāhoehoe* slab trails, Feature A and Feature B.

Feature A (Figure 344) is a *pāhoehoe* slab trail that measures approximately 35 m (114.8 ft.) long. The trail begins at the south edge of the 'a'ā, runs north for approximately 15 m (49.2 ft.), turns and runs northwest almost parallel to the edge of the 'a'ā, and ends at the 'a'ā edge after 20 m (65.6 ft.). The slabs that make up the 20 m (65.6 ft.) northwest portion of the trail are slightly larger than the slabs in the north/south running portion. The northwest section is more defined due to the size of the slabs than the north/south section, which becomes difficult to discern due to the smaller and more widely spaced slabs in the last approximately 5 m (16.4 ft.) of the south end of the trail.

Feature B (Figure 345) is a very well-defined *pāhoehoe* slab trail that runs almost directly north/south across the 'a'ā flow for approximately 21 m (68.9 ft.). The trail begins and ends at the edge of the 'a'ā. It is a direct route across the flow. The trail is marked by *pāhoehoe* slabs, the largest of which is approximately 60 cm (2 ft.) across. The discoloration of the 'a'ā cobbles around and between the slabs, due to bruising from foot traffic, also mark the trail.

The trail's function is interpreted as transportation.



Figure 344. Site -26359 Feature A, showing trail with *pāhoehoe* trail, view to west



Figure 345. Site -26359 Feature B, overview of trail with *pāhoehoe* slabs, view to south

4.3.88 State Site # 50-10-27-26360

SIHP #	50-10-27-26360
FUNCTION:	Animal Husbandry
SITE TYPE:	Wall
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	35 m by 60 cm (114.8 ft. by 1.9 ft.)
CONDITION:	Poor
AGE:	Historic
ELEVATION:	370 ft a.m.s.l.

DESCRIPTION: Site 26360 (Figure 346) is a historic wall that measures approximately 35 m (114.8 ft.) and runs northwest/southeast at 130 degrees between two areas of 'a'ā flow. The southeast end of the wall begins at the 'a'ā flow; the northwest end of the wall ends approximately 5 m (16.4 ft.) short of the second 'a'ā flow due to bulldozer activity. A fair amount of collapse is present along the wall, particularly at the northwest end. Like the nearby *ahupua'a* wall, site 26360 is faced on both sides and is rubble filled. Most of the wall is constructed of *pāhoehoe* boulders and slabs, although the southeast end of the wall is constructed of 'a'ā boulders. The inclusion of 'a'ā boulders indicates the utilization of materials present in the immediate vicinity. Site 26360 encloses an extensive area that is bounded by the 'a'ā flows and a wall to the south. The southern wall is site 10712, the Kohanaiki/Kaloko *Ahupua'a* boundary. Although the wall marks the pre-contact *ahupua'a* boundary it was constructed post-contact, likely as a cattle ranching wall.

The site's function is interpreted as animal husbandry based on its proximity to the *ahupua'a* boundary, an animal husbandry wall. Walls were historically built within Kohanaiki and Kaloko to contain animals including goats and cattle.



Figure 346. Site -26360, view to northeast

4.3.89 State Site # 50-10-27-26361

SIHP #	50-10-27-26361
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	14 m by 50 m (45.9 ft. by 164 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	340 ft a.m.s.l.

DESCRIPTION: Site 26361 (Figure 347) is *pāhoehoe* slab trail that runs more or less north/south for approximately 14 m (45.9 ft.) across a narrow finger of 'a'ā flow. The trail extends between the flow's edges. The trail is marked by 10 *pāhoehoe* slabs and the removal of any large boulders. The trail is not well defined. The trail's south half is more defined than the north half because the majority of the slabs (7 of 10) are in the south half. The three slabs that form the trail's north half are widely spaced, and make the trail more difficult to discern. All of the slabs that make up the trail are relatively small, measuring on average of 30 cm (0.98 ft.) across.

The site's function is interpreted as transportation across the 'a'ā flow.



Figure 347. Site -26361, overview of southern half of trail, view to north

4.3.90 State Site # 50-10-27-26362

SIHP #	50-10-27-26362
FUNCTION:	Burial
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	64 m by 3-5 m (210 ft. by 9.8-16.4 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	335 ft a.m.s.l.

DESCRIPTION: Site 26362 (Figure 348 and Figure 349) is a lava tube measuring 64 m (210 ft.) east/west by 3-5 m (9.8-16.4 ft.) north/south with ceiling heights ranging from 80 cm by 150cm (2.6 ft. by 4.9 ft.). The tube entrance has a constructed wall consisting of stacked *pāhoehoe* cobbles approximately 110 cm (3.6 ft.) in height (Figure 350). The southern end of the entrance has a *pāhoehoe* slab pavement that provides easy access into the tube. The main chamber is located just beyond the tube opening and measures 8 m by 5 m (26.3 ft. by 16.4 ft.). This chamber contains all the cultural material/modification found at this site.

The main chamber contains more than 30 marine shell pieces, several *kukui* endocarps, urchin shell pieces, and one water-worn stone. At the end of this main chamber is a small opening that leads into another chamber containing extensive ceiling fall. Just past this small opening is an area of highly fragmented bone; the bone is human and has been identified as Burial 31 (see below). The tube continues for approximately 50 m (164 ft.) until it opens into the east end of a small depression; site -26365 is at the west end.

The site's function is interpreted as burial due to the presence of Burial 31, the only identified burial at the site. Evidence of temporary habitation is also evident based on the presence of the marine shell midden and the constructed wall. Excavation potential is poor due to a lack of soil.

Burial 31

Burial 31 was found 10 m (32.8 ft.) west of the entrance to site 26362 (Figure 348). The burial was determined to be a traditional native Hawaiian burial based on the lack of historic grave goods and the burial's location in the lava tube. Diagnostic bones included a patella, a lumbar vertebrae, the second phalange of a finger, the right calcaneus, metacarpals, and a fragment of the fibula (Figure 351). The bones are generally decomposed, and all of the long bones are fragments.

The burial is located on top of the boulder fall between site 26362's main chamber and the chamber leading to 26365. The fragmented state of the long bones indicates that the burial has been disturbed, and it may be a secondary burial. No material culture was found with Burial 31.

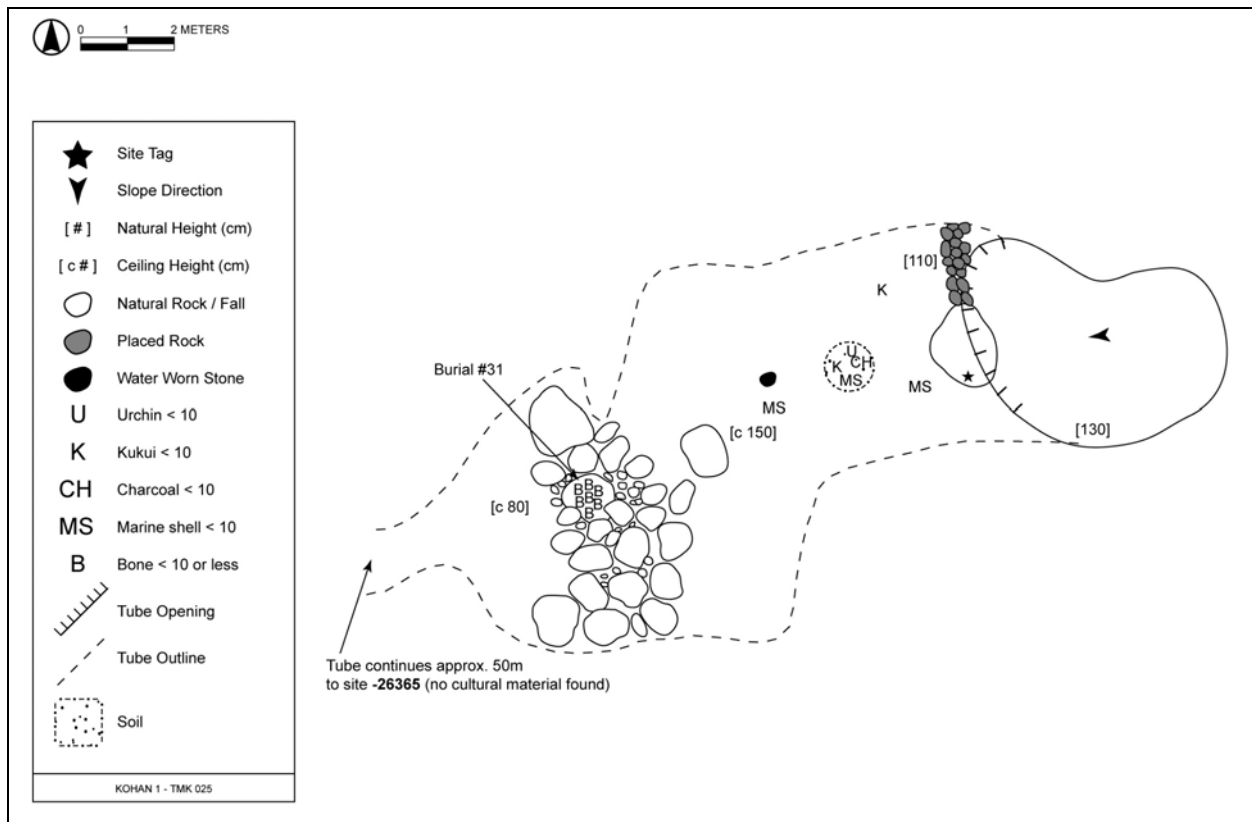


Figure 348. Site -26362, plan view



Figure 349. Site -26362 entrance, view to west



Figure 350. Site -26362, overview of wall, view to east

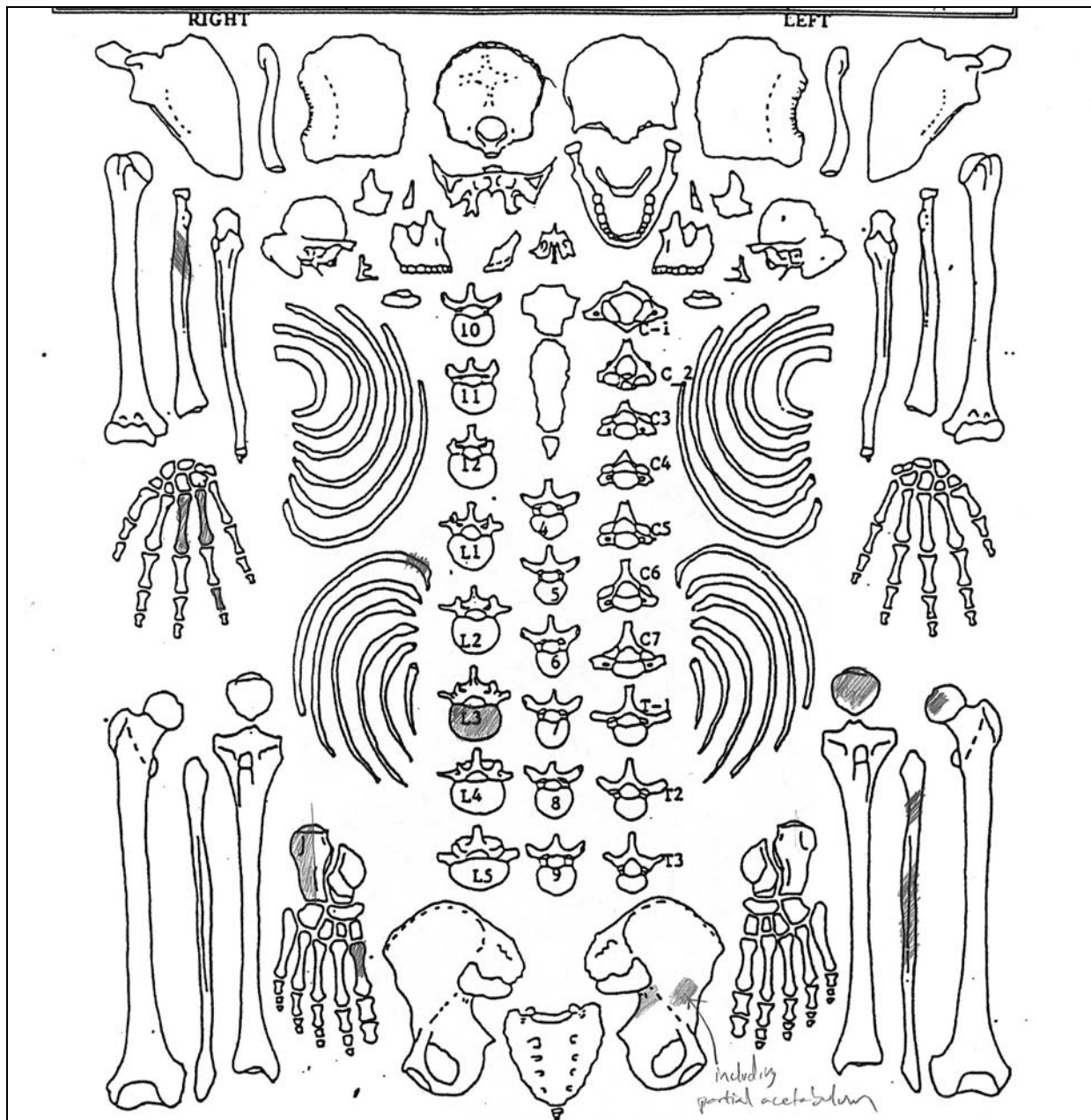


Figure 351. Burial 31, (Site -26362) skeletal inventory form (patella, vertebrae, phalange, calcaneous, metacarpals, radius fragment, fibula fragments, femoral fragment, ilium fragments)

4.3.91 State Site # 50-10-27-26363

SIHP #	50-10-27-26363
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	18 m by 4-7 m (59.1 ft. by 13.1-23 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site 26363 (Figure 352 and Figure 353) is a lava tube measuring 18 m (59.1 ft.) east/west by 4-7 m (13.1-23 ft.) north/south with ceiling heights ranging from 65-180 cm (2.1-5.9 ft.). The tube's entrance is located at the west end of a small depression. The main chamber is located just beyond the tube opening and measures 5 by 7 m (16.4 by 23 ft.) with a maximum height of 180 cm (5.9 ft.). The north side of the chamber contains more than 100 *kukui* endocarps and several large cowry shell pieces. Two locations contain cultural modifications where the flow has been filled and leveled with small to medium *pāhoehoe* cobbles. The tube continues 13 m (42.7 ft.) to the west, however, no cultural modification or material was observed except for a few *kukui* endocarps. The tube ends approximately 20 m (65.6 ft.) past the area mapped.

The site's function is interpreted as temporary habitation based on the presence of the floor leveling, the large *kukui* cluster, and several cowry shell pieces. Excavation potential is poor due to a lack of soil.

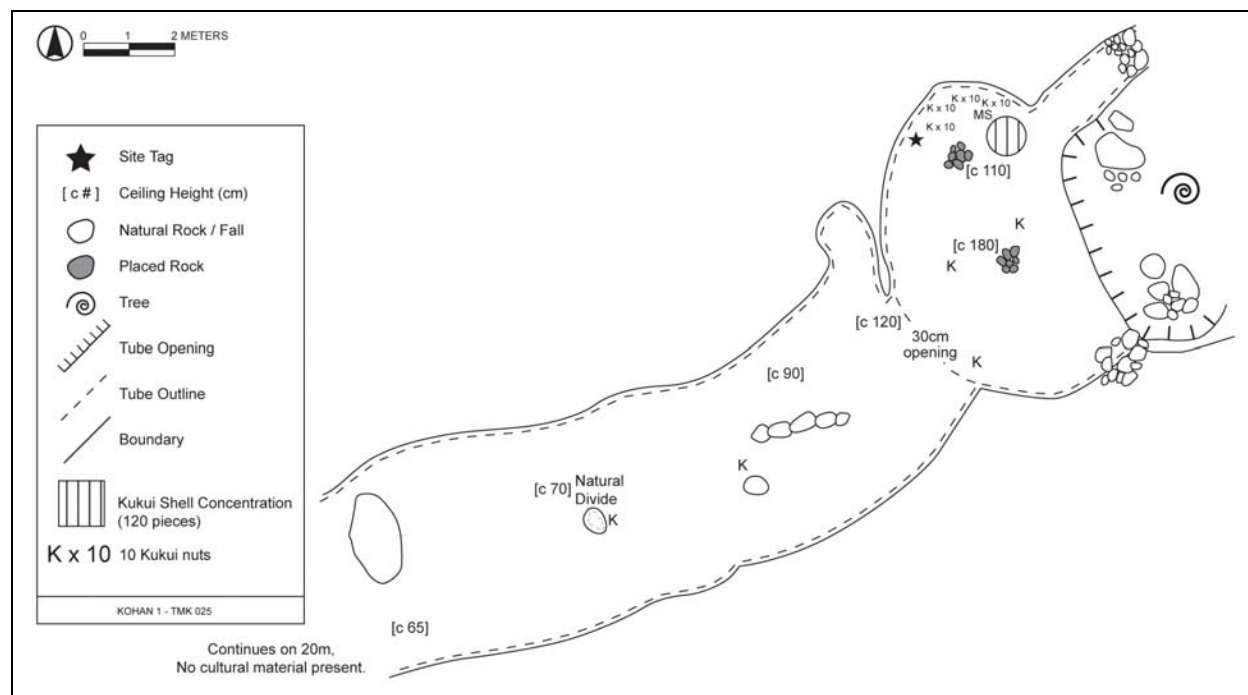


Figure 352. Site -26363, plan view



Figure 353. Site -26363, overview of cave showing leveled floor, view to west

4.3.92 State Site # 50-10-27-26364

SIHP #	50-10-27-26364
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	8 m by 10 m (26.3 ft. by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site 26364 is a lava tube with a main chamber measuring 8 m (26.3 ft.) northeast/southwest by 10 m (32.8 ft.) northwest/southeast with a maximum ceiling height of 250 cm (8.2 ft.) and a side chamber measuring 10 m (32.8 ft.) north/south by 5 to 10 m (16.4 to 32.8 ft.) east/west with a maximum ceiling height of 110 cm (3.6 ft.). The tube entrance (measuring 5 m (16.4 ft.) wide) is located at the southwest end of a large depression. The tube and much of the surface area surrounding the tube entrance has been damaged by bulldozing that is most likely associated with the construction of Hina Lani Street. Just beyond the tube opening, the tube's main chamber is filled with large boulders and garbage; the tube likely once extended to the present location of Hina Lani Street (Figure 355). During road construction, the tube was likely destroyed and pushed back to its current location within site -26364. Several intact areas in the main chamber contain extensive midden. A corner in the southwest end has more than 50 urchin pieces and *kukui* endocarps. The chamber also contains large 'opihī shell, cowry and *kukui*.

Three areas of constructed modification are within the chamber (Figure 354). On the southeast side, a 2-3 course stacked wall, measuring 40 cm (1.3 ft.) in height, separates a smooth semi-level area from the main chamber. The smooth area also has four *pāhoehoe* cobbles that have been aligned. Another alignment constructed of small *pāhoehoe* boulders is on the northwest side. Beyond this alignment, heading northwest is a side tube/chamber measuring 10 m (32.8 ft.) north/south by 5-10 m (16.4-32.8 ft.) east/west with a maximum ceiling height of 100 cm (3.3 ft.). This area contains no constructed modification and only a few *kukui* endocarps. A modern campsite including a foam mattress pad, a beer can, water bottle, paper towels (used), and string were found approximately 6 m (19.7 ft.) from the side tube entrance. The tube continues beyond this chamber although the low ceiling and 'a'ā covered floor made entry impossible.

Two petroglyphs were found on the surface close to the northwest end of the tube opening (Figure 356). The petroglyphs are carved into smooth bedrock. The petroglyph on the north side of the bedrock resembles a long haired female giving birth (Figure 357). The other petroglyph to the south is faint and not easily described. These petroglyphs survived bulldozing by a few inches. The surrounding area has been extensively bulldozed and other petroglyphs in this area may have been destroyed.

The site's function is interpreted as temporary habitation based on the amount of midden and the extent of modification. Excavation potential of this site is poor due to a lack of soil.

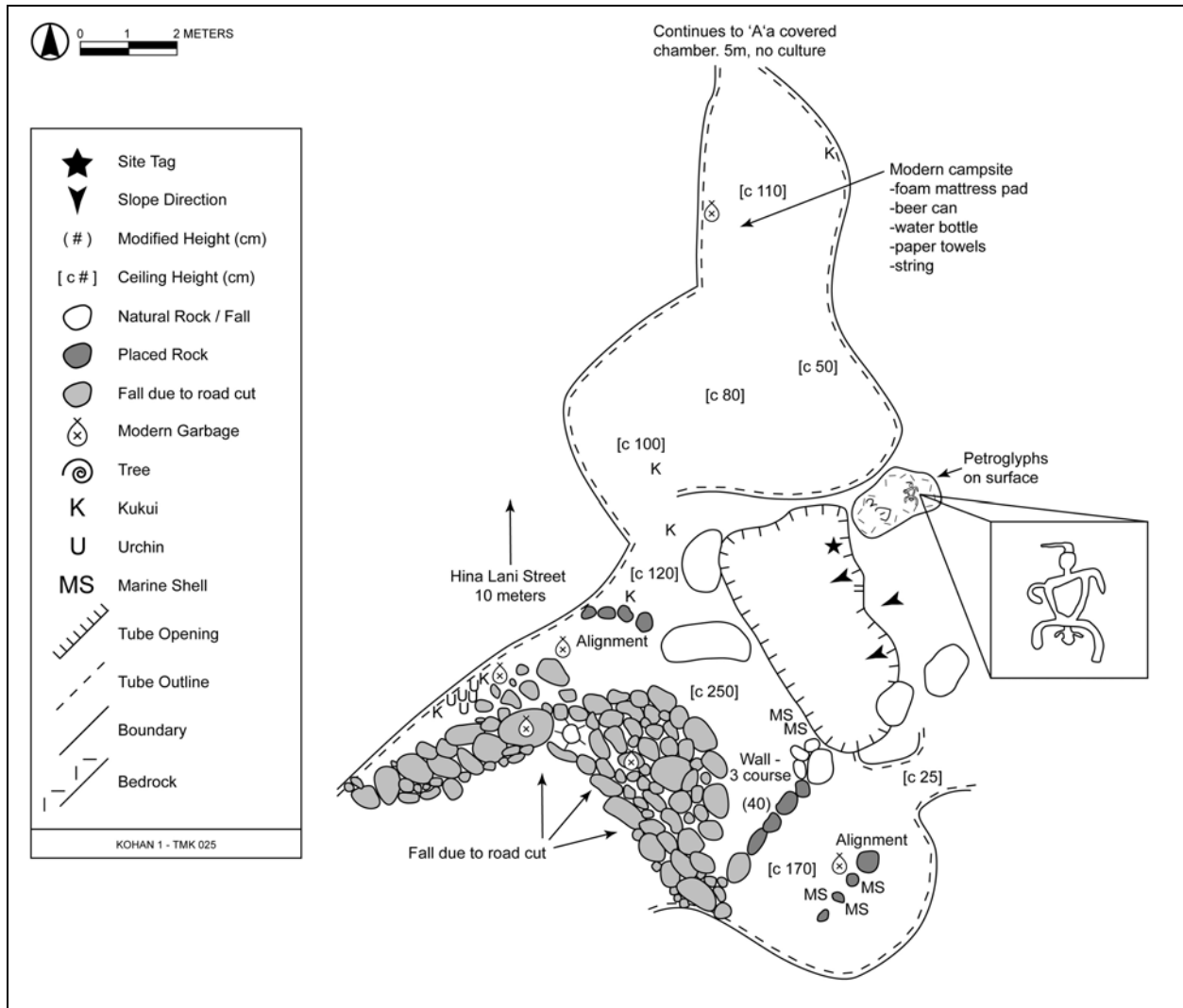


Figure 354. Site -26364, plan view



Figure 355. Site -26364, overview of cave, view to southwest



Figure 356. Site -26364, close-up of petroglyphs

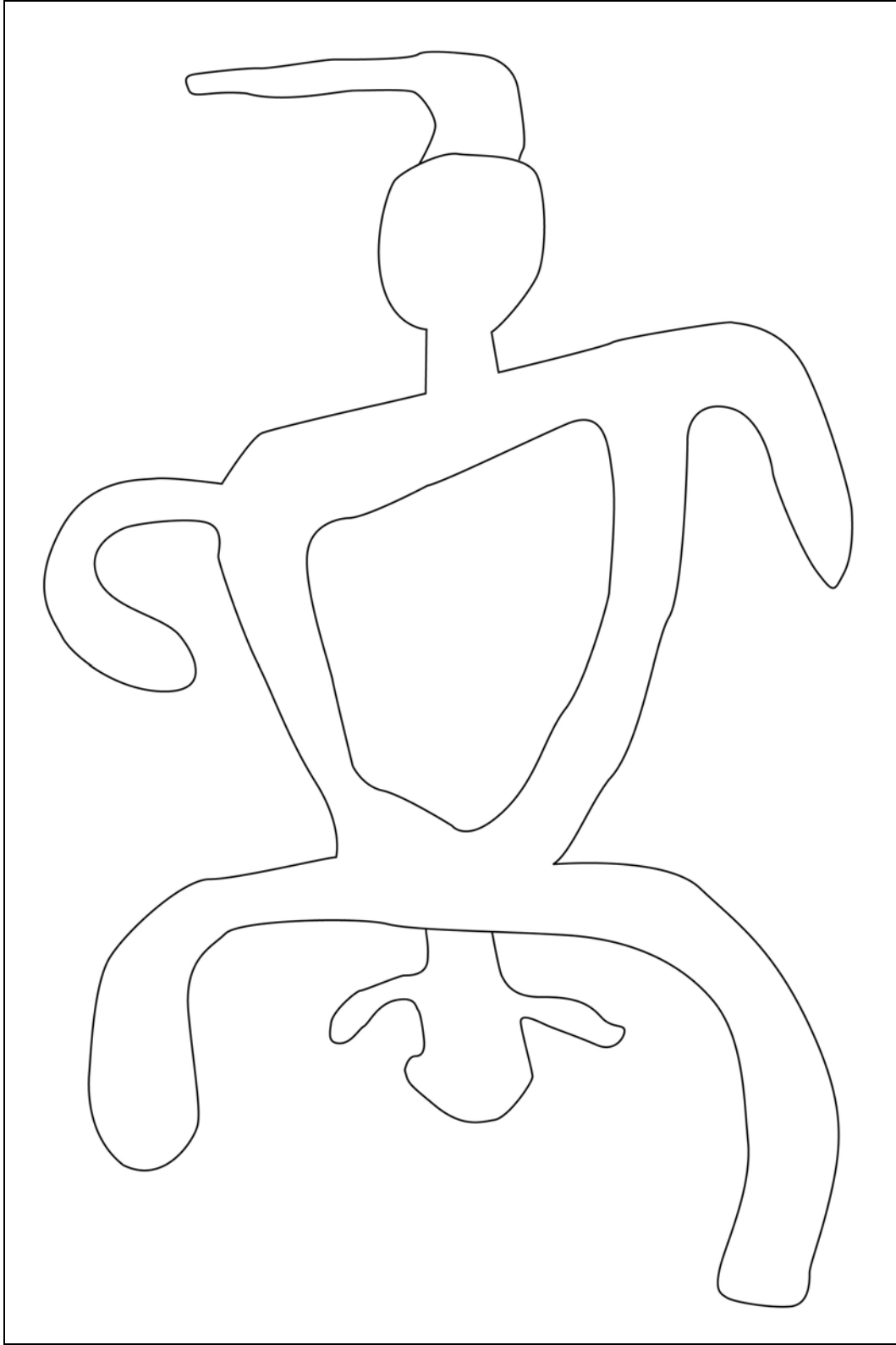


Figure 357. Site -26364, petroglyph outline

4.3.93 State Site # 50-10-27-26365

SIHP #	50-10-27-26365
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	25 m by 10 m (82 ft. by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site 26365 (Figure 358 and Figure 359) is a lava tube and chamber measuring approximately 25 m (82 ft.) east/west and 10 m (32.8 ft.) north/south with ceiling heights from 50-180 cm (1.6-5.9 ft.). This tube is located at the western end of a depression measuring approximately 4 m (13.1 ft.) east/west by 3 m (9.8 ft.) north/south. The east end of the tube is located at the western end of a depression measuring approximately 40-50 m to the east. A *pāhoehoe* cobble, boulder, and slab platform-like surface, measuring approximately 5 m (16.4 ft.) east/west by 2 m (6.6 ft.) north/south with a height of approximately 50 cm (1.6 ft.), is along the southern wall of the tube.

The southern wall of the platform appears to be faced. A circular excavated area, measuring approximately 1 m (3.3 ft.) in circumference and approximately 70 cm (2.3 ft.) in depth, is at the western end of this platform. Ash, charcoal, *kukui*, cowry, and marine shell were found within and around the excavated area. The northern "wall" of this excavated area, which measures approximately 4 m (13.1 ft.) and 50 cm (1.6 ft.) in height, also appears to be faced. A careful inspection of the platform indicates that it consists primarily of natural fall, although there is some modification. Most of this lava tube chamber may have been one continuous leveled *pāhoehoe* cobble/slab platform at one time since most of the boulders and cobbles have been brought into the chamber. Currently, however, areas of the tube chamber appear to be platform-like, similar in style to the one described above, and areas where boulders and cobbles have been removed and piled elsewhere. More than 1,000 shell/shell fragments (urchin, cowry, marine shell) were found throughout the chamber, on the rocky "platform"-like areas and the soil deposits observed in areas where boulders and cobbles have been removed. *Kukui* endocarps are also scattered throughout the tube chamber. Some modification also appears evident on the depression itself; an area measuring approximately 1.5 m (4.9 ft.) east/west by 1 m (3.3 ft.) north/south appears to have been slightly leveled/larger cobbles and boulders removed and piled along the edge. An upright *pāhoehoe* slab, measuring approximately 60 cm (2 ft.) in length, is also present. The depression contains a few fragments of bamboo.

The site's function is interpreted as temporary habitation based on the extensive surface leveling and midden. The excavated area within the site may be an archaeological excavation unit based on its dimensions and the presence nearby of a camera lens cap. Due to the high density of midden, data recovery is recommended.

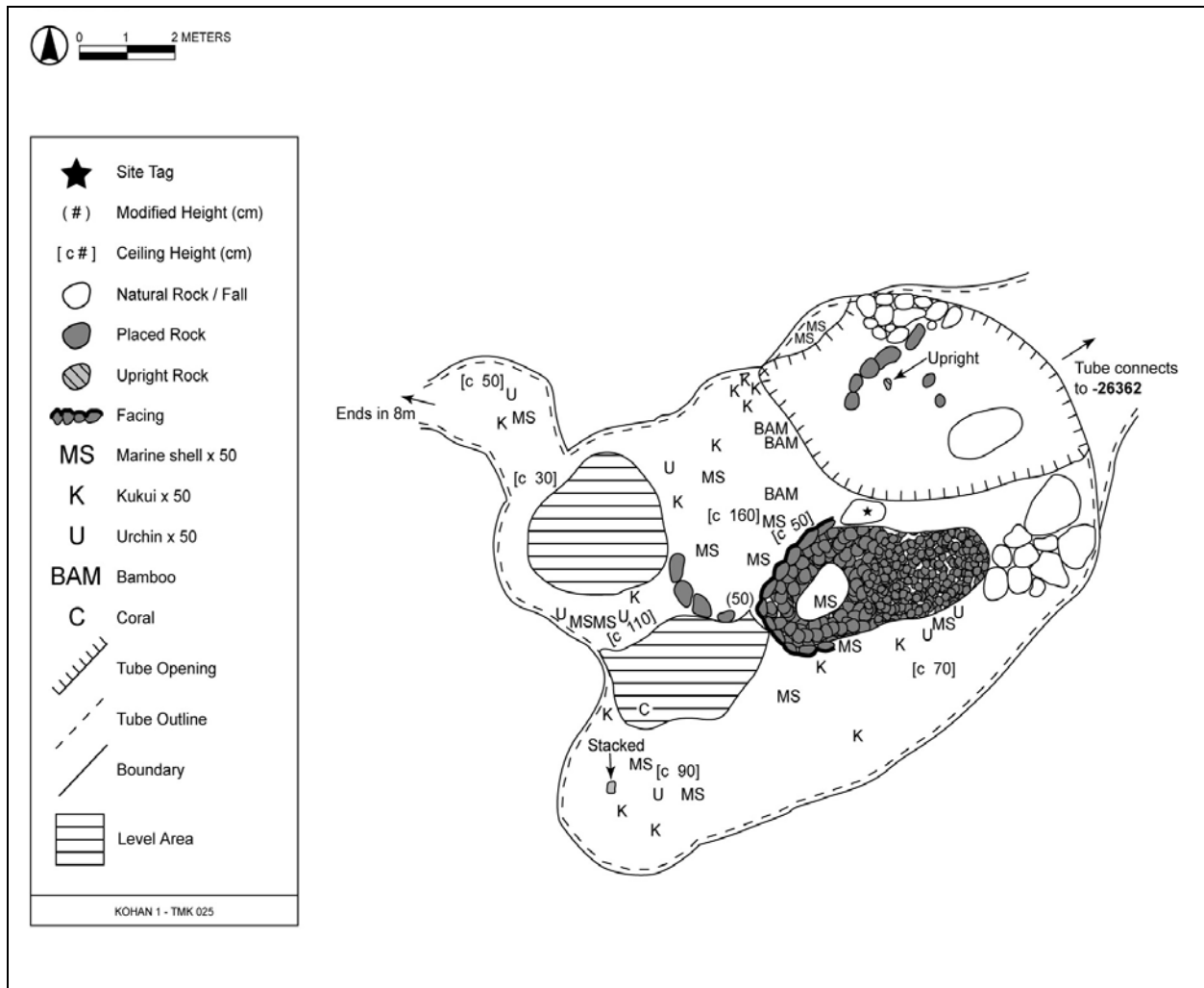


Figure 358. Site -26365, plan view



Figure 359. Site -26365, terrace overview, view to east

4.3.94 State Site # 50-10-27-26366

SIHP #	50-10-27-26366
FUNCTION:	Animal Husbandry
SITE TYPE:	Wall
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	25 m by 60 cm (82 ft. by 2 ft.)
CONDITION:	Good
AGE:	Historic
ELEVATION:	340 ft a.m.s.l.

DESCRIPTION: Site 26366 is an approximately 25 m (82 ft.) long stacked stone wall, running approximately 130 degrees from the northwest end to the southeast end (Figure 360 and Figure 361). Most of the wall is faced on both sides, although the last 5 m (16.4 ft.) of the southeast end of the wall has no facing on the *mauka*/northeast side. The wall is built on top of an undulating *pāhoehoe* outcrop. The outcrop is, in some areas, raised as high as 70 cm (2.3 ft.) above the *makai* terrain. Thus, the wall's constructed height is only 30 cm (0.98 ft.) high in some areas but as high as 1.2 m (4 ft.) in others. The top of the wall is relatively level for its entire length, although a few small areas contain collapse. The wall averages four courses stacked with a constructed height of 80 cm (2.6 ft.) and width of 60 cm (2 ft.). The facing on both the *mauka* and *makai* sides incorporation uprights in the first/base course. The wall was constructed using the rubble-fill method and the wall's construction is more informal than the construction of the nearby Kaloko/Kohanaiki Ahupua'a wall.

The site's function is interpreted as a ranching wall. Its construction style is historic, and there are no remnants of possible structures or anything else in the immediate vicinity that might suggest that this wall was habitation-related. The wall's construction suggests that it was used to restrict animal activity since the wall ends where the outcrop is high enough and steep enough that the wall is no longer necessary as a physical boundary/obstacle.

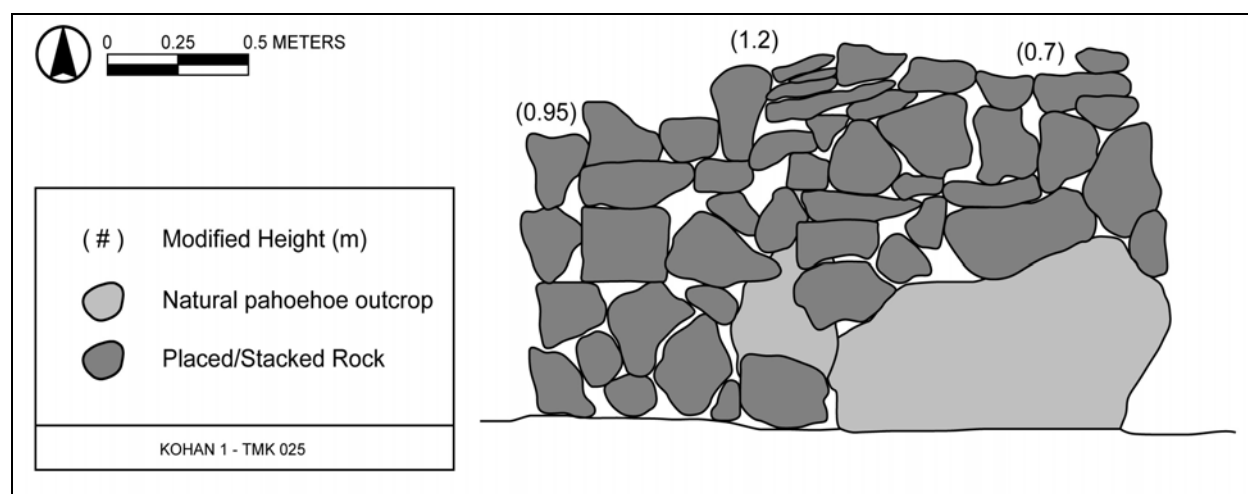


Figure 360. Site -26366, profile of *makai* face of wall



Figure 361. Site -26366, view to northwest

4.3.95 State Site # 50-10-27-26367

SIHP #	50-10-27-26367
FUNCTION:	Animal Husbandry
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 5 m (32.8 ft. by 16.4 ft.)
CONDITION:	Good
AGE:	Historic
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site 26367 is a depression with a 2-course wall constructed on the south end and a large 'a'ā flow on the north end (Figure 362 and Figure 363). The depression measures 10 m (32.8 ft.) east/west by 5 m (16.4 ft.) north/south. The depression's north end contains a large natural 'a'ā flow approximately 3 m (9.8 ft.) in height. The south end has a constructed wall consisting of large cobbles to small boulders, 2-courses and approximately 40-50 cm (1.3-1.6 ft.) in height. The depression, approximately 1 m (3.3 ft.) in depth, is centrally level and has a 10 cm (0.33 ft.) soil deposit. The combination of constructed and natural features created an enclosure that appears to fit well with the surrounding historic features (i.e. 10712 wall). The enclosure is approximately 50 m (164 ft.) northeast from the gate in the historic *ahupua'a* wall (Site 10712), and it appears to have been a pen for small cattle.

