



# **NORTH HĀLAWA VALLEY: STEWARDSHIP MANAGEMENT PLAN**

HĀLAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT  
AND NĀ KŪPUNA A ME NĀ KĀKO'O O HĀLAWA, INC.

Prepared in fulfillment of Cooperative Agreement No. 2550.01 (2012)  
and OHA Memorandum of Agreement No. 20-01 (2020)

SEPTEMBER 2021

## **APPENDICES A-G**

## MEMORANDUM OF AGREEMENT

WHEREAS, the Federal Highway Administration, Hawaii Division (FHWA) has determined that construction of the proposed Interstate Route H-3, Halawa to Halekou Interchange, and the Kaneohe Loop Interchange, will have an adverse effect upon the Luluku Discontiguous Archaeological District, which has been determined eligible for inclusion on the National Register of Historic Places, and upon any as yet unidentified historic properties within inaccessible, unsurveyed portions of the corridor which may also be likely to be eligible, and has consulted with the Hawaii State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, officials of the State of Hawaii Department of Transportation (Hawaii DOT) and of the Office of Hawaiian Affairs (OHA) participated in the consultation and have been invited to concur in this Memorandum of Agreement (Agreement);

NOW, THEREFORE, the FHWA, the SHPO and the Council agree that the undertaking shall be implemented in accordance with the following stipulations to take into account the effect of the undertaking on the historic properties.

STIPULATIONS

FHWA shall ensure that the following measures are carried out in consultation with the Hawaii DOT, SHPO, OHA and the Council:

- A. Archaeological resource impact mitigations will be implemented in portions of properties within the Luluku Discontiguous Archaeological District that will be affected by highway construction, according to the two-part Mitigation Plan found in Attachment A.
  1. The Data Recovery Plan shall provide for data recovery from sites and/or features directly affected by highway construction to recover significant information from these sites and/or features prior to destruction. Archaeological excavations shall be designed to retrieve information from sites and/o. features to address research questions, which are specified in Attachment A, and provide a basis for future site interpretation.
  2. The Preservation Plan shall specify sites and features proposed for active and passive preservation.

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- B. An Interpretive Development Plan will be completed by the Hawaii DOT in consultation with the FHWA, SHPO and OHA, and shall address interpretive development of sites which will be selected after completion of the measures set forth in the Data Recovery Plan.
1. The Interpretive Development Plan shall address provisions for acquisition of access, on-site interpretation, maintenance, appropriate treatment of structural components, acquisition of water rights, financial responsibility and interpretive concerns.
  2. This plan shall be completed within 2 years after the completion of archaeological field work for use thereafter by the Federal, State, or City government which is authorized by law to carry out the activities described in the plan.
  3. Copies of the completed plan will be provided to the Hawaii Department of Land and Natural Resources, the City and County of Honolulu Department of Parks and Recreation, the Pacific Area Office of the National Park Service, and others identified during the development of the plan.
- C. Identification and treatment of historic properties, which may be found in presently unsurveyed portions of the H-3 road corridor, will proceed according to the attached Identification & Treatment Plan (Attachment B).
- D. Through pre-construction meetings and scheduled project personnel meetings, the FHWA and Hawaii DOT shall ensure that State project personnel and the contractors' workforce are sensitive to the cultural and research significance of archaeological properties associated with the H-3 project and are aware of the existence of Federal and State antiquity statutes, to help minimize the possibility of vandalism, inadvertent damage or theft of such properties.
- E. To ensure adequate archaeological monitoring of construction work, the Hawaii DOT shall incorporate Section 107.17(D), Archaeological and Paleontological Findings, State standardized special provisions, in all H-3 construction contracts (Attachment C).
- F. To prepare for the possibility that Native Hawaiian human burials and/or associated funerary objects are uncovered during archaeological or construction work which will require removal and reinterment, OHA shall prepare a Burial Treatment Plan acceptable to FHWA, Hawaii DOT, and the SHPO.

1. OHA agrees to complete this plan within 3 months after Council acceptance of this Agreement.
  2. Should such a plan not be submitted by OHA within the agreed upon time frame, the FHWA may develop and implement a plan in consultation with the SHPO.
  3. The plan shall be the result of a good faith effort to obtain the views of interested persons evincing cultural and traditional ties to the features or to the land in which the features are located. The plan shall provide methods for appropriate treatment of the human remains and associated funerary objects.
  4. All costs for the development of the Burial Treatment Plan will be borne by OHA, and as appropriate, the Hawaii DOT. All costs for the implementation of the plan will be borne by the FHWA and the Hawaii DOT.
- G. All archaeological work performed under this Agreement shall be directed by a professional archaeologist who meets the minimum qualifications set forth in the Department of the Interior's "Professional Qualifications" guide. (See Appendix C of Draft 36 CFR 66, at 42 FR 5382, 1/28/77.)
- H. All final archaeological reports resulting from actions pursuant to this Agreement shall be provided to the signatories to this Agreement and to the National Park Service for possible review in professional journals and possible submission to the National Technical Information Service. All such reports shall be responsive to contemporary professional standards identified in the Council's current Manual of Mitigation Measures and the Department of the Interior's "Format Standards for Final Reports of Data Recovery Programs." Precise locational data may be provided in a separate appendix if it appears that release of such information could jeopardize the integrity of archaeological sites.
- I. The SHPO shall designate an appropriate institution for the proper curation of all recovered materials, field notes and records which result from the actions covered by this Agreement; however, the treatment of uncovered Native Hawaiian burials and/or associated funerary objects will be in accordance with the Burial Treatment Plan provided in Stipulation F.

**J. Dispute Resolution**

1. At any time during the implementation of the measures stipulated in this Agreement, should an objection be raised by a local government or a member of the public, FHWA shall consult with the objecting party, the SHPO, and, as needed, with the Council to resolve the objection. A record of the objection and FHWA's actions to resolve the objection shall be retained by the FHWA as part of the project files.
2. Should an objection be raised by a signatory to this Agreement (ACHP, the SHPO, Hawaii DOT or OHA) regarding the implementation of the measures stipulated in this Agreement, FHWA shall consult with the objecting party to resolve the objection. A record of the objection and FHWA's actions to resolve the objection shall be retained by the FHWA as part of the project files. If FHWA determines that the objection cannot be resolved, it shall nevertheless seek the recommendations of the objecting party, document its consideration of the objecting party's recommendations in the project files and inform the objecting party and the ACHP of that consideration.

**K. Agreement Amendment**

Should FHWA, the SHPO or the Council determine that the terms of this Agreement cannot be met, that party will immediately notify the other consulting parties and request consultation to amend this Agreement in accordance with 36 CFR 800.5(e)(5).

Execution of this Memorandum of Agreement evidences that FHWA has afforded the Council an opportunity to comment on the undertaking and its effects on historic properties, and that FHWA has taken into account the effects of its undertaking on historic properties.

Federal Highway Administration, Hawaii Division

By: William R. Lake 7/21/87  
William R. Lake, Division Administrator (date)

Hawaii State Historic Preservation Officer

By: William W. Paty JUL 22 1987  
William W. Paty (date)

Advisory Council on Historic Preservation

By: [Signature] 12 August 87  
(date)

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CONCURRING PARTIES:

Office of Hawaiian Affairs

By: Moses K. Keale, Sr. 7/29/87  
Moses K. Keale, Sr., Chairman (date)  
Board of Trustees

Hawaii State Department of Transportation

By: Edward Y. Hirata 7/28/87  
Edward Y. Hirata, Director (date)

ATTACHMENT A:  
 ARCHAEOLOGICAL MITIGATION PLAN,  
 KĀNE'ŌHE INTERCHANGE, INTERSTATE H-3 HIGHWAY, O'AHU

INTRODUCTION

Archaeological survey conducted in the proposed H-3 Highway Kāne'ōhe Interchange during 1984 and 1985 recorded 15 archaeological sites, which, in addition to 2 sites that had been recorded previously, have been determined eligible for nomination to the National Register of Historic Sites as the Luluku Discontiguous Archeological District on the combined bases of three criteria for eligibility: A, C, and D.

Criterion A specifies association with events or broad patterns important in the history of an area. The Luluku Discontiguous Archeological District has been declared eligible on the basis of its association with at least two such patterns or events: the transition to the early state system of government in Hawai'i; and the interaction between early Euroamerican culture and Hawaiian culture at Contact.

Criterion C applies to sites that reflect architectural achievement. The Luluku Discontiguous Archeological District has been determined eligible as the architectural remains of an agricultural system associated with ethnic groups that have occupied this area throughout the prehistoric and historic periods.

The District satisfies Criterion D because the sites have yielded or have the potential to yield information significant for our understanding of traditional culture, history, prehistory, and/or foreign influences on traditional culture and history.

Site 50-0a-G5-71\* is a small structure on a ridge. It overlooks Site G5-85, the largest site in the area--an extensive set of pondfield terraces in an area of upland Kāne'ōhe that may have been under cultivation for more than 1000 years. The Interchange has been redesigned since the 1984-

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\*In the B. P. Bishop Museum site numbering system, 50=Hawai'i; 0a=O'ahu; G=Ko'olaupoko District; 5= Kāne'ōhe ahupua'e; and the final numbers=the unique site number. "50-0a-" is understood throughout this document.

1985 archaeological survey to incorporate a larger loop than was originally planned, thus avoiding impacts to Site G5-71 and the most intact portions of Site G5-85.

The project area boundaries for the 1984-1985 survey coincided with the Interchange corridor as it was originally planned; all the sites within those boundaries have been surveyed and mapped. Fourteen sites within the original Kane'ohē Interchange project area are located either in part or in their entirety within the corridor and will be directly affected by construction activities: Sites G5-85, G5-86, G5-87, G5-88, G5-89, G5-90, G5-91, G5-92, G5-93, G5-94, G5-95, G5-96, G5-97, and G5-99.

The three remaining sites surveyed in 1984-1985 will be affected only indirectly by construction activities: G5-68, G5-71, and G5-98.

The modified Interchange route that has been designed in order to minimize adverse impacts to Sites G5-71 and G5-85 is described on Map A:1 as the "Modified Loop Ramp B". The Modified Loop Ramp will directly affect one feature at a site that was not part of the original Kane'ohē Interchange project area: Site G5-105 Feature 17.

The total number of sites associated with the Interchange project area is now 18, and the number of sites in the corridor itself, 15. Site G5-105 is affected by the Modified Loop Ramp "B" and has been determined likely to be eligible for inclusion in the National Register of Historic Places as part of the Luluku Discontiguous Archeological District by the State Historic Preservation Office and the Federal Highways Administration, in accordance with 36 CFR Part 800. Site G5-105 is therefore included in this Mitigation Plan. Site G5-85's original boundaries as submitted to the National Register of Historic Places will be extended to incorporate Features 108 through 130.

This document presents the plans for mitigation of the adverse impacts that will be sustained by the archaeological sites of the Luluku Discontiguous Archeological District due to construction of the Kane'ohē Interchange. The research problems and specific questions that will guide the next phase of research are discussed first below, followed by a prioritization of the research goals. The remainder of the document is organized in the following manner: Section 1 discusses data recovery in areas expected to sustain direct impacts; Section 2 presents plans for retrieval of information through excavation in areas outside the direct impact zone; and Section 3 discusses



preservation plans, both for scientific preserves and for interpretive display.

#### BACKGROUND TO THE RESEARCH PROBLEMS

The 18 sites in the redesigned Kane'ohē Interchange project area are located in five 'ili. These are Hawaiian land tenure units, divisions of the basic unit, the ahupua'a, which is usually aligned from the mountains to the sea (mauka-makai), crosscutting inland and coastal land types and resource zones. The 'ili in which the sites are located occur in the inland portion of Kane'ohē ahupua'a.

The majority of the sites (10) occur in Luluku, the 'ili for which the National Register district is named. An eleventh marks the Luluku/Punalu'u mauka boundary; the seven remaining sites occur the 'ili of Punalu'u mauka, Kapalei, Pa'u, and Kea'ahala.

Pre-Contact (pre-1778) resource utilization in this upland area probably included both agriculture and the collection of forest products, such as fibers and bird feathers. The people who cultivated the agricultural fields that dominate the area archeologically may have lived either near their fields or in other 'ili, possibly at the coast, where they could fish and collect shellfish to add animal protein to their diet. No definite pre-Contact habitation evidence has yet been recovered in the project area.

Habitation was probably coastal during the earliest settlement period in Hawai'i. Inland expansion, utilizing especially the fertile valleys of the windward sides of the islands, occurred gradually as agriculture became more and more the dominant subsistence base. This inland expansion eventually produced the ahupua'a (mauka-makai) system of land tenure (see Hommon 1976, in press). Any inland shifts in actual residence that may have created new upland core settlements are not yet well-understood. Habitation patterns are a critical component in the development of the mauka-makai economic orientation and constitute one of several important focal points for the next phase of research.

The Kane'ohē Interchange project area's sites possess important potential to inform us regarding certain aspects of both the expansion process and the changes in land tenure and government that resulted. At the most extensive and impressive site, the 4.05-hectare irrigated taro terrace complex in Luluku

(Site G5-85), pondfields were cultivated during at least five separate intervals and continued in use into at least the 16th Century; the date for their abandonment is not yet known. Six trenches and four 1-m<sup>2</sup> units excavated during the survey phase of the research revealed a sequence of field use that probably began c. A.D. 500 or 600 and peaked during the 13th through 15th Centuries A.D. It was during the period between the earliest and the latest dates obtained for this site that inland expansion in Hawai'i increased dramatically in momentum. The ahupua'e presumably became the basic land tenure unit in upland Kane'ohe by A.D. 1400.

Other, as-yet undated sites in Luluku 'ili include a feature complex (G5-95) containing a platform, mounds, rock alignments, and a historic-period road; a platform structure associated with rock-lined compartments--probably gravesites--at Site G5-71; individual features that may be gravesites (at G5-95, G5-96, and G5-97); a linear mound associated with a trail, a ditch, and artifacts of indigenous Hawaiian type (Site G5-98); and historic-period artifact concentrations (at Sites G5-93, G5-94, and G5-95) that may overlie earlier, subsurface materials.

During the peak period of cultivation, between the 13th and 15th Centuries, additional changes occurred in the islands, apparently including the transition from locally-based chiefdoms to an early state form of government. Demographic increase may also have characterized this period.

Dryland taro was grown at Site G5-86, a terraced but unirrigated agricultural site located in Punalu'u mauka, the next 'ili to the north, by A.D. 1100-1200, as indicated by a 14C date produced by the main agricultural layer exposed in a trench excavated at the site. Site G5-86 also includes mounds, a trail, and a historic-period charcoal kiln. Site G5-88 in Punalu'u mauka contains a cemetery with historic-period and probably prehistoric graves, as well as an early 20th-Century house site.

Trails, rock mounds, a historic refuse concentration, and other features including a seepage well occur at sites (G5-90, G5-91, G5-99) in the other three 'ili: Kapaeha, Pa'u, and Kea'ahala. Rock walls or linear mounds coincide with the Luluku/Punalu'u mauka, Punalu'u mauka/Kapaeha, and Pa'u/Kea'ahala 'ili boundaries.

A faced mound at Site G5-91 in Kea'ahala was excavated and is interpreted as a clearing or planting mound; several other mounds are located at the same

site. No dateable materials were recovered at the site. Two additional characteristics that seem to date to the period between A.D. 500 or 600 and A.D. 1600 in the Hawaiian Islands are visible archaeologically. One of these is the intensive use and modification, through agricultural terracing, of virtually every fertile valley, and many less fertile areas, on the major islands in the chain. The second resulted from the first: clearing, use, and later abandonment of these field systems produced dramatic changes in sedimentary and erosional regimes, with the result that many valleys filled in, hillslopes lost their soil and vegetation cover, and major landform changes took place. An outstanding example is provided by Kawainui Marsh, Kailua ahupua'a, O'ahu, where many hectares of arable land were created between A.D. 1200 and 1700 (Allen in press; Kraft 1980a and b).

The proliferation of agricultural terraces and other archaeological sites that apparently occurred between A.D. 1200 and 1600 has been explained by researchers including Cordy (1978), Homan (1976, in press), and Kirch (1985) in several ways. Three alternative models have been emphasized: 1/ simple demographic increase with concomitant increases in both food needs and the need for space; 2/ elaboration of the social rank system at the local level, not necessarily involving population increase but requiring increased quantities of produce and other items for prestation and especially ritual purposes; and 3/ development of the state form of government, which superimposed island-wide prestation-, ritual-, and exchange-related material needs over those already existing at the local (valley or ahupua'a) level. These three alternatives, although contrasting in terms of immediate causality, are not necessarily mutually exclusive. All three may have contributed at various periods to the expansion in site numbers during the period between A.D. 1200 and 1600.

The three models are theoretical constructs to be evaluated as archaeological research continues in many areas of the Islands. The recovery of certain types of archaeological evidence in localized project areas, while not directly proving or disproving the accuracy of the models, can add significantly to the data bank to be used in their evaluation. The following paragraphs discuss certain test implications of the three theoretical frameworks for research in upland Kane'ohe.

The first hypothesis to be tested states that a significant increase in

the number of agricultural fields took place between A.D. 1200 and 1600. This hypothesis has been cited in support of all three models; it is not adequate in itself to support one specific framework as opposed to the other two. Each of the remaining hypotheses discussed here strengthens the support for a specific model.

If the first (demographic) model is applicable, we should expect evidence supporting the following hypotheses: a/ habitations and other site types increased in number in the project area between A.D. 1200 and 1600; b/ deposition of other types of archeological evidence for cultural activities (e.g., midden remains and lithic scatters) also increased during the period in question; and c/ burials increased in number within the ahupua'a or locally.

If the second (elaboration of social rank) model is applicable, we should expect evidence supporting the following hypotheses: a/ the A.D. 1200-1600 artifact assemblages collected at the sites include not only utilitarian (probable low-status) types (e.g., basalt flakes and functional adzes) but also types associated with high rank (e.g., niho palaoa, ceremonial adzes) or caches of specific artifact types; and b/ sites of high status or ritual types that probably needed subsistence support from members of the community exist in the area (e.g., heiau, chiefly house complexes).

If the third (state evolution) model is applicable, we should expect evidence supporting the following hypotheses: a/ evidence for human settlement (e.g., habitation, agriculture, lithic workshops) centered in coastal areas until A.D. 1200, and then expanded inland (while coastal activities also continued); b/ coastal midden materials and/or artifacts (e.g., fishhooks) were transported inland in significant numbers, indicating regular interaction between the project area and the coast; c/ materials (e.g., basalt for adze manufacture, volcanic glass) were imported from other ahupua'a, indicating inter-ahupua'a and possible island-wide contacts; and d/ evidence exists for supra-family-level coordination of agricultural or other activities (e.g., terrace construction, water use) during the period.

Incomplete and largely indirectly-dated evidence for expanded agricultural terrace complexes was generally used in the past to support the first model: that of demographic increase. This evidence may, if combined with evidence from other site types, be applied more effectively to test the hypotheses concerned with more complex societal changes, which include changing land tenure; the proliferation of social classes, with enhanced

social rank differentiation; increasing political control over the subsistence base, including water rights; and expanding exchange networks and communication with other valleys, districts, and islands.

Site G5-85 has already produced the best chronological information available from any documented field system in the Hawaiian Islands for the period between A.D. 1200 and 1600; several subsurface fields reflecting several periods of use at a single site have been directly dated for the first time. More extensive excavation during the next phase of research is expected to establish several important parameters for cultivation at the site that were considered beyond the scope of the survey testing program: most importantly, we need to determine: 1/the horizontal areas that were involved in production at various times including the period of maximum expansion; and 2/ the complexity of the irrigation system (and the need for a managerial hierarchy). Evidence anticipated from other sites in the area will enhance our understanding of not only the cultivation process and sequence at Site G5-85, but, at a more general level, the processes involved in bringing about changes in Hawaiian habitation and land tenure; increasing political controls over production; possible inter-'ili or -ahupua'a exchange; and the transformation of the pre-Contact landscape in a core windward region.

#### RESEARCH PROBLEMS

The general problems and more specific questions that are of special research interest for the data recovery phase of work are discussed below. Those questions assigned highest priority are indicated by asterisks; discussion of the prioritization follows this section.

#### The Evolution of Agriculture in the Hawaiian Islands

Both unirrigated and irrigated agricultural technologies presumably arrived in the Hawaiian Islands with the first Polynesian colonists. Kāne'ōhe has been a core agricultural area for some centuries; sites in upland Kāne'ōhe can help to explain the evolution of both wetland and dryland agriculture in windward valleys.

Photographic evidence from the late 1920's (Allen 1987) suggests that every stream valley throughout the Interchange project area at one time contained agricultural terraces downslope below the locations surveyed.

Archaeological survey has established the former presence of dryland terraces within the project area in Punalu'u mauka (at Site G5-86) and probable pondfield terraces in areas of Pa'u and probably Kepalei that are now covered by the Castle Hills Estates housing project.

The specific questions that will guide the next phase of research follow.

\*1/ How extensive were the pondfield terraces at Site G5-85 during the peak period of production? How many stream tributaries and ditches were in use concurrently?

The surface terrace complex may or may not reflect the size of earlier terrace sets at the site. The assumption that a surface terrace set constitutes a reliable indicator as to the extent of subsurface terraces is an error that has flawed many archaeological research projects concerned with Hawaiian pondfield complexes. Excavation at Site G5-85 is expected to establish the contemporaneity of fields in various areas of the site. Subsurface terraces at the other agricultural complexes in the area will also be dated, if possible, as will non-agricultural sites.

\*2/ Did the sequence of agricultural development in Luluku 'ili begin on the basal slopes and floodplain margin, as suggested by two 14C dates from Site G5-85? Does it appear likely that the steeper slopes above were put into production only during the period of maximum expansion of field areas between A.D. 1200 and 1600?

Two dated radiocarbon samples from Site G5-85 Feature 35 Layer VIII suggest pondfield use around A.D. 500-600; a third, however, produced a historic-period date. The layer will be re-tested, and other basal slope/floodplain pondfield localities dated. Attempts will be made to date early agricultural layers in outlying areas of the site on the steeper slopes.

\*3/ Were pondfield or dryland terraces extensive prior to the 20th Century in those portions of Punalu'u mauka, Kepalei, Pa'u, and Kes'ahala that lie within the Luluku Discontiguous Archeological District?

4/ Over how long a period were the dryland and ponded fields cultivated in the five 'ili (within the project area)? Is there evidence for expansion or contraction in the numbers of fields in 'ili other than Luluku through time? In particular, did cultivation decrease after A.D. 1600, a period for

which a population decline has been suggested for the Hawaiian Islands?

Social Rank Differentiation and Social Organizational Change

\*5/ Is there evidence for use of the area by members of more than one traditional Hawaiian social class during either the pre- or post-Contact period?

The emergence of the state political system in the Hawaiian Islands is believed to have followed an elaboration of the social class system, which resulted in more effective controls over land, water, and the production of food. The archaeological evidence for status differentiation may occur at any site type but frequently occurs in burials. Burials and other sites in the project area will be investigated for the presence or absence of prestige goods that were typically associated with members of the chiefly class.

Changing Political Organization

As indicated, Kāneʻōhe was a core area early on, both in terms of coastal and upland productivity. By European contact it had become an important ahupuaʻa in the island-wide political network that characterized the Hawaiian state system of government. The area is therefore an important one for the study of sociopolitical change during the pre-Contact period.

One of the ways increasing political control manifests itself archaeologically in the Islands is through the coordinated construction and maintenance of large irrigated terrace complexes and water control systems such as that suggested at Site G5-85 in the current project area. As discussed in Allen (1987), the terraces at Site G5-85 can be divided into two large, apparently coordinated sets of features distinguished by differences in construction techniques. These two areas correlate closely with distinct Land Commission Awards granted at Mahele (the major land redistribution that occurred around 1850). The two areas are characterized by different vegetation and land uses today.

Within either of the two areas, the terraces are nearly uniform in construction technique, are functionally well-coordinated to share water, and tap water from various tributaries to the Luluku drainage system. The terraces and the water diversion network suggest efficient management of large-scale construction projects, cooperative use of water sources and maintenance of both the terraces and the irrigation channels.

Similar coordination is suggested for extensive pondfield complexes elsewhere in the Hawaiian Islands, including Halawa, Moloka'i (Kirch and Kelly 1975); Hanalei, Kaua'i (Athens 1983; Earle 1978; Schilt 1980); and, on O'ahu, the following sites: 'Ahuimanu (Kennedy 1981; Nature Conservancy 1981), Anahulu (Kirch 1979), Makaha (Green 1980; Ladd and Yen 1972); and Kawainui Marsh (Allen in press; Gordy 1977).

None of these terrace complexes appear to reflect only the efforts of individuals or families; they suggest management by overseers--presumably low-level chiefs responsible for collecting the produce for redistribution by higher chiefs. As yet, however, we do not know the horizontal extent of contemporaneous taro production during any single period either at one site or throughout a broader area. That goal is critical for future research into both field systems and sociopolitical change in the Hawaiian Islands.

Questions concerning dating and the extent of areas that were in approximately contemporaneous use are addressed above (see Questions 1-4). Excavations during the next phase of research in the project area will also attempt to answer the following question:

\*6/ Is there widespread evidence for coordinated construction and maintenance (by chiefs or supervisors) of the field complex and the irrigation network in the five 'ili?

#### Changes in Land Use and Tenure

\*7/ Did the cultivators of the fields in the project area live among their fields during pre-Contact times? Or is there historic or other evidence for their residence in coastal areas? Did the pattern change through time?

\*8/ Is there evidence for tool manufacture and other activities accessory to cultivation and/or habitation in the project area? Does any evidence date to the peak period of agricultural activity?

As the suggested increase in sociopolitical control over each 'ili and ahupua'a took place, and collection and redistribution of material goods evolved, it may have become less necessary for the cultivators to exploit both the uplands and the coast for themselves. We believe that any habitation-related evidence that may be recovered in the project area will date to the period after A.D. 1200 or 1300, by which time a sophisticated system of



sociopolitical control facilitated the collection and redistribution of goods; exchange with other areas was well-developed; and cultivators may have been required to live near their fields for purposes of maximal productivity.

Although no archaeological evidence for habitation sites has yet been found within the project area, L.C.A. records suggest that Site G5-93 may have included a house site. The historic-period house compound at Site G5-88 may overlie pre-Contact habitation evidence. Site G5-85 Feature 123, a stone-lined feature that is probably a hearth, needs investigation. And certain locations that appear potentially attractive for habitation and other activities, but which possess no surface features (e.g., Wedelia Knoll; see Map A-3) will be excavated in order to check for subsurface materials.

\*9/ When were the rock alignments (Sites G5-87, G5-89, and G5-92) that mark the 'ili boundaries constructed?

The clear demarcation of the five 'ili in the project area with rock walls indicates that these land units were considered valuable, presumably for agricultural use, when the walls were built. At Mahele, Lulukū contained areas claimed by several individuals. Punelu'u mauka had belonged to Liholiho until he granted it to an advisor in 1821. Kapalei was set aside at Mahele for Queen Kalama. Pa'u was granted to an individual. Kea'ahala was proclaimed Crown Land.

All five 'ili were therefore valued at mid-19th Century; they may have been set aside by the ali'i (chiefly class) sometime before Contact. If the stone structures that mark at least one boundary of each of the five 'ili can be dated, they may help to establish a local chronology for the pre-Contact expansion inland and for the sociopolitical changes addressed in the preceding sections.

#### Population Change in Pre-Contact Hawai'i

Although increased subsistence needs, resulting from increased populational size, have been invoked in the past to explain the expansion in agricultural production during the period before A.D. 1600, archaeological evidence (e.g., numerous house sites or burial plots) that might support or refute this hypothesis remains elusive.

Archaeological evidence has also been cited to suggest a decline in population after A.D. 1600; that evidence includes an apparent decrease in the

number of dated sites originating in that period. Other factors may be involved: for example, our inability thus far to date surface layers at sites such as Site G5-85 because of contamination; or a sampling bias that tends to select sites that may produce data from the earliest period of settlement in the Hawaiian Islands.

The sites dated thus far in the project area (G5-85 and G5-86) appear to have been used primarily during the suggested period of peak population. Evidence will be sought in the Luluku Discontiguous Archeological District for a dense local population during the period of maximum site expansion, and further attempts will be made to date surface and upper subsurface layers in order to clarify the period(s) by which the sites were abandoned.

Research concerned with demographic change, like that concerned with sociopolitical process, will eventually depend on information synthesized from many valleys and ahupua'a throughout the Hawaiian Islands, but must begin in local areas, with projects such as the current one. The specific questions to guide research into demographic change during the next phase of research follow.

10/ Is there archaeological evidence in the project area for a demographic increase around the time of the apparent increase in agricultural production at Site G5-85, c. A.D. 1300? Can an expansion in agricultural fields be attributed to population increase?

11/ Does evidence for a decrease in the area under active cultivation post-1600 exist? If so, can this agricultural decrease be used to support the hypothesis that population in the Hawaiian Islands decreased sometime prior to European contact?

We do not expect evidence from agricultural sites to support the suggestions summarized above concerning population increase or decline; the questions are included here because this theoretical approach has been considered important in past research into Hawaiian agricultural systems.

#### Landscape Change

The results of the test excavations conducted in 1985 at Sites G5-85 in Luluku and G5-86 in Punalu'u mauka indicate significant changes through time in the erosional regime upalope, above the known agricultural fields.

Intensification and expansion of the agricultural fields appear to have hastened these changes in the two site areas investigated and was probably instrumental in bringing about landscape change on a much broader scale. The other 'ili in the project area, like the sites tested, are located in an upland zone characterized by colluvial and alluvial transport of materials ranging in size from clays through very coarse boulders. The sites in these land units need investigation.

\*12/ Does subsurface evidence exist for agricultural fields in Punalu'u mauka, Kapalai, Pa'u, and Kea'ahala? Is there evidence for increasing deposition due to erosion uplope during or after the period(s) of cultural activities at the sites?

#### Nutritional and Health Patterns in Pre- and Post-Contact Hawai'i

The main body of evidence applying to this problem will be produced by buried human skeletal remains.

13/ Do any burials in the project area suggest changes in nutritional status or physical health during the late pre-Contact era (dates to be established through relative and chronometric dating methods), when a population decline may have occurred? Are changes (e.g., increased caries, changed stature, signs of communicable diseases) indicated after European contact?

#### Post-Contact Changes

Local residents consider Site G5-71 a shrine; the archaeological evidence to date (Allen 1987; Dye 1976) suggests alternative functions including habitation and burials. The results of Dye's test excavation suggest that the site dates to the historic period. Specific questions to be investigated include the following:

\*14/ Does Site G5-71 reflect exclusively post-Contact activities? Do the rock-lined compartments reflect conversion to Christianity, as suggested by two possible headstones? In what capacity did the platform component function in the ongoing cultural system?

Many surface indicators exist for late 19th-Century use of the project area. What is lacking, as is common at historic-period sites in Hawai'i, is

evidence from the period of initial contact with Europeans--the period 1778 and approximately 1830.

Excavations at sites including G5-93 (which overlaps a known kuleana awarded at Mahele), G5-85, G5-90, G5-94, and G5-95 may produce evidence from this earliest period of culture contact. The specific question for research follows.

\*15/ Was this area of upland Kāne'ōhe in use from the initial days of the post-Contact period?

\*16/ Did any of the site areas continue in use from the pre- into the post-Contact period, and, if so, did their function(s) change?

The last question will be approached through archival research, concerned not only with the five 'ili in the project area, but including a review of Land Commission Award records for all of Kāne'ōhe.

\*17/ How did land use in the project area at Mahele compare with land use in other areas of Kāne'ōhe shupua'a? Is there any evidence that the taro cultivators of upland Kāne'ōhe at the time of Mahele resided at the coast? In what other areas of the shupua'a was the cultivation of taro, using either irrigation or rainfall-dependent technologies, concentrated?

#### PRIORITIZATION OF RESEARCH QUESTIONS

Although an attempt has been made here to itemize and discuss all the research problems and questions that will guide the next phase of research, it is important to point out that many of the research questions will be addressed concurrently, during the same procedures at the same sites and features.

Although all the problems discussed above are important, the nature of the sites of the project area suggest that data regarding certain specific questions are more likely to be recovered during the next phase of research than is evidence concerning other questions.

Thirteen questions are assigned high priority for the data retrieval program. These largely concern sites threatened with adverse impacts: agricultural, possible burial, and post-Contact era sites, boundary markers, and certain sites whose interpretation will require extensive excavation

(especially Site G5-95). The thirteen questions, which were indicated with asterisks in the preceding section, include the following: Questions 1-3 concerned with agricultural development; Question 5 regarding social rank differentiation; Question 6 concerning changing sociopolitical organization; Questions 7-9 concerned with land use and tenure; Question 12 regarding landscape change; and Questions 14-17 concerned with changes during the post-Contact period.

Nine questions are accorded the highest priority and are considered critically important to the research program: Questions 1-3, 6, 9, 12, 14, 16, and 17.

#### SECTION 1 - ARCHAEOLOGICAL DATA RECOVERY PLAN

In order to retrieve archeological data from areas threatened by construction activities and mitigate anticipated impacts to those areas, excavations will be conducted at the directly-affected sites that were part of the original project area; and at Site G5-105 Feature 17, which was not a part of the original area but will be directly affected. At Site G5-85, several features (Fe 108-110, 123, and 124) outside the original project area will be affected by construction of the Modified Loop Ramp and have been added to the features scheduled for mitigation. Information recovered through these excavations will be applied to the research questions and will aid in interpretive displays scheduled for Site G5-71 and portions of Site G5-85.

Tables A:1 through A:5 summarize the mitigation plans for all the sites. The sites and features that are expected to sustain direct impacts due to highway construction are listed in Table A:1; the areas that will be subjected to data recovery at those fifteen sites in order to mitigate adverse impacts are listed in Table A:3. Table A:6 lists the percentage of each site that is scheduled for data recovery.

#### AREAS RECOMMENDED

Site G5-85 Features 108-110, 123, and 124, and Site G5-105 Feature 17 (see Riford 1987) will be mapped as well as excavated during the next phase of research.

Site G5-85 Features 101, 108-110, 123, 124, and the area between Features 43/44 and 105/106 (Maps A-2 and A-3) are expected to produce the following types of evidence: a water control structure (Fe 101); subsurface terraces--stone retaining walls and/or soils evidence--upslope above the main known sets (Fe 108, 124); subsurface terraces in a transitional zone between known terrace sets and near an area planted in rice at Mahele (the area between Fe 43/44 and 105/106); charcoal for dating purposes; a hearth and related habitation evidence possibly including midden and stone tools (Fe 123); a basalt tool workshop (Fe 109); and historic-period artifacts (Fe 110). The research questions addressed include Questions 1, 2, 4, 6, 7, 8, 15, and 16.

Site G5-86 Features 1-6 and 8 (Map A-4) should produce subsurface agricultural soils and possibly structures related to habitation, and dating materials (Fe 1, 2, 4, 5, 6, and 8) and post-Contact materials for charcoal (fuel) production (Fe 3). Questions 3, 4, 7, 8, 12, 15, and 16 will be addressed.

Sites G5-87 (Map A-4), G5-89 (Maps A-1 and A-5), and G5-92 (Map A-1) are expected to produce charcoal or volcanic glass flakes from underlying agricultural soils that will suggest the earliest dates at which the features could have been constructed. Other artifacts such as bottles, which are commonly incorporated in historic-period walls in Hawai'i, may also be recovered. Questions 9, 15, and 16 will be addressed at a minimum; any agricultural soils may address other questions, as well.

Site G5-88 Features 1, 2, and 7 (Map A-5) will produce pre- and post-Contact artifacts related to habitation and should yield subsurface evidence for agricultural terraces and dating materials. The expected evidence will be applied to Questions 3, 4, 6, 7, 8, 9, 12, 15, 16, and possibly 5 and 13.

Site G5-90 (Map A-1) will produce artifacts of post-Contact and possibly indigenous types; local residents believe burials may exist in the mound area (Questions 13, 15, and 16).

Site G5-91 Features 1-5, and Site G5-99 (Map A-1) may produce evidence for buried agricultural fields (stone retaining walls, agricultural soils) and dating materials (charcoal, volcanic glass, Euroamerican artifacts of dateable types) applicable to Questions 3, 4, 6, and 12.

Sites G5-93 and G5-94 (Map A-1) will produce historic-period artifacts possibly including early types dating to the initial post-Contact period, as

suggested by the survey results; habitation evidence is also expected at Site G5-93. Questions 7, 8, 15, and 16 will be addressed.

Site G5-95 Features 1-4 (Fe 9 and 10 to be monitored only) (Map A-6) may produce habitation-related evidence such as hearths, midden, utilitarian stone tools; post-Contact artifacts; and dating materials including charcoal, volcanic glass, and/or Euroamerican artifacts of dateable types. Fe 1 and 4 may contain burials. The evidence will be applied to Questions 5, 7, 8, 13, 15, and 16.

Site G5-96 Feature 1 (Fe 2 to be monitored) and Site G5-97 (Map A-1) are probable burials; G5-97 may date to the post-Contact period, based on a ceramic ale jug sherd in association. Questions 5 and 13 will be addressed, at a minimum.

Site G5-105 Feature 17 (Map A-2) is probably an agricultural clearing mound; it may produce dating materials and/or evidence for subsurface fields (Questions 1, 2, 4, 6, 16, and possibly 8).

The ridge (within Site G5-85) that is designated "Wedelia Knoll" on Map A-3 will be directly affected by relocation of Likelike Highway; certain areas between Sites G5-85 and G5-86 lie in the path of freeway construction. Both will be excavated for signs of subsurface features (Table A:3) related to agriculture, habitation, or other land use.

#### PROCEDURES

The excavations will include hand-trowelled and screened units in areas where human bones or concentrations of artifacts and/or midden are anticipated; hand-shovelled, unscreened trenches to expose soils and sequences in agricultural areas; and backhoe units wherever practical in agricultural areas.

Stratigraphic profiles and plan views will be prepared, and full records and documentation maintained during fieldwork. Soils will be described in the field.

Data recovery will also involve laboratory analyses of several types; contingent on the excavation results, these may include the following: analysis of both historic artifacts and those of traditional Hawaiian types; osteological analyses of human and non-human bone; midden and soils studies;

radiocarbon and volcanic glass dating analyses; and the identification of charcoal fragments, pollen, and other botanical remains.

All cultural materials to be analyzed will be processed at the B. P. Bishop Museum Archeology Laboratory during the laboratory stage of research. The disposition of all native Hawaiian human skeletal remains that must be removed from the project area will be proceed in accordance with the burial treatment plan (see Stipulation F). Other skeletal remains will be treated according to State regulations.

## SECTION 2 - EXCAVATION FOR INTERPRETIVE AND MANAGEMENT PURPOSES

Limited excavations will be conducted in areas that will not be directly affected by construction in order to recover subsurface data necessary for management of the sites to be preserved and for the development of an understanding as to how each site in the Luluku Discontiguous Archeological District functioned in its local, ahupue'a-, and Island-wide social, political, and economic networks.

Possible contemporaneity of use, and the interrelationships that may have existed among the various sites are of great interest to the public and will constitute a major focus for research. The information gained regarding the functions, chronological development, and significance of the sites involved will be especially necessary for the development of plans for public interpretive display (see Tables A:4 and A:5).

These investigations to be conducted in areas either slated for preservation or outside the corridor follow the guidelines of the Advisory Council (1980), which state (p. 11) that limited excavation may be appropriate: "If a property that can be protected within a project's area of impact needs study in order to deal fully with research questions being asked in connection with the project at other properties". Limited excavation outside the Interchange project area is planned following the Advisory Council's (1980:11) guideline that such research may be appropriate: "If there is reason to be less than fully confident about the protective mechanisms employed (for instance, protective covenants may be lost as title changes hands in the future)".



AREAS RECOMMENDED

Table A:4 lists the sites and features that will be investigated, and Table A:6 indicates the percentages of the site areas that will be excavated. These investigations will yield important information for the development of the Interpretive Development Plan; they constitute an important part of the mitigation of adverse impacts to sites within the District that will be directly affected by construction. Portions of the following eight sites will be investigated in order to answer research questions that the directly-affected sites cannot answer fully.

One mound at Site G5-68 (Map A-1) will be disassembled in order to check the relationship of this area to Site G5-85 (which will be adversely affected). The feature may produce evidence for agriculture (e.g., buried agricultural soils) and materials for dating (charcoal, volcanic glass, Euroamerican artifacts of dateable types). The research questions of particular concern are Questions 1, 2, 4, 6, 16, and possibly 8.

At Site G5-71 (Maps A-3, A-5), portions of the compartmented and platform features will be excavated in order to interpret site function and chronology accurately for purposes of interpretive display, as well as for scientific purposes; the site will be stabilized and restored. Site G5-71 overlooks terraces at Site G5-85 and may have been closely related to that site; both function and dating need interpretation before any relationship can be assessed accurately. The research questions that will be addressed at Site G5-71 include Questions 5, 6, 7, 8, 13, 14, 15, and 16.

At Site G5-85, certain features (discussed in Section 1) will sustain direct impacts due to highway construction, and others (to be discussed in Section 3) will be preserved either as a scientific preserve or as part of an interpretive display. In order to mitigate negative impacts adequately, to interpret the site's extent and chronology accurately, and to facilitate effective management of the interpretive display, we need subsurface information from certain areas of the site that are not expected to be directly affected by construction.

Site G5-85, as Table A:6 indicates, covers a 4.05-hectare area; this single site accounts for more than 69% of the area covered by known archeological features in the Luluku Discontiguous Archeological District.

The retrieval of subsurface information from areas throughout the site is considered critical for the interpretation of the district as a whole. Because Site G5-85 consists of large agricultural terraces, excavations must crosscut large areas; small units produce inadequate evidence for the analysis of such sites.

It is for these combined reasons that the areas to be excavated in non-threatened areas at the site (Table A:4) seem relatively extensive. The percentage of the total site area that will be excavated in non-threatened areas, however, is not more than the 0.7% indicated in Table A:6; even when this figure is combined with the figure for directly-affected areas scheduled for data recovery, the total area to be excavated at the site is only 1.0%.

Those areas that will be subjected to limited excavation in non-threatened portions of the site include: 1/ 'auwai and possible stream exclusion features, which should produce data concerning water direction and volume, irrigation technology, and possible coordination of irrigation and drainage networks; 2/ agricultural terraces (some with possible 'auwai) in zones that appear transitional between known terrace sets (e.g., Fe 13a and the area between Fe 10 and 11) or even between complexes (Fe 105-106, which approach the lowland historic-era rice zone); 3/ possible dryland terraces (Fe 99 and 100); 4/ core area terraces where it is hoped the A.D. 500-600 dates for buried terraces will be confirmed (Fe 21, 25, 26, 28, and 35-38); and 5/ terraces or remnants near the perimeter of the known site, which must be investigated for subsurface fields and their sequences (Fe 31; 55, 57, or 59; 78-80; 88-97; 105-106; 120; and 128; and the area between Likelike Highway and Site G5-68). Some of these areas possess little surface evidence, probably because of modification for pineapple cultivation earlier in this century; terrace structures, soils, and charcoal and volcanic glass for dating purposes are, however, expected beneath the modern surface. As discussed earlier, it is particularly important for research purposes to ascertain the horizontal extents of the terrace areas that were cultivated contemporaneously at various points in the past.

Portions of those terraces that may be replanted in taro will be excavated beforehand in order to recover data that will be damaged by renewed cultivation. The research aims to be served by these investigations include Questions 1, 2, 4, 6, and possibly Questions 7, 8, 10, 11, 15, and 16.

At Site G5-88, Feature 3 will be subjected to limited excavation in order to retrieve data related to habitation in the Feature 7 compound (artifacts of utilitarian types, structural remains) and probable pre-existing agriculture in the area (buried terrace facings, agricultural soils). Feature 4 will be partially excavated for agricultural evidence. Questions 3, 4, 6, 7, 8, 12, 15, and 16 will be addressed.

Sites G5-91, G5-98, and G5-99 (Map A-1) are expected to produce agricultural evidence including structural remains of a seepage well at Site G5-99 Fe 1, a ditch and trail at Site G5-98, basalt flakes and other tools, buried agricultural soils, and possibly charcoal and volcanic glass for dating. Site G5-98 may be closely related to Site G5-85, which begins a short distance to the north and west. Sites G5-99 and G5-91 are located in two other valleys and may have been associated with former agricultural terrace systems in those valleys. Questions 1, 2, 3, 4, 6, 12, and possibly 15 and 16 will be addressed through the investigations at these sites.

Site G5-95 Features 5 through 8 are expected to yield artifacts and structural remains related to habitation and work area activities. The site overlooks portions of Site G5-85 and may have been associated with cultivation at that site. Post-Contact artifacts recovered previously suggest that the site was in use sometime during the last 150 years. The research aims of concern include Questions 7, 8, 15, 16, and possibly 5.

#### PROCEDURES

The excavations will include small, hand-trowelled, screened units in areas likely to produce human bones or concentrations of artifacts or midden, as well as more extensive, unscreened units in agricultural sites and where subsurface features may not occur (as, on Wedelia Knoll). Backhoes will be used for the trenches wherever possible to save time and labor. In many cases, however, hand excavation with picks and shovels will be necessary in order to avoid damaging terraces and other features unnecessarily.

#### SECTION 3 - PRESERVATION PLAN

The preservation plans for the proposed H-3 Highway Kane'one Interchange project area are of two types.

1/ "Passive" preservation maintains selected areas as scientific preserves, or data banks, to be safeguarded against unnecessary developmental impacts and kept in their current condition for possible future research. "Passively" preserved areas should generally be left under the current vegetation cover, with the possible exception of sites or features that may be destroyed by invasive vegetation; vegetation in those areas should be cleared. Most vegetation cover--including mango, guava, and other tree and ground cover should be allowed to remain; and protective ground cover may be planted if necessary to prevent further erosion. Professionally-supervised inspections of these sites are recommended at 2-3-year intervals, with maintenance or modifications as found necessary during inspections.

2/ "Active" preservation (with possible future restoration) will maintain especially significant areas as parts of an interpretive display accessible to the community for educational purposes. "Active" preservation will involve extensive clearing of vegetation; repair of damaged features (which may be numerous in the areas currently covered with hau); stabilization; the replanting (at Site G5-85) of certain terraces in Hawaiian taro; construction of trails; arrangement for interpretive displays and tours; and maintenance of both those terraces planted in taro and those additional areas to be visited by the public.

#### PASSIVE PRESERVATION FOR FUTURE SCIENTIFIC RESEARCH

Certain areas at fourteen sites--Sites G5-68, G5-71, G5-85 through G5-93, G5-95, G5-98, and G5-99--are scheduled for preservation as scientific preserves, or "data banks". Sites G5-71 and G5-98 and portions of the other sites are located within lands scheduled for purchase by the State of Hawai'i Department of Transportation for the Interstate H-3 Highway project.

#### Areas Recommended

Table A:5 lists the areas that are recommended for preservation as scientific preserves.

Site G5-71 and portions of Site G5-85 (Map A-3) will also be preserved for interpretive display; their maintenance is discussed in the following section. The remaining portions of Site G5-85 will be left in relatively unmodified condition, as outlined in the section on Procedures.

Sites G5-87, G5-89, and G5-92 (Map A-1) coincide with 'ili boundaries. These structures will be breached necessarily by the freeway. Excavation units are planned for Sites G5-87 and G5-89, as well. It is suggested that a segment of each structure outside the corridor be tagged and left in unmodified condition.

The other areas recommended for "passive" preservation include Site G5-68 (Map A-3); G5-86 Feature 4 (a dryland agricultural terrace), the Feature 5 trail, and the Feature 7 mounds (Map A-4); Site G5-88 Features 3, 4, 5 (the cemetery), 6 (a possible burial) and 8, and portions of Fe 1, 2, and 7 (Map A-5); the artifact scatter outside the corridor at Site G5-90 (Map A-1); Site G5-91 Fe 6 through 8 and 9 (Map A-1); portions of Site G5-93, if possible (Map A-1); Site G5-95 Features 5 through 8 and portions of Features 9 and 10 (a historic road and ditch), as well as a large Albizia tree that overlooks most of the site (Map A-6); and Site G5-99 Fe 1 and portions of Fe 2--the road (Map A-1).

Each of these has esthetic and/or informational qualities that merit its preservation. In particular, Site G5-86 Feature 4 represents one of two major dryland terrace types documented for the Kailua-Kāne'ohe area and belongs to a set that has already produced a relatively early date; Feature 5 is a kerbstone-lined trail of traditional type. The Site G5-88 Feature 5 cemetery contains 20th-Century as well as apparently earlier burials and is reportedly still in use. Sites G5-93 (a historic artifact concentration) and G5-98 (mounds, a trail, and a dammed gully) are located within or very near kulesna awarded at Mahele.