The site's function is interpreted as animal husbandry based on its size and location. This site appears to be historic based on its association with nearby historic sites and the lack of evidence for a pre-contact feature. Excavation potential of this site is good due to a 10 cm (0.33 ft.) soil deposit.

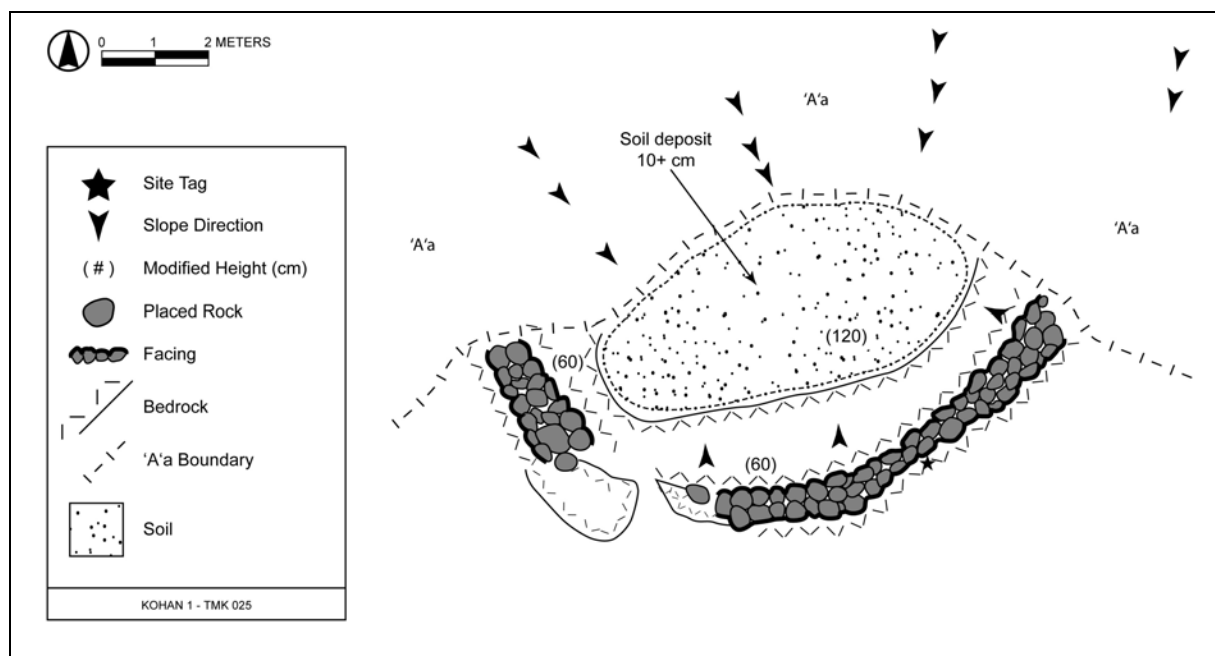


Figure 362. Site -26367, plan view



Figure 363. Site -26367, view to west

4.3.96 State Site # 50-10-27-26368

SIHP #	50-10-27-26368
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m (32.8 ft.) by 50-80cm m
CONDITION:	Remnant
AGE:	Pre-contact
ELEVATION:	325 ft a.m.s.l.

DESCRIPTION: Site -26368 is a *pāhoehoe* slab trail running through an 'a'ā flow (Figure 364). The trail is oriented in a north-south direction. It begins at the southern edge of an 'a'ā flow, extends up the slope and continues north for approximately 8 m (26.3 ft.). The trail consists of approximately 17 *pāhoehoe* slabs that range from between 10 cm (0.33 ft.) and 50 cm (1.6 ft.) in length. The trail appears to end abruptly and may have been disturbed by bulldozer activity or historic wall construction activity.

The site's function is interpreted as transportation.



Figure 364. Site -26368, view to southeast

4.3.97 State Site # 50-10-27-26369

SIHP #	50-10-27-26369
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 80 cm (32.8 ft. by 2.6 ft.)
CONDITION:	Remnant
AGE:	Pre-contact
ELEVATION:	320 ft a.m.s.l.

DESCRIPTION: Site -26369 is a *pāhoehoe* slab tail running through an 'a'ā flow (Figure 365). The trail runs in a north-south direction for approximately 10 m (32.8 ft.) and averages approximately 80 cm (2.6 ft.) wide. Approximately 60-75% of the trail is *pāhoehoe* slabs; the trail is faint.

The site's function is interpreted as transportation.



Figure 365. Site -26369, view to north

4.3.98 State Site # 50-10-27-26370

SIHP #	50-10-27-26370
FUNCTION:	Lava Tube
SITE TYPE:	Shelter
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7.5 m by 4.3 m
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	280 ft a.m.s.l.

DESCRIPTION: Site -26370 is a shelter inside of a large 5 m by 12 m (16.4 ft. by 39.3 ft.) tumulus (Figure 366 and Figure 367). An old 1 inch by 1 inch by 6 foot milled lumber pole is on top of the tumulus. The site is within undulating *pāhoehoe* and a small *noni* tree is outside the entrance.

The shelter's floor is covered with silt and yellow flagging tape fragments that are in poor conditions were found inside the shelter. No artifacts were observed except for a large pithy wood piece near the entrance; the piece of wood measures (1 m by 5 m diameter/ 3.3 ft. by 16.4 ft.). Shell midden is evident but it is not particularly dense; it contains cowry and *Nerita*. The soil deposit is approximately 5 cm (2 inches) deep but it is fairly uniform across the surface. One small boulder from the ceiling fall has been located as a step. Another very large 1 m by 0.8 m by 0.8 m (3.3 ft. by 2.6 ft. by 2.6 ft.) boulder from the entrance collapse has been moved to the back corner of the blister.

The site's function is interpreted as shelter based on its small size and the sparse midden deposit. The site has fair excavation potential based on the presence of midden.

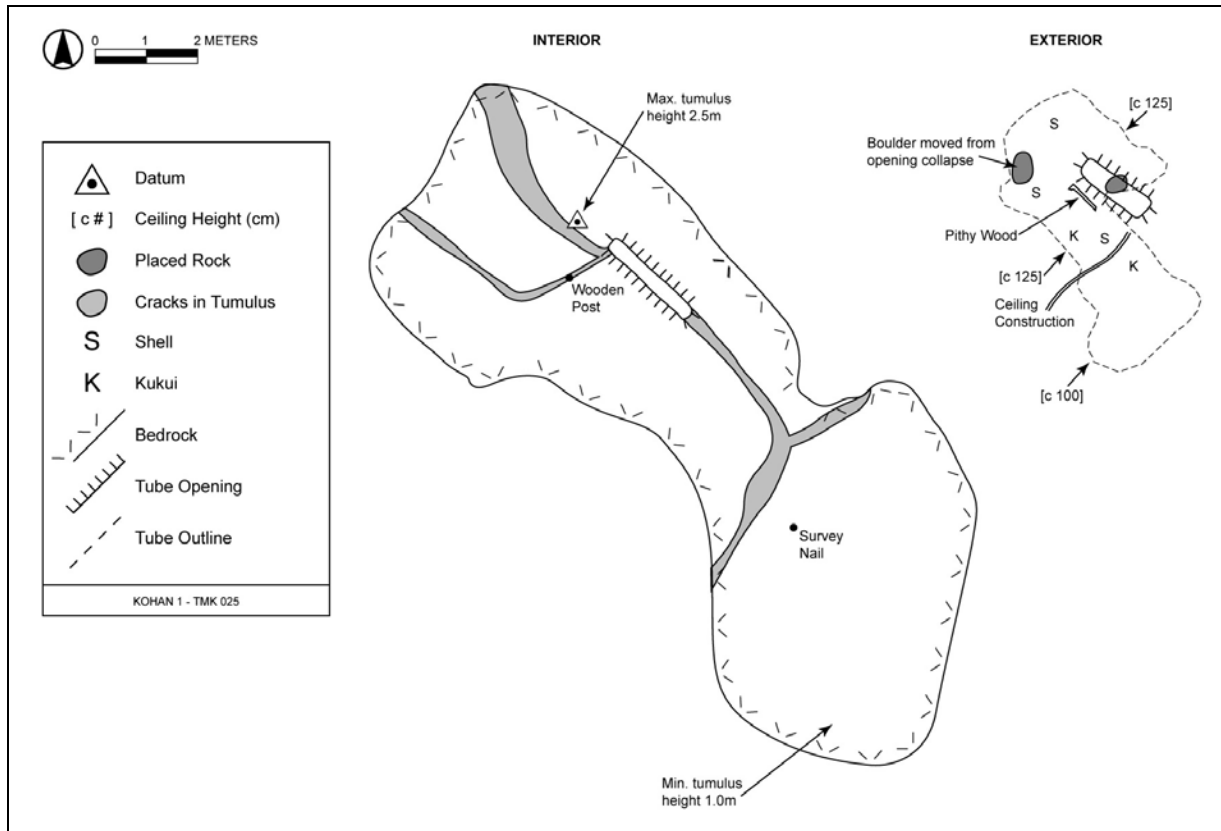


Figure 366. Site -26370, plan view



Figure 367. Site -26370 showing entrance to shelter, view to north

4.3.99 State Site # 50-10-27-26371

SIHP #	50-10-27-26371
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	98 m by 2.5 m (321.5 ft. by 8.2 ft.)
CONDITION:	Excellent
AGE:	Historic
ELEVATION:	560 ft a.m.s.l.

DESCRIPTION: Site 26371 is a well defined trail that crosses the major 'a'ā flow bisected by Hina Lani Street, near the southeast corner of the project area (Figure 368). The trail is constructed of 'a'ā large cobbles and small boulders and forms a causeway of varying height over undulating 'a'ā terrain creating a very level transportation surface. The causeway ranges in height from as low as flush with the surrounding 'a'ā to as high as 1.3 m (4.3 ft.) and 5 courses high. The wall retaining the causeway fill is usually faced where the causeway is tallest. The causeway measures on average 2.5 m (8.2 ft.) wide. The central 1.5 m (4.9 ft.) of the trail is covered in thick (5 cm / 0.16 ft.) paving of deeply bruised basalt rubble, interspaced with small cobbles. On its far north end, the trail drops down off the 'a'ā to pāhoehoe and is lost. On the south side, the trail is bisected by Hina Lani Street, but continues on the south side (outside of the project area) and travels several hundred more meters in TMK: [3] 7-3-009: 28.

The site's function is interpreted as transportation.

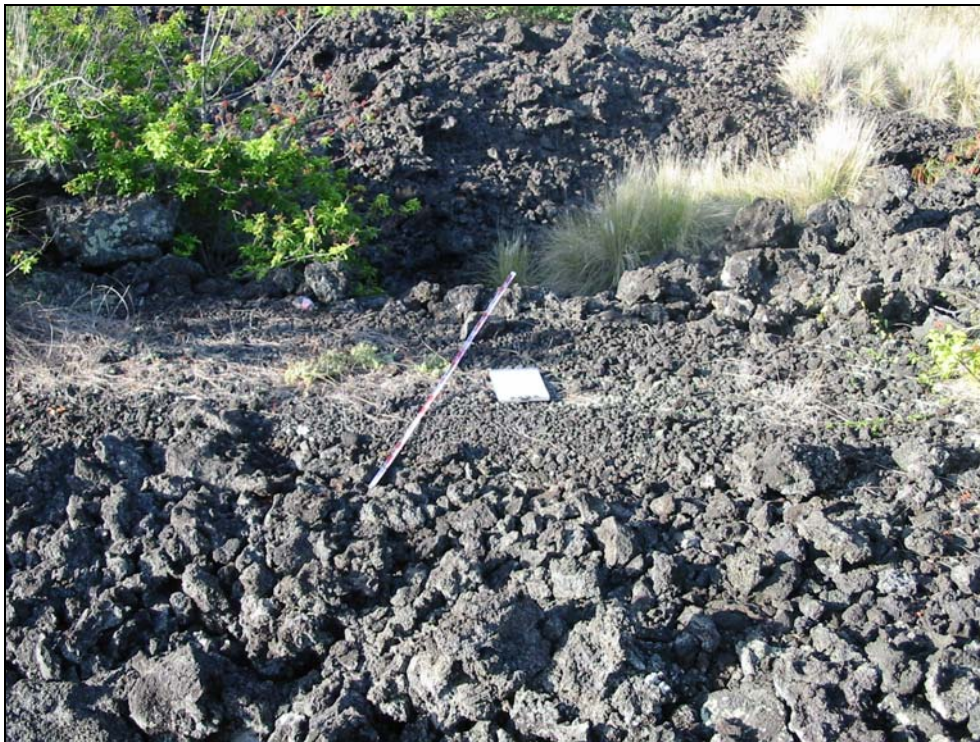


Figure 368. Site -26371, overview of horse trail, view to south

4.3.100 State Site # 50-10-27-26372

SIHP #	50-10-27-26372
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	2
DIMENSIONS:	23 m by 50 m (75.5 ft. by 164 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	515 ft a.m.s.l.

DESCRIPTION: Site -26372 consists of two *pāhoehoe* slab trails within a raised 'a'ā flow. Vegetation in the vicinity of the trails, designated Features A and B, consists of sparse patches of *koa haole*, grasses, morning glory, and Christmas berry.

Feature A is a *pāhoehoe* slab trail (Figure 369). The main segment of the trail, the most well defined portion, runs more or less northwest/southeast for approximately 13 m (42.7 ft.) and consists of approximately 15 slabs. The slabs are relatively small; the largest is 30 cm (0.98 ft.) across. The south end of the trail begins with an arrangement of five slabs adjacent to each other. The trail continues with slabs until it reaches the northwestern-most point. At this point, the trail ends. The north end of the trail consists of a three slab arrangement (forming a sort of triangle) that is approximately 10 m (32.8 ft.) northeast of the northwest end. Thick grass covers the area between these two points so visibility is poor, however, no connecting slabs were observed. Approximately 5 m (16.3 ft.) northwest of the south end of the trail is a trail branch to the southwest that connects with Feature B. This trail branch contains four slabs in its 20 m (65.6 ft.) course and then connects to the center slab of Feature B, trail. In addition to the slabs, this branch of the Feature A trail is marked by slight discoloration.

This trail is a north/south trail that crosses the 'a'ā. The five slab arrangement at the south end of Feature A is directly east of the center slab of Feature B. Feature B's center slab and Feature A's southwest branch slab are clearly visible from the south end of Feature A. The five slabs arrangement is unique and was likely constructed to mark something significant such as a trail crossing.

Feature B is a more or less north/south running *pāhoehoe* slab trail that measures approximately 10 m (32.8 ft.) (Figure 370). The trail consists of approximately 12 slabs that are rather large and thick; the largest slab measures approximately 60 cm (2 ft.) across and approximately 15 cm (0.49 ft.) thick. The trail is short and does not completely cross the 'a'ā. A large piece of cowry shell was found on the 'a'ā surface, alongside the largest slab. Approximately 13 m (42.7 ft.) directly east of Feature B's center slab and along the same east/west alignment as the southwest branch of Feature A, is a one *pāhoehoe* slab. The slab, measuring approximately 30 cm (0.98 ft.) across, is placed at the crest of the end of the raised 'a'ā flow. No other slabs connect this single slab with Feature B although the slab is in the same east/west alignment as the Feature A branch and the center slab of Feature B.

The site's function is interpreted as transportation. While Feature B does not completely cross the 'a'ā, it is clear that its function is transportation across the 'a'ā. The wide spacing of some of the slabs indicates the possibility that rather than stepping stones, these slabs also served as path markers since they are clearly visible across the 'a'ā.



Figure 369. Site -26372, Feature A, close-up of five slab arrangement at south end of trail, view to south



Figure 370. Site -26372, Feature B, overview of trail, view to south

4.3.101 State Site # 50-10-27-26373

SIHP #	50-10-27-26373
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	77 m by 4 m (252.6 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact / Historic
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26373 is an east/west running lava tube (Figure 371 and Figure 372). A large ash deposit is in the center of the cave, immediately within the *mauka* entrance of Tube 1, the main tube. Midden is scattered throughout this area and includes *Nerita*, urchin, *kukui*, cowry, *Conus* sp., *Isognomon* sp., and other marine shell. Although the midden is scattered throughout the tube entrance, it is more concentrated along the sides of the cave, as if discarded after eating. The tube's entrance is constructed to partially restrict access. A basalt flake was found inside of the constructed entrance with the midden scatter. A modern (likely 1970's) safe that has been hacked into was also found in the same area.

The entrance tube's floor may have been paved since rubble covers the ground, particularly along the tube sides/walls. The rubble paving is absent at the cave's center in the ash deposit area. It is currently uncertain whether the area beneath the built-up ash deposit is paved.

The ash deposit was likely a fire pit. The majority of this ash deposit is 3-5 cm (0.1-0.16 ft.) deep with isolated spots that are approximately 10 cm (0.33 ft.) deep. Some cut goat bones are present in the midden indicating that someone was eating goat. Several larger placed *pāhoehoe* slabs are partially arranged around the ash deposit. On one of the placed *pāhoehoe* slabs is a small constructed arrangement including a whole, large 'opihi shell, a large almost whole piece of urchin, a piece of *kukui*, a couple of goat bones, and an extremely squared off piece of basalt, approximately the size of a bar of soap that appears to be natural. This small cache is not likely pre-contact although its age is indeterminate.

The midden scatter significantly decreases as the tube continues to Entrance 2. Natural collapse surrounds Entrance 2, and a small amount of shell and some *kukui* are present in the limited amount of midden found around this entrance. The tube continues west to Entrance 3. In between Entrances 2 and 3, are some placed small boulders with a few scattered *kukui* and shell. In comparison to the main activity area immediately inside Entrance 1, there is very little cultural material or modification in this section of the tube. A small *kukui* scatter is at the edge of the collapse surrounding Entrance 3. In between Entrance 2 and Entrance 3, a small arrangement of small roof fall *pāhoehoe* slabs and a small mound are present. In the entrance chamber of Entrance 3, a few scattered *kukui*, urchin shell, and a partially smashed goat pelvis sitting on top of a large piece of collapse were found.

The tube branches off beyond the Entrance 3 chamber. One branch loops around and connects back to the main tube between Entrances 1 and 2. Another branch has several smaller tubes that contain no material culture or modifications. There is an upper tube that parallels the main tube for a short distance; no material culture or modifications are present. The main tube continues just beyond Entrance 4 before it ends; no material culture or modifications are present.

The site's function is interpreted as temporary habitation based on the amount of midden present and modifications such as placed boulders and paving. The lack of modifications beyond the main activity area, do not suggest more intensive use such as recurrent use or permanent habitation.

The presence of several concentrations of goat's bones, some of which appear to have been cut or cracked indicates post-contact use of this cave. However, the tube was likely utilized both pre- and post-contact.

A second tube, approximately 5 m (16.4 ft.) and 45 degrees from Entrance 1, runs more or less northeast/southwest for approximately 50 m (164 ft.) before it becomes too narrow to pass due to a large roof collapse. The tube continues beyond this collapse but was not possible to explore. Other than one *'opihi* shell and two to three urchin pieces within 5 m (16.4 ft.) of the entrance of this second tube, there is no culture or modifications present. As such this tube was not mapped.



Figure 371. Site -26373, showing large ash deposit, placed small boulders around the deposit, and rubble along the side of the tube, view to southwest

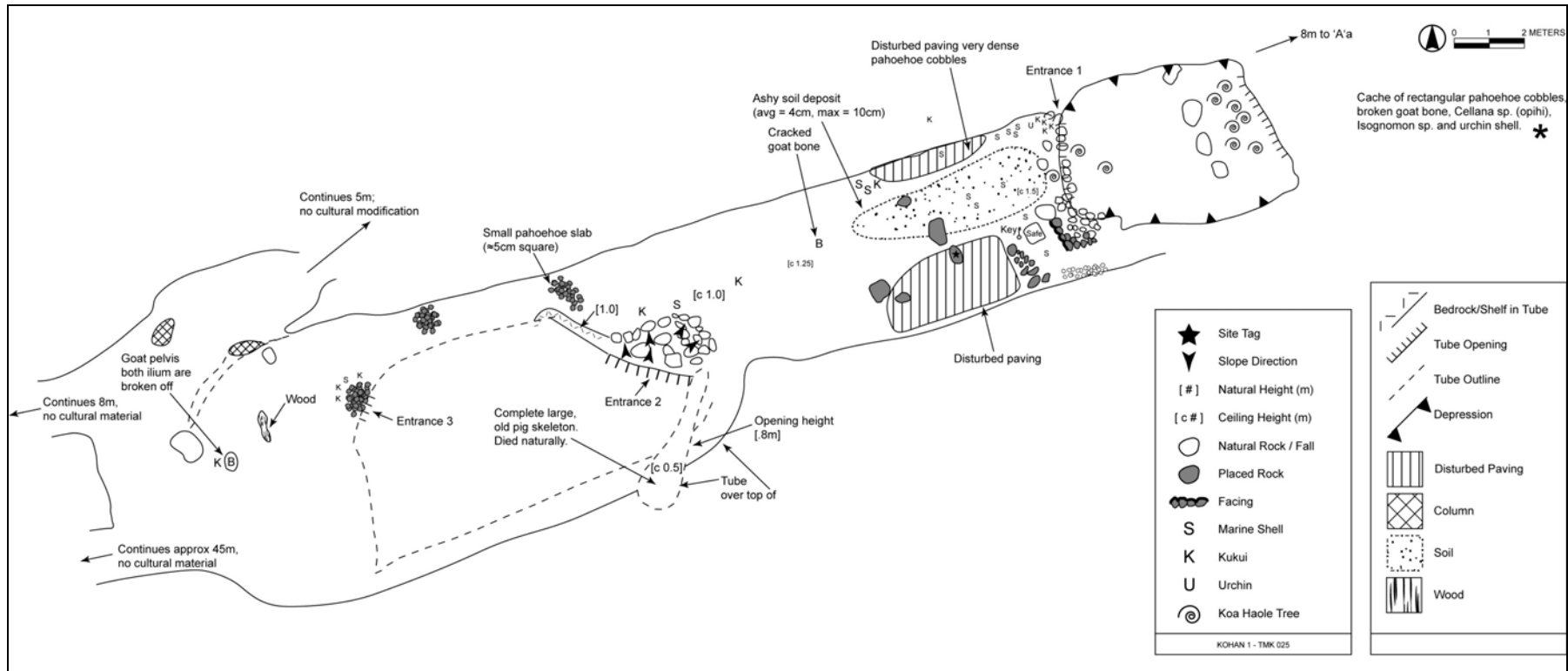


Figure 372. Site -26373, plan view

4.3.102 State Site # 50-10-27-26374

SIHP #	50-10-27-26374
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7 m diameter (23 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	510 ft a.m.s.l.

DESCRIPTION: Site -27-26374 is a large sink (7 m / 23 ft. diameter) exposing an east/west trending lava tube (Figure 373 and Figure 374). It is located in a shallow broad depression, filled with head high *koa haole*. Visibility of this cave from the surrounding terrain is very poor and visibility of the surrounding terrain from the site surface is also very poor.

The sink is characterized by a natural ramp created by collapse on the south side of the sink. This ramp appears modified, although the modification is only visible in the slope into the sink. The cave's interior is structurally minimally modified. The area along the tube's north wall, where light from the sink shines, has been cleared of some roof fall. This area also contains the least amount of collapse (as much as 95% of the original tube ceiling is intact), so minimal clearing would have been needed to make this area habitable. A high concentration of angular small cobble, suggesting paving to level a potentially uneven floor, is present in this same area along the tube north wall.

All soil deposits in the cave are slightly gray and ashy. They range in depth from 5 to 12 cm (2 to 4.7 inches). The soil deposits contain a high concentration of marine shell midden including urchin, cowry, *Nerita*, *Isognomon*, and *kukui*. Isolated high densities of broken *kukui* scatters, and a number of isolated and currently unidentified large fish and seabird bones, were found outside of the soil deposits closer to the edges of the caves.

The sink creates a low, approximately 1.0 m (3.3 ft.) high, dome sloping to the west. At the back of this dome is a collapse that has an approximately 2 m (6.6 ft.) wide opening. On the other side of the opening is a large chamber with central collapse and some midden and *kukui*. This chamber is part of -26310, Feature C. The boundary between -26310 and -26374 is this narrow passage between the west tube of -26374 and the chamber of -26310.

The site's east tube splits at 18 m (59.1 ft.). The north side of the tube has extensive collapse at 10 m (32.8 ft.) with additional extensive collapse at 15 m (49.2 ft.). No material culture or modifications were observed. The last collapse encountered was not passed due to the high possibility of entrapment. However, it was possible to view beyond the collapse and no cultural material was present. The south side ends at 30 m (98.4 ft.) due to extensive collapse, and is completely impassable. One larger (5 cm / 0.16 ft.) *kukui* fragment and one marine shell (2.5 cm / 0.08 ft.) fragment was seen near the back that was likely present due to rodent activity.

The site's function is interpreted as temporary habitation. Although the lava tube contains modifications, a larger floor area or more intensive modification such as slab pavements or well made hearths are not present and indicate this was not a permanent habitation. The floor of the tube outside of the soil deposit area is steep and the collapsed areas shift easily. The site would have been difficult to find from the exterior although it is easily accessible from another nearby

tube temporary habitation, site -26310; the tubes connect and are likely closely related in function and age. Site -27-26374 is relatively close to a 10 m (32.8 ft.) 'a'ā tongue that extends west from where the site may be more visible than anywhere else in the area.



Figure 373. Site -26374, overview of cave entrance, view to northwest

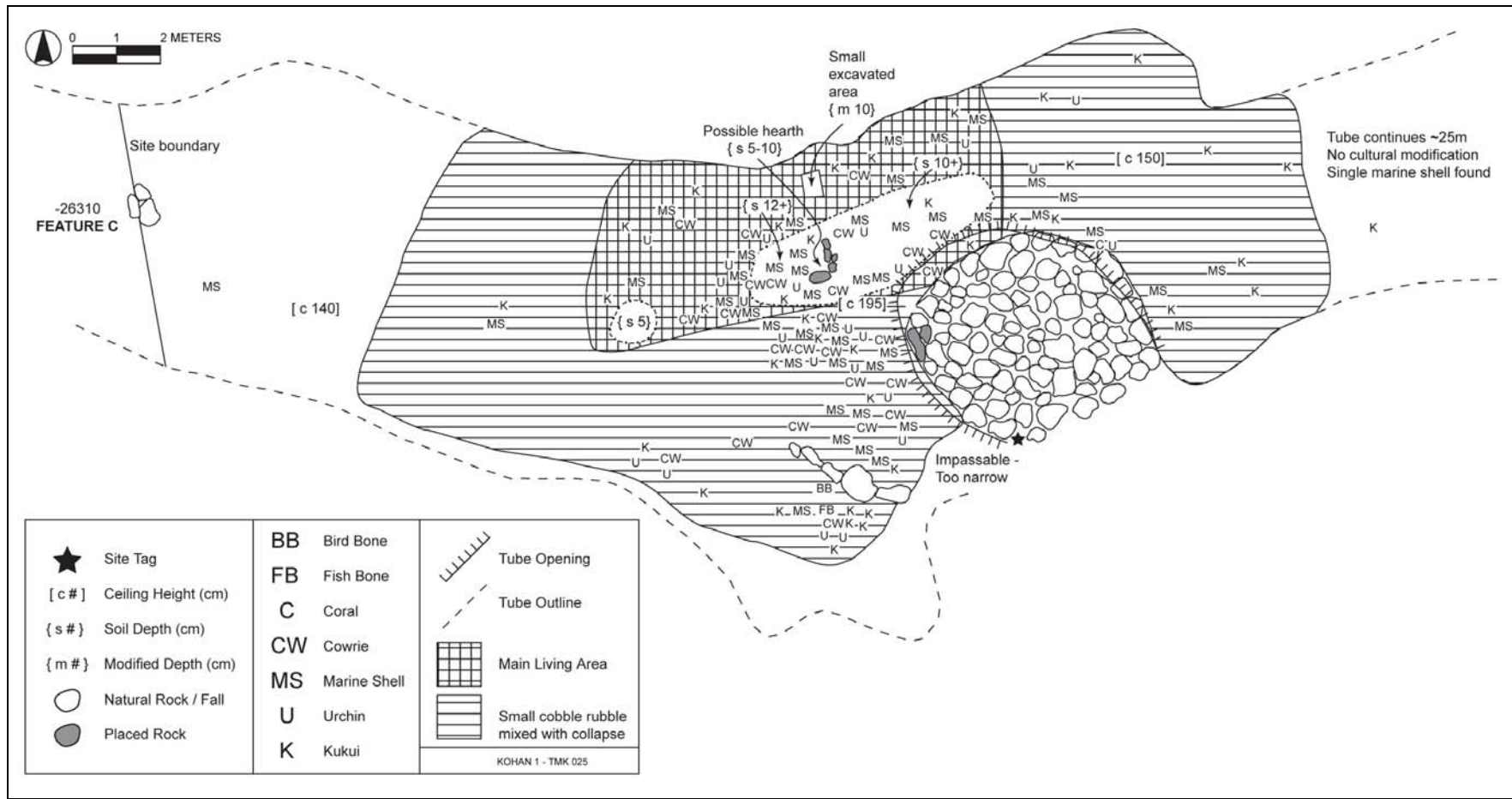


Figure 374. Site -26374, plan view

4.3.103 State Site # 50-10-27-26375

SIHP #	50-10-27-26375
FUNCTION:	Quarry
SITE TYPE:	Modified outcrop
TOTAL FEATURES:	2
DIMENSIONS:	23 m by 3.5 m (75.5 ft by 11.5 ft)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	515 ft a.m.s.l.

DESCRIPTION: Site -26375 is complex containing two modified outcrops within an undulating *pāhoehoe* flow. Feature A is a quarry and Feature B's function is indeterminate. The 15 m area between the two features contains dense *koa haole* and various grasses.

Feature A consists of a modified crevice that is approximately 7.5 m long and 2 m wide (24.6 ft. long and 6.6 ft. wide) (Figure 375). Modification consists of several *pāhoehoe* boulders that have been removed from inside the crevice or blister and placed along the crevice edges, atop the *pāhoehoe* flow surface, thus clearing the floor of the crevice which has a 5-7 cm soil deposit layer. A single manuport is present; it is a water worn stone, measuring approximately 40 cm wide. The stone was placed on the floor at the north end of the crevice where boulders have been previously excavated. The function of this modified crevice appears to be quarry based on the removal of naturally eroding boulders from the crevice floor. Agriculture function was an alternative interpretation, however, testing (see below) indicates that is unlikely. If the remaining boulders had been removed from the crevice floor, a much larger area would have been created for agricultural purposes and have required minimal energy investment. Since the boulders were not all removed, quarry is the likely function rather than agriculture.

Feature B is a filled crevice in the top of a tumulus measuring 4.3 m by 1 m (Figure 376). The northeast end of the crevice has been filled primarily with small *pāhoehoe* cobbles. The fill material in this portion of the crevice is very well sorted and the surface is flat and level, although not flush with the tumulus surface. The middle section of the crevice is comprised of a diffuse mix of natural and placed fill. The southwest portion of the crevice fill is all natural. Both the center and southwest sections of the crevice are not particularly level and have a rather lumpy surface. This filled crevice is not flush with the tumulus surface, and is too small to be a habitation site, and is too small to be a likely agricultural site. Therefore, the only likely remaining function for this filled crevice is a possible burial.

A site tag (TF-158) was found at the north end of the Feature B. Cobb et al. (2003:n.p.) describe the site as as a “sealed cave with small entrance droppng straight down, sealed with cobbles” and had the potential to contain a burial. A subsurface burial check was conducted (see below) and no burial was present.

The site's function is interpreted as a complex with a quarry activity area and a filled crevice whose function is indeterminate. The interpretations are based on preliminary assessment and excavation results.

4.3.103.1.1.1 Testing Results

Excavation of **Feature A** was conducted to aid in determining the feature's function (Figure 375 and Figure 377). A single stratum of silty sediment was excavated to *pāhoehoe* bedrock, 7

cmbs. The test unit was in the north portion of the crevice, next to and slightly beneath the manuport. All sediment was screened through 1/8 inch screen. No subsurface features or cultural materials were encountered. Excavation has not significantly enhanced or altered interpretation of the function.

Excavation of **Feature B** was conducted to determine whether a burial was present (Figure 376, Figure 378 and Figure 379). The eastern portion of the filled crevice was tested since it appears to have been placed or stacked. Most of the small cobble fill on the east side of the crevice is naturally eroding. Although three pieces of *kukui* were found at approximately 20 cmbs, they are interpreted as natural rather than cultural material. A single stratum of *pāhoehoe* cobbles was excavated to *pāhoehoe* bedrock, 27 cmbs. No cultural material was encountered and the cobbles removed from the test unit appear to be naturally eroding. A burial is not present, however, the excavation has not aided in providing an interpretation of the feature's function.

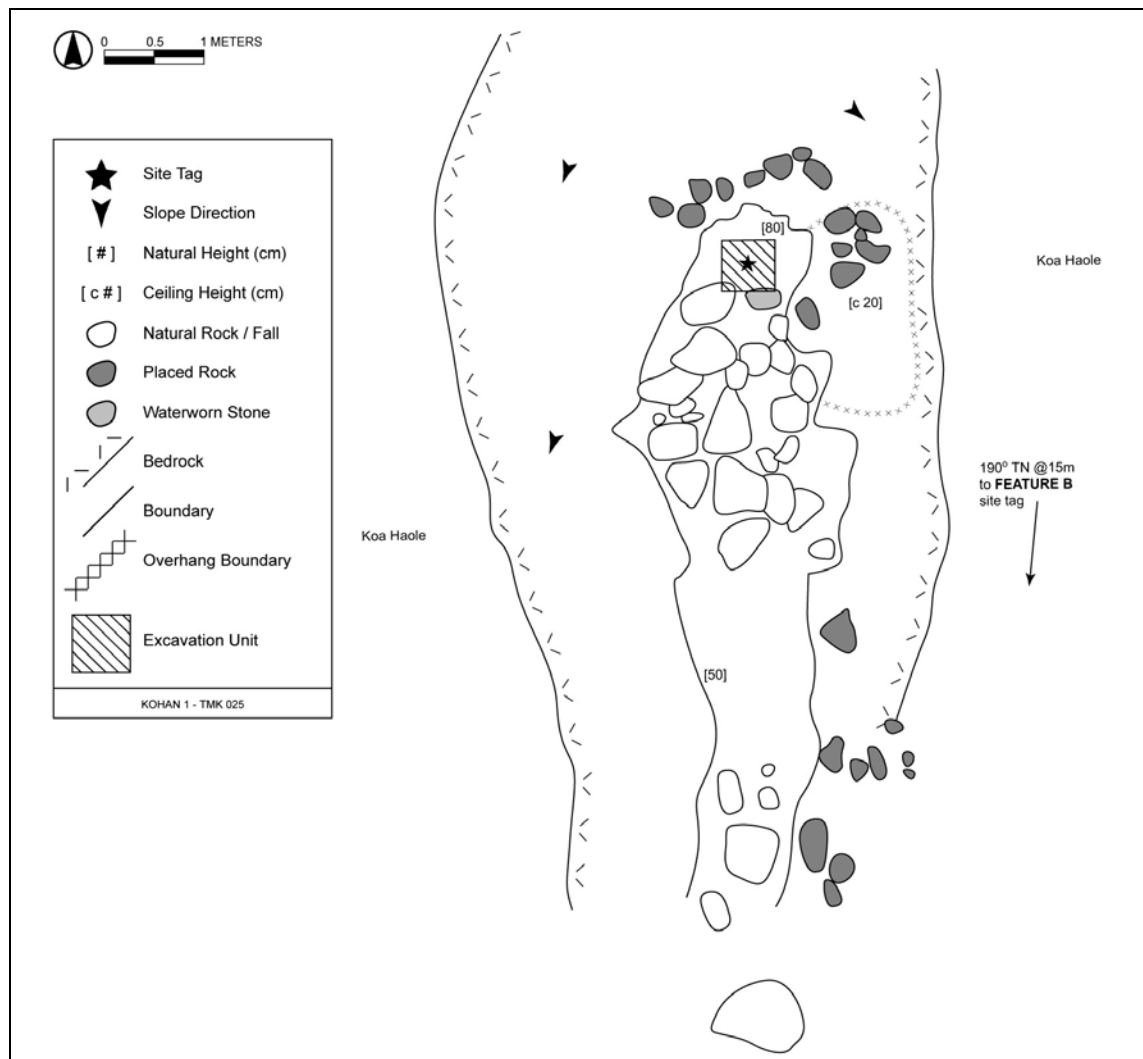


Figure 375. Site -26375, Feature A, plan view

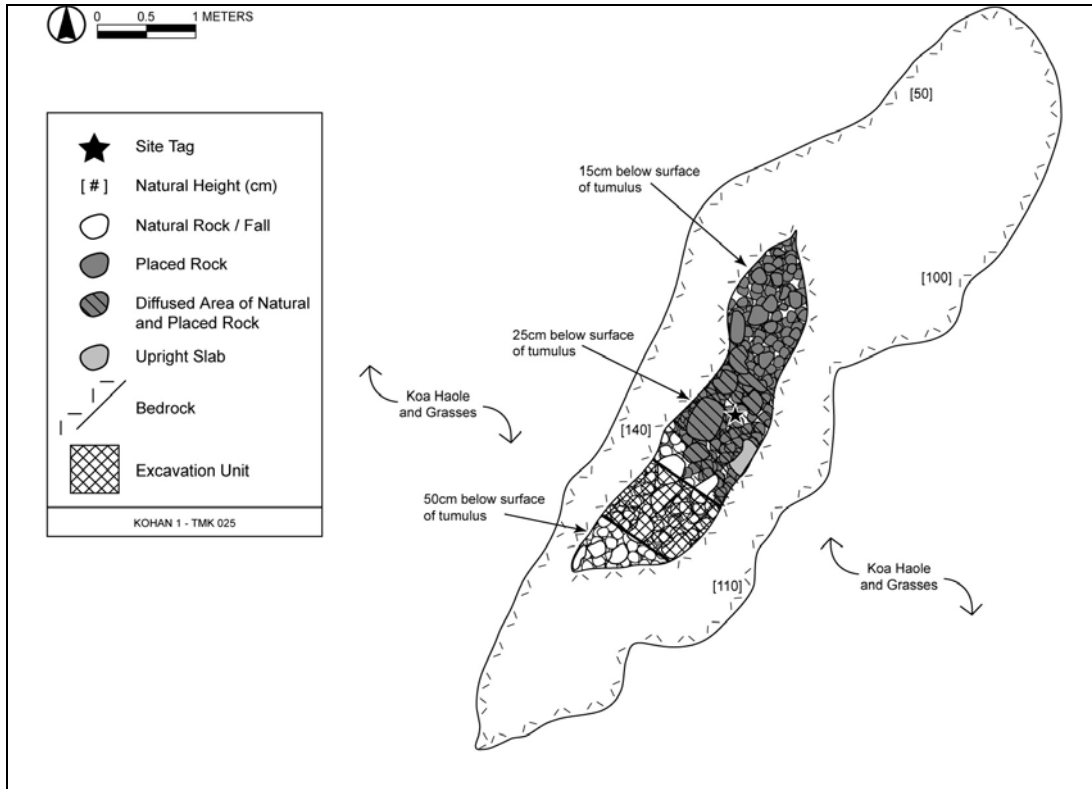


Figure 376. Site -26375, Feature B, plan view



Figure 377. Site -26375, Feature A, pre-excitation (left) and post-excitation (right), view to east

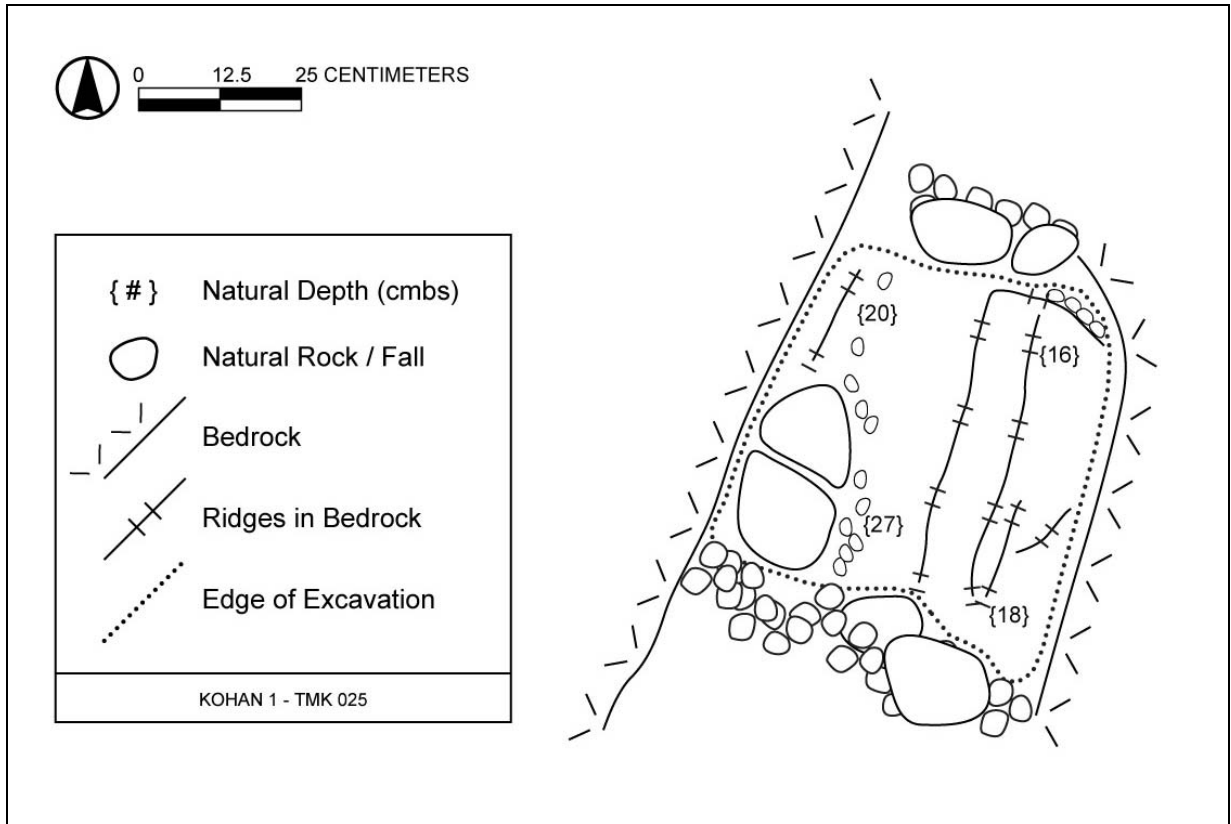


Figure 378. Site -26375, Feature B, excavation plan view



Figure 379. Site -26375, Feature B, pre-excavation (left) and post-excavation (right), view to south

4.3.104 State Site # 50-10-27-26376

SIHP #	50-10-27-26376
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	2
DIMENSIONS:	4 m by 3 m (13.1 ft. by 9.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	515 ft a.m.s.l.

DESCRIPTION: Site -26376 consists of two enclosures, Feature A and Feature B. The site is within moderately undulating *pāhoehoe* and vegetation consists of *koa haole* and grasses. Site -26372, Feature B, *pāhoehoe* slab trail, is located 45 m (147.6 ft.) south.

Feature A is an enclosure/modified tumulus (Figure 380 and Figure 382) . A wall constructed of stacked/piled *pāhoehoe* cobbles, 30 cm (0.98 ft.) high, surrounds the east side of the enclosure and forms a semi-circle. The west side of the enclosure remains open. The enclosure surrounds a naturally level, 20 cm (0.66 ft.) deep depression in the bedrock. No cultural materials are present.

Feature B is an enclosure-like structure that utilizes a sloping *pāhoehoe* formation as the north side of the enclosure and *pāhoehoe* slabs and cobbles to build up and slightly level the remaining circular surface (Figure 381 and Figure 383). A large water worn cobble measuring approximately 30 cm (0.98 ft.) in diameter and 15 cm (0.49 ft.) in thickness is located at the east end of the enclosure.

The site's function is interpreted as habitation. Feature B, enclosure, also helps to support this theory. No artifacts or midden were located at Feature A however, a large water worn stone was located at Feature B. Feature B's structure was most likely used for habitation based on size and design of the enclosure. Excavation potential of this site is poor due to lack of soil.

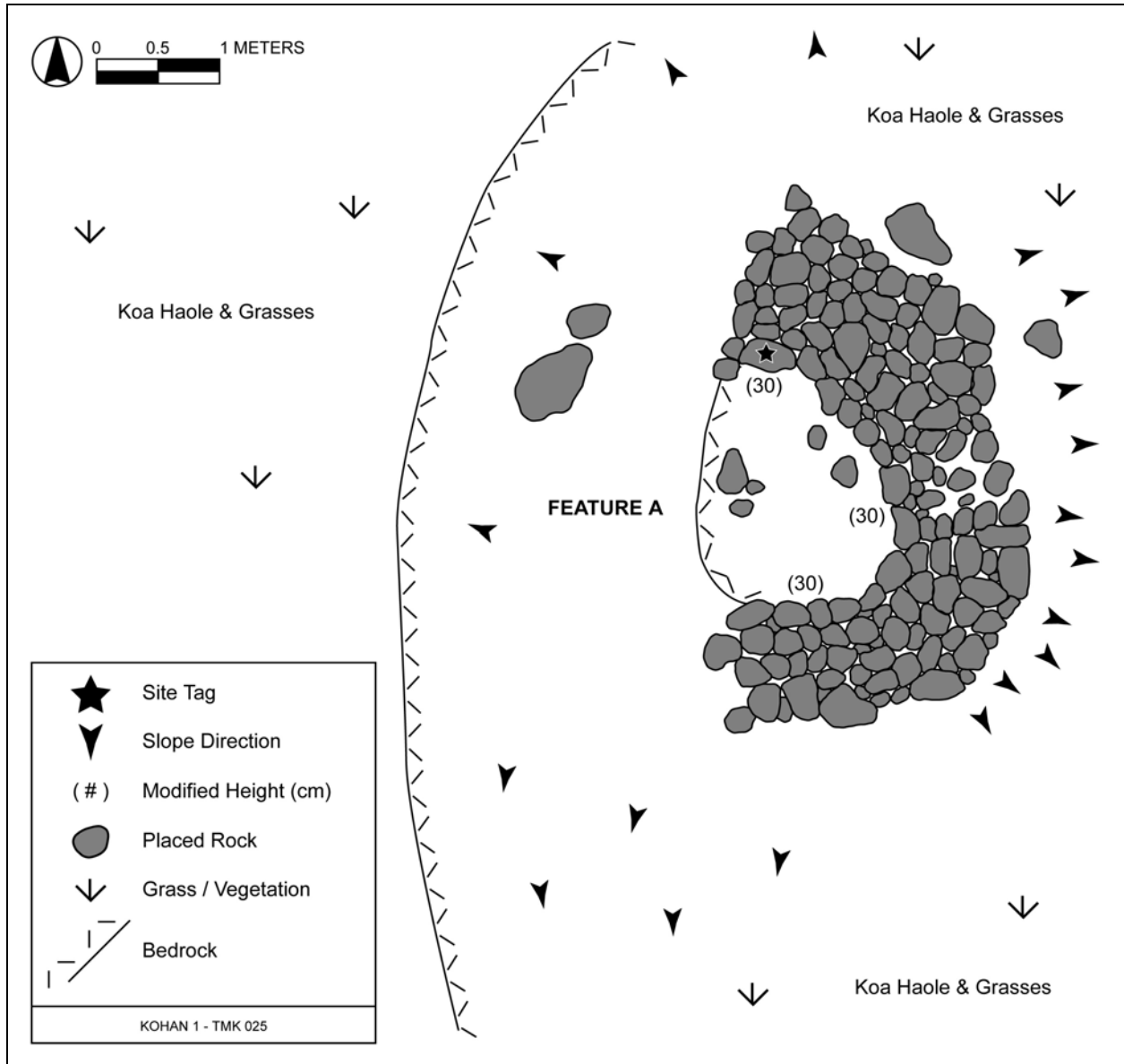


Figure 380. Site -26376, Feature A plan view



Figure 381. Site -26376, Feature B plan view



Figure 382. Site -26376, Feature A, enclosure, view to east



Figure 383. Site -26376, Feature B, enclosure, view to southwest

4.3.105 State Site # 50-10-27-26377

SIHP #	50-10-27-26377
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	28 m by 4 m (91.9 ft. by 13.1 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26377 is a lava tube (Figure 384 and Figure 385). The tube is accessed through an opening in the surface followed by a downward sloping entrance tube filled with natural collapse. A few *kukui* are located on a natural shelf in the tube wall within this initial entrance tube. Two tubes run behind and under the entrance tube at the floor of the tube. Neither of these tubes is connected to the entrance tube. Both tubes are quite shallow, contain only a few pieces of midden including *kukui* and urchin just beyond their entrances, and run for a short distance, approximately 6 m (19.7 ft.) north. Heading south from the base of the entrance tube, the tube continues south for approximately 20 m (65.6 ft.). After 8 m (26.3 ft.) the tube splits in two and the tubes run parallel to each other. A few pieces of midden were found in these split tubes, otherwise, no modifications or other cultural materials were present. The majority of the midden, predominantly *kukui* with only a couple of pieces of marine shell, is located at the base of the entrance tube. Some modification is present; a few placed cobbles and small boulders are on the main tube floor, and four upright pieces of collapse, that are somewhat poorly faced, are present. A rounded stone manuport is on top of a piece of collapse. The stone is not water worn but rounded; it does not appear to have been worked and it is not naturally from this cave.

The site's function is interpreted as a temporary shelter based on several factors. The midden present is predominantly *kukui* and is not varied or extensive enough to be considered a habitation site. The slight modification in the form of placed boulders and cobbles is also not intensive enough to be indicative of a habitation site.



Figure 384. Site -26377, view to south

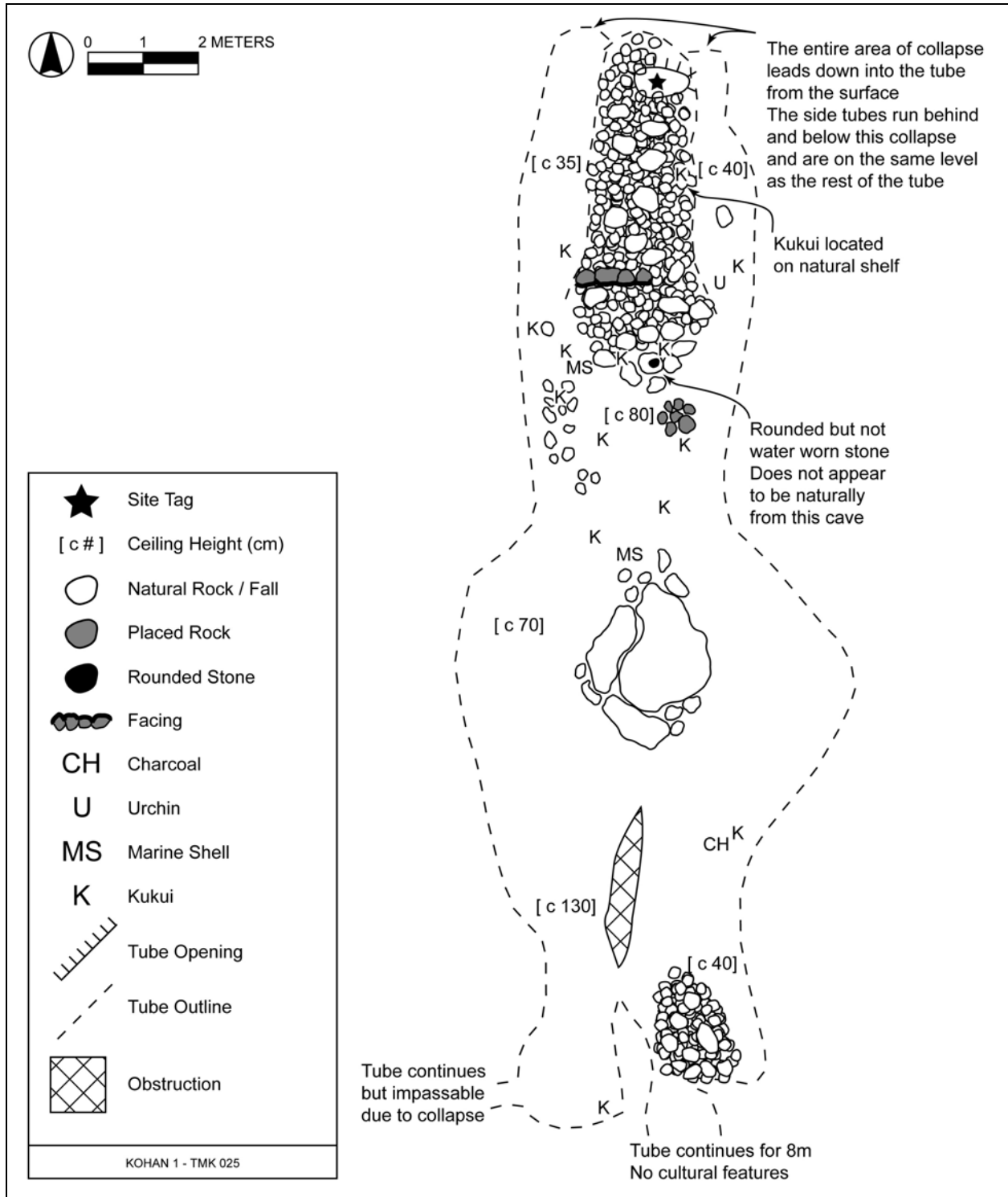


Figure 385. Site -26377, plan view

4.3.106 State Site # 50-10-27-26378

SIHP #	50-10-27-26378
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	4 m by 5 m (13.1 ft. by 16.3 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26378 is a lava tube measuring 4 m (13.1 ft.) northeast/southwest by 5 m (16.3 ft.) northwest/southeast with ceiling heights ranging from 100 to 120 cm (3.3 to 3.9 ft.) (Figure 386 and Figure 387). The tube opening is located at the northeast end of a *pāhoehoe* outcrop. A second opening is located 10 m (32.8 ft.) to the southwest, however, it appears to be the result of recent bulldozer activity and no cultural modification or material is associated with it. Inside and just beyond the northeast tube opening, the tube opens into a small chamber with an average ceiling height of 110 cm (3.6 ft.). Approximately 50 marine shell pieces and 3 *kukui* pieces were located near the tube entrance. No other cultural materials or modifications were observed. The tube continues 20 m (65.6 ft.) to the southwest and 10 m (32.8 ft.) to the northeast, however, both tubes become impassable due to low ceiling heights. The surface of -26378 has been extensively bulldozed; damage to the northeast tube opening consists of fall. A bulldozer road runs north/south at the west end of the tube opening. Excavation potential is fair due to a 4 cm (0.13 ft.) soil deposit at the tube entrance.

The site's function is interpreted as shelter based on the small quantity of midden and lack of cultural modification.



Figure 386. Site -26378, tube opening, view to northeast

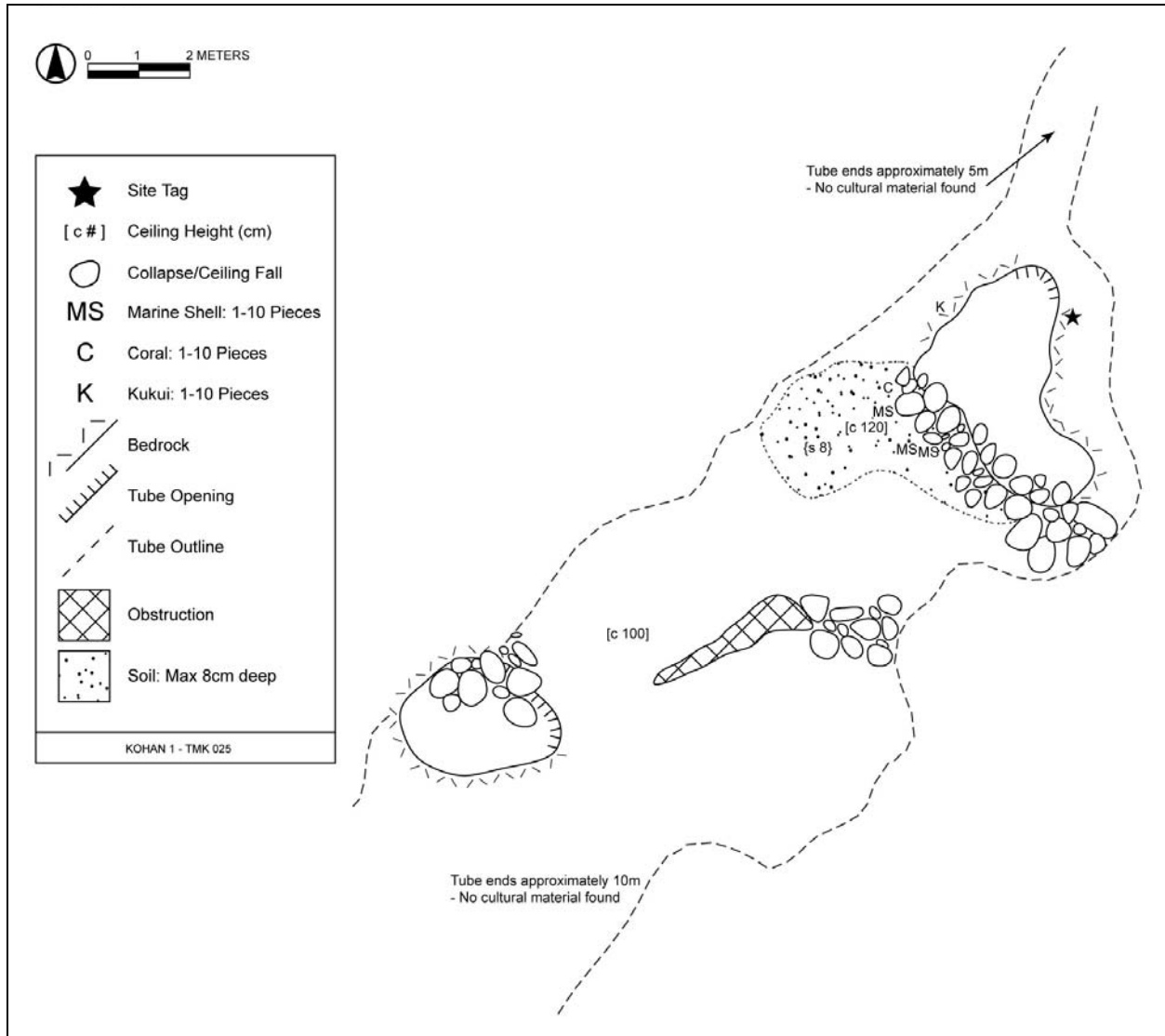


Figure 387. Site -26378, plan view

4.3.107 State Site # 50-10-27-26379

SIHP #	50-10-27-26379
FUNCTION:	Complex
SITE TYPE:	Habitation/Agriculture
TOTAL FEATURES:	3
DIMENSIONS:	11 m by 22 m (36 ft. by 72 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	495 ft a.m.s.l.

DESCRIPTION: Site -26379 is a large depression that contains three features (Figure 388). Feature A is a lava tube habitation with extensive modifications at its entrance that include a platform and leveling. The tube also contains hundreds of marine shell pieces, urchin, *kukui* and several coconut pieces. Feature B is a modified depression that contains an enclosure; it appears to be associated with Feature A and is likely an agricultural modification. Feature C is a lava tube shelter with several marine shell pieces, *kukui*, and a volcanic glass flake.

Feature A is a lava tube measuring 9 m (29.5 ft.) east/west by 6 m (19.7 ft.) north/south with ceiling heights ranging 180 to 220 (5.9 to 7.2 ft.) (Figure 388 and Figure 390). The tube entrance is located at the west end of the large depression. The entrance, measuring 8 m (26.3 ft.) wide and 2 m (6.6 ft.) in height, has been extensively modified. The area in front of the tube entrance, measuring 6 by 3 m (19.7 by 9.8 ft.), has been leveled. Inside the tube, the leveled area is evident. A 30 cm (0.98 ft.) faced wall lines the tube opening / drip line. On the south end of the opening a 2 by 1.5 m (6.6 by 4.9 ft.) raised platform joins the leveled opening and naturally raised lip (measuring 80 cm / 2.6 ft.) on the south side of the tube. Midden scatters are found throughout the tube. Hundreds of marine shell pieces, including large cowry, are present; hundreds of urchin shell pieces, spines and mouth parts are also widely scattered. *Kukui* is also scattered throughout the tube, however, two *kukui* clusters (one in the middle and one in the rear of the tube) are quite prominent and worth noting: each cluster contains 100+ *kukui* endocarps. Four coconut shell pieces were also identified.

Feature B is an enclosure/modified depression measuring 3 m (9.8 ft.) east/west by 2 m (6.6 ft.) north/south (Figure 388 and Figure 391). The enclosure was constructed by the removal of cobbles and boulders from the center of the large depression. Cobbles are stacked 3-courses high to prevent the cobbles and boulders from falling down slope into the cleared/modified area. A 3 cm (0.1 ft.) soil deposit is currently present. No artifacts or midden were found within the enclosure.

Feature C is a lava tube (Figure 389 and Figure 392). The entrance to the tube is accessed from the large modified depression/ sink hole. Some of the boulders and large cobbles appear to have been cleared from the entrance and stacked around it, likely for easier access. Within the entrance there are also some small boulders placed in an alignment. Approximately 8 m (26.3 ft.) within the tube, there is a stacked boulder alignment that may be an attempt to separate the entrance chamber from a small crawl space that leads to another chamber. Next to this alignment, a few pieces of cowry, marine shell, and *kukui* are present. Beyond this alignment is a small crawl space that extends for approximately 2.5 m (8.2 ft.) before the tube opens up again, and continues for approximately 10 m (32.8 ft.) before it becomes impassable. The only cultural

material found in this section of the tube was a small volcanic glass flake measuring 1.5 cm (0.05 ft.) in length. While the boulder alignment could indicate that access to another chamber, possibly containing burials, has been block off, no evidence of burials was found and the only activity occurring in the tube appears to have been temporary habitation or shelter.

The site's function is interpreted as habitation complex. The large midden deposits and extensive modification within Feature A suggest it was used for an extended period. Feature B appears to have been used for agriculture based on the presence of the soil deposit; agriculture additionally supports the extended habitation function. Feature C appears to have had less intensive use and was likely used as shelter. Excavation potential of Feature A is fair due to the extensive midden scatter and Feature B's potential is fair due to a 3 cm (0.1 ft.) soil.

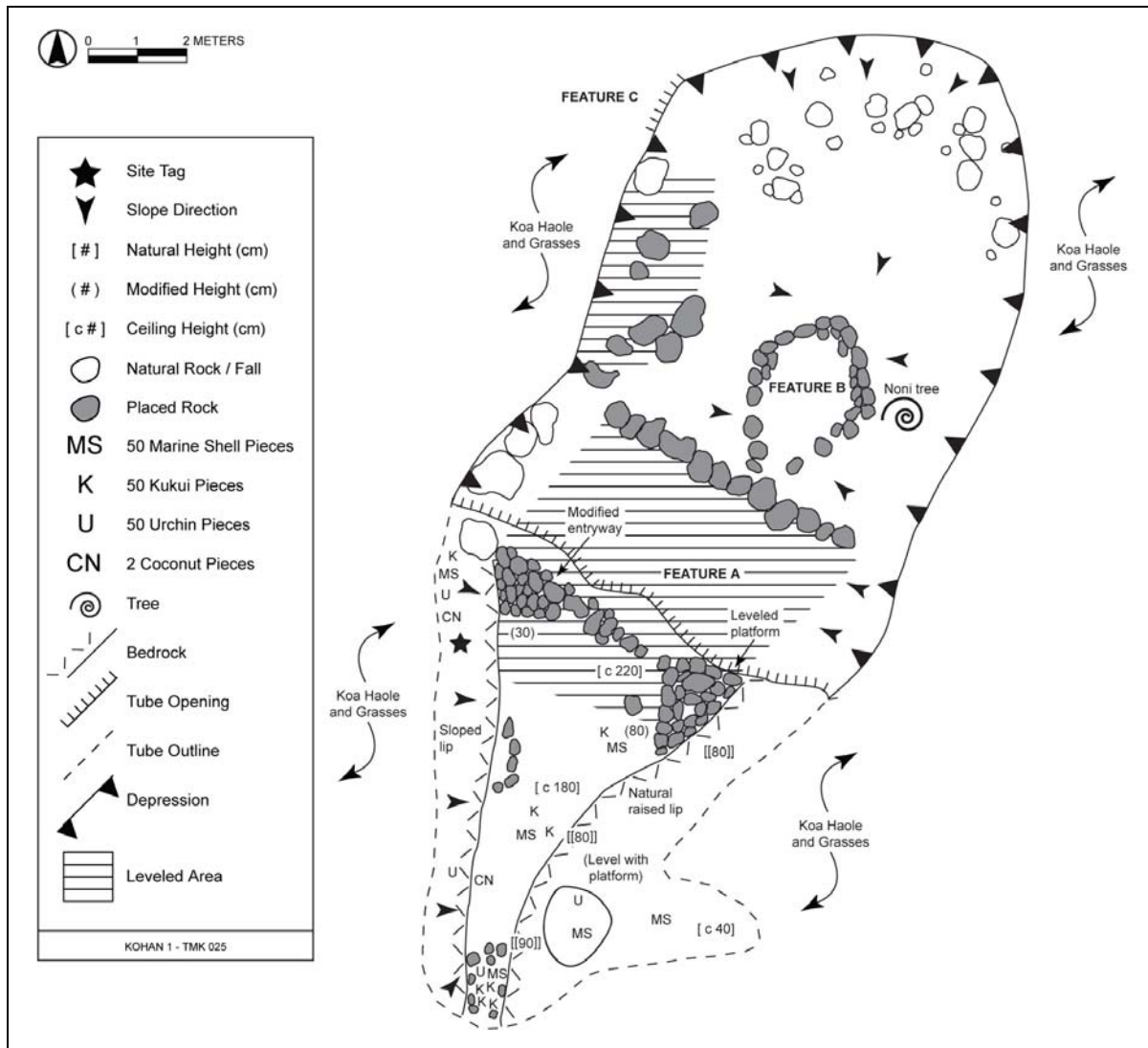


Figure 388. Site -26379, plan view, Features A, B and C

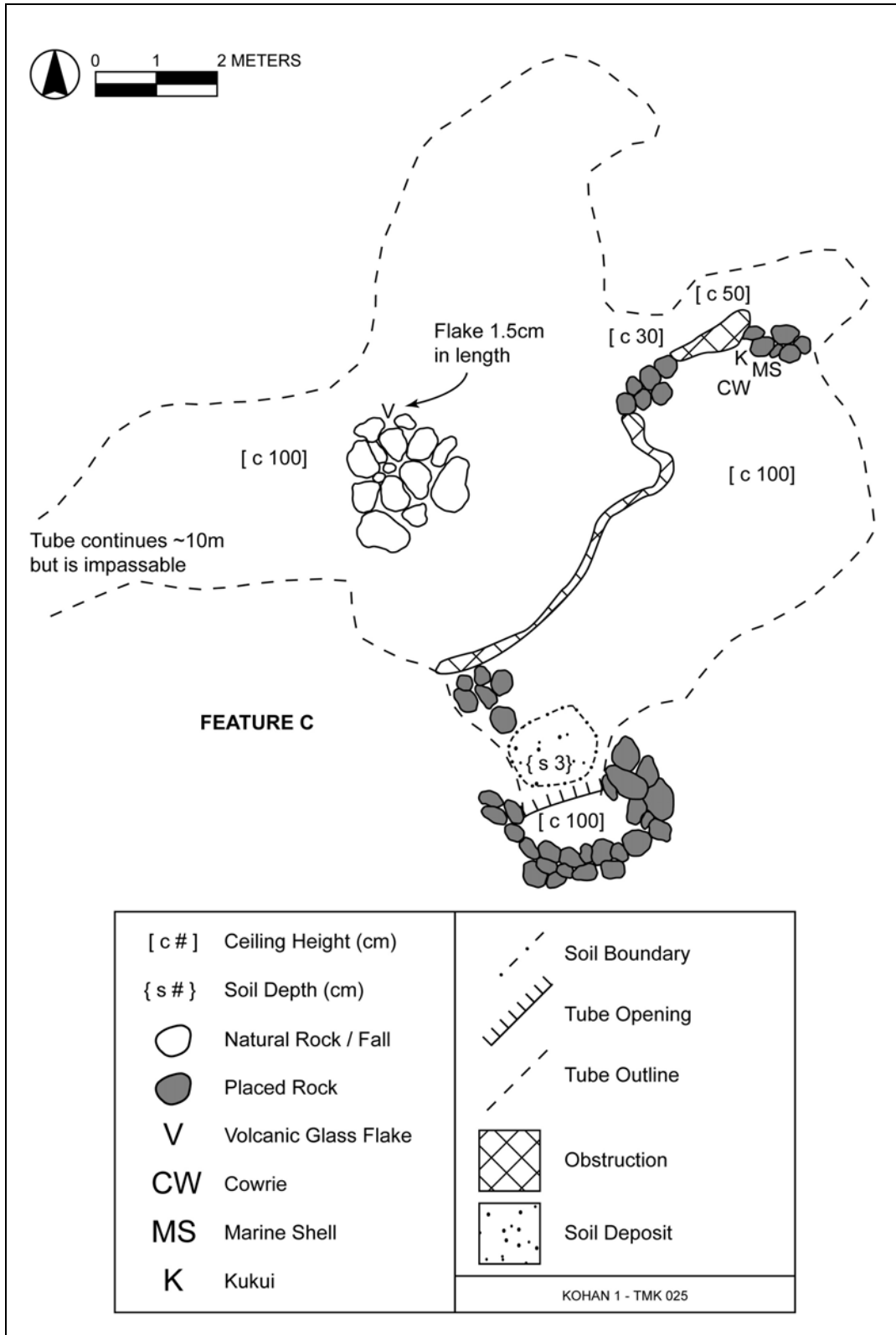


Figure 389. Site -26379, Feature C



Figure 390. Site -26379, Feature A, showing modified entrance and platform, view to southeast



Figure 391. Site -26379, Feature B, showing modified depression, view to east

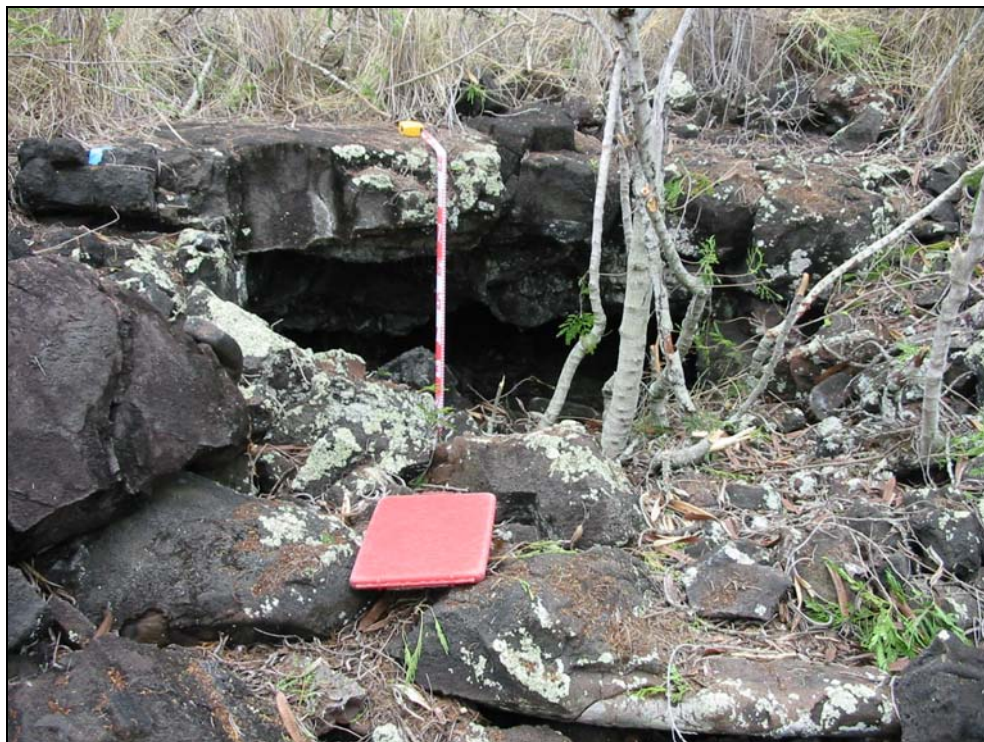


Figure 392. Site -26379, Feature C, lava tube entrance, view to north

4.3.108 State Site # 50-10-27-26380

SIHP #	50-10-27-26380
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	116 m by 3-5 m (380.6 ft. by 9.8-16.3 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	490 ft a.m.s.l.

DESCRIPTION: Site -26380 is a lava tube (Figure 393) measuring 116 m (380.6 ft.) east/west by 3-5 m (9.8-16.3 ft.) north/south and ceiling heights ranging 90-250 cm (3-8.2 ft.). The entrance to the tube is located at the west end of a 2 m (6.6 ft.) deep depression, approximately 13 m (42.7 ft.) long. The first large chamber is located just beyond the opening and measures 6 by 4 m (19.7 by 13.1 ft.). This area contains a shallow 2 cm (0.07 ft.) deep soil deposit with approximately 100 marine shell pieces and 20 *kukui* endocarps. At the end of this chamber to the northwest is a small alignment of four *pāhoehoe* cobbles and another large chamber measuring 7 by 4 m (23 by 13.1 ft.) with a 2 by 2 m (6.6 by 6.6 ft.) skylight in the ceiling. The skylight has been filled with items including lumber, slate sloping, metal fence, full garbage bags, bottles, cans and cardboard. It is unknown if an additional tube extends beyond this chamber due to the large garbage pile. The tube continues from the first main chamber to the southwest as it proceeds down slope through a 5 by 2 m (16.4 by 6.6 ft.) section of tube. This area contains more than 250 marine shell pieces, 20 *kukui* pieces, 20 urchin pieces and a piece of coconut. Another large chamber opens beyond this area, measuring 18 by 7 m (59.1 by 23 ft.). It contains more than 200 marine shell pieces, 20 *kukui* pieces and 20 urchin pieces. The tube continues to the southwest to the right of a large ceiling fall. Several *kukui* and urchin shell pieces were found. Another large chamber measuring 10 by 6 m (32.8 by 19.7 ft.) with a ceiling height of 240 cm (7.9 ft.) was found after entering a small 80 cm (2.6 ft.) by 4 m (13.1 ft.) extension of the tube. Approximately 50 marine shell pieces are in the large chamber; it also contains extensive water collection modifications. Two areas contain the most modifications. One water collection area is leveled with *pāhoehoe* slabs on the left side of the tube; four bamboo pieces were found. The second area is a low, two-stepped platform located just beyond the leveled area. Each step measures 1.4 by 1.4 m (4.6 by 4.6 ft.).