#### Procedures

Further erosion should be prevented on the steep slopes below Sites G5-95 and G5-98.

The Site G5-86 Feature 5 trail is eroded in several areas and should be protected from further erosion through the planting of ground cover upslope. All sites should be permanently tagged.

#### ACTIVE PRESERVATION FOR INTERPRETIVE DISPLAY

The Interpretive Development will be prepared after fieldwork is

concluded. The following sites are slated for interpretive display and controlled public access: Sites G5-71 and portions of Site G5-85.

#### Areas Recommended

The areas recommended for interpretive display at Sites G5-71 and G5-85 (Map A-3) are located in lands within the H-3 Highway Kane'ohē Interchange.

All of Site G5-71 will be preserved for educational display. At Site G5-85 the following terraces are recommended for pondfield cultivation of Hawaiian taro (Maps A-3): Features 6-8, 16A, 21/21A, 25-26, 28, 30/30A, 33, and 36. The entire area to be cleared, stabilized, and provided with access or a panoramic approach incorporates Features 1-42, 49, 98-100, 102, and 131-132. These features provide a fairly representative sample of the structures present at Site G5-85, and include disparate cultivation terrace types, 'auwai terraces, a seepage well, spillways, platforms, and a 20th-Century feature, the Feature 132 excavated bomb shelter.

It is recommended that the stratigraphic profiles at certain productive and accessible excavation locations at Sites G5-85 be covered with clear acrylic or impregnated with a clear resin, in order to provide segments of the buried sequences for inspection as part of the interpretive display. These localities will be selected for the completeness of their stratigraphic sequences and if possible for information concerning specific technological practices including irrigation and drainage of the agricultural fields. They will probably include the trench planned for Features 35 and 38 and one 'auwai, at a minimum.

#### Procedures

The specific interpretive procedures will be detailed at a later date. Further erosion on the steep slope below Site G5-71 should be prevented. At Site G5-85 any invasive hau should be cleared from all terraces affected adversely by the vegetation. Prevention of hau regrowth will require constant attention for several seasons.

SECTION 4 - BUDGET ESTIMATE

<u>PERSONNEL COSTS :</u>	<u>\$350,000</u>	<u>Fieldwork</u>
(including overhead)		<u>Laboratory analysis</u>
		<u>Report production</u>
-----		
<u>NON-PERSONNEL COSTS:</u>	<u>\$50,000</u>	<u>Specialist studies,</u>
		to include radiocarbon dating,
		botanical analyses, etc.
		<u>Field and laboratory expenses</u>
-----		
<u>TOTAL COST:</u>	<u>\$400,000.</u>	
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FULFILLMENT OF OBLIGATION TO MITIGATE NEGATIVE IMPACT

The State of Hawai'i Historic Preservation Office will verify completion of fieldwork and will review both the specific preservation plan for interpretation and all reports concerning the data recovery and preservation portions of research.

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Table A:1

## SITES AND FEATURES IN LINE OF DIRECT IMPACT, MODIFIED LOOP RAMP

Site (50-0a-)	Feature Number	Form	Function	Highway Construction Technique
65-85	43	Facing, terrace	Agricultural	Viaduct
	101	Rock wall	Stream retention	Viaduct
	108*	Rock alignment	Agricultural or slope retention	Fill
	109*	Artifact concentration	Basalt tool production	Fill
	110*	Artifact concentration	Refuse dump	Fill
	123*	Uprights	Hearth	Near relocated Likelike Highway; at grade
	124*	Facings, terraces	Agricultural water diversion	Near relocated Likelike Highway; at grade
65-86	1, 2, 4	Facings, terraces	Agricultural	Fill
	3	Rock-lined depression	Charcoal kiln	Fill
	5	Rock alignments	Trail	Fill
	6	Rock mounds, facings	Agricultural and possible habitation	Fill
	8	Rock concentrations	Agricultural	Cut
65-87		Rock wall remnant	<u>Ili</u> boundary	Fill
65-88	1	Rock wall	<u>Ili</u> boundary; historic- period habitation	Cut and fill
	2	Rock wall, facing	Agricultural; historic- period habitation	Cut and fill
	7	Terrace	Historic-period habitation and prob. agriculture	Cut and fill
65-89		Rock wall	<u>Ili</u> boundary	Cut and fill
65-90		Artifact concentra- tions; rock mounds	Refuse dump; possible structures	Fill
65-91	1 to 5	Rock mounds	Agricultural	Cut
65-92		Rock alignment	<u>Ili</u> boundary	Cut
65-93		Artifact concentration	Refuse dump	Fill
65-94		Artifact concentration	Refuse cache	Fill
65-95	1	Rock-lined compartment	Possible grave	Viaduct
	2	Rock platform	Possible habitation	Viaduct
	3	Artifact concentration	Refuse dump	Viaduct
	4	Rock platform	Possible grave	Viaduct
	9	(Road)	Historic-period road	Viaduct
	10	(Ditch)	Historic-period ditch	Viaduct
65-96	1	Rock mound	Possible burial	Fill
	2	Excavated cave	World War II bomb shelter	Fill
65-97		Rock-lined compartment	Probable burial	Viaduct
65-99	2	(Road)	Historic-period road	Cut and fill
		Rock mounds	Probable agricultural	
65-105*	17	Rock mound	Agricultural	Fill

Needs intensive survey including mapping as part of impact mitigation.

Table A:2  
SITES LOCATED ENTIRELY OUTSIDE IMPACT ZONE

Site 50-0a-)	Feature Number	Form	Function	Highway Construction Technique
G5-68	All	Rock mounds	Agricultural	--
G5-71	All	Platform; rock-lined compartments	Habitation or religious; probable burials	--
G5-98	All	Rock mound; facing; alignments	Agricultural; water diversion; trail	-- --

Table A:3  
DATA RECOVERY

Site (50-0a-)	Feature	No screening (sq m)*	Screening (sq m)	Monitor Only
G5-85	Between 43/44 and 105/106	100 (backhoe)		
	101	4		
	108**	2		
	109**		3	
	Between 108 and 109**		5	
	110**		2	
	123**	5	3	
	124**	5		
Between G5-85 and G5-86		100 m (backhoe)		
G5-86	1, 2, 4	50		
	3		2	
	5		4	
	6 (or other possible habitation)		10	
	6 (agricultural areas)	10		
	8	20		
G5-87			6	
G5-88	1		2	
	2 and 7		20	
G5-89	Downslope portions	(See G5-88 Feature 1)		
	Upslope end		4	
G5-90	Artifact concentrations		5	
	Mounds		3	

Table A:3. Continued.

Site (50-0a-)	Feature	No screening (sq m)	Screening (sq m)	Monitor Only
G5-91	1-5	All to 30 cm b.s.		
G5-92		2		
G5-93	Artifact concentrations		5	
	Area around mango (poss. house site)		10	
G5-94			4	
G5-95	1 (poss. burial)		2	
	2-3		10	
	4 (poss. burial)		2	
	9-10			X
G5-96	1 (poss. burial)		3	
	2 (prob. bomb shelter)			X
G5-97 and areas adjacent	(Prob. burials)		6	
G5-99	2			X
	Lower mounds-- poss. terraces	15 (backhoe)		
G5-105	17**		2	
None on surface	Wedelia Knoll (prob. habitation area)	20 (backhoe)	10 (if trenches productive)	

\*Total trench area may refer to a single trench or to discontinuous trench segments.

\*\*Needs intensive survey with mapping.

XOutside property.

Table A:4  
EXCAVATION FOR INTERPRETIVE PURPOSES  
(area in sq m)

Site (50-0a-)	Feature	No Screening (sq m)*	Screening (sq m)
G5-68 possible agriculture	--	One feature to 30 cm b.s.	
G5-71 (excavate and restore)	Platforms		3
	Rectangular compartments		4 (Expose 2 burials)
G5-85 possible 'auwai	3	15	
	6	30	
	76 <sup>x</sup>	10	
	102	15	
agricultural terraces	13a	15	
	21, 25, 26, 28	35	
	31	12	
	35-38	20	
	55, 57, or 59	10	
	78-80 <sup>x</sup>	15	
	99-100	10	
	105-106	20 (backhoe)	
	120, 128 <sup>**x</sup>	40 (backhoe)	
possible stream retention	48	5	
possible subsurface terraces	88-97	10	
	Near G5-68	10	
	Between 10 and 11	20	
G5-88 habitation/ probable agriculture	3 <sup>x</sup>		2

Table A:4. Continued.

Site (50-0a-)	Feature	No Screening (sq m)	Screening (sq m)
G5-88) probable agriculture	4*	10	
G5-91	6-8; 9*	15	
G5-95 possible habitation	5*		2
	6-7*		2
	8*		2
G5-98 possible agriculture, trail, work area	1		2
	3 and gully	20 (backhoe)	
G5-99 possible agriculture	1		1
	mound area	2 mounds to 30 cm	
Between G5-86 and Likelike Highway		10	

\*Total trench area may refer to a single trench or to discontinuous trench segments.

\*\*Needs intensive survey with mapping.

\*Outside property.

Table A:5  
PRESERVATION

Site (50-0a-)	Feature	For Interpretive Display (Active)	As Data Bank (Passive)
G5-68	2 mounds		X
G5-71	All	X	X
G5-85	1-71, 72-87 <sup>x</sup> , 88-100, 102-105, 106-107 <sup>x</sup> , 111-115 <sup>x</sup> , 116-130 <sup>x</sup> , 131-132		X
	1-42, 49, 98-100, 102, 131-132	X (Clear for visibility from trail)	
	6-8, 16A, 21/21A, 25-26, 28, 30/30A, 33, 36	X (Replant in taro)	
G5-86	4 (portion)		X
	5 (portion)		X
	7 <sup>x</sup>		X
G5-87	(portion)		X
G5-88	1 (portion) <sup>x</sup>		X
	2 and 7 (compound) <sup>x</sup> (portions if possible)		X
	3 <sup>x</sup>		X
	4, 8 <sup>x</sup>		X
	5 (cemetery) <sup>x</sup>		X
	6 (possible burial) <sup>x</sup>		X
G5-89	(Portions)		X
G5-90	Artifact scatter on road <sup>x</sup>		X
G5-91	6-8; 9 <sup>x</sup>		X



Table A:5. Continued.

Site (50-0a-)	Feature	For Interpretive Display (Active)	As Data Bank (Passive)
G5-92	(Portion)		X
G5-93	(Portions if possible)		X
G5-95	5 <sup>x</sup>		X
	6-7 <sup>x</sup>		X
	8 <sup>x</sup>		X
	9 (portion)		X
	10 (portion)		X
	Albizia tree <sup>x</sup>		X
G5-98	All		X
G5-99	1		X
	2 (portions)		X
G5-105	3		X

\*Needs intensive survey with mapping.

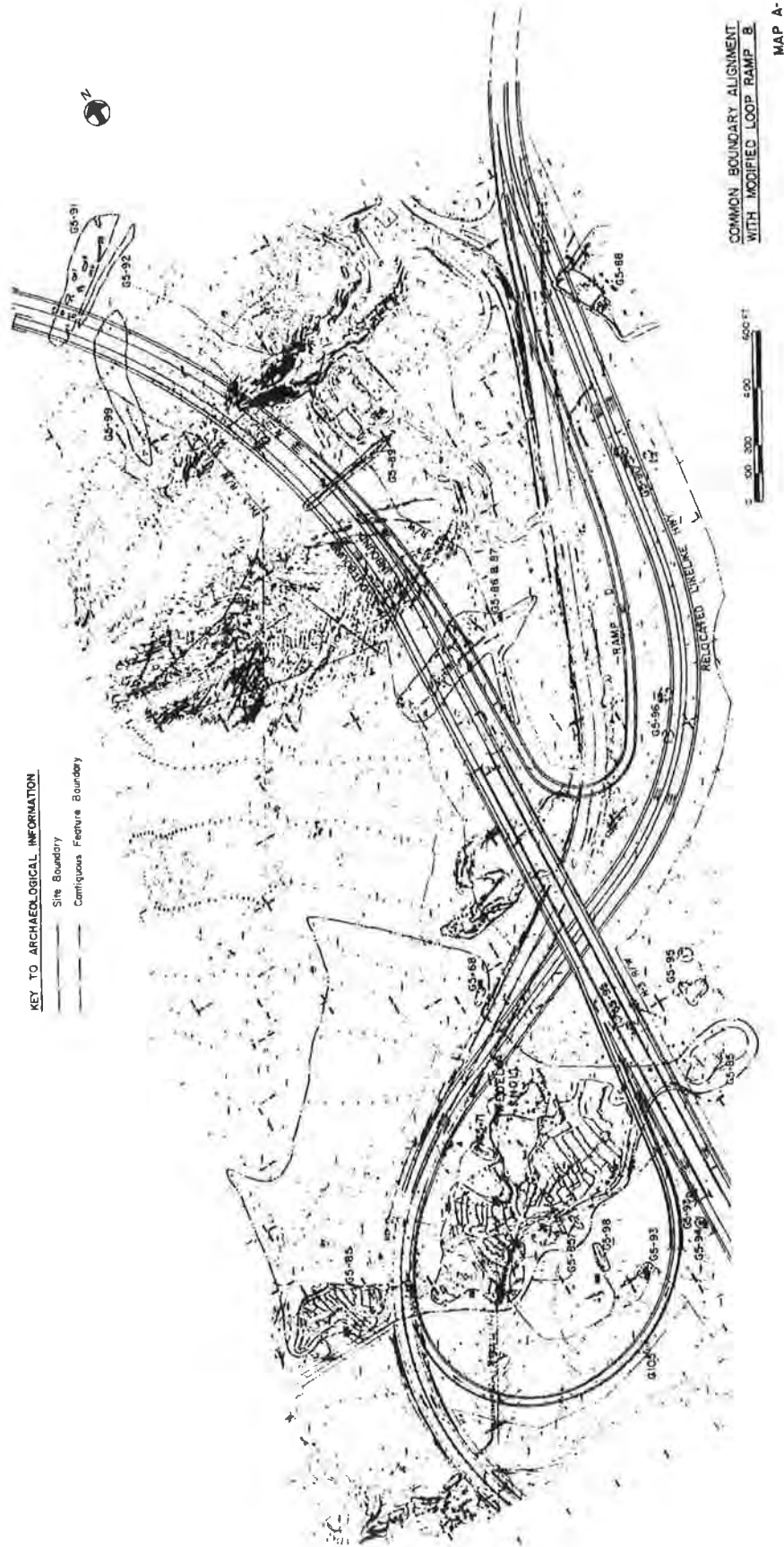
<sup>x</sup>Outside property.

Table A:6  
EXCAVATION SAMPLE SIZES

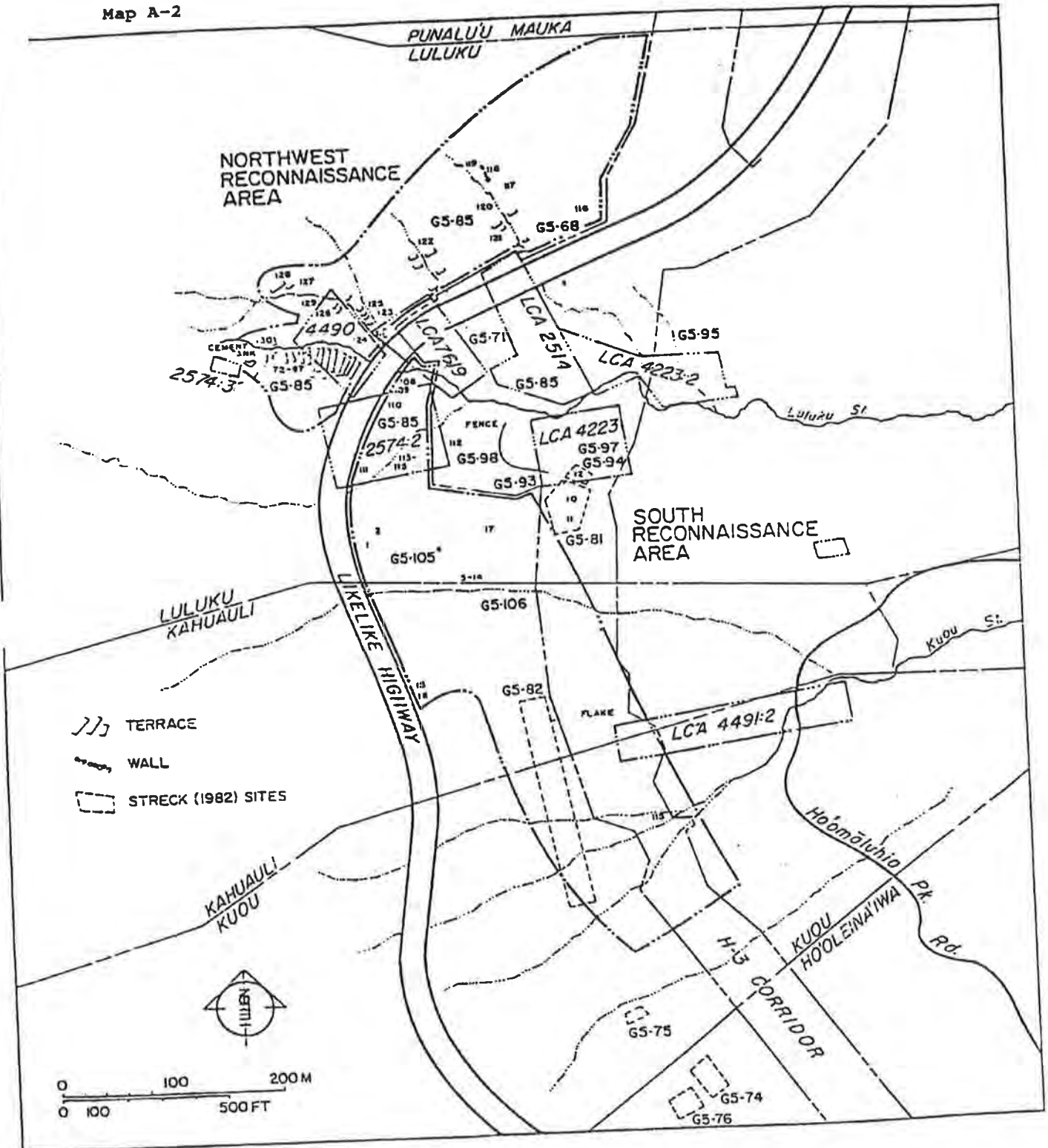
Site (50-0a-)	Area in ha (100%)	Sample Included in Data Recovery (%)	Sample to be Excavated in Nonthreatened Areas (%)
G5-68	0.008	0.0	2.5
G5-71	0.008	0.0	8.8 (stabilize and restore)
[G5-85]	4.050	0.3	0.7
[G5-86]	0.430	2.2	0.0
[G5-87]	0.090	0.7	0.0
[G5-88]	0.300	0.7	0.4
[G5-89]	0.030	2.0	0.0
[G5-90]	0.040	2.0	0.0
[G5-91]	0.030	3.3	5.0
[G5-92]	0.030	0.6	0.0
[G5-93]	0.070	2.1	0.0
[G5-94]	0.040	1.0	0.0
[G5-95]	0.530	0.2	0.1
[G5-96]	0.020	1.5	0.0
[G5-97]	0.004 <sup>+</sup>	10.0	0.0
G5-98	0.170	0.0	1.3
[G5-99]	0.004 <sup>+</sup>	2.5	2.5
[G5-105 Feature 17]	0.004	100.0	0.0
Total area	5.858		

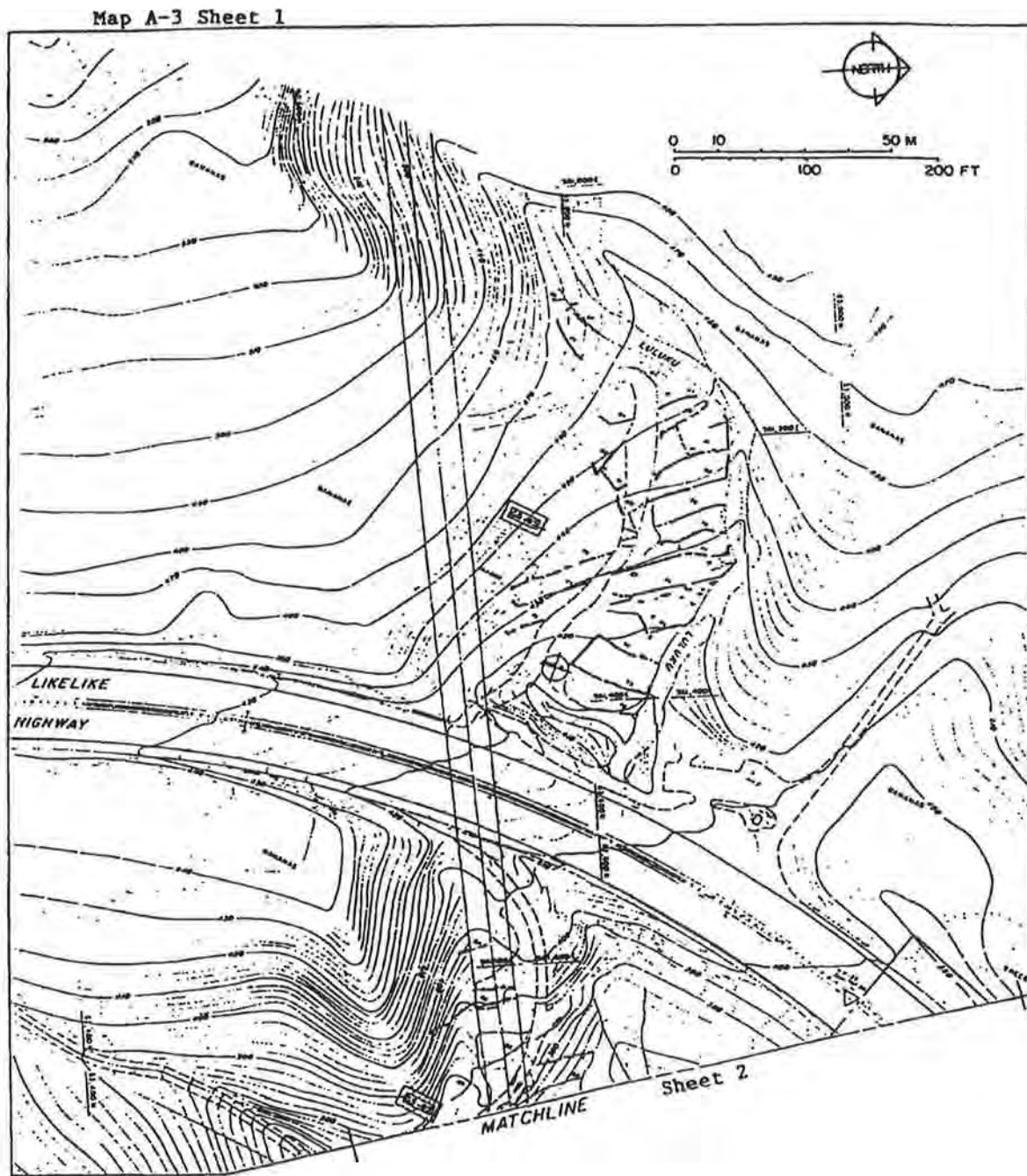
[ ] Sites threatened with direct impact.

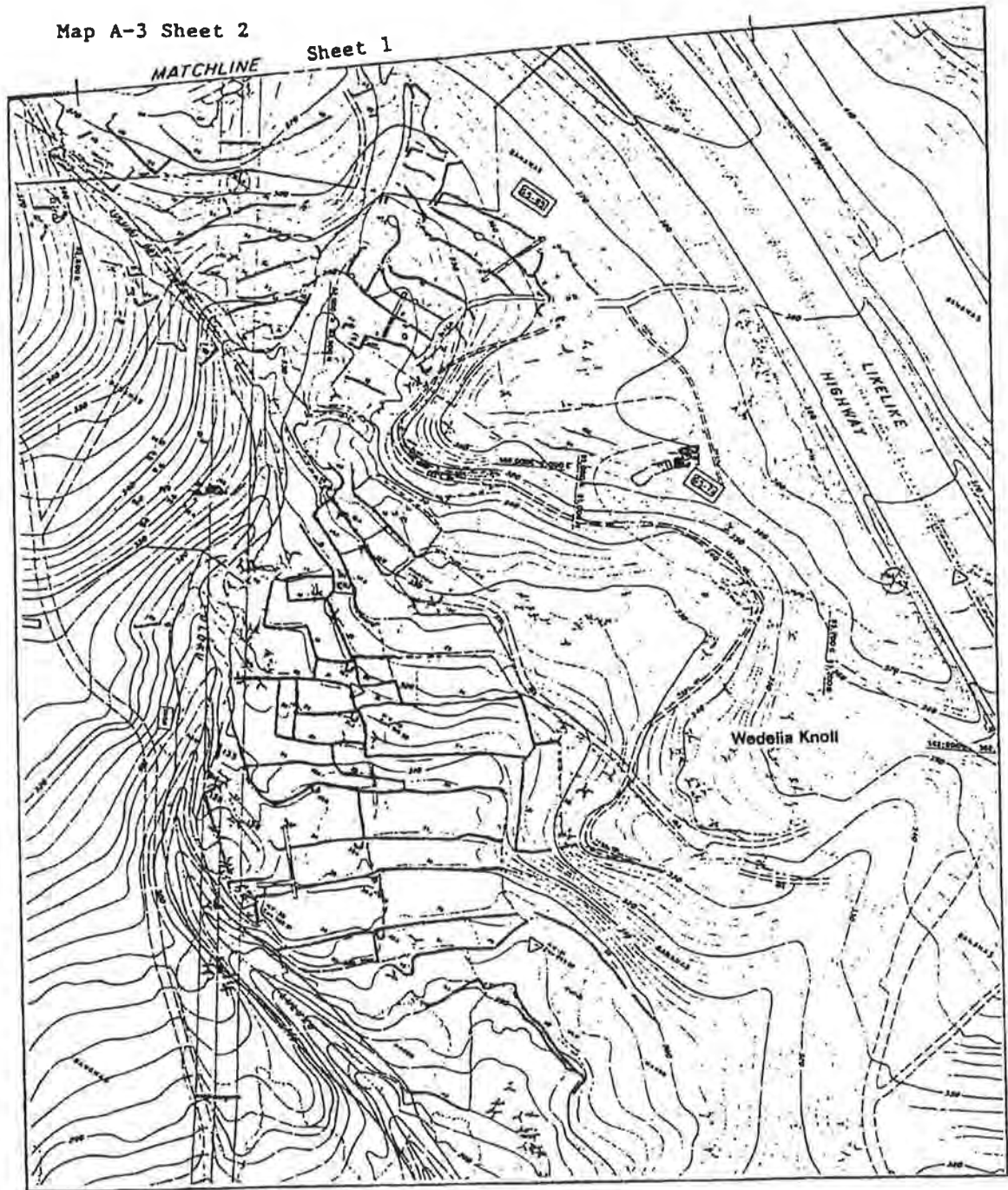
<sup>+</sup>Total does not include adjacent areas with possible subsurface features,  
to be investigated.



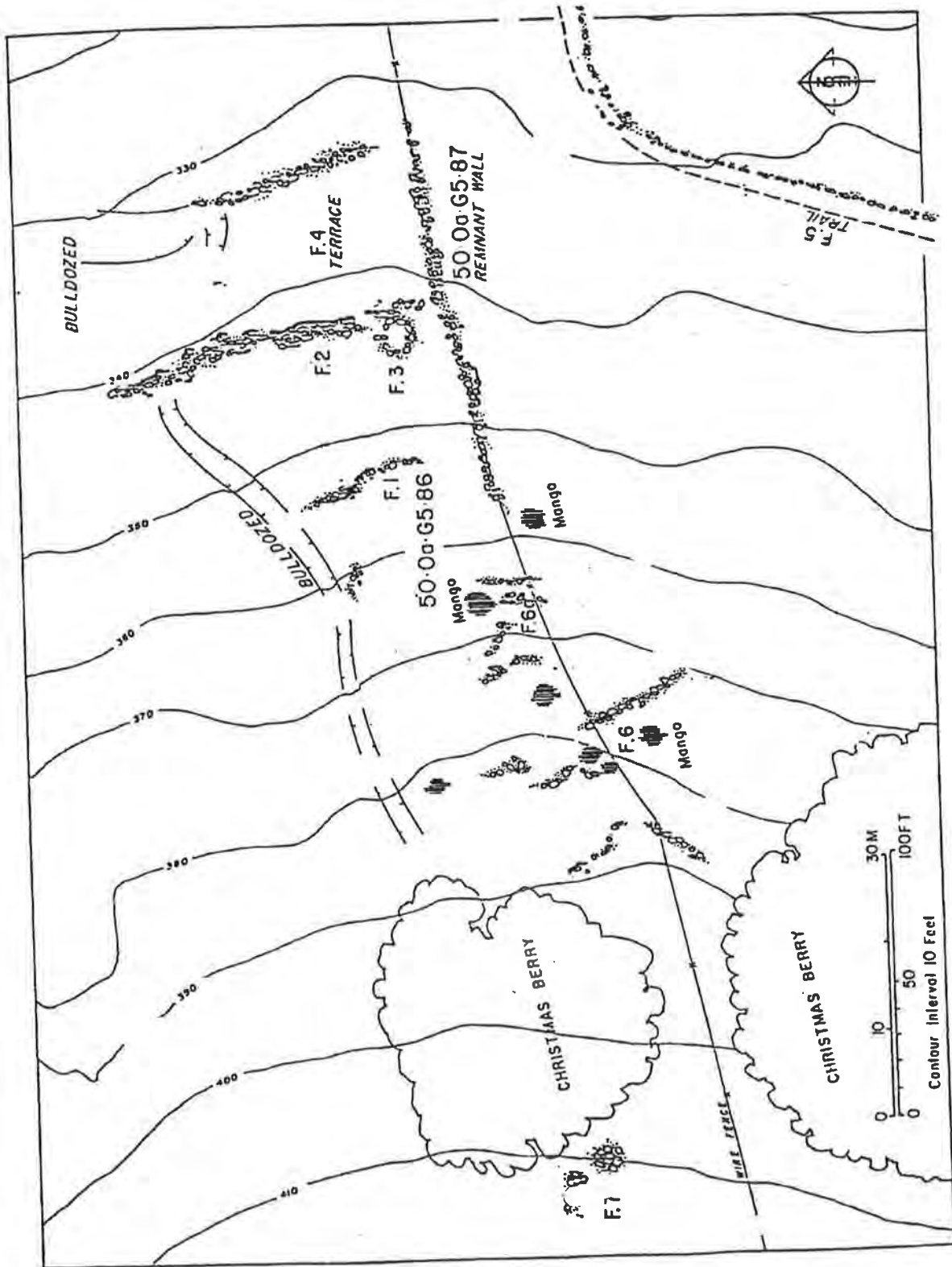
Map A-2



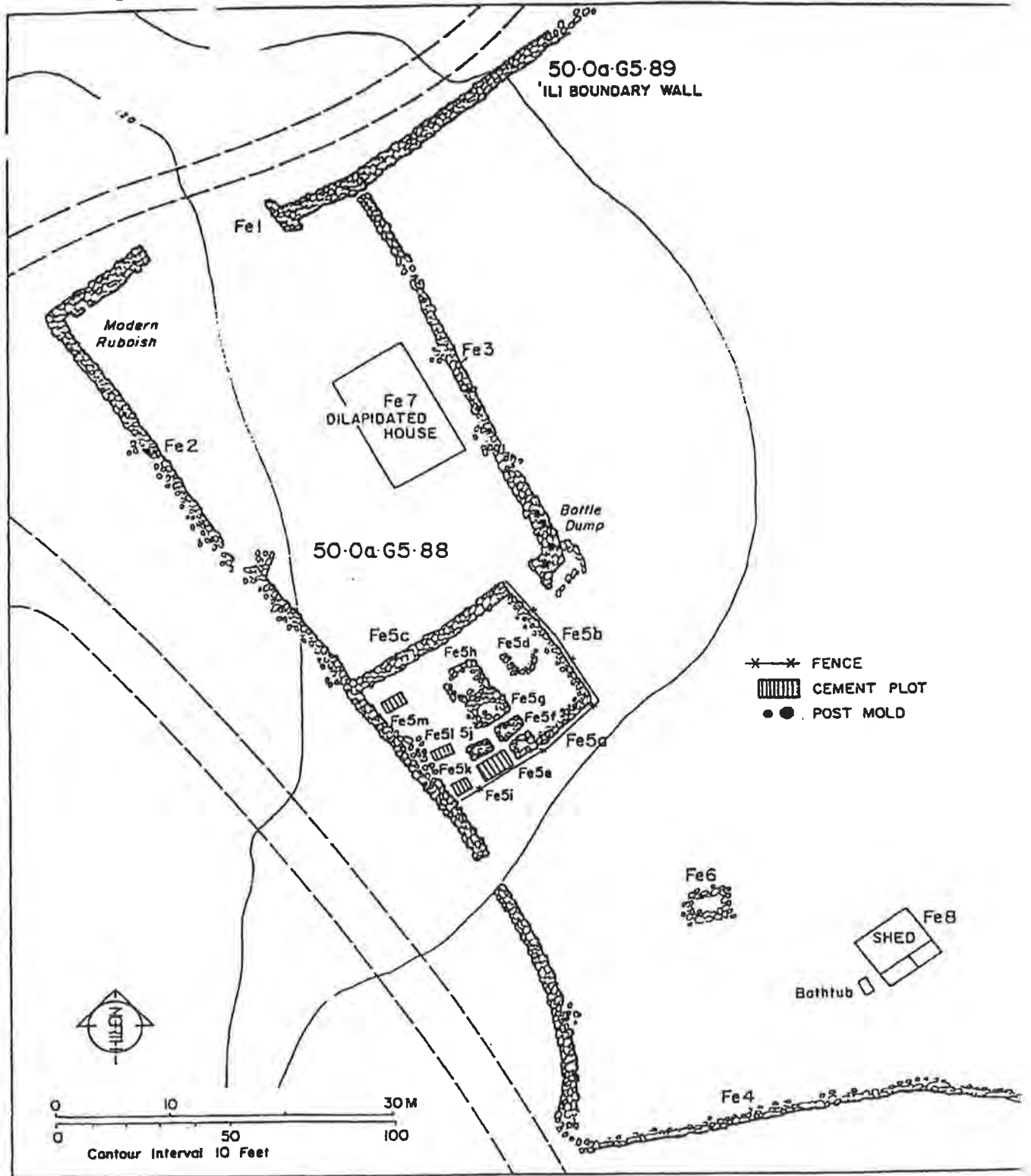




Map A-4

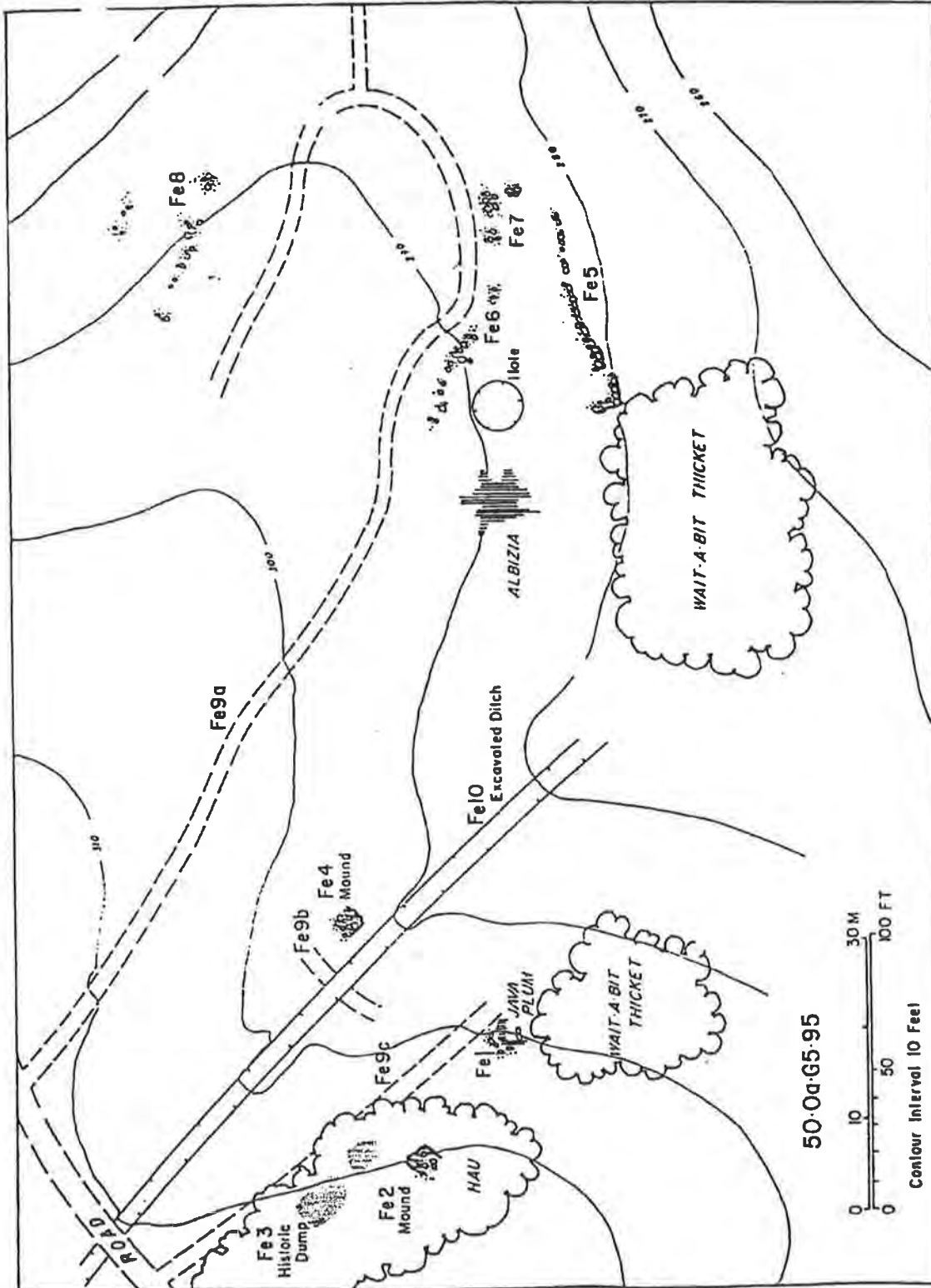


Map A-5





Map A-6



ATTACHMENT B  
IDENTIFICATION AND TREATMENT PLAN  
FOR UNSURVEYED PORTIONS OF THE H-3 CORRIDOR

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- A. A two-part archaeological survey of the unsurveyed corridor portions (see Map B-1) will be conducted by the Bishop Museum to locate any unknown historic properties. The first part of this survey will take place in conjunction with Hawaii DOT construction engineering surveys. This will ensure complete archaeological survey coverage of the entire H-3 alignment. The second part of the survey will be conducted in conjunction with clearing and construction activities for the North Halawa Valley and Haiku Valley access roads.
1. Background research for the plan shall include an overview of the currently known prehistoric and historic utilization of the areas of potential impact in the H-3 corridor. The overview should provide a summary and evaluation of previous archaeological surveys, and shall also include research on and identification of historic land grant awards, with emphasis on providing a projection of the types and likely locations of archaeological and/or traditional cultural sites to be found.
  2. The fieldwork portion of the plan, as noted above, is a two-part survey which will be performed concurrently with construction engineering surveys and access road clearing to assure complete survey coverage of both the H-3 corridor and the construction access roads. The survey shall include standard archaeological recording, mapping, and point location of all newly identified sites within the corridor and access roads, with collection of data to be sufficient to allow determination of significance.
  3. Newly identified historic sites will be evaluated in accordance with the provisions of 36 CFR Subpart B. Historic sites may consist of either surface structures or subsurface archaeological deposits. All of the signatories to this agreement will be informed by FHWA of the results of the consultations required by this provision.

- 2 -

4. Appropriate levels of treatment for any such affected historic properties will be determined in consultations between FHWA, the SHPO, Hawaii DOT and OHA. This determination shall address those properties or classes of properties which will be preserved in place, which may require no data recovery or which will be subject to data recovery.
- B. Data Recovery Plans for newly identified archaeological properties shall be submitted to the SHPO for review prior to the initiation of data recovery efforts. If an objection is raised, the dispute resolution mechanism stipulated in the Agreement will be employed.
1. Provision as stipulated under item I of the Agreement shall be made for the appropriate curation of all recovered artifacts, field notes and records resulting from data recovery efforts associated with actions covered by this plan.
  2. In the event that data recovery efforts yield evidence of Native Hawaiian human burials and/or associated funerary objects, provisions as stipulated under item F of the Agreement shall be followed.
  3. All final archaeological reports resulting from actions arising from this plan shall be provided to the signatories to this Agreement, as stipulated under item H of the Agreement.



ATTACHMENT B-MAP 1

*FINAL*

# INTERPRETIVE DEVELOPMENT PLAN

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## Hālawā-Luluku Interpretive Development Plan

December 12, 2008



Hālawā-Luluku Interpretive Development Project

Honolulu, Hawai'i

A cooperative program of the Federal Highways Administration, Hawai'i Department of  
Transportation and the Office of Hawaiian Affairs.

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## FOREWORD

The H-3 Freeway caused great harm to the 'āina and people of Hawai'i. While H-3 did indeed facilitate a convenient route to cross the island at high speed, the physical, spiritual, cultural, environmental, historical, and community damage it has caused has been enormous.

This plan represents the best efforts of a group of cultural practitioners who love the 'āina dearly to bring healing to the places most severely affected by the freeway's construction. We ourselves have been personally impacted by H-3 as we have fought to protect the lands we love, and the process of creating this plan has been long and often very painful. However, we believe that what we now have before us is a good place to begin.

We want to emphasize that the mitigations outlined in this plan will not undo the damage caused by H-3. Within the lands listed, there are many badly needed mitigation efforts that were not named in the report due to the many obstacles we encountered in the process.

There are also many lands not listed in this plan that are severely affected by the freeway's construction and presence, and these places need healing also. Some important examples include the lands (including fragile watershed), waters and ocean of Mōkapu, Pu'uloa, 'Ewa, Kāne'ōhe and Kailua. The entire districts of Ko'olaupoko and Ko'olauloa suffer from increased development and traffic, whole farming communities have been all but obliterated, and the effects of increased militarization resound throughout Hawai'i and the world. We believe that these lands and issues should have been included in the original IDP, but we were limited by such factors as government restrictions, budget, and very problematic archaeological data and issues.

Still, we are people of hope and people of action. We hope that the healing process that this plan will enable will continue to blossom, and that it will provide a strong foundation for future healing and growth throughout all lands and for all people affected by H-3. We intend to continue to help in this healing process as we both encounter and create opportunities to do so.

We hope that the work that is being done in this project will inspire others to be involved in the healing of the 'āina, and we stand strongly in support of those who are doing this work now, alongside our efforts. We pray that our collective striving will result in many good things for the lands and people of Hawai'i Nei and our Mother Earth.

Aloha me ka 'oia'i'o,  
HLID Working Group

## EXECUTIVE SUMMARY

### HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PLAN

December 2, 2008

#### PURPOSE

On August 12, 1987, the Federal Highways Administration (FHWA), State Historic Preservation Division, State of Hawai'i (SHPD), and the Advisory Council on Historic Preservation (ACHP), with concurrence by the Office of Hawaiian Affairs (OHA) and the Department of Transportation, State of Hawai'i (HDOT), executed a Memorandum of Agreement (MOA) to mitigate adverse impacts resulting from the construction of Interstate H-3 Highway (See Appendix A, *Memorandum of Agreement*, 1987).

On August 10, 1999, the H-3 Cooperative Agreement (OHA Contract No. 1385) was signed between the HDOT and OHA to undertake a project that would preserve and interpret the cultural resources located from North Hālawā Valley to the 'ili of Luluku in Kāne'ōhe. Funds amounting to \$11 million were set aside for this project.

In April 2000, the Hālawā-Luluku Interpretive Development (HLID) Project commenced with the hiring of a Project Director under the auspices of OHA.

This document represents the culmination of several years of research, dialog and planning to arrive at a plan for the mitigation of impacts that resulted from the construction of the Interstate H-3. This Interpretive Development Plan (IDP) is a guide for the implementation of the mitigation measures proposed by the public as interpreted by the project's Working Group (WG).

#### THREE-PHASE PROGRAM

The HLID plan of action includes three phases as follows:

Phase 1 – Planning. The planning phase includes three parts as follows:

*Plan to Plan.* The *Plan to Plan* is the organizing document for proceeding with the overall Interpretive Development Plan. The *Plan to Plan* describes the processes that HLID would utilize in the development of the plan. The FHWA approved the *Plan to Plan* in November of 2003 and gave the go ahead to proceed with the *Strategic Plan* (SP) phase.

*Strategic Plan (SP).* The SP phase focuses on interpreting cultural landscapes and identifying mitigation actions. The mitigation actions are intended to resolve negative impacts resulting from the development of the Interstate H-3 highway. The SP was approved in January 2006.

*Interpretive Development Plan (IDP) (Master Plan).* The IDP phase is the detailed programming phase of the project. During this phase of work, details of the mitigation actions identified in the SP phase of work is quantified in sufficient detail to move into Phase 2, or the Design and Development Phase of the project. It is at this point that concept ideas begin to take on tangible features.

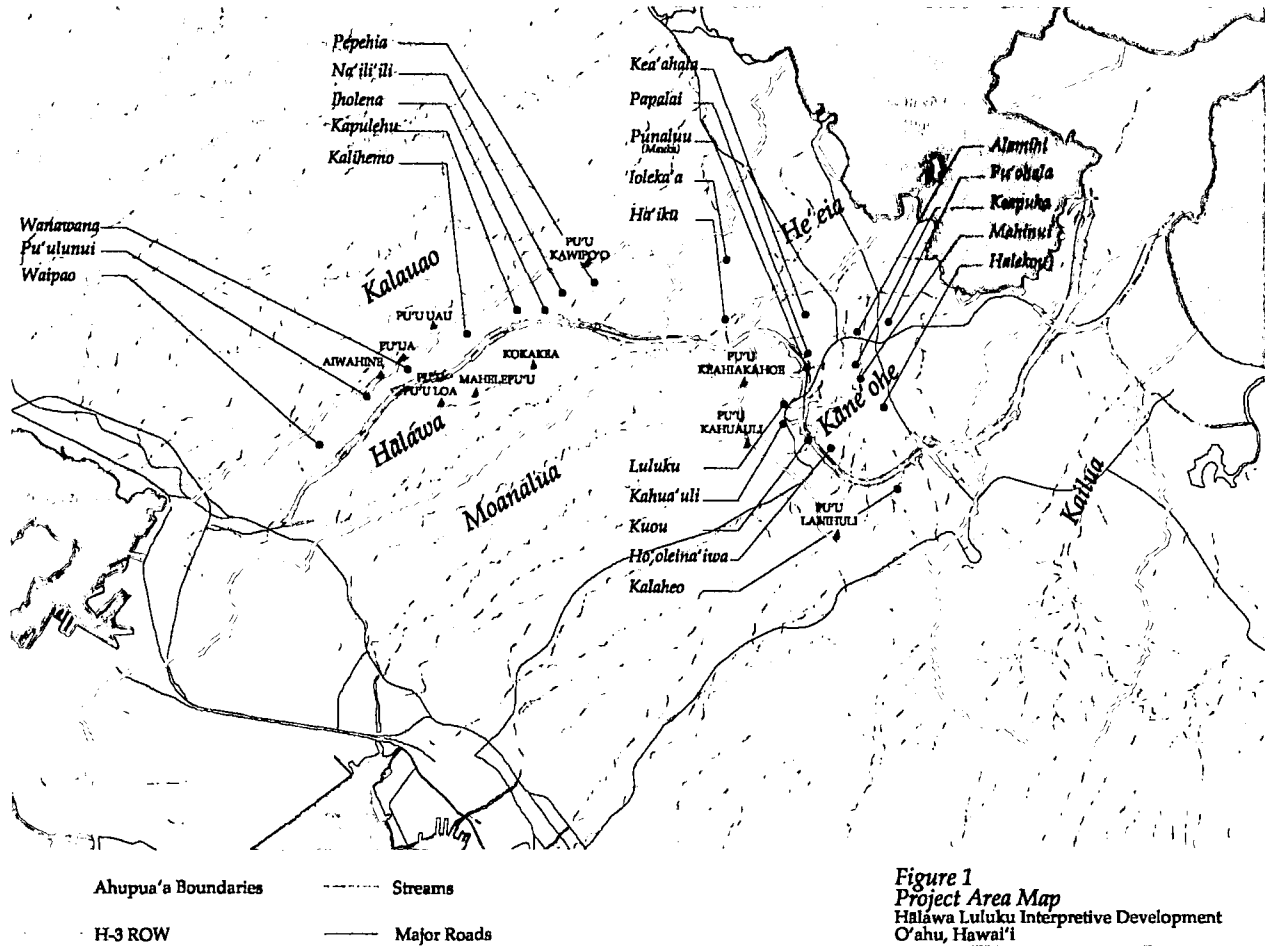
Phase 2 – Design and Development Phase. This phase of work includes the design of mitigation elements and features.