The level water collection area is a narrow strip of *pāhoehoe* slab pavement that runs between natural, uneven rises in the tube floor. The spaces between the slabs are filled in with small *pāhoehoe* and 'a'ā cobbles that create a level, smooth surface.

The stepped platform is small; each step is approximately 20 cm high. Construction is formal and both tiers are faced on all three sides. The exterior faces are constructed of large (35 cm wide on average) *pāhoehoe* boulders and filled with small 'a'ā cobbles with a few smaller (30 cm wide) *pāhoehoe* slabs inlaid. The three slabs in the upper tier are set flush with the 'a'ā cobbles. The lower tier has a circular arrangement of approximately five small slabs that are partially inlaid but sit slightly above the 'a'ā cobbles. The northwest side of the upper tier abuts a naturally vertical portion of the tube floor that looks like an uprighted *pāhoehoe* slab. Behind

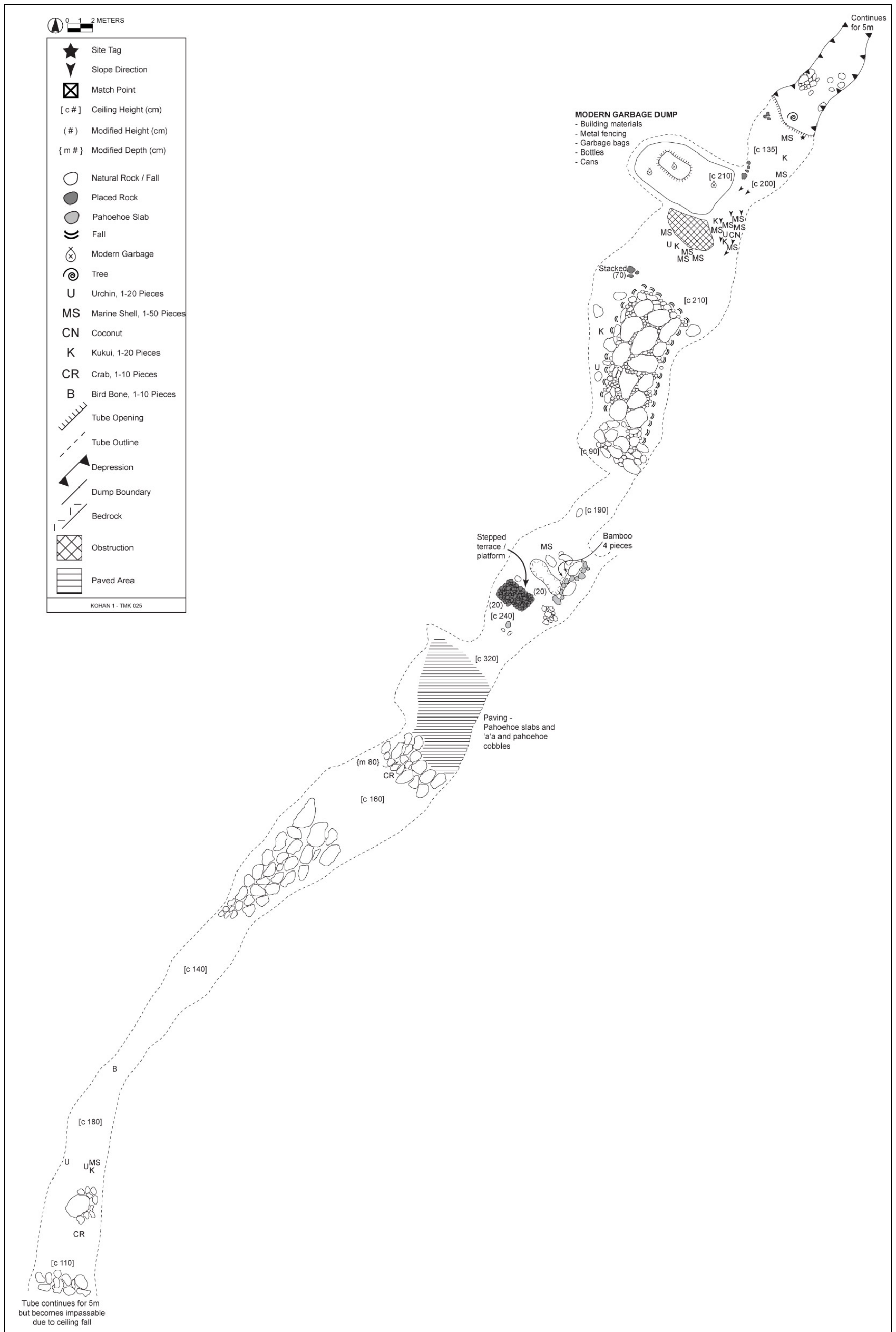


Figure 393. Site 26380, overview

(northwest) of this piece of vertical floor is a natural niche with a naturally smooth *pāhoehoe* floor.

A few meters beyond the stepped terrace/platform, the lava tube widens to a chamber measuring approximately 7 m by 7 m (23 ft. by 23 ft.) with a maximum ceiling height of 320 cm (10.5 ft.). The chamber floor has been leveled/paved with *pāhoehoe* slabs and *pāhoehoe* and 'a'ā cobbles with the same construction style described above for the level water collection area (Figure 394). The pavement is very smooth and level; the *pāhoehoe* slabs are inlaid flush. The pavement appears to have approximately three slightly different levels, although the height difference appears to be minimal (less than 20 cm) and is likely due to the undulations in the tube floor. The pavement depth ranges between 10 to 20 cm and a few small pieces of marine shell were found on the surface.

An area of ceiling fall borders the southern end of the paved area. Within the ceiling fall there is an excavated area measuring approximately 60 cm (2 ft.) in diameter and approximately 80 cm (2.6 ft.) in depth. Some crab fragments were observed near this area of ceiling fall. The tube continues in a south/southeasterly direction for approximately 60 m (196.9 ft.) beyond the paved chamber. No other modifications were noted in the tube; some bird bone, urchin, marine shell, crab, and *kukui* were noted.

The site's function is interpreted as habitation with collect water activity areas. The stepped platform and the two pavement areas have formal construction and contain the finest work found in the project area lava tubes. The midden deposit suggests this tube was used for extended periods of time. The extensive modifications also suggest this tube was used repeatedly. The bamboo remains also substantiates this interpretation. The site may have been used as extended habitation, however, there is currently insufficient evidence to support this interpretation. It is possible and likely that such evidence is buried under the large modern garbage pile. Excavation potential of this site is fair due to a 2 cm (.07 ft.) soil deposit at the entrance.



Figure 394. Site -26380, showing paved area, view to north

4.3.109 State Site # 50-10-27-26381

SIHP #	50-10-27-26381
FUNCTION:	Permanent Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	5 m by 6 m (16.4 ft. by 19.7 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	450 ft a.m.s.l.

DESCRIPTION: Site -26381 is a large four sided enclosure; most of the southwest side is open (Figure 395 and Figure 396). The enclosure measures approximately 5 m by 6 m (16.4 ft. by 19.7 ft.) and contains some collapse that is primarily concentrated in the southwest half of the enclosure. The interior and exterior corners of both the south and west corners are faced and are still partially intact, which indicates that the southwest wall likely continued. The exterior and interior of the structure is well faced. The interior facing appears to be superior to the exterior facing since it incorporates numerous uprights in its first course. The east corner is the highest intact point; its interior is stacked approximately 4-5 courses high, including uprights. The east corner's exterior is stacked approximately 6 courses high.

The structure's exterior facing does not appear to incorporate any uprights, however, the exterior has suffered far more collapse than the interior. Both the interior and exterior corners of the structure are rounded corners rather than right angle corners. Thus, the structure is a slightly rounded-off square shape with one side partially open. The enclosure floor primarily contains cobbles with some small areas of collapse; no paving is present. There are a few thin *pāhoehoe* slabs on the floor surface that do not appear to be collapse.

The site's function is interpreted as a permanent habitation based on the enclosure's size and the extensive labor investment. The well faced exterior, and particularly the interior with its incorporation of uprights, indicates that this was likely an intensively utilized site despite the absence of any surface midden. Based on the intact nature of the site and its formal construction, preservation is recommended.



Figure 395. Site -26381 overview, view to northeast

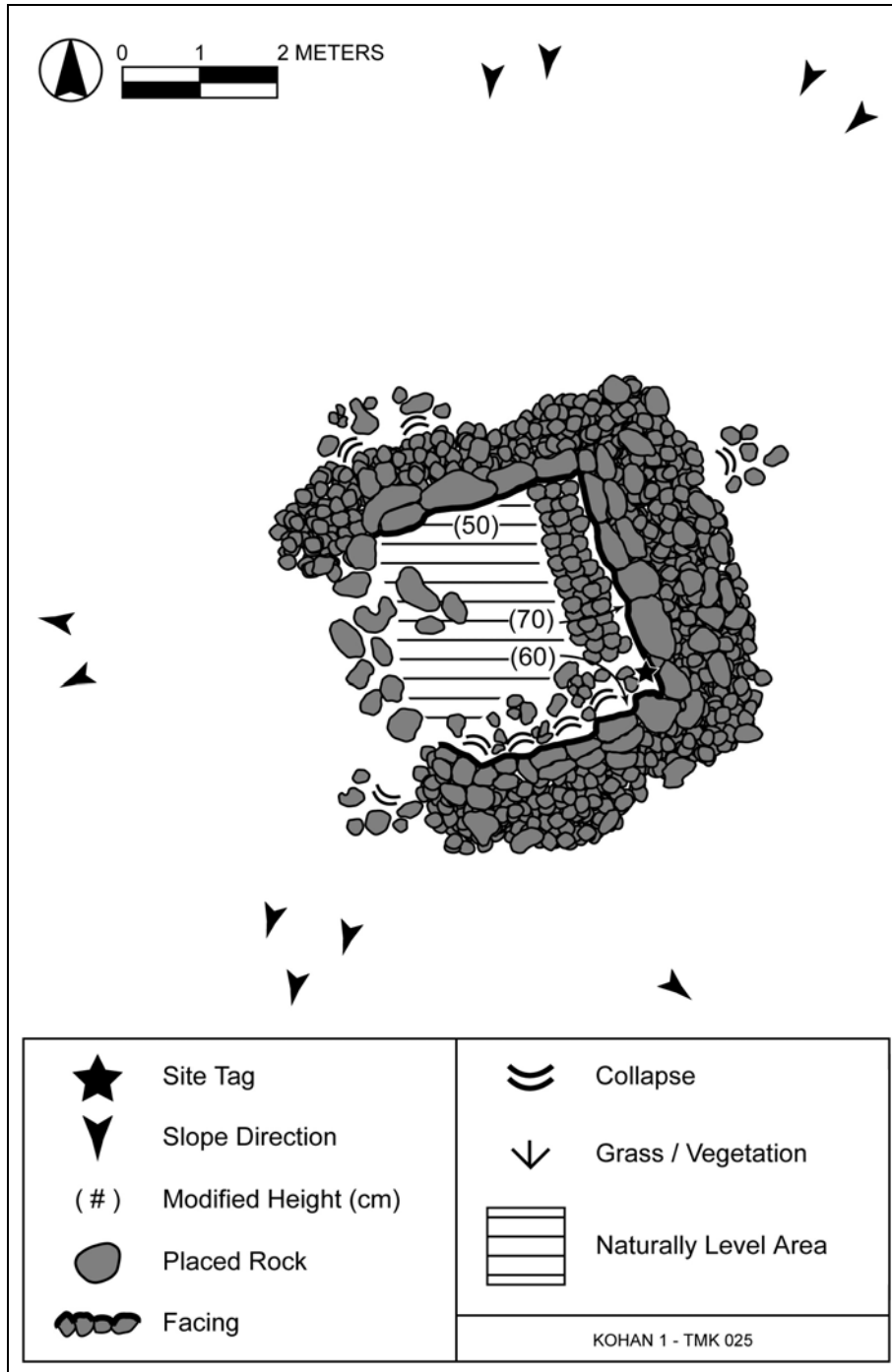


Figure 396. Site -26381 plan view

4.3.110 State Site # 50-10-27-26382

SIHP #	50-10-27-26382
FUNCTION:	Transportation
SITE TYPE:	Trail
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	18.5 m by 50 cm (60.7 ft. by 1.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	360 ft a.m.s.l.

DESCRIPTION: Site -26382 is a trail that runs more or less north/south directly across the 'a'a flow from edge to edge (Figure 397). The trail is partially marked by small *pāhoehoe* slabs. The north end of the trail is marked with four side by side slabs and some discoloration. The trail runs south for approximately 9 m (29.5 ft.) and is marked by small slabs. At that point, there is a pronounced 2 m (6.6 ft.) long section of discoloration and no slabs. The trail then continues for the remainder of its course, marked only by very slight discoloration and a narrow patch cleared of larger boulders. The trail is not very well defined.

The site's function is interpreted as transportation.



Figure 397. Site -26382, trail overview, view to south

4.3.111 State Site # 50-10-27-26383

SIHP #	50-10-27-26383
FUNCTION:	Temporary Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	2
DIMENSIONS:	12 m by 10 m (39.4 ft. by 32.8 ft.)
CONDITION:	Good/Poor
AGE:	Pre-contact
ELEVATION:	510 ft a.m.s.l.

DESCRIPTION: Site -26383 contains two modified lava blisters (Figure 398). Boulders have been removed from the interior and placed along the exterior creating two separate semi-circular enclosures. The site is located on a gentle slope of *pāhoehoe* lava. Vegetation in the site's vicinity consists of thick *koa haole* and grasses.

Feature A is located at the west end of the site (Figure 399). It is the largest of the two features measuring 8 m (26.3 ft.) north/south by 4.5 m (14.8 ft.) east/west. *Pāhoehoe*, ranging in size from large cobbles to large boulders, is piled/stacked around the exterior of the blister; the blister's interior is cleared and naturally level. At the northwest end of the enclosure, the wall extends 2.5 m (8.2 ft.) west. A 2 m (6.6 ft.) section at the west end is open and is likely the structure entry.

Feature B is located at the east end of the site (Figure 400). It measures 4 m (13.1 ft.) north/south by 3 m (9.8 ft.) east/west. Like Feature A, this lava blister has been excavated, has a clear and naturally level floor, and has piled/stacked *pāhoehoe* cobbles and boulders surrounding the exterior. The east end is open and is the likely entry.

The site's function is interpreted as temporary habitation based on the construction of the structures and close proximity (55 m / 180.5 ft. north) to site -26376 (two habitation enclosures). The naturally level interior, the stacked/piled 30 cm (0.98 ft.) high exterior, and entryway suggest this site was used likely on a temporary basis. No artifacts or midden to are present at the site. Excavation potential of this site is poor due to a lack of soil.

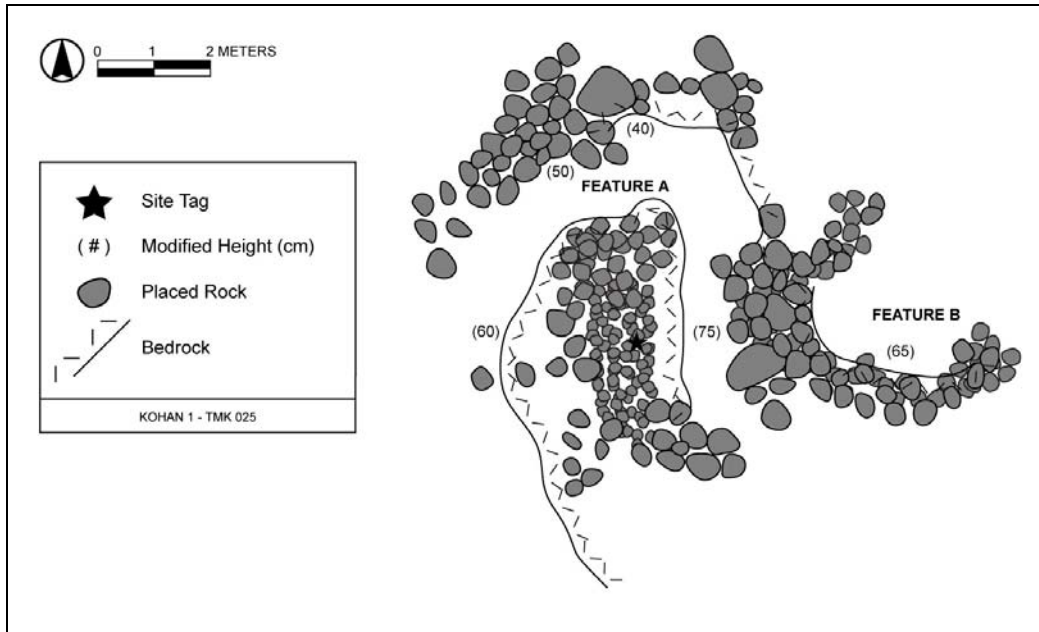


Figure 398. Site -26383, plan view



Figure 399. Site -26383, Feature A, view to east



Figure 400. Site -26383, Feature B, view to southwest

4.3.112 State Site # 50-10-27-26384

SIHP #	50-10-27-26384
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	20 m by 35 m (65.6 ft. by 114.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	490 ft a.m.s.l.

DESCRIPTION: Site -26384 is a lava tube that branches into two; one branch runs more or less north/south and a second branch runs more or less northeast/southwest (Figure 401). Very sparse scattered midden consisting of only *kukui* with a single *Nerita* shell is present. There is an area of collapse immediately inside the cave entrance (Figure 402). A piece of burned wood was found on top of a large piece of this collapse. This same area also contains a large, naturally smooth *pāhoehoe* nodule that has been cleared of collapse. In the area that is approximately 2 m (6.6 ft.) from the tube wall opposite the entrance, boulders have been piled to create a short rounded divider that may have been used to block the entrance area and the relatively flat floored niche behind the pile.

Two water catchments and a single shark's tooth were found in the tube's south branch. The top of the shark's tooth, containing the cartilage, is broken off. It is therefore not possible to determine if the broken portion was modified, although the remaining tooth was not modified.

The northeast/southwest branch has multiple water catchments, some of which are very well defined, and were constructed with small cobbles. The tube continues on to connect with a large natural lava tube that lacks cultural material or modifications and site -26342, Feature B, a temporary shelter. A small tube that connects site -26384 and site -26342, Feature B has been blocked off with stacked boulders. There is also a small constructed mound near this blocked tube; no cultural material is present.

Pieces of immature pig skull were found along the edge of some collapse in the northeast/southwest branch. No surface modification is evident around the cave, although extensive bulldozing has been conducted on the surface to the east.

The site's function is interpreted as a shelter with activity areas. The shelter interpretation is based on the small amount of scatter *kukui* midden and single *Nerita*, and the modifications of placed boulders and clearing of some areas, in particular the large smooth nodule directly inside the lava tube's entrance. The activity area interpretation relates to water collection based on the presence of multiple water catchment features.

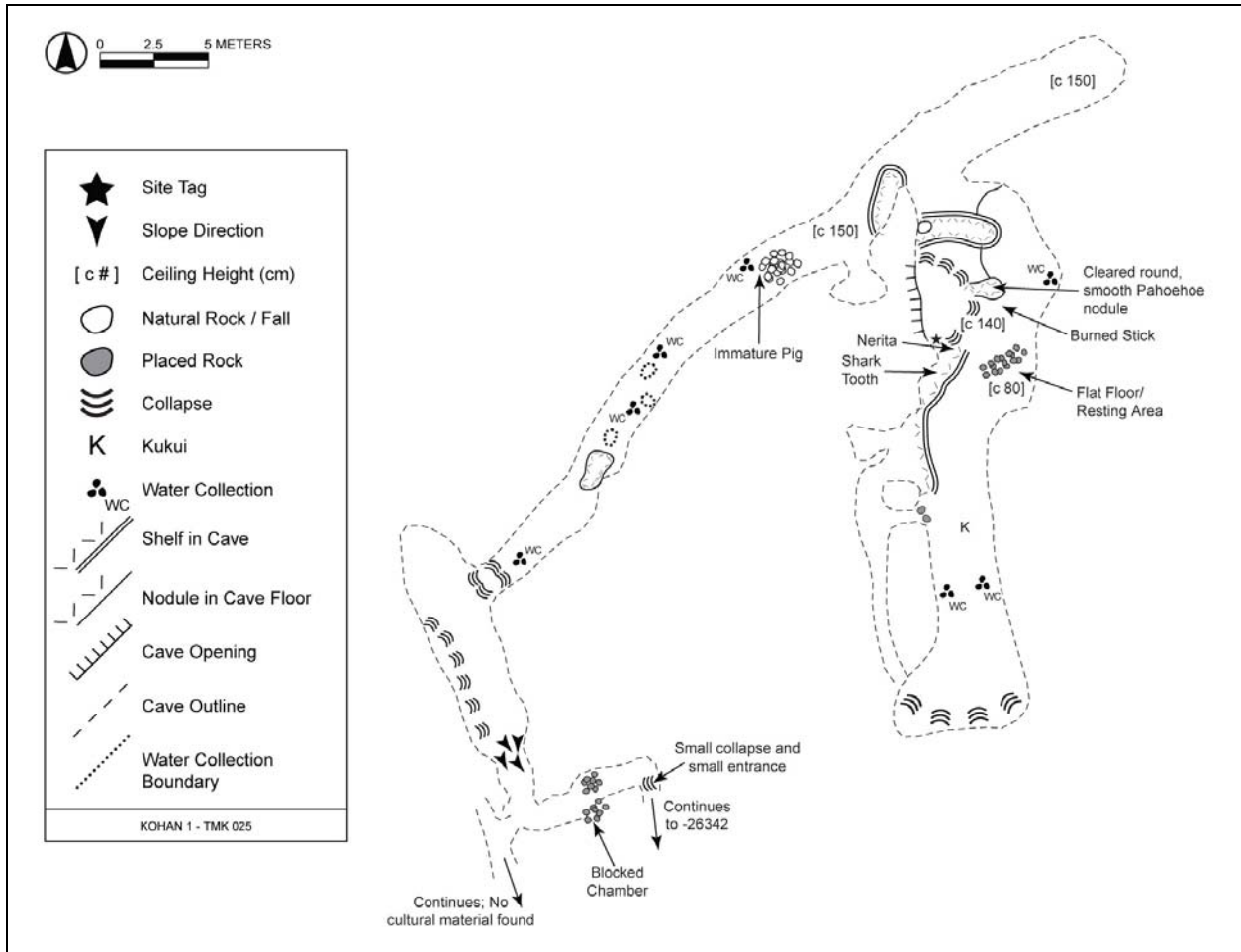


Figure 401. Site -26384, plan view



Figure 402. Site -26384, showing main entry area, view to north

4.3.113 State Site # 50-10-27-26385

SIHP #	50-10-27-26385
FUNCTION:	Temporary Habitation
SITE TYPE:	Mound
TOTAL FEATURES:	27
DIMENSIONS:	23 m by 10 m (75.5 ft. by 32.8 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	530 ft a.m.s.l.

DESCRIPTION: Site 26385 is a grouping of ephemeral modifications of bedrock surfaces and crevices on the east side of the large site complex 26315/26348 (Figure 403 and Figure 404). It is dominated by Feature A, a very level *pāhoehoe* outcropping, that is almost flush with the surrounding ground, and appears to be the site of a thatched structure. The functions of the other features are not as clear although they appear to be directly related to habitation sites and activity in the area. A description of the three largest and best defined features follows.

Feature A is a large (7 m / 23 ft. diameter) flat *pāhoehoe* bedrock exposure (Figure 405). Modification includes flattening the only large split in the *pāhoehoe*, along its southern edge, and filling a low spot on the northwest edge. Fill consisted of small boulders to small cobbles (all angular to sub-angular). Neither of the filled areas appears to be more than 30 cm (0.98 ft.) deep. The southwest and northwest modifications utilize larger stones and appear to be loose foundations for wooden posts. A slight depression in the center of the bedrock appears to have some paving with well sorted small cobbles.

Based on the exposure's flat, smooth surface and the modifications along the corners, this feature is believed to have originally supported a wooden structure. The feature is, however, much less formal than 26315 and 26348, Feature C since it is primarily natural bedrock and is less noticeable. The mounds and filled crevices are small and do not appear capable of any function except small foundations and living surface improvements.

Feature B is a small mound of large to small cobbles measuring 2.5 m (8.2 ft.) northeast/southwest by 1.5 m (4.9 ft.) northwest/southeast (Figure 406). The mound's estimated maximum height is 25 cm (0.82 ft.). Since the mound consists of relatively well sorted material and it is not deep enough to conceal a burial, this mound is a very small agricultural mound.

Feature C encompasses the handful of small mounds and mounded crevices in the vicinity. Modifications are generally informal, consisting of small boulders to medium cobbles (Figure 407). They are not large enough or well sorted enough to be agricultural, nor are they generally distinct enough to be markers of the filled crevices; none are large enough to contain burials and the modified bedrock does not appear to be suitable for a living surface.

Based on the modifications of Feature A, Feature C is a number of remnant temporary structure foundations. Very few of these subfeatures retain any geometric shape.

The site's function is interpreted as habitation and activities directly related to habitation. Feature A appears to be the site of a thatched structure. It seems likely that many of the more ephemeral mounds and filled crevices, may have been foundations for small structures or remnant foundations for structures. None of these features are large enough to contain burials,

nor large enough for agriculture. Additional evidence supporting habitation interpretation includes site 26385's proximity to sites 26315 and 26348, large habitation complexes, and multiple nearby habitation sites. Figure 403 is an overview of the site's three largest features, and Figure 404 shows the locations of the 27 features and surrounding sites.

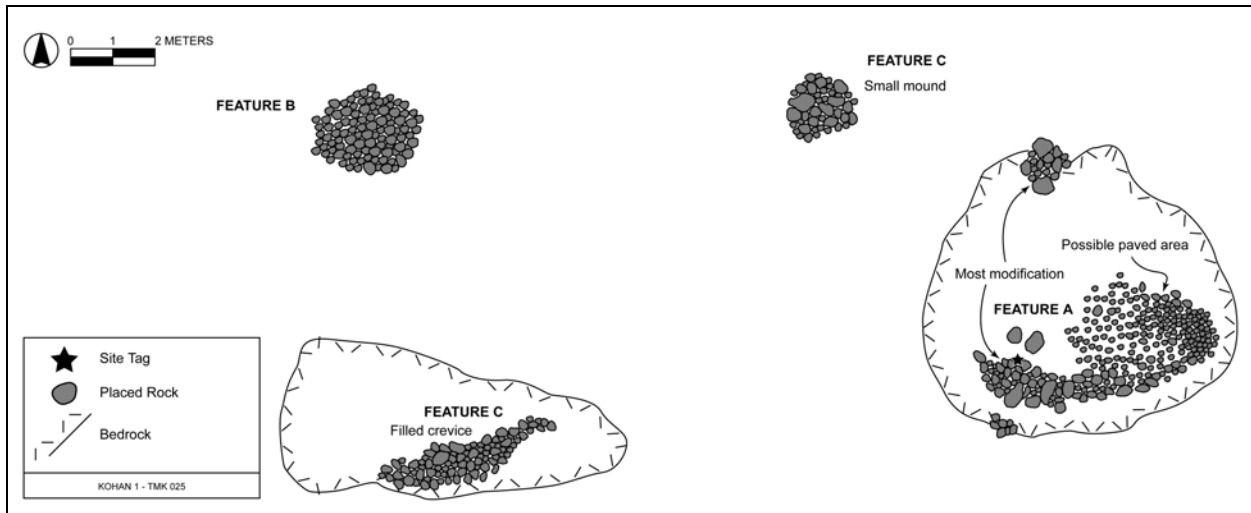


Figure 403. Site -26385 overview

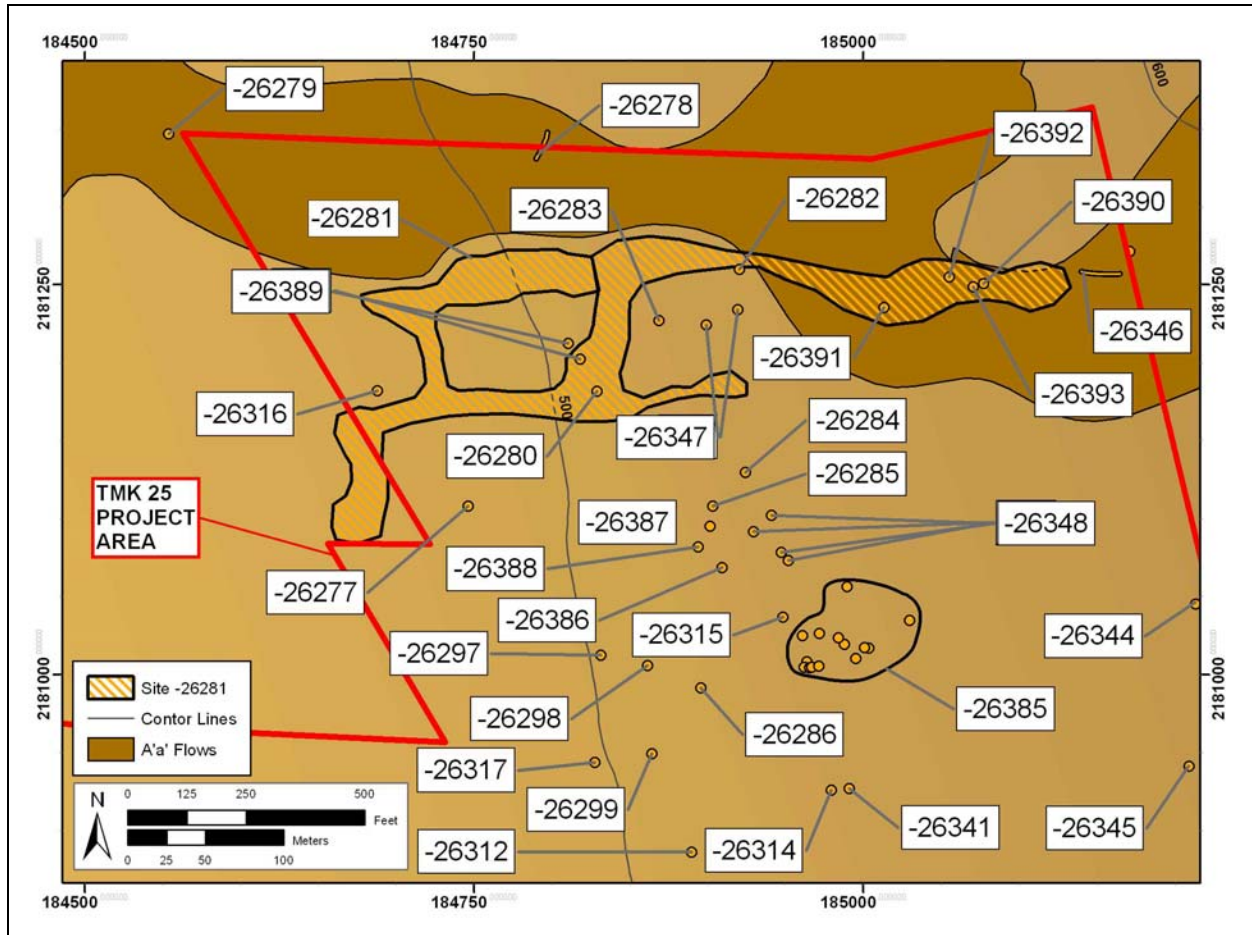


Figure 404. Site -26385, showing location of features (site is circled) and sites within the vicinity



Figure 405. Site -26385, Feature A, view to west



Figure 406. Site -26385, Feature B, view to northeast



Figure 407. Site -26385, Feature C, view to east

4.3.114 State Site # 50-10-27-26386

SIHP #	50-10-27-26386
FUNCTION:	Activity Area
SITE TYPE:	Modified outcrop
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	30 m by 10 m (98.4 ft. by 32.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26386 is an approximately 30 m (98.4 ft.) long area of modified 'a'ā outcrop comprised of multiple excavated pits and constructed cubbies (Figure 408). There are a total of 10 excavated pits (Figure 409). Two excavated pits that are immediately adjacent to each other were constructed by excavating a single trench that was bisected by the construction of a single trench that was then bisected by the construction of a wall directly across the middle of the trench to create the two smaller pits. This construction method was also used for two adjacent pits on the southwest end of the site. All of the excavated pits are circular and average between 1 m (3.3 ft.) and 2 m (6.6 ft.) across and approximately 70 cm (2.3 ft.) deep.

The site also has three constructed cubbies. These cubbies are small excavated or natural small holes/pits in the 'a'ā; two cubbies are partially covered with a single *pāhoehoe* slab. All three cubbies are small with a surface diameter of no more than 60 cm (2 ft.). The openings of these cubbies have been partially modified to restrict their openings.

The site's function is interpreted as an activity area for storage. The multiple excavated pits served as storage pits. The pits are too small for animal husbandry and the 'a'ā cobbles that make up each pit are too large for agricultural mulch. The constructed small cubbies appear to have served as storage for small items since the openings are partially covered and items are protected from the elements. The three constructed cubbies appear to have been bird traps since the cubbies contain small holes that are necessary for bird traps. The presence of possible bird trap also gives this site a possible ceremonial function. Additionally, site -26348, a permanent habitation site complex, is approximately 15 m *mauka* of site 26386. Site -26386 is a component site of complex site -26348, and its storage function and possible ceremonial function are associated with the activities at site -26348.



Figure 408. Site -26386, showing one of the constructed cubbies and its lid, view to northwest

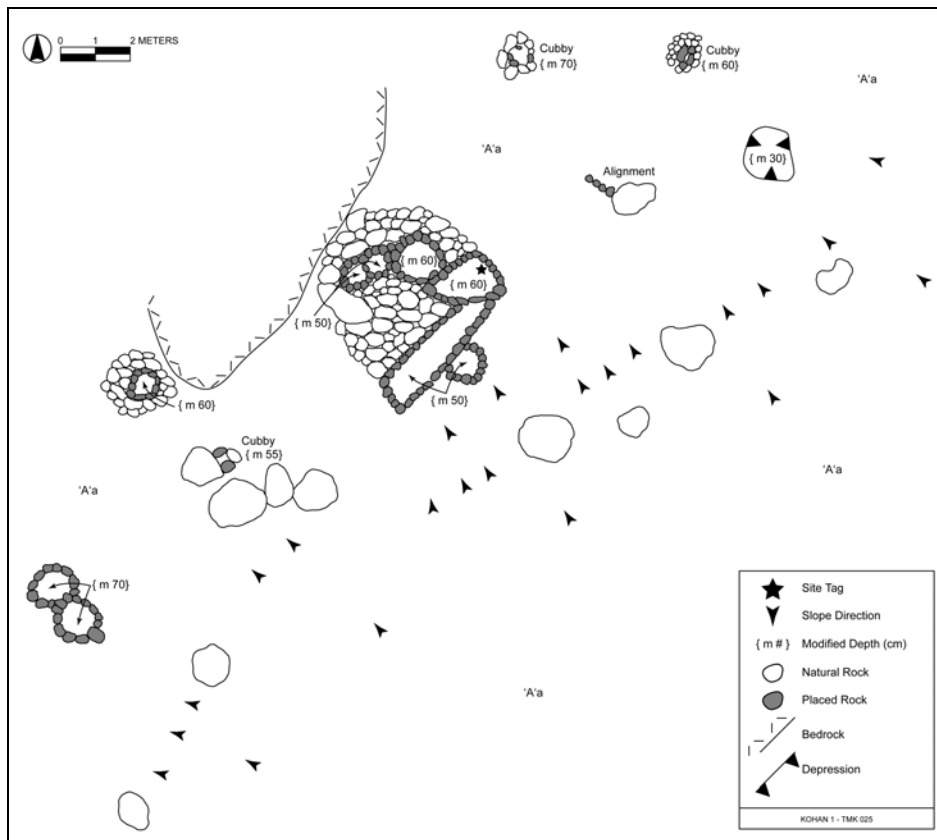


Figure 409. Site -26386, plan view

4.3.115 State Site # 50-10-27-26387

SIHP #	50-10-27-26387
FUNCTION:	Activity Area
SITE TYPE:	Modified outcrop
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	6 m by 3 m (19.7 ft. by 9.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26387 consists of an excavated modified outcrop and a small, fairly linear mound approximately 3 m (9.8 ft.) apart on a *pāhoehoe* flow (Figure 410 and Figure 411). The excavated modified outcrop is approximately 1 m long by 0.75 m (3.3 ft. by 2.5 ft.) wide, and its overhang is a maximum depth of 30 cm (0.98 ft.). The outcrop material has been removed or placed on top of the bedrock, creating a depressed area. The northern end of the outcrop appears to have been constructed by loosely stacking boulders and large cobbles that are currently mostly collapsed; the bedrock continues on three sides but is open to the north, where this wall was constructed to create a square depression.

Approximately 3 m (9.8 ft.) to the north of the outcrop is a small linear mound constructed on top of the bedrock where the bedrock slopes downward to the north. The alignment is 0.5 m (1.6 ft.) wide by approximately 3 m (9.8 ft.) long, and is very loosely constructed of mostly 20-30 cm (0.66-0.98 ft.) size large cobbles and small boulders (runs southeast/northwest). On the eastern side of the linear mound, the *pāhoehoe* bedrock slopes upward, creating a 2 m by 1 m (6.6 ft. by 3.3 ft.) depression between the linear mound and the up-sloping bedrock.