Phase 3 – Implementation Phase. This phase of work includes the implementation of preservation plans and construction plans.

**PROJECT AREA**

The HLID project area is defined as the area impacted by the development of the Interstate H-3 Highway. The project area includes the ahupua'a of Hālawā, He'eia, Kāne'ohe, and Kailua. The ahupua'a limits of the project area are shown in Figure 1. Project Area Map.

For the purposes of this H-3 mitigation program, however, the project area was further defined by the FHWA and HDOT to include only the lands directly impacted by the highway and within the highway right-of-way to be defined as the "project area" between North Hālawā Valley and Halekou. The exception to this general rule is North Hālawā Valley because the State has acquired the entire valley.



*Kāne'ohe Ili Locations - Source: Lyons, C.J., 1876  
Hālawā Ili locations are approximate. Source: Bishop, S.E., May 1887 (Copied from original map of Lyons, C.J., March 1887)*

**FOCUS AREAS**

The project area revealed a rich tapestry of history, archaeology, and culture which is the subject of this IDP. When assessing the landscape and the facets of interpretation they offered, four areas with distinct themes emerged in the Strategic Planning process. They are: North Hālawā Valley, Luluku Agricultural Terraces, Kukui o Kāne Heiau, and Ha'ikū Valley. Plans for two of the four areas – Ha'ikū Valley and



Kukui o Kāne Heiau - were not fully developed because of circumstances outside of the control of this project relating to site access.

Descriptions of Kukui o Kāne Heiau in this report are limited because the archaeological studies conducted by Bishop Museum relating to this site were not completed at the time of this report. Further mitigation or interpretive discussions may be needed when the report is completed. Further, access to the site has not been resolved.

Mitigation for areas impacted by H-3 within Ha'ikū Valley was initially included in the IDP because planning was completed in the Strategic Plan. However, according to FHWA the focus of mitigation was to be confined to the area adjacent to the highway right-of-way. Consequently, only two archaeological sites are addressed in the IDP for further study.

### PUBLIC PARTICIPATION PLAN

The opportunity for participation was open to all members of the public. HLID maintained contact (via mailings) with all interested members of the community (Advisory Group) who indicated interest in the project, and who wished to comment on and recommend processes, strategies and interpretation for North Hālawā Valley, Luluku Agricultural Terraces, Kukui o Kāne Heiau, and Ha'ikū Valley to the WG, OHA, HDOT, SHPD and FHWA. In addition to mailings, notices of the public meeting were placed in the daily newspapers (statewide distribution) and *Ka Wai Ola*, a publication of OHA. Through these notices individuals, organizations, and agencies were invited to comment on the proposed plans. HLID's public participation complies with HDOT's Public Information Program.

### OBJECTIVES

The objectives of the mitigation program are:

1. "Healing of the 'Āina" - Implement actions to a) preserve cultural and historic sites through site stabilization; b) implement preservation and restoration plans to protect existing resources by designating kapu areas; c) communicate the significance of the cultural landscape and features through an interpretive program; and d) heal the 'āina and its people.
2. Sustainability - Establish and utilize sustainable practices that demonstrate how the host Hawaiian culture cares for the land.
3. Access - Develop facilities and implement programs and strategies that provide access to individuals' (and groups') pursuit of traditional Hawaiian cultural practices.
4. Natural/Ecological Resources - Implement actions that promote ecological balance of the environment and perpetuate both the knowledge and practice of Native Hawaiian culture. Restore native vegetation and control hoofed and other feral animals in a culturally and environmentally appropriate manner, minimizing excess cruelty and safety hazards.
5. Educational Program - Develop educational programs, materials, and facilities to interpret the historic and cultural resources of the project area to a wider audience by reconnecting the people with the 'āina. The documentation and sharing of modern-day efforts to protect the 'āina from destruction are a major component.
6. Recreational Programs - Identify and develop culturally sensitive outdoor recreational pursuits which promote sharing the 'āina and complements Hawaiian history, culture and the traditions

of these lands and people. Work with organizations involved with these activities in ensuring culturally and environmentally appropriate access.

### IMPLEMENTATION OVERVIEW

This IDP was reviewed and approved by the signatories of the MOA that include: OHA, HDOT, SHPD and FHWA. Approval of the IDP occurred in a three-step process that included the following actions:

1. Approval by the HLID Working Group of the actions proposed. WG approval occurred through agreement in the WG meetings. Recommendations made in this report include the results of a collaborative discussion of the WG and the project planning consultant, R.M. Towill Corporation, and approval of the mitigation discussed by the WG. The WG approved document is called the Preliminary IDP. The Preliminary IDP was presented to the public at meetings to inform them of the project and obtain their feedback. Public feedback was incorporated into the IDP before the Preliminary IDP was sent for agency approval.
2. Approval by signatories of the recommendations of the WG. Once the Preliminary IDP was finalized, it was sent concurrently to OHA, SHPD, HDOT, and FHWA for their review and comment. Agency comments were sent to HDOT for review and approval.
3. Approval by HDOT. HDOT approval of the Preliminary IDP resulted in the Final IDP, which was then sent to FHWA for its concurrence. FHWA concurrence is the final approval, and their approval shall signify closure of the IDP planning phase.

### OPERATIONS AND MANAGEMENT

#### *Administrative Authority*

Administrative authority for the mitigation program rests with the following organizations:

- Federal Highways Administration (FHWA),
- State Department of Transportation (HDOT), and
- Office of Hawaiian Affairs (OHA).

Overall responsibility for the mitigation program is with FHWA and HDOT. HDOT has overall legal responsibility for the lands within the Interstate H-3 right-of-way. HDOT is also responsible for activities and public access into the project areas. This latter responsibility is recommended to be transferred to OHA who will be assigned the responsibility of overall "Program Manager." As Program Manager, OHA shall select an organization or organizations to manage the day-to-day activities within the project areas. OHA shall also have general oversight over all facilities and programs in the project areas, and responsibility for administering the capital funds for the project. In addition, OHA shall organize an Advisory Group to assist in program review.

In addition, OHA, as Program Manager, shall select a nonprofit organization (NPO) to implement the mitigation program for the project areas. OHA may use the following criteria to select the implementing body for each project area:

- Demonstrated experience in the implementation of cultural programs,
- Demonstrated actual experience in the areas of the project, including intimate knowledge of and demonstrated love for the lands in the project areas,
- Demonstrated leadership and management experience of the organization team,

- Familiarity with the central community of cultural practitioners in each respective area, and ability to work in a respectful, empowering, culturally appropriate manner with all bonafide cultural practitioners and affected families,
- Ability and willingness to fairly balance the diverse needs of kupuna, keiki, ʻōpio, educators, disabled persons and the general public,
- Demonstrated fiscal management experience,
- Does not have any delinquent State accounts,
- Organization has the ability to fund a comprehensive insurance program,
- Organization's charter is complementary to the mitigation program objectives, and
- Organization has a comprehensive 5-10 year program vision and business plan that implements the vision, goals and objectives of the IDP.

### *Operations and Maintenance*

The implementation phase of the program will require the formation of an operating and programming body, such as a NPO. The NPO(s) will conduct the day-to-day business of implementing the IDP with participation by agencies, organizations and individuals who will be asked to partner with the governing entity.

The new NPOs will share responsibility for implementing and sustaining the elements recommended in this IDP. It is important that these new entities have a strong understanding of appropriate cultural protocols, a direct relationship to the land they steward, and a passion for the preservation, cultural, and/or historical perspectives stated in this IDP. Further, the stewards should be bonafide, successful nonprofit organizations or governmental agencies that qualify to be stewards of the interpretations/program elements from this IDP.

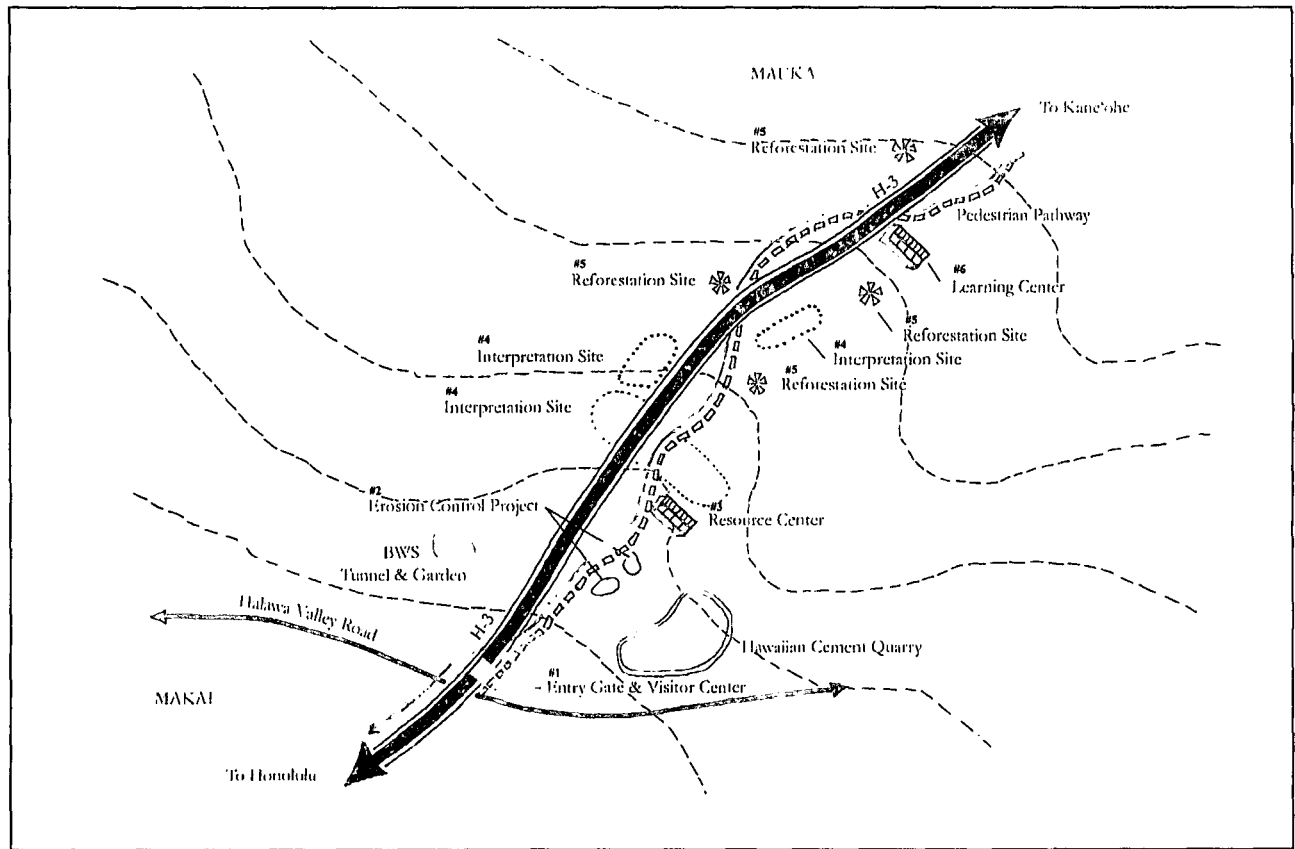
Transition from planning to design to implementation to sustenance requires a management and business plan which has a five- and ten-year vision, and which addresses how and when the themes, goals and objectives of this IDP will be implemented. HDOT and/or OHA should provide scrutiny to insure the management and business plans are realistic and have critical benchmarks.

Management plans should address preservation actions and management actions needed to meet the stewardship responsibility of the entity. Business plans should address forward-looking planning that discusses revenue generation, anticipated costs, partnerships and sustenance.

AREA VISION

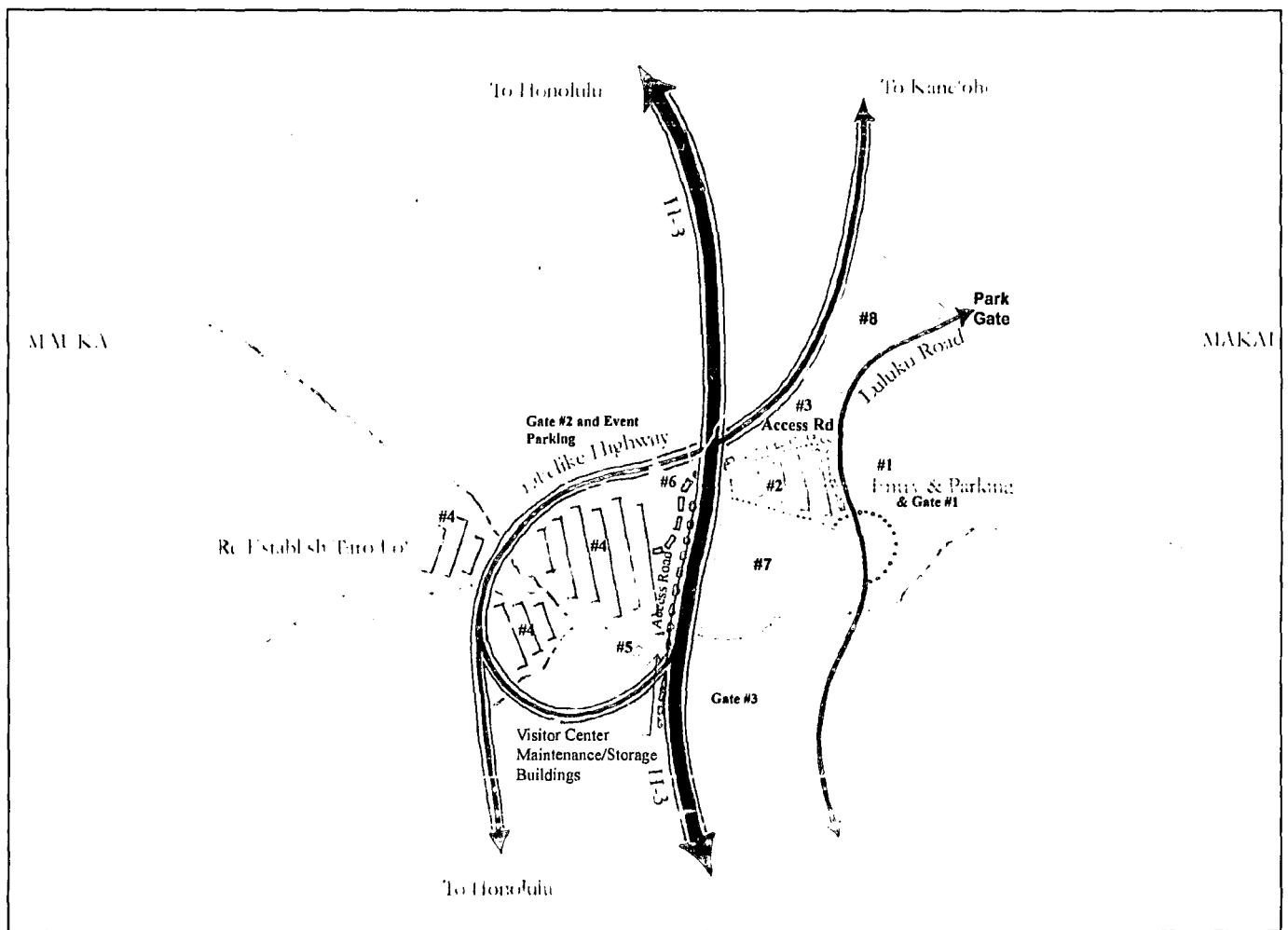
*North Hālawā Valley*

North Hālawā Valley serves as a healing and learning center through the preservation of traditional cultural practices. North Hālawā Valley is observed as a healing place for the mind and body, a place for learning and a place of worship. Practitioners, students and visitors are immersed into an environment that is experiencing healing through the efforts of volunteers working on restoring native vegetation, and the stabilization and restoration of cultural sites. Knowledge and education are promoted through the teaching of traditional and contemporary practices on the land.



*Luluku Agricultural Terraces*

The Luluku Agricultural Terraces shall be restored through the perpetuation of culturally appropriate science, engineering, and agricultural practices. Research will be demonstrated through the planting of primarily native Hawaiian *kalo* (taro) using ancient and contemporary techniques in water resource management and sustainable agricultural practices. The relationship between the land and its people are of both historical and cultural importance in the context of interpretations which emphasizes Luluku's ability to feed many people in the Kāne'ohē district and areas beyond.



*Kukui o Kāne Heiau*

Kukui o Kāne Heiau, the largest known heiau in the Ko'olaupoko District, represents a place of special reverence because of its association with the Hawaiian god Kāne. The location of the heiau is a testament of its importance to the people of the district. The preservation of this sacred site upholds traditional religious values to modern-day cultural practitioners and in its interpretation maintains answers of the site's historical significance which will be expressed by scholars and educators.



*Ha'ikū Valley*

Ha'ikū Valley serves current and future generations by preserving the history and heritage of native Hawaiians through its collection of literature, artifacts, and cultural practices. The vision for the Valley is to transform it into a gathering place for knowledge, learning, and conservation (of artifacts, etc.); and a place where there is an opportunity to teach culture. Practitioners, students and visitors are immersed into an environment that has been transformed over the years into an example of an impact zone that is trying to heal itself through the efforts of volunteers working on restoration projects that will transform the ecology and preserve links to the past. Ha'ikū serves as a place for renewal of the spirit and re-connection with the 'āina. Conservation projects to preserve former agricultural features and places of honor and worship continue through the efforts of volunteers under the guidance of knowledgeable kupuna and professionals.

**IMPLEMENTATION**

Table 1 summarizes the approved project costs for each project area by phases. The four phases will be programmed as part of the Statewide Transportation Improvement Program (STIP). Each program year begins in October corresponding to the Federal fiscal year. The first program year for the STIP is 2009 (FY 2009). The second program year is projected for FY 2010, followed by year three and four at FY 2011 and 2012, respectively. Implementation will be determined annually by availability of funds for that particular fiscal year, need for the project, and the overall priority assigned to the project.

Table 1  
Proposed Implementation Budget (\$millions)

Project Area	Phase 1	Phase 2	Phase 3	Phase 4
A. North Hālawā Valley	\$3.71	\$2.41	\$2.39	\$2.40
B. Luluku Agricultural Terraces	\$6.12	\$3.13	\$3.99	\$2.23
Total	\$9.83	\$5.54	\$6.36	\$4.63

## UNRESOLVED ISSUES

### *North Hālawā Valley*

- Actions proposed by this plan will be limited to areas under the jurisdiction of the HDOT.
- Implementation of mitigation actions by HDOT imposed by the conditions of the current Conservation District Use Permit is currently unknown.
- Mitigation proposed within this plan is within the State's Conservation District and will require a Conservation District Use Permit.

### *Luluku Agricultural Terraces*

- Complete historical and archaeological study of the area was not conducted, therefore the inter-relationship between the various parts of the terraces is unknown. Additional study is required.
- Historic documentation of the site is currently incomplete making it difficult to have a clear understanding of the role of this site.
- Access to the site requires coordination with the City and County of Honolulu because the Luluku Agricultural Terraces abuts Ho'omaluhia Botanical Park.

### *Kukui o Kāne*

Complete historical and archaeological study of the area is currently on-going by the Bishop Museum and their report is pending. A draft of the Museum's findings has been transmitted to SHPD for review. There is a possibility that the Bishop Museum study may not be completed in time to be considered by the HLID Project. Interpretation of Kukui o Kāne Heiau may be delayed beyond the completion of the IDP. In that likelihood, a separate effort to mitigate and interpret Kukui o Kāne Heiau will be undertaken.

Access to the site is currently blocked by H-3 and Likelike Highway and site access by cultural practitioners needs to be resolved by the HDOT and adjoining land owners.

- The genealogical caretakers of the heiau need to be consulted before the final plan is implemented.

### *Ha'ikū Valley*

- Access into the valley is currently under the jurisdiction of the Department of Hawaiian Home Lands (DHHL) and the City and County of Honolulu. Implementation of the actions proposed will require coordination and partnership with DHHL.
- The City and County of Honolulu is currently negotiating the acquisition (land exchange) of a



portion of the land for its use, primarily to gain access to the Ha'ikū Stairs. Implementation of proposed actions will require coordination and partnership with the City.

- Access from Kahekili Highway to Ha'ikū Valley is currently through a residential subdivision. The Ha'ikū Road access requires coordination and implementation by the City and County of Honolulu and the Kamehameha Schools.
- OHA is considering a proposal for the acquisition of Ha'ikū Valley to be forwarded to the Hawai'i State Legislature.

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*FINAL*

**INTERPRETIVE DEVELOPMENT PLAN**

**Hālawā-Luluku Interpretive Development Plan**

December 12, 2008

Prepared for:

**Hālawā-Luluku Interpretive Development Project**

**Honolulu, Hawai'i**

Prepared by:

**R.M. Towill Corporation**

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19361-2P

A cooperative program of the Federal Highways Administration, Hawai'i Department of Transportation and the Office of Hawaiian Affairs.

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## 1

## INTRODUCTION

## 1.1 PURPOSE

On August 12, 1987, the Federal Highway Administration (FHWA), State Historic Preservation Division, State of Hawai'i (SHPD), and the Advisory Council on Historic Preservation (ACHP), with concurrence by the Office of Hawaiian Affairs (OHA) and the Department of Transportation, State of Hawai'i (HDOT), executed a Memorandum of Agreement (MOA) to mitigate adverse impacts resulting from the construction of Interstate H-3 Highway (See Appendix A, Memorandum of Agreement, 1987).

*STIPULATION B. "An Interpretive Development Plan will be completed by the HDOT in consultation with the FHWA, SHPO and OHA, and shall address the interpretive development of sites which will be selected after completion of the measures set forth in the Data Recovery Plan."*

*"1. The Interpretive Development Plan shall address provisions for acquisition of access, on-site interpretation, maintenance, appropriate treatment of structural components, acquisition of water rights, financial responsibility and interpretive concerns."*

*"2. This plan shall be completed within 2 years after the completion of archaeological field work for use thereafter by the Federal, State, or City government which is authorized by law to carry out the activities described in the plan."*

*"3. Copies of the completed plan will be provided to the Hawai'i Department of Land and Natural Resources (DLNR), the City and County of Honolulu Department of Parks and Recreation, the Pacific Area Office of the National Park Service, and others identified during the development of the plan" (Memorandum of Agreement, 1987).*

On August 10, 1999, the H-3 Cooperative Agreement (OHA Contract No. 1385) was signed between the HDOT and OHA to undertake a project that would preserve and interpret the cultural resources located from North Hālawā Valley to the 'ili of Luluku in Kāne'ohe. Funds amounting to \$11 million were set aside for this project.

In April 2000, the Hālawā-Luluku Interpretive Development (HLID) Project commenced with the hiring of a Project Director under the auspices of OHA.

This document represents the culmination of several years of research, dialog and planning to arrive at a plan for the mitigation of impacts that resulted from the construction of the Interstate H-3. This Interpretive Development Plan (IDP) is a guide for the implementation of the mitigation measures proposed by the public as interpreted by the project's Working Group (WG).



The next phases of work for this project beyond the IDP are the design and implementation of the interpretive programs outlined in this document.

## 1.2 PUBLIC PARTICIPATION PLAN

The opportunity for participation was open to all members of the public. HLID maintained contact (via mailings) with all interested members of the community (Advisory Group) who indicated interest in the project, and who wished to comment on and recommend processes, strategies and interpretation for North Hālawā Valley, Lulukū Agricultural Terraces, Kukui o Kāne Heiau, and Ha'ikū Valley to the WG, OHA, HDOT, SHPD and FHWA. In addition to mailings, notices of the public meeting were placed in the daily newspapers (statewide distribution) and *Ka Wai Ola*, a publication of OHA. Through these notices individuals, organizations, and agencies were invited to comment on the proposed plans. HLID's public participation complies with HDOT's Public Information Program.

Comments received from the public on the draft IDP are included in Appendix B.

HLID developed a public participation plan that includes the following membership elements:

- WG – Individuals with cultural relationships to the project area and who can contribute to the understanding of cultural practices in the area.
- Advisory Group (Interested Public) – Individuals and organizations who are interested in the outcome of the project.
- General Public – Individuals, organizations, and agencies who are invited through public notice to comment on the proposed plans.
- Agencies – Department of Parks and Recreation, City and County of Honolulu; National Park Service, Pacific Area Office; and DLNR, State of Hawai'i.

The strategic discussions were centered within the WG, who assisted in recommending processes, strategies and interpretation for North Hālawā Valley, Lulukū Agricultural Terraces Kukui o Kāne, and Ha'ikū Valley to OHA, HDOT, SHPD and FHWA. Members of the WG are:

**HLID Working Group:**

Donna Bullard

Donna Ann Kamehaiku Camvel

Wali Camvel

Mahealani Cypher

Lela Hubbard

Marion Kelly (Honorary Member)

Clara "Sweet" Matthews

Robert "Boot" Matthews

Havana McLafferty

Jodi Nahinu

Vienna Nahinu

Ella Paguyo

John Talkington

Laulani Teale

WG members, most of whom are themselves cultural/religious practitioners, also have specific areas of interest and knowledge which were addressed:

- Issues related to places, practices and uses that help define the cultural landscape;
- Knowledge of individuals and groups with history of the project area; and,
- Knowledge of cultural and land stewardship principles used by Hawaiians.

The role of individual WG members was to represent an issue and/or areas of responsibility and to consider all relevant information, deliberate, and accomplish the goals established for the project. It should be noted that while WG members and the public provided input into this plan, final decisions were made by OHA, HDOT and FHWA. The recommendations made by the WG and public were considered in the analyses by OHA, HDOT and FHWA. While the WG feels that there are still many problems caused by the H-3 project that have not been addressed by this plan, they are hopeful that the mitigations included in this plan will be a good start toward the long-term healing of the 'āina.

Community participation involved engaging individuals and representatives of organizations in meetings to obtain feedback for proposed mitigation measures. Persons attending the meetings represented the broader community and served as a sounding board to the activities of the WG.

The interested public provided input towards the planning of the major phases of the project. The public participation goal was to confirm the appropriateness of work activities proposed for the project and the recommendations of the *Plan to Plan*, *Strategic Plan*, and *Interpretive Development Plan* to OHA, HDOT and FHWA.

### 1.3 THREE-PHASE PROGRAM

The HLID plan of action includes three phases as follows:

Phase 1 – Planning. The planning phase includes three parts as follows:

*Plan to Plan.* The *Plan to Plan* is the organizing document for proceeding with the overall Interpretive Development Plan. The *Plan to Plan* describes the processes that HLID would utilize in the development of the plan. The FHWA approved the *Plan to Plan* in November of 2003 and gave the go ahead to proceed with the *Strategic Plan* (SP) phase.

*Strategic Plan (SP).* The SP phase focuses on interpreting cultural landscapes and identifying mitigation actions. The mitigation actions are intended to resolve negative impacts resulting from the development of the Interstate H-3 highway. The SP was approved in January 2006.

*Interpretive Development Plan (IDP) (Master Plan).* The IDP phase is the detailed programming phase of the project. During this phase of work, details of the mitigation actions identified in the SP phase of work is quantified in sufficient detail to move into Phase 2, or the Design and Development Phase of the project. It is at this point that concept ideas begin to take on tangible features.

Phase 2 – Design and Development Phase. This phase of work includes the design of mitigation elements and features.

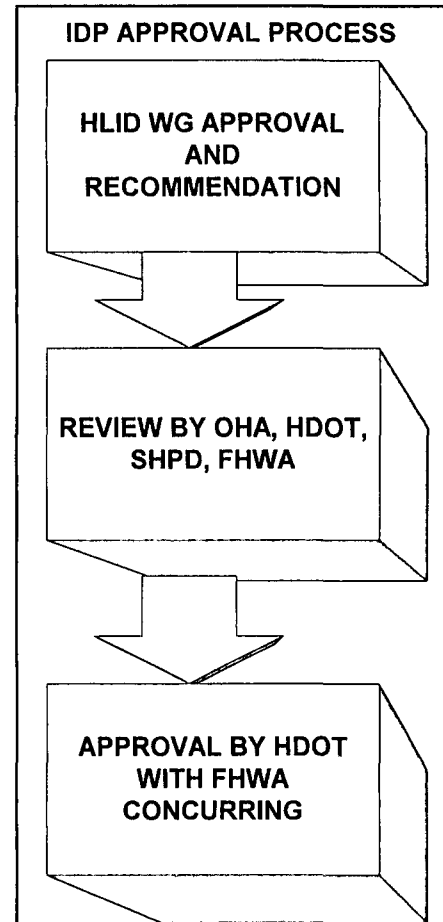
Phase 3 – Implementation Phase. This phase of work includes the implementation of preservation plans and construction plans.

#### 1.4 APPROVAL PROCESS

The IDP was reviewed and approval the signatories of the MOA that included: OHA, HDOT, SHPD and FHWA.

Approval of the IDP required a three step process that included the following actions:

1. The HLID Working Group approved the actions proposed in this document. WG approval occurred through agreement in the WG meetings. Recommendations made in this report are the result of a collaborative discussion of the WG and the project planning consultant, R.M. Towill Corporation, followed by approval of the mitigation discussed by the WG. The WG approved document is called the Preliminary IDP. The Preliminary IDP was presented to the public at meetings to inform them and obtain their feedback. Public feedback was reconciled before the Preliminary IDP was sent for agency approval.
2. Approval by signatories of the recommendations of the WG. Once the Preliminary IDP was published, it was sent concurrently to OHA, HDOT, SHPD and FHWA for their review and comments. Agency comments were sent to HDOT for review and approval.
3. Approval by HDOT. HDOT approval of the Preliminary IDP resulted in the Final IDP, which was sent to FHWA for their concurrence. FHWA concurrence is the final approval, and its approval shall signify closure of the IDP planning phase.



## 2

**METHODOLOGY****2.1 CULTURAL LANDSCAPE – AN APPROACH**

A cultural landscape, as defined by the National Park Service, is the overlay of cultural elements (sites, trails, structures, wahi kapu, etc.) on the natural environment. Landscapes are dynamic and ever changing, and should be viewed as a continuum of place and time intersecting and with each epoch adding to the overall character of the land. Although ideological and thematic components are necessary, the focus of this report is on assemblage of information relating to the lands traversed by H-3, the impacts to cultural resources resulting from the construction of H-3, and proposals for the preservation and management of the physical elements that make up the landscape.

In the course of establishing how the cultural landscape was impacted by the development of H-3, many sources of information were consulted to seek the knowledge required to understand how the land was revered and utilized. In many instances, however, we may have lost information to history through the passing of kupuna or through the modification of the land to a point where past uses cannot be recognized.

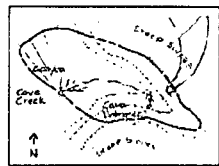
Section 2.2 describes the discrete elements of the cultural landscape as prescribed by the National Park Service. Section 2.3 describes integrity as the second ingredient required to ascribe to a cultural landscape. Section 2.4 outlines the various sections used to frame the Interpretive Development Plan for each of the focus areas identified for this project.

**2.2 ELEMENTS OF THE CULTURAL LANDSCAPE**

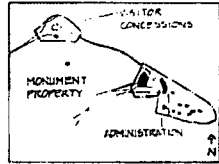
The National Park Service identifies a series of 13 elements typically used to evaluate cultural landscapes (See Figure 2-1). They include:

Natural Systems and Features	Spatial Organization
Land Use	Cultural Traditions
Cluster Arrangement	Circulation
Vegetation	Building and Structures
Views and Vistas	Constructed Water Features
Small-Scale Features	Archaeological Sites
Topography	

Figure 2-1. Elements of the Cultural Landscape



**Natural Systems and Features**  
Natural aspects that often influence the development and resultant form of a landscape.



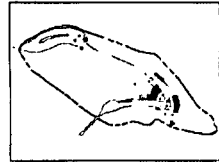
**Spatial Organization**  
Arrangement of elements creating the ground, vertical, and overhead planes that define and create spaces.



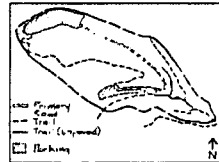
**Land Use**  
Organization, form, and shape of the landscape in response to land use.



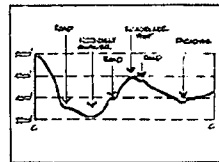
**Cultural Traditions**  
Practices that influence land use, patterns of division, building forms, and the use of materials.



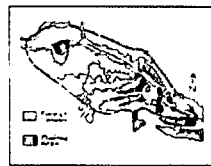
**Cluster Arrangement**  
The location of buildings and structures in the landscape.



**Circulation**  
Spaces, features, and materials that constitute systems of movement.



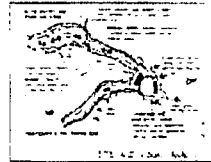
**Topography**  
Three-dimensional configuration of the landscape surface characterized by features and orientation.



**Vegetation**  
Indigenous or introduced trees, shrubs, vines, ground covers, and herbaceous materials.



**Buildings and Structures**  
Three-dimensional constructs such as houses, barns, garages, stables, bridges, and memorials.



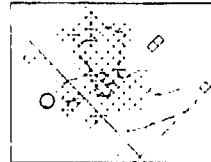
**Views and Vistas**  
Features that create or allow a range of vision which can be natural or designed and controlled.



**Constructed Water Features**  
The built features and elements that utilize water for aesthetic or utilitarian functions.



**Small-Scale Features**  
Elements that provide detail and diversity combined with function and aesthetics.



**Archeological Sites**  
Sites containing surface and subsurface remnants related to historic or prehistoric land use.

## 2.3 INTEGRITY

Integrity is defined by the National Park Services as follows:

*Integrity- the authenticity of a property's historic identity, evinced by the survival of physical characteristics that existed during the property's historic or prehistoric period. The seven qualities of integrity as defined by the National Register Program are location, design, setting, materials, workmanship, feeling, and associations.*

1. Location: Location is the place where a historic property was constructed or the place where a historic event occurred. Integrity of location refers to whether a property has been moved or relocated since its construction. A property is considered to have integrity of location if it remains at its original site, or was moved before or during its period of significance. The integrity of a feature during its active career is not lost if the relocation enhanced or continued its function.
2. Design: Design is the composition of elements that constitute the form, plan, space, structure, and style of a property. Design also recognizes that properties change through time. For example, a heiau may be raised or lowered; buildings may be added or removed from the site; and vegetation added or removed as a result of changes in leadership. Changes made to continue the function of the aid during its career may acquire significance in their own right. These changes do not necessarily constitute a loss of integrity of design. The design integrity of a heiau may also be reflected by the survival of ancillary buildings and structures. The loss or substantial alteration of ancillary resources, such as sleeping or eating spaces, and waterways, for example, may constitute a significant loss of design integrity.
3. Setting: Setting is the physical environment of a historic property that illustrates the character of the place. Integrity of setting remains when the surroundings of a heiau have not been subjected to radical change. Integrity of setting of an isolated heiau would be compromised, for example, if it were now completely surrounded by modern development.
4. Materials: Materials are the physical elements combined in a particular pattern or configuration to form a historic property during a period in the past. Integrity of materials determines whether or not an authentic historic resource still exists.
5. Workmanship: Workmanship is the physical evidence of the crafts of a particular culture or people during any given period of history. Workmanship is important because it can furnish evidence of the technology of the craft, illustrate the aesthetic principles of a historic period, and reveal individual, local, regional, or national applications of both technological practices and aesthetic principles.
6. Feeling: Feeling is the quality that a historic property has in evoking the aesthetic or historic sense of a past period of time. Although it is itself intangible, feeling is

dependent upon the aid's significant physical characteristics that convey its historic qualities. Integrity of feeling is enhanced by the continued use of an historic optic or sound signal at a light station. The characteristic flashing signal of a light adds to its integrity. While sounds themselves cannot be nominated to the National Register, they enhance the integrity of feeling. The mournful call of fog horns on San Francisco Bay is an integral part of experiencing life there.

7. Association: Association is the direct link between a property and the event(s) or person(s) for which the property is significant. A period appearance or setting for a historic property is desirable. Integrity of setting, location, sign, workmanship, materials, and feeling combine to convey integrity of association.

The National Park Service has identified four methods for caring for historic properties: preservation, rehabilitation, restoration and reconstruction. The features of each are described below.

1. Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.
2. Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical or cultural values.
3. Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.
4. Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

## 2.4 PROJECT AREA

The HLID project area is defined as the area impacted by the development of the Interstate H-3 Highway. The project area includes the ahupua'a of Hālawā, He'eia, Kāne'ohe, and Kailua. The ahupua'a limits of the project area are shown in Figure 2-2. Project Area Map.

The project area was further defined by the FHWA and HDOT to only include the lands directly impacted by the highway and within the highway right-of-way. The exception to this general rule is North Hālawā Valley because the State has taken action to acquire the entire valley.

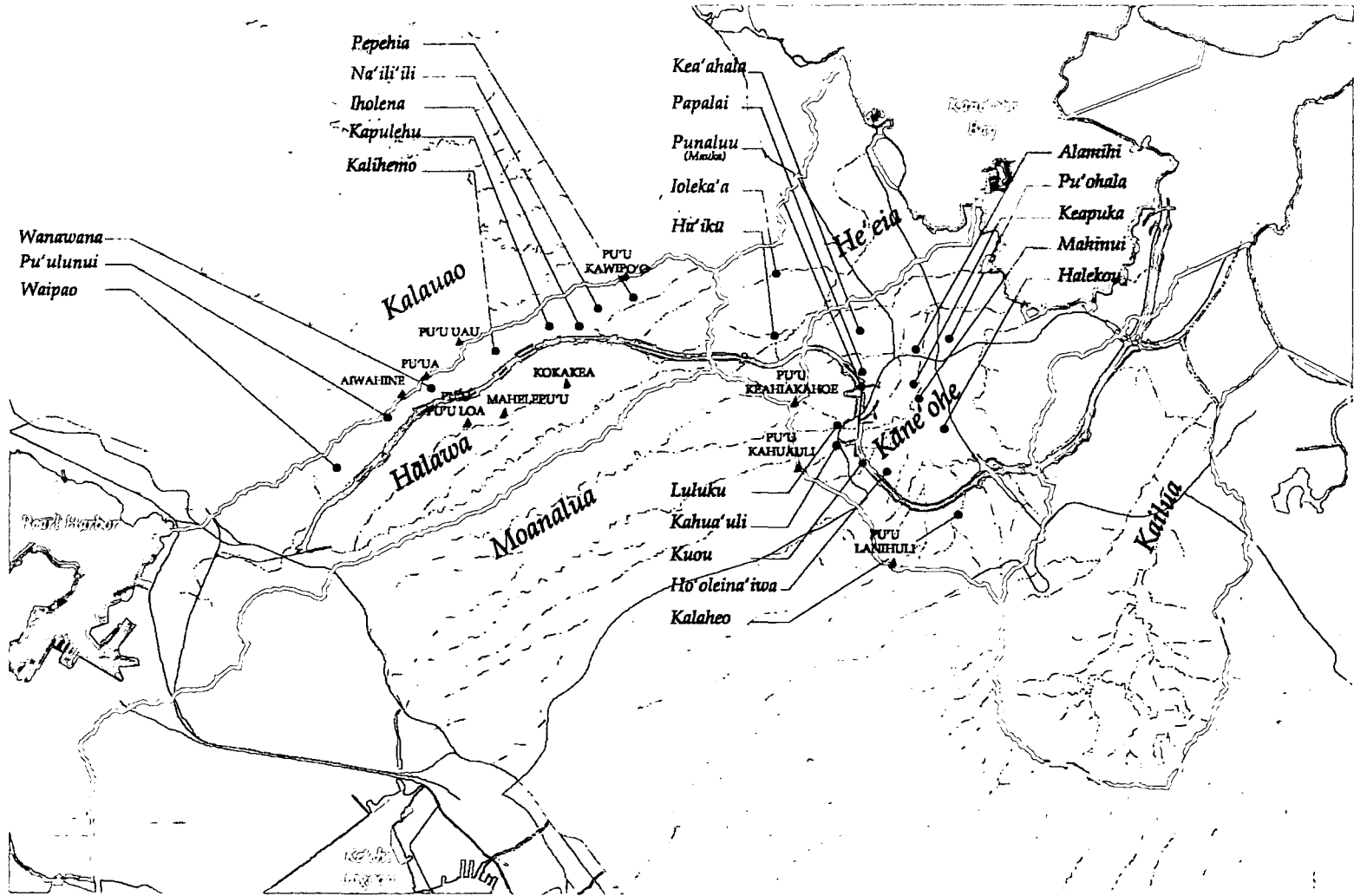
## 2.5 FOCUS AREAS

The project area revealed a rich tapestry of history, archaeology, and culture which is the subject of this IDP. When assessing the landscape and the facets of interpretation they offered, four areas with distinct themes emerged in the Strategic Planning process. They are: North Hālawā Valley, Lulukū Agricultural Terraces, Kukui o Kāne Heiau, and Ha'ikū Valley. Plans for two of the four areas – Ha'ikū Valley and Kukui o Kāne Heiau -- were not fully developed because of circumstances outside of the control of this project. However, it should be noted that the WG considered all areas impacted by the freeway to be important areas for long-term mitigation, and this consideration should be part of all aspects of planning.

Descriptions of Kukui o Kāne Heiau in this report are limited because the archaeological studies conducted by Bishop Museum relating to this site were not completed in time to be integrated into the IDP. Further mitigation or interpretive discussions may be needed when the report is completed. Access to the site has not been resolved.

Mitigation for areas impacted by H-3 in within Ha'ikū Valley was initially included in the IDP because planning was completed in the Strategic Plan. However, according to FHWA the focus of mitigation was to be confined to the area adjacent to the highway right-of-way. Consequently, only two archaeological sites are addressed in the IDP for further study. As a result, alternative mitigation strategies, not a part of this IDP, were discussed by the WG. It is hopeful that the result of these other strategies complements those which are part of this IDP. While the WG objected to not including Ha'ikū Valley in the overall planning, it was prepared to move forward with the parts of the plan that are approved by the FHWA for inclusion.

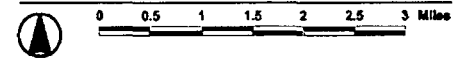




Ahupua'a Boundaries       Streams  
 H-3 ROW       Major Roads  
 Additional Areas Impacted by H-3

Kāne'ohe Ili Locations - Source: Lyons, C.J., 1876  
 Halawa Ili locations are approximate. Source: Bishop, S.E., May 1887 (Copied from original map of Lyons, C.J., March 1887)

**Figure 2-2**  
**Project Area Map**  
 Halawa Luluku Interpretive Development  
 O'ahu, Hawai'i



R.M. Towill Corporation

## 2.6 EDITORIAL NOTES

The following notes are provided to assist the reader.

### a. Site Numbering

Archaeological sites identified in this document are numbered according to protocol established by the State Historic Preservation Division and the Bishop Museum. The reader should note that in most instances the State's numbering system is being utilized and reference to archaeological sites simply stated as "site ####."

The State of Hawai'i, Historic Preservation Division's site numbering system is as follows: 50 = State of Hawai'i; 80 = Island of O'ahu, 10 = USGS quadrangle map; #### = unique site number. E.g. Kukui o Kāne Heiau - 50-80-10-1888.

The Bishop Museum uses the following numbering system: 50 = Hawai'i, Oa = O'ahu, G = Ko'olaupoko, 5 = District, and ### = site number. For convenience, the sites are labeled G5-### (site number). E.g. Kukui o Kāne Heiau= 50-Oa-G5-86 or G5-86.

### b. Disclosure

The views expressed in this report are varied and are not intended to support or discredit one viewpoint over another. Rather, the report seeks to identify the many sources of information that are available to assist in the planning for the study area. The information gathering was for understanding, learning and respecting the Hawaiian culture, its history, and the traditional practices associated with the lands impacted by H-3.

Members of the WG and individuals who attended the public information meetings disagreed with Bishop Museum's interpretation of how the native people utilized the lands traversed by H-3, especially as this interpretation helped to facilitate the freeway's construction. They believe Bishop Museum's archaeologists were incorrect in their interpretation of the history and nature of the land. The WG is hopeful that the HLID process could correct those interpretations.

## 3

**NORTH HĀLAWA VALLEY****3.1 DEVELOPMENT THEME: "HEALING AND LEARNING CENTER"**

North Hālawā Valley serves as a healing and learning center through the preservation of traditional cultural practices. North Hālawā Valley is observed as a healing place for the mind and body, a place for learning and a place of worship. Practitioners, students and visitors are immersed into an environment that is experiencing healing through the efforts of volunteers working on restoring native vegetation, and the stabilization and restoration of cultural sites. Knowledge and education are promoted through the teaching of traditional and contemporary practices on the land.

**3.2 OBJECTIVES**

The objectives of the mitigation program for North Hālawā Valley are:

1. "Healing of the 'Āina" - Implement actions to a) preserve cultural and historic sites through site stabilization; b) implement preservation and restoration plans to protect existing resources by designating kapu areas; c) communicate the significance of the cultural landscape and features through an interpretive program; and d) heal the 'āina and its people.
2. Sustainability - Establish and utilize sustainable practices within the valley that demonstrate how the host Hawaiian culture cares for the land.
3. Access - Develop facilities and implement programs and strategies that provide access into the valley to individuals' (and groups') pursuit of traditional Hawaiian cultural practices.
4. Natural/Ecological Resources - Implement actions that promote ecological balance of the environment and perpetuate both the knowledge and practice of Native Hawaiian culture. Restore native vegetation and control hoofed and other feral animals in a culturally and environmentally appropriate manner, minimizing excess cruelty and safety hazards.
5. Educational Program - Develop educational programs, materials, and facilities to interpret the historic and cultural resources of the project area to a wider audience by reconnecting the people with the 'āina. The documentation and sharing of modern-day efforts to protect the 'āina from destruction are a major component.
6. Recreational Programs - Identify and develop culturally sensitive outdoor recreational pursuits which promote sharing the 'āina and complements Hawaiian history, culture and the traditions of these lands and people. Work with organizations involved with these activities in ensuring culturally and environmentally appropriate access.

### 3.3 SITE ASSESSMENT

#### 3.3.1 CURRENT SITE DESCRIPTION

The traditional lands of Hālawā are located on the leeward side of the Koʻolau Mountain Range in the ʻEwa district on the moku (island) of Oʻahu and extend from the Koʻolau Mountain Range to Pearl Harbor (Keawalau o Puʻuloa). The ahupuaʻa is further divided into two sections -- North Hālawā and South Hālawā Valleys. (See Figure 3-1).

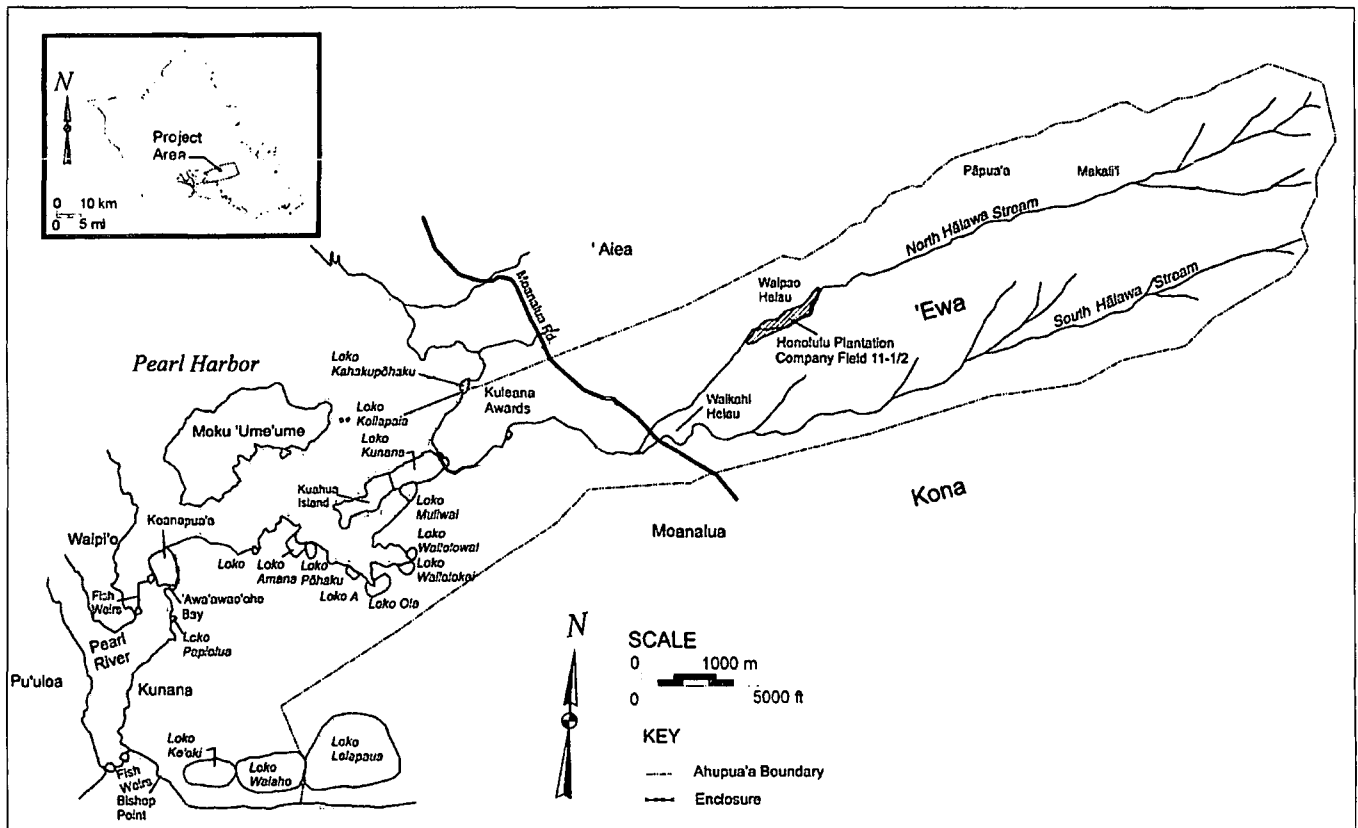


Figure 3-1. Hālawā Ahupuaʻa Map (Klieger, 1995)

The project area is limited to the upper portions of the North Hālawā Valley, an area of approximately 3.48 square miles. ʻAiea Ridge borders the Valley to the north, and on the south by the North Hālawā Ridge. The headwall at the back of the valley is part of the Koʻolau Range, which separates North Hālawā Valley from Haʻikū Valley. Kamananui Stream (aka North Hālawā Stream) travels the length of the valley from the headwaters at the Koʻolau Summit to Pearl Harbor.

#### 3.3.2 CULTURAL RESOURCES

Bishop Museum developed a hypothetical model of North Hālawā Valley based on data gathered during archaeology studies. It should be noted that there are alternative analyses, including that of Barry Nakamura, former Bishop Museum employee, which disagree strongly

with the Museum's findings and conclusions. The WG are among those who disagree, and the following analysis does not necessarily represent the cultural views or historical understanding of the WG.

While the islands of Hawai'i were first believed to have been settled by Polynesian migration somewhere between 200 and 600 AD, the earliest documented evidence of human presence in North Hālawā Valley dates to the period around 1100-1200 AD. Prior to this time the valley was covered by diverse Dry-Mesic Coastal and Lowland Forest. Fresh water flowed from the Ko'olau Mountains through Kamananui and Kamaikai Streams to many fisheries. Archaeological sites show the steady development of agricultural terraces and movement into Hālawā. Population densities were small and living sites reflected a temporary pattern of use.

By 1600 AD, there was a sharp increase in the native Hawaiian population of Hālawā. Permanent settlements were established along the length of Kamananui Stream. Dryland agricultural terraces and lo'i kalo systems replaced native forests in the mid-and lower reaches of the valley. House, work and religious sites, including heiau, marked the landscape. Hunting, agriculture, poi making, house building, and production of the tools supporting these activities were all in evidence.

There is evidence that sandalwood was abundant at the higher levels in the valley along the leeward walls of the Ko'olau's. Taro dominated agricultural production through the eighteenth century, and dry land taro was grown as far inland as four and five miles.

Cattle grazing soon caused a change in Hālawā Valley; and by the 1830s, cattle grazing changed the pattern in the valley. In 1870, Dowsett and Williams leased the entire valley of Hālawā for livestock grazing and sugar cane cultivation. Besides cattle, horses, goats, mules and sheep also grazed there and Hālawā Ranch also ran a dairy in the valley. In 1898, the Honolulu Sugar Company began operation in Hālawā under lease from the Dowsett Estate. Sugar plantation practices along with feral cattle and pigs in the uplands, added to the erosion of native flora and fauna and at the end of the century a Forest Reserve boundary was established to mitigate declining watershed conditions.

During the 1900's many lo'i kalo were turned to rice production by the influx of Asian laborers for the sugar industry.

During World War II the military decided to locate the Pacific Command on the lands of Pearl Harbor. This effectively cut off traditional access between mauka (upland) and makai (coastal) sections of the ahupua'a of Hālawā. The military occupation ended access to many traditional Hawaiian resources, land practices and management strategies in the area.

In 1939, a rock quarry was opened at the confluence of Kamananui and Kamaikai Streams by Clarke-Hālawā Rock Company, which is known as Hawaiian Cement Company today.

The following is a summary of cultural resources identified in North Hālawā Valley by Bishop Museum. The Bishop Museum concluded:

"The three sites determined eligible for listing on the National Register under criterion c - Sites 2010, 2011, and 2098 -- embody excellent examples of agricultural and habitation site types

within the valley and wider ahupua'a. Of the 11 sites designated as having traditional cultural significance, eight have burial features (Sites 2008, 2015, 2100, 2103, 2140, 2231, 2236, and 2254), two have possible religious features (Sites 2011 and 2137), and one has both burial and religious features (Site 2010). Elements that could be interpreted as religious characteristics at Site 2010 include: a relatively large size, architectural complexity as shown by internal and external terraces, and the presence of a small stone cup fragment at the Feature 4 enclosure; the presence of branch coral and possible fallen upright stones at the Feature 65 platform; a basalt zoomorphic bowl at the Feature 74 terrace; and three isolated upright boulders labeled Features 105, 1 13a, and 1 14a. At Site 2011, terrace Features 182 and 183 are thought to have religious functions or associations based on their prominent location within the landscape and, in the case of Feature 182, its stepped structure that includes well-defined, high facings, a paved surface, and interior, faced depressions. The possibility of a ritual or religious function at Site 2137 is based on the lack of habitation features or debris within the Features 36 and 53 enclosures. Feature 36 is also associated with the Feature 63 petroglyph boulder, and Feature 53 includes a large number of uprights. These possible religious features at Sites 2010, 2011, and 2137 likely represent agricultural or family shrines (Hartzell, et. al. 2003).” Note that recommendations were made prior to the construction of the H-3, and as such follow-up actions are required to ascertain if the mitigation was performed and whether the site still remains intact or was destroyed during construction.

#### **Sites Recommended For Preservation (Passive)**

“Sites in this category recommended for passive preservation by Bishop Museum were not directly impacted by H-3, and were left untouched except for minor vegetation clearing to improve accessibility during the survey. A total of 27 sites are recommended for passive preservation. Twenty-two of these sites are significant solely for their information content (criterion d). Five contained burials and so are also significant for traditional cultural importance. These sites include pre-European era temporary habitation rock shelters, rock shelters and caves with burials, several small agricultural sites, permanent habitations, and one plantation era sugarcane production camp. Passive preservation generally does not involve signage, paths, or landscaping. Sensitive sites, such as burial caves, could thus be protected by avoiding improvements that would make these sites easy to find or identify (Hartzell, et. al. 2003).” Other sites have also been identified by native Hawaiians for restoration and reconstruction.

#### **Sites Recommended For Preservation (Interpretive)**

“Three sites are recommended by Bishop Museum for interpretive preservation—Sites 2010, 2098, and 2137. The HLID Working Group, consisting of native Hawaiians and other cultural practitioners, believes that there are many sites within the Valley that should be considered for preservation as part of an interpretive program.” (Hartzell, et. al. 2003). Although there is a significant heiau complex, identified by the Bishop Museum as sites 2010 and 2137, which is actively being used by cultural practitioners, there are other sites that may need to be reassessed as having potential for interpretive preservation.

According to Bishop Museum “each site is significant under multiple criteria of the National Register, and Sites 2010 and 2098 are excellent examples of a common site type in the valley, i.e., sets of agricultural terraces with small scattered clusters of permanent habitations. Site 2010 also contains several small religious structures, and Site 2137 appears to include small religious structures as well (Hartzell, et. al. 2003).”

“These three sites were officially shifted into the preservation category after the 1992 controversy over Sites 2010 and 2137 arose. The Bishop Museum had contacted Office of Hawaiian Affairs and State Department of Transportation (HDOT) about preserving Site 2010 in 1990. In 1992, as part of the evaluation of Sites 2010 and 2137 by State Historic Preservation Division (SHPD) and OHA, both were considered to merit preservation; Site 2098 was also recognized as being an excellent example of a site type. This evaluation led to the preservation of all three sites. Sites 2137 and 2098 had undergone partial data recovery by that time, but both sites were then shifted into the preservation category. It is felt that these three sites have considerable educational value, and the public could benefit from their interpretation (Hartzell, et. al. 2003).”

“Site 2010 covers a large portion of the valley slope in the lower portion of the project area. It consists primarily of a series of agricultural terraces, clearing mounds and associated activity areas. There are two linear mounds, possibly representing boundary markers that divide the site into three sections. Each section has a minimum of one rectangular enclosure that probably represents a habitation locale, agricultural terraces, and activity areas. A fourth enclosure may represent a religious structure of an earlier period. Other indications that some areas of Site 2010 were used for religious purposes related to smaller shrine activities include several upright stones at the upstream and downstream ends of the site, a feature complex at the uppermost part of the site that has terraces, a platform, and more upright stones, and perhaps even the zoomorphic bowl found on the surface of one terrace (Hartzell, et. al. 2003).”

“Site 2137, located near North Hālawā Stream, has two main components: a traditional native Hawaiian portion representing a habitation and agricultural complex and a twentieth century residence related to the Honolulu Plantation Company. The traditional Hawaiian component is interpreted as a permanent habitation, probably a household (kauhale) composed of different roofed structures and distinct activity areas. The archaeological findings suggest that these activities included cooking, construction of structures supported by posts, and manufacture and use of stone tools. Distinct sleeping and storage areas, as well as a possible family shrine, are also present. Occupation of this site began as early as the fourteenth century (Hartzell, et. al. 2003).”

“All of Site 2098 lies below the steeper portion of the valley slopes, but the topography of the site changes dramatically from a gradual slope at the bottom to fairly steep toward the upper portion. The site consists of 212 surface features, the majority being dry land agricultural terraces. Permanent habitation areas are also present. Cultural remains were very dense and very diverse, suggesting that site use spanned several centuries (Hartzell, et. al. 2003).”

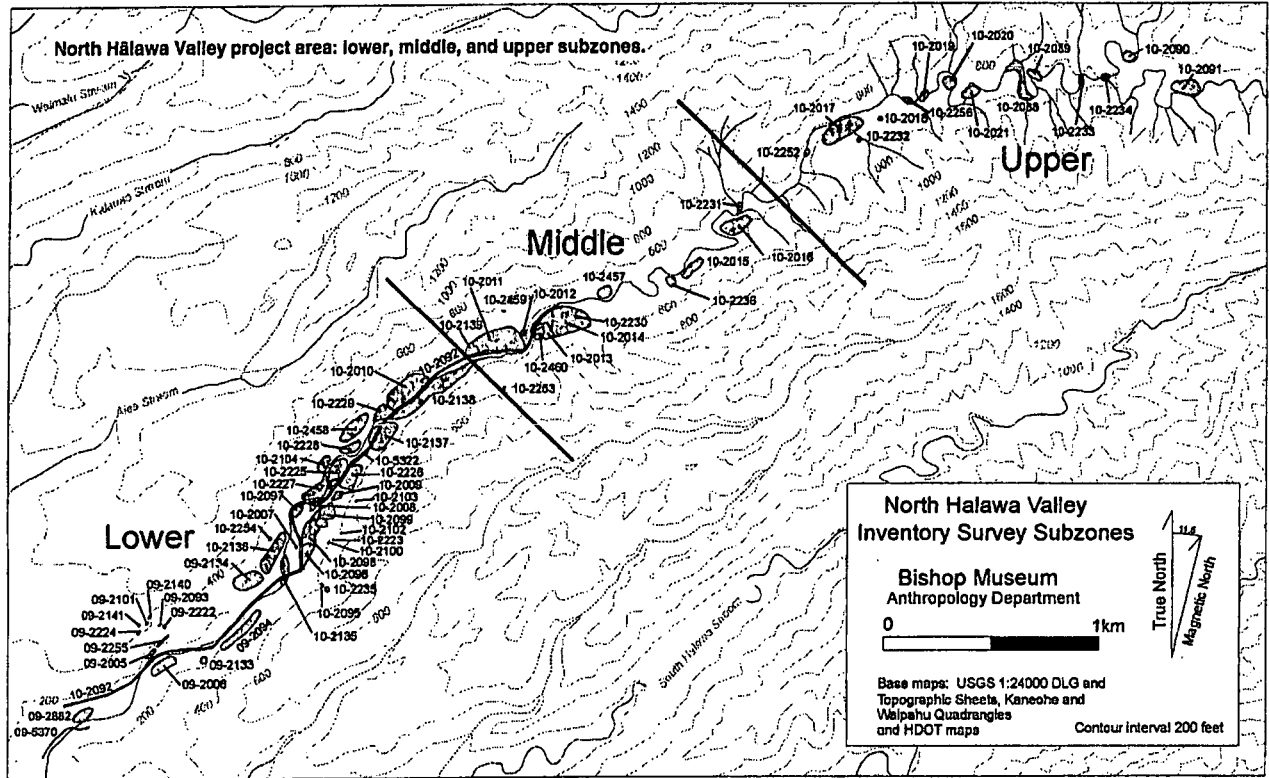


Figure 3-2. Cultural Sites Identified by Bishop Museum (Pre-H-3)  
Hartzell, et. al. 2003

### 3.3.3 NATURAL AND SCENIC RESOURCES

A number of small-scaled features have been identified in North Hālawā Valley by cultural practitioners that have cultural and religious significance. A sampling of the sites identified to date include a pueo (owl) rock (see Figure 3-3), a Portuguese brick oven (see Figure 3-4), a honu (turtle) rock (see Figure 3-5), and a manō (shark) rock (see Figure 3-6). These features, except for the Portuguese brick oven, are attributed to native practitioners and are not included in the findings of the Bishop Museum.

In addition, there are a large number of sites throughout North Hālawā Valley that are important to and are monitored by religious practitioners. The locations of these sites have been kept private in the interest of site protection. Also, it should be noted that there are many cultural sites throughout the Valley that have taken on additional cultural significance through the cultural and religious events that have taken place since 1972.





Figure 3-3. Pueo Rock

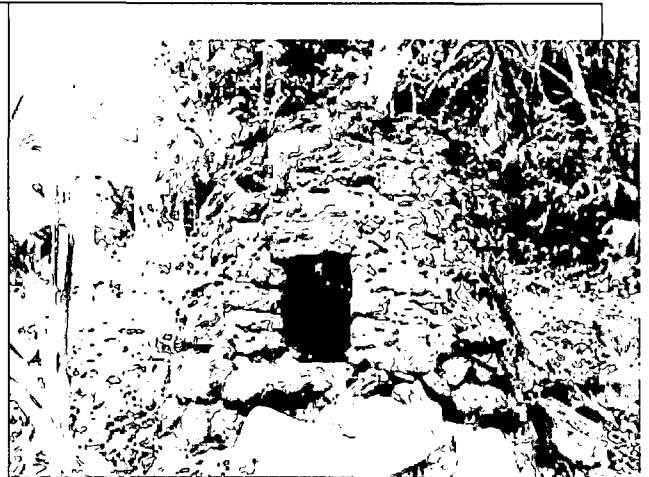


Figure 3-4. Brick Portuguese Oven, North Hālawā Valley, Site 2137



Figure 3-5. Honu Rock



Figure 3-6. Manō Rock

Views from outside of North Hālawā Valley and into the Valley can be divided into *vistas* (views of objects or specific places) and *panoramas* (views of a large area). The panoramic views from within North Hālawā Valley towards Pearl Harbor are limited by natural topography, man-made features and vegetation. Approximately two (2) miles into the valley, the valley turns to the right (northeast) and therefore limits continuous views out of the valley. Views of the landscape from within the valley towards the 'Aiea and Hālawā ridges and the Ko'olau summit, on the other hand are available from most locations. This view, however, is often blocked by the highway because the highway is generally above (viaduct structure) in the Hālawā Ridge direction. In the case of Sites 2137 and 2010, the close proximity of H-3 has changed the vistas for these features by blocking views of each site from the other. However, Bishop Museum's researchers have not yet been able to find documentation to evaluate H-3's impact to sightlines important in traditional management, such as a point for observing the ocean, the stars, or the clouds that required an unobstructed view over a long distance. Kamakahukilani Von Oelhoffen, a cultural practitioner from before the construction of the

freeway and master of traditional astronomy and navigational/geometric arts, has emphasized the importance of sightlines for astronomical observance. Ms. Von Oelhoffen was able to identify alignments of natural features that could be used as “time markers” from both heiaus (personal communications L. Teale, 2007).

An increased amount of trash along the H-3 corridor now detracts from the view plane at an aesthetic level. The lights of H-3 and vehicles traveling across the highway impact on the darkness of the Valley in its natural state. A clear view of the night sky is blocked by the viaduct structures and the lights when in close proximity to the H-3 structure from the floor of the Valley.

The cultural practitioners of the Valley further believe an additional consequence of the lighting from the highway is the disorientation of the pueo (*Asio flammeus sandwicensis*) and thereby causing its death by collisions with vehicles on the highway. This is a major cultural and environmental concern.

### 3.3.4 EXISTING FACILITIES

Aside from the H-3 freeway, the only major modern structures in the project area are the service road and its associated bridges. Only remnants of pre- and post-contact activity remain. A discussion of archaeological structures includes those features that may also be considered as buildings and structures. Post-contact sugar and ranch era elements such as the rail line and irrigation ditches have been destroyed or disturbed beyond recognition.

### 3.3.5 IMPACTS BY H-3 ON NORTH HĀLAWA

The cultural landscape of North Hālawā Valley was impacted by the development of the Interstate H-3 in several ways that include:

- Destruction of cultural and worship sites;
- Changes to the landform;
- Reduction of access into the valley;
- Increase in hazards (landslides);
- Impact to flora and fauna and the introduction of non-native species;
- Runoff from eroded areas and pollution from erosion-control measures;
- Altered stream alignment and stream flow;
- Disturbance of burials;
- Exposure of sacred and natural resource area to abuse, such as artifact and plant theft;
- Introduction of H-3;
- Impact of trash, light and noise; and
- Obstructions and disruption of worship sites.

## 3.4 MITIGATION AND PROGRAM ELEMENTS

Mitigation elements are implementing actions identified by the WG and the public to mitigate the impacts associated with the development of the Interstate H-3. These mitigation elements are listed in Tables 3-1 and 3-5. Table 3-1 lists desired facilities and programs to mitigate the

impacts of the highway's construction and were considered for implementation. Table 3-5 lists long-term facilities, studies, operations and program elements that are beyond the scope of this IDP and H-3 mitigation program. (See Section 3.7 Long Term Operations and Program Elements).

The mitigation elements have been sorted using three different parameters:

1. By impact (column 1);
2. By project type – access or capital project (column 4); and
3. By sequence or ranking (column 5). The ME number is a discrete number used to identify the mitigation action.

**Table 3-1. Impacts, Mitigation and Program Elements for North Hālawā Valley**

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENT	Project Type (A=Access, C=Capital, P=Program )	Rank
Obstruction and disruption of worship sites	15	Limit motorized traffic to HDOT service vehicles and program vehicles	A	1
Operation and Management	38	Issues of legal access to sites. Provide access through implementation and enforcement of visitation rules to these sites. Install stream flow warning system to advise of flash floods	A	1
Obstruction and disruption of worship sites	20	Use bicycles (no motorized bikes, scooters, mopeds) and valley shuttle (van or bus, to be determined). Allow walking-hiking (no private vehicles beyond visitor center)	A	6
Impact to flora and fauna and introduction of non-native plant species	4	Install tool shed and compost toilet or sanitoi in North Hālawā Valley. Construct small maintenance building (e.g. Shipping container 8 ft by 20-30 feet) in North Hālawā Valley (under viaduct near Hale o Papa)	C	1
Destruction of cultural and worship sites	2	Preserve (stabilization, restoration, reconstruction) and interpret sites (to be identified). E.g. restoration of walls	C	2
Reduction of access into the valley	3	Construct parking in Hālawā at entry to the valley at Hālawā Valley Road (30 parking stalls) for visitors	C	3
Impact to flora and fauna and introduction of non-native plant species	5	Establish nursery to propagate native plant seedlings for out-planting in the valley	C	4
Impact to flora and fauna and introduction of non-native plant	23	Restore native species in North Hālawā Valley; establish program for the reforestation	C	4

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENT	Project Type (A=Access, C=Capital, P=Program )	Rank
species		of native plants in North Hālawā Valley		
Introduction of H-3	25	Construct support utilities (water, electric, waste disposal) in Hālawā to support the interpretive programs	C	7
Obstructions and disruption of worship sites	27	Establish camping area, with composting toilets, for spiritual, religious and cultural practice	C	8
Introduction of H-3 into the Valley	22	Prepare educational displays (e.g. poster art, murals) on freeway pillars telling real story of the destruction brought about by H-3. Interactive displays - audio visual	C	12
Obstructions and disruption of worship sites	26	Construct education Center in North Hālawā Valley at Bridge 17, program facility to accommodate 50-60 persons in classroom environment utilizing hālau type structures with electricity (solar)	P	9

### 3.5 IMPLEMENTATION MANAGEMENT

#### A. Administrative Authority

Administrative authority for the North Hālawā Valley mitigation program rests with the following organizations:

- Federal Highway Administration (FHWA),
- State Department of Transportation (HDOT), and
- Office of Hawaiian Affairs (OHA).

Overall responsibility for the mitigation program is the responsibility of the FHWA and the HDOT. HDOT is responsible for the lands within the Interstate H-3 right-of-way. The HDOT is also responsible for activities and access into the valley. This latter responsibility is recommended for transfer to OHA who is also recommended to be assigned the responsibility of overall "Program Manager." As Program Manager, OHA shall select an organization or organizations to manage the day-to-day activities within the Valley. OHA shall also have general oversight over all facilities in the Valley.

#### B. Operations and Maintenance

Operations, maintenance and program administration will be assigned to the Hālawā nonprofit organization (H-NPO). The H-NPO shall be a culturally based organization representing the cultural practitioners and caretakers of the Valley. The H-NPO will be the governance entity for

the Valley. The H-NPO will be selected by OHA and shall be responsible for the following: (provided as guidance)

- 1) Project Management
  - Daily administrative and fiscal management
  - Collection of fees and payment of accounts due
  - Scheduling of activities
  - Facility maintenance and repair
  - Revenue generation and seeking funding for the mitigation program
- 2) Program Management
  - Maintenance of interpretive devices and materials
  - Provide for the curation of artifacts
  - Conduct education program for the public
  - Provide for the restoration of cultural sites and features
  - Provide for the maintenance and restoration of native plant species
  - Conduct research, as required, to understand cultural sites
  - Document findings and activities carried out in the valley

### 3.6 USER ANALYSIS

Once North Hālawā Valley is set aside as a historic and cultural preserve and a management organization established, the public will be allowed access that is culturally and environmentally appropriate. The management organization's goal is to preserve and interpret the Valley's resources and address basic safety concerns.

#### 3.6.1 AUDIENCE

Users of the valley's resources include:

- Native practitioners
- Students
- Educators
- Recreational users
- Hunters
- Workers (volunteers and employees)
- Researchers

#### 3.6.2 VISITOR ACCESS

Generally, access control will be maintained by the H-NPO (name to be determined) and shall take guidance from the HDOT and OHA. An access plan shall be developed by the H-NPO, with concurrence by OHA and HDOT, which will include cultural considerations and provide a more comprehensive framework for access that includes all current and potential users. In the development of the plan, the needs of known and yet to be identified cultural practitioners will need to be addressed.

Access into the valley will be controlled via a series of gates into the valley. These gates will determine the type of vehicles that will be allowed as follows:

**Table 3-2. Access Control Points**

Gate 1 (at Visitor Center)	No public – personal vehicles - beyond the visitor center without prior consent. Pedestrian and authorized service vehicles only.
Gate 2 (at milepost 1)	Pedestrian and authorized service vehicles only.
Gate 3 (at highway underpass)	Pedestrian and authorized service vehicles only.
Gate 4 (at Hale o Papa)	Pedestrian and authorized service vehicles only.
Gate 5 (at Luakini)	No access, except by permission of HDOT and H-NPO.

Public access into the valley will be controlled by the HDOT and H-NPO who will be the “keeper of the keys” for the gates. Access will be available to the public for the following purposes and on the following priority basis:

**Table 3-3. Visitor Groups Access Priority**

Priority Group	Visitor Group	Purpose
1	HDOT Personnel Hālawa Valley cultural practitioners Volunteers	Repair and Maintenance Exercise cultural belief (prior H-NPO acknowledgement required) Work parties and service personnel
2	Invited Public Cultural Practitioners Researchers	Educational or cultural program; Exercise of cultural belief; Conduct research studies in the valley (prior approval by H-NPO required)
3	General Public	General recreation purposes – walking, bicycling, etc. – access allowed during open periods to be determined
4	Special Interest	Commercial activity (e.g. tours) with prior consent from the H-NPO
5	Special Interest	E.g. hunters (valley access to be closed to other users when hunting is permitted)

### 3.6.3 VISITOR PROJECTIONS

- Daily Users
  - Cultural Practitioners
  - Employees and Volunteer Workers
  - Interpretive Guides
  - Researchers
  - Students (all grades)
  - Commercial Tours
- Weekend
  - Daily Users
  - Recreational users
- Monthly
  - Hunters
  - Special Events

### 3.7 CONCEPTUAL INTERPRETIVE LAYOUT

In order to realize the vision for North Hālawā Valley the facilities shown in Figure 3-7 are proposed. Facility summary (referenced to numbered locations):

- #1. Visitor Center Complex (4,000 s.f.) - Designed to greet, educate and orient visitors to the Valley and its resources and serves as a security-control point in an informal environment. Provides a place for presentations that orient the visitor to North Hālawā Valley and the development of H-3 along with teaching of cultural protocols. One story visitor facility located under the viaduct and includes: parking for 30 cars, a meeting room for 60 persons (600 s.f.), office space (300 s.f.), restroom (550 s.f.), conference-classrooms (2 @ 200 s.f. each), storage-utility-mechanical room (300 s.f.), space for educational and artifact displays (500 s.f.), supply and storage (850 s.f.), covered lanai (500 s.f.). Chainlink fencing will enclose the entire site. A gate will be installed after the entry to the parking lot along the valley access road. The HDOT built access road into the valley will be a two-lane paved road with a chainlink fence on the Honolulu-side of the road. The two existing gates (at Hawaiian Cement and Board of Water Supply (BWS) underpass) on the existing access road will be kept in place. Power, water, and telephone service to be provided to the visitor center from service connection on Hālawā Road. Other facilities requiring power will be supplied via solar collectors. Charges for utility facilities are yet to be determined.

Two alternative sites for the visitor center is being considered: 1) 2-3 acres site on the opposite side of H-3 adjacent to the stream, and 2) 3-5 acre site on the opposite side of Hālawā Valley Road. A decision by HDOT is pending.

- #2. Erosion control project of the HDOT to stabilize the hillside from erosion and rockfalls with vegetation.

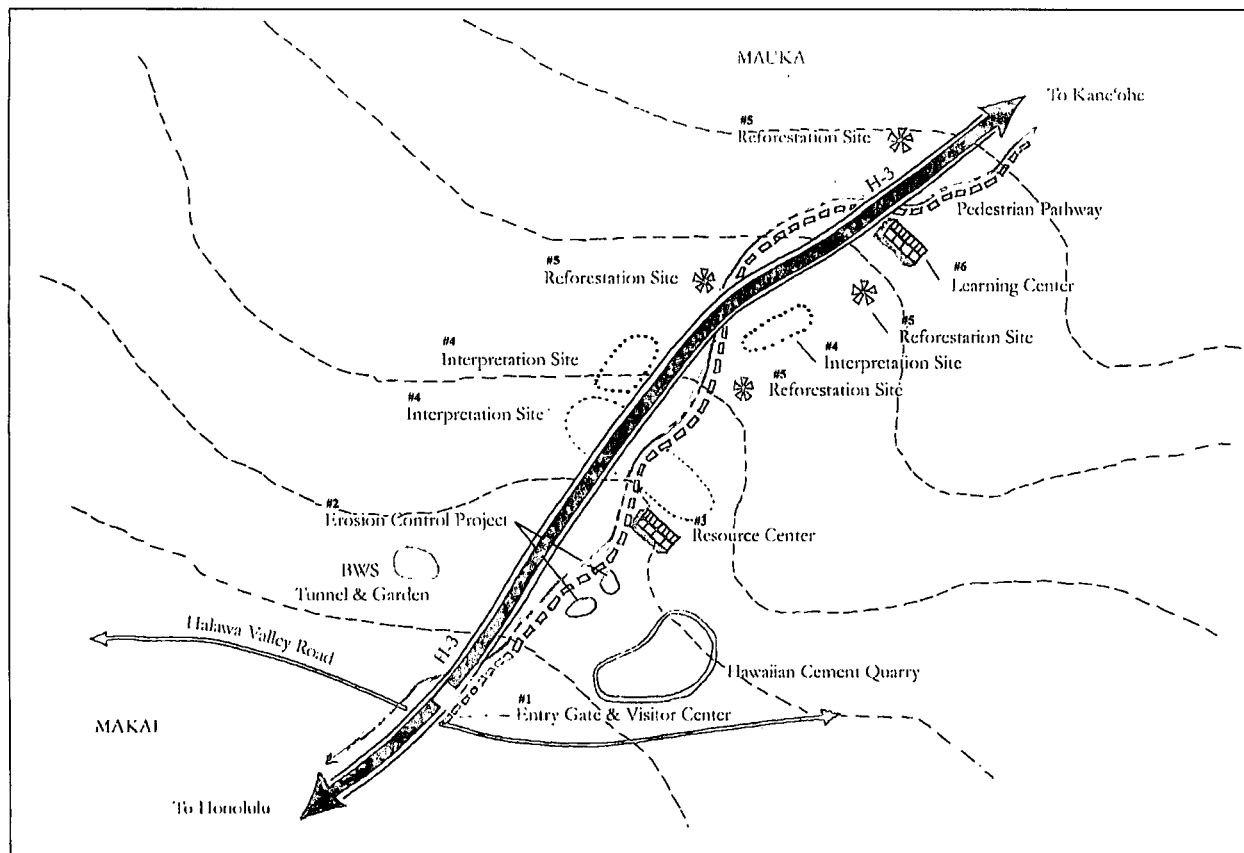


Figure 3-7. North Hālawā Valley Concept Plan

- #3. Resource Center (1,800 s.f.) - Designed as a teaching/learning facility where visitors are informed of the valley resources and cultural protocols. To be located adjacent to the Hale o Papa. This is where volunteer workers report for work and serves as a training center for volunteer docents. The Resource Center (1800 s.f.- 30'x60' under roof) will be provided with an open gathering area (1500 s.f.), small kitchen (100 s.f.), restrooms (composting toilets), small office (100 s.f.), and storage room (100 s.f.). The building will be open on three sides with the kitchen, toilets, small office and storage on the closed end. The resource center will be built in a more traditional hālau style with modern adaptations to meet building codes. Power and potable water to be provided. Non-native trees (ironwood and banyan trees) to be removed and replaced with native trees.
- #4. Interpretation Sites (typical) - Special sites identified and selected for interpretation because of their significance. These sites are where preservation work occurs, such as is taking place on the Hale o Papa Complex and Luakini Archaeological Preserve, and includes sites described in section 3.3.2 above. Planned activities include: wall restoration (re-building collapsed walls), installing barriers to keep unauthorized personnel out (see Figures 3-12 to 3-14), weed control, native plant restoration, and providing interpretive signage. A cable gate will be installed at the entry of the road to the archaeological preserve (see Figure 3-11).



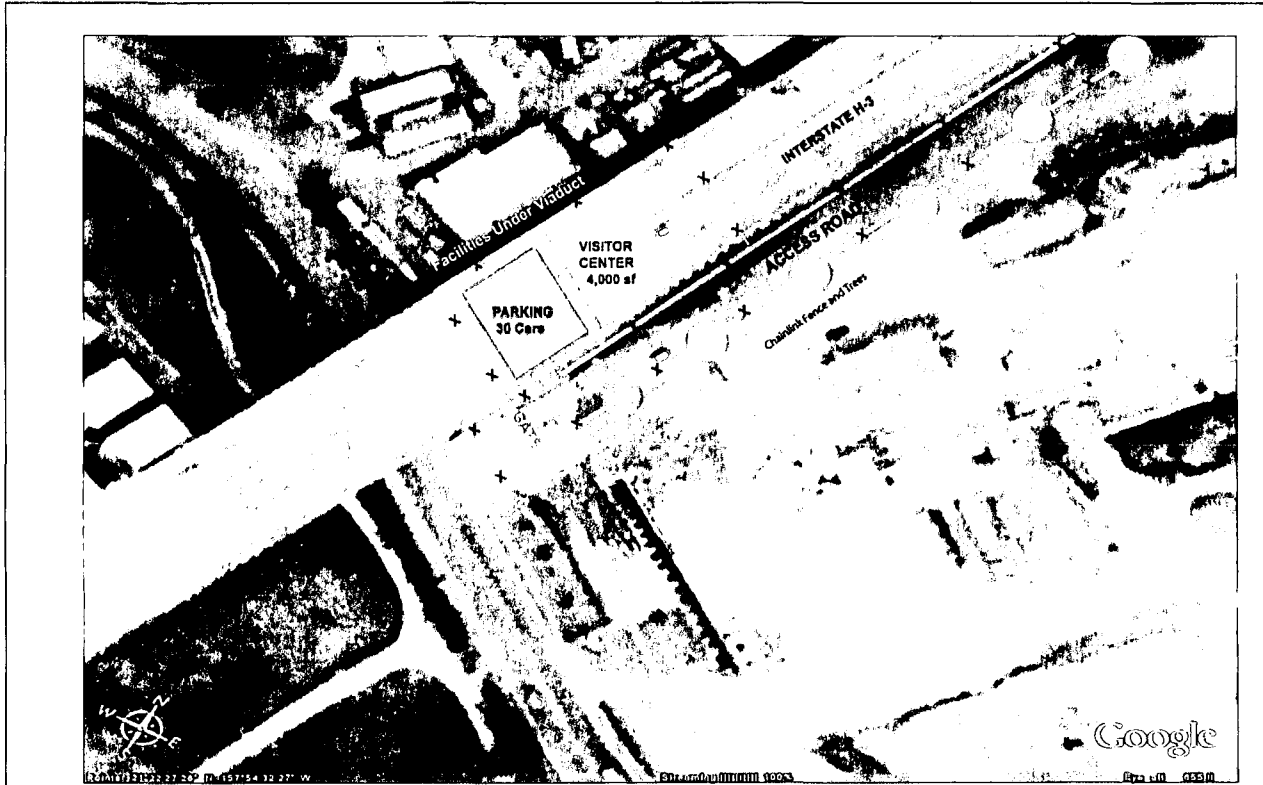


Figure 3-8. Valley Entry Plan

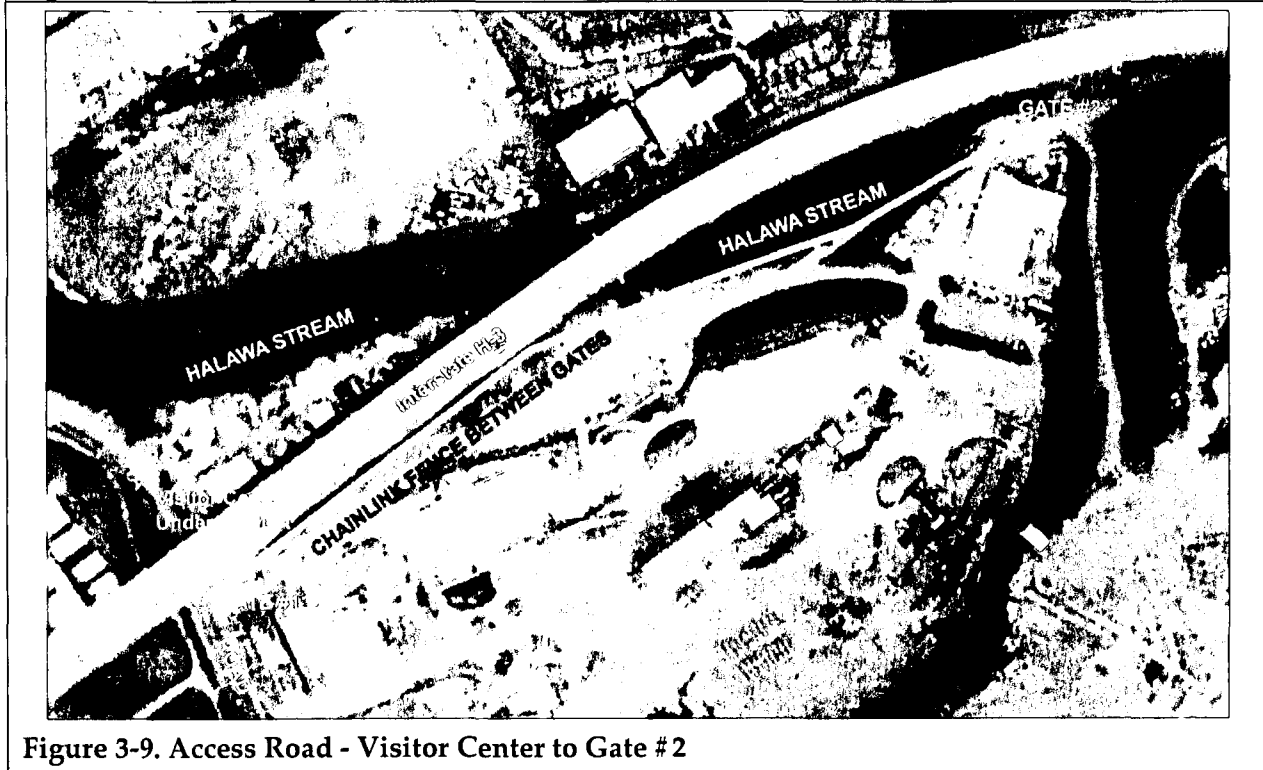


Figure 3-9. Access Road - Visitor Center to Gate #2

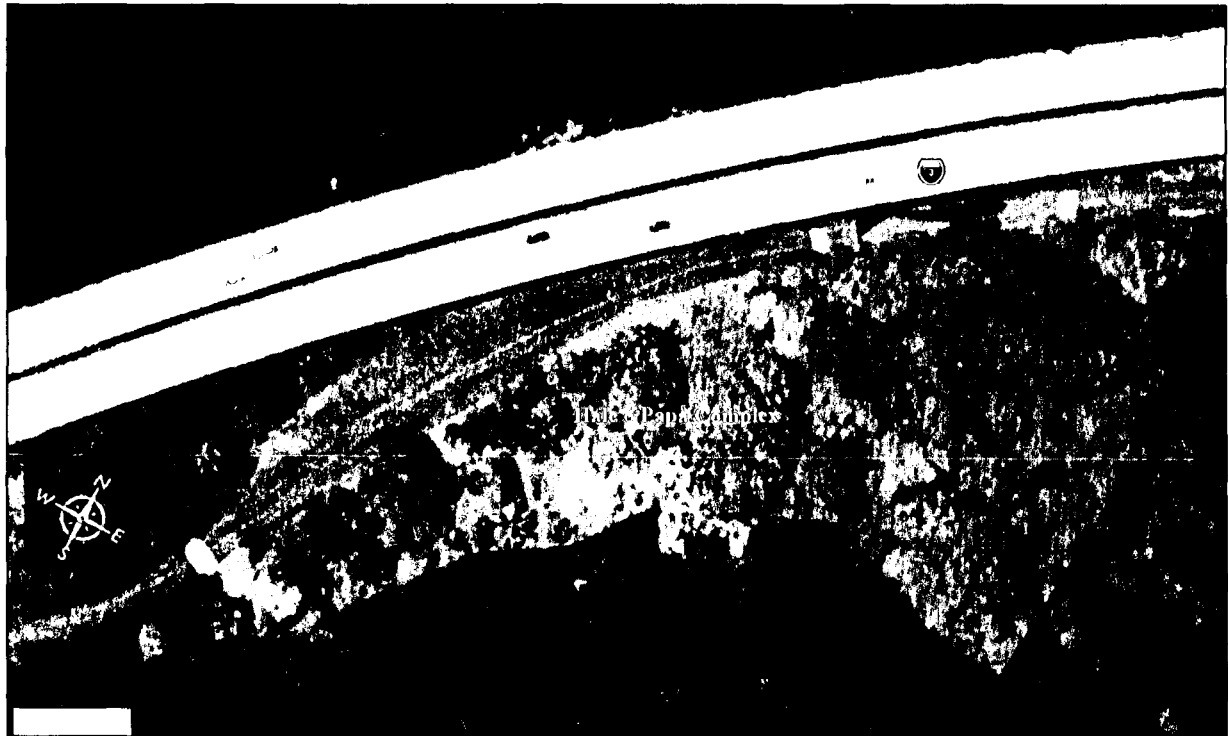


Figure 3-10. Hale o Papa Complex

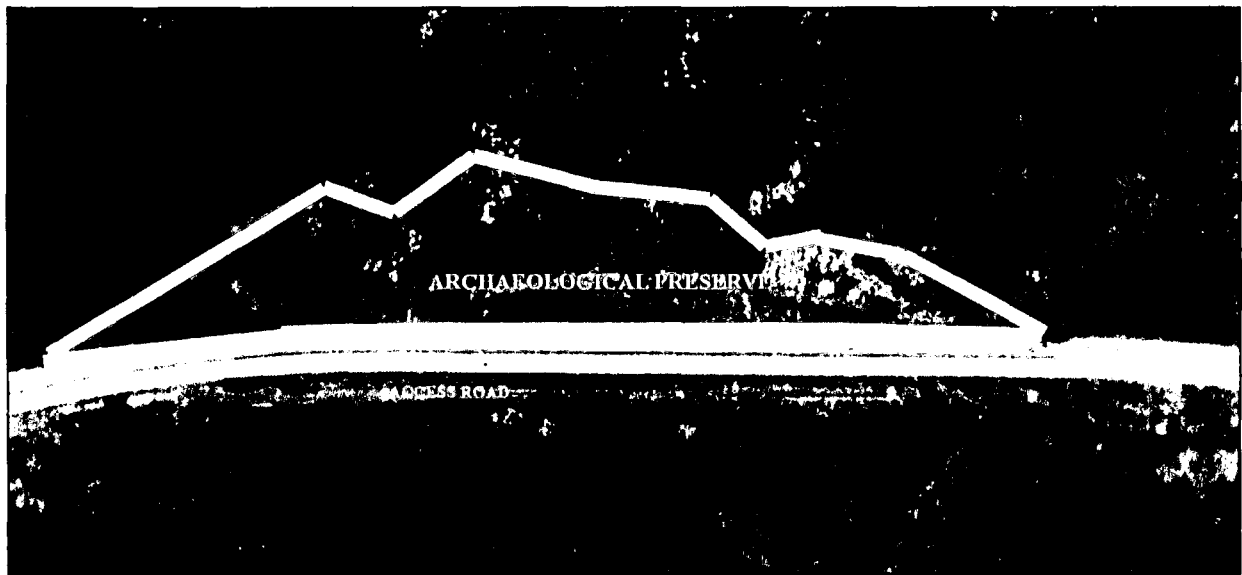


Figure 3-11. Luakini Archaeological Complex

- #5. Re-forestation sites – Work sites where re-forestation work is taking place, e.g., new planting, weeding, invasive species control, etc. Part of one site is a plant nursery (15-20,000 s.f. propagation area and grow-out area) for native plants for eventual out-planting in the valley.
- #6. Learning Center (at bridge 17) (2,000 s.f.) – The Learning Center is designed as a training and education center for 50-60 students. Five classrooms for 12-15 students each (750 s.f.), 4 private office (100 s.f. each), restrooms (200 s.f.), utility and storage (250 s.f.), covered lanai (200 s.f.), and an open area (5,000 s.f.), parking for 5 service vehicles (10,000 s.f.). Electricity to be provided via a photovoltaic system. Water service to be developed via rainwater harvesting. A 10,000 gallon water tank to be installed along with photovoltaic water pumps. The site to be landscaped with native shrubs and trees.
- #7. Water Supply and Stream Monitoring. Water for drinking and irrigation will be developed separately. Irrigation water will come from the stream and from rainwater harvesting. In addition, consideration of a non-potable well should be investigated. Drinking water will be from municipal services. A stream monitoring system is proposed to measure stream flow (stream levels). This monitoring system shall be used to warn valley users of rising stream waters. The system will be used as an early warning system to evacuate valley users during storm conditions.

### 3.7.1 DEVELOPMENT-DESIGN PRINCIPLES:

The many meetings with community stakeholders identified certain matters that were important to them. Therefore, any undertaking or improvements within the valley shall center on the following principles:

- A. Low impact and low rise - limit the amount of land modification and new modern construction taking place within the valley, utilized renewable energy sources, non-polluting waste systems in the valley, environmentally/aesthetically appropriate design and materials utilized;
- B. Pedestrian oriented - no private vehicles in the valley;
- C. Ongoing religious and cultural practices respected;
- D. Practice respect for the 'āina;
- E. Pass the knowledge of the culture, and educate all who are interested;
- F. Building built under the highway viaduct to be only one-story;

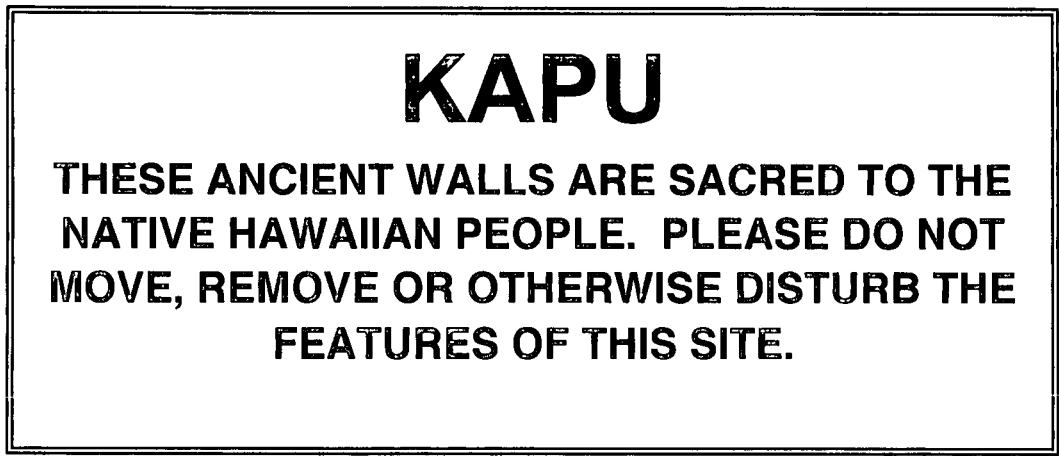


Figure 3-12. Example of Sign at a Cultural Site  
(Actual wording and layout to be determined.)