The depression is filled with small cobbles and does not appear to be a filled crevice or collapse. Approximately 5 cm (0.16 ft.) of soil is within both this depression and at the nearby collapsed blister; this soil is likely from the recent grasses covering the site. No midden or artifacts were found. The linear mound is only one-two courses high and not more than 25 cm (0.82 ft.) high.

The site's function is difficult to determine due to the minimal modification and construction that required a low investment of energy. The modified outcrop does not appear to be storage function, since the depths of the openings under the outcrop are less than 30 cm (0.98 ft.) and end within a meter of the underground opening. The modified outcrop and the linear mound are too small for animal husbandry or habitation, and both are too shallow for burials. Based on the proximity of several sites (-26284, -26285, -26348), this feature may be associated with agricultural activity or ceremonial activity. The site's function is, therefore, a general activity site. This site is part of a much larger site complex (-26284, -26285, -26348) and its function should be considered within that larger context.

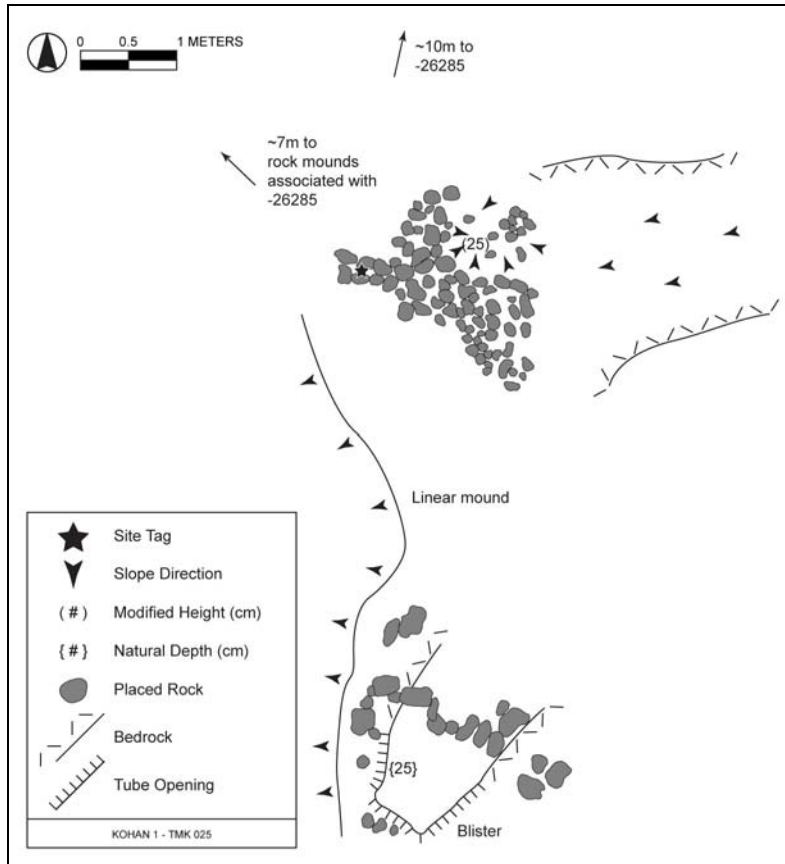


Figure 410. Site -26387, plan view



Figure 411. Site -26387, view to north

4.3.116 State Site # 50-10-27-26388

SIHP #	50-10-27-26388
FUNCTION:	Temporary Habitation
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	20 m by 1-2 m (65.6 ft. by 3.3-6.6 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	520 ft a.m.s.l.

DESCRIPTION: Site -26388 is a lava tube measuring 20 m (65.6 ft.) northeast/southwest by 1-2 m (3.3-6.6 ft.) northwest/southeast with ceiling heights ranging from 45 cm to 150 cm (1.5 ft. to 8.2 ft.). The tube opening is located at the southwest end of a northeast trending slope and measures 1 by 1 m (3.3 by 3.3 ft.) (Figure 412). The tube opening is located in the tube ceiling and has a depth of 160 cm (5.2 ft.). The southeast end of the opening has several stacked cobbles and boulders that facilitate entry. The northwest end of the opening has been leveled and paved by several *pāhoehoe* slabs. The tube continues in both a northeast and southwest trending direction (Figure 413).

To the northeast, a large chamber continues for several meters before it constricts to a much smaller tube, approximately 60 cm (2 ft.) in height by 1 m (3.3 ft.) in width. The northwest end of the large chamber contains an area of approximately 15 stacked cobbles and several marine shell, urchin, and *kukui* pieces. The southwest trending tube also continues for several meters before significantly constricting. Within the chamber, multiple marine shell pieces, large urchin spines, urchin, *kukui*, an urchin file, a coral abrader, and a scoria abrader were identified. No cultural modification or materials were located past these large chambers, likely due to the rough 'a 'ā floor beyond the large chambers.

The site's function is interpreted as temporary habitation based on the presence of the midden and cultural modifications and artifacts. Excavation potential is good due to a 3 cm (0.1 ft.) soil deposit.



Figure 412. Site -26388, tube entrance, view to southeast

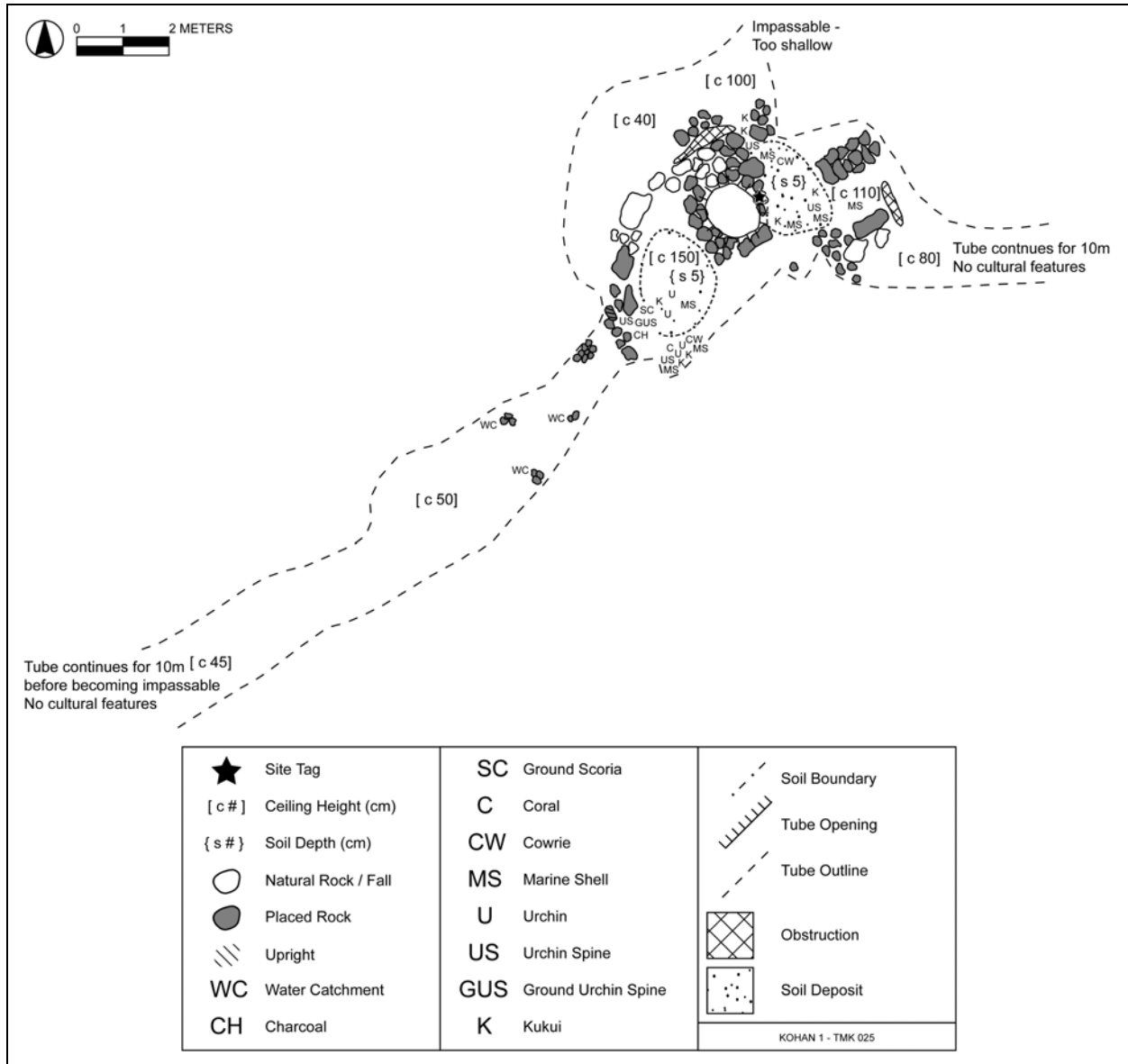


Figure 413. Site -26388, plan view

4.3.117 State Site # 50-10-27-26389

SIHP #	50-10-27-26389
FUNCTION:	Permanent Habitation
SITE TYPE:	Enclosure
TOTAL FEATURES:	2
DIMENSIONS:	12 m by 11 m (39.4 ft. by 36 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	500 ft a.m.s.l.

DESCRIPTION: Site -26389 consists of two square habitation features that are likely associated with site -26281, an agricultural activity site. Feature A is located on a *pāhoehoe* outcrop, approximately 10 m (32.8 ft.) northeast of Feature B. Feature B is at the valley bottom. A large *kiawe* tree is approximately 10 m (32.8 ft.) west of the site. Most of the surrounding area has thick *koa haole* and grass (that is less dense in the valleys). The site itself has thick grasses, some *koa haole*, and *‘ilima*.

Feature A is located on a naturally elevated *pāhoehoe* outcrop (exposed bedrock) that has an excellent 360 degree view. The *pāhoehoe* bedrock exposure is on the south end of an elevated ridge that runs north/south. This ridge is elevated approximately 180 cm (59 ft.) above the surrounding landscape. On both sides of the ridge (to the south and northwest) the landscape consists of long valleys that contain agricultural activities (see site -26281).

Feature A consists of a generally square enclosure that was built on the southern terminus of the elevated *pāhoehoe* outcrop (Figure 414 and Figure 415). The structure is a square enclosure measuring approximately 2 m by 2 m (6.6 ft. by 6.6 ft.); it appears to have a “doorway” in the southeast corner. Cobbles have been cleared from the middle of the structure. Most of the structure has fairly simple construction, consisting of small to medium size cobbles (10-30 cm / 0.33-0.98 ft. in diameter) piled two to four courses high at the edge of the *pāhoehoe* outcrop where it begins to slope downward steeply; the walls are approximately 70 cm (2.3 ft.) thick and generally only about 30 cm (0.98 ft.) high. Wall construction, particularly the north, west, and south walls, consists of small-medium size cobbles that fill the cracks in the exposed bedrock; large boulders (30-50 cm / 0.98-1.6 ft.) form the outline of the wall. Along these walls are several flat pieces of *pāhoehoe* that are the size and shape of facing stones, although none are currently upright or positioned as facing stones. Some natural collapse (due to heavy vegetation, weathering, etc.) is evident, although the east wall portions of the structure remain intact. Two facing stones remain upright at the northeast corner, and the stones are placed to make a formal corner.

The east wall is constructed by stacking flat (horizontal) slabs of *pāhoehoe* along the outer edge of the exposed bedrock to construct a formal faced wall. However, portions of this wall have fallen down the steep slope below Feature A. The east wall also has a small “doorway” that consists of two upright slabs (approximately 50 cm / 0.98 ft. apart) and at least one horizontal slab that creates an entrance/exit. A horizontal placed slab just below this “doorway” appears to have created another step leading up to the structure from below.

A single large caliber bullet casing was found in the center of Feature A, which appears to be recent (not older than 50 years).

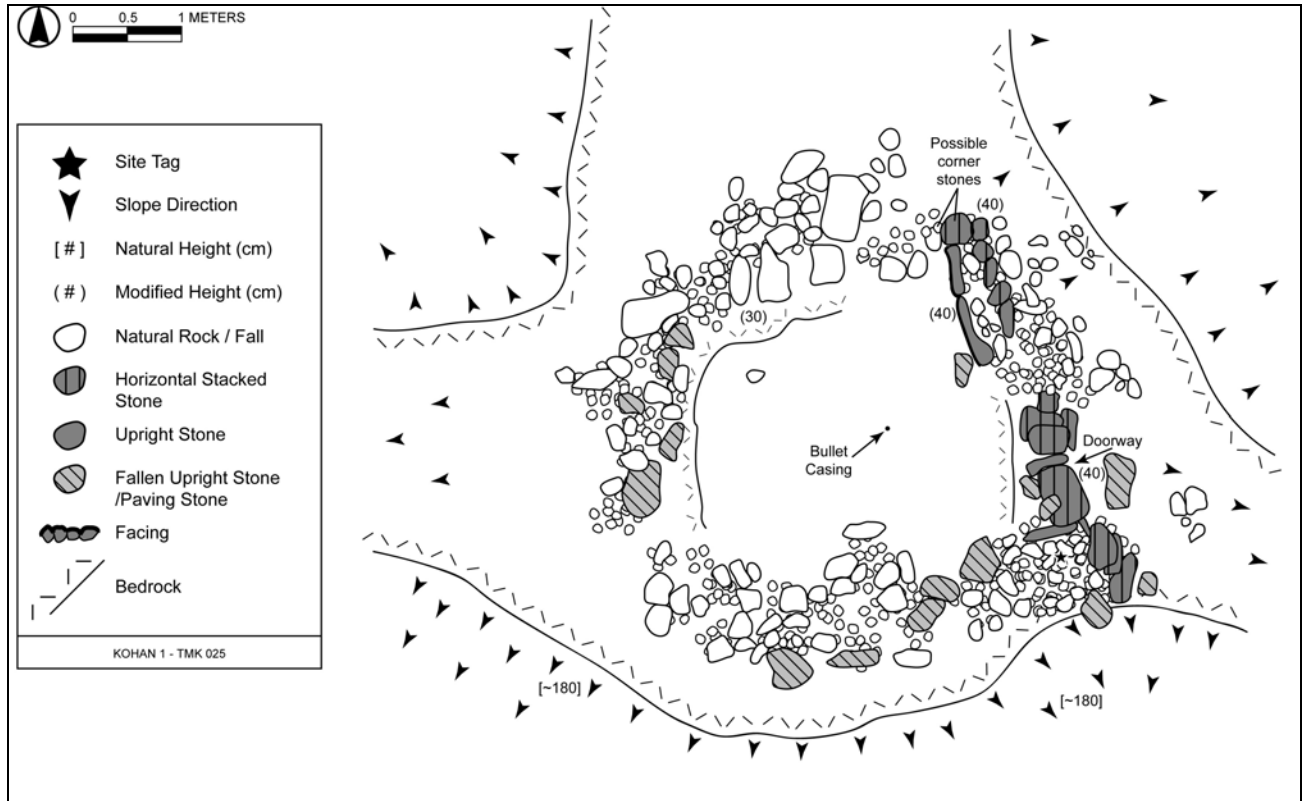


Figure 414. Site -26389, Feature A, plan view

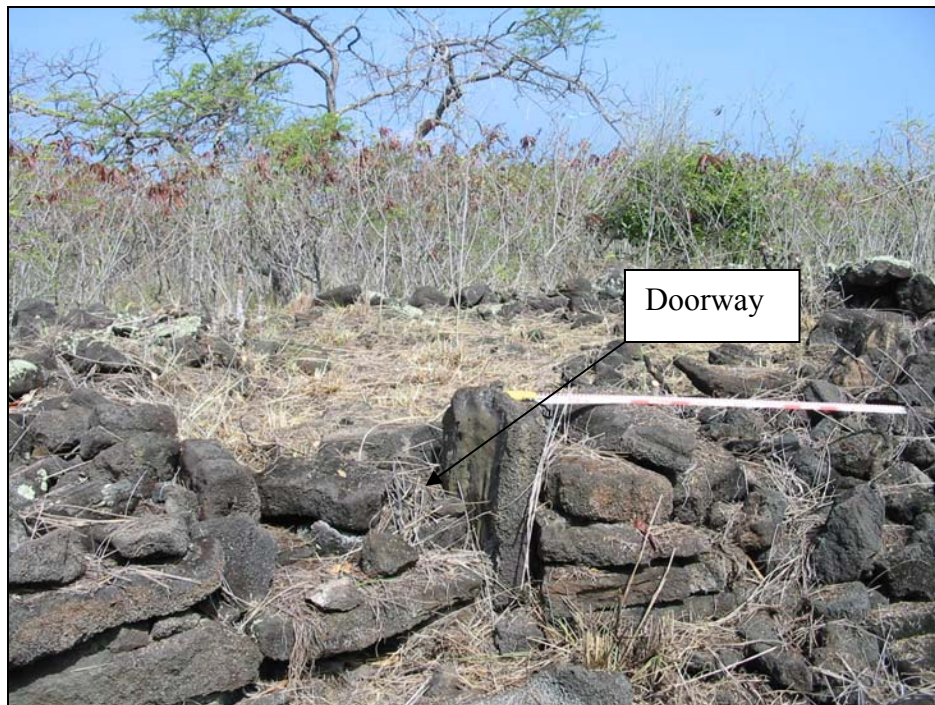


Figure 415. Site -26389 overview, Feature A is in foreground, view to west

Features A and B are spatially associated with the agricultural features described in site -26281. Feature B is located in the same valley as site -26281 although on a slightly elevated pāhoehoe exposure; Feature A is above the valley. Feature A has an excellent view of site -26281 due to its location, but Feature B has no view.

Feature B is located downhill (at the valley bottom), approximately 6 m (19.7 ft.) southeast of Feature A, and was covered by thick grasses and *koa haole*. It is a square enclosure (approximately 3 m by 4 m) that is constructed using similar building techniques as Feature A (Figure 416 and Figure 417). Walls are constructed with large, medium, and small cobbles (ranging from 10-50 cm / 0.33-1.64 ft. in diameter) stacked three to four courses high on average, and are approximately 1 m (3.3 ft.) thick and 45 cm (1.5 ft.) high at maximum. The northern corner of the structure is the most well-preserved and most formal (Figure 417); it consists of *pāhoehoe* slabs stacked three to four courses high (45 cm / 1.5 ft. in height), particularly on the north side of the northeast wall, and has a formal corner. The northwest wall is somewhat collapsed although it is clearly stacked about three courses high to create a fairly vertical face approximately 40 cm / 1.3 ft. high on the outside of the enclosure (the inside of the structure has a shallower depth since the underlying *pāhoehoe* bedrock slopes upward slightly to the southeast). This northern corner of the structure has five to ten paving stones set into the ground. The enclosure's northeast and southwest walls continue approximately 1 m southeast before both dip down significantly (20-30 cm / 0.66-1 ft.) and the rock fill changes to smaller cobbles (10-20 cm in diameter). These low areas are approximately 50 cm (1.6 ft.) wide. As the walls continue to the southeast they increase in height (40-45 cm / 1.3-1.5 ft) and construction is a mix of small to large cobbles and boulders mounded about three courses high. A similar dip in the height of the wall occurs in the southeast wall, creating somewhat mound-like southern and eastern corners. These two mound-like corners are less formally constructed than the northwest wall and north and west corners. The dips in the wall may be doorways or part of the structure's design. It is possible that more formal construction once existed throughout, since this structure has suffered some natural collapse over time.

The site's function is interpreted as permanent habitation. Both features are similarly constructed and both have similar weathering and collapse. Feature A's construction appears to be formal on at least the east wall and was likely formally constructed throughout, although collapse due to natural weathering (and possibly recent human activity based on the presence of a bullet casing) obscures the details of some of the original construction. The elevated location with an excellent view of the area suggests an ideal place for permanent habitation. There is no indication of use as a burial site, agriculture, ceremonial or other functions.

Feature B reinforces the site function interpretation as permanent habitation. The presence of paving stones and some formal construction (the stacking of *pāhoehoe* slabs and the formal corner) suggest an increased energy investment. The features' similarities suggest chronological association as well as spatial association, and the structures were likely part of the same habitation complex.

The only cultural item found within or within the vicinity of Feature A or Feature B was the single large caliber bullet casing found in the center of Feature A. Excavation potential for Feature A is fair due to the presence of the 5-10 cm (0.16- 0.33 ft.) deep soil in its center. Feature B contains slightly less soil. Feature A has evidence of relatively recent fires in the area (burned *koa haole* tree stumps).

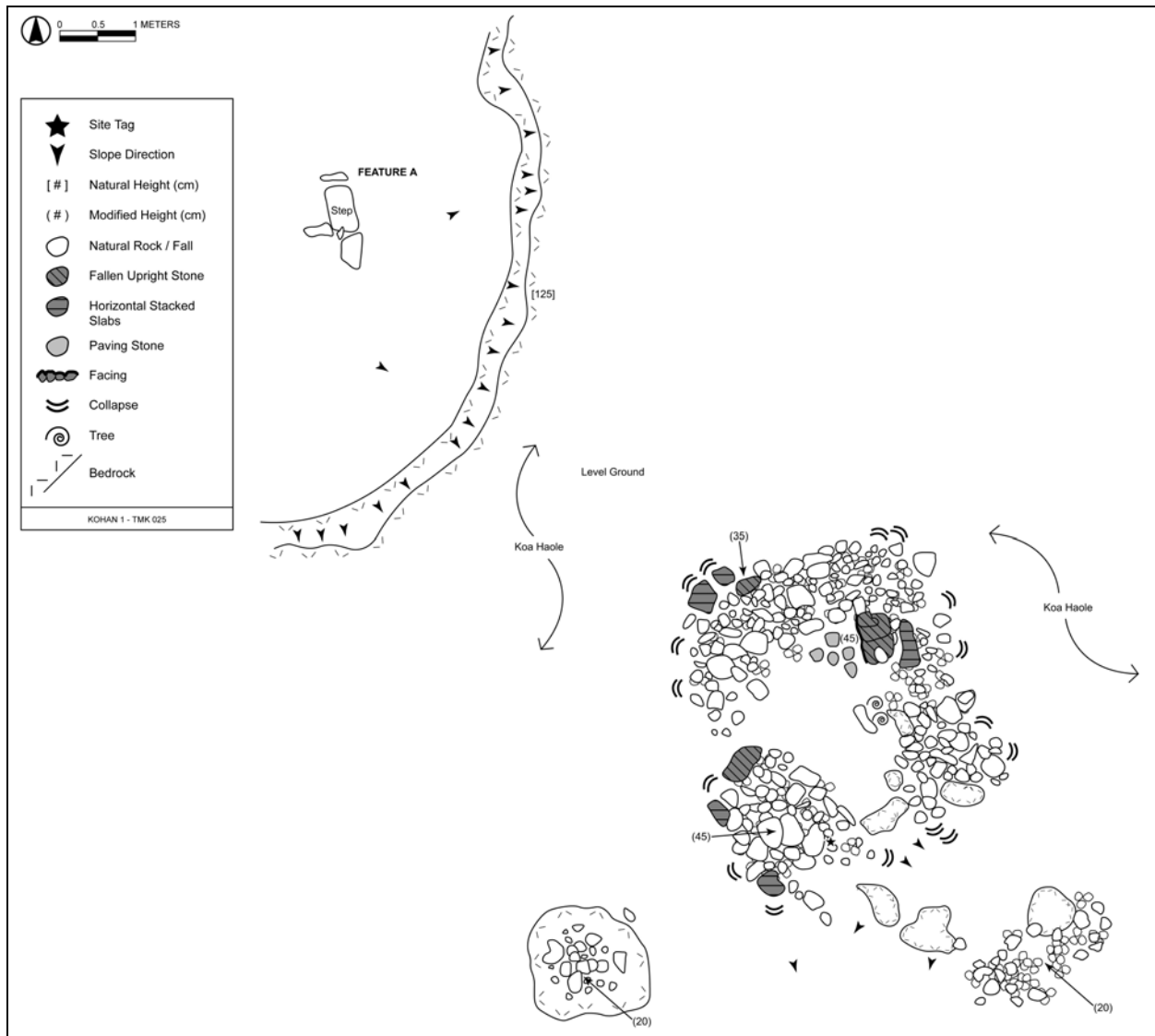


Figure 416. Site -26389, Feature B, plan view



Figure 417. Site -26389, Feature B showing stacked northwest wall, view to southeast

4.3.118 State Site # 50-10-27-26390

SIHP #	50-10-27-26390
FUNCTION:	Shelter
SITE TYPE:	Lava Blister
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	10 m by 3-6 m (32.8 ft. by 9.8-19.7 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	560 ft a.m.s.l.

DESCRIPTION: Site -26390 is a modified blister with minor modifications and a small amount of midden (Figure 418 and Figure 419). The blister opening is located at the north end of a pronounced *pāhoehoe* tumulus and measures 70 cm by 70 cm (2.3 ft. by 2.3 ft.). This area slopes slightly to the southwest with vegetation consisting of *koa haole* and grasses; the site is near a modern garbage dump, located 20 m (65.6 ft.) to the northwest.

The blister's interior measures 10 m (32.8 ft.) north/south by 3-6 m (9.8-19.7 ft.) east/west, with ceiling heights ranging from 50-80 cm (1.6-2.6 ft.). Within the blister, approximately 2 m (6.6 ft.) south of the opening, a few (more than four) sea urchin shell pieces and two *kukui* endocarps were found. No other midden or cultural material was identified, although a 3-5 cm (0.1-0.16 ft.) soil deposit is throughout the blister and is likely concealing the presence of any additional cultural material. Two placed *pāhoehoe* cobbles are in the center portion of the blister; they were likely moved from the center of the chamber to the side, since they are not roof collapse.

The site's function is interpreted as shelter based on the minor modification and small amount of midden. The blister's small size indicates extended habitation is less likely, and no other functions are indicated for this site. Excavation potential is fair due to a 3-5 cm (0.1-0.16 ft.) soil deposit and a small amount of surface midden.



Figure 418. Site -26390, view to south

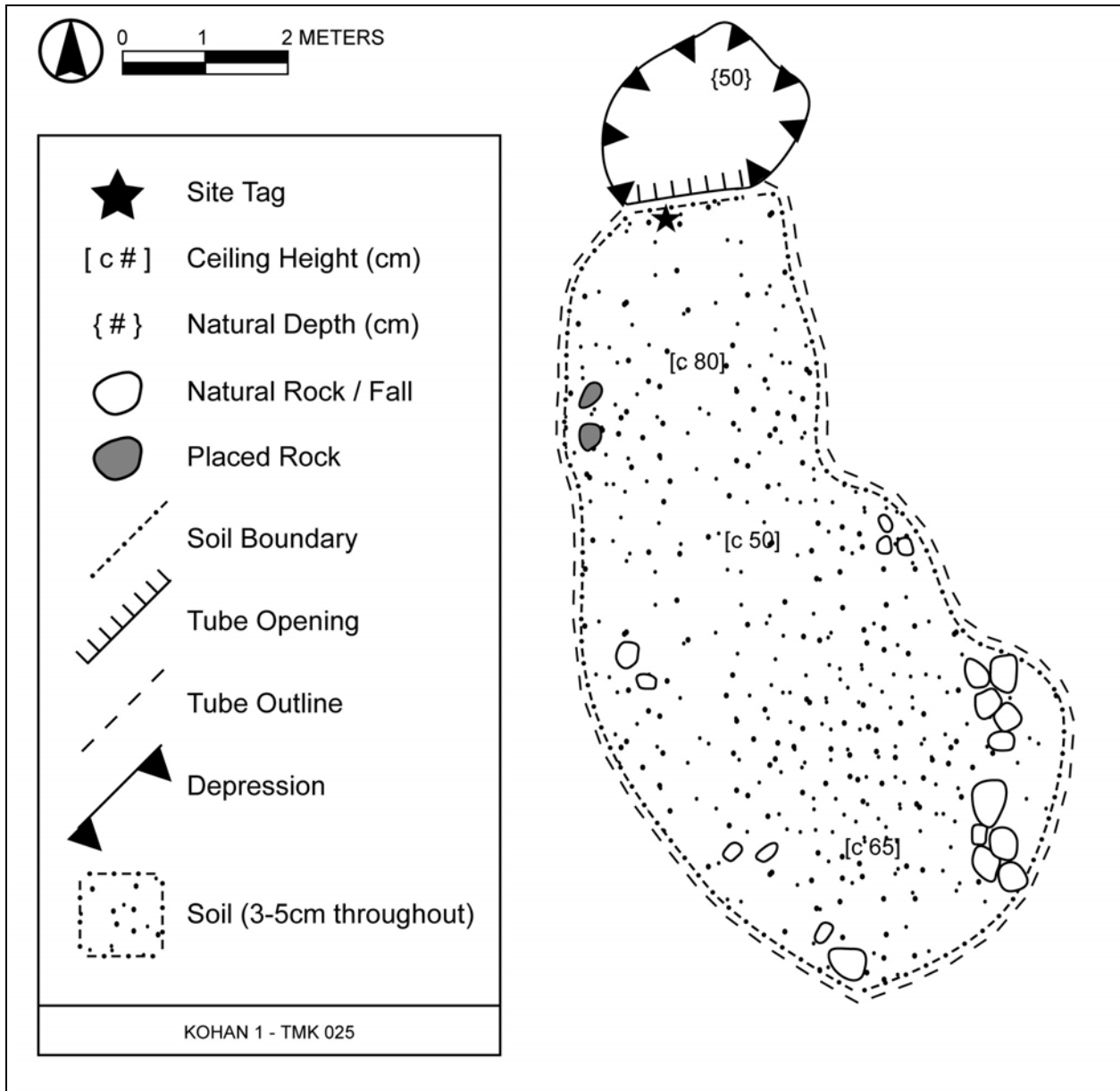


Figure 419. Site -26390, plan view

4.3.119 State Site # 50-10-27-26391

SIHP #	50-10-27-26391
FUNCTION:	Shelter
SITE TYPE:	Lava Tube
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	7 m by 1-3 m (23 ft. by 3.3-9.8 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	545 ft a.m.s.l.

DESCRIPTION: Site -26391 is a short lava tube with a small amount of midden (Figure 420 and Figure 421). It is located in a portion of the project area that slopes gently to the southwest. The lava tube measures 7 m (23 ft.) northeast/southwest by 1-3 m (3.3-9.8 ft.) northwest/southeast with ceiling heights ranging from 60-80 cm (2-2.6 ft.). Vegetation consists of *koa haole* and grasses.

There are two entrances. One is located on the northeast end (measuring 1.0 m by 0.5 m / 3.3 ft. by 1.6 ft.), and one is on the southwest end (measuring 1.0 m by 0.7 m / 3.3 ft. by 2.3 ft.). Within the tube, no constructed modification was observed. However, several *kukui* endocarps and a portion of a sea urchin mouth were found. Although very little midden is present, a 2-3 cm (0.06-0.1 ft.) soil deposit is present throughout the lava blister, which may contain more midden.

The site's function is interpreted as shelter based on the small amount of midden and the lack of constructed modification. More frequent habitation is unlikely based on the lack of modification, and no other function is indicated for this site. Excavation potential is fair, due to the presence of shallow (2-3 cm / 0.06-0.1 ft.) soil deposit and a few pieces of midden.



Figure 420. Site -26391, showing northeast opening, view to southeast

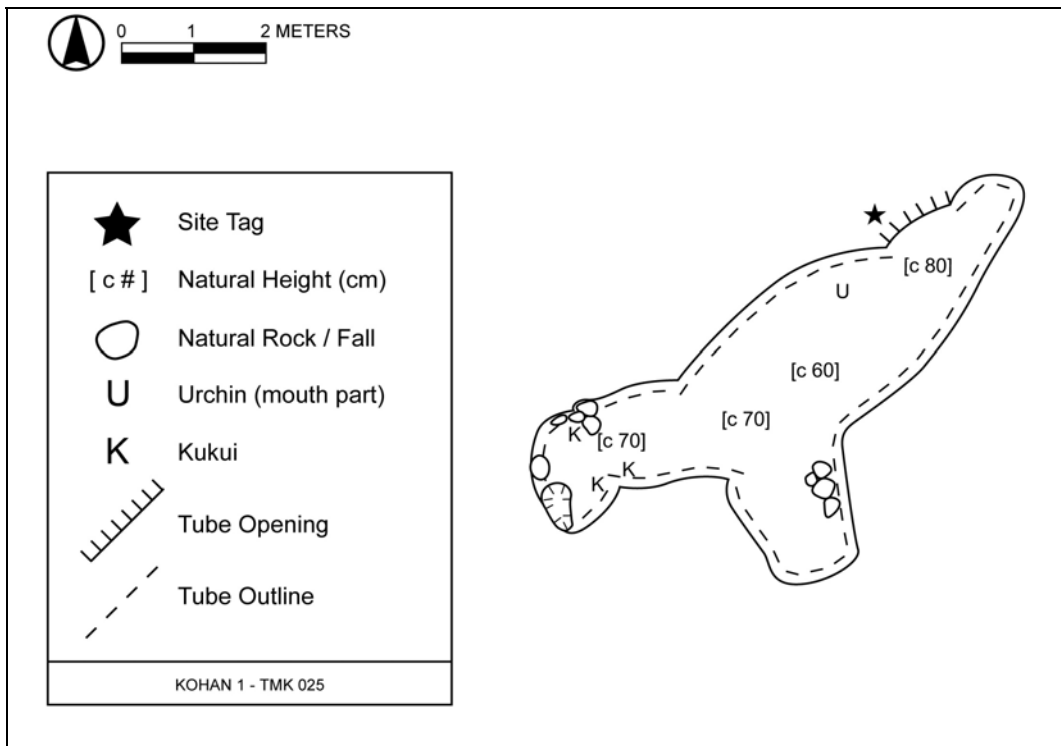


Figure 421. Site -26391, plan view

4.3.120 State Site # 50-10-27-26392

SIHP #	50-10-27-26392
FUNCTION:	Agriculture
SITE TYPE:	Mound
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	3 m by 1 m (9.8 ft. by 3.3 ft.)
CONDITION:	Good
AGE:	Pre-contact
ELEVATION:	560 ft a.m.s.l.

DESCRIPTION: Site 26392 is a large agricultural mound in a relatively flat area that slopes downward slightly to the west (Figure 422 and Figure 423). Vegetation consists of thick *koa haole* and grass. This general area contains a many small mounds, and bulldozer activity (see site-26281). The small mounds within 26281 appear to be agricultural clearing activity in the area and are not formal, although they are distinguishable from the bulldozer activity. Site 26393 is 10 m / 32.8 ft. east of site 26392.

Site 26392 is larger than the agricultural clearing mounds and is piled higher, somewhat more neatly, and has small cobble fill on top. The site is approximately 3 m by 1 m (9.8 ft. by 3.3 ft.) and runs roughly north/south. On the north and east side of the structure the small (10-20 cm / 0.33-0.66 ft.) and medium (20-30 cm / 0.66-0.98 ft.) cobble fill is 20-40 cm (0.66-1.3 ft.) higher than the surrounding natural *pāhoehoe* bedrock upon which the mound is built. On the south side of the structure, the small to large (40-60 cm / 0.66-1.3 ft.) cobble construction slopes upward to the north and is approximately 70 cm (2.3 ft.) higher than ground surface. The structure's west side has a vertical face that is generally four courses high and is constructed of medium to large size cobbles on top of the *pāhoehoe* bedrock. The west wall is partially collapsed and at least a few courses of small boulders in the middle of the structure are visible above the natural rise of the bedrock; some soil is also present. While the sides of the structure (primarily the west and south sides) are constructed of medium to large boulders, the top of the structure consists primarily of small cobbles as fill; this fill is somewhat level (slightly convex).

The site's function was initially interpreted as a burial based on the mound's construction; its size and shape are consistent with burial mounds. Based on testing (see below), the site's function was determined to be agricultural. The site is mounded like site -26393, about 10 m (32.8 ft.) to the east (see below), with medium *pāhoehoe* cobbles on top to the bedrock. These medium cobbles were then paved and partially filled with smaller (3-10 cm / 1.1-3.1 inches) cobbles, creating the paved level surface on top of the mound; this surface was likely used as a bed for agricultural or horticultural production.

Testing Results

Two test units (Figure 422 and Figure 423) were excavated to determine whether the mound contained a burial and to aid in determining the site's function. Unit A measures 160 by 60 cm (5.2 by 1.9 ft.) and was excavated into the site's short axis, approximately 2/3 of the way across to the site's west side. Unit A was excavated to underlying *pāhoehoe* bedrock at a depth of 54 cm (1.7 ft.). Unit B is a small (30 by 30 cm / 0.98 by 0.98 ft.) unit in an area of the mound that had been previously disturbed/excavated. Unit B was excavated to what appeared to be *pāhoehoe* bedrock, but the small size of this unit precluded definitive determination that this was actually bedrock, rather than a large *pāhoehoe* cobble. No cultural materials or subsurface features were encountered during excavation of either test unit (Figure 424).