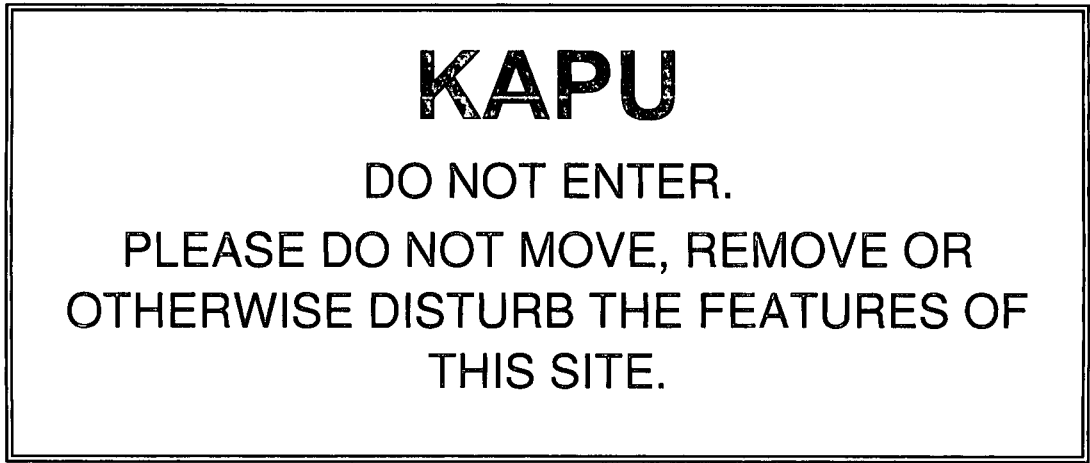


Figure 3-13. Example of Sign at a Cultural Site  
(Actual wording and layout to be determined.)

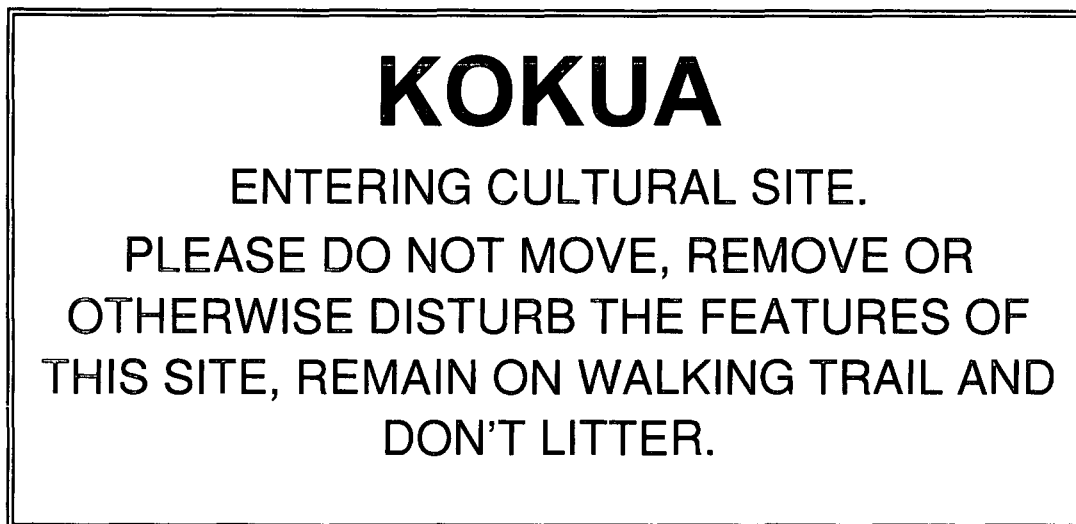


Figure 3-14. Example of Sign at a Cultural Site  
(Actual wording and layout to be determined.)

- G. Selection of Contractors. Restoration work shall be conducted by those with a strong cultural understanding of the specific project area that they will be working in. The following shall apply:
- The H-NPO shall review all restoration proposals for work and shall be involved in the planning phases.
  - Restoration work shall provide for using of cultural monitors to oversee cultural compliance.
  - Ideally, contractors should be selected from those who already have a relationship to the land and intimate knowledge of the land.
  - Contractors shall use cultural protocols that consider historical and current practices. The H-NPO should approve these protocols.
- H. Work in the valley shall consider stream data collected by the U.S. Geological Service and other related services as it relates to stream water flow and flooding. Daily stream monitoring will be required during period of severe weather to ensure public safety. Water use shall also be coordinated with the Commission on Water Resource Management and the Board of Water Supply.

### 3.7.2 PROJECT COST ESTIMATE

#### A. Capital Project Funding

Funding of approximately \$8 million for the mitigation program is provided by FHWA through HDOT. Table 3-4 shows the projects requested for approval by HDOT/FHWA. These projects are a fundamental part of mitigation and preservation in the valley, and funding approval to

the greatest extent possible, will be requested. Once the IDP is approved, funds will be requested and programmed via the State Transportation Improvement Program (STIP). Programs and operations funding, not included in Table 3-4, are discussed below.

Project costs were based on a proposed development program prepared by the WG to partially fulfill the needs of the mitigation program identified. Unit costs were assembled based on available 2007 data from contractors and recent bid tabulations. Design costs were estimated at ten (10) percent of the construction cost. Construction inspection and management services were estimated at fifteen (15) percent of construction cost, and a contingency of 15 percent of the construction, design and inspection cost was estimated to account for price escalation and inflation.

Once the costs estimates were developed, the WG was tasked to phase each project. Four (4) development phases were established without regard for the time period of each phase, except the first development phase. Projects in the first developmental phase are important to the success of the overall mitigation/preservation program. The project's assumption is that all projects identified which are eligible for funding will be implemented.

**Table 3-4. North Hālawā Valley Cost Estimate (preliminary and subject to change)**

Proj. No.	Project Title	Note	Total	Phase 1	Phase 2	Phase 3	Phase 4
1	Gate beyond 3rd gate control arch. sites	Cable gate (pipes, cables, lock)	\$2,000	\$2,000			
2	Banyan removal at Hale o Papa	1 x \$5,000 ea.	\$5,000	\$5,000			
3	Composting toilets at Hale o Papa 2 ea @ \$5,000 ea.	2 ea. X \$5,000 ea.	\$10,000	\$10,000			
4	Prepare educational displays (e.g. poster art) on freeway pillars telling real story of the destruction brought about by H-3. Interactive displays - optional audio visual using solar power	10 ea. @ \$5000 ea.	\$50,000	\$20,000	\$20,000	\$10,000	
5	Ironwood trees removal at Hale o Papa	6 ea. x \$2000/ ea.	\$12,000	\$12,000			
6	Access road with Fence from entry @ Halawa Road to 1st Gate	To be built by HDOT FAP No. 1-H-3-1 (75) Unit VIIC					
7	Potable water system from Halawa Rd located along the access road	2' x \$60/ l.f. x 10,560 l.f.	\$633,600	\$633,600			
8	Nursery 15,000 s.f. (site work, chain-link fenced facility with 2-20x50 shade houses, 50 s.f secure storage, irrigation system on timer, grow out benches, and solar power system)	15,000 s.f. X \$100/s.f.	\$1,500,000	\$1,500,000			
9	Terrace Wall Restoration at Hale o papa - to be determine upon consultation with native practitioners	2000 l.f. @ \$200/l.f.	\$400,000	\$400,000			
11	Resource Center -hālau (30 x 60) @ Hale o Papa	30ft x 60 ft x \$250/s.f.	\$450,000		\$450,000		
12	Solar collectors for power at Hale o Papa for lighting and general electrical needs	3 @ \$10,000 ea.+ accessories	\$30,000		\$30,000		

Proj. No.	Project Title	Note	Total	Phase 1	Phase 2	Phase 3	Phase 4
13	Rock wall repair & upright rock Hale o Papa	100 l.f. X \$200/lf	\$20,000		\$20,000		
14	Tree removal on arch. site (various)	10 trees @ \$5000/tree	\$50,000		\$50,000		
15	Walking Path along stream from Halawa Rd	5280 l.f. X \$60/l.f.	\$316,800		\$316,800		
17	Non-potable irrigation system for nursery and new plantings. A 5000 gal. tank to be located towards the back of the spur road and water piped to luakini site. Water source from the stream and rain fall harvesting. Waterline to be laid on the surface.	2-inch x 10,560 l.f. x \$60/l.f. plus water tank @ \$3500	\$637,100		\$637,100		
18	Parking Area located adjacent to the visitor center @ \$5,000/stall X 30 stalls	\$5000/stall x 30 stalls	\$150,000		\$150,000		
19	Restore native species in North Halawa Valley; Formulate program for the reforestation of native plants in North Halawa Valley	Lump sum	\$50,000			\$50,000	
21	Visitor Center at Halawa Road 4,000 +/- s.f.	4000 s.f. x \$400/ s.f.	\$1,600,000			\$1,600,000	
23	Camping area, with composting toilets, for spiritual, religious and cultural practice (location to be determined)	Lump sum	\$20,000				\$20,000
24	Guinea grass control-eradication (along the road-sides)	Lump sum	\$50,000				\$50,000
25	Non-potable well drilling (location to be determined, solar power required for pump)	Lump sum	\$300,000				\$300,000
26	Construct Learning Center in North Halawa Valley at Bridge 17, program facility to accommodate 50-60 persons in classroom environment utilizing halau type structures with electricity (solar)	2000 s.f. x \$350/ s.f.= \$700,000 + 6,000 s.f. x \$100 = \$600,000	\$1,300,000				\$1,300,000
27	Storage for equipment and supplies located near the Hale o Papa.	2 ea. storage container @ \$5000 ea.	\$10,000		\$5,000	\$5,000	
28	Miscellaneous signs (e.g. Kapu, No Entry)	Lump sum (12 signs)	\$5,000	\$2,000	\$1,000	\$1,000	\$1,000
<b>INELIGIBLE PROJECTS*</b>							
10	Stream clearing and trash removal						
16	A. Caretaker's Home						
21	B. Commercial Kitchen						
22	C. Wood Chipper						
	<b>TOTAL</b>		<b>\$7,601,500</b>	<b>\$2,584,600</b>	<b>\$1,679,900</b>	<b>\$1,666,000</b>	<b>\$1,671,000</b>
	Design @ 10% of Total		\$760,150	\$258,460	\$167,990	\$166,600	\$167,100
	Construction management-inspection 15% of Total		\$1,140,225	\$387,690	\$251,985	\$249,900	\$250,650
	Subtotal		\$9,501,875	\$3,230,750	\$2,099,875	\$2,082,500	\$2,088,750
	Contingency @ 15%		\$1,425,281	\$484,613	\$314,981	\$312,375	\$313,313

Proj. No.	Project Title	Note	Total	Phase 1	Phase 2	Phase 3	Phase 4
	<b>TOTAL</b>		<b>\$10,927,156</b>	<b>\$3,715,856</b>	<b>\$2,414,856</b>	<b>\$2,394,875</b>	<b>\$2,402,063</b>
<i>* Projects identified by the WG but have been determined to be ineligible for mitigation funding because of the nature of the project, e.g. used for maintenance or does not provide for direct mitigation of an impact resulting from H-3.</i>							

## B. Operations and Program Funding

Operations and maintenance functions shall be the responsibility of the H-NPO (see additional discussion in Section 8, Implementation) and are beyond the scope of this IDP and the H-3 mitigation program.

## C. Phasing and Implementation

Table 3-4 lists the development phases anticipated. The four phases will be programmed as part of the Statewide Transportation Improvement Program (STIP). Each program year begins in October corresponding to the Federal fiscal year. The first program year for the STIP is 2009 (FY 2009). A total of \$3.7 million is projected and is allocated as follows for FY 2009:

Construction	\$2.58 million
Design @10%	\$0.26 million
Construction Mgmt @15%	\$0.39 million
Contingency @ 15%	\$0.48 million

The second program year is projected for FY 2010, followed by year three and four at FY 2011 and 2012, respectively. Limitation on project implementation will be determined annually by availability of funds for that particular fiscal year, project need, and the overall priority assigned to the project.

## 3.8 LONG TERM OPERATIONS AND PROGRAM ELEMENTS

The second group of mitigation elements is actions which are part of the long-term implementation; operations and maintenance of the interpretive and/or cultural programs for North Hālawā Valley. These items are part of the overall program for North Hālawā Valley, however, are not part of the H-3 mitigation program. In addition, it is assumed that HDOT will continue to maintain the access road and bridges into the Valley. In the implementation phase of this project an operations and governing body, such as a not-for-profit organization identified earlier, is required to work with governmental agencies, other organizations and individuals. The actions proposed are long-term (such as the curation of artifacts and research material) and require sustained effort beyond the scope of this H-3 mitigation program.



Table 3-5. Long Term Operations and Program Elements (North Hālawā Valley)

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENT	Project Type (C,L,O,P)*	Rank
Removal of cultural objects from the Valley		Provide for the recovery and repatriation of artifacts removed from the Valley back to the valley. Provide for the curation of artifacts.	C	4
Altered stream alignment and stream flow	6	Control wash water from Hawaiian Cement operations and other sources of aquatic pollution.	C	4
Security, obstruction and disruption of worship sites	21	Caretakers' facility at in the valley (3-bedroom house) for maintenance and security.	C	7
Impact of trash	9	Identify and implement pollution control methods to mitigate trash from freeway, chemical usage (e.g. Herbicides for weed control), acid rain from auto emissions, etc.	C	4
Impact of trash	18	Prevent trash from the highway becoming a safety problem: Mitigate potential harm (e.g. install screen along the highway).	C	6
Destruction of cultural and worship sites	28	Nominate North Hālawā Valley to the National and State Registers of Historic Places.	C	10
Altered stream alignment and stream flow	29	Renovate/remove drain lines from freeway that discharge freeway runoff into North Hālawā and Ha'ikū Valleys and Luluku.	C	10
Altered stream alignment and stream flow	30	Evaluate channelization, dams, injections wells, etc., used in the construction of H-3 in North Hālawā. Advocate for stream biology where reduced water flow occurs.	C	10
Operations and Management	39	Identify carrying capacity for further or existing activity to maintain cultural and ecological integrity. Monitoring Program to assess area usage and determine Limits of Acceptable Change.	L	1
Introduction of H-3	8	Prevent mitigation/interpretive funds from being spent on on-going maintenance issues that are normally funded by HDOT operations funds (i.e., trash from freeway, invasive species control). Identify these items to HDOT on an ongoing basis.	O	1
Obstructions and disruption of worship sites	11	Develop an access and security plan that is culturally-focused and approved by the H-	O	1

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENT	Project Type (C,L,O,P)*	Rank
		NPO.		
Obstructions and disruption of worship sites	14	Manage valley access (consider entry fee) and culturally appropriate security for valley to protect facilities and artifacts.	O	1
Operations and Management	33	Establish policies set by WG-practitioners-caretakers regarding use by large groups, recreational use, pig hunting, etc.). Obtain community input.	O	1
Operations and Management	34	Prevent misuse of project funds by identifying ongoing funding obligations: issues and costs that are normally funded by other State and Federal agencies (i.e., FHWA, SHPD, BWS, and DLNR). Identify these items to the agency(s) on an ongoing basis.	O	1
Operations and Management	35	Develop programs and uses that envision long-term sustained usage. Discourage potentially destructive and harmful usage.	O	1
Operations and Management	36	Utilize the Ahupua'a Concept in addressing all mitigation elements to fully assess the negative impact H-3 has had on all mitigation elements.	O	1
Operations and Management	37	Establish NPO for Hālawā.	O	1
Operations and Management	40	Establish culturally sensitive security program.	O	1
Destruction of cultural and worship sites	1	Identify and locate wahi kapu sites to prevent unauthorized access. Prepare preservation plan for these sites.	P	1
Obstructions and disruption of worship sites	12	Provide long-term practitioner/caretaker access to all areas of cultural practice; Conduct analysis of Legal Issues pertaining to any potential violations in Clean Water Act, Endangered Species Act, Stream Alterations, Conservation District Permits, and AIRFA.	P	1
Obstructions and disruption of worship sites	10	Identify buffer zones for cultural and educational areas and provide for site protection. Protect and preserve sites through less disruption to the sites is better than trying to guess and ultimately harming the integrity. Protect sites from exploitation.	P	2

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENT	Project Type (C,L,O,P)*	Rank
Destruction of cultural and worship sites	17	Identify and locate the 64 spiritual / cultural sites in North Hālawā Valley. Compile all data and evidence compiled by Bishop Museum and other entities. Prepare preservation plans for these sites.	P	4
Obstructions and disruption of worship sites	19	Construct Hālau for small gathering in North Hālawā Valley (60'x40') makai of the Hale o papa that is open, naturally ventilated, and accommodates 50 persons.	P	4
Runoff from eroded areas	24	Establish program to prevent erosion control and develop program for bank restoration.	P	4
Altered stream alignment and stream flow	32	Restore stream (environment, water flow, vegetation) to one that can sustain a biologically diverse community of plant and animal life.	P	5
Disturbance of burials	7	Identify location for burials of iwi within and adjacent to the project area. Identify sites and provide for restoration and protection of the sites, burials grounds with these areas.	P	7
Obstructions and disruption of worship sites	13	Develop program for culturally acceptable pig hunting that utilizes appropriate safety and cultural protocols (will call when needed). Basic cultural understanding required for cleanup and pono behavior expected.	P	8
Obstructions and disruption of worship sites, harm to pueo and other nocturnal creatures	31	Close freeway (2 way traffic) for cultural observances and shutting off of the highway lights.	P	11

\* C= Capital project; L = Long term action; O = Operations and Maintenance, P - Program Action

### 3.9 UNRESOLVED ISSUES

Several issues remain unresolved at this writing and will require additional study before implementation of the proposed mitigation actions. They include:

- A. Actions proposed by this plan will be limited to areas within the highway right-of-way under the jurisdiction of the HDOT.
- B. Implementation of mitigation actions by HDOT imposed by the conditions of the current Conservation District Use Permit is currently unknown.
- C. Mitigation proposed within this plan is within the State's Conservation District and will require a Conservation District Use Permit.

## 4

**LULUKU AGRICULTURAL TERRACES****4.1 DEVELOPMENT THEME: "LULUKU AGRICULTURAL DISTRICT"**

The Luluku Agricultural Terraces shall be restored through the perpetuation of culturally appropriate science, engineering, and agricultural practices. Research will be demonstrated through the planting of primarily native Hawaiian *kalo* (taro) using ancient and contemporary techniques in water resource management and sustainable agricultural practices. The relationship between the land and its people are of both historical and cultural importance in the context of interpretations which emphasizes Luluku's ability to feed many people in the Kāne'ōhe district and areas beyond.

**4.2 OBJECTIVES**

The objectives of the mitigation program are:

1. "Healing of the 'Āina" - Implement actions to a) stabilize the site to prevent erosion; b) implement preservation plans to protect existing resources, and c) communicate the significance of the cultural landscape and features of modern activities through an interpretive program that describe the impacts to the 'āina.
2. Sustainability - Establish sustainable practices within the area that demonstrates how the host culture cared for the land.
3. Access - Develop facilities and implement programs that provide access into the terraces and mauka stream system for individuals' and groups' to pursue knowledge and traditional cultural practices.
4. Natural/Ecological Resources - Implement actions that promote ecological balance of the environment and perpetuate both the knowledge and practices of Native Hawaiian culture.
5. Educational Program - Develop educational programs and materials to interpret the historic and cultural resources plus contemporary history of the H-3 struggles of the project area to a wider audience.

**4.3 SITE ASSESSMENT****4.3.1 CURRENT SITE DESCRIPTION**

The 'ili of Luluku, located in the ahupua'a of Kāne'ōhe, district of Ko'olaupoko, is where these numerous agricultural terraces are located (See Figure 4-1). These lo'i kalo were part of a large complex of agricultural terraces that were initially divided by the construction of the Likelike Highway. The portion of the terraces which are the focus of this study were further impacted by the construction of the Interstate H-3 and are now located within the Kāne'ōhe Interchange.

The site is located at the base of the Ko'olau Mountain Range and is at an elevation ranging between 62 feet to 716 feet. The site is currently inaccessible by the public.



Figure 4-1. Luluku Agricultural Terraces

#### 4.3.2 CULTURAL RESOURCES

Based on the research conducted to date, the Bishop Museum recommended the following mitigation measures: Note that recommendations were made prior to the construction of the H-3, and as such follow-up actions are required to ascertain if the mitigation was performed and whether the site still remains intact or was destroyed during construction.

Site 1887 (G5-85)--Luluku Field Complex (see Figure 4-2)

Site 1887 (G5-85), the large pond field complex, is significant because of information it has already provided regarding settlement patterns, landscape modification (termed "landscape architecture in the National Register nomination form), and indigenous agricultural practices and architecture. Certain areas of the site can be correlated with kuleana documented in the Mahele in the mid-19th century. The site has potential for further information concerning other

areas of significance including demographics and foreign influences on traditional cultivation practices.

The site represents an inland component of the prehistoric settlement in Kāneʻohe and may provide indirect evidence relevant to understanding island-wide population expansion. It also constitutes the most extensive early wetland agricultural complex known on Oʻahu and contains a stratigraphic sequence reflecting a long period of continued use and development that probably began by 500 A.D. Significance is further enhanced by the excellent state of preservation of a large portion of the site. Although the surrounding area has been altered by 20th-century developments (roads and plantations), small areas of native vegetation still exist nearby in a rural setting, suggesting the relative integrity of Site 1887 (G5-85) within its physical and cultural environment.

Recommendations for Site 1887 (G5-85) include preservation of much of the site. These areas include probable ʻauwai, mounded spillways, and certain terraces, as well as buried features.

Preservation should include permanent clearing of any hau that endangers the lower terraces, and consistent maintenance of preserved terraces. This will include the repairing of existing loʻi kalo terraces for:

- Re-planting of native Hawaiian kalo;
- Establishing a native Hawaiian kalo seed bank for purposes of distribution of native Hawaiian varieties of kalo;
- Re-establishing food production on site continuing; and
- Collaborative partnerships in food production and food security in the surrounding areas.

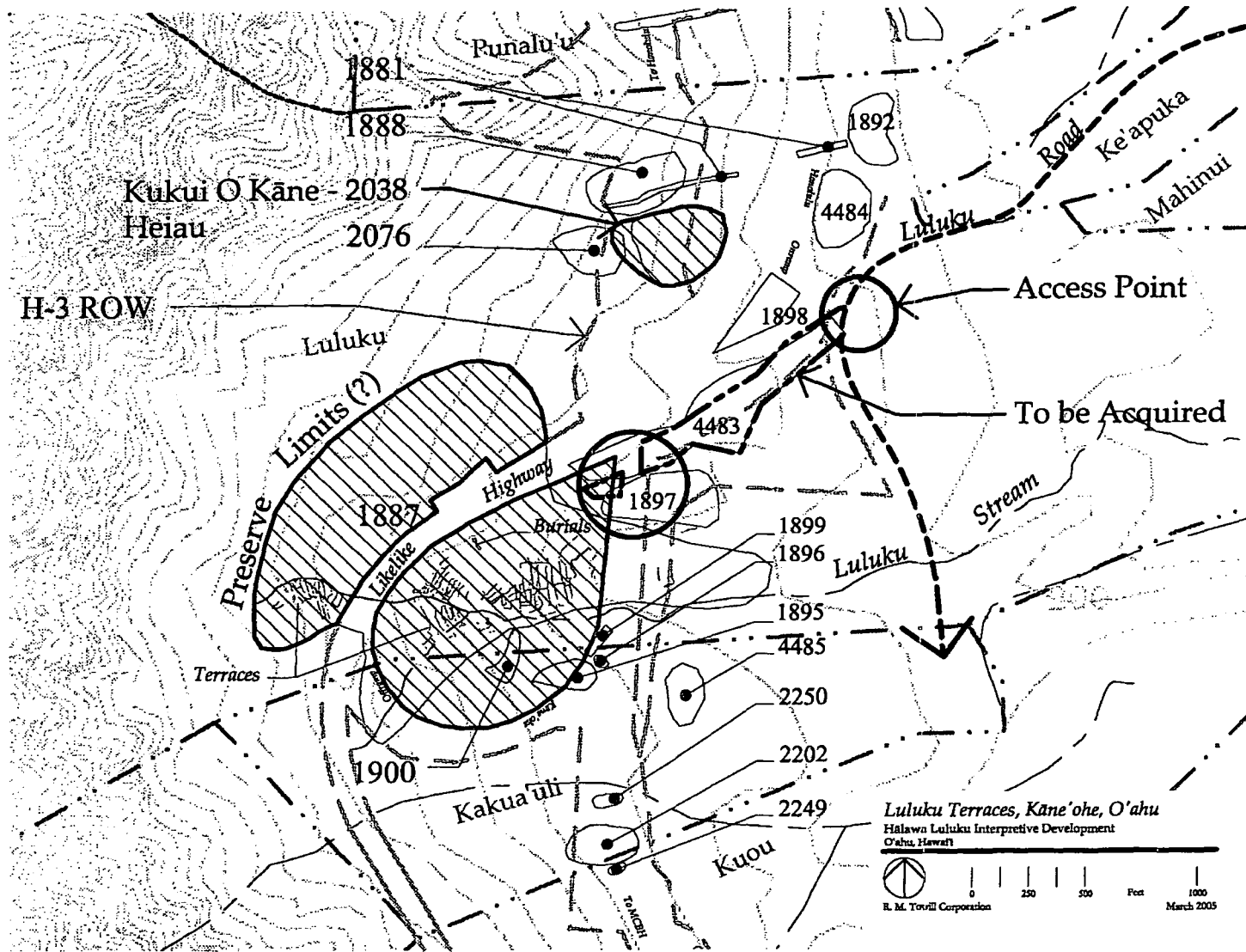
One of the best available means to ensure a culturally appropriate management model at Lulukū Agricultural Terraces would incorporate the following:

- The HDOT selecting the OHA as the government agency with oversight for the Lulukū project area;
- OHA selects a Hālawā nonprofit organization (H-NPO), who in participation with agencies, organizations, and individuals will partner with OHA in a process to determine an operating entity to manage and implement the development phase of this project.

#### 4.3.3 NATURAL AND SCENIC RESOURCES

A number of small-scaled features have been identified in and about the Lulukū Agricultural Terraces by cultural practitioners and the Bishop Museum that have cultural and religious significance.

Figure 4-2. Archaeological Sites at the Luluku Agricultural Terraces



#### 4.3.4 EXISTING FACILITIES

Aside from the H-3 freeway, the only major modern structure in the project area is the agricultural terraces. Only remnants of pre- and post-contact activity remain. Post-contact rice, pineapple, and ranch era elements such as the irrigation ditches have been destroyed or disturbed beyond recognition.

#### 4.3.5 IMPACTS BY H-3 ON LULUKU AGRICULTURAL TERRACES

The cultural landscape of Luluku Agricultural Terraces was impacted by the development of the Interstate H-3 in several ways that include:

- Introduction and expansion of non-native plant species, increased number of potential sites for establishment of new alien species,
- Destruction of portions of the project site by H-3,
- Reduced productive farm acreages and displacement of farmers who grew banana in the area and loss of productive, managed banana farm lands,
- Contributed to the loss of knowledge and history of the area,
- Disrupted water resources of the area through the channelization of streams under the highway, changing the stream course and access to the streams,
- Altered water flows and flow capabilities through the terrace system,
- Damaged portions of the terrace walls, māno (water source) and 'auwai (ditch),
- Damage areas deemed culturally significant by archaeologists identified as test pits and trenches in varying sizes,
- Disrupted the spatial relationship of lo'i and 'auwai to streams in the 'ili,
- Damaged portions of the ahupua'a walls,
- Abandonment of the lo'i kalo,
- Interrupted the arrangement and pattern of terraces in relation to the stream, 'auwai, and lowland flats,
- Increased trash from the highway,
- Impacted short distance views from within Luluku due to the bifurcation (division) of the project site, and blocked views toward Kāne'ōhe town and Kāne'ōhe Bay,
- Destroyed symbols of Hawaiian history and culture,
- Bifurcation (division) of the project site and separation of archaeological sites from each other,
- Allowed drainage from the freeway decks to ground below, and
- Caused removal of burial features.

#### 4.4 MITIGATION AND PROGRAM ELEMENTS

Mitigation elements are implementing actions identified by the WG and the public to mitigate the impacts identified in Section 4.3.5, above, associated with the development of the Interstate H-3. The proposed mitigation elements are arranged according to the type of mitigation proposed. Table 4-1, lists desired facilities and programs to mitigate the impacts of the



highway's construction within the scope of this IDP and H-3 mitigation program. Table 4-5 lists long-term operation and program elements that are beyond the scope of this IDP and H-3 mitigation funding.

The mitigation elements have been sorted using three different parameters:

1. By impact (column 1);
2. By project type – access or capital project (column 4); and
3. By sequence or ranking (column 5). The ME number is a discrete number used to identify the mitigation action.

**TABLE 4-1. Impacts, Mitigation and Program Elements for Luluku Agricultural Terraces**

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type (A=Access or C=Capital)	Rank
Bifurcation of the agricultural terraces site	1	Provide access to Luluku site, must implement/enforce visitation to these areas - issue of legal access to sites.	A	1
Bifurcation of the agricultural terraces site	3	Site access currently restricted. Install access road and parking (15 spaces) at entry point to accommodate access to the side.	A	1
Operations and Management	2	Implement managed access and security (partially through agreement with Park and Recreation (Ho'omaluhia Park).	A	2
Disrupted the water source for the agricultural complex	13	Restore stream (environment, water flow, vegetation) to pre-freeway construction levels.	C	2
Bifurcation of the agricultural terraces site	14	Restore the Luluku Lo'i system and provide public access to the Luluku agricultural complex; acquire remaining land between Parcel 20 and Luluku Stream (approx. 15 acres).	C	2
Bifurcation of the agricultural terraces site	9	Build a cultural resource complex that include a visitor center, education facilities, public gathering area, a maintenance facilities.	C	3
Bifurcation of the agricultural terraces site	12	Develop interpretive materials for orientation, education, cultural, and natural themes.	C	3
Bifurcation of the agricultural terraces site	6	Vegetation – implement a restoration and maintenance program.	C	8

## 4.5 IMPLEMENTATION AND DEVELOPMENT

### A. Administrative Authority

Administrative authority for the Luluku Agricultural Terraces mitigation program rests with the following organizations:

- Federal Highway Administration (FHWA)
- State Department of Transportation (HDOT)
- Office of Hawaiian Affairs (OHA)

Overall responsibility for the mitigation program is the responsibility of the FHWA and the HDOT. HDOT has the overall responsibility for the lands within the Interstate H-3 right-of-way and is also responsible for activities and access into the terraces. This latter responsibility is recommended for transfer to OHA who will be assigned the responsibility of overall "Program Manager." As Program Manager, OHA shall select an organization or organizations to manage the day-to-day activities within the terraces. OHA shall also have general oversight over all facilities in the terraces.

### C. Operations and Maintenance

Operations, maintenance and program administration will be assigned to the Luluku nonprofit organization (L-NPO). The L-NPO shall be a culturally based organization representing the cultural practitioners and caretakers of the area. The L-NPO will be the governance entity for the Luluku Agricultural Terraces. The L-NPO will be selected by OHA and shall be responsible for the following: (provided as guidance)

- 1) Project Management
  - Daily administrative and fiscal management
  - Collection of fees and payment of accounts due
  - Scheduling of activities
  - Facility maintenance and repair
  - Revenue generation and seek funding for the mitigation program
- 2) Program Management
  - Maintenance of interpretive devices and materials
  - Provide for the curation of artifacts
  - Conduct education program for the public
  - Provide for the restoration of cultural sites and features
  - Provide for the maintenance and restoration of native plant species
  - Conduct research, as required, to understand cultural sites
  - Document findings and activities carried out at the terraces

## 4.6 USER ANALYSIS

Once the plans to establish Luluku Agricultural Terraces as a historic and cultural resource complex is approved, and a management organization is established to preserve and interpret the areas' resources, public access will be allowed.

#### 4.6.1 AUDIENCE

Users of the 'ili's resources include:

- Community Members
- Native Practitioners
- Students
- Educators
- Recreational Users
- Workers (Volunteers and Employees)
- Researchers

#### 4.6.2 VISITOR ACCESS

A controlled access plan is needed to provide security and to protect the nature of the cultural and resource complex. Table 4-2 and 4-3 below are provided as guidance for access into the area. Several gates will serve as control points beyond which only certain individuals, groups of visitors, or types of vehicles will be allowed.

Three gates will be established to provide security and serve as check points to filter the type of vehicular and pedestrian traffic allowed. The gates are as follows:

**Table 4-2. Access Control Points**

Gate 1 (at Luluku Road)	Pedestrian access only. No public or personal vehicles will be allowed beyond the entry parking lot (#1) without prior consent. Service and farm vehicles allowed.
Gate 2 (at milepost 1)	Parking lot #2. Overflow and event parking. Access beyond this point is allowed to service vehicles and pedestrians only.
Gate 3 (at highway underpass)	Access allowed for service vehicles and pedestrians only.

Visitors to the complex will be given a priority designation based on their purpose for the visitation as follows:

**Table 4-3. Visitor Groups Access Priority**

Priority Group	Visitor Group	Purpose
1	HDOT Personnel Luluku Terraces cultural practitioners Volunteers	Repair and Maintenance Exercise cultural beliefs (Requires prior L-NPO approval) Work parties and service personnel
2	Invited Public Other cultural Practitioners Researchers	Educational or cultural program Exercise of cultural belief Conduct studies in the terraces (Requires prior L-NPO approval)
3	General Public	General recreation purposes: walking,

		etc. (Access allowed only during open periods)
4	Special Interest	Commercial activity (e.g., tours)

**4.6.3 VISITOR PROJECTIONS**

- Daily Users
  - Community Members
  - Practitioners
  - Employees and Volunteer Workers
  - Researchers
  - Educators
  - Students (all grades)
  - Commercial Tours (limited and controlled)
- Facility Users
  - Persons-groups attending scheduled function at the site
  - Special event
- Weekend
  - Daily Users
  - Recreational Users
- Monthly
  - Special Events

**4.7 CONCEPTUAL INTERPRETIVE LAYOUT**

To realize the vision for the Luluku Agricultural Terraces the facilities shown in Figure 4-3 are proposed.

Facility summary (referenced to numbered locations):

- #1. Entry and Parking. Entry to the Agricultural Terraces will be via Luluku Road approximately 1 mile after entering Ho’omaluhia Park. Inside the entry a paved visitor parking area for 15 cars will be provided. The entry point will be gated to restrict access during closed periods. No private vehicles (other than farmers) will be allowed beyond the parking area without special permit issued by the L-NPO. A gate will be installed beyond the parking lot to restrict access. A paved access road (2-lanes, 20 feet wide with grassed shoulders) will lead from the parking lot to the agricultural terraces, learning and resource complex.
- #2. Taro Lo’i. Mauka of the parking lot the 4+-acre area will be cultivated in restored taro lo’i and other traditional crops. An irrigation system to be developed by diverting water from the stream. The taro lo’i will be part of a working farm.
- #3. Access Road. Two lane paved road with grass shoulders to be built on the Likelike Highway side of 4-acre cultivated area. Trees will be planted on the Likelike Highway side

of the road to serve as a visual buffer. A chainlink fence to be installed on the Likelike Highway side as a safety barrier between the trees and the existing highway guardrails.

- #4. Restored Taro Lo'i. The approximately 10+ acres of taro lo'i, walls, and auwai will be restored for cultivation along with an irrigation system utilizing water from the stream. After passing through the lo'i, the water to be returned to the stream. Each lo'i will be developed in stages.

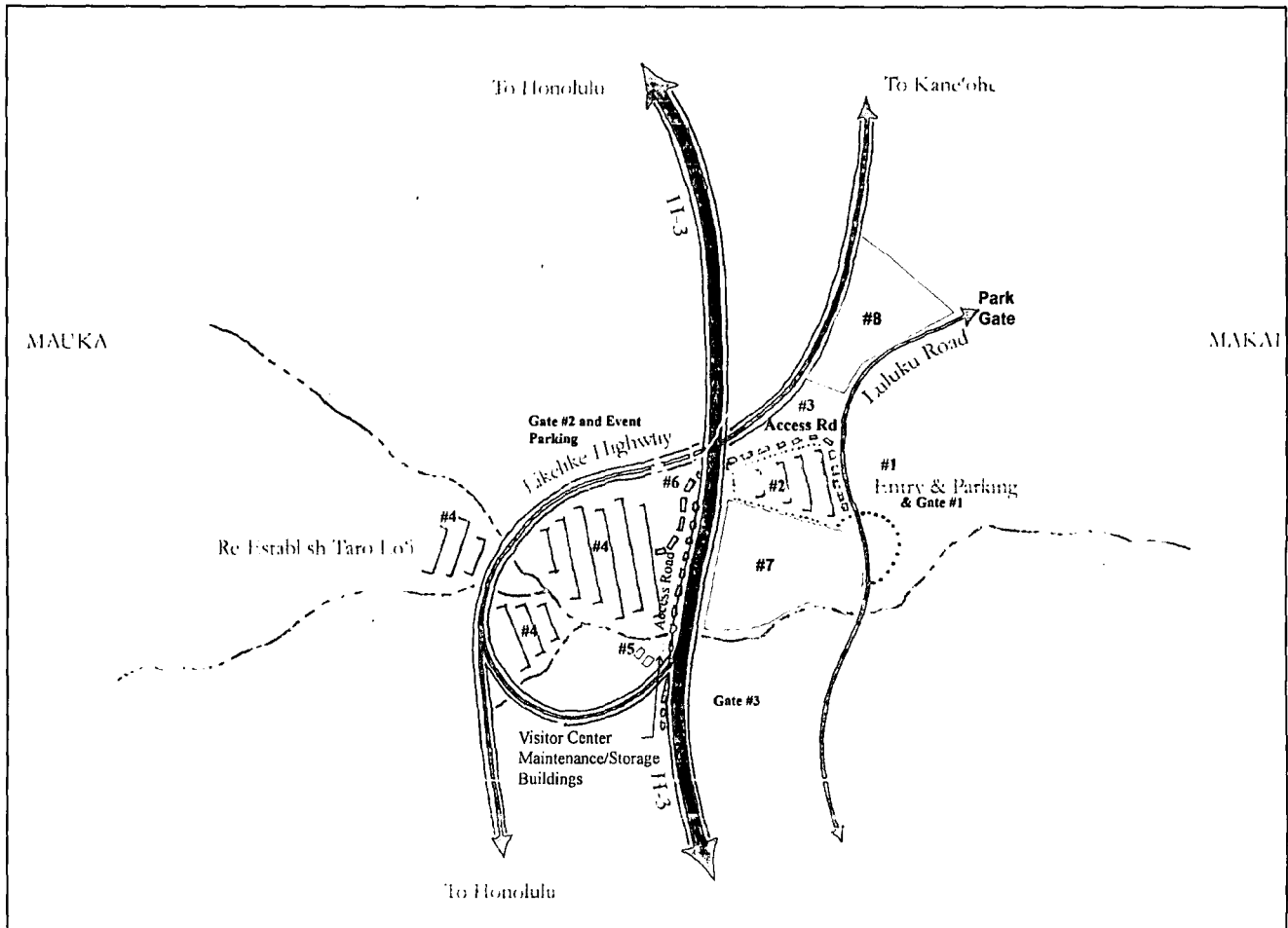


Figure 4-3. Luluku Agricultural Terraces Concept Plan

- #5. Visitor Center Complex. The Complex (3-buildings) will be the central point for programs at the Terraces. The area's resources and cultural protocols will be explained at this location. This is where volunteer workers report for work and is also a training center for volunteer docents. The complex (3,500 s.f.) will be provided with conference/meeting room (600 s.f. divisible by 2), restrooms (200 s.f. - use of composting toilets to be considered), office space (300 s.f.), and supply/storage room for artifacts (200 s.f.), an imu, maintenance building (1,000 s.f.) where farm equipment and supplies can be safely secured and a kahua or open gathering place (1,000 s.f.). The complex will also include an open or traditional style hālau for demonstrations of harvesting, preparing, and eating produce or

creating utilitarian objects. This latter building will be open on three sides with storage on the closed end. Modern adaptations towards meeting building codes shall be applied. Electrical service and potable water to be developed and supplied from Luluku Road.

- #6. Interpretation Sites (typical) - These are special sites that are selected for interpretation because of their significance (sites identified in section 4.3.2 above). These sites are also where preservation work takes place. Planned activities include: wall restoration (re-building collapsed walls), installing barriers to keep unauthorized personnel out, weed control and native plant restoration. Initial work will include the delineation of the sites to be protected. Special event parking to be located in the open field near the highway.
- #7. Additional land to be acquired, approx. 15 acres, to unify the bifurcated lo'i complex system.
- #8. Additional land to be annexed into the project for lo'i development. Discussions pending with HDOT.

#### 4.7.1 DEVELOPMENT-DESIGN

##### PRINCIPLES

To realize the vision for Luluku Agricultural Terraces a cultural learning resource complex should be built to accommodate various interpretive programs that will address areas of cultural, educational, historical, resource, and agricultural importance.

Improvements within the complex should center on the following principles:

- A. Culturally appropriate practices on the 'āina;
- B. Use of green or environmentally sustainable building practices;
- C. Focused on food production;
- D. Pedestrian oriented (ADA compliant);
- E. Ongoing religious and cultural practices respected;
- F. Respect for the 'āina practiced at all times;
- G. Pass the knowledge of the culture and educate all who are interested; and
- H. Selection of Contractors. Restoration work shall be conducted by those with a strong cultural understanding of the specific project area that they will be working in. The following should be considered:



Figure 4-4. Luluku Agricultural Terraces

- The L-NPO shall review all restoration proposals for work and shall be involved in the planning phases;
- Restoration work shall provide for using of cultural monitors to oversee cultural compliance;
- Ideally, contractors should be selected from those who already have a relationship to the land and intimate knowledge of the land; and
- Contractors shall use cultural protocols that consider historical and current practices. The L-NPO should approve these protocols.

#### 4.7.2 LULUKU PROJECT COST ESTIMATE

##### A. Capital Project Funding

Funding for the mitigation program is provided by FHWA through HDOT, and approximately \$8 million is currently available. However, Table 4-4 shows the projects requested for approval by HDOT/FHWA. These projects are a fundamental part of mitigation and preservation in the valley, and it seeks funding approval to the greatest extent possible. Once approved these funds would be requested and programmed via the State Transportation Improvement Program (STIP). Program and operations funding is shown below.

Project costs were based on a proposed development program prepared by the WG to fulfill the needs of each identified mitigation action. Unit costs were prepared based on available costs from contractors and recent bid tabulations. Design costs were estimated at ten(10) percent of the construction cost. Construction inspection and management services were estimated at fifteen (15) percent of construction cost, and a contingency of 15 percent of the construction, design and inspection cost was estimated to account for price escalation and inflation.

Once the costs estimates were developed, the WG was tasked to phase the projects. Four (4) development phases were established without regard for the time period for each phase. We assume that all projects will get implemented.

##### B. Operations and Program Funding

Operations and maintenance functions shall be the responsibility of the N-NPO.

Table 4-4. Luluku Agricultural Terraces Cost Estimate (preliminary and subject to change)

Proj No.	Project Title	Note	Cost	Phase 1	Phase 2	Phase 3	Phase 4
1	Access A/C road from Luluku Road + drainage + erosion control	7,920 l.f. X \$125/l.f.	\$990,000	\$990,000			
2	Access Road (Clear&Grub) 4 ac	4 ac.x \$6000/ac.	\$24,000	\$24,000			
3	Parking Area 15 cars @ 5000 clear and grub and Gravel + erosion control	15 stalls x \$5000/stall	\$75,000	\$75,000			
4	Construct a ford across stream for light trucks	Lump Sum	\$500,000	\$500,000			
5	Hazardous material investigation of dump site located northwest and near site 1897of the lower lo'is plus removal of material (item observed: car bodies, appliances, containers, etc.)	Lump Sum	\$10,000	\$10,000			
8	Lo'i wall and auwai restoration	5280 l.f. X \$200 l.f.	\$1,056,000	\$1,056,000			
9	Lo'i restoration - irrigation water 4" and 2" mains (water intakes from the stream)	80,000 l.f. x \$40/l.f.	\$3,200,000	\$1,600,000	\$1,600,000		
10	Develop Interpreted signs and storyboards under covered hālau.	Lump Sum	\$5,000		\$5,000		
11	Utility and storage bldg or container 20 X 30	20 ft. x 30 ft. x \$200/s.f.	\$120,000			\$120,000	
12	Visitor Complex						
	A. Resource Center @ 1000 s.f. covered area with storage	1000 s.f. x \$250/s.f.	\$250,000			\$250,000	
	B. Visitor center display boards 2 to 3 boards 4x8'	Lump Sum	\$5,000			\$5,000	
	C. Maintenance shed 20 X 40	20 ft. x 40 ft. x \$250/s.f.	\$320,000		\$320,000		
	D. Visitor Center 3,500 s.f.	3,500 s.f. x \$250/s.f.	\$875,000			\$875,000	
	F. Provide power and potable water to the visitor center complex (power and water to be brought in from Luluku Road)	Lump Sum	\$250,000		\$250,000		
13	Imu site with potable water (cleared area with concrete pad)	1 ac.C&G @ \$5,000/ ac.	\$5,000			\$5,000	
14	Iwi relocation site (clear, grub, drainage)	1 ac.C&G @ \$6000/ac.	\$6,000			\$6,000	
15	Vegetation – develop restoration program and maintenance program for native plants to include a covered nursery site	Lump Sum	\$50,000				\$50,000
16	Land acquisition, approx. 15 acres adjacent to Luluku Stream and Parcel 20. Required to make the Luluku Complex whole. Will also include the 'wetland' area for lo'i development	15 acres @ \$200,000/ ac.	\$3,000,000			\$1,500,000	\$1,500,000



<b>INELIGIBLE PROJECTS*</b>							
6	C. Wood chipper						
7	D. Tiller						
12E	B. Commercial Kitchen						
12G	A. Caretaker's Home						
7	D. Tiller						
	<b>TOTAL</b>		\$10,741,000	\$4,255,000	\$2,175,000	\$2,761,000	\$1,550,000
	Design @ 10% of Total		\$1,074,100	\$425,500	\$217,500	\$276,100	\$155,000
	Construction Management / Inspection 15% of Total		\$1,611,150	\$638,250	\$326,250	\$414,150	\$232,500
	Subtotal		\$13,426,250	\$5,318,750	\$2,718,750	\$3,451,250	\$1,937,500
	Contingency @ 15%		\$2,013,938	\$797,813	\$407,813	\$517,688	\$290,625
	<b>TOTAL</b>		<b>\$15,440,188</b>	<b>\$6,116,563</b>	<b>\$3,126,563</b>	<b>\$3,968,938</b>	<b>\$2,228,125</b>

\* Projects identified by the WG but have been determined to be ineligible for mitigation funding because of the nature of the project, e.g. used for maintenance or does not provide for direct mitigation of an impact resulting from H-3.

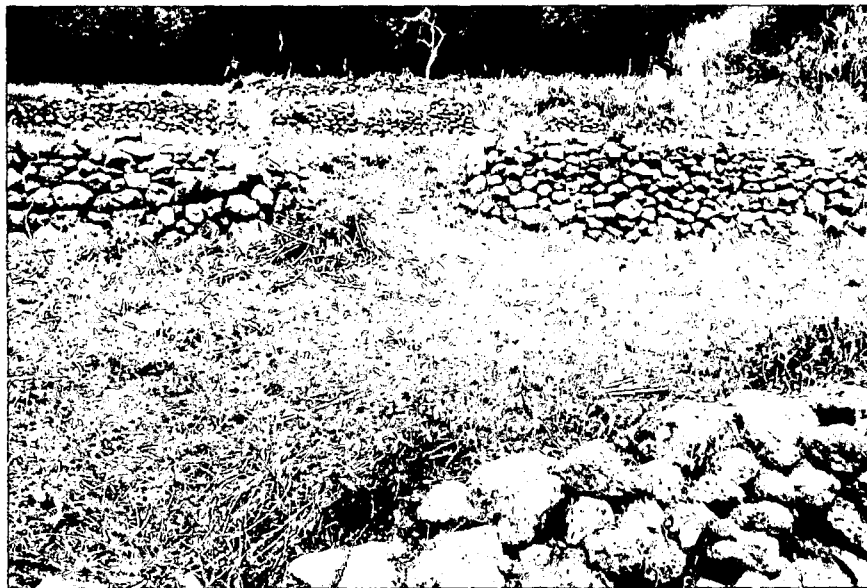


Figure 4-5. Terrace Walls Requiring Repair

**C. Phasing and Implementation**

Table 4-4 lists the development phases anticipated. The four phases will be programmed as part of the Statewide Transportation Improvement Program (STIP). Each program year begins in October corresponding to the Federal fiscal year. The first program year for the STIP is 2009 (FY 2009). A total of \$6.12 million is projected and is allocated as follows:

Construction	\$4.3 million
Design @10%	\$0.43 million
Construction Mgmt @15%	\$0.64 million

Contingency @ 15%

\$0.80 million

The second program year is projected for FY 2010, followed by phases three and four at FY 2011 and 2012, respectively. Limitations on project implementation will be determined annually by availability of funds for that particular fiscal year, project need, and the overall priority assigned to the project.

#### 4.8 LONG TERM OPERATIONS AND PROGRAM ELEMENTS

The mitigation elements listed below in Table 4-5 are: 1) actions for long-term implementation; 2) operations and maintenance actions; and 3) interpretive and/or cultural programs at the Luluku Agricultural Terraces and are beyond the scope of this IDP and H-3 mitigation program. These items have been identified for future planning and implementation by the L-NPO. These items are part of the overall program for Luluku Agricultural Terraces, however, are not part of the H-3 mitigation program. In the implementation phase of this project an operations and governing body, such as a not-for-profit organization identified earlier, is required to work with governmental agencies, other organizations and individuals. The actions proposed are long-term (such as the curation of artifacts and research material) and require sustained effort beyond the scope of this H-3 mitigation program.

Table 4-5. Luluku Agricultural Terraces Long Term Operations and Program Elements

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type (L, O, P)*	Rank
Operations and Management	4	Identify carrying capacity for cultural resource complex and it's interpretive programs.	L	1
Operations and Management	1	Establish collaborative partnerships with similar organizations, groups, or individuals.	O	3
Bifurcation of the agricultural terraces site	5	Prepare preservation (stabilization, restoration, rehabilitation) plan for arch. sites.	P	1
Operations and Management	6	Ensure ongoing maintenance: issues and costs that would normally be funded by DOT operating funds need to be identified so we don't inadvertently spend our funds on projects that DOT would be obligated anyway. Ongoing trash issues, invasive species control.	P	1
Bifurcation of the agricultural terraces site	2	Identify site(s) to be interpreted.	P	2

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type (L, O, P)*	Rank
Bifurcation of the agricultural terraces site	4	Identify buffer zones for cultural and educational areas and provide for site protection. Protect and preserve sites through less disruption to the sites is better than trying to guess and ultimately harming the integrity. Protect sites from exploitation.	P	2
Bifurcation of the agricultural terraces site	16	Develop and implement an archaeology program of preservation (stabilization, restoration, reconstruction).	P	3
Burials and Inadvertent Discoveries	8	Identify location for burials of iwi within and adjacent to the project area. Identify sites and provide for restoration and protection of the sites, burials grounds with these areas.	P	7

\* L = Long term action; O = Operations and Maintenance, P - Program Action

#### 4.9 UNRESOLVED ISSUES

Several issues that remain unresolved at this writing require additional study before implementation of the proposed mitigation actions. They include:

- Complete historical and archaeological study of the area was not conducted, therefore the inter-relationship between the various parts of the terraces is unknown. Additional study is required.
- Historic documentation of the site is currently incomplete making it difficult to have a clear understanding of the role of this site.
- Access to the site requires coordination with the City and County of Honolulu because the Luluku Agricultural Terraces abuts Ho'omaluhia Botanical Park.
- Acquisition of the expansion area is pending action by HDOT.

## 5

**KUKUI O KĀNE HEIAU****5.1 DEVELOPMENT THEME "A SACRED PLACE"**

Kukui o Kāne Heiau, the largest known heiau in the Ko'olaupoko District, represents a place of special reverence because of its association with the Hawaiian god Kāne. The location of the heiau is a testament of its importance to the people of the district. The preservation of this sacred site upholds traditional religious values to modern-day cultural practitioners and in its interpretation maintains answers of the site's historical significance which will be expressed by scholars and educators.

Kukui o Kāne Heiau, located below the cliffs of Keahiakahoe, had been described as one of the largest temple complexes in the district of Ko'olaupoko. The name Kukui o Kāne, or the light of Kāne, suggests that it was built and dedicated to the worship of the Hawaiian god Kāne. As one of the four major Hawaiian gods, Kāne was associated with the sun as well as freshwater streams and springs. Kāne Kawailoa is interpreted as the life-giving waters of Kāne. With the abundance of fresh water resources in Kāne'ohe it enabled the ancient Hawaiians to excel in wetland agriculture and the food production of kalo, the staff of life. It is the reverence of this relationship and the Hawaiians' understanding of their environment that resulted in creating what we now call sustainable practices.

In 1819, the Kuhina Nui Ka'ahumanu and priest Hewahewa commanded the abolishment of the ancient kapu system and forbidding the worshipping of the "old gods." Many of the temples were destroyed or abandoned and left in disrepair, forcing others to go "underground."

By the early 1900's Libby, McNiell, and Libby began clearing and planting pineapple on large tracts of land in Kāne'ohe. In 1916 author and historian Thomas G. Thrum records in the Hawaiian Annual, Kukui o Kāne, at Lulukū, of platform character and large size, "now being destroyed." Old native Hawaiians in the area believed that the bulldozing of the heiau caused the demise and failure of Libby's attempts to grow pineapple in the area.

In 1930, archaeologist J. Gilbert McAllister located a part of the heiau complex which Thrum had described as "being destroyed." McAllister reports in his archaeology of Hawai'i "The ploughed-up remains indicate heavy walls and several terraces. It is impossible to obtain dimensions."

In 1990 what was assumed to be "dry land agricultural terraces" by the lead archaeologist at the Bishop Museum was bulldozed, buried and paved over as part of the H-3 freeway (Scott Williams, 1987).

**5.2 OBJECTIVES**

The objectives of the mitigation program are:

1. Archaeological Documentation. To perform a complete cultural and archaeological resurvey and analysis of the area to determine what measures will be implemented to perpetuate and preserve what remains of these sites.
2. "Healing of the 'Āina" - Implement actions to a) preserve this cultural site through site stabilization; b) implement preservation plans to protect existing resources; and c) communicate the significance of the cultural landscape and features through an interpretive program.
3. Access - Provide managed, limited access to the area for individuals (and groups) pursuing traditional knowledge and cultural practices.
4. Sustainability - Establish and communicate cultural protocol(s) for users and visitors that show respect for the sacredness of this site.
5. Natural/Ecological Resources - Implement actions that promote ecological balance of the environment which perpetuates both the knowledge and practice of Native Hawaiian culture.
6. Educational and Cultural Program - Develop educational programs and materials that facilitates the interpretation of the historic and cultural resources of the project area to a wider audience.

### 5.3 SITE ASSESSMENT

#### 5.3.1 CURRENT SITE DESCRIPTION

Kukui o Kāne Heiau is located in Luluku and Punalu'u Mauka in the ahupua'a of Kāne'ohe.

The archaeological evidence published to date relating to Kukui o Kāne Heiau is primarily from the Bishop Museum.

The size and complexity of the heiau has not been disputed as the physical evidence was documented prior to the construction of H-3. The conclusions as to its significance, however, range from merely being an agricultural feature to one that recognizes the site as an important feature - a heiau. Bishop Museum is still working to complete their study on this important site (2007).



Figure 5-1. Location Map

The draft report was completed by Bishop Museum in early 2007 and is being reviewed by SHPD. At this time, it remains uncertain whether the review will be completed prior to the close of this consultation process. If so, actions may be needed to address the needs of that report.

Initial recognition of the site as a heiau was recorded by Thomas Thrum (1916) and later by McAllister (1933) during his survey of sites on O'ahu. He noted that Kukui o Kāne Heiau was located in Luluku 'ili (Bishop Museum reports the site to be in Punalu'u Mauka), and reports of the destruction of the site by the "remains indicate heavy walls and several terraces." The destruction was caused by Libby, McNiell and Libby Co. in clearing land for pineapple. McAllister reports the structure to be the largest and most important heiau in the region, incorporating thick walls and terraces.

The Bishop Museum's 1987 summary of the Site 1888 (G5-86) is as follows: (see Figure 5-1 and 5-5)

"Site 1888 (G5-86) is an extensive agricultural complex located immediately adjacent to an 'ili boundary, and across that boundary from Luluku, a highly valued agricultural 'ili. Although duration and extent of cultivation at this damaged site are not yet clearly understood, the massive terraces suggest larger-scale production than that needed to support an extended family. Site 1888 (G5-86), at least during this later period of use, almost undoubtedly functioned within a larger, ahupua'a-based framework in which surplus produce was collected on a regular basis for redistribution by the ali'i nui (supreme chief)." "The C14 date obtained for Feature 2 suggest initial clearing between A.D. 915 and 1200; cultivation probably continued into the post-Contact period. Certainly the charcoal kiln suggests a habitation or work area at the site in the 19<sup>th</sup> century." "As mentioned previously, all of Punalu'u 'ili had been granted by Liholiho (Kamehameha) to Don Marin in (1821), early in the post-Contact period. Marin (Manini) was a medical advisor and friend to the King. The Site 1888 (G5-86) terraces, in their later period of use, probably produced crops for Manini and his son, as well as their royal patrons" (Allen, 1987).

In 1989, Scott Williams reported on additional archaeological survey work conducted on Sites 2038 (G5-106) and 2076 (G5-110), located adjacent to Site 1888 (G5-86). These two sites were not evaluated during the 1987 work because they were "outside of the limits of the Kāne'ohe Interchange and were heavily overgrown." Based on the field work conducted, Williams concluded that Site 2038 (G5-106) is "probably the remains of Kukui o Kāne Heiau" (Williams, 1989). Williams further noted "these four sites (G5-86, G5-87, G5-106 and G5-110) form a large complex of distinct but spatially and temporally associated sites."

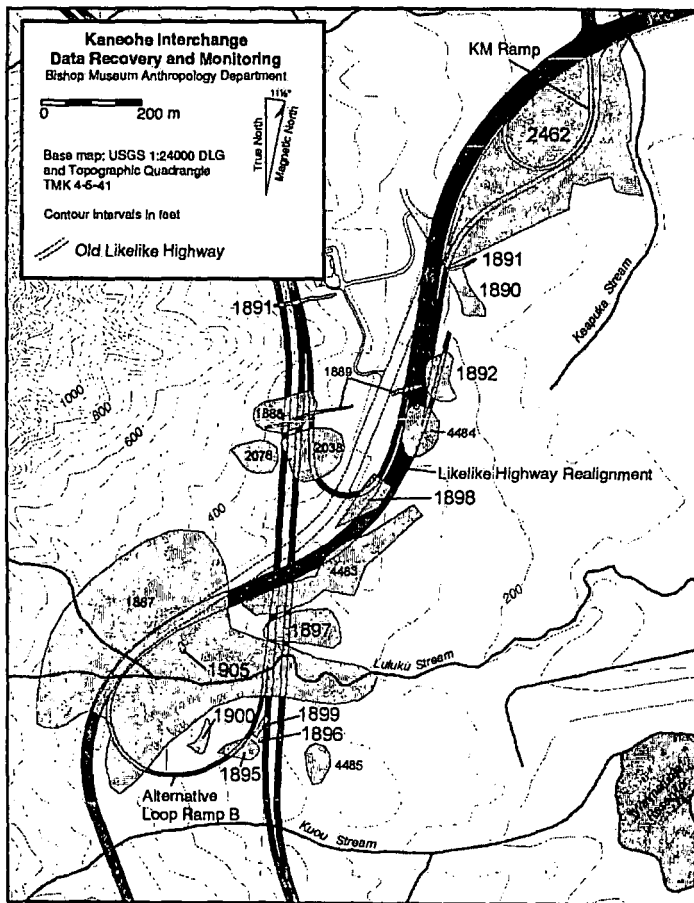


Figure 5-2. Archaeological Sites Map

- "1. The complex of features originally designated as four sites is actually one complex of functionally and temporally related features and represented at least three phases of site use: the first probably representing dryland agriculture, which over the years evolved into a multi-functional complex of religious, domestic, and agricultural features, included Kukui o Kāne.
- "2. Based on looking at the data as a body, rather than in bits and pieces. This suggests to me that there is no definitive evidence arguing against the large terraces of Site 1888 (G5-86) being the remains McAllister recorded as Kukui o Kāne Heiau. . . . I feel that prior to this time, I and other have been treating our data as "trees," without ever stopping to look at the whole forest" (Williams, 1991).

Earl "Buddy" Neller, an archaeologist in Hawai'i working at Kukui o Kāne, had a comprehensive background working for both federal and state agencies and was well-versed in the legal protocols concerning pre-contact and historic sites of the area. With a deep understanding of Hawaiian culture and history, he acquired the respect of many in the Hawaiian community. Buddy worked at Kukui o Kāne for the SHPD during the preparation of Jane Allen's 1987 Bishop Museum's report Five Upland Ii. He disagreed with many of the Museum's reports especially Jane Allen's stand on the dryland agricultural terraces of site (G5-

In 1991, Scott Williams, principal investigator for the Kukui o Kāne Heiau site, reversed his position reported above by stating "In my opinion, there is no definitive archaeological evidence to suggest that large terraces are not the remains of a heiau platform with the exception of the data on soil characteristics, which suggest that the terraces were used for dryland agriculture. To me, this evidence does not outweigh the other archaeological evidence which suggest that the large terraces were something more than just dryland field systems" (Williams, 1991). This conclusion was reached on the following basis:

86). No archaeologist in Hawai'i had ever made mention or findings of dryland agriculture terraces until this 1987 report. Buddy's knowledge of ancient Hawaiian dryland agricultural practices describes mounding and mulching techniques without the support of walled terraces. These practices are consistent with the planting of uala or sweet potato to which the museum assumed was the use of these terraces. It was argued that the Hawaiians with their expertise in the practical use of their environment for food production would build and utilize these rocky terraces which would require logistically a large number of human and natural resources specifically for the growing of sweet potato. Many in the Hawaiian community as well as cultural practitioners felt that this was an effort to downplay the importance of what they knew was part of Kukui o Kāne Heiau, despite Buddy's recommendations and protests from cultural practitioners and community groups, like Malama Kukui o Kāne. The Bishop Museum's findings on the "agricultural terraces" were found to be not significant enough to save the heiau from the path of the freeway. However, in 1990, based on the suggestions of their reports site (G5-86) was marked for passive preservation where the sites were documented, given map coordinates and then buried in place. Today there is very little evidence of what was described as a large complex.

### 5.3.2 SIGNIFICANT SITES AND EVALUATION

Each feature of the Kukui o Kāne Heiau is architecturally significant as a reflection of an important period of Hawaiian culture, or in its potential for Hawaiian archaeological research. Survey and testing have secured for Site 1888 (G5-86) an important place in the prehistoric Hawaiian chronology and have established the potential value of the remaining sites.

In February 1986, National Register of Historic Places nomination forms were prepared by the Bishop Museum for HDOT. The forms were submitted to the FHWA and to the Keeper of the National Register for all 17 sites located within the Kāne'ōhe Interchange project area. The Keeper of the National Register has determined the sites eligible for placement on the National Register as a discontinuous district based on satisfying as a group criteria A, C, and D.

Criterion A applies to association with events or broad patterns important in the history of an area. The Keeper found the site eligible based on two patterns or events.

- The transition in pre-contact Hawai'i to a state form of government; and
- The interaction between early Euro-American cultures at contact.

**Criterion C** applies to sites that represent architectural achievements. The Keeper found the site eligible based on the structural remains of the agricultural system associated with ethnic groups that have occupied the area throughout its pre-history and history.

**Criterion D** applies to sites that have the potential to yield information significant for our understanding of traditional culture, history, pre-history, and/or foreign influences on traditional culture and history.

Site significance also depends, to a degree, upon integrity i.e., the state of preservation and intactness of the site and its physical surroundings. Table 5-1 indicates the state of preservation for each site and its immediate surroundings.



### 5.3.3 IMPACTS BY H-3 ON KUKUI O KĀNE HEIAU

A complete survey and analysis of the area needs to be done to determine what remains of the complex, and if any measures should be taken to correct the impact.

The cultural landscape of Kukui o Kāne Heiau was impacted by the development of the Interstate H-3 in several ways that include:

- Destruction of large portions of the site;
- Lack of appropriate access to the site;
- Introduction of non-native plant species;
- Destruction of underground water source for Kumukumu Springs;
- Disturbance of burials; and
- Adverse social impact to families who care for the site(s) (burials).

## 5.4 MITIGATION AND PROGRAM ELEMENTS

Mitigation elements (ME) are implementing actions identified by the WG and the public to mitigate the impacts associated with the development of the Interstate H-3. A complete list of the mitigation elements is shown in Table 5-1. These mitigation elements are desired facilities and programs to mitigate the impacts of the highway construction. It should be noted that interpretive and/or cultural programs at the Kukui o Kāne Heiau and are beyond the scope of this IDP and H-3 mitigation program. These items have been identified for future planning and implementation by the L-NPO. These items are part of the overall program for Kukui o Kāne Heiau, however, are not part of the H-3 mitigation program. In the implementation phase of this project an operations and governing body, such as a not-for-profit organization identified earlier, is required to work with governmental agencies, other organizations and individuals. The actions proposed are long-term and require sustained effort beyond the scope of this H-3 mitigation program.

The mitigation elements have been sorted using three different parameters:

1. By impact (column 1);
2. By project type (column 4); and
3. By sequence or ranking (column 5). The ME number is a discrete number used to identify the mitigation action.

Table 5-1. Impacts, Mitigation and Program Elements for Kukui o Kāne Heiau

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type *	Rank
Destruction of large portions of the site	1	Site access to be restricted and managed until such time as a site manager can be obtained to prevent damage.	A	1
Destruction of large portions of the site	16	Recognize significance of numerous burials at site (included therein if supported by the family caretakers).	C	1
Operations and Management	1	Create access for family and native Hawaiian cultural practitioners. Provide cultural access to sites; resolve legal issues for access and visitation, implement/enforce visitation to these areas - issue of legal access to sites. DOT and BM, SHPD to offer ho'okupu (ceremonial gift) to site.	C	1
Operations and Management	2	Develop parking area (3 stalls) to provide access to the heiau located adjacent to the BWS facility. An easement or land acquisition will be required.	C	2
Destruction of underground water source for Kumukumu Springs	2	Identify carrying capacity for further or existing activity to maintain cultural and ecological integrity. Research the possibility of the spring's restoration.	L	9
Introduction of non-native plant species	15	Establish the Luluku – Kuku'i o Kāne NPO. Clear invasive plant species and assist native plants to flourish.	O	2
Disturbance of burials	17	DOT/Bishop Museum/SHPD/OHA should offer ho'okupu to honor burials they disturbed. Iwi and funerary items should be replaced in accordance with the wishes of the family.	P	1
Disturbance of burials	11	Develop a program for monitoring, maintenance, security, and managed access.	P	2
Destruction of large portions of the site	6	Prepare preservation (stabilization and reconstruction) plan for identified archaeological sites.	P	3
Destruction of large portions of the site	3	Develop a program for the restoration of native plants (remove introduced plants) and planting of native species, as appropriate, with consultation of the ohana. Assist existing native and cultural plants to flourish.	P	4
Destruction of underground water source for Kumukumu Springs	8	Interpret the Kukui o Kāne site as an important feature of the Ko'olaupoko landscape.	P	4
No access to the site	14	Establish Hawaiian protocol for visitors to the site in consultation with the families.	P	5

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type *	Rank
Destruction of large portions of the site	7	Identify wahi kapu sites and develop a program for their protection. Restore destroyed/impacted areas to the degree possible.	P	6
No access currently to the site	13	Ensure ongoing maintenance: issues and costs that would normally be funded by DOT operating funds need to be identified so we don't inadvertently spend our funds on projects that DOT would be obligated anyway. Ongoing trash issues, invasive species control.	P	8
Disturbance of burials	9	Identify buffer zones for cultural and educational areas and provide site protection. Protect and preserve sites through less disruption to the sites is better than trying to guess and ultimately harming the integrity. Protect sites from exploitation. No fences unless approved by caretakers.	P	10
Destruction of large portions of the site	4	Conduct an on-site survey of cultural/historic sites that have survived construction of the freeway as well as identify possible sites that were lost as a result of the freeway's construction. Identify sites for restoration and protection.	P	10
Destruction of large portions of the site	5	Nominate Kukui o Kāne Heiau to the National and State Registers of Historic Places.	P	11
	18	Develop program for pig hunting that utilizes appropriate cultural protocols. Give preference to hunters who utilize culturally-based hunting methods and who are known for pono behavior in sacred places.	P	11
	19	Identify location(s) of burials within and adjacent to the project area in order that they may be protected. Properly recognize extent of sites and provide for restoration and protection of the complex and burial grounds within these areas. Site privacy should be respected.	P	12

\* Project Type Key: (A=Access, C=Capital, L = Long term action; O = Operations and Maintenance, P - Program Action )

## 5.5 MITIGATION PROPOSAL

Kukui o Kāne Heiau, the largest known heiau in the Ko'olaupoko District, represents a place of special reverence because of its association with the Hawaiian god Kāne. The location of the heiau is a testament of its importance to the people of the district. The preservation of this sacred site lies in its religious values to modern-day cultural practitioners and in its interpretation of the site to scholars and educators in order that the site's significance is not lost to history.

In order to realize the vision for Kukui o Kāne Heiau the following facilities are proposed:

- #1 Parking development for family and native Hawaiian cultural practitioners. Access to be determined;
- #2 Access trail to heiau site; and
- #3 Site preservation and protection.

The project identified above has been determined not to be eligible for mitigation funds as defined in this IDP because HDOT decided in favor of the proposal forwarded by the current genealogical caretaker which is to "not allow access."



Figure 5-3. Access Concept Plan (Kukui o Kāne Heiau)

## 5.6 UNRESOLVED ISSUES

Several issues that remain unresolved at this writing require additional study before implementation of the proposed mitigation actions. They include:

- Complete historical and archaeological study of the area is currently on-going by the Bishop Museum and their report is pending. A draft of the Museum's findings has been transmitted to SHPD for review. There is a possibility that the Bishop Museum study may not be completed in time to be considered by the HLID Project. Interpretation of Kukui o Kāne Heiau may be delayed beyond the completion of the HLID. In that likelihood, a separate effort to mitigate and interpret Kukui o Kāne Heiau will be undertaken.
- Access to the site is currently blocked by H-3 and Likelike Highway and site access by cultural practitioners needs to be resolved by the HDOT and adjoining land owners.
- The genealogical caretakers of the heiau need to be consulted before the final plan is implemented.

## 6

## HA'IKŪ VALLEY

## 6.1 DEVELOPMENT THEME: "HAWAIIAN CULTURAL PRESERVE"

Ha'ikū Valley serves current and future generations by preserving the history and heritage of native Hawaiians through its collection of literature, artifacts, and cultural practices. The vision for the Valley is to transform it into a gathering place for knowledge, learning, conservation (of artifacts, etc.); and a place where there is an opportunity to teach culture. Practitioners, students and visitors are immersed into an environment that has been transformed over the years into an example of an "impact zone" that is trying to heal itself through the efforts of volunteers working on restoration projects that will transform the ecology and preserve links to the past. Ha'ikū serves as a place for renewal of the spirit and re-connection with the 'āina. Conservation projects to preserve former agricultural features and places of honor and worship continue through the efforts of volunteers under the guidance of knowledgeable kupuna and professionals.

## 6.2 OBJECTIVES

The objectives of the mitigation program are:

1. "Healing of the 'Āina" - Implement actions to a) stabilize historic and cultural sites; b) implement preservation and restoration plans (such as placing "kapu" signs and fences) to protect existing resources; c) communicate the significance of the cultural landscape and features through an interpretive program; and d) healing of the people.
2. Sustainability - Establish sustainable practices within the valley that demonstrates how the host culture cared for the land.
3. Access - Develop facilities and implement programs that provide access into the valleys for individuals' and groups' pursuit of knowledge and traditional cultural practices.
4. Natural/Ecological Resources - Implement actions that promote ecological balance of the environment and perpetuate both the knowledge and practice of Native Hawaiian culture.
5. Educational and Cultural Programs - Develop educational and cultural programs, materials, and facilities to interpret the historic, educational, and cultural resources of the project area to a wider audience by reconnecting them to the 'āina. Renovate the Omega Station as a museum for teaching culture, and storage of artifacts found along the H-3 corridor. Support the development of charter school(s).
6. Recreational Programs - Identify and develop culturally sensitive outdoor recreational pursuits which promote sharing the 'āina and complements Hawaiian history, culture and the traditions of these lands. Separate the "Ha'ikū stairs" activity from cultural activities.
7. Monitoring Program - Establish an on-going monitoring program to study the impacts

of the freeway and compliance with regulatory requirements.

### 6.3 SITE ASSESSMENT

#### 6.3.1 CURRENT SITE DESCRIPTION

The ahupua'a of He'eia is one of eleven (11) traditional land subdivisions within the Ko'olaupoko District on the windward side of O'ahu. The ahupua'a includes the lands from Ha'ikū and 'Ioleka'a to Kāne'ohe Bay (see Figure 6-1). He'eia also includes a portion of Mōkapu peninsula, the "sacred land of Kamehameha" (Pukui, Elbert and Mookini, 1974). The ahupua'a is bounded by Kāne'ohe and Kahalu'u.



Figure 6-1 Ha'ikū Valley

#### 6.3.2 SIGNIFICANT SITES AND EVALUATION

At the conclusion of the archaeological inventory survey conducted by the Bishop Museum they evaluated the historic significance of their findings as shown in Table 6-1. The location of the archaeological sites is shown in Figure 6-2. In addition to evaluating each site in accordance with the National Historic Register of Historic Places Criteria, the status of each site and its proposed mitigation is identified.

In addition to the evaluation by the Bishop Museum, the Coast Guard's evaluation of the Omega Station as a site eligible for placement on the National Register of Historic Places was

conducted. The conclusion of this evaluation was stated earlier as "the individual structures on the site are not as significant individually as they are as a site."

Table 6-1. Significance Assessment of Sites in Ha'ikū Valley (Williams and Nees, 2002)

Site No.*	Site	NHRP** Criteria	Status	Mitigation Action Taken or Pending
331	Kaulehu Cave	b, d	Intact	Preservation (plan pending)
332	Kahekili Heiau	a, d	Location only	Preservation (plan pending)
333	Kane Ane Kānaloa	a, d	Undetermined	No mitigation to occur
1904	wall	d	Portion remains	No mitigation to occur
2041	terraces; <i>imu</i>	a, d	Intact (outside project area)	Preservation (plan pending)
2042	pondfield system	a, c, d	Portion remains (outside project area)	Data Recovery completed; Preservation of intact portion (plan pending)
2078	terraces; <i>imu</i>	a, d	Intact	Preservation (plan pending)
2079	platform	a?, d	Portion remains	No mitigation to occur
2080	rock mound	a?, d	Destroyed	No mitigation to occur
2081	<i>imu</i>	d	Destroyed	No mitigation to occur
2082	<i>imu</i>	d	Destroyed	No mitigation to occur
2083	pondfields	d	Intact (outside project area)	Preservation (plan pending)
2323	<i>imu</i>	d	Destroyed	Monitoring completed
2324	firepit	d	Destroyed	Monitoring completed
4506	transmitter	a, d	Not affected	No mitigation to occur
4507	substation	a, d	Not affected	No mitigation to occur
4508	substation	a, d	Not affected	No mitigation to occur
4509	retaining wall	a, d	Not affected	No mitigation to occur

\*State Site Number preceded by "50-80-10-".

\*\* National Register of Historic Places Criteria:

a: association with events or broad patterns important to the history of an area.

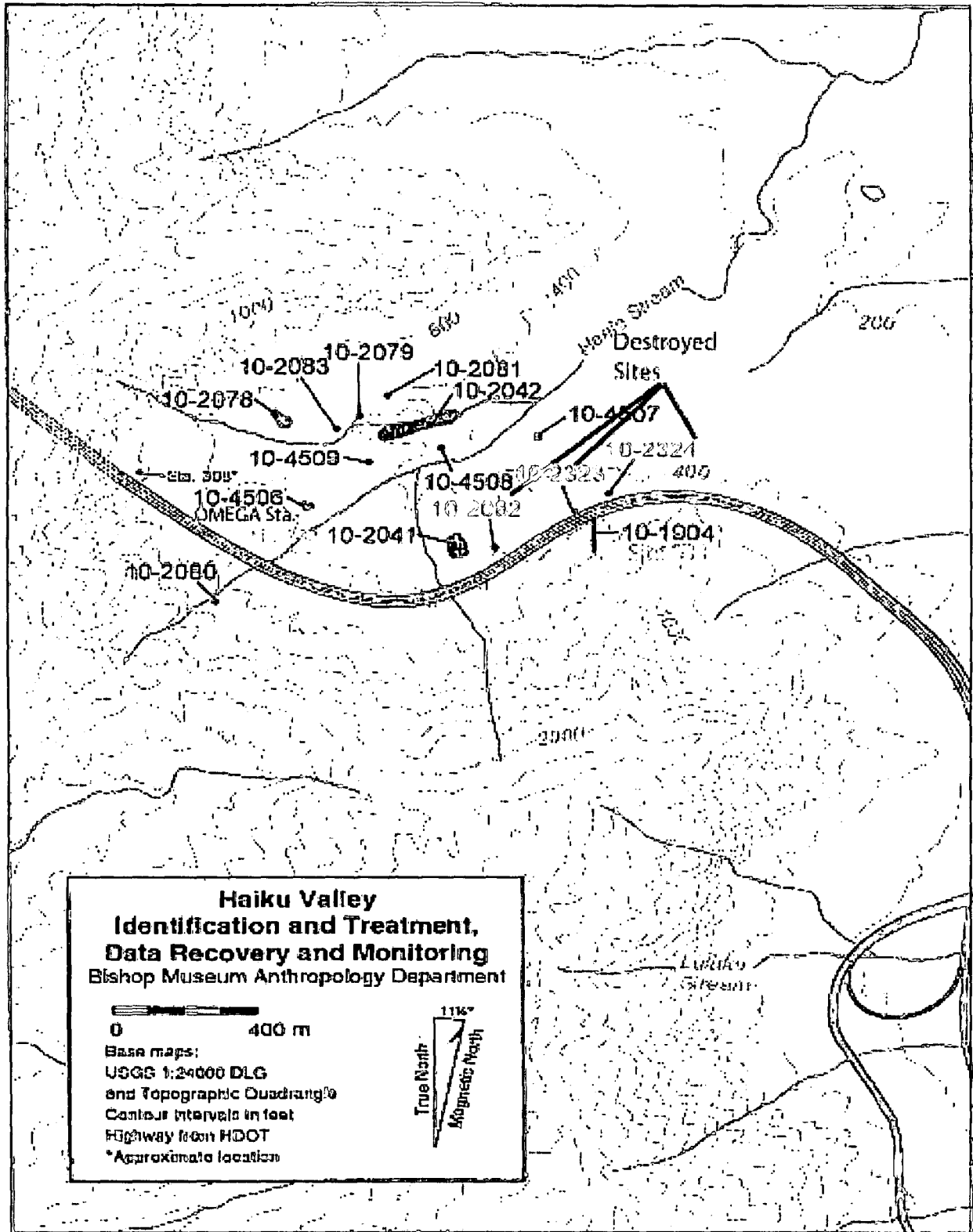
b: association with persons important to the history of an area.

c: reflect architectural achievements.

d: yield or have the potential to yield data important to history.



Figure 6-2. Archaeological Sites (Bishop Museum, 2002)



### 6.3.3 IMPACTS ON HA'IKŪ VALLEY

The cultural landscape of Ha'ikū Valley was impacted by the development of the Interstate H-3 in several ways that include:

- Destruction of cultural sites;
- Removal of artifacts from the Valley;
- Loss of access to cultural sites;
- Impacts to unmarked burials;
- Introduction of non-native plant species;
- Impacts to flora and fauna;
- Visual impacts on the environment (trash, night lights, noise);
- Changes to the landform;
- Reduction of access into the valley; and
- Impacts on dike water.

### 6.4 IMPACT MITIGATION

Mitigation elements are implementing actions identified by the WG and the public to mitigate the impacts associated with the development of the Interstate H-3. These mitigation elements (see Table 6-2) are desired facilities and programs to mitigate the impacts of the highway construction. The mitigation elements listed below in Table 6-2 are for long-term implementation because the mitigation actions are beyond the scope of this IDP and this H-3 mitigation program. Implementation of these mitigation elements will require formation of an operating and programming body, i.e., a not-for-profit organization, who partners with agencies, organizations and individuals to obtain funding for the projects listed below.

The mitigation elements have been sorted using three different parameters:

- A. By impact (column 1);
- B. By project type – access or capital project (column 4); and
- C. By sequence or ranking (column 5). The ME number is a discrete number used to identify the mitigation action.

Table 6-2. Impacts and Proposed Mitigation-Program Elements for Ha'ikū Valley

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type *	Rank
Reduction of access into the valley	9	(Purchase or) partner with DHHL and City to keep Ha'ikū Valley as a cultural preserve.	C	1
Removal of artifacts from the Valley (currently held at Bishop Museum)		Renovate the Omega Station (1 <sup>st</sup> floor) for the curation of artifacts and other materials collected during the archaeological inventory surveys conducted for the H-3 corridor. Allocate approximately 3,000 s.f. for storage, the remainder for educational display.	C	2
Reduction of access into the valley	9	(Purchase or) partner with Kamehameha Schools to develop an access road into the Valley from Ha'ikū Road to keep Ha'ikū Valley as a cultural preserve. The road to avoid having public access through the neighborhood.	C	2
Destruction of cultural and worship sites	12	Identify location for burials of iwi within and adjacent to the project area. Identify sites and provide for restoration and protection of the sites, burials grounds within these areas. Establish burial area for iwi from the Ko'olaupoko area.	C	10
Closing of the OMEGA Station and Ha'ikū Stairs	18	Manage access into the valley to minimize disturbance to surrounding communities. Work with City and County and Kamehameha Schools to restore Ha'ikū Road.	A	2
Operations and Management	5	Provide access to cultural sites, must implement/enforce visitation to these areas - issue of legal access to sites.	A	5
Reduction of access into the valley	2	Valley Access Drive along the loop road. Develop access agreement with City; walking-hiking (no private vehicles beyond education center); Service vehicles; bicycles (on paved roads).	A	6
Destruction of cultural and worship sites	8	Control access into the valley with guard station at entry (main gate).	C	1
Reduction of access into the valley	5	Re-establish utilities (water, sewer and power).	C	2
Closing of the OMEGA Station and Ha'ikū Stairs	7	Develop caretaker's hale (quarters) or use existing building(?) for caretaker in Ha'ikū.	C	3
Closing of the OMEGA Station and Ha'ikū Stairs	13	Development restoration program for native vegetation.	C	4
Impact to flora and fauna and introduction of non-native plant species	16	Identify planting areas for hula hālau "greeneries" and the kahuna lapa'au.	C	4

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type *	Rank
Impact on dike water	25	Restore stream (environment, water flow, vegetation).	C	4
Impact to flora and fauna and introduction of non-native plant species	10	Cultural and education center at OMEGA Station; Office (2) and counter spaces; Parking (30 spaces); Meeting room = 25 persons); Restrooms; Kitchen for the use of education staff, caretakers quarters upstairs; and interpretation and preservation of artifacts.	C	5
Destruction of cultural and worship sites	22	Construct hula mound just makai of OMEGA station in Ha'ikū.	C	5
Closing of the OMEGA Station and Ha'ikū Stairs	20	Develop office space for users (OHA, DHHL) in Ha'ikū at either the Omega Station or USDA site.	C	9
Closing of the OMEGA Station and Ha'ikū Stairs	19	Establish classrooms (hālau, schools) in the Quarantine Station buildings in Ha'ikū.	C	10
Closing of the OMEGA Station and Ha'ikū Stairs	6	Construct parking for visitors in Ha'ikū at Quarantine Station and Omega building.	C	10
Impact to flora and fauna and introduction of non-native plant species	14	Renovate maintenance building for use by kahuna la'au lapa'au.	C	10
Impact to flora and fauna and introduction of non-native plant species	15	Utilization of maintenance building as storage area for nursery.	C	11
Visual impact on the environment (trash, night lights, noise)	23	Convert highway lighting to low height strip lighting (similar to airport onramp lighting) in Ha'ikū.	C	13
Operations and Management	9	Monitoring activities in the valley to determine Limits of Acceptable Change.	L	4
Operations and Management	10	Identify carrying capacity for further or existing activity to maintain cultural and ecological integrity.	L	4
Operations and Management	7	Repatriate USMCBH to mainland, Pearl Harbor too, remove freeway as no longer needed.	L	6
Destruction of cultural and worship sites	21	Nominate Ha'ikū Valley and Omega Station to the National and State Registers of Historic Places.	L	11
Visual impact on the environment (trash, night lights, noise)	24	Redirect Kāne'ohē Marine Corps Air Station aircraft flight pattern flying over Kāne'ohē is very noisy, effect of vibration?	L	13

IMPACT	ME No.	MITIGATION-PROGRAM ELEMENTS	Project Type *	Rank
Operations and Management	1	Form a Ha'ikū NPO.	O	1
Operations and Management	2	Develop a management and security plan.	O	1
Operations and Management	4	Involve the ARCH (Ahupua'a Restoration Council of He'eia) in plan (recognize their status in some way).	O	2
Operations and Management	3	Ensure Ongoing maintenance: issues and costs that would normally be funded by HDOT operating funds need to be identified so we don't inadvertently spend our funds on projects that HDOT would be obligated anyway. Ongoing trash issues, invasive species control.	P	2
Operations and Management	8	Identify buffer zones for cultural and educational areas and provide for site protection. Protect and preserve sites through less disruption to the sites is better then trying to guess and ultimately harming the integrity. Protect sites from exploitation.	P	3
Destruction of cultural and worship sites	1	Identify sites to be interpreted and prepare plan (phase 1); implement plan (phase 2).	P	5
Operations and Management	6	Does not want area exploited as a tourist site, i.e.. Traffic, roads, overall affect on environment, e.g.. Omega site as museum.	P	6
Destruction of cultural and worship sites	11	Wahi kapu (kapu sites); develop archaeology - preservation program (stabilization, restoration, rehabilitation).	P	8
Impact to flora and fauna and introduction of non-native plant species	17	Develop program for pig hunting that utilizes appropriate protocols.	P	9
Closing of the OMEGA Station and Ha'ikū Stairs	3	Establish a Quarantine Station building as the staging center for visitors to the Ha'ikū Stairs.	P	12
* Project Type Key: (A=Access, C=Capital, L = Long term action; O = Operations and Maintenance, P - Program Action )				

## 6.5 MITIGATION PROPOSAL

Mitigation of the impact of H-3 on the historic and cultural sites in Ha'ikū Valley will necessarily be conducted in increments because of the following:

- Land ownership and control is under the jurisdiction of the Department of Hawaiian Home Lands (DHHL) and the City and County of Honolulu (CCH).
- Access to the site is through a residential neighborhood.

As shown in Table 6-1 several sites were identified by the Bishop Museum and McAllister that are eligible for nomination to the National Register of Historic Places under differing nomination criteria.

Two sites in particular are the focus of this mitigation program and they are:

- Site 332, Kahekili Heiau (located between the former Omega Station maintenance building and the H-3 right-of-way)
- Site 333, Kāne Ame Kanaloa Heiau (located at the edge of the H-3 right-of-way and a portion of Site 1904)

Mitigation actions proposed by the WG for Ha'ikū Valley is limited to sites directly impacted by the construction of Interstate H-3. For Sites 332 and 333 the following actions are proposed:

- A. Conduct an Archaeological Inventory Survey (determine the site limits, identify features, determine significance, etc.);
- B. Prepare an Interim Site Preservation Plan;
- C. Prepare a Cultural Impact Assessment Report;
- D. Implement the site preservation recommendations (site stabilization, site protection by fencing, and vegetation removal to protect site);
- E. Prepare a site preservation plan (to include site stabilization and restoration, as required); and
- F. Implement the recommendation of the Preservation Plan.

The second set of mitigation actions proposed is the establishment of a site in Ha'ikū Valley for the storage and curation of artifacts and material collected during the archaeological inventory survey conducted by Bishop Museum. The collected material is currently being stored at the Bishop Museum which the WG feels is not *pono*. The WG believes that the collected material should be returned from where they originated. Material accumulated also has important research value that can provide information about the site it was collected from as well as provide information on about people and the culture. For the WG, the obvious site for the storage of the material collected is the Omega Station. The Omega Station has 14,472 s.f. feet of interior space, 7,236 s.f. on each floor. The Omega station, because of its size, provides the opportunity to store as well as display the findings. In addition, the space can be utilized as an educational venue.

Mitigation action proposed include: (in order or priority)

- Secure Omega Station from vandalism. Secure ground level doors and entry points and 2nd level entry doors by installing sturdy locks, gates or both
- Clear debris from interior and exterior of Omega Station. Remove broken or damaged material
- Re-establish power and water to Omega Station to make it usable. As an alternative, consider use of solar power and composting toilets
- Interior renovation of ground floor Omega Station (lighting, windows, doors, flooring, etc.)
- Resurface parking area
- Landscaping of building exterior
- Second floor renovation 7,236 s.f. (prepare vertical access plan)

Part of the mitigation action proposed includes establishing an agreement with the DHHL for access and use agreement via an easement, license, or other such document. The administration and implementation of this program is discussed below.

The project identified above have been determined not to be eligible for mitigation funds as defined in this IDP because the site identified are not within the project limits of the highway. Further, access and landownership of the valley prevent public use of the valley. Specific mitigation actions will need to be coordination with the Department of Hawaiian Home Land.

## 6.6 UNRESOLVED ISSUES

Several issues that remain unresolved at this writing require additional study before implementation of the proposed mitigation actions. They include:

- A. Access into the valley is currently under the jurisdiction of the Department of Hawaiian Home Lands (DHHL). Implementation of the actions proposed will require coordination and partnership with DHHL.
- B. The City and County of Honolulu is currently negotiating the acquisition (land exchange) of a portion of the land for its use, primarily to gain access to the Ha'ikū Stairs. Implementation of proposed actions will require coordination and partnership with the City.
- C. Access from Kahekili Highway to Ha'ikū Valley is currently through a residential subdivision. The Ha'ikū Road access requires coordination and implementation by the City and County of Honolulu and the Kamehameha Schools.
- D. OHA is considering a proposal for the acquisition of Ha'ikū Valley.

## 7

**GENERAL MITIGATION GUIDANCE**

The following program elements were identified by the Working Group as desired program elements applicable to all areas in this Plan. The implementation phase of the program will require the NPOs to address these important issues for implementation or further study. The NPOs will further need to involve agencies, organizations and individuals who will partner with the NPOs. Implementation of these elements is outside of this current IDP and H-3 mitigation program.

Several guiding principles were repeatedly identified by the WG throughout this consultation. These principles should be considered when implementing this Plan. Some of these include:

- Respect and care for kupuna. Special consideration is needed for kupuna. Ease of access into the cultural areas and health needs should be considered in all aspects of planning.
- Aloha 'āina. True demonstrated love for the land is a necessary characteristic of all who will play any significant role in this project. The needs of these lands, which are in great need of healing, come first. Demonstrated aloha 'āina should be a criterion for selection of those who will do project work.
- Respect for kuleana. Respect and support of each other's kuleana is important to meet the objectives of the project. Consideration should be given to those with demonstrated actual experience in the areas of the project, including intimate knowledge of and demonstrated love for the lands in question.
- Safe access. The project should support safe access to all cultural practitioners.
- Involvement of 'ōpio (youth). Hands-on involvement of youth should be an important component of project work and should be encouraged and acknowledged.
- Pono. Everyone involved in the project is expected to be pono. If something is not right there is an obligation to make it right as soon as possible.

The mitigation elements in Table 7-1 provide additional general guidance for all focus areas.



Table 7-1. General Mitigation Guidance Actions

ME #	MITIGATION ELEMENTS	PROPOSED TIME SEQUENCE (1-2-3)
1	Establish precautions to prevent having to mitigate our mitigations, through subversion by Government Agencies/Contractors. Establish criteria and guidelines for the hiring of contractors doing work in the project areas.	1
2	Create a non-profit organization for the overall management of the project and ongoing management.	1
3	Establish Management, Business, and Access Plans of area for sustainability and for accountability/governance.	1
4	Formulate a program to discuss principals of Cultural Preserve/ ongoing management of project, contractor/subcontractor, funding issues, non-profit organization formation, etc. presented and interpreted by legal experts.	1
5	If the HLID website is kept, revise current HLID website with additional information regarding the development of H-3 and the history of the lands affected.	1
6	Formulate ongoing program on the NHPA Section 106 process to coincide with ongoing legal analysis needs for the WG's use in order that they fully understanding their rights under this law and State and Federal agencies obligations under this process.	1
7	Conduct study of legal analysis of practitioner's rights under State and Federal Law to be done for WG's assistance in setting policy.	1
8	Access to sites must be secured and to implement/enforce visitation rights to these areas - issue of legal access to sites.	1
9	Acquire or develop base maps (overview of Hālawā and Ko'olaupoko corridor) and detailed area maps from Hālawā to Mōkapu; existing and proposed, culturally-appropriate trail maps, and traditional/cultural maps of the impact areas.	1-2
10	Prepare/compile a book or similar publication - content including but not limited to - outline envisioned originally by Mahealani Cypher. Prepare a publication(s) on the truths of H-3 from the beginning until present. Allocate \$300,000 to carry-out this work. Compile and assemble from existing sources, photos, videos, written documents and individual oral histories related to the history of H-3 and document the "struggle" of those who opposed the construction of the highway.	2-3
11	Prepare video to depict the history of H-3, including the story of the WG and this project. Allocate funds (\$4,000) for project documentation (video cameras, digital cameras and computers).	2-3

ME #	MITIGATION ELEMENTS	PROPOSED TIME SEQUENCE (1-2-3)
12	Cultural input from kanaka maoli providing cultural, spiritual, historical data and evidence and kanaka maoli perspective. Assemble / compile collection of knowledge / maps about these lands.	2-3
13	Formulate a program to address liability Issues: Management of project, individuals, WG, contractors, access, land owners, condemnation, etc. needs to be addressed by legal person.	2
14	Identify carrying capacity for further or existing activity to maintain cultural and ecological integrity.	2-3
15	Return artifacts to areas they were taken from utilizing NAGPRA and NHPA laws. Conduct study of NAGPRA to understand legal issues to assist in the return of artifacts from Bishop Museum to the Valleys.	2-3
16	Focus on programs for the education, perpetuation and preservation of the Native Hawaiian culture and its cultural/sacred resources, and education, perpetuation, preservation, protection and rehabilitation of the natural resources of the areas affected.	2-3
17	Establish a cultural preserve for the land impacted by H-3.	2-3
18	Collect all known testimonies from the numerous public hearings surrounding H-3 for a permanent record of the people's objection to this project. Assemble / compile collection of knowledge/maps about these lands.	1-2-3
19	Keep area clear of visual distraction (i.e. limit new construction heights).	1-2-3

Notes – Proposed Time Sequence: 1 = Implementation in the first 3-years; 2 = Implementation within 5 years; 3 = implementation beyond 5 years.

## 8

### IMPLEMENTATION PLAN

#### 8.1 IMPLEMENTATION OVERVIEW

This IDP was reviewed and approved by the signatories of the MOA that include: OHA, HDOT, SHPD and FHWA.

Approval of the IDP occurred in a three-step process that included the following actions:

1. Approval by the HLID Working Group of the actions proposed. WG approval occurred through agreement in the WG meetings. Recommendations made in this report include the results of a collaborative discussion of the WG and the project planning consultant, R.M. Towill Corporation, and approval of the mitigation discussed by the WG. The WG approved document is called the Preliminary IDP. The Preliminary IDP was presented to the public at meetings to inform them of the project and obtain their feedback. Public feedback was reconciled before the Preliminary IDP was sent for agency approval.
2. Approval by signatories of the recommendations of the WG. Once the Preliminary IDP was finalized, it was be sent concurrently to OHA, SHPD, HDOT, and FHWA for their review and comments. Agency comments were sent to HDOT for review and approval.
3. Approval by HDOT. HDOT approval of the Preliminary IDP resulted in the Final IDP, which was sent to FHWA for their concurrence. FHWA concurrence is the final approval, and their approval shall signify closure of the IDP planning phase.

#### 8.2 OPERATIONS AND MANAGEMENT

##### 8.2.1 ADMINISTRATIVE AUTHORITY

Administrative authority for the mitigation program rests with the following organizations:

- Federal Highway Administration (FHWA),
- State Department of Transportation (HDOT), and
- Office of Hawaiian Affairs (OHA).

Overall responsibility for the mitigation program is the responsibility of the FHWA and the HDOT. HDOT has overall legal responsibility for the lands within the Interstate H-3 right-of-way. With this responsibility, HDOT is also responsible for activities and public access into the project areas. This latter responsibility is recommended for transfer to OHA who will be assigned the responsibility of overall "Program Manager." As Program Manager, OHA shall select an organization or organizations to manage the day-to-day activities within the project areas as described in previous section. OHA shall also have general oversight over all facilities in the project areas, and responsibility for administering the capital funds for the project.