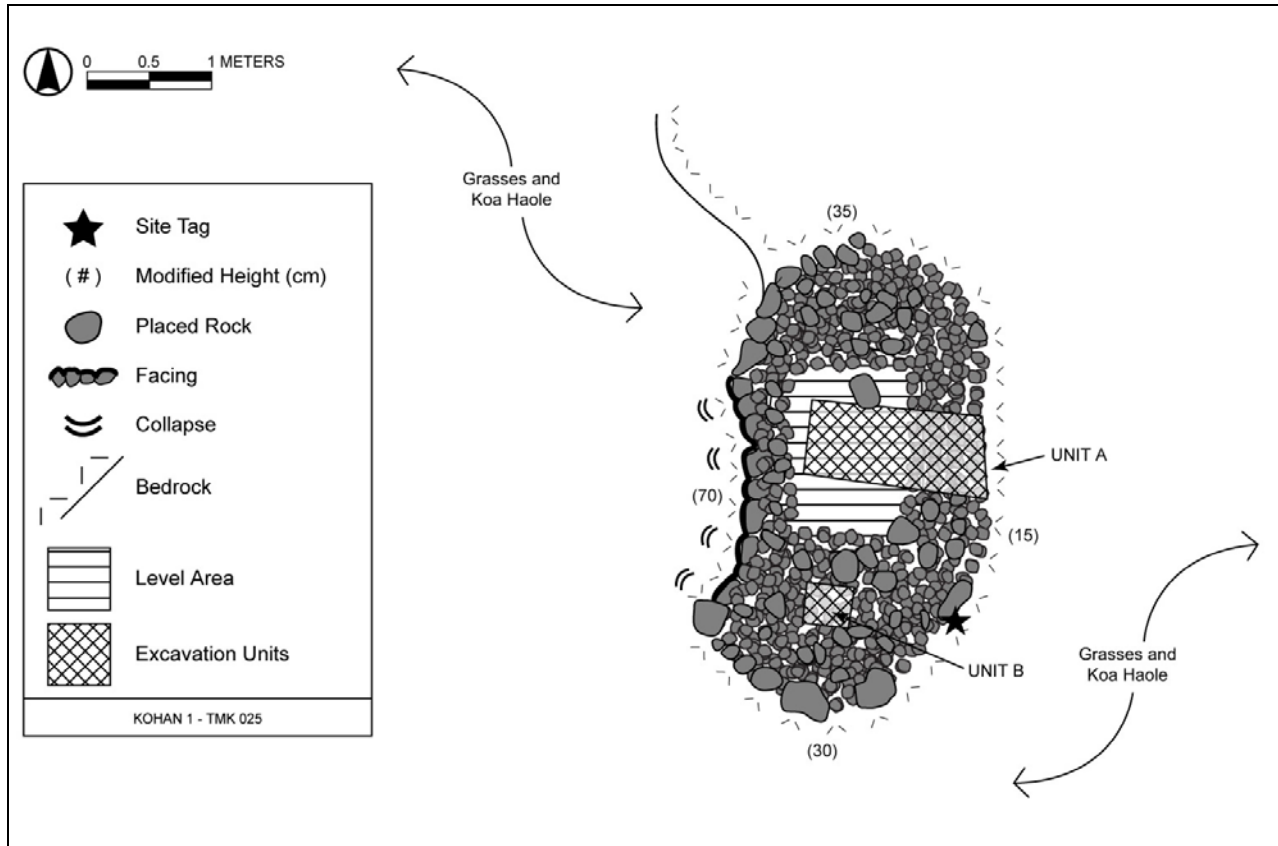


Figure 422. Site -26392, plan view and showing excavation units A and B



Figure 423. Site -26392, pre-excitation, view to north



Figure 424. Site -26392, post-excitation, view to north

4.3.121 State Site # 50-10-27-26393

SIHP #	50-10-27-26393
FUNCTION:	Agriculture
SITE TYPE:	Mound
TOTAL FEATURES:	No feature designations assigned
DIMENSIONS:	2.1 m by 2.1 m (6.9 ft. by 6.9 ft.)
CONDITION:	Poor
AGE:	Pre-contact
ELEVATION:	560 ft a.m.s.l.

DESCRIPTION: Site -26393 is a roughly square agriculture mound constructed of medium cobbles and small boulders to a maximum height of 50 cm (1.6 ft.) above the surrounding ground (Figure 425 and Figure 426). The west portion of the mound is slightly higher above the ground. Vegetation consists of thick *koa haole* and grass.

Site -26392, a similar mound, is located approximately 10 m (32.8 ft.) to the west. Site -26393 is located in the same area as the site -26281 features (agricultural mounds), but is not consistent with this feature type. Site -26393 is larger than most of the agricultural clearing mounds and is taller. The north edge is quite linear and appears to have an alignment of at least five small boulders as a foundation, and the top of the mound is covered in rubble (with approximately 25 cm / 0.82 ft. in diameter cobbles). The south side of the mound is built on bedrock, like many of the agricultural clearing mounds, but this does not seem to comprise a majority of the foundation of the mound. The mound also does not appear to be bulldozer push pile; bulldozer activity 2 m (6.6 ft.) to the south is entirely different in color and arrangement. The mound itself is relatively well settled and dense with rubble filling in many of the top gaps, unlike the loose bulldozer push nearby.

This site's function was initially indeterminate, and based on testing (see below) was determined to be agricultural or horticultural, and may have been a bed for crop production. The mound is similar to the agricultural clearing mounds in the area, although its size and some of its characteristics (northern alignment, rubble fill on top) are more formal. The mounds composition of cobbles creates a relatively flat paved surface for the mound.

Testing Results

Excavation was conducted to aid in the determination of the site's function (Figure 425-Figure 427). A 160 by 50 cm (5.2 by 1.6 ft.) trench was excavated from the west side of the mound and continued approximately 2/3 of the way across the mound towards the east. A single stratum was excavated down to *pāhoehoe* bedrock, to a depth of 38 cm (1.2 f t.). Stratum I consisted of small *pāhoehoe* cobbles (5-15 cm / 1.9-5.9 inches) mounded on an underlying *pāhoehoe* bedrock exposure. No cultural materials or subsurface features were encountered during excavation (Figure 427).

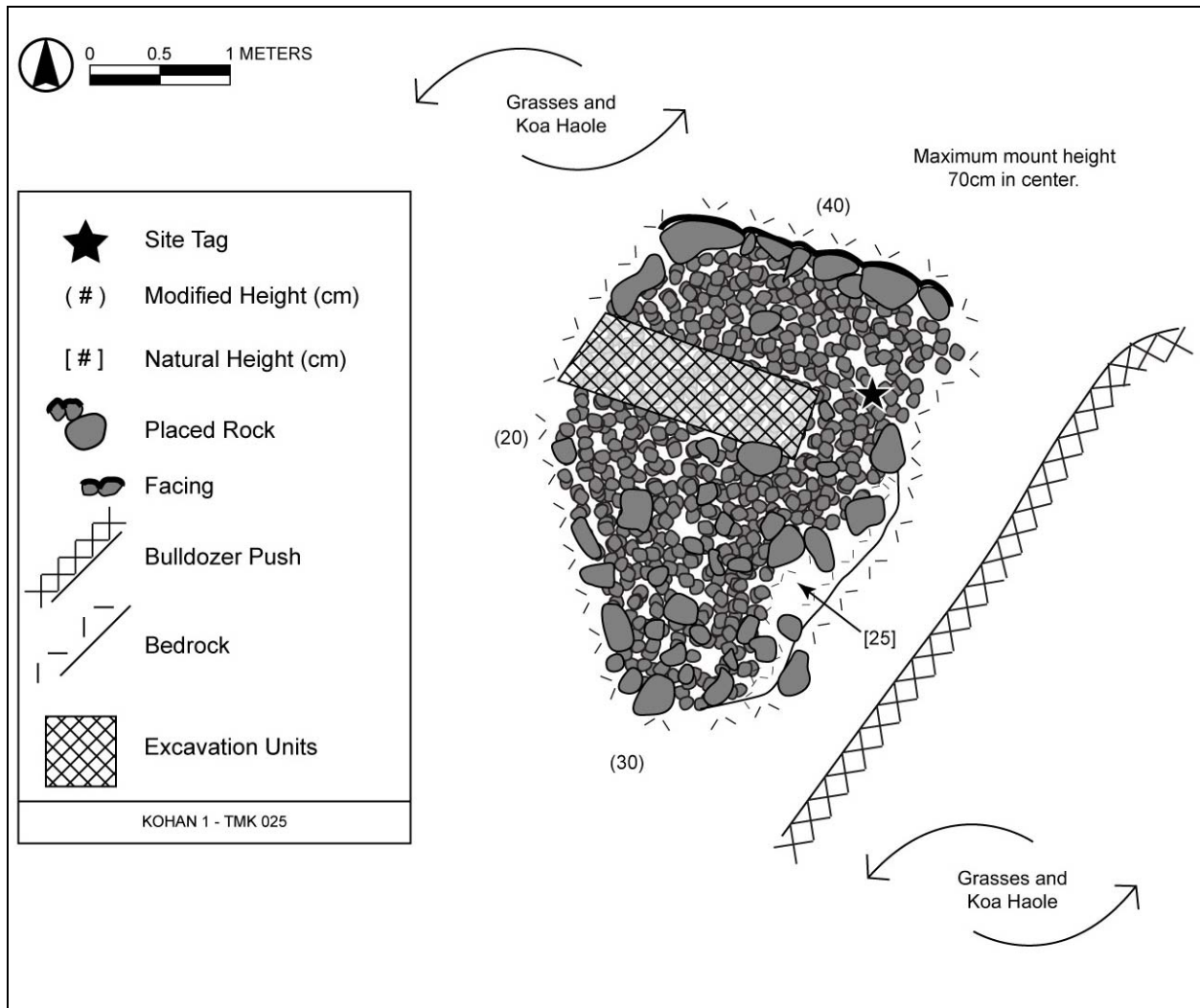


Figure 425. Site -26393, plan view showing excavation unit



Figure 426. Site -26393, pre-excitation, view to southwest



Figure 427. Site -26393, post-excitation, view to southwest

Section 5 Results of Laboratory Analysis

5.1 Midden Analysis

Midden was recovered from 3 of the 15 test units excavated during the testing phase of the project (see Table 7). The majority of test units were conducted to test for the presence of human remains. None of the test units revealed human remains.

Marine midden (vertebrate and invertebrate) accounted for 55.0% (493.3 g) of all the midden recovered from the project area. Of the total marine midden inventory, 100% represents shellfish (invertebrates), and no fish bone was present.

The most common components of marine midden recovered in the project area include the following types in descending order: Snakehead cowry (*Cypraea caputserpentis*), Pearl shell (*Isognomon sp.*), Cone shells (*Conus sp.*), *Strombus* shells, unidentified shell, sea urchin (Echinoderm) and *Drupa*. The majority of these shellfish species are typically found in the tidal zone along rocky shores or sandy areas. Unidentified shellfish accounted for only 1.2% of the marine midden inventory.

Of the total midden inventory, 45% (402.9 g) was terrestrial midden. Of the total terrestrial midden inventory 99.4% represented *kukui* endocarps, 0.5% goat bones (*Capra hircus*), and the remaining 0.03% consisted of rodent 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 7. Midden Catalog (all depths are in cm and weights in g)

State Site #50-10-27-	20741	26321	26321	26344	26344
Feature	A	A	A	C	C
Trench	1	1/SE quad	1/SE quad	1	1/
Depth/Stratum	0-36 / I	0-60 / I	60-62 / II	0-40/I	40-82/II
<i>Conus sp.</i>				8.0	2.1
<i>Cypraea caputserpentis</i>	5.3		2.1	192.0	242.9
<i>Drupa</i>					1.3
<i>Isognomon sp.</i>		6.2	4.0	3.6	7.0
<i>Strombus</i>				1.9	4.9
Misc./ Unid shell				2.3	4.0
Total shell midden	5.3	6.2	6.1	207.8	262.2
Echinoderm			0.6		3.4
Fish bone					
Total marine midden	5.3	6.2	6.7	207.8	265.6
Goat bone		2.1			
Rodent bone					0.1
<i>Kukui endocarp</i>				183.5	217.2
Total Midden	5.3	8.3	6.7	391.3	482.9

5.2 Artifact Analysis

A total of 58 indigenous Hawaiian portable artifacts were noted in surface contexts and within lava tubes during the inventory survey (Table 8). Additionally, one historic artifact was noted during the inventory survey (-26342). Only six artifacts were collected as they were encountered during test excavations. All other artifacts will either be preserved in place or will be retrieved during data recovery.

The most common type of artifact is manuports. Eighteen of the artifacts are manuports, whose primary modification is removal from its natural context. Twelve (12) of the manuports are water-worn or fine-grained basalt stones, which do not naturally occur within the project area. Six (6) of the manuports are unmodified coral.

The second most frequent artifact type is lithic flakes. Eight were encountered in total at four sites; five in a single surface site (-26344). The flakes found at site 26344 were encountered during the test excavations of platform Features C and E. All but one of these flakes are volcanic glass; the other flake is fine-grained basalt.

The remaining artifact types consist of hammerstones, abraders, files, a basalt tool fragment, modified shells, isolated components of octopus lures (*lūhe'e*), fishhooks, pandanus brushes, coral gaming disks (*ulu maika*), a possible digging stick, and a historic bottle.

Considerable excavation was also undertaken by Archaeological Consultants of Hawai'i (Kennedy 1984), most specifically at -26324. Numerous artifacts and midden were recovered from these excavations. Reproductions of photos in the Kennedy 1984 report are included in Appendix A. According to Kennedy, the artifacts were stolen and thus no further information is available at this time.

Table 8. Artifact Catalog

SIHP # 50-10-27-	Context	# of pieces	Material	Function	Comments
20741	Surface	1	Modified cowry shell	Portion of Octopus Lure	Not collected (preserve in site)
26284	Surface	2	Basalt	Manuports	Not collected (preserve in site)
26288	Surface, in lava tube	1	Modified bone	Fishhook	Not collected (preserve in site)
26289	Surface, in lava tube	1	Modified Basalt	Hammerstone	Not collected (data recovery)
	Surface	1	Water-worn Basalt	Manuport	Not collected (data recovery)
26290	Surface, in lava tube	2	Coral (not branch)	Manuports	Not collected (preserve in site)
	Surface, in lava tube	1	Coral (not branch)	Abrader	Not collected (preserve in site)
	Surface, in lava tube	1	Modified Sea Urchin Spine	File	Not collected (preserve in site)
	Surface, in lava tube	1	Modified bone	Fishhook	Not collected (preserve in site)
	Surface, in lava tube	2	Water-worn Basalt	Manuports	Not collected (preserve in site)
	Surface, in lava tube	1	Modified Red Scoria	Octopus Lure Sinkers	Not collected (preserve in site)
26291	Surface, in lava tube	1	Water-worn Basalt	Hammerstone	Not collected (data recovery)
26300	Surface, in lava tube	1	Volcanic Glass	Flake	Not collected (data recovery)
26303	Surface, in lava tube	1	Basalt	Manuport	Not collected (data recovery)
27304	Surface, in lava tube	1	Coral (not branch)	Ulu Maika	Not collected (data recovery)
26317	Surface, in lava tube	1	Coral (not branch)	Abrader	Not collected
26321	Surface, in lava tube	4	Water-worn Basalt	Manuports	Not collected (data recovery)

SIHP # 50-10-27-	Context	# of pieces	Material	Function	Comments
	Surface, in lava tube	1	Modified Basalt	Hammerstone	Not collected (data recovery)
	Sub-surface, excavation unit	1	Modified Basalt	Abrader Blank	Collected
26324	Surface, in lava tube	1+*	Pandanus brushes	Brushes	Not collected (preserve in site)
	Surface, in lava tube	1+*	Modified Sea Urchin Spines	Files	Not collected (preserve in site)
	Surface, in lava tube	1+*	Coral (not branch)	Abraders	Not collected (preserve in site)
	Surface, in lava tube	1+*	Modified Basalt	Abraders	Not collected (preserve in site)
26326	Surface, in lava tube	10	Modified <i>Nerita</i> shells	Drilled <i>Nerita</i> shells	Not collected (data recovery)
26334	Surface, in lava tube	1	Coral (not branch)	Hammerstone	Not collected (data recovery)
26341	Surface, in lava tube	3	Coral (not branch)	Manuports	Not collected (data recovery)
	Surface, in lava tube	1	Modified Sea Urchin Spine	File	Not collected (data recovery)
26342	Surface, in lava tube	1	Coral (not branch)	Manuport	Not collected (data recovery)
	Surface, in lava tube	1	Water-worn Basalt	Manuport	Not collected (data recovery)
	Surface, in lava tube	1	Modified Basalt	Hammerstone	Not collected (data recovery)
	Surface, in lava tube	1	Modified wood	Possible digging stick	Not collected (data recovery)
	Surface, in lava tube	1	Glass	Historic bottle	Not collected (data recovery)
26343	Surface, in lava tube	1	Modified Basalt	Ground tool fragment	Not collected (data recovery)
26344	Sub-surface, excavation unit	5	Volcanic Glass	Flakes	Collected
26347	Surface, in lava tube	1	Modified pearl shell	Modified Shell	Not collected (data recovery)
	Surface, in lava tube	1	Modified cowry shell	Portion of Octopus Lure	Not collected (data recovery)
26349	Surface, in lava tube	1	Volcanic Glass	Flake	Not collected (data recovery)

SIHP # 50-10-27-	Context	# of pieces	Material	Function	Comments
26362	Surface, in lava tube	1	Water-worn Basalt	Manuport	Not collected (preserve in site)
26373	Surface, in lava tube	1	Modified Basalt	Flake	Not collected (data recovery)
26388	Surface, in lava tube	1	Modified Sea Urchin Spine	File	Not collected (data recovery)
	Surface, in lava tube	1	Coral (not branch)	Abrader	Not collected (data recovery)
	Surface, in lava tube	1	Scoria	Abrader	Not collected (data recovery)

*Exact numbers not determined. All artifacts intended to be preserved in site

Section 6 Summary and Interpretation

6.1 Feature Types

The site (or feature) type designation refers to the actual structural or non-structural (i.e. lava tube, blister, enclosure) elements of a site (or feature). Of the 121 sites (221 features), the most common feature types are discussed below, a table representing every feature type and the sites where these types were found can be seen in the Survey Findings Section 4.1 (Table 4). The most prevalent types are lava tubes and blisters (85), mounds (8 total features, with 64 sub-features), enclosures (31), trails (17), and walls (17).

6.1.1 Mounds

Mounds are linear, circular or amorphous stone piles which typically lack a vertical face or a level top surface. They often accompany excavated blisters, or follow depressions or subtle topographic lines. In the case of the project area, virtually all of the mounds identified were for agriculture. No burials were identified in selected test excavations and most of the mounds were too small for this to be a consideration. Two sites in particular contain the majority of the mounds within the project area. Site 26281 along the north edge of the project area contains 37 agriculture mound features, and site 26385 contains a total of 27 very small mounds and filled crevices associated with habitation activities.

6.1.2 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. In the project area lava tubes appear to be concentrated in one particular *pāhoehoe* running northeast/southwest from TMK: [3] 7-3-009:026. In the present project area these tubes are primarily located in Kaloko *Ahupua'a*. The range of functions for tubes and blisters within the project area include: agricultural (sites 26281, 26288, 26289, 26379, 26392, 26393), burial (sites 26290, 26310/A, 26310/B, 26311, 26362), probable burial (26324/B), numerous temporary and permanent habitation sites, water collection activity areas (sites 26289/D, 26290/A, 26290/D, 26319), markers (sites 26295, 26302/A, 26302/B, 26312, 26322, 26331/C, 26334/D, 26352, 26353) quarries (sites 26286, 26291/B, 26310/D, 26317, 26344/F, 26345/A, 26375/A), storage (site 26348/D), and indeterminate (sites 26279, 26294, 26306, 26345/B, 26375/B). Most of the blisters and small tubes inspected during the present survey were modified in some way and were assigned a site number. There were very few that showed no evidence of utilization.

Lava tubes also generally offer a greater degree of midden and artifact preservation compared to surface sites. Of the 58 indigenous artifacts found, 49 were observed in tubes, 4 were found within 3 surface sites, and 5 were found within one test excavation.

6.1.3 Mounds

Mounds are linear, circular or amorphous stone piles which typically lack a vertical face or a level top surface. They often accompany excavated blisters, or follow depressions or subtle topographic lines. In the case of the project area, the majority of the mounds identified were for agriculture, and some were associated with habitation. No burials were identified in selected test

excavations and most of the mounds were too small for this to be a consideration. Two sites in particular contain the majority of the mounds within the project area. These mounds have been grouped into features based on proximity and similarity of construction/function; individual mounds are considered to be sub-features of the site and therefore count as a single occurrence of that feature type. Site -26281 along the north edge of the project area contains 37 agriculture mound features, and site -26385 contains a total of 27 very small mounds and filled crevices associated with habitation activities.

6.1.4 Enclosures

There are a fairly large number of enclosures within the project area, consisting of 14% of all the features, and approximately a quarter of all surface features. Nearly all enclosures are associated with either temporary or permanent habitation. The types of enclosures encountered and a thorough discussion of their function is presented below in the Functional Interpretation section, under the Habitation category. The size and formality of enclosures within the project area varies greatly (see Table 11 and Table 12) and ranges from C-shaped enclosures to fully enclosing walls, with a full range of very informal to formal style of construction.

6.1.5 Trails

Seventeen trails within fourteen sites (11.5 percent of the total sites) were encountered during the inventory survey (sites 20741/C, 26278, 26336, 26340, 26346, 26353/A, 26353/B, 26355, 26359/A, 26359/B, 26361, 26368, 26369, 26371, 26372/A, 26372/B, 26382). The majority of trails within the project area appear to be pre-contact in nature, although sites 26355 and 26371 are historic. The trails are generally widespread, except for a remarkable cluster of trails crossing the 'a'ā flow "island" near the center of the project area, including the *mauka/makai* trail 26353.

Site 26353, is the only *mauka/makai* trail of a pre-contact style in the project area. It is a narrow slab trail over 'a'ā that is typical of pre-contact footpaths. It traverses an "island" of 'a'ā just *makai* of the central project area. It was not traced off of the 'a'ā, likely due to bulldozing to the east, west and south of the trail and the inherent difficulty in identifying trails on *pāhoehoe*. It is presently believed that this is a remnant of an earlier *mauka/makai* route that was largely modified into Kohanaiki Road as indicated on Emerson's 1888 Registered Map 1449. More discussion on this possibility is discussed in the Transportation sub-section in Feature Functions, below.

Site 26371 is the only historic trail identified in the project area. It is constructed of large 'a'ā cobbles and small boulders to create a causeway across the undulating 'a'ā terrain in the southeast corner of the project area. The trail was also identified south of Hina Lani street in TMK: [3] 7-3-009:028 where it runs for a considerable distance. The trail is wide and extremely level and characteristic of horse trails during post-contact times. The trail runs approximately northwest/southeast, very roughly *mauka/makai*. It is possible that this trail is that shown on Emerson's Registered Map 1280 due to its location on this particular 'a'ā flow. This possibility is discussed further in the Transportation sub-section in Feature Functions, below.

Attempts were made with all trails in the project area to follow them to their full extent and where possible make relevant correlations. It proved impossible to follow trails on the grass-covered *pāhoehoe* adjacent to the 'a'ā lava where the trails were still visible. 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 may have been traversed by travelers.

6.1.6 Walls

Walls within the project area range from long animal husbandry walls to short walls (only a few meters long) constructed in lava tubes, as well as walls built for general habitation purposes (see also discussion of enclosures). The low-density presence of animal husbandry walls suggest minor historic era cattle or goat ranching within the project area, which is not surprising given the nearby Huehue Ranch operation in Kaloko which began in the late nineteenth and early twentieth century. Walls within lava tubes often occur near their entryway and may serve a variety of functions, such as the delineation of space within the tube, blocking of a portion of the entrance to maintain moisture within the tube for water collection, or other habitation related functions such as storage.

6.2 Feature Functions

The bases for functional interpretations are presented in the Survey Findings Section 4.1 (Table 5) of this report. Eleven primary function categories were identified within the project area and include: agriculture, animal husbandry, burial, ceremonial, habitation, indeterminate, marker, quarry, storage, transportation and water collection.

6.2.1 Agriculture

During the inventory survey six sites, or 5 percent of the total sites, were considered to function, in whole or part, in an agricultural capacity (State sites 26281, 26288, 26289, 26379, 26392, 26393). Of these sites, only site 26281, consists of widespread agricultural features; sites 26281, 26392, and 26393 are isolated sites, but do have agriculture as the primary site function. The other three sites primarily function as temporary or permanent habitations and have secondary agricultural features.

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 26281, 26379, 26392 and 26393), to larger more defined enclosures (Site 26288, 26289) 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 majority of the project area.

Site 26281, however, is considerably more intensive agricultural modification than seen elsewhere in the project area. It consists of numerous small mounds that are spread throughout braided, natural gullies in the *pāhoehoe* near the north boundary of the project area, and just south of an 'a'ā flow. The mounds are often less than a meter square and stacked on bedrock, characteristic of clearing mounds that remove unwanted material from the broader planting bed of the gullies. This area likely was fairly intensive, but appears to still be highly localized, utilizing the relatively deep depressions to grow sweet potato or another dryland crop. Sites 26392, and 26393 are interesting in that they are in these gullies at the *mauka* end of where it was identified, but feature much more substantial construction than the simple clearing mounds.

Because they are at the highest elevation, it may be that they represent the most intensive use of this braided gully system for agriculture. The modification was not identified much further *mauka* of these two sites, nor does it continue into the next parcel.

In general the agricultural features in the project area 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. They are a part of subsistence patterns for the region that often are discussed primarily around the higher elevations that have the intensive "Kona Field System." Site 26281 is a particularly good example of a localized, but fairly intensive agricultural area not connected to the more continuous 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 (*'ohia'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 a missionary couple that first arrived in Hilo in 1831, describes features in Puna similar to *pāhoehoe* clearings 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.

6.2.2 Animal Husbandry

Five sites within the project area, in part or in whole, are interpreted as animal husbandry sites (10712, 26296/B, 26360, 26366, 26367). One site (10712) is the historic *ahupua'a* wall between Kaloko and Kohanaiki that was likely built after Emerson's 1880s surveys. Another site (26360) is 70 m north of the *ahupua'a* wall and is similarly constructed. Site 26360 is a wall that encloses a large area within two branches of 'a'ā flow, and the *ahupua'a* wall as a southern boundary. The two walls created a paddock between 10712 and the flows that very likely held historic livestock. Another site (26296/B) is an enclosure feature within a pre-contact permanent habitation. Two additional historic sites (26366 and 26367) are within the vicinity of the other two historic walls.

Historical research suggests that both goat and cattle grazing probably took place within the project area. Captain George Vancouver gave Ke'eaumoku, an *ali'i*, a pair of goats in 1792, and

the following year, he brought Ke'eaumoku four sheep. Vancouver also brought the first cattle, California longhorns, to Kamehameha in 1793.

Historic documents related to the Government Homestead Program of the late 1880s indicate officials determined that goats were the only animals that were adept at grazing within arid, rocky Kaloko and Kohanaiki (Maly and Maly 2003:76, 79). Goats were present in the area prior to the late 1880s and may have been present within the project area. Limited cattle ranching was practiced at the same time, although by 1900, cattle ranching had for the most part replaced the goats (Maly and Maly 2003:75).

Post-contact animal husbandry was also evident in the *mauka* (eastern) portion of the project area, likely associated with nearby activity at the Huehue Ranch (see Background Research section). Here, a wood watering trough, a short length of barbwire fence and a small barbwire enclosure were present. This is near the area marked on older USGS maps (those after the 1928 series) as a water source, which was not located.

6.2.3 Burial

A total of four (4) sites within the project area were found during the present study to contain burials (26290, 26310, 26311, and 26362). Five burials were present in the four sites; site 26310 contained two burials. One probable burial was also identified.

Numerical designations given to burials by CSH are sequential for the entire Kohan 1 project (including the present project area as well as TMK: [3] 7-3-009: 017, 026 and 028), resulting in non-sequential numbers for burials within the present project area. The CSH burial numbers listed in Table 9 correspond to the burial numbers reported to SHPD upon initial discovery of a burial, and therefore represent the order of discovery during the Kohan 1 project fieldwork. The numerical designations have been retained to ensure consistency between the records of initial discovery (as reported to SHPD) and discussion in the inventory survey report.

All confirmed burials (with identified human remains) are located within lava tubes, which vary in size from very small to fairly large tubes. Given the lack of historic artifacts and the burial style (concealed within lava tubes), all confirmed burials are understood to be of Native Hawaiian ancestry and interred in a pre-contact style of burial. There are no directly associated burial goods.

Site 26324 contains the only probable burial in the project area. It consists of a cobble filled depression/natural cupboard inside a small side tube that is graced with a small petroglyph panel. Further, Kennedy (1984:50, 57) reported that human remains were present in then entryway to 26324 (ACH/ACP Site 22). However, no remains were observed during a CSH field check (Shideler and Hammatt 2005:56), nor during the current survey. Cultural Surveys Hawai'i contacted Mr. Joseph Kennedy, Principal Investigator of Archaeological Consultants of the Pacific (ACP), in an effort to determine the whereabouts of the human remains and other materials documented in the Kennedy 1984 Kaloko/Kohanaiki work. Mr. Kennedy replied to CSH by phone on February 27, 2008 and informed us that all material from the area corresponding to the present project area was stolen from his O'ahu office more than a few years ago. As far as Cultural Surveys Hawai'i knows, these remains are no longer at SIHP 50-10-27-26324 nor are they in the project area.

Table 9. List of Burials and Associated Sites

SIHP No. (50-10-27-)	CSH Burial Number	Site Type	Function	Age
26290	5	Lava Tube	Burial (confirmed)	Pre-contact
26310	1	Lava Tube	Burial (confirmed)	Pre-contact
26310	2	Lava Tube	Burial (confirmed)	Pre-contact
26311	4	Lava Tube	Burial (confirmed)	Pre-contact
26362	31	Lava Tube	Burial (confirmed)	Pre-contact
26324 entry	-	Lava Tube	Burial (Kennedy 1984)	Pre-contact
26324/B	-	Lava Tube	Probable Burial	Pre-contact

6.2.4 Ceremonial

Two sites in the project area (26275 and 26307), comprising seven features are interpreted as ceremonial function. To assist in functional interpretation Table 10 categorizes these ceremonial sites by size and structural type. This table also includes a comments column which provides further justification for ceremonial site function, though no specific *heiau* interpretation is attempted.

Site 26275 is a tall platform partially closing the entrance to a small blister at the base of an *ā'ā* flow. Inside the blister is numerous heads of branch coral and large marine shells. The site is interpreted as a small shrine, most likely related to water collection.

Site 26307 and its four features are situated on the *ā'ā* and on the sides of a natural depression. The site is visible from a distance, although it is not prominently placed. The relationship of features and utilization of the natural depression is unique, and much of the construction is quite formal. For these reasons, this is also believed to be a shrine, though not of a type typically described as a *heiau* though in a broader definition it may be seen as one. A specific function is not clear and there were no cultural remains at the site to aid in interpretation. The large excavated pit is suggestive of some documented ritual storage of poles related to bird feather gathering.

Table 10. Characteristics of Ceremonial Features

Site Number/Feature	Formal Type	Surface Area (m ²)	Comments
26275/A	Lava Tube	24.0	Contains multiple heads of branch coral
26275/B	Platform	9.0	Tall, formal platform
26275/C	Enclosure	11.3	Low wall separates space, but is not structural
26307/A	Terrace	15.0	Contains cupboard

Site Number/Feature	Formal Type	Surface Area (m2)	Comments
26307/B	Terrace	8.0	Possibly a shelf for offerings
26307/C	Modified depression	1.6	The modified depression is between two constructed walls
26307/D	Modified depression	6.0	Unusual and relatively large rectangular excavation in the 'a'ā

Small structures, like the structures within sites -26275 and -26307, are generally classified as shrines. All households contained shrines “where offerings were made daily to Lono and to ancestral deities (*'aumākua*)”. Shrines were also “frequently incorporated within the men’s house or *mua*”, which was also present in every household (Kirch 1984:260).

Attributes including altars and paving, generally refer to internal features of ceremonial structures (Hammatt et al 1997:176-177). Altar in this case is employed to describe a slightly elevated or raised stone foundation within the structure. Bennett designated altars as one of the *heiau* features focusing primarily on ethnographic evidence related to “*lele*” which he described a “a sort of scaffolding supported by posts on which offerings were laid and left to moulder away” (Bennett 1930:39).

According to David Malo (1903), “In front of the *lele* was a pavement of pebbles (or framework) on which offerings were deposited until they were offered up, when they were laid on the *lele*” (Malo 1990:213-214).

The term paving is employed referring to well constructed surface layer(s) of a specific structure. Although a common structural component, paving is suggestive of a “greater construction effort” (Hammatt et al 1997:185). Paving is evident within 26307/A and 26307/B, both of which are terraces.

Location refers to our perception of prominent placement of specific structures in terms of view planes from and to the particular structures (Hammatt et al 1997:189). The importance of *heiau* location has been well documented (Bennett 1930:341; Buck 1964:516; Stokes and Dye 1991:21; and Kolb 1991:80-83).

When considering location (Kolb 1991):

...local topography of a temple was intimately tied to the concept of religious “sanctity”. Large *heiau* were generally situated upon prominent locations such as hill tops, bluffs, or knolls. This higher ground affirms the divine and inaccessible nature of high-ranking *ali'i*, while affording an excellent view of the surrounding countryside and coast. Smaller *heiau*, on the other hand were usually placed within villages, upon mountain slopes, in upland valleys, along the coast, or in any other location that would best serve the people (Bennett 1931:35).

The incorporation of the local topography makes any cursory analysis of *heiau* form suspect in two ways (Hommon 1987:24-5). First, the placement of *heiau* architectural elements tends to be influenced more by the contour of the landscape

than by the abstract plan imposed upon the site by the architect. This suggests that the location of a *heiau* played a much more important role in its design than previously thought, and may partially explain the large amount of variability present in *heiau* form. Each promontory varies in its size, shape, and orientation of natural rock outcrops....

Second, some platforms and terraces that appear to be solid architectural elements are actually masonry veneers, and thus are deceptive as to the amount of labor used in their construction. (Kolb 1991:82-83).

Site 26275 and its three features are situated on *pāhoehoe* at the base of the steep edge of a raised *ā'ā* flow. The site and its features fit the small size category, and is preliminarily interpreted as a shrine. The presence of the less common artifacts, branch coral in particular is suggestive of the ceremonial function, very likely related to water collection which is considered particularly difficult at this relatively low elevation.

6.2.5 Habitation

Eighty-two (82) sites (67.8% of the total sites) in the project area, in part or in whole, are interpreted as habitation sites (20741, 26276, 26277, 26280, 26282, 26283, 26284, 26285, 26287, 26288, 26289, 26291, 26292, 26293, 26296, 26297, 26298, 26299, 26300, 26301, 26303, 26304, 26305, 26308, 26309, 26310, 26313, 26314, 26315, 26316, 26317, 26318, 26320, 26321, 26323, 26324, 26325, 26326, 26327, 26328, 26329, 26330, 26331, 26332, 26333, 26334, 26335, 26337, 26338, 26339, 26341, 26342, 26343, 26344, 26347, 26348, 26349, 26350, 26351, 26354, 26356, 26357, 26358, 26363, 26364, 26365, 26370, 26373, 26374, 26376, 26377, 26378, 26379, 26380, 26381, 26383, 26384, 26385, 26388, 26389, 26390, and 26391). Thirteen (13) of these sites also contain non-habitation component features (20741, 26288, 26289, 26291, 26296, 26310, 26317, 26324, 26331, 26334, 26344, 26354, and 26379), such as: agriculture, burial, and quarry.

Two specific types of habitation types – temporary (which includes shelters) and permanent - are used in the present analysis of these sites. Of the total 121 habitation sites in the project area, 71 sites fit the characteristics of temporary habitation, 10 are categorized as permanent habitation, and one site, due to the disturbed nature of the site, can only be determined to be general habitation.

The distinction between the two habitation modes is posited based on the following set of criteria, as articulated in Hammatt et al 1997:

6.2.5.1 Size

- 1) no set determining (m²) area
- 2) but small <20 m²
- 3) larger >20 m²

6.2.5.2 Architectural type

- 1) Temporary Habitation - lava tubes & blisters, irregular shapes, standard C- and L-shapes platforms enclosures, terraces, alignments
- 2) Permanent Habitation - platforms, enclosures (rectangular, square), terraces

6.2.5.3 Substantiveness of sites/features

- 1) Substantial - Well paved, bifaced, (thick) sturdy walls, volume (though no specific m³), defined areas by alignments
- 2) Unsubstantial - Minimally or unmodified tubes/blisters, rough, loose paving (or none), uniface (piled versus stacked) walls, incorporated natural features.

6.2.5.4 Single versus Multiple Components

- 1) Temporary Habitation - generally single featured but multiple not all that unusual
- 2) Permanent Habitation - either single or multiple component but usually other feature associations.

6.2.5.5 Internal features

- 1) Temporary Habitation - few, if any, from just survey level observation, cupboards (excavation observations, e.g. multiple hearths)
- 2) Permanent Habitation - cupboards, single, well-defined hearth, constructed entrances or pathways, internal alignments (indicating segregation for multiple purposes)

6.2.5.6 Functional Associations

- 1) Temporary Habitation - agricultural, natural resources (lithic sources/ quarries) fish/shell fish
- 2) Permanent Habitation - other permanent habitation, burials, religious features/sites (uprights, i.e. heiau), shrines; potable water source(s)

6.2.5.7 Geographic location - dependent on area working - below Kona example

- 1) Temporary Habitation - coast to inland, but more prevalent inland, amongst intensive agriculture, along trails, edges and/or interfaces of lava flows
- 2) Permanent Habitation - mainly coastal but scattered inland, shoreline access
- 3) Topographic Setting

The criteria have been developed over years doing archaeological research within the Hawaiian Islands. This includes locales where other researchers have developed models for distinguishing temporary and permanent habitation (e.g. Cordy 1981, Cordy et al. 1991 and Jensen 1988). Thus, models for distinguishing temporary versus permanent (Cordy et al. 1991, Clark 1986, Weisler and Kirch 1982, Green 1980) are available for comparative analyses.