### Advisory Group

OHA shall organize an Advisory Group (AG) to advise it on the progress and operations of the project NPOs. The AG shall serve at the will of OHA and will be on call. The OHA representative shall serve as the Chair of the AG. The membership of the AG may include:

- OHA representative (1)
- DLNR-SHPD representative (1)
- HDOT representative (1)
- NPO representatives (4)
- Cultural practitioners (2)

The responsibilities of the AG are as follows:

- Review and comment on program recommendations
- Provide input into funding requests
- Provide general oversight
- Recommend changes and corrective actions to OHA
- Recommend new programs
- Assist in seeking additional human or financial resources

### **8.2.2 OPERATIONS AND MAINTENANCE**

The implementation phase of the program will require the formation of an operating and programming body, such as a nonprofit organization (NPO), organized for each program area. The NPOs will conduct the day-to-day business of implementing the IDP with participation by agencies, organizations and individuals who will be asked to partner with the governing entity. Criteria for selecting an organization to implement the mitigation program for the project areas shall include, but not be limited to:

- Demonstrated experience in the implementation of cultural programs,
- Demonstrated actual experience in the areas of the project, including intimate knowledge of and demonstrated love for the lands in question,
- Demonstrated leadership and management experience of the organization team,
- Familiarity with the central community of cultural practitioners in each respective area, and ability to work in a respectful, empowering, culturally appropriate manner with all bonafide cultural practitioners and affected families,
- Ability and willingness to fairly balance the diverse needs of kupuna, keiki, ōpio, educators, disabled persons and the general public,
- Demonstrated fiscal management experience,
- Does not have any delinquent State accounts,
- Organization has the ability to fund a comprehensive insurance program,
- Organization's charter is complementary to the mitigation program objectives,

- Organization has a comprehensive 5-10 year program vision that implements the vision, goals and objectives of the IDP, and
- Organization has a comprehensive 3-5 year business plan that implements the program envisioned.

The new NPOs will share responsibility for implementing and sustaining the elements recommended in this IDP. It is important that these new entities have a strong understanding of appropriate cultural protocols, a direct relationship to the land they steward, and a passion for the preservation, cultural, and/or historical perspectives stated in this IDP. Further, the stewards should be bonafide, successful nonprofit organizations or governmental agencies that qualify to be stewards of the interpretations/program elements from this IDP.

Transition from planning to design to implementation to sustenance requires a management and business plan which has a five- and ten-year vision, and which addresses how and when the themes, goals and objectives of this IDP will be implemented. The management plan will be prepared during the design phase of project implementation. HDOT and/or OHA should provide scrutiny to insure the management and business plans are realistic and have critical benchmarks.

Management plans should address preservation actions and management actions needed to meet the stewardship responsibility of the entity. Business plans should address forward-looking planning that discusses revenue generation, anticipated costs, partnerships and sustenance.

The NPOs will be responsible for the following: (provided as guidance)

- 1) Project Management
  - Daily administrative and fiscal management
  - Collection of fees and payment of accounts due
  - Scheduling of activities
  - Facility maintenance and repair
  - Revenue generation for the mitigation programs and facilities
- 2) Program Management
  - Maintenance of interpretive devices and materials
  - Provide for the curation of artifacts
  - Conduct education program for the public
  - Provide for the restoration of cultural sites and features
  - Provide for the maintenance and restoration of native plant species
  - Conduct research, as required, to understand cultural sites
  - Document findings and activities carried out in the valley

### 8.2.3 OPERATIONS AND PROGRAM FUNDING

Operations and maintenance functions shall be the responsibility of the NPOs and the Program Manager and is beyond the scope of this IDP.

### 8.2.4 VISITOR ACCESS

Access control will be maintained by the NPOs for each of the project areas. The NPOs shall be responsible for access into the project areas and shall consult with HDOT and OHA.

## 8.3 IMPLEMENTATION

Table 8-1 summarizes the project costs for each project area by phases. The four phases will be programmed as part of the Statewide Transportation Improvement Program (STIP). Each program year begins in October corresponding to the Federal fiscal year. The first program year for the STIP is 2009 (FY 2009). The second program year is projected for FY 2010, followed by year three and four at FY 2011 and 2012, respectively. Limitation on funding will be determined annually by availability of funds for that particular fiscal year, project need, and the overall priority assigned to the project.

### 8.3.1 NORTH HĀLAWA VALLEY FUNDING AND IMPLEMENTATION – PHASE 1

Table 8-1 lists the development phases anticipated for Hālawā Valley. A total of \$3.71 million is projected and is allocated as follows:

Construction	\$2.58 million
Design @10%	\$0.26 million
Construction Mgmt @15%	\$0.39 million
Contingency @ 15%	\$0.48 million

### 8.3.2 LULUKU AGRICULTURAL TERRACES FUNDING AND IMPLEMENTATION – PHASE 1

Table 8-1 lists the development phases anticipated for the Lulukū Agricultural Terraces. A total of \$6.12 million is projected and is allocated as follows:

Construction	\$4.26 million
Design @10%	\$0.43 million
Construction Mgmt @15%	\$0.64 million
Contingency @15%	\$0.80 million

Table 8-1. Summary of Project Costs by Project Phases

	Project Phase				
	Phase 1	Phase 2	Phase 3	Phase 4	Total
<b>Halawa Valley</b>					
Construction	\$2,584,600	\$1,679,900	\$1,666,000	\$1,671,000	\$7,601,500
Design @ 10% of Construction	\$258,460	\$167,990	\$166,600	\$167,100	\$760,150
Construction Management 15%	\$387,690	\$251,985	\$249,900	\$250,650	\$1,140,225
Subtotal	\$3,230,750	\$2,099,875	\$2,082,500	\$2,088,750	\$9,501,875
Contingency @ 15%	\$484,613	\$314,981	\$312,375	\$313,313	\$1,425,281
<b>TOTAL</b>	<b>\$3,715,363</b>	<b>\$2,414,856</b>	<b>\$2,394,875</b>	<b>\$2,402,063</b>	<b>\$10,927,156</b>
<b>Luluku Agricultural Terraces</b>					
Construction	\$4,255,000	\$2,175,000	\$2,761,000	\$1,550,000	\$10,741,000
Design @ 10% of Construction	\$425,500	\$217,500	\$276,100	\$155,000	\$1,074,100
Construction Management 15%	\$638,250	\$326,250	\$414,150	\$232,500	\$1,611,150
Subtotal	\$5,318,750	\$2,718,750	\$3,451,250	\$1,937,500	\$13,426,250
Contingency @ 15%	\$797,813	\$407,813	\$517,688	\$290,625	\$2,013,938
<b>TOTAL</b>	<b>\$6,116,563</b>	<b>\$3,126,563</b>	<b>\$3,968,938</b>	<b>\$2,228,125</b>	<b>\$15,440,188</b>
<b>SUMMARY</b>					
A. Construction	\$6,839,600	\$3,854,900	\$4,427,000	\$3,221,000	\$18,342,500
B. Design	\$683,960	\$385,490	\$442,700	\$322,100	\$1,834,250
C. Inspection	\$1,025,940	\$578,235	\$664,050	\$483,150	\$2,751,375
Subtotal	\$8,549,500	\$4,818,625	\$5,533,750	\$4,026,250	\$22,928,125
D. Contingency	\$1,282,425	\$722,794	\$830,063	\$603,938	\$3,439,219
<b>TOTAL</b>	<b>\$9,831,925</b>	<b>\$5,541,419</b>	<b>\$6,363,813</b>	<b>\$4,630,188</b>	<b>\$26,367,344</b>

## APPENDIX

- A. Memorandum of Agreement
- B. Public Comments Received
- C. References
- D. Expenditure Summary – Phasing Plan by Focus Areas
- E. Minutes of the Board of Trustee, Office of Hawaiian Affairs, April 3, 2008
- F. Glossary of Acronyms, Definitions, and Place Names



APPENDIX A  
Memorandum of Agreement

## MEMORANDUM OF AGREEMENT

WHEREAS, the Federal Highway Administration, Hawaii Division (FHWA) has determined that construction of the proposed Interstate Route H-3, Halawa to Halekou Interchange, and the Kaneohe Loop Interchange, will have an adverse effect upon the Luluku Discontiguous Archaeological District, which has been determined eligible for inclusion on the National Register of Historic Places, and upon any as yet unidentified historic properties within inaccessible, unsurveyed portions of the corridor which may also be likely to be eligible, and has consulted with the Hawaii State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, officials of the State of Hawaii Department of Transportation (Hawaii DOT) and of the Office of Hawaiian Affairs (OHA) participated in the consultation and have been invited to concur in this Memorandum of Agreement (Agreement);

NOW, THEREFORE, the FHWA, the SHPO and the Council agree that the undertaking shall be implemented in accordance with the following stipulations to take into account the effect of the undertaking on the historic properties.

STIPULATIONS

FHWA shall ensure that the following measures are carried out in consultation with the Hawaii DOT, SHPO, OHA and the Council:

- A. Archaeological resource impact mitigations will be implemented in portions of properties within the Luluku Discontiguous Archaeological District that will be affected by highway construction, according to the two-part Mitigation Plan found in Attachment A.
  1. The Data Recovery Plan shall provide for data recovery from sites and/or features directly affected by highway construction to recover significant information from these sites and/or features prior to destruction. Archaeological excavations shall be designed to retrieve information from sites and/o. features to address research questions, which are specified in Attachment A, and provide a basis for future site interpretation.
  2. The Preservation Plan shall specify sites and features proposed for active and passive preservation.

- 2 -

- B. An Interpretive Development Plan will be completed by the Hawaii DOT in consultation with the FHWA, SHPO and OHA, and shall address interpretive development of sites which will be selected after completion of the measures set forth in the Data Recovery Plan.
1. The Interpretive Development Plan shall address provisions for acquisition of access, on-site interpretation, maintenance, appropriate treatment of structural components, acquisition of water rights, financial responsibility and interpretive concerns.
  2. This plan shall be completed within 2 years after the completion of archaeological field work for use thereafter by the Federal, State, or City government which is authorized by law to carry out the activities described in the plan.
  3. Copies of the completed plan will be provided to the Hawaii Department of Land and Natural Resources, the City and County of Honolulu Department of Parks and Recreation, the Pacific Area Office of the National Park Service, and others identified during the development of the plan.
- C. Identification and treatment of historic properties, which may be found in presently unsurveyed portions of the H-3 road corridor, will proceed according to the attached Identification & Treatment Plan (Attachment B).
- D. Through pre-construction meetings and scheduled project personnel meetings, the FHWA and Hawaii DOT shall ensure that State project personnel and the contractors' workforce are sensitive to the cultural and research significance of archaeological properties associated with the H-3 project and are aware of the existence of Federal and State antiquity statutes, to help minimize the possibility of vandalism, inadvertent damage or theft of such properties.
- E. To ensure adequate archaeological monitoring of construction work, the Hawaii DOT shall incorporate Section 107.17(D), Archaeological and Paleontological Findings, State standardized special provisions, in all H-3 construction contracts (Attachment C).
- F. To prepare for the possibility that Native Hawaiian human burials and/or associated funerary objects are uncovered during archaeological or construction work which will require removal and reinternment, OHA shall prepare a Burial Treatment Plan acceptable to FHWA, Hawaii DOT, and the SHPO.

1. OHA agrees to complete this plan within 3 months after Council acceptance of this Agreement.
  2. Should such a plan not be submitted by OHA within the agreed upon time frame, the FHWA may develop and implement a plan in consultation with the SHPO.
  3. The plan shall be the result of a good faith effort to obtain the views of interested persons evincing cultural and traditional ties to the features or to the land in which the features are located. The plan shall provide methods for appropriate treatment of the human remains and associated funerary objects.
  4. All costs for the development of the Burial Treatment Plan will be borne by OHA, and as appropriate, the Hawaii DOT. All costs for the implementation of the plan will be borne by the FHWA and the Hawaii DOT.
- G. All archaeological work performed under this Agreement shall be directed by a professional archaeologist who meets the minimum qualifications set forth in the Department of the Interior's "Professional Qualifications" guide. (See Appendix C of Draft 36 CFR 66, at 42 FR 5382, 1/28/77.)
- H. All final archaeological reports resulting from actions pursuant to this Agreement shall be provided to the signatories to this Agreement and to the National Park Service for possible review in professional journals and possible submission to the National Technical Information Service. All such reports shall be responsive to contemporary professional standards identified in the Council's current Manual of Mitigation Measures and the Department of the Interior's "Format Standards for Final Reports of Data Recovery Programs." Precise locational data may be provided in a separate appendix if it appears that release of such information could jeopardize the integrity of archaeological sites.
- I. The SHPO shall designate an appropriate institution for the proper curation of all recovered materials, field notes and records which result from the actions covered by this Agreement; however, the treatment of uncovered Native Hawaiian burials and/or associated funerary objects will be in accordance with the Burial Treatment Plan provided in Stipulation F.

#### J. Dispute Resolution

1. At any time during the implementation of the measures stipulated in this Agreement, should an objection be raised by a local government or a member of the public, FHWA shall consult with the objecting party, the SHPO, and, as needed, with the Council to resolve the objection. A record of the objection and FHWA's actions to resolve the objection shall be retained by the FHWA as part of the project files.
2. Should an objection be raised by a signatory to this Agreement (ACHP, the SHPO, Hawaii DOT or OHA) regarding the implementation of the measures stipulated in this Agreement, FHWA shall consult with the objecting party to resolve the objection. A record of the objection and FHWA's actions to resolve the objection shall be retained by the FHWA as part of the project files. If FHWA determines that the objection cannot be resolved, it shall nevertheless seek the recommendations of the objecting party, document its consideration of the objecting party's recommendations in the project files and inform the objecting party and the ACHP of that consideration.

#### K. Agreement Amendment

Should FHWA, the SHPO or the Council determine that the terms of this Agreement cannot be met, that party will immediately notify the other consulting parties and request consultation to amend this Agreement in accordance with 36 CFR 800.5(e)(5).

Execution of this Memorandum of Agreement evidences that FHWA has afforded the Council an opportunity to comment on the undertaking and its effects on historic properties, and that FHWA has taken into account the effects of its undertaking on historic properties.

Federal Highway Administration, Hawaii Division

By: *William R. Lake* 7/21/87  
William R. Lake, Division Administrator (date)

Hawaii State Historic Preservation Officer

By: *William W. Paty* JUL 22 1987  
William W. Paty (date)

Advisory Council on Historic Preservation

By: *[Signature]* 12 August 87  
(date)

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CONCURRING PARTIES:

Office of Hawaiian Affairs

By: *Moses K. Keale, Sr.* 7/29/87  
Moses K. Keale, Sr., Chairman (date)  
Board of Trustees

Hawaii State Department of Transportation

By: *[Signature]* 7/28/87  
Edward Y. Hirata, Director (date)

APPENDIX B  
Public Comments Received

**VERBATIM TRANSCRIPT  
OF SPEAKERS' COMMENTS  
Public Informational Meeting on  
HLID Interpretive Development Plan (IDP)**

**DATE** Wednesday, January 23, 2008  
**TIME** 6:00 PM  
**LOCATION** `Āliamanu Middle School Cafeteria

**Richard Paglinawan:** Thank you. My name is Richard Kekumuikawaiokeola Paglinawan, and I'm here as a consultant from the Queen Emma Land Company, formerly known as the Queen Emma Foundation. We've met with OHA and with DOT officials several times and we had expressed concerns. Our portion that is impacted, the land, is at North Hālawā; the entryway into the Valley is over Queen Emma land.

One of the concerns expressed at that time, and it's still valid, is in terms of accessibility. That issue needs to be addressed because there is a liability issue that goes with that accessibility. There's only a small portion, but you need to understand there is a current operation of a quarry. It's a very active business that is going on. Huge cement trucks come through that area and it poses some serious problems.

Secondly, the lessee, the quarry people have experienced vandalism, stealing of tools, breaking in, and equipment loss. The other thing which is very important and most people may not be aware of, but they're actively dynamiting that hillside all week; so if anybody strays off the road and goes up mauka, then they may endanger themselves. There is also storage of dynamite on the site for the quarry operation. Also there was possible talk of use of the mauka trail that goes up. That trail goes through the area that they've dynamited, and that road changes depending on where they dynamite, and so sometime it poses problems and yet some people want to go up there. These are the kinds of concerns the Queen Emma [Land Company] has.

What I've heard in terms of what is being proposed is wonderful and I would also like to say not only aloha but mālama, because mālama means active, doing something. Aloha you just talk, I love the land, but you gotta put your action where your mouth is. I think that's what I hear people talking about, addressing the issues from different parts of the island in terms of Ko'olauloa and the Leeward area. So I would like to specifically raise that issue again, and the planners need to address that because we haven't heard from them but we understand because it's the plan phase. Until something concrete comes up, then we'll be able to really get down to business on that, [but] these are the kinds of issues that we'd like the planning effort to address. Thank you.

**Dante Carpenter:** Aloha ahihi `oukou. I want to introduce myself as Dante Ke`ala Carpenter, a resident of the Salt Lake area. I also see another very strong resident, Mr. Howard Shima, who is one of several pillars of the Salt Lake and Moanalua community. Having served on the local county boards for so many years, of the many good things that happen here, Howard's been one of the significant champions for these efforts and I appreciate that very much as one of the members of this community.



I've lived here about a dozen or more years now. I live in one of the condominiums here. Since 1996, I have been the president of Country Club Village Phase 2, comprised of two high-rise buildings, a 469-unit condominium just down the road. I grew up as a kid across the street when Damon Tract was a viable part of the area here. Most of the poor people lived there and you had two destinations: you were either going directly to O'ahu Prison or indirectly to O'ahu Prison. Times were tough, but some of us made it through; in fact, Ben Cayetano lived in Damon Tract at one time and he went on to do some interesting things with his life. So did Sparky Matsunaga, our family's neighbor, as well.

I also had the occasion a few years ago to be a member of the Office of Hawaiian Affairs – initially as administrator, then as trustee – and as one of the trustees I had many occasions to sit in with the Hālawala-Lulukū Interpretive Development group. I was always taken by the fact that the individuals and the collective effort of these individuals – even though they obviously spoke their mana`o very loudly with what I call the three P's: passion, persistence, and perseverance on a continuing basis, and still are. To their credit, tomorrow when I drive over the H-3 freeway on my way to take a look at a project on the Windward side, every time I now pass over the H-3 freeway, I have a much richer and deeper understanding and appreciation for what is now going on as a result of your efforts underneath that freeway. Most people have absolutely no clue about the importance of what has been obliterated and what you're trying to put back together, literally, to cement that which was the history and in fact still is the history of Hawai'i.

I want to – without naming names, but [it's] hard to not appreciate the efforts of the Matthews' – Boot and Sweets – and their continuing endeavors; Wali and Donna Camvel, Vienna, Mahealani Cypher, my wife's cousin Leialoha "Rocky" Kaluhiwa, and a host of other folks who perhaps couldn't make it this evening but wanted to. I guess one of the lasting impressions of the Working Group – on many evenings on their own time, and still basically on their own time without compensation but with just the dedication of their own hearts and families – was and still is their exhibition and passion for ensuring that the culture of Hawaii is preserved and protected. To me, they're lifelong advocates and thank God for that, otherwise we would have no history. I want to thank them very much for their continuing endeavors in that regard. Your ho`omanawanui, the patience that you've exerted over the years, even though you had many disagreements with yourselves as to how Chester, with RM Towill, consultants, should put this bloody plan together. And Chester going, "oh, wow, man" – he's trying to put all the pieces together and take all the different points of view into consideration and come up with some coherent plan – not easy to do. But Chester, your group has worked some minor miracles in this process as well. Kina, I also want to commend you for persevering.

Everybody's exerted a large amount of patience in this entire process. Frankly, I always thought the process was too slow. I think it's still too slow. Witness the fact that 106 allocated something like 11 million dollars to review the mitigation plan which is, as I understand it, now in its third element, having reached the design-development portion in the interpretive development end of it. We started out with eleven million dollars, we have eight million dollars left; so that means there's been the expenditure over an inordinately long time primarily for consulting, to the tune of three million dollars.

When I look at the projected expenditures over the next four elements, it looks like maybe 35 to 40 million dollars are going to be required. I don't know how much you're going to have left from that remaining eight million as we speak. However, my understanding is when we went to the 106 program

discussions, we were given to understand not to worry about the amount of money. The initial set-aside (\$11 million) can be boosted by requesting future federal dollars, so I've always been conscious of that. Certainly the State of Hawai'i as well as private contributors who either own land or possess lots of money as a result of activities on this island should contribute toward the total effort that I think is admirable and has been ongoing all these years (HLID).

Anyway, I want to wish you well. Frankly, I wish the Department of Transportation did a little bit more than just sort of stand by and wait for things to happen. I'm not really too sure where the Federal Highway Administration fits in here. I thought they were a part of the so-called Memorandum of Agreement, the tripartite agreement between Federal Highway DOT, Hawaii DOT, and the Office of Hawaiian Affairs; and yet, I don't really see them in the mix except to say that you couldn't at one point in time do the Ha'ikū Valley plan because it was beyond their APE and rights-of-way as it related to the construction of the freeway. I see that you've persevered and you've now made that point to them that indeed, the whole project was impacted by the acquiescence to that portion of the property.

Whatever I can do to assist, be assured that I'd be very happy to try to assist your cause. I want to again commend each and every one of you for your individual as well as continuing collective efforts towards the culmination of this project which I know is going to be fantastic. Every time I think about it I get chicken skin, so I'm gonna have chicken skin tonight too. Thank you. Please continue the good work and mahalo plenty.

**Leialoha "Rocky" Kaluhiwa:** Aloha ahiahi. I am Leialoha "Rocky" Kaluhiwa, and I am kupa'āina from He'eia. Tonight I have with us two of our kupuna kupa'āina who are also on the Ko'olau Foundation: Caroline Bright who was a civilian worker while they were building the Omega Station. She was one of them that brought the lunches from Mōkapu to Ha'ikū while they were working; she's 82 years young. I also have Aunty Alice Hewett who is the mother of our kahu, Kawaikapuokalani Hewett.

A little background about our family: our family's been there over a hundred years. We are descendants of Koamokumoku o He'eia, she was the high chiefess of He'eia, and Komomua: they ruled most of the ahupua'a of He'eia. All of our lives growing up, Aunty Alice, Carol, all of us, all the time the Coast Guard had the Omega Station, we were always allowed access to the Omega Station. We just had to talk into a little intercom there, and they would let us in to do our cultural gathering. I remember growing up, my father used to tell me about Kaualehu: "don't tell nobody, there's a secret cave, a family cave, our secret's in there, there's a canoe in there." Lo and behold, here came H-3, the whole world knows about the cave and [inaudible] Kawaikapuokalani looking at the mo'o rock and all of these things up there – "no tell nobody." Yeah right, everybody knows now 'cause it's open.

We never knew about this law saying that they had to question us too when they were building H-3, because none of our kupa'āina – Alice's family still lives across Haleiwa Joe's. [Inaudible] that was kuleana lands. Our family has over 20 homes on Ha'ikū Road – none of our families were ever asked anything about the H-3. We meet once a month, we have an organization with over 300 members, not realizing that it was the law to ask us about building the H-3.

DOT took us off of being part of the mitigation plan but we fought – like us, always fighting everything. We fought for He'eia Kea, we fought for [inaudible], and we're gonna stick with it. Akua is gonna

guide us and Akua has guided us this far, and you know what? Our family all support a museum there, a cultural foundation, because this is not only important to our own Hawaiian culture, this museum will be important to the world. This is the only communications station during World War II that communicated with the entire world. Carol came last night with documentation of the building of the Omega Station. We have documentation in our own family that's not written, and these are the things that we want to share in the museum because there's no documentation in the libraries to tell you about the Hawaiians that took the haoles up there to build the cable cars, but it's in our family. [Inaudible] took the haoles up there, walked the ridges, put the wires up. These are the things that we have to share with the community and the only way we're gonna share it is build our museum. Thank you, mahalo.

**Pascual Dabis:** My name is Pascual Dabis. I'm the president of the Pig Hunters Association of O`ahu. I've been with this organization since [inaudible]. Anyway, your hard work of planting all those beautiful plants [inaudible], I've been in there since I was 11 years old, way back in 1941. With all the pigs that have been coming down into the Valley from Camp Smith and over at the State land, the State park, Queen Emma Foundation, at one time we had access to Queen Emma Foundation property through Hālawā Quarry. Somebody made some pilikia by throwing some bottle of beer or something like that and they shut us out altogether, however, they still had the problem. [Inaudible] wild pigs were coming to the area to do a lot of excavation.

I've asked a number of times to call upon us to do animal control, like I'm doing with Department of Land and Natural Resources. All of the people that have called the department about feral pigs in their residential area, I am there to help them out by delegating certain individuals to do the animal control by using box traps. The federal government doesn't do that, they use [inaudible]. On top of that, to do the job simultaneously we use dogs, and that's what we've been doing all along. They've been going in to North Hālawā illegally to catch the feral pigs and [inaudible]. DOCARE [Division of Conservation and Resources Enforcement] is also involved in that too. Anybody that goes in there, they get slapped on the wrist. So if you would call upon DLNR to tell us, "eh, we having a problem, feral pigs are going into our area and digging up our beautiful plants that we've been planting there." Then they'll call me, I'll assign somebody or we can go in together with our dogs and get rid of the animal. Thank you.

**Richard Paglinawan:** The other issue is about condemnation because Kamehameha Schools – Queen Emma has been impacted by condemnation of land for public access.

**Howard Shima:** Question 1 ~ I'm just curious as to when the implementation will start to take place. I notice that you have phase two, design and development phase, that's the next phase? Question 2 ~ You're on the T-I-P? Comment ~ This has been very revealing because I was completely ignorant as to this program and this is a wonderful document, well-planned. I drive the H-3 frequently, beautiful drive. I didn't know that there was so much negative impact during the construction as documented in this document.

**VERBATIM TRANSCRIPT  
OF SPEAKERS' COMMENTS  
Public Informational Meeting on  
HLID Interpretive Development Plan (IDP)**

**DATE** Tuesday, January 22, 2008  
**TIME** 6:00 PM  
**LOCATION** Castle High School Cafeteria

**Carol Bright:** Aloha. I'm gonna give you a brief history about myself. I come from Komomua o He'eia and they was [inaudible] for hundreds of years. Kamehameha had the land all the way from He'eia down [inaudible].

I'm Carol K. Bright, Halualani, and I come from the Komomua [inaudible]. I strongly support cultural preservation in Ha'ikū 'cause I was born and raised there. I was a little girl looking for medicine in the valley, which we found. They had mountain apples, pineapples, everything that we can eat, so we never did starve.

When the H-3 was built, a lot of our families were buried there; there are a lot of burials in Ha'ikū Valley, 'cause everybody comes from there. My family was buried there too, not only the kings and queens. When the H-3 was built, it definitely affected all these things in Ha'ikū Valley. I don't see how this plan is complete unless it makes sure that those impacts on our culture are addressed. Otherwise, how can this be a mitigation plan?

On October 22<sup>nd</sup>, 1972 [inaudible], Norman Cox who was [inaudible]. He proposed to us that we should make a cultural center there, a Hawaiian cultural center and a museum. Anyway, I feel that the state and federal government has fulfilled the national historic preservation requirements.

Mahalo.

**Leialoha "Rocky" Kaluhiwa:** My father, my uncles [inaudible] took the military [inaudible] to put up the cable cars when the Omega Station was built. I just want to say the kupa'aina of Ha'ikū are still existing. We have families in their 80's and 90's, families that were never notified when they were gonna build the freeway. They just took it for granted and the freeway came on. People who were supposed to have been questioned, give mana'o was never contacted. And another thing is Ha'ikū was dropped from this project, and only two meetings ago were we back on. We were not even notified that we could make some kind of presentation, so maybe the next time we can make a presentation. We support [inaudible] Ha'ikū, we have over three hundred strong. We have an organization, we meet, every other year we go to Vegas because people from all over the world. Our families [inaudible] and we do support the cultural and the military museum for Ha'ikū 'cause its important to the world. Mahalo.

**Mel Kalahiki:** [The major portion of Mr. Kalahiki's comments were inaudible.]

**William Hoohuli:** Hi. My name is William Hoohuli. I come from the Wai'anae side. I just wanted to say some things as I hear people talk about their families, things they have on their [inaudible]. My great-great-great grandfather was the alii for all this side. He was sent here from Kona by Queen Ka'ahumanu and he took over the place of Chief Keanaina. I just want to say too that Hālawā was part of our ancestral land. When I say ancestral, I mean ancient – ancient times. It's just that as the years went by, if you weren't born at that time, then you don't get title to the land, somebody else gets it. I just wanted to say what you gonna do with progress, but progress have to turn around and look at the people that's trying to take care of the land and everything else. I got more to say but I just wanted to say that my family comes from here also. Like I said, my great-great-great grandfather was the chief of this side too, and I guess everybody came before their time. That's all I got. Thank you.

**Kenneth Conklin:** Aloha. I prepared six pages of written testimony which I turned in and you can find them on my website anytime about 24 hours from now – no need to go through that. I also have my book with me this evening – anyone interested in that I have several copies available.

The main point I'm trying to say in my testimony this evening is that we all have a right to freely express our religious views. The Constitution guarantees there shall be no restriction of the right to freedom of expression of religion by the government, and [inaudible] and furthermore that all of us have an equal right under the law regardless of race. I would not like to see the establishment of so-called kapu areas administered by OHA and by 'aha councils if those restrictions would be imposed on the basis of religion or race.

I've been working at Kawa'ewa'e Heiau for a long time [inaudible], at a time when I did not see anyone in this room participating [inaudible], maybe one. I worked with Mahealani Cypher for awhile on some committees involving Ha'ikū Valley and I am very concerned about cultural preservation, but I am also very concerned about equality under the law for all people regardless of race and freedom of expression for all people and all religions. If there are going to be restrictions [inaudible] certain land areas, I understand those restrictions are necessary to safeguard and protect artifacts and special places, but those restrictions need to be imposed equally on all people regardless of race or religion. The opportunities need to be made available to all people, regardless of race or religion, to participate in cultural preservation, respecting the history of this place and [inaudible].

Thank you very much.

**Herb Lee:** Aloha. I just wanted to make some brief statements. I've been involved with a whole bunch of people in the restoration and stewardship of Waikalua Loko Fishpond for the past 13 years. We formed a nonprofit in 1995. It's been all about stewardship and our mission is to try to teach the next generation about stewardship practices. It's been a wonderful journey. We've been fortunate to receive opportunities to work with a lot of different people and to try to put some of the stewardship practices along with curriculum because that really is a most important tool in terms of trying to get the knowledge into the current education system. Unfortunately we have to meet all of these standards and practices, but the bottom line is that we have thousands of kids that are coming down to cultural sites like Waikalua and Kawainui, the lo'i and a lot of different places. The partnerships and all the other kinds of stewardships that's going on in the ahupua'a of Kāne'ohē and the Ko'olaupoko district is very, very important in terms of creating an opportunity for the children to really understand what the values of stewardship and giving back to one's community is about. We're at a point in our life where we have

to look to the next generation and we have to hopefully leave it better than what we got it, and so we've been focused on that.

I just wanted to say mahalo to all the people that have helped us in the restoration of Waikalua Loko and been supportive of us being able to take children not just to the Fishpond but to all of the different places within the ahupua`a and the district, the streams, the oceans, the wetlands, the lo`i, the forest, to be able to learn all of the important components of what makes a thriving ahupua`a. I just want to say aloha to Mark, and Mahealani Cypher and so many other people, Donna and Wali, everybody that are doing great things in the community to provide what we call community classrooms. It's really about getting the kids out into the community learning firsthand, maka`ala ka `ike, working with their hands and learning by doing. As we all know, not all knowledge is learned in one school, so the more opportunities we can have to be able to bring kids to really understand the sites, the cultural aspects, it's going to create a situation where these young people are going to be great stewards in the future and really help to protect our culture. Mahalo to everybody for that and I just want to lend my support for the proposed plan for all of it, for Iia`ikū, for Luluku, because it's all connected and it's all important. Thank you very much.

Attachments ~ written testimony submitted by:

1 page	Carol Bright
6 pages	Kenneth R. Conklin, Ph.D.
1 page	Estelle Drew
1 page	Leilani Jones-Tollefsen
1 page	Mahealani Cypher for Ko`olaupoko Hawaiian Civic Club
1 page	Ilona Lopes
1 page	Luluku Farmers' Association

**Pamela Nakagawa**

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**From:** Mary Riford [maryr@hawaii.rr.com]  
**Sent:** Friday, February 15, 2008 3:26 PM  
**To:** Pamela Nakagawa  
**Subject:** HLID letterhead note and Preliminary Draft IDP edits and notes

Hello Pam,

One note for you, I was typing in the HLID address from a letter dated January 14, 2008 and noted the letterhead zip code "9681" is lacking a number.

The following are a few small edits and comments concerning the Preliminary Draft Interpretive Development Plan.

I was pleased to hear the presentations concerning Halawa and Luluku at the public meeting at Castle High School January 22, 2008. The general feeling is one of moving forward. The Luluku group getting together with the Maunawili/Luluku banana farmers is a good idea and hopefully beneficial for both groups.

Because the Kaneohe Interchange Loop Ramp was enlarged to preserve intact terraces a larger area of banana farmland was impacted.

Preliminary Draft IDP

Small errors to note/edit:

Fig. 4.2 pg.40

Site "1881" is 1889, the Punalu'u Mauka Luluku 'ili boundary features.

There are two locations containing burials within Site 1887. Site 1905 is marked as "Burials". The second, an existing reinterment location, can be marked as a dot on Fig. 4.2 between the "ur" in the word "Burials".

pg.47 4.6.1 H. "The HAC..." to "LAC" the Luluku 'Aha Council ?

The note ends with a question because maybe the Halawa 'Aha Council is involved with Development and the Luluku 'Aha Council takes over for operations.

--end of small edits--

Lukuku Stream notes

In Table 4.4 (pg.48) I noted 80,000 linear feet of pipeline estimated for irrigation. Does the current stream carry a sufficient amount of water to irrigate kalo ?

The agricultural terraces above Likelike Highway (illustrated on Fig.4.3 #4) have direct access to the current stream. The main Luluku stream below Likelike Highway is very downcut, way below the level of the terraces and original auwai. The second tributary of Luluku Stream, located on Fig. 4.3 as beginning under the loop ramp, was dry prior to construction of the loop ramp.

When the H-3 temporary access road was being built a section of the main channel of Luluku Stream was temporarily diverted while a large diameter corrugated metal pipe was placed in the original stream channel. With the pipe in place Luluku Stream continues to flow along it's original channel at the same depth as before the pipe.

As with MANY windward streams there is a tunnel, Luluku tunnel, at the base of the Koolaus. As with MANY windward streams the water flow is reduced because much of the water is being diverted.

Table 4.1 "Restore stream ... to pre-freeway construction levels." Maybe this should read restore stream to pre-Luluku tunnel levels.

Hopefully there are native kalo that require less water than some of the wetland species.

Additional comment:

Having worked in the Luluku project area and other portions of the H-3 corridor, I may be able to assist in locating features

recorded in the past if and when there is interest in identifying previously mapped features.

Sincerely,  
Mary F. Riford





**STATE OF HAWAII**  
**HALAWA LULUKU INTERPRETIVE DEVELOPMENT**  
677 ALA MOANA BOULEVARD, SUITE 811  
HONOLULU, HAWAII 96813

April 15, 2008

Ms. Mary Riford  
47-517 Lulani Road  
Kaneohe, HI 96744

Dear Ms. Riford:

I have provided our planning Consultant, RM Towill Corporation, with your email, dated February 15, 2008, to Pam Nakagawa, asking them to review and update our plan as appropriate.

I appreciate you taking the time to provide your comments to us, and especially your willingness to assist in locating features. As you know, there are very few remaining archaeologists who have knowledge of the Luluku area and who actually worked during the inventory survey and discovery phases in Luluku. We will maintain your information for future reference.

Again, thank you for taking the time to convey your thoughts on these matters.

Sincerely,

Kahikina D. Akana  
Project Coordinator

Cc: OHA BOT  
OHA ADM  
RM Towill Corporation/Chester Koga

**KO'OLAUPOKO HAWAIIAN CIVIC CLUB**

February 25, 2008

Mr. Kahikina Akana  
c/o Office of Hawaiian Affairs  
Halawa-Luluku Interpretive Development Project  
677 Ala Moana Boulevard, Suite 811  
Honolulu, HI 96813

Subject: Comments on Latest Draft of the Interpretive Development Plan

Dear Mr. Akana:

We wish to offer our mana`o on the latest draft of the Halawa-Luluku Interpretive Development Plan Project (HLID). The Ko'olaupoko Hawaiian Civic Club has been in existence since 1937, and is comprised of members from the ahupua`a of Kane`ohe, He`eia, Kahalu`u, Waihe`e, Ka`alaea, Waiahole, Waikane, Hakipu`u and Kualoa. Among the major purposes of our civic club is our advocacy for the preservation and perpetuation of our native Hawaiian culture and heritage.

Most of our board members are of native Hawaiian ancestry, but our board is open to both native Hawaiians and non-Hawaiians alike. We have been tracking the evolution of this cultural mitigation plan for many years now, and have observed the progress of this project from its initial inception in 1987, when the first Memorandum of Agreement was approved by OHA's Board of Trustees.

Our comments and concerns are as follows:

1. Lack of Planning Consistency: We are deeply concerned that this draft is a less-than satisfactory reflection of all the years of work done by the community involved in working with the plan. It appears choppy and inconsistent with previous versions of the plan, and displays an unusual shift in thinking and approach. For example, earlier versions of the HLID plan showed a consistent and common thread among all four planning components – Halawa Valley, Ha`iku Valley, Kukuio Kane and Luluku – which unified the planning thought and approach toward a reasonable and supportable cultural mitigation interpretive plan. This latest draft is vastly different, showing strong direction toward activities in both Halawa and

Comments on Halawa-Luluku Interpretive Development Project

February 25, 2008

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- Luluku, and nothing at all to reflect cultural mitigation for the impacts on Ha`iku Valley. Kukuiokane Heiau, a major cultural impact identified during early arguments over the routing of H-3 in Kane`ohe, seems almost to be an afterthought, with no funding allocated in the first stage of implementation. Native Hawaiians from the Kane`ohe area, some of whom may have ancestors buried at Kukuiokane, have been prevented from visiting the site ever since the heiau was bulldozed by the state Department of Transportation (SDOT) in 1990. When is that access going to be restored?
2. Funding Support – We note that the budgets for this project reflect \$10 million to be allocated for design, construction, inspection and contingency in phase one, but these monies would only be applied to Halawa and Luluku. There is NO FUNDING at all for Kukuiokane or Ha`iku Valley. This appears to be a serious oversight on the part of your agency and should be corrected as soon as possible. Justification for funding the other two areas of the mitigation plan, Kukuiokane and Ha`iku Valley, are as follows:
    - a. Kukuiokane Heiau was a major area of challenge during the planning for construction of H-3. The community strongly urged the State to re-route the highway to avoid the center of the heiau complex. Large terraced walls were visible remains of this heiau, described as the largest heiau complex in the Kane`ohe region. Initial Bishop Museum reports interpreted the site incorrectly as agricultural terraces. These reports, written by archaeologist Scott Williams, were later corrected to properly interpret Site G5-86 as Kukuiokane (the center of which is where the H-3 ramp now crosses). The Hawaiian caretaker of Kukuiokane Heiau, Daniel Yanagida, testified before OHA and repeatedly informed both the State DOT and Bishop Museum archaeologists that the site was, indeed, the heiau. He informed them that the area contained many burials and that there should be no mechanical digging into the site. After the site was bulldozed, iwi kupuna were uncovered. Yanagida urgently requested the return of the remains for reburial, and was rebuffed. He died after three months of unanswered appeals to the State DOT, OHA and Bishop Museum.
    - b. Interstate H-3 enters Ha`iku Valley at the north wall of the pali Ko`olau and exits at an area known as “hospital rock” on the south

Comments on Halawa-Luluku Interpretive Development Project

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side of the valley. It is clearly visible from nearly every part of this valley, and the sight-line extends all the way to Mokapu. State DOT and Federal Highways Administration (FHWA) officials have claimed that the project cannot include Ha`iku Valley for this HLID plan because it was not addressed in the "Area of Potential Effects" (APE) portion of the environmental impact review process in 1976-77. We submit that the EIS APE is not the only governing document relating to this project, and that other federal laws and the MOA should also be taken into account in making that determination – and that FHWA/SDOT err in asserting that Ha`iku Valley should not be included. Act 106, the National Historic Preservation Act, would require that any federal undertaking (and H-3 has been determined to be covered under this definition) must address impacts of the project upon cultural landscapes affected by the undertaking. There is no argument that the highway project clearly is evident in and has an impact upon the immediate cultural landscape of Ha`iku Valley and the surrounding communities of Kane`ohe, He`eia, and Mokapu, all of which have significant cultural properties that would have been adversely affected by the interruption of the sight-line with the upper reaches of Ha`iku Valley by building of the highway. In addition, the MOA between signatories to the project, which include FHWA, SDOT, and the President's Advisory Council for Historic Preservation, with OHA signing on as a "consulted party", states clearly that further resolution of disputes can be addressed any unknown cultural or historic properties that were not addressed at the time of the signing. Although attempts have been made to have these concerns resolved through that process, the SDOT and FHWA have consistently maintained that their position is firm and the community's concerns are to be discounted. FHWA only recently agreed, however, to include a small impact area of the freeway in Ha`iku Valley, i.e., the highway corridor's close proximity to both Kane a me Kanaloa and Kahekili (or Kanehekili) Heiau. This plan does not address access to those sites for native Hawaiian cultural practitioners or kupa`aina families who once lived in the valley and were displaced by military occupation in the mid-1900s. The families tell us that they were never consulted by archaeologists conducting research for the H-3 project, nor were they consulted by archaeologists doing work for the Coast Guard decommissioning project, nor by the state Department of Hawaiian

Comments on Halawa-Luluku Interpretive Development Project

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Home Lands (DHHL). Therefore, any reports conducted for H-3 regarding archaeology in, adjacent to or impacted by the interstate H-3 corridor are incomplete and cannot serve as the foundation for decision-making by FHWA and DOT to exclude the valley as part of the cultural areas impacted by the highway project. We insist that Ha`iku Valley be fully reintegrated into the HLID project and receive its full share of first phase funding which reflects the priorities set by its advocates within the HLID working group.

- c. Cost estimates for both Halawa and Luluku appear to be greatly inflated. Is the consultant who prepared these estimates likely to be the contractor who will be hired to implement the design and construction phase of this project? We strongly urge that all contracts relating to HLID be terminated at the conclusion of their current period, and any further contracts be procured through the state's procurement (bid) process. There is no way to identify whether these estimates are legitimate. They all seem extraordinarily high for the relatively simple projects requested by the working group. Is it possible to have a third or independent party prepare a new set of cost estimates?
  - d. Additional funds – In discussions with SDOT in previous years, the HLID working group was advised not to let themselves be too restricted by the available funds allocated to this project (i.e., the original \$11.2 million). They were advised to come up with the best plan possible. Within the working group were advocates for all four cultural areas, and the cost their mitigation elements is likely to exceed the allocated funding. What is OHA's strategic plan to pursue additional funding to satisfy this cultural mitigation/interpretive plan? How will FHWA and DOT assist to facilitate satisfaction of all of the mitigating elements that are possible? These questions have not been adequately answered in the latest draft of the plan.
3. Artifacts and Other Takings – While Bishop Museum archaeologists in 1977 had claimed that there were no sites of significant value within the entire 10-mile right-of-way for H-3, they were paid millions of dollars in state and federal funds to conduct archaeological research throughout the course of the project. As a result, volumes of work reflect a high degree of historic and

Comments on Halawa-Lulukū Interpretive Development Project

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cultural impact from the highway upon the lands through which the highway is routed. Cases of artifacts found during these studies are housed in storerooms in various places, likely most of it at the Bishop Museum. It is unknown how many of the more valuable artifacts were taken home by people working on the project – we note this as an additional concern. Our point here is that these artifacts are part of the history of these lands and should be included in any interpretive development plan as a means of educating our communities and generations to come on how our people lived in ancient times. This latest draft does not address how these artifacts will be displayed and used in interpretive format for educational purposes, as one would ordinarily expect from cultural mitigation. We have previously urged, and continue to recommend strongly that the FHWA/SDOT acquire Ha`iku Valley from DHHL, renovate the OMEGA Station building (which is eligible for listing in the National Register), and house the artifacts and interpretive displays at that location. This plan remains deficient if it does not adequately address these impacts.

4. Mitigation Elements – We strongly urge that all of the feasible mitigation elements requested by the working group be fully funded and included in the project budget. The working group includes community advocates, cultural practitioners, and historic preservationists who have worked for many years to protect the cultural areas affected by interstate H-3. They now desire closure, a completion of the work done in a manner that is pono, correct, and truly mitigates the spiritual wrenching that occurred when the highway destroyed many of their cultural areas. This plan is not defensible if all we are looking at is a narrow, limited perspective. It dishonors national and state historic preservation law and is insensitive to the culture and history of our native Hawaiian people.
5. Our Ko`olau Vision for this Cultural Mitigation – For the past 15 years, our community has been involved in working toward a future use of Ha`iku Valley since it was first announced that the Coast Guard would be closing its facility on that property. A copy of that vision, including our ideas for how this would integrate well with the HLID cultural mitigation plan, is attached for your information and for inclusion in any final plan/implementation funding and scheduling for the remainder of this project.

Comments on Halawa-Lulukou Interpretive Development Project

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We in Ko'olaupoko have a deep and abiding aloha for our 'aina, for our kupuna kahiko and the cultural heritage they have left behind for all of us to learn from and receive our inspiration and guidance. The loss of cultural areas, access to our wahi kapu and wahi pana, the destruction of sacred places, our disconnection from those things in antiquity that increase our mana – all of these remain a painful legacy of the building of H-3. We ask that this plan be revised to fully include and fund mitigation elements for all of Ha'iku Valley and Kukuioke, and to ensure that this interpretive development plan clearly identify how the work on H-3 will be used to help educate others on the history of our people in Halawa and Ko'olaupoko, all of the cultural landscapes affected by this federal undertaking.

Our members feel very strongly about this matter, and we respectfully urge your kokua to make all of this pono once again.

Mahalo nui loa.

Me kealoha pumehana,



MAHEALANI CYPHER

President

cc: Federal Highways Administration, State Dept. of Transportation, State Historic Preservation Office, Office of Hawaiian Affairs BOT, ACHP

Attachment

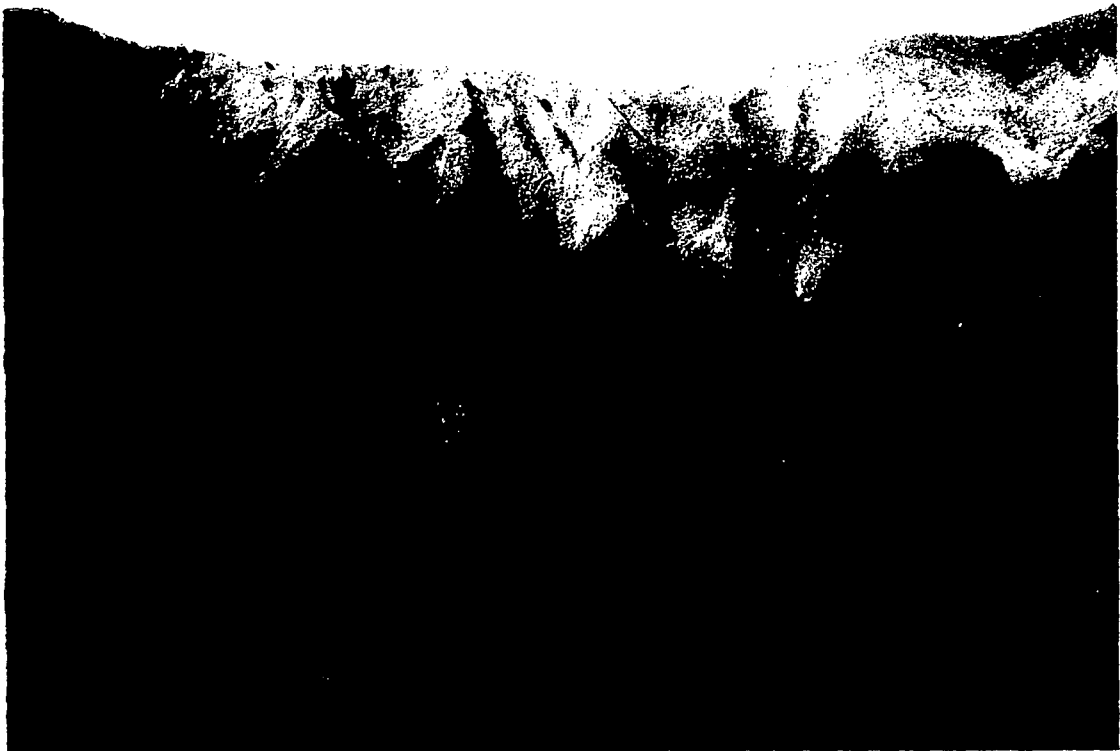
P. O. Box 664  
Kaneohe, HI 96744  
Ph. (808) 235-8111  
koolaupokohcc.org

KO'OLAU FOUNDATION

PROPOSAL FOR THE  
HA'IKU VALLEY  
CULTURAL PRESERVE

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PRESERVING THE HERITAGE  
OF NATIVE HAWAIIANS BY UTILIZING  
THE AHUPUA'A AS A LEARNING  
ENVIRONMENT





# PROPOSAL OVERVIEW

## PRESERVING THE HERITAGE OF NATIVE HAWAIIANS BY UTILIZING THE AHUPUA'A AS A LEARNING ENVIRONMENT

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### PROJECT GOALS

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The overall vision for Ha'iku Valley is to develop partnerships and consolidate management of these lands to establish a new cultural preserve, encompassing all of the lands within Ha'iku Valley. These would include lands currently owned or controlled by the State of Hawai'i Department of Hawaiian Home Lands (DHHL), the City & County of Honolulu Board of Water Supply (BWS), Kamehameha Schools (KSBE) and Hawaiian Electric Co. (HECO).