CSH incorporates aspects of these models into the set of criteria which we then apply to the range of sites within a project area. The process of interpretation involves: 1) in field site recordation and tentative interpretations; 2) laboratory analysis that includes a) reevaluation

based on inventory of all sites; b) incorporation of subsurface testing data; c) correlation to previous studies; and d) review of historic background data. In field interpretations can thus be altered based on compilation of full inventory survey data and correlations to previous studies.

The primary criteria utilized for in field interpretations include size, architecture type (e.g. lava tube, c-shape, platform, terrace, etc.) and substantiveness of architecture (i.e. substantial versus insubstantial). These three primary criteria provide essential determining factors that are found in the existing habitation models (e.g., Cordy et al. 1991:527-536, Clark 1987:105-214, Green 1980:54-63).

6.2.5.8 Size

Though size can be a key determining factor there are variables which can affect its diagnostic value. These variables include differences in field and recordation methodology related to measuring and reporting on sites or features size. Examples include utilization of interior versus exterior measurements, defining natural areas or surfaces utilized for habitation (e.g. cave floor areas, modified outcrop surface area) and personal perception(s) of site or feature limits (e.g. exterior perimeters of enclosures, platforms, c-shapes, etc.). CSH utilizes maximum exterior measurements as the basis for calculating area. Thus, based on the documented size range differences and the regional variations in habitation models, as well as the above-mentioned variables CSH utilizes structure size of ca. 20 m² as a general dividing line between large and small. The implication here is that large is suggestive of permanent habitations with small indicative of temporary habitations. However, additional criteria are necessary to affix these differing modes of habitation, especially because of variability in architecture or structure type and substantiveness of structures which size (m²) does not address.

6.2.5.9 Architectural Type

Based on the previous habitation models as well as CSH's research (Hammatt et al. 1997), certain architectural or structural types tend to be more often associated with one mode of habitation or the other. Types such as C- and L-shaped enclosures, isolated hearths, caves, and modified outcrops, for example, are more often associated with temporary habitations. Platforms, rectangular enclosures and terraces are more often associated with permanent habitations. However, these architectural types are not necessarily mutually exclusive and therefore besides size, and type, substantiveness of architecture is essential in the interpretations.

6.2.5.10 Substantiveness

Substantiveness of structures refers to quality of construction which in part infers amount of labor invested. Permanent habitations are expected to have more substantial architecture; such as well-paved surfaces; bi-faced, thick, sturdy walls; and in the cases of platforms and terraces, significant boulder or cobble fill. In contrast, temporary habitations are expected to have less substantial architecture; such as minimally or unmodified lava tubes or blisters; rough, loose pavings; incorporation of natural features (e.g. large boulders, bedrock ledges, outcrops); and unfaced or unifaced walls. Thus the substantiveness criterion suggests mode of habitation based on perceived labor investment as an indicator of the pre-determined use of the structure. In other words, greater investment would be put into permanent habitations to provide stable and comfortable structures versus little effort invested in structures that were pre-determined for short-term or temporary use.

These three criteria: size, architecture type, and substantiveness provide the basis of CSH mode of habitation interpretations. However other criteria are viewed as necessary in supporting these interpretations. These additional criteria include: single versus multi-component site layout; internal features; functional associations and; geographic location.

6.2.5.11 Single versus Multiple Components

Habitation sites are described as either single-structure site or as a complex of related multiple structures. Typically, but not exclusively, temporary habitation sites are single-structure sites or they contain only one habitation structure in a complex layout. In contrast, permanent habitation residences, although commonly containing one primary habitation structure (i.e. sleeping house), often include other function-specific structures (e.g., men's house, sleeping house and cooking house), in addition to other functional feature types that supplement a permanent household (e.g. garden areas, storage or special-use caves, and family temples).

The variation between single-structure and multiple-structure permanent residences have been described, by several 19th-century Hawaiian scholars (summarized in Cordy 1981:73-76), as being dependent on the inhabitants' social rank. The larger, multiple-structure permanent residences (containing "men's houses, sleeping houses, *heiau* houses, women's eating houses, houses for the storage of provisions, houses for cooking, and many other houses" [Kamakau 1976:96]) were occupied by the *ali'i* or wealthy commoners, and the single-house residences were occupied by other commoners (*maka'āina*). Hawaiian scholar, David Malo, described a *maka'ainana* house as a "little shanty" in which all residential activities took place, "the fireplace was close to their head, and the poi dish conveniently at hand" (Kamakau 1976:96). Ethnographers E.S. Craighill Handy and Mary Kawena Pukui also noted the presence of single-structure households and multi-structure households, although they emphasized the multi-structure pattern (Handy and Pukui 1972:7, 112). The supposition that a multiple-house (structure) design was common among both social classes has been demonstrated in the archaeological record (e.g. Cordy 1981; Weisler and Kirch 1982). CSH's work in inland settlements, in Waiohinu, Ka'u, and Honokohau, North Kona (Robins et al. 1992 and 1995 respectively), documented that multiple-structure households were common, accounting for approximately 50% of all permanent habitation sites.

6.2.5.12 Internal Features

The presence of internal features in habitation structures tends to indicate longer or permanent use of the structure. The more common internal features associated with permanent habitation are: solitary inlaid hearths, entry ways (including constructed pathways and doorways), and alternating surfaces (tiers) or internal alignments defining different living areas. Internal features that may occur in both temporary and permanent habitation structures include cupboards, post-holes, alignments, and less substantially constructed hearths.

Observations of cultural material (midden, artifacts, manuports, etc.) at sites provides additional supportive data, however the presence or absence of such material was not a key determining criterion.

If extensive excavation of habitation sites has occurred then thickness of a site's or feature's cultural deposit and the type of associated artifacts may assist in distinguishing between temporary and permanent habitation. For example, thicker cultural deposits that contain a variety

of domestic-related tools could be an indicator of permanent habitation activities (Clark 1986: 207), while sparser cultural deposits with a limited variety of tool types may be an indicator of temporary habitation activities (Robins et al. 1995:199-200). However, the density of a cultural deposit or artifact types alone does not necessarily distinguish between temporary and permanent use, since similar domestic activities - revealed by similar artifact types - may be found at both temporary and permanent habitation sites (Cordy et al. 1991:528, 533-534). In addition, a dense and thick cultural deposit may be produced at a temporary habitation site that was used frequently over a long period of time (i.e., recurrent habitation). Regardless of whether or not intact cultural deposits can indicate temporary or permanent use, not enough subsurface data was obtained, during the inventory survey of this project, to facilitate this type of comparative analysis.

6.2.5.13 Functional Associations

The functional association of other features, sites, or complexes can assist in mode of habitation interpretations. Based on previous research temporary habitations in the central Kona region tend to be associated with *mauka/makai trails*, intensive agriculture, specific resource procurement (e.g. lithics, birds, timber, etc.) and natural features such as lava tubes and/or blisters. Permanent habitations may be associated with other permanent habitations in a cluster or “village” setting, burials, religious sites/features, potable water, and ocean access (Clark 1986, Jensen 1988, Cordy et al. 1991, Robins et al. 1995, Colin et al. 1996). Additionally, historic records related to Land Commission Awards (LCAs) are evaluated when applicable, as providing functional interpretations, possibly related to mode of habitation and thus is included in the column on “other functional associations.”

6.2.5.14 Geographic Location

Similar to other criteria previous research has documented trends pertaining to geographic location of temporary and permanent habitations. The trends pertinent to the Kona region for temporary habitations indicate that sites may be found from the coast to inland, but that they are more commonly found inland, especially within an intensive agricultural context (Hammatt and Clark 1980, Robins et al. 1995). Permanent habitations are more commonly documented historically and archaeologically as being coastal with scattered inland sites. The predominance of permanent habitations being coastal is especially true for clustered housing, or “village”-like settings.

6.2.5.15 Interpretation Summary

The interpretations of habitation sites into temporary or permanent can be an uncomplicated process depending on survey area, number of sites, and type of sites present. However as can be seen in large studies, like the present survey, the quantity, variety and varying conditions of habitation sites necessitates utilization of a wide range of interpretive criteria. As explained, CSH makes in-field interpretation based on observable criteria, particular size, architectural type, and substantiveness of architecture. Other criteria are then applied as supportive data of one mode or the other. Table 11 and Table 12, for temporary habitation and permanent habitation respectively, have columns for the individual criterion utilized on a per site/feature basis. Following the tables are summary sections for temporary and permanent habitations within the present project area. No recurrent habitations were identified within the project area.

6.2.6 Temporary Habitation

Seventy-one (71) habitation sites (representing 86.6% of the total habitation sites) in the project area are interpreted as temporary in usage. Table 11 lists the criteria that distinguish them as temporary in use.

Table 11. Characteristics of Temporary Habitation Sites and Features*

Site Number/ Feature	Formal Type	Floor Size (m ²)	Substaniveness	Internal Features	Other Functional Associations
20741	Complex				Transportation, animal husbandry, ceremonial
20741/A	Pavement	58.4	Cleared, leveled	None	
20741/B	Pavement	4.6	Cleared, leveled	None	
20741/F	Pavement	4.4	Cleared	None	
26276	Modified depression	14.0	Cleared	None	
26277	Complex				
26277/B	Terrace	10.0	Faced, paved	None	
26283	Enclosure	12.0	Mounded	None	
26285	Enclosure	6.3	Mounded, loose paving	None	
26298	Platform	16.0	Rough paving	None	
26301	Terrace	13.7	Mounded	None	
26305	Modified outcrop	3.0	Leveled	Alignment	
26308	Enclosure				
26308/A	Enclosure	23.0	Mounded	None	
26308/B	Enclosure	72.0	Cleared	Terrace	
26309	Complex				
26309/A	Enclosure	20.0	Mounded	None	
26309/B	Modified depression	20.0	Cleared	None	
26313	Enclosure	18.4	Unifaced	None	
26315	Complex				
26315/A	Enclosure	27.5	Unifaced	None	
26315/B	Terrace	9.0	Mounded	Cupboard	
26328	Platform	20.3	Mounded	None	
26329	Enclosure	2.3	Unifaced	None	
26332	Enclosure	4.0	Unifaced	None	
26334	Complex				Marker

Site Number/ Feature	Formal Type	Floor Size (m ²)	Substaniveness	Internal Features	Other Functional Associations
26334/B	Platform	4.5	Pavement	None	
26334/C	Modified outcrop	1.5	Leveled	None	
26337	Complex				
26337/C	Modified outcrop	30.0	Pavement	None	
26343	Complex				
26343/A	Wall	7.0	Bifaced	None	
26343/B	Wall	8.0	Mounded	None	
26354	Complex				Marker
26354/A	Enclosure	9.6	Unifaced, leveled	Cupboard	
26376	Enclosure				
26376/A	Enclosure	3.0	Mounded	None	
26376/B	Enclosure	18.0	Mounded, leveled	None	
26383	Enclosure				
26383/A	Enclosure	5.3	Mounded	None	
26383/B	Enclosure	5.0	Mounded	None	
26385	Mounds	**			

*Lava tubes and lava blisters not included

**27 dispersed ephemeral features that support temporary habitation structures

6.2.6.1 Size

With the exclusion of non-constructed floor areas (lava tubes, blisters and rock shelters) and the interior of site boundary walls, the temporary habitation structures of the sites measure an average of 15 m², in a range from 1.5 m² to 72 m². The majority (73.3%) of these structures measure under 20 m².

6.2.6.2 Architectural Type

The structures represented in the non-lava tube temporary habitation sites include a variety of architectural ("formal") types. Almost half (45.2%) of the non-lava tube temporary habitation structures are enclosures. No other structure type accounts nearly as large a percentage of the temporary habitation structures. Pavements, platforms, terraces, and modified outcrops each make up 9.7%. Modified depressions, walls, and mounds each represent less than 7% of the temporary habitation structures.

6.2.6.3 Single versus Multiple Components

The temporary habitation sites are comprised of 42 single-structure sites and 29 multiple-structure sites. Only 10 (20741, 26288, 26289, 26291, 26310, 26317, 26324, 26334, 26354, and 26379) of the total 71 temporary habitation sites (three of the multiple-structure sites and seven lava tube sites) contain non-habitation components. These non-habitation components include activity area for water collection, agriculture, animal husbandry, ceremonial, quarrying, markers, burials and probable burials, transportation and commemorative rock art.

6.2.6.4 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. In terms of elevation the majority of the temporary habitation sites (73.6%) are located above 400 ft a.m.s.l. The sites are scattered across the eastern portion of the project area in both Kaloko Ahupua'a and Kohanaiki Ahupua'a.

6.2.7 Permanent Habitation

Ten (10) of the habitation sites (representing 12.2% of the total 82 habitation sites) are considered to be permanent habitation sites. Table 12 lists the criteria that distinguish them as permanent habitation in function. These criteria are the same as those listed in Table 11 for temporary habitations thus allowing for comparison per mode of habitation.

Table 12. Characteristics of Permanent Habitation Sites and Features

Site Number/ Feature	Formal Type	Floor Size (m ²)	Substaniveness	Internal Features	Other Functional Associations
26284	Complex				
26284/A	Platform	48.0	Paved	Cupboard	
26284/B	Terrace	40.0	Cleared, alignments	None	
26284/C	Enclosure	5.3	Faced	None	
26284/D	Terrace	19.8	Pavement	Alignment	
26296	Enclosure				Animal husbandry
26296/A	Enclosure	23.4	Bifaced	None	
26314	Enclosure	16.0	Bifaced	Entry	
26331	Complex				Marker
26331/A	Enclosure	3.9	Bifaced	None	
26331/B	Enclosure	10.0	Bifaced, pavement	None	
26331/D	Pavement	11.6	Pavement	None	
26331/E	Terrace	3.2	Mounded	None	
26335	Enclosure	10.0	Bifaced	Entry	
26344	Complex				Quarrying
26344/C	Platform	58.5	Paved	Hearth, terrace	

Site Number/ Feature	Formal Type	Floor Size (m ²)	Substantiveness	Internal Features	Other Functional Associations
26344/D	Platform	23.5	Paved	Depression	
26344/E	Platform	18.0	Paved	Depression	
26348	Complex				Storage
26348/A	Enclosure	450.0	Stacked	Upright, filled crevice	
26348/B	Depression	20.5	Faced	Pavement, hearths	
26348/C	Enclosure	22.0	Mounded, cleared	None	
26348/E	Enclosure	12.5	Mounded	None	
26350	Complex				
26350/A	Terrace	10.2	Paved	None	
26350/B	Pavement	40.0	Paved	Hearth, wall	
26350/C	Enclosure	4.0	Mounded	Pavement	
26350/D	Wall	7.5	Bifaced	None	
26381	Enclosure	10.5	Bifaced	None	
26389	Enclosure			None	
26389/A	Enclosure	7.5	Bifaced	Entry	
26389/B	Enclosure	3.0	Stacked	Pavement	

6.2.7.1 Size

The permanent habitation structures measure between 3 m² and 58.5 m², with the exception of one site structure (Site 26348/A) measuring 450.0 m². This structure has been excluded as it is a large enclosing wall of a permanent habitation site complex. The average size of the structures, excluding 26348/A, is only 17.9 m². Though this average size is small for permanent habitation structures the substantiveness, internal features, and associations as parts of larger habitation complexes justifies the interpretation of these structures as permanent habitation structures.

6.2.7.2 Architectural Type and Internal Features

The permanent habitation sites consist of 25 individual structures which represent a variety of architectural types. Enclosures are the most common type (representing 52.0% of the feature inventory) in the project area, with platforms (16.0%) and terraces (16.0%) following in prevalence.

All but a few of the permanent habitation structures have some elements of substantial or solid architecture, such as: paved surfaces and bifaced walls. Those few structures that lack substantial architecture are either associated with other substantially built structures in a complex or they are poorly preserved structures. The majority of these architectural types (52.0%) also include internal features suggestive of permanent habitation use. Such features include: single

hearths, constructed entrances, constructed depressions, and internal alignments designating different use areas. Cupboards are also present in both permanent habitation and temporary habitation structures.

6.2.7.3 Single versus Multiple Components

Of the 10 permanent habitation sites, three sites are single-structure sites and seven are multiple-structure sites comprising between two and five structures.

Seven of the sites (26284, 26314, 26335, 26348, 26350, 26381, and 26389) are interpreted solely as permanent habitation in usage. Less than half (42.9%) of these solely permanent habitation sites are single-structure sites while the majority (57.1%) are complexes ranging between two and five structures. These non-habitation components include agriculture, animal husbandry, markers, quarrying, possible burials, and storage.

6.2.7.4 Distribution of Permanent Habitation

All of the permanent habitation sites within the project area are located on the *pāhoehoe* flow that dominates the majority of the project area. All but two of the permanent habitation sites are located above 400 ft a.m.s.l., which represents a similar percentage to the amount of the temporary habitation sites above 400 ft a.m.s.l. All 11 of the permanent habitation sites are located within Kohanaiki Ahupua'a.

6.2.8 Indeterminate

A total of five sites within the project area, or 4.1%, in part or whole, lacked characteristics that would, upon field inspection, help to determine function (sites 26279, 26294, 26306, 26345/B, 26375/B). These sites have therefore been listed as "indeterminate." Of the five sites, one is a modified tumulus (26279), one is a wall (26294), two are modified outcrops (26306, 26375/B), and one is a lava tube (26345/B). Test excavations were conducted at four of the sites (26279, 26306, 26345/B, 26375/B) to determine if a burial was present, and no burials or cultural material were present. The fifth site (26294) consists of two parallel linear boulder alignments/low walls and lacks any excavation potential whatsoever.

6.2.9 Marker

Four sites and five features within the project area are considered to function as markers. They consist of eight cairns (sites 26295, 26302/A, 26302/B, 26312, 26322, 26331/C, 26334/D, 26352, 26353) and a historic survey control marker (Site 20741).

Site 26295 has no evidence of habitation, burial, or other associated activities. Site 26302/A and 26302/B are at the northern edge of an 'a'ā flow where the site borders *pāhoehoe* bedrock. Site 26312 is located atop a naturally fractured *pāhoehoe* outcrop that is elevated above the surrounding ground. Site 26322 likely indicates a nearby habitation site (26321 is within 40 m / 131.1 ft.). Site 26331/C is within a permanent habitation complex and may be a *kuahu*, or ritual marker based on its reddish interior cobbles. Site 26334/D marks a temporary habitation lava tube system just south of the current end of Huliko'a Drive. Site 26352 is on top of a raised, thin 'a'ā flow that borders the southwest edge of a raised *pāhoehoe* outcrop. The marker is similar in size and prominence to 26322, 200 m *makai*, and there is a possibility that they are the only remnants of a trail.

One additional marker is adjacent to the *mauka/makai* trail, site 26353 and the historic *ahupua'a* wall, site 10712. This cairn was probably placed to mark the transition from 'a'ā to a *pāhoehoe* exposure, though its style and placement on a small, flat rise could lead one to conclude that it could also be a historic survey marker.

A prominent outcrop at Site 20741, a permanent habitation, was reused a survey control marker in modern times and it is believed to also be the survey control "Kumuohe" indicated on Emerson's RM 1449 dating to 1888.

6.2.10 Quarrying

Seven sites in the project area (26286, 26291/B, 26310/D, 26317, 26344/F, 26345, 26375), in part or in whole, appear to have been utilized as quarry areas for scoria. Site 26286 is comprised of four features that have evidence of quarrying or have sections of bedrock that have been removed and were apparently transported elsewhere. Five quarry features (26291/B, 26310/D, 26317, 26345, and 26375) are part of sites that contain non-quarrying components. Three of these features (26291/B, 26310/D, 26317) are located within habitation sites while sites 26345 and 26375 both contain indeterminate function features. One site (26286) is within the vicinity of habitation sites. Approximately 50 m separates sites 26375 and 26310/D and a trail, site 26371, is to the southeast but does not appear to run between the sites.

Evidence of quarrying is indicated by the removal the outer crust of a *pāhoehoe* tumulus and the layer of high to medium grade scoria. Quarrying activities do not appear to have been extensive and there is no evidence of further processing of the quarried material (i.e. abrader basins or partially worked pieces of scoria). Based on the quality of the scoria and the lack of evidence of extensive quarrying it is believed that the activities represent a localized (*ahupua'a*) exploitation of a resource for local consumption.

6.2.11 Storage

The majority of storage features in the project area are believed to have been utilized for articles associated with habitation activities. Some cupboards are also found in relation to ceremonial sites. In most cases, the cupboards were part of a larger feature in which they were described and so do not have their own designation. This includes sites such as 26284, 26307, 26354, 26286, 26315. Two sites were found to

Only one site within the project area has been designated as primarily storage (site 26386), a series of cupboards in a low *ā'ā* flow in the northeast quadrant of the project area. One other site contains a feature that has been designated as storage function (26348/D). Both of these storage functions are in association with the permanent habitation complex of site 26348.

6.2.12 Transportation

Transportation refers to the project area's 17 trail segments within 14 sites, and is the second greatest number of sites with the same primary function. As stated previously, this is a common site type within the Kekaha region in general and one of the more prevalent types specific to the Intermediate Zone. The trails or trail segments observed indicate a network of transportation corridors, composed primarily of widespread, short cross-slope trails, in many cases located only as a remnant trail segment. *Mauka-makai* running trails are also present, but are generally short

and often also remnants, their origins and destinations somewhat unclear. This is especially true where trails shortly assume a route primarily on *pāhoehoe* where it rarely can be traced. Outside of this general pattern, there are two particularly interesting areas regarding trails: one near the center of the project area where multiple trails converge, the other near the southeast corner of the project area where a well defined, historic trail descends off the 'a'ā flow.

Six trails (26361, 26382, 26359, 26353, 26340) converge near the makai center of the project area. Here, 26353, a combination *pāhoehoe* exposure and slab trail on 'a'ā, is the longest running *mauka-makai* trail identified. The presence of numerous, tightly spaced cross slope trails coming from both Kohanaiki (26340) and Kaloko (26361, 26382, 26359) are highly suggestive that 26353 was an important route. It's relationship to the *ahupua'a* boundary mirrors that shown on some historic maps (RM 1449 c1888, 1928 USGS/Territory of Hawaii) and is probably an older route that was generally still in use at the time of production of these maps. It seems highly likely that in the locality of the converging trails, that the cross-slope *pāhoehoe* slab trails would have become less used during mid-late post-contact times and that the older route over the stepping stones at 26253 would likely undergo small adjustments such as redirection off of the 'a'ā flow to better accommodate pack animals or live stock. No redirected route was observed, but it seems most likely to have moved to the *pāhoehoe* where it is hard to trace and there are multiple bulldozer roads in the area that likely obscured any evidence.

The only clearly historic trail in the project area was located in the southeast corner of the project area. Site 26731 is a wide, curbstone trail over 'a'ā that utilizes constructed causeways to cross low-lying areas in the flow. It descends from the 'a'ā to the northwest onto *pāhoehoe* where it is no longer present. To the southeast it is cut by Hina Lani Street, but continues across the street in TMK: [3] 7-3-009:028, also surveyed under CSH Job Code KOHAN 1. Presently, there is not good evidence of how far the trail ran off the 'a'ā, but its relative position across the back of the large 'a'ā flow dominating lower Kaloko matches the trail indicated on RM 1280. Because there are numerous bulldozer roads across this end of the 'a'ā flow, some of these may have traced the route shown on the map, and 26731 is another trail, perhaps related to ranching activity found in the *mauka* extents of the project area and concentrated at the other end of the trail in Parcel 28.

All trail routes located in the project area were almost entirely only identified on 'a'ā flows. Following trails on the *pāhoehoe* lava was particularly problematic. The *pāhoehoe* flow generally negates the necessity of constructing a substantial trail structure for foot trails. Additionally, grass and *koa haole* growth is thickest on the *pāhoehoe* terrain; this, in combination with the lack of trail structure, makes identifying specific trail alignments on the *pāhoehoe* lava essentially impossible. Thus, determining trail origin or destination is speculative at best. However, while not definitive, both of these areas of particular interest do show similarities to trails or roads shown on historic maps.

6.2.13 Water Collection Activity Area

During the inventory survey three sites, or 2.4 percent of the total sites, were considered to function, in whole or part, as water collection activity areas (State sites 26289/D, 26290/A, 26290/D, 26319). Three features are within temporary habitation sites (26289/D, 2626290/A, 26290/D) and one site, consisting of four features, is a water collection area (26319). Multiple lava tube habitation sites also contained isolated water collection activity features.

Small informal concentrations of cobbles and small boulders in lava tubes are indicative of water collection activity areas. Lava tubes containing these features generally have high humidity and water drips are often evident on the ceiling. The rock concentrations were placed to hold a container, often a bottle gourd, upright to collect the falling water drops. No gourds were found in place in the project area, nor were any other containers such as wooden bowls or carved logs.

The story of Ko'amokumokuohe'eia and historic newspaper articles translated by Kepā Maly (see above Mythological and Traditional Accounts) suggest that water collection was very important in the Kekaha region, and the three formal water collection sites mentioned above appear to fit very closely with the type of activity described in these accounts. Differences in the size and formality of water collection features may be attributable to varying sizes of containers used, i.e., gourds versus carved logs.

Water catchment features within the project area are usually found in moist lava tubes (high humidity) that have water dripping from the ceiling, but are generally not found in lava tubes with excessively stale air. In some water collection lava tubes, charcoal is often associated with water collection features. The charcoal has been identified as charred *kukui* nut (also known as candle nut) that almost certainly were used as a light source during collection of water vessels. Other associated features include small cairns in the lava tube that likely directed water collectors to the tube exits.

6.3 Site Distribution

The distribution of sites, like the types and functions, generally correlate with expectations for the Intermediate Zone. Notably, however, there was considerably more habitation sites than was expected. In general, there is a clear preference of *pāhoehoe* terrain over 'a'ā terrain in terms of site location. The 'a'ā tends to display features such as trails, habitation, and storage sites and generally the elevated flows likely create separation and distinction for certain ceremonial sites.

Sites are fairly evenly distributed *mauka/makai* within the project area, with habitation and burial site location apparently more dependent on the choice of a natural geological feature for utilization than a particular elevation. The most commonly utilized geological feature is lava tubes. The tubes are quick shelter and require little investment to use for temporary habitation. Perhaps most importantly they provide water from humid areas. Small ridges are also a heavily used geographic feature that attracts habitations. The cluster of habitation sites just south and just east of the top of Huliko'a Drive is perhaps the best and most surprising example of dense habitation in the project area. Because many of the sites are close together, it seems reasonable to conclude that many, though probably not all, the structures were in use contemporaneously. If not used contemporaneously in this area, it is difficult to understand why so many enclosures were constructed, instead of modifying existing structures.

Perhaps the most notable distinction in site distribution is the difference in site type densities between the *ahupua'a*. Very few enclosures were located in Kaloko, but there is naturally many more lava tubes that were almost without exception utilized. Kohanaiki, on the other hand, does not have large tubes and has relatively few altogether. Of those observed, they are generally dryer than those in Kaloko. As a result, there would have been a considerable difference in water availability in the two *ahupua'a* at these elevations. Interestingly, the number of enclosures in

Kohanaiki is in sharp contrast to Kaloko, with several permanent habitation sites and the relatively dense area of habitation around the top of Huliko'a Drive. Though there are few lava tubes to collect water in, the intensive apicultural site near the northern edge of the project area is the best evidence that many of these Kohanaiki habitations were well populated. It stands to reason that it is likely that several families lived seasonally in the area, perhaps more often. It also seems likely that survivors of disease epidemics after contact made the shortest move possible, to the Kohanaiki Homesteads established along the government road (Māmalahoa Highway) 2.4 kilometers or 1.4 miles directly upslope.

6.4 Conclusions

In conclusion, the site/feature types and functions correlate with the anticipated finds for the region and zone within which the project area lies. Habitation sites have been interpreted as temporary and permanent sites. Burials, trails, and lithic resource procurement are documented site types within the Intermediate Zone of the Kekaha region and are present within the project area. Agricultural sites/features are also present but represent opportunistic productivity versus the type of full scale land modification for intensive productivity at higher elevations (i.e. upland zone). *Mauka/makai* transportation through the center of the project area is suggested by the trail (26353) adjacent to the historic *ahupua'a* wall (10712) on the boundary of Kohanaiki and Kaloko.

Most of the recorded sites in the project area are presumed to be pre-contact, with some historic period activity. Based on historic information, goat and cattle and grazing was the main form of land use during the historic to modern era.

Section 7 Significance Assessments

7.1 Significance Assessments

A total of 121 sites of varied archaeological significance are present in the project area. Individual site significance and recommended treatment are specified in Table 13. Sites were evaluated for significance according to the broad criteria established for the National and State Registers. 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 121 sites with the project area all meet Criterion D and 104 sites (86%) are considered solely to meet Criterion D. Ten sites were interpreted as additionally conforming to Criterion C, and nine additionally conform to Criterion E. No sites were found to meet Criterion A or B.

For a breakdown by site, please see Table 13 on the following page.

Table 13. Significance Assessments and Recommendations

SIHP No. (50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
10712		Wall	Animal Husbandry	D	Historic	Preserve
20741		Complex	Temporary Habitation	C, D	Pre-Contact	Preserve
26275		Complex	Permanent Habitation	C, D, E	Pre-Contact	Preserve
26276		Modified depression	Temporary Habitation	D	Pre-Contact	No Further Work
26277		Complex	Temporary Habitation	D	Pre-Contact	Data Recovery
26278		Trail	Transportation	D	Pre-Contact	No Further Work
26279		Modified outcrop	Indeterminate	D	Pre-Contact	No Further Work
26280		Lava blister	Temporary Habitation	D	Pre-Contact	No Further Work
26281		Mounds	Agriculture	D	Pre-Contact	No Further Work
26282		Lava blister	Temporary Habitation	D	Pre-Contact	No Further Work
26283		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26284		Complex	Permanent Habitation	C, D	Pre-Contact	Preserve
26285		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26286		Activity Area	Quarry	D	Pre-Contact	No Further Work
26287		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26288		Complex	Temporary Habitation	C, D	Pre-Contact	Preserve
26289		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26290		Lava tube	Burial	D, E*	Pre-Contact	Preserve
26291		Lava tube	Temporary Habitation/Quarry	D	Pre-Contact	Data Recovery
26292		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26293		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26294		Wall	Indeterminate	D	Pre-Contact/ Historic	No Further Work
26295		Cairn	Marker	D	Pre-Contact	No Further Work
26296		Enclosure	Permanent Habitation	C, D	Pre-Contact/ Historic	Preserve
26297		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery

SIHP No. (50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
26298		Platform	Temporary Habitation	D	Pre-Contact	No Further Work
26299		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26300		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26301		Terrace	Temporary Habitation	D	Pre-Contact	No Further Work
26302		Cairn	Marker	D	Pre-Contact	No Further Work
26303		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26304		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26305		Modified outcrop	Temporary Habitation	D	Pre-Contact	No Further Work
26306		Modified outcrop	Indeterminate	D	Pre-Contact	No Further Work
26307		Complex	Ceremonial	C, D, E	Pre-Contact	Preserve
26308		Enclosure	Temporary Habitation	D	Historic	No Further Work
26309		Complex	Temporary Habitation	D	Pre-Contact	No Further Work
26310		Lava tube	Complex	D, E*	Pre-Contact	Preserve
26311		Lava tube	Burial	D, E*	Pre-Contact	Preserve
26312		Cairn	Marker	D	Pre-Contact	No Further Work
26313		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26314		Enclosure	Permanent Habitation	D	Pre-Contact	No Further Work
26315		Complex	Temporary Habitation	D	Pre-Contact	Data Recovery
26316		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26317		Lava tube	Temporary Habitation/Quarry	D	Pre-Contact	No Further Work
26318		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26319		Lava tube	Activity Area	D	Pre-Contact	No Further Work
26320		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26321		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26322		Cairn	Marker	D	Pre-Contact	No Further Work
26323		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26324		Lava tube	Temporary Habitation	D, E**	Pre-Contact	Preserve
26325		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work

SIHP No. (50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
26326		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26327		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26328		Platform	Temporary Habitation	D	Pre-Contact	Data Recovery
26329		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26330		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26331		Complex	Permanent Habitation	C, D	Pre-Contact	Preserve
26332		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26333		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26334		Complex	Temporary Habitation	D	Pre-Contact	Data Recovery
26335		Enclosure	Permanent Habitation	D	Pre-Contact	No Further Work
26336		Trail	Transportation	D	Pre-Contact	No Further Work
26337		Complex	Temporary Habitation	D	Pre-Contact	Data Recovery
26338		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26339		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26340		Trail	Transportation	D	Pre-Contact	No Further Work
26341		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26342		Lava tube	Temporary Habitation	D	Pre-Contact/ Historic	Data Recovery
26343		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26344		Complex	Permanent Habitation	D	Pre-Contact	Data Recovery
26345		Modified outcrop/Lava tube	Complex	D	Pre-Contact	No Further Work
26346		Trail	Transportation	D	Pre-Contact	No Further Work
26347		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26348		Complex	Permanent Habitation	C, D	Pre-Contact	Preserve
26349		Complex	Temporary Habitation	D	Pre-Contact	Data Recovery
26350		Complex	Permanent Habitation	C, D	Pre-Contact	Preserve
26351		Lava blister	Temporary Habitation	D	Pre-Contact	No Further Work

SIHP No. (50-10-27-	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
26352		Cairn	Marker	D	Historic	No Further Work
26353		Trail	Transportation	D, E	Pre-Contact	Preserve
26354		Complex	Temporary Habitation	D	Pre-Contact	Data Recovery
26355		Trail/Wall	Transportation	D	Pre-Contact/ Historic	No Further Work
26356		Lava blister	Temporary Habitation	D	Pre-Contact	No Further Work
26357		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26358		Unknown/Bulldozed	Habitation/Indeterminate	D	Pre-Contact	No Further Work
26359		Trail	Transportation	D	Pre-Contact	No Further Work
26360		Wall	Animal Husbandry	D	Historic	No Further Work
26361		Trail	Transportation	D	Pre-Contact	No Further Work
26362		Lava tube	Burial	D, E*	Pre-Contact	Preserve
26363		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26364		Lava tube	Temporary Habitation	D, E	Pre-Contact	Preserve
26365		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26366		Wall	Animal Husbandry	D	Historic	No Further Work
26367		Enclosure	Animal Husbandry	D	Historic	No Further Work
26368		Trail	Transportation	D	Pre-Contact	No Further Work
26369		Trail	Transportation	D	Pre-Contact	No Further Work
26370		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26371		Trail	Transportation	D	Historic	No Further Work
26372		Trail	Transportation	D	Pre-Contact	No Further Work
26373		Lava tube	Temporary Habitation	D	Pre-Contact/ Historic	Data Recovery
26374		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26375		Modified outcrop	Complex	D	Pre-Contact	No Further Work
26376		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26377		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work

SIHP No. (50-10-27-)	Feature	Site Type	Function	Significance	Age	Mitigation Recommendation
26378		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26379		Complex	Temporary Habitation/ Agriculture	D	Pre-Contact	Data Recovery
26380		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26381		Enclosure	Permanent Habitation	C, D	Pre-Contact	Preserve
26382		Trail	Transportation	D	Pre-Contact	No Further Work
26383		Enclosure	Temporary Habitation	D	Pre-Contact	No Further Work
26384		Lava tube	Temporary Habitation	D	Pre-Contact	No Further Work
26385		Mounds	Temporary Habitation	D	Pre-Contact	No Further Work
26386		Modified outcrop	Activity Area	D	Pre-Contact	No Further Work
26387		Modified outcrop	Activity Area	D	Pre-Contact	No Further Work
26388		Lava tube	Temporary Habitation	D	Pre-Contact	Data Recovery
26389		Enclosure	Permanent Habitation	D	Pre-Contact	Data Recovery
26390		Lava Blister	Temporary Habitation	D	Pre-Contact	No Further Work
26391		Lava Tube	Temporary Habitation	D	Pre-Contact	No Further Work
26392		Mound	Agriculture	D	Pre-Contact	No Further Work
26393		Mound	Agriculture	D	Pre-Contact	No Further Work

* Site contains confirmed human remains

** Site contained human remains removed by a previous study (Kennedy 1983/1984)

Section 8 Project Effect and Mitigation Recommendations

8.1 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 less concern due to the extensive industrial/commercial developments separating the project area from the potential sites there.

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. However, due to the situation of the parcel on the slope immediately overlooking the park, there is a significant additional potential effect.

Because this report represents one of four parcels which CSH was contracted to survey (under CSH job code KOHAN 1), there is significant potential for development to affect historic properties outside of the project area as it has been defined for the purposes of the report – in those other parcels. All of these parcels are included in our client's project plans, suggesting development is just as likely for each parcel. Therefore the effect on historic properties in the present project area will be greatest by the development inside the respective parcel. Detailed consideration for one project area of the CSH KOHAN 1 survey affecting another is not undertaken here.

8.2 Mitigation Recommendations.

It is recommended that of the 121 sites in the project area, 29 sites (24%) be subjected to a program of data recovery to address scientific and informational concerns and 18 sites (15%) be preserved (see Figure 428). The remaining 76 sites are not recommended to undergo further research, as the documentation and plotting of location during the current study has addressed the limited information available at these sites.

In consultation with SHPD and concerned community, it is also recommended that limited data recovery be considered for all preserved sites, to focus on improving documentation and conducting further photography. It is believed that improving documentation before preservation could help mitigate possible vandalism, rock robbing or looting. Also in the case of sites where it is not feasible to create public or descendant access due to site sensitivity or safety concerns, a more detailed record will be available.

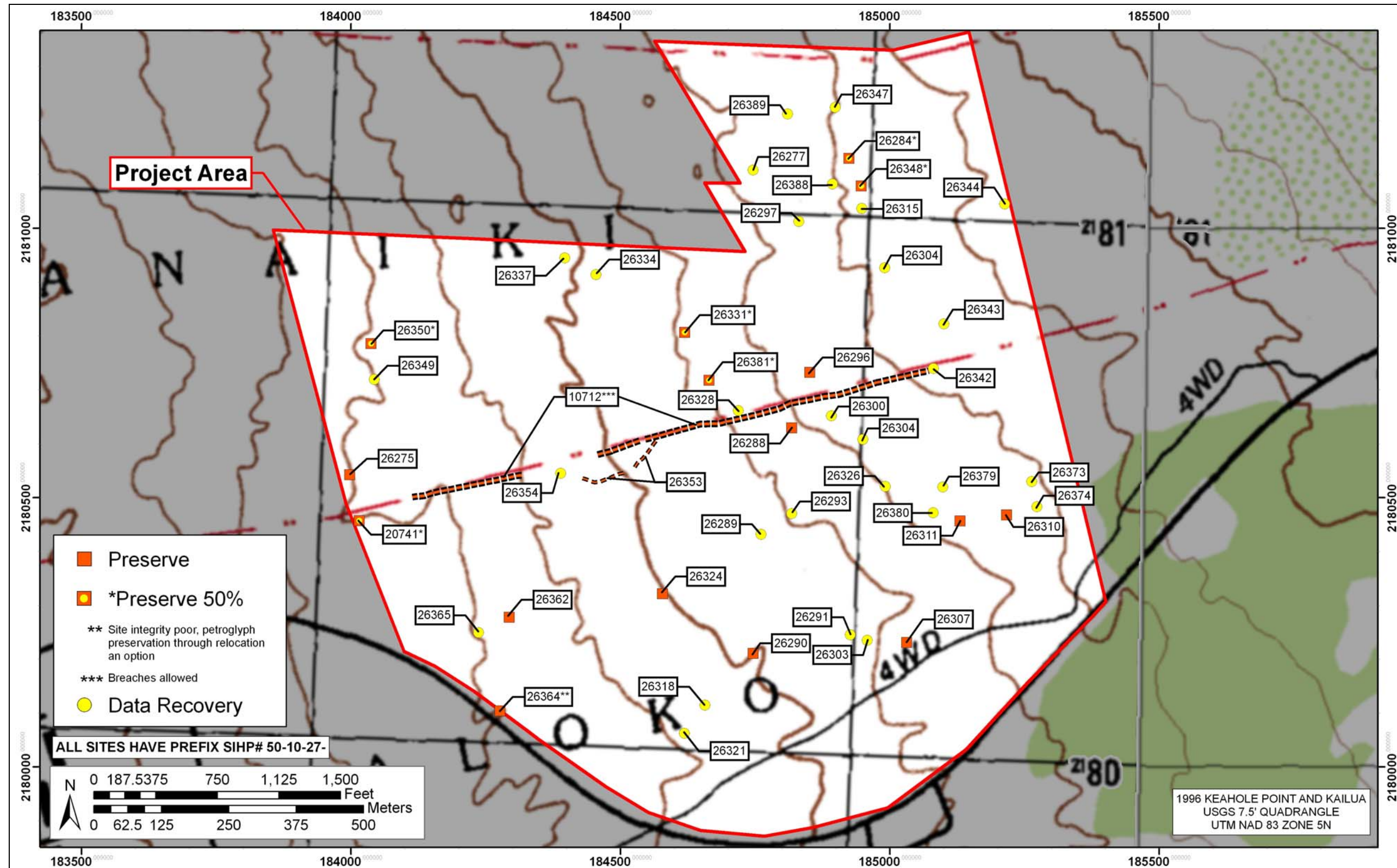


Figure 428. Portion of USGS topographic map showing the locations of historic properties recommended for data recovery and preservation

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.

8.2.1 Data Recovery

Twenty-nine (29) sites (see Table 14) are recommended for data recovery and should be subjected to further documentation and, if feasible, excavation to address scientific and information interests. Data recovery should proceed in accordance with a data recovery plan that is to be submitted to DLNR State Historic Preservation Division for review and approval.

The sites selected for data recovery include those sites with the most formal construction and the largest cultural deposits. In this project area this results in a close focus on temporary habitation, both in lava tubes and on the surface. Most permanent habitations are currently recommended for preservation.

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 to 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.

Table 14. Historic Properties Recommended for Data Recovery

SIHP # 50-10-27	Site Type	Function	Significance	Age
26277	Complex	Temporary Habitation	D	Pre-Contact
26289	Lava tube	Temporary Habitation	D	Pre-Contact
26291	Lava tube	Temporary Habitation/Quarry	D	Pre-Contact
26293	Lava tube	Temporary Habitation	D	Pre-Contact
26297	Lava tube	Temporary Habitation	D	Pre-Contact
26300	Lava tube	Temporary Habitation	D	Pre-Contact
26303	Lava tube	Temporary Habitation	D	Pre-Contact
26304	Lava tube	Temporary Habitation	D	Pre-Contact
26315	Complex	Temporary Habitation	D	Pre-Contact
26318	Lava tube	Temporary Habitation	D	Pre-Contact
26321	Lava tube	Temporary Habitation	D	Pre-Contact
26326	Lava tube	Temporary Habitation	D	Pre-Contact
26328	Platform	Temporary Habitation	D	Pre-Contact
26334	Complex	Temporary Habitation	D	Pre-Contact
26337	Complex	Temporary Habitation	D	Pre-Contact
26341	Lava tube	Temporary Habitation	D	Pre-Contact
26342	Lava tube	Temporary Habitation	D	Pre-Contact/ Historic
26343	Lava tube	Temporary Habitation	D	Pre-Contact
26344	Complex	Permanent Habitation	D	Pre-Contact
26347	Lava tube	Temporary Habitation	D	Pre-Contact
26349	Complex	Temporary Habitation	D	Pre-Contact
26354	Complex	Temporary Habitation	D	Pre-Contact
26365	Lava tube	Temporary Habitation	D	Pre-Contact
26373	Lava tube	Temporary Habitation	D	Pre-Contact/ Historic
26374	Lava tube	Temporary Habitation	D	Pre-Contact
26379	Complex	Temporary Habitation/ Agriculture	D	Pre-Contact
26380	Lava tube	Temporary Habitation	D	Pre-Contact
26388	Lava tube	Temporary Habitation	D	Pre-Contact
26389	Enclosure	Permanent Habitation	D	Pre-Contact

8.2.2 Preservation

Eighteen (18) sites in the project area recommended for preservation (see Table 15). Of these, six (6) habitation sites are considered more flexible and are recommended for further consideration and consultation to be finalized before acceptance of a preservation plan (see those sites marked with a “†” in Table 15). It is recommended that considerations for the preservation of these sites be detailed in an archaeological preservation plan approved by the State Historic Preservation Division.

Though it would be archaeologically preferable to preserve all six of these habitation sites, the information they contain can be able to be addressed through extensive data recovery and preservation of each is not deemed necessary. However, in order to maintain a representative sample of sites in the project area some should be preserved. Further, because of the number of sites recommended for preservation, we are concerned about the ability to preserve all the sites in a manner that is accessible to the public. It is recommended that at least half of these sites be preserved, resulting in a minimum of 15 sites preserved in the project area (changing data recovery total to 32). However, these sites could also be considered a potential amenity for the proposed residential neighborhood. They speak to the history of the locale, creating a uniqueness that cannot be engineered into an urban area. One option might be to voluntarily preserve some of these habitation sites on lots that would appeal to home owners who are interested in history and would perceive this as value added to their property. The recommendation would thus be interim preservation with an option to pursue data recovery at the landowner's discretion.

Site 26364 is a lava tube that was largely destroyed by the construction of Hina Lani Street and its integrity is very poor. However, there is a petroglyph at the entrance to the tube, which should be preserved. Due to the disturbed nature of the site, it is an option to relocate the bedrock slab with the petroglyph.

Table 15. Historic Properties Recommended for Preservation

SIHP # 50-10-27	Site Type	Function	Significance	Age
10712 ¹	Wall	Animal Husbandry	D	Historic
20741 [†]	Complex	Temporary Habitation	C, D	Pre-Contact
26275	Complex	Permanent Habitation	C, D, E	Pre-Contact
26284 [†]	Complex	Permanent Habitation	C, D	Pre-Contact
26288	Complex	Temporary Habitation	C, D	Pre-Contact
26290	Lava tube	Burial	D, E*	Pre-Contact
26296	Enclosure	Permanent Habitation	C, D	Pre-Contact/ Historic
26307	Complex	Ceremonial	C, D, E	Pre-Contact
26310	Lava tube	Complex	D, E*	Pre-Contact
26311	Lava tube	Burial	D, E*	Pre-Contact

26324	Lava tube	Temporary Habitation	D, E**	Pre-Contact
26331 [†]	Complex	Permanent Habitation	C, D	Pre-Contact
26348 [†]	Complex	Permanent Habitation	C, D	Pre-Contact
26350 [†]	Complex	Permanent Habitation	C, D	Pre-Contact
26353	Trail	Transportation	D, E	Pre-Contact
26362	Lava tube	Burial	D, E*	Pre-Contact
26364 ^{††}	Lava tube	Temporary Habitation	D, E	Pre-Contact
26381 [†]	Enclosure	Permanent Habitation	C, D	Pre-Contact

[†] Historic ranching wall is recommended for preservation with breaches allowed in consultation with SHPD

[†] Site is recommended for preservation, but is more flexible than those not indicated with a cross. Substantive data recovery may alternatively address some of these sites, such as those most difficult to plan around or least likely to be accessible to the public, but at least half of these sites are recommended to ultimately be preserved.

^{††} Site has very poor integrity, petroglyph could be removed and preserved elsewhere

* Site contains confirmed human remains

** Site contained human remains removed by a previous study (Kennedy 1983/1984)

8.3 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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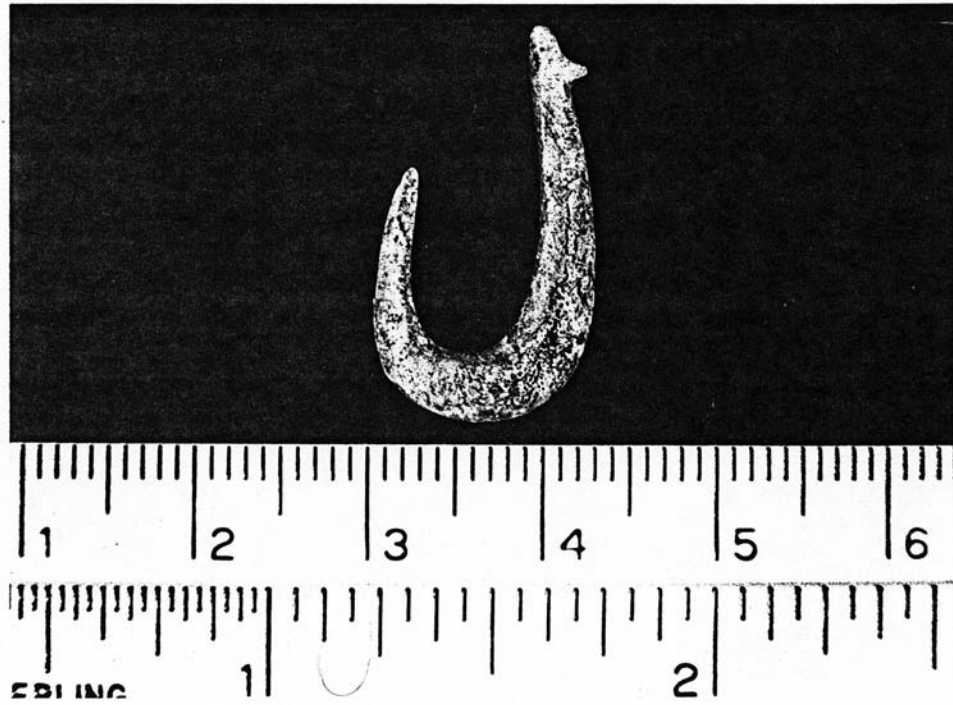
Yen, D. E.

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Appendix A Kennedy (1984) Photos

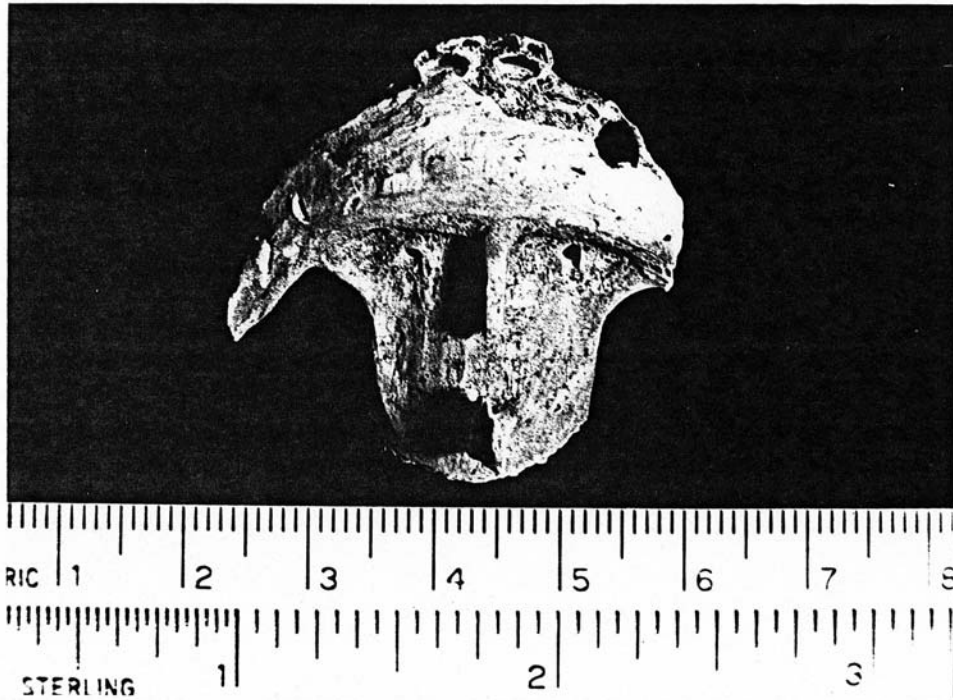
Kennedy's (1984) *An Intensive Archaeological Survey for the Proposed Kaloko Golf Course, Kaloko, North Kona, TMK 7-3-09: por. 17*, for the then-proposed Kaloko Golf Course project reported on an excavation and burial within his site 22 (present SIHP 50-10-27-26324/A). The burial included human teeth and a human skull fragment that were presumed to be from the same young adult (Kennedy 1984:50, 57). See a current description of the site on page 256.

The following photos are from the excavation of site 22 (present SIHP 50-10-27-26324/A) (Kennedy 1984:44-53).



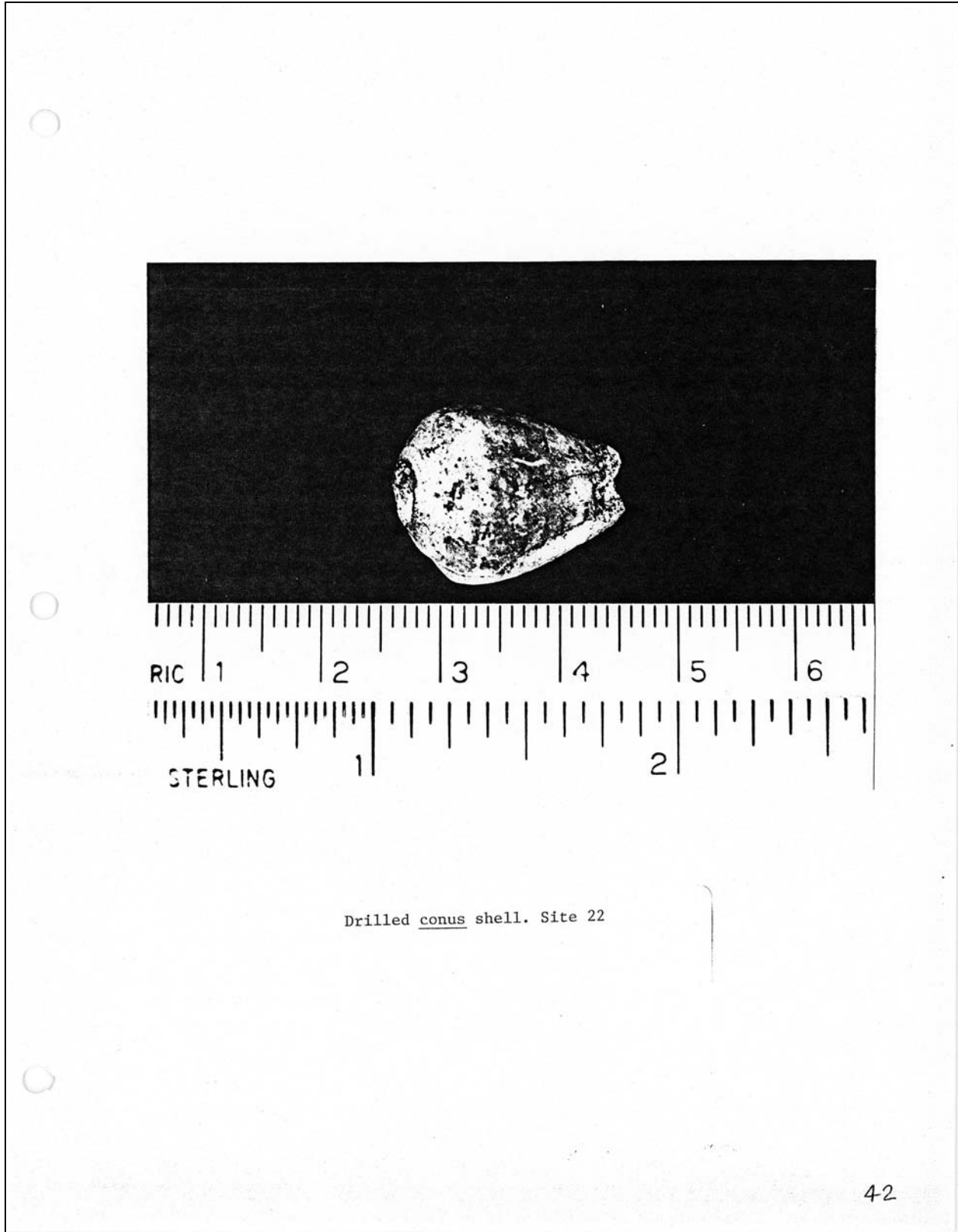
Rotating type fishhook. Site 22

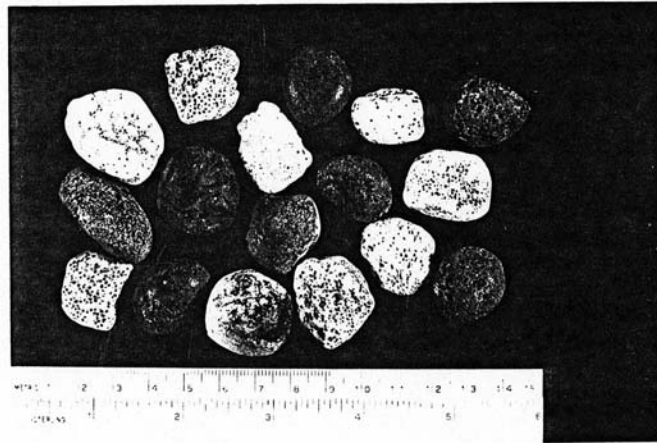
53



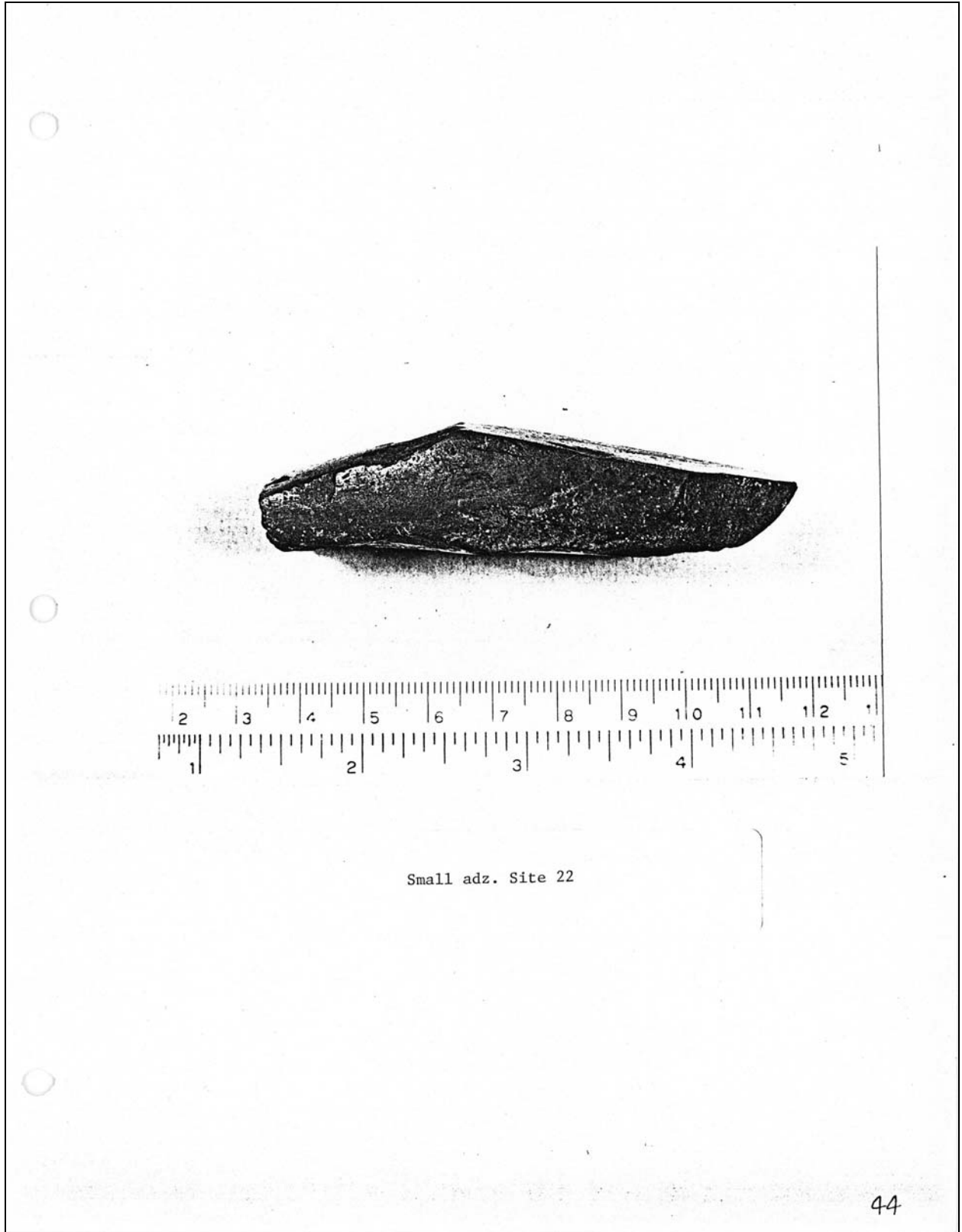
uhu palate. Site 22

4-1



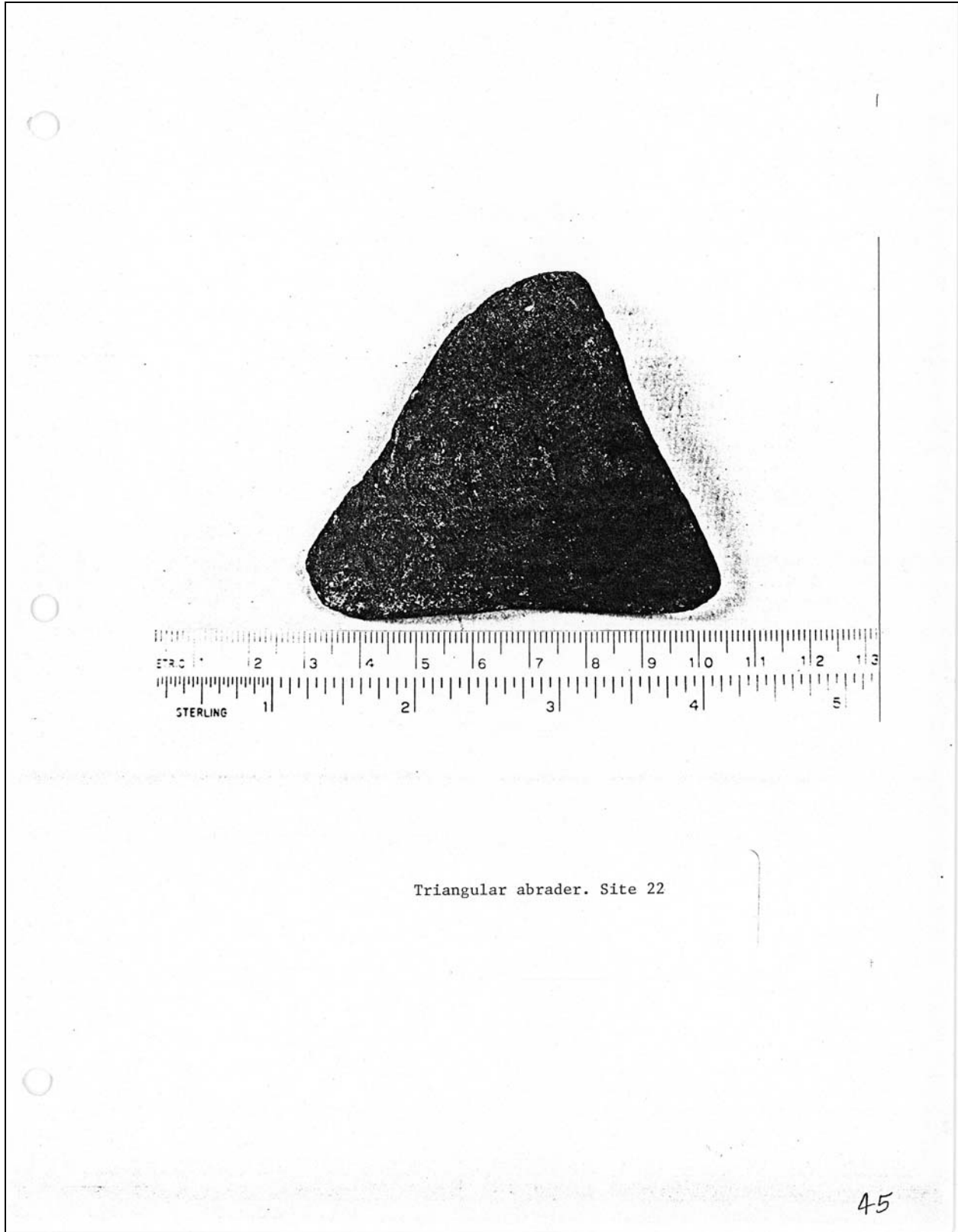


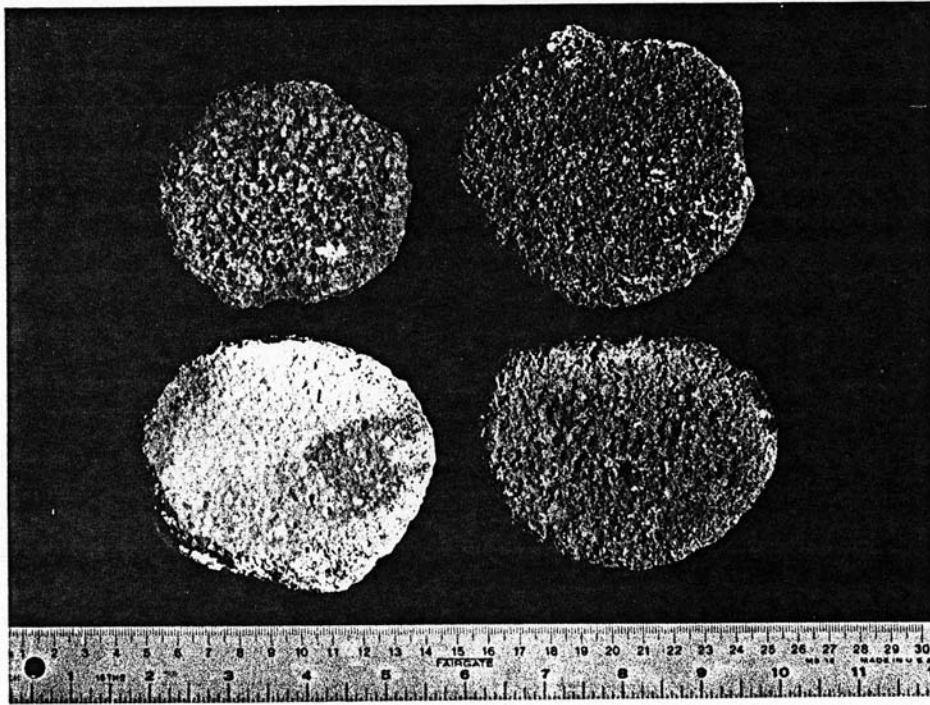
Water-worn stone, coral and basalt.
Possible game stones. Site 22



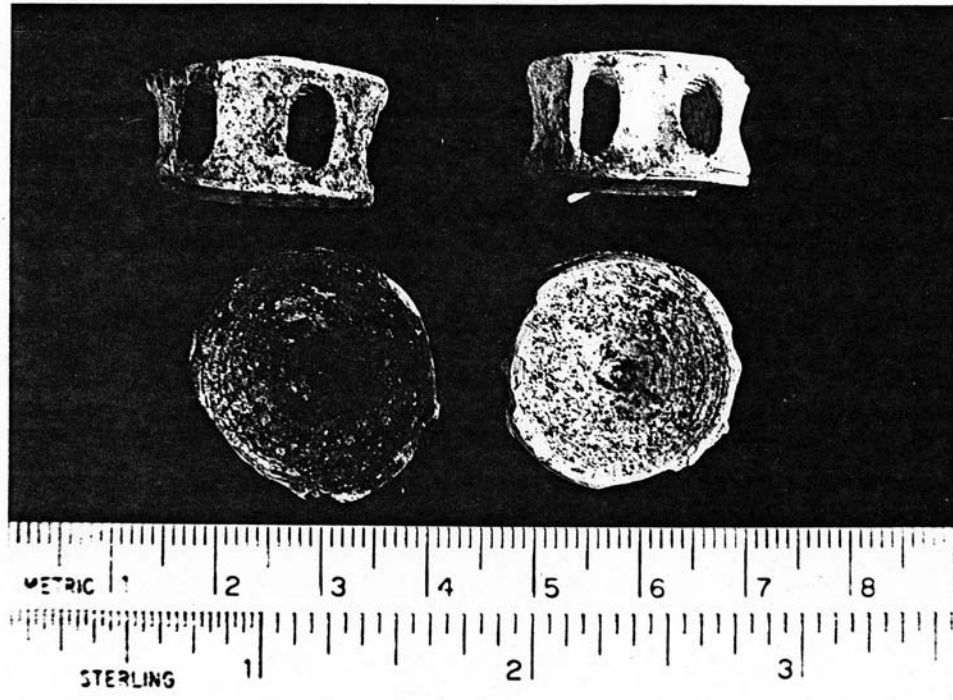
Small adz. Site 22

44





Worked lava discs. Site 22

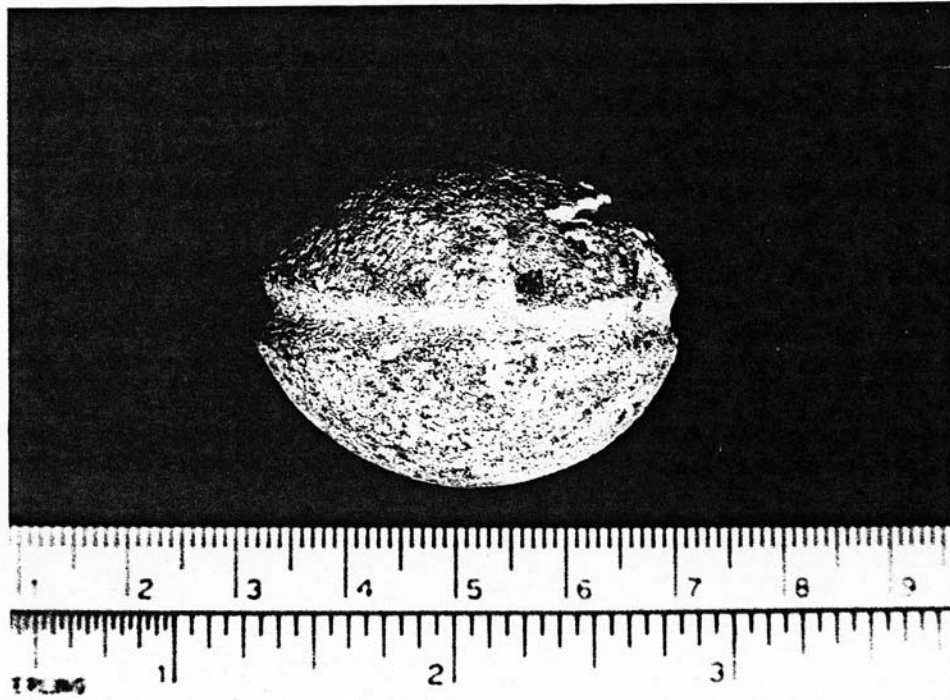


Shark vertebrae. Site 22 .



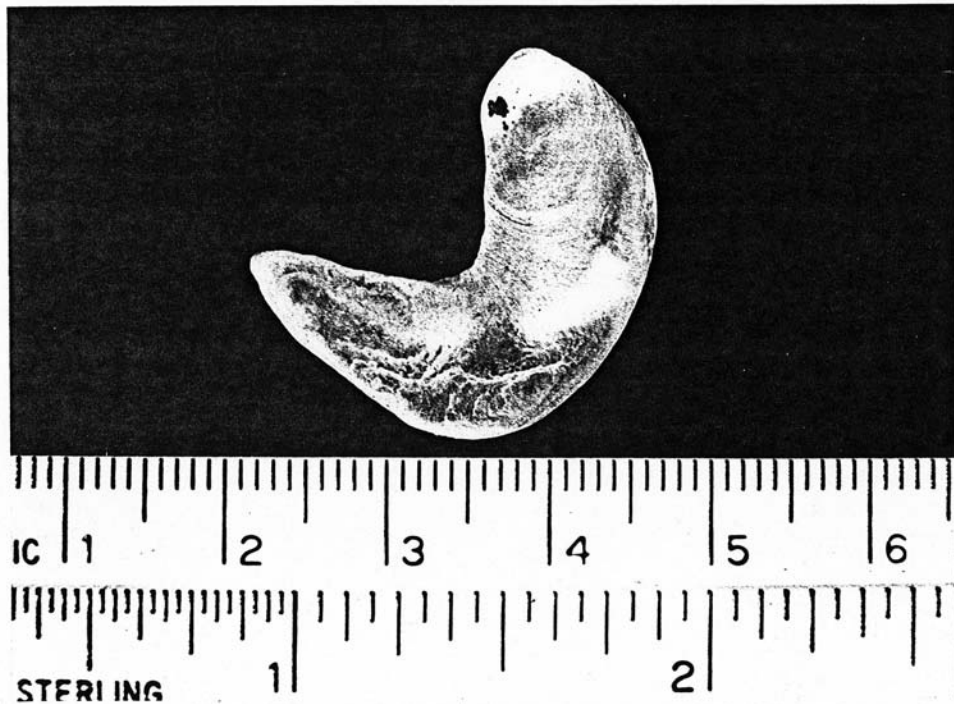
Worked bone picks. Site 22

48



Coffee bean type net sinker. Site 22

49



Pearl shell fishhook blank. Site 22

51

Appendix B Temporary Field Numbers

SIHP No. (50-10-27-	CSH Temporary Field No.
10712	07-029
20741	48 (temporary site # from Colin et al. 1996)
26275	07-002
26276	07-003
26277	07-013
26278	07-015
26279	07-018
26280	07-019
26281	07-020
26282	07-022
26283	07-023
26284	07-024
26285	07-025
26286	07-026
26287	07-027
26288	07-031
26289	07-033
26290	07-036
26291	07-043
26292	07-045
26293	07-047
26294	07-049
26295	07-050
26296	07-051
26297	07-053
26298	07-054
26299	07-055
26300	07-056
26301	07-059
26302	07-063
26303	07-065
26304	07-072
26305	07-074
26306	07-076
26307	07-077
26308	07-078
26309	07-081
26310	07-082

SIHP No. (50-10-27-	CSH Temporary Field No.
26311	07-083
26312	07-086
26313	07-087
26314	07-088
26315	07-089
26316	07-090
26317	07-091
26318	07-092
26319	07-093
26320	07-095
26321	07-100
26322	07-101
26323	07-102
26324	07-104
26325	07-105
26326	07-107
26327	07-112
26328	07-113
26329	07-115
26330	07-116
26331	07-117
26332	07-118
26333	07-120
26334	07-121
26335	07-122
26336	07-123
26337	07-124
26338	07-125
26339	07-126
26340	07-127
26341	07-128
26342	07-130
26343	07-132
26344	07-134
26345	07-136
26346	07-138
26347	07-141
26348	07-142
26349	07-144
26350	07-145
26351	07-146
26352	07-147

SIHP No. (50-10-27-	CSH Temporary Field No.
26353	07-150
26354	07-151
26355	07-152
26356	07-153
26357	07-156
26358	07-158
26359	07-159
26360	07-161
26361	07-162
26362	07-163
26363	07-164
26364	07-165
26365	07-166
26366	07-167
26367	07-168
26368	07-171
26369	07-173
26370	07-174
26371	07-175
26372	07-177
26373	07-178
26374	07-179
26375	07-180
26376	07-183
26377	07-185
26378	07-186
26379	07-189
26380	07-190
26381	07-191
26382	07-192
26383	07-193
26384	07-195
26385	07-197
26386	07-198
26387	07-199
26388	07-200
26389	07-201
26390	07-202
26391	07-203
26392	07-204
26393	07-205