A broad partnership between the landowners in Ha'iku Valley and other community and government entities is the most optimal solution to the question of the future of this valuable resource.

The DHHL has no immediate plans for use of its lands in the valley, but has leased 10 acres at the Quarantine Station area to a charter school for 20 years. The Board of Water Supply's primary uses for their lands in the valley are water resources and watershed protection. KSBE plans to utilize some of its lands for educational and cultural projects, and has leased some acreage to a native plant nursery operator alongside Ha'iku Road. With multiple landowners, however, the most effective overall management of the valley and its buildings should be handled by the Cultural Preserve entity. It is imperative that any plan to develop a cultural preserve ensure that total management of the valley rests with the Cultural Preserve entity, with some involvement on a "governing body" include representatives of the largest landowners.

The goals of this project are three-fold:

1. Establishment of a Cultural Preserve in Ha'iku Valley.
2. Conversion of the OMEGA Station into the Ko'olau Museum and Hawaiian Cultural Center
3. Development of a Cultural and Environmental Education Program with the Ahupua'a as a Learning Environment

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## BACKGROUND

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Ha'iku Valley lies at the mauka reaches of the ahupua'a of He'e'ia in moku Ko'olaupoko, O'ahu. In ancient times, this valley was the location of a number of heiau, burial grounds, and home to kahuna la'au lapa'au (traditional medical practitioners). It was considered an area "hospital", a place where the people of Ko'olau would come to see the healers and obtain medicinal herbs and help. The farming of kalo reached from the marshy makai area, up the foothills to what is now the entrance point to Ha'iku Valley, at the end of Ha'iku Road.

With the coming of westernization, many of the people who lived in the mauka areas of the valley either moved away or were displaced by government uses of the valley. Kupa'aina families who lived in the valley were relocated to makai lands to make way for development of the Naval Station in the early 1940s, later converted to the OMEGA navigational station.

The Coast Guard announced its closure of the OMEGA Station in the mid-1990s, coinciding with the construction of interstate H-3 freeway, which skirted along the pali mauka of the valley. Upon closure, control of the lands was transferred to the State Department of Hawaiian Home Lands.

Residents of the Kane'ohe and He'e'ia area participated in community planning sessions during the mid-1990s, called by the Ko'olau Foundation, to discuss possible future uses of Ha'iku Valley. Other meetings were held by planning consultants for the Harris Administration, which attempted to develop a master plan for Ha'iku Valley in conjunction with failed efforts to achieve a land exchange with DHHL.

Throughout this time, the Ko'olau Foundation and the Ko'olaupoko Hawaiian Civic Club have urged the establishment of a cultural preserve to encompass all of the lands in the upper Ha'iku Valley.

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## MASTER PLAN

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Once the cultural preserve is established, the following activities can make this endeavor a self-sustaining perpetual land trust to protect cultural resources and burials in the valley and preserve the heritage of native Hawaiians while educating all – Hawaiian and non-Hawaiian alike – on the history and culture of the Hawaiian people.

- **Ko'olau Museum** – Renovation of the OMEGA Station and development of a new museum and cultural center that features both native Hawaiian heritage and celebrates the history of the OMEGA navigational station that once functioned at the site. This facility can become a repository and interpretive display area for artifacts taken from the H-3 freeway and other sites excavated in the Ko'olaupoko area.
- **Cultural and Environmental Educational Programs** – Develop programs for cultural and environmental education, in partnership with the University of Hawai'i (Windward Community College), the Department of Education, private and public schools and the general community.
- **Facility Utilization** - Restore utility infrastructure (sewage, electricity, water, telephone) servicing all buildings on the property, and convert quarantine station buildings for various uses.
- **Kahuna La'au Lapa'au** – Renovation of the mauka maintenance building to house a healing center, enabling kahuna la'au lapa'au to reside there and grow their medicinal plants in the area. A program could be developed in partnership with Papa Ola Lokahi to provide alternative medical services at this location. In addition, the building can be used for canoe-building and storage.
- **Hula Halau Planting Areas** – Hula halau from Ko'olaupoko would be offered areas where they can plant the greenery needed for their performances, in an effort to eliminate the necessity for them to gather in the forest.
- **Charter School and Cultural Learning Centers** – Renovate and provide space in one of the buildings at the Quarantine Station for a native Hawaiian charter school and for Hawaiian language or hula classes.
- **Cultural Events** – Construct a hula mound on the makai side of the OMEGA station and clear vegetation/install landscaping to allow for viewing hula festivals and other Hawaiian cultural events, such as chanting competitions or the slack-key Hawaiian music festival. Organize areas where traditional Hawaiian games and sports can be played, both for learning or in competitions.
- **Respect for Iwi kupuna** – Establishment of set-aside lands for reinterment of unclaimed iwi kupuna found in the Ko'olaupoko area.

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## CURRENT LANDOWNER INTERESTS

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The valley is currently owned by a number of parties with many similar interests in the future use of these properties:

- Department of Hawaiian Home Lands – Preservation of Cultural Areas/Land exchanges, where appropriate, for developable homestead land.
- City & County of Honolulu/Board of Water Supply – Watershed protection and water resource access.
- Kamehameha Schools – Preservation and Cultural/Environmental Learning Opportunities
- Hawaiian Electric Company – Utility

Other interests in the valley have been with regard to recreational activities, eco-tourism, public safety facilities, etc.

Most of the current landowners agree that preservation of natural and cultural areas is foremost. All agree that controlled or limited access by the public is paramount. Despite preliminary efforts by the City to develop a master plan for the valley – and the fact that the City does not own all of the valley – there is no clear, coherent plan that addresses all of the key issues of concern in the community as well as provides for the common goals of all the current landowners.

The new component involves developing a cultural preserve that allows for use as a cultural and learning environment. During the mid-1990s, as the Coast Guard began its efforts to decommission the station, a number of meetings were held with the community to discuss the community's vision and desires for the future use of Ha'iku Valley. Those meetings encompassed a range of community interests and established a dialogue on community concerns.

*A broad partnership between the landowners in Ha'iku Valley and other community and government entities is the most optimum solution to the question of the future of this valuable resource.*

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## COMMUNITY CONCERNS

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The communities whose boundaries abut the upper reaches of Ha'iku Valley include: Ha'iku Village, Hokulele Subdivision, and Castle Hills. In addition, The State Hospital (Dept. of Health) and Windward Community College occupy lands just makai of the project area.

The primary concerns expressed by the communities include:

- 1) Trespassers seeking access to Ha'iku Valley
- 2) Traffic volume may have an effect on neighborhood streets
- 3) Concern for safety of pedestrians and children playing in the neighborhoods if access is allowed through one of the subdivisions.
- 4) Parking; and
- 5) Trash and litter left by trespassers to the valley or dumped by passersby near the Ha'iku Road gate.

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## MITIGATING STRATEGIES

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The key mitigation strategies include:

Security – Installation of a guard shack at the bottom of Ha'iku Road next to the triangle park, to be staffed during all open hours. Hiring of culturally-appropriate security personnel (Hawaiian forest rangers or *Na Koa*) to staff the front gate and patrol the property from sunrise to sunset. Ideally, a caretaker should reside on the property to establish a 24-hour presence and deter trespassers and other intruders during non-visiting hours and provide after-hours security support.

Management – The Cultural Preserve, hopefully to be established under the auspices of the Office of Hawaiian Affairs, would involve a partnership between OHA, Dept. of Hawaiian Home Lands, Kamehameha Schools, and the City & County of Honolulu Board of Water Supply. Management of the valley could be contracted out to a private non-profit group – possibly the Ko'olau Foundation - to administer security, maintenance and cultural/educational programs for the valley. This management group would work with the community and the Neighborhood Board to ameliorate or mitigate any anticipated or ongoing problems or concerns. A recent development has been a proposal initiated by

OHA to establish a state Ha'iku Valley Cultural Preserve Commission, which would manage and operate the valley and be administratively connected to OHA.

Improvement of Infrastructure/Facilities – Funding will be pursued to restore all utilities, including waterlines, sewer lines, electrical and telephone services, to clean and secure the OMEGA Station and upper maintenance building, and to establish office operations in the OMEGA Station building. Major funding will be needed to convert the OMEGA Station into the Ko'olau Museum. Funding might also be pursued from the Interior Department and private foundations for future improvements.

Traffic Management – Access to the valley would be managed through a scheduling process to minimize the number of vehicles entering the area on any given day. Large tour buses would not be allowed until there has been adequate mitigation of community concerns. Visitors would be required to sign in at the gate as well as sign waiver forms. A log would be kept of all visitors' entry and departure times.

Parking – Parking will be available at both the OMEGA Station and the Maintenance Building. Additional parking would be available along wider road shoulders in the valley. The Quarantine Station is currently leased to Samuel Kamakau Charter School, which is seeking funds to develop their facilities at that location.

Liability – All visitors to the property would be required to sign a waiver of liability (consent of entry) form upon entrance. In addition, liability insurance would be required for the non-profit entity to supplement any coverage by government entities for their properties.

Funding – Funding for initial management of the property (excluding Quarantine Station management and security) would have to come from the State, OHA or a joint fund set up by the partners. Kamehameha Schools may be willing to support funding for educational and cultural uses of the valley. The Board of Water Supply may be willing to fund conservation education programs. The entity selected to manage the valley would also need to apply for federal, state and private funds to conduct future anticipated programs at Hai'ku.

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### START-UP TASKS (WHAT'S NEXT)

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The following is a suggested list of tasks or procedures that must be done to implement this program. Some of these tasks can be expedited, on an interim basis, to allow for

cultural access, security and environmental assessments. Other tasks may take longer but would support the long-range program for management of this valley:

1. Board of Water Supply/City & County of Honolulu: Partner with BWS to include their lands as part of the cultural preserve, and collaborate to develop a conservation outreach and educational program.
2. Office of Hawaiian Affairs: Establish the Ha'iku Valley Cultural Preserve in a partnership with all landowners. Partner with Dept. of Hawaiian Home Lands to manage DHHL's Ha'iku Valley property as part of the cultural preserve, and select community non-profit management entity (the Ko'olau Foundation?) or work with a new Ha'iku Valley Cultural Preserve Commission to serve as caretaker/manager of the cultural preserve. Provide assistance for start-up costs (similar to Waimea Valley) for security at the Ha'iku Road gate (7 days a week), and organization of cultural, educational and management programs for the valley. Seek federal funding assistance to renovate infrastructure and buildings for development of the cultural preserve (by ensuring that Ha'iku Valley receives its fair allocation of funds from monies set-aside for the H-3 cultural mitigation plan). Assist in the establishment of broader partnership with all other landowners, parties in Ha'iku Valley.
3. Department of Hawaiian Home Lands: Establish a partnership and formalize and agreement with the Office of Hawaiian Affairs to allow for inclusion of Ha'iku Valley lands in the Cultural Preserve, and to allow OHA or the new Ha'iku Valley Cultural Preserve Commission to oversee management.

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### ANTICIPATED START-UP COSTS & FUNDING SOURCES

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Although a comprehensive cost estimate cannot be developed until the planning and implementation stages are clarified, the following are projected costs and potential funding sources that might be considered to fund various aspects of this new cultural preserve:

Federal Government: funding for infrastructure and facility renovation; funding for historic preservation, establishment of new museum, conservation education, etc. Estimated cost: \$10 million.

State Government: funding and assistance in alien species removal, planting of native species, assistance with development of environmental education programs, etc. Funding for cleanup and securing of buildings, initial start-up costs of new cultural preserve commission. Estimated cost: \$3.9 million.

Office of Hawaiian Affairs: funding some start-up costs of community management group to support security, maintenance and management staffing; education and program development and community outreach. Estimated cost: \$500k

Board of Water Supply: Funding watershed/conservation education partnership. Estimated cost: \$75,000.

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### THE KO'OLAU FOUNDATION

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The Ko'olau Foundation is a non-profit organization dedicated to the preservation, protection, and advocacy for native Hawaiian historic sites, and for cultural and environmental education programs. The organization was originally formed over 30 years ago, and has evolved over the years into its current focus on the native Hawaiian culture.

The Foundation is in the process of applying for federal tax exempt (501©3) status. The majority of its board members are of native Hawaiian ancestry and most of its Board members reside in the communities of Kane'ohe and He'eia.

02-25-08\*\*





**STATE OF HAWAI'I**  
**HALAWA LULUKU INTERPRETIVE DEVELOPMENT**  
677 ALA MOANA BOULEVARD, SUITE 811  
HONOLULU, HAWAI'I 96813

April 9, 2008

Ms Mahealani Cypher, President  
Ko'olaupoko Hawaiian Civic Club  
Post Office Box 664  
Kane'ohe, HI 96744

Dear Ms Cypher:

This letter follows my previous letter to you dated March 10, 2008. At a recent OHA Board of Trustees meeting, the Board requested I provide more detail to my initial letter to you.

Your letter commented on four concerns, which I will address.

The first concern involved lack of planning consistency from earlier versions of the Interpretive Development Plan (IDP) through the Preliminary Draft IDP that was approved by the HLID Working Group, and that North Halawa Valley and Luluku are receiving more attention than Ha'iku Valley and Kukuio Kane. You are correct in your observation. The IDP addresses four focus areas: North Halawa Valley, Luluku, Kukuio Kane, and Ha'iku Valley, and the earlier versions focused on interpretations in all four areas. However, that balanced approach was changed by the Federal Highway Administration (FHWA) decision to limit our mitigation work with Ha'iku Valley to the footprint of the freeway. Many people, including yourself, have requested FHWA reconsider their decision, but they continue to remain firm in that decision. As evidenced by your August 8, 2006 and October 18, 2006 letters to FHWA, and their response to you—issues regarding the footprint or the area affected can only be resolved at that federal level. The HLID working group did challenge FHWA and HDOT to allow some interpretations in Ha'iku Valley, and they responded by allowing two site interpretations in the valley. In the Preliminary Draft IDP recently approved by the OHA Board of Trustees, the plan includes mitigation of two Heiau—Kahekili Heiau and Kane Ame Kanaloa Heiau, which border the freeway's footprint. It includes some funds for an archaeological inventory survey and cultural impact assessment for those sites.

With regard to your second concern, the IDP does contain funding for Kukuio Kane and Ha'iku Valley. There is \$280,313 requested in Phase 1 for Ha'iku Valley, and a total of \$3,719,531 for the valley through all four phases. This amount is smaller than the funding requests for North Halawa Valley and Luluku because it is based on the actual mitigations developed within the respective focus areas. There is a total \$1,937,463 requested for Kukuio Kane in Phase 2 funding. We were challenged in the mitigation of Kukuio Kane by the lack of published material indicating

the exact location of the heiau and the wishes of the Yanagida family to leave the site alone. The interpretation and funding in the IDP is a compromise of varying interpretations.

Our Planning Consultant, RM Towill Corporation provided the cost estimate in the IDP. It may seem high because it includes percentage factors that account for construction management and contingency increases such as increased cost of materials and inflation. The FHWA set aside \$11M for this project, and approximately \$7.5 M of that will be available for implementation of IDP projects.

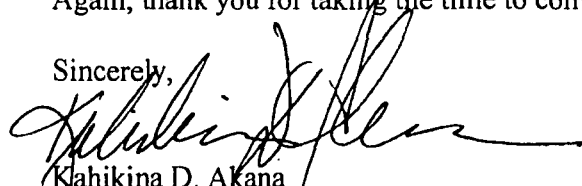
Your third comment addresses artifacts and the use of the Omega Station to store them. The artifacts and items discovered during the archaeological inventory surveys of these lands are currently being properly housed by Bishop Museum. In earlier versions of the IDP, purchase of Hai'ku Valley was one of the mitigations being proposed. However, FHWA's decision to limit the area within the valley to the footprint of the freeway prevented us from considering that mitigation further. Therefore, the current version of the IDP contains funding for cleaning and securing the Omega Station only. We made inquiries regarding obtaining Ha'iku Valley land from the Department of Hawaiian Homelands, and discovered these lands are not condemnable because of DHHL's responsibilities under the Hawaiian Homestead Commission Act.

I can understand your concern that all of the mitigations offered by the working group be funded by the IDP. From the start of the project, we always encouraged the working group to develop the best interpretive plan without regard to funding. The aim was to submit the best plan we could have and to leave the decision about funding to the federal and state approval authorities. The IDP's request for \$35M fulfills that aim. We know that the original \$11M is assured to us, and implementation of the IDP will start with whatever is remaining from the \$11M when implementation starts. However, the remainder of the \$35M would be pursued through the State Transportation Improvement Program (STIP) as well as by grant requests through other federal, State, or private programs.

Finally, thank you for sharing the Koolau Foundation cultural plan you attached to your letter. This plan was provided to HLID in the early development of the IDP, and was considered by the HLID working group as it put the IDP together.

Again, thank you for taking the time to convey your thoughts on these matters.

Sincerely,



Kahikina D. Akana  
Project Coordinator

Cc: OHA BOT  
OHA Adm  
RM Towill Corporation/Chester Koga

Melvin D. L. Kalahiki  
45-705 Kamehameha Highway, #204  
Kaneohe, Hawaii 96744  
H (808) 236-3636 C 284-8722  
[melkalahiki@aol.com](mailto:melkalahiki@aol.com)

February 28, 2008

Mr. Kahikina D. Akana  
Project Coordinator  
State of Hawaii  
Halawa Luluku Interpretive Development  
677 Ala Moana Boulevard, Suite 811  
Honolulu, Hawaii 96813

Aloha Kahikina,

Mahalo for the preliminary draft copy of the Interpretive Development Plan.

I would like to have more information on the Luluku Cut from H-3 in to Kaneohe. This site was a complete agricultural series of terraces with a house site at the top, and the family graves complete with stone markers. I would like to visit those graves if that is possible.

Did the Luluku cut off have any native impact on Kukui O Kane Heiau? I would also want to visit the site for the family, and for the Council of Hawaiian Organizations. It was the Council of Hawaiian Organizations that had the Kapu on that sacred heiau site from the beginning of construction on H-3.

Mahalo nui loa,

  
Melvin D. Lono Kaiolohia Kalahiki



**STATE OF HAWAII**  
**HALAWA LULUKU INTERPRETIVE DEVELOPMENT**  
677 ALA MOANA BOULEVARD, SUITE 811  
HONOLULU, HAWAII 96813

April 10, 2008

Mr. Melvin D. L. Kalahiki  
45-705 Kamehameha Highway, #204  
Kaneohe, HI 96744

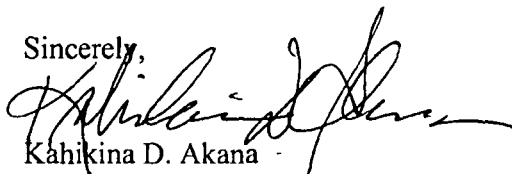
Dear Mr. Kalahiki:

I wanted to follow up my letter of March 10, 2008, to you to address your request to visit the gravesite within the Luluku Agricultural Terraces.

The opportunity for you to visit the site is available, however, the area is currently dangerous because of the thick growth of brush and grass that covers the landscape. There also exists many open excavations under the thicket which may be a hazard to you. Because of these and other conditions, we have secured access to the area until some of these conditions can be abated.

The Interpretive Development Plan which is currently being reviewed by State and Federal agencies will allow us to have an access road built and to make the landscape safer. Once these things are done, we would be happy to arrange for your visit to the grave site.

Sincerely,



Kahikina D. Akana  
Project Coordinator

Cc: OHA BOT  
OHA Adm  
RM Towill Corporation/Chester Koga

William A. Hoohuli  
94-1067 Leomana Place  
Waipahu, Hawaii 96797-4079  
(808) 677-0998

Certified Mail No. 7005 1160 0003 7976 8381  
Return Receipt Requested

State of Hawaii  
Kahikina D. Akana, Project Director  
Halawa Luluku Interpretive Development  
677 Ala Moana Boulevard, Suite 811  
Honolulu, Hawaii

February 25, 2008

**AFFIDAVIT**

State of Hawaii            )  
                                  )ss  
County of Honolulu        )

I, William Aweau Hoohuli married, the husband of Kim Suzanne Salcido [Hoohuli] of 94-1067 Leomana Place, Waipahu, Hawaii, 96797 come forth and say that this particular Hoohuli Ohana have the distinction of being lineal descendants of the ancient ancestors of the mukupuni of Oahu and the moku of Aiea, Halawa, Moanalua, Kona, Koolaupoko, Ewa, Waianae, Waialua, and Koolauloa through the children of these ancient ancestors Kaleimanuia (w) and Lupekapukeahoomalii (k).

These ancient ancestors maintained, cultivated and utilized the elements of the aforementioned lands to sustain their heritage, culture and religion. They strived to sustain their heritage, culture and religion through their monuments, the heiau, loi, luakini, auwai, imu, the gods that they worshipped and many other objects. The monuments are the ancient ancestors calling cards to their identity on how they sustained their lives. They left this heritage for their descendants. They left these monuments intact for over 500 years. This means this Hoohuli Ohana ancient lineal ancestor's monuments existed before the founding of the United States of America and before the State of Hawaii's Land System.

It took the need for another “Freeway” to damage and destroy much of the ancient ones heritage, culture and religion that were left for their descendants. Yes, we are alive and we do know our genealogy, whose ancient ancestor’s lineal descendents also include Kauai, Maui, Lanai, Molokai, and Niihau.

The healing process for the damages done and referred to by the Halawa-Lulukū Interpretive Development Plan for the lands of these descendants’ ancient lineal ancestors requires the immediate, unlimited and unconditional efforts of the following agencies:

- Federal Highways Administration (FHWA);
- State Department of Transportation (HDOT); and
- Office of Hawaiian Affairs (OHA)

It is important to seek corrections to the Halawa-Lulukū Interpretive Development Plan. This plan should also include the adjoining lands and other impacted areas that were excluded from the Halawa-Lulukū Interpretive Development Plan. It is important to seek redress, not only for the land (aina) and its people, but also to all and any ancient lineal descendants such as this Hoohuli Ohana and the cultural descendants. Although some of our ancient ancestor’s monuments were damaged and destroyed during the construction of the H-3 Freeway, there are other monuments that endure.

This Hoohuli Ohana, as lineal descendants to these ancient lineal ancestors that occupied the ancient lands, the mukupuni of Oahu and the moku of Aiea, Halawa, Moanalua, Kona, Koolaupoko, Ewa, Waianae, Waialua, Koolauloa, and the lands recognized by the Halawa-Lulukū Interpretive Development Plan requests that this Hoohuli Ohana be given access rights to the ancestral lands and to the burial, cultural and religious sites.

The Hoohuli Ohana Lineal descendants are as follows:

Violet Kalauae Hoohuli (w)  
Doris Koleka Hoohuli Dung (w)\*  
Rose Pua Hoohuli Poe (w)  
Pauline Kauhane Hoohuli Poe (w)\*

Joseph Kahapea Hoohuli Jr (k)  
Stanley Mataio Hoohuli (k)\*  
Matthew Kaehukai Hoohuli (k)\*  
Stella Keala Hoohuli Enos (w)  
Mabel Kulani Hoohuli Wright (w)  
Josiah "Black" Lanakila Hoohuli (k)  
David Kawika Hoohuli (k)\*  
William "Willie" Aweau Hoohuli (k)  
Ernest Kalani Hoohuli (k)

In closing, I quote the following from the Hawaii Island Burial Counsel where this Hoohuli Ohana is recognized as a lineal descendant. It is with hope that a similar statute can be enacted in regards to the cultural sites.

Access to the burial site for appropriate cultural activities will be permitted to any lineal and/or cultural descendant who has been formally recognized by the HIBC in accordance with administration procedures contained within 13 §13-300-35: *Recognition of Lineal and Cultural Descendants*. The right to access the burial site by formally recognized descendants will be incorporated into the property deed by way of covenant, and NELHA will maintain, and update if necessary, a list of recognized descendants.

Cc:  
Senator Daniel Akaka;  
Senator Daniel Inouye;  
Senator Colleen Hanabusa;  
Federal Highway Administration;  
State of Hawaii Department of Transportation,  
Office of Hawaiian Affairs;  
Mahealani Cypher  
Hoohuli Ohana

\* Denotes deceased

William Aweau Hoohuli  
Affiant William Aweau Hoohuli  
Hoohuli Ohana Kupuna and Genealogist

2/25/2008  
Dated

NOTARY'S STATEMENT

State of Hawaii        )  
County of Honolulu    )

On this day 25, Feb, 2008 personally appeared William Aweau Hoohuli,  
Hoohuli Ohana Kupuna and Genealogist who, having first been sworn, acknowledged the  
foregoing before me.

LS  
[SEAL]

Linda A. Woolsey  
LINDA A. WOOLSEY  
NOTARY PUBLIC

My commission expires 12-10-2008





**STATE OF HAWAII**  
**HALAWA LULUKU INTERPRETIVE DEVELOPMENT**  
677 ALA MOANA BOULEVARD, SUITE 811  
HONOLULU, HAWAII 96813

April 10, 2008

Mr. William A. Hoohuli  
94-1067 Leomana Place  
Waipahu, HI 96797-4079

Dear Mr. Hoohuli:

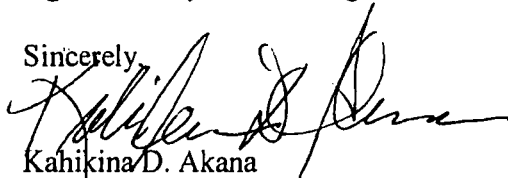
I wanted to follow up my letter of March 10, 2008 to address two concerns you mentioned in your Affidavit of February 25, 2008.

The first is that the plan should also include the adjoining lands and other impacted areas. The Interpretive Development Plan (IDP) considers impacts within an area around the H-3 freeway which was originally identified when the Environmental Impact Statement (EIS) study for the freeway was completed. Based on the EIS, the Federal Highway Administration and the State Department of Transportation determined the area within which we are working.

The other concern requested that the Hoohuli Ohana be given access rights to the ancestral lands. The IDP requires an access plan to be developed by the `Aha Council for the area, with concurrence by OHA and HDOT, which includes cultural considerations and provides a comprehensive framework for access that includes all current and potential users. Once the IDP is approved by FHWA and HDOT, we will enter the Final Design and Implementation phases where things like access plans for each of the areas will be developed. We will hold your affidavit and forward it to the council once it is formed.

Again, thank you for taking the time to inform us of your concerns.

Sincerely,



Kahikina D. Akana  
Project Coordinator

Cc: OHA BOT  
OHA Adm  
RM Towill Corporation/Chester Koga

# KO`OLAU FOUNDATION

February 25, 2008

Mr. Kahikina Akana  
c/o Office of Hawaiian Affairs  
Halawa-Luluku Interpretive Development Project  
677 Ala Moana Boulevard, Suite 811  
Honolulu, HI 96813

Subject: Comments on Latest Draft of the Interpretive Development Plan

Dear Mr. Akana:

The following is our mana`o on the recent draft of the Halawa-Luluku Interpretive Development Plan Project (HLID), revealed in a public information meeting recently at Castle High School in Kane`ohe.

The Ko`olau Foundation is dedicated to the preservation and perpetuation of the history, heritage and culture of native Hawaiians, and to educating others about cultural and historic properties and the environment. Although we have been in existence for over 30 years, our name and mission have changed from an environmental focus to historic preservation and education purposes.

We are concerned that this draft does not include any mitigation for the impacts of H-3 upon Ha`iku Valley, ahupua`a o He`eia, moku Ko`olaupoko. From what we understand under federal historic preservation law, the federal highway project's impact upon our cultural areas should have been properly addressed and mitigated as part of the project's construction.

Among our membership – myself included – are kupa`aina families, descendants of the people who lived in Ha`iku Valley in ancient times. They trace their genealogy back many generations to Chief Komomua and High Chiefess Koa o Mokumoku o He`eia, who held these lands given them from the Kamehameha dynasty. The latter, keali`iwahine, was among the families who lived in He`eia from ancient times.

These families inform us that they were never consulted by archaeologists conducting research for the H-3 project, and who wrote reports about its impact on Ha`iku Valley. There are kupuna (elderly) members of these families who recall, as young children, being instructed to go to the uplands of Ha`iku Valley to gather plants to be used as medicine by their kahuna la`au lapa`au, the healers of their family. Their mo`olelo tells of the heiau (temples) and burials throughout the area. Up until the closure of the Coast

Guard station, their family regularly visited their iwi kupuna gravesites at Kane a me Kanaloa heiau and elsewhere in Ha'iku Valley.

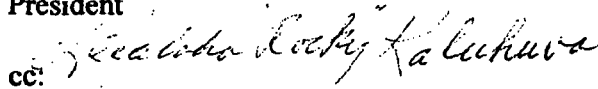
We feel this plan is seriously flawed if it does not include Ha'iku Valley as a major cultural landscape affected by the freeway. We ask that the entire valley be inserted into the plan, with adequate funding to provide for preservation of and access to at least the two major heiau, Kane a me Kanaloa and Kahekili (aka Kanehekili) Heiau and the kupa'aina burial grounds. In addition, we ask that a proper curation plan be included to address how the artifacts taken during archaeological work on H-3 will be displayed as part of the interpretive educational purpose of this project. We strongly recommend that these displays would be most suitable in a large, museum-like building such as the old OMEGA Station in Ha'iku Valley. We ask that this property be acquired and the building renovated into a museum that can be viewed by students, the community and guests in our 'aina, and that proper access also be addressed by this plan.

Mahalo for this opportunity to comment.

Me kealoha pumehana,

LEIALOHA "ROCKY" KALUHIWA  
President

cc:



Advisory Council for Historic Preservation (U.S.)  
U.S. DOT Federal Highways Administration  
State Historic Preservation Office  
State Dept. of Transportation  
Office of Hawaiian Affairs BOT

P. O. Box 4749  
Kane'ohe, HI 96744  
Ph. (808) 286-7955  
Email: rockyfromhecia@aol.com



**STATE OF HAWAII**  
**HALAWA LULUKU INTERPRETIVE DEVELOPMENT**  
677 ALA MOANA BOULEVARD, SUITE 811  
HONOLULU, HAWAII 96813

April 9, 2008

Mrs. Leialoha "Rocky" Kaluhiwa, President  
Ko'olau Foundation  
Post Office Box 4749  
Kane'ohe HI 96744

Dear Mrs. Kaluhiwa:

This letter follows my previous letter to you dated March 10, 2008. At a recent OHA Board of Trustees meeting, the Board requested I provide more detail to my initial letter to you.

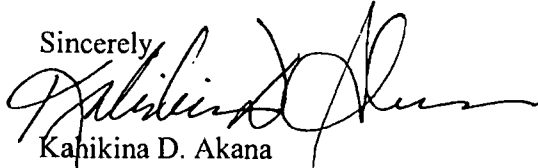
In your letter of February 25, 2008, you commented that the HLID Interpretive Plan (IDP) excludes any mitigation for the H-3 impacts upon Ha'iku Valley. I'm not certain to which IDP edition you are referring. However, I can assure you that the January 22d and February 26, 2008 editions include mitigation for Kahekili and Kane Ane Kanaloa Heiau in Ha'iku Valley. Funding for the mitigations in Phase 1 is \$280,313, and a total of \$3,719,531 for the valley through all four phases. Much of our mitigation effort in Ha'iku Valley is impacted by the Federal Highway Administration decision to limit our work to the footprint of the H-3 freeway.

With regard to your concern about artifacts and the use of the Omega Station to store them, the artifacts and items discovered during the archaeological inventory surveys of these lands are currently being properly housed by Bishop Museum. In earlier versions of the IDP, purchase of Ha'iku Valley was one of the mitigations being proposed. However, FHWA's decision to limit the area within the valley to the footprint of the freeway prevented us from considering that mitigation further. Therefore, the current version of the IDP contains funding for cleaning and securing the Omega Station only. We made inquiries regarding obtaining Ha'iku Valley land from the Department of Hawaiian Home Lands and discovered these lands are not condemnable because of DHHL's responsibilities under the Hawaiian Homestead Commission Act. Current legislation, which was introduced as part of the Office of Hawaiian Affairs' Legislative Package, would be helpful in helping to resolve this particular issue. We hope that all or parts of HB2704 HD2 SD1 or its companion SB 2727 will be passed during this Legislative session.

Letter to Rocky Kaluhiwa, Page 2

Again, thank you for taking the time to convey your thoughts on these matters.

Sincerely,



Kahikina D. Akana  
Project Coordinator

Cc: OHA BOT  
OHA ADM  
RM Towill Corporation/Chester Koga

### Comment on the Preliminary Draft of the Hālawā — Luluku Interpretive Development Plan

February 19, 2008

I am grateful for the opportunity to address the H-3 mitigation recommendations and actions as presented in the Preliminary Draft Interpretive Development Plan and public informational meeting at Castle High School on January 22, 2008. I am cognizant of the great efforts the Hālawā Luluku Interpretive Development Project coordinators, the Working Group and others have taken to try to achieve a balance between the cultural and preservation issues at Luluku, Punalu'u Mauka, Ha'ikū and Hālawā. These are extremely complex and sensitive issues and we must thoroughly consider all of the adverse effects of this development plan on the 'āina.

I have been a lifelong resident of Pū'ahu'ula, Kāne'ohe. I am half of a collaboration, which documented the construction of the H-3 freeway from March of 1989 and witnessed first hand the destructive and insensitive devastation. For over twenty years, I have documented the cultural, archaeological and geographical wahi pana of Hawai'i. My comments will be addressed only on the Ko'olau side because that is my kuleana.

It is a significant and important event that these lands that were directly impacted by the H-3 freeway can be preserved and protected from future and thoughtless development. I feel the plans for Luluku, which were discussed in earlier public meetings, have shifted in the Preliminary Draft Interpretive Development Plan. There were to be no or low impact construction within the Luluku area and it was not to be another tourist attraction. In the Preliminary Draft Plan, it lists the building of a Visitor Complex including: Resource Center (1,000 s.f.), Maintenance Shack (20'x40'), Visitor Center (3,500 s.f.), Commercial Kitchen (1,000 s.f.), Caretaker's Hale (1,800 s.f.), fifteen car parking area, second parking area (for event parking) and a two lane (20') paved access road to the Luluku terraces. At the public meeting on 1/22/08, it was also mentioned of the possibility of renting out these facilities for events. Luluku is not the appropriate area for these types of commercial activities and structures.

First priority needs to be given to the protection and preservation of one the earliest intact agricultural complexes on O'ahu. It is imperative to consider and focus on all of the possible adverse effects that may alter directly or indirectly the integrity of the Luluku archaeological complex. On March 4, 1986, seventeen sites within the Luluku Discontinuous Archaeological District were placed on the National and State Register of Historic Places. Therefore, the National Historic Preservation Act with section 106 and 36 CFR 800 regulates Luluku. Native Hawaiians built these great projects with great sensitivity to alignment and placement in order to integrate them within the landscape and I feel their needs to be a greater awareness of the where the destroyed sites where on the 'āina of Luluku before any plans are made.

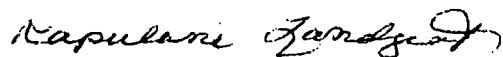
The building of a Visitor Complex and/or Museum on the Ko'olau side could be located in Ha'ikū in and around the Omega Station, which would be less of an impact on the 'āina, where there are preexisting structures, infrastructure and roads. I question the site location of Kahekili Heiau (Site 332) in the Preliminary Draft IDP, January 22, 2008, Figure 6-2, p. 68; please refer back to Mo'olelo Ha'ikū, Archaeological Inventory Survey, Figure 1-4, p. 11 for a more accurate site location.

It is unconscionable; that eleven years after the freeway was opened the final Kukuiokāne archaeological report by Bishop Museum is still incomplete. How can you mitigate the destruction of Kukuiokāne? There needs to be a visual and public reminder to everyone who drives over the land of Kukuiokāne, that they indeed are driving over the largest and most important heiau in Ko'olau Poko.

The history of the H-3 freeway was built on secrecy and lack of information. The construction of the H-3 freeway drew the largest protest and opposition than any other earthwork project in Hawai'i. There needs to be a professionally done comprehensive visual and historical record of the H-3 freeway. "Each new generation grows up thinking that what they see is how a place has always been; the photos allow them to see how it was before they got here, a way to understand history." (*Kawaharada, Introduction to Ē Luku Wale Ē, 2007*)

I hope the Office of Hawaiian Affairs, the H.I.D Project Coordinators, the Working Group and others will be able to address these difficult issues and achieve a balance that continues to preserve and protect these nā wahi pana o Ko'olau Poko.

'O wau nō me ka ha'aha'a,



Kapulani Landgraf



**STATE OF HAWAII**  
**HALAWA LULUKU INTERPRETIVE DEVELOPMENT**  
677 ALA MOANA BOULEVARD, SUITE 811  
HONOLULU, HAWAII 96813

April 10, 2008

Ms Kapulani Landgraf  
45-139 `Awele Place  
Kane`ohe, HI 96744

Dear Ms Landgraf:

Thank you for your input dated February 19, 2008, to the Preliminary Draft of the Halawa-Lulukuu Interpretive Development Plan. At an OHA Board of Trustees meeting on April 3, 2008, the trustees requested I address your concerns more specifically.

First, I want to thank you for your quiet involvement with the project, and for sharing your mana`o and pictures with us at HLID. You have always been sensitive to the history of these lands and the issues involved with the many changes occurring on these lands.

I know that the Interpretive Development Plan seems to focus on commercializing Lulukuu and creating a tourist attraction. However, our purpose in Lulukuu was to restore sustainable agriculture to the land while also educating people about the Hawaiian culture. The capital improvements you mention are purposely designed to be outside of the terraced area so it would not interfere with farming and educational activities. The working group members were mindful of trying to maintain a sense of cultural presence while still achieving the sustained agricultural purpose.

With regard to Kahekili Heiau, members of the HLID working group and kupa aina of Ha`iku Valley felt strongly about the location of this site despite the information provided by Mo`olelo Haiku. Because of this difference, we included funds in Table 6-3, for an archaeological survey, interim site preservation plan and cultural impact assessment for Site 332 & 333.

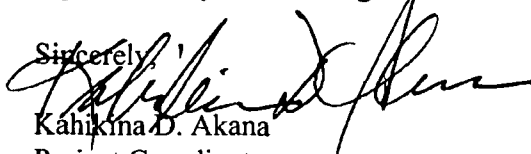
Finally, I agree with you that there needs to be a professionally done comprehensive visual and historical record of the H-3 freeway. We did identify this kind of mitigation in Table 7-1, ME #9, and hope that it will be approved for implementation.



Kapulani Landgraf response letter, Page 2

Again, thank you for taking the time to convey your thoughts on these matters.

Sincerely,



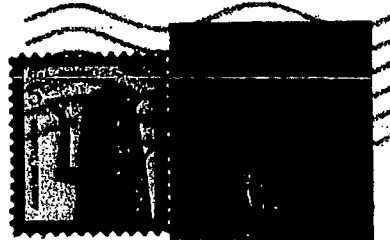
Kahikina D. Akana  
Project Coordinator

Cc: OHA BOT  
OHA ADM  
RM Towill Corporation/Chester Koga



Ms. Elizabeth A. Stone  
General Delivery HI 968  
Naalehu, HI 96772

23 JAN 2008 PM 3 T



Carlsbad Caverns National Park, NM

H-3 Public Meeting  
677 Ala Moana Blvd  
Suite 811  
Honolulu, Oahu 96813

January 19, 2008

Dear H-3 Public Hearing,

This is to OPPOSE more highways  
in our state. We OPPOSE traffic, noise,  
congestion, pollution and higher taxes,  
and destruction of scenic value.  
Could alternate services single lane  
country roads alleviate traffic, or  
more BUS times, or staggering the traffic  
hours and work hours help alleviate  
the congestion?

Sincerely  
Elizabeth Ann Stone

TESTIMONY  
HLID PUBLIC INFORMATION MEETING

January 22, 2008

Aloha.

My name is Carol Bright. I am a kupa`aina of Ha`iku Valley, and have lived in the ahupua`a of He`eia all my life.

I strongly support a cultural preserve for Ha`iku Valley, and I want this plan to help create that preserve.

Ha`iku Valley has heiau, it has many burials, including our family members. It has medicinal plants that I used to help gather when I was a little girl.

When the H-3 highway was built, it definitely affected all of these things in Ha`iku Valley. I don't see how this plan is complete unless it makes sure that those impacts on our culture are addressed. Otherwise, how can this be a mitigation plan?

I want to see all of the artifacts set up as educational displays in the OMEGA Station building, so you will need to make sure that this building is acquired or leased from Hawaiian Home Lands, cleaned up, secured and renovated for these interpretive displays.

Only then will I feel that the state and federal government has fulfilled the national historic preservation requirements.

Mahalo for this opportunity to offer my comments.

Carol Bright  
46-317 Halualani Pl.  
Kaneohe, HI 96744

To: Halawa-Lulukū Interpretive Development Project  
Re: Interpretive Development Plan "Preliminary Draft"  
For: Public hearing at Castle High School  
Date: January 22, 2008  
From:  
Kenneth R. Conklin, Ph.D.  
46-255 Kahuhipa St. Apt. 1205  
Kane'ohe, HI 96744  
tel/fax (808) 247-7942  
e-mail Ken\_Conklin@yahoo.com

Aloha mai kakou

O Ken Conklin ko'u inoa. Mai ke ahupua'a o He'eia mai au. I am Ken Conklin. I have been a resident of the ahupua'a of He'eia continuously since 1992, and visited here several times during a period of ten years before that. I have a deep respect and appreciation for Hawaiian history, culture, language, and people. On numerous occasions I have participated with work groups restoring and maintaining the Kawa'ewa'e Heiau in Kane'ohe, including occasions when I led the cultural entrance protocol offering 'oli (chant) and pule (prayer) to the gods in Hawaiian language along with ho'okupu (offerings).

Following are comments related to the Interpretive Development Plan, a document of 9 pages dated January 14, 2008.

It is good that the federal and state governments are cooperating with community members to mitigate the adverse effects from the construction of the H-3 highway, including a substantial budget for protection of, public access to, and interpretation of, historical and cultural artifacts and places.

However, I am concerned that some elements of the proposed

*Conklin, H-3 testimony 1/22/08, page 1 of 6*

mitigation are themselves likely to cause adverse effects which would, in turn, need to be mitigated -- adverse effects on unity and equality in Hawaii's multicultural, multiracial society.

As is often said, an ounce of prevention is worth a pound of cure. It is in that spirit that I express the following concerns in hopes of preventing adverse social and cultural effects that would arise from a few ill-advised components of your "preliminary draft" plan.

The most troubling element of the preliminary draft is its contemplation that certain areas of Hawaii's public lands will be labeled "kapu" and that the interpretation of "kapu" by the designated management agencies ("Aha Council" and the Office of Hawaiian Affairs) will result in complete exclusion of the general public except for a few chosen individuals who will be granted access based on their racial heritage and/or religious practices

For evidence that this is a real concern, I direct your attention to page 3, "Objectives", item # 1 "Healing of the 'Aina" part (b) "implement preservation and restoration plans to protect existing resources by designating kapu areas"; and to page 5 describing the role of the 'Aha Councils; and to page 4 identifying the race-based Office of Hawaiian Affairs as having administrative authority for the mitigation program in general and especially that OHA will become Program Manager responsible for permitting the activities and public access allowed at Halawa and especially at Luluku.

Regarding OHA: Its mandate is to serve the needs of ethnic Hawaiians to the exclusion of others. It routinely gives grants for racially exclusionary programs. It has spent (literally) untold millions of dollars on propaganda and advertising for the racially exclusionary Kau Inoa program and in support of the racially exclusionary Akaka bill. It sponsors television infomercials and newspaper ads claiming that the 1.8 million acres of ceded lands

*Conklin, H-3 testimony 1/22/08, page 2 of 6*

(including about 95% of all the government lands of the State of Hawaii) belong to ethnic Hawaiians collectively as a racial group. It is grossly inappropriate to put OHA in charge of managing lands that should be accessible (or restricted) without regard to race.

The public lands of Hawaii must always remain open or restricted to all the people of Hawaii on an equal basis regardless of race and also regardless of religion.

The very first phrase in the First Amendment found in the Bill of Rights of the U.S. Constitution says "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." As it says, government shall not prohibit the free exercise of religion. Therefore those who wish to practice their religion on public lands should be allowed to do so (subject to reasonable regulation). However, the Constitution also says, in the same place, that there can be no government establishment of religion. And in the 14th Amendment the Constitution also says that each person is guaranteed the equal protection of the laws regardless of race.

Setting aside certain public lands as "kapu" and then administratively giving different amounts and kinds of access to different people based on race or religion is both illegal and immoral, because it uses government power to establish preferential treatment for one religion above others and for one race above others.

Of course there are conflicting uses for particular parcels of land, and compromises must be made to allow private cultural or religious practices at some times while guaranteeing public access at others. The National Parks have wrestled with this issue for many decades. For example, "Devil's Tower" mountain (featured in the movie "Close Encounters of the Second Kind") is sacred to a

*Conklin, H-3 testimony 1/22/08, page 3 of 6*

tribe of Indians, but is also a favorite place for skilled athletes to engage in rock climbing; and the park authorities regulate access so as to accommodate both interests on a schedule widely publicized to everyone well ahead of time.

There are some who say that anyone with a drop of Hawaiian native blood is an "indigenous person" with a special spiritual and even genetic relationship to the land. The racist Kau Inoa TV ads paid for by OHA are beamed into the living rooms of all Hawaii's people, insulting the 80% who are so unfortunate as to lack a drop of native blood.

One Kau Inoa ad features "cultural practitioner" Butch Helemano saying "Well basically, you know, being Hawaiian allows me to look at the world with a different perspective than others that aren't. In other words we can look at the sea and look at it as a place of sacredness and look at the sky as a place that we hear and look for messages so don't forget who we are and your culture cuz that's the most important thing here as a Native Hawaiian." Another Kau Inoa ad features "cultural practitioner" Vicky Holt Takamine saying "Every other people that come here to these islands have an ancestral homeland that they can go back to", as though we should all get out of Hawaii, or at least that we don't truly belong here and should not have equal status. Full text and analysis of several Kau Inoa ads can be found at <http://tinvurl.com/22ekaa>.

Certainly anyone who chooses to believe a religious tenet is free to believe it and even to proclaim it in the mass media -- even such a divisive, demeaning, and despicable belief as Butch Helemano's statement that there are inborn racial differences in the ability to perceive spiritual messages emanating from the land, sea, and sky. Anyone is free to say that this is our land and anyone lacking a drop of the magic blood should go back to

*Conklin, H-3 testimony 1/22/08, page 4 of 6*

whatever homeland their ancestors came from. But although anyone is free to hold and proclaim such racist beliefs, nobody should be allowed to enshrine them into the laws governing management of and access to our public lands. That enshrinement is exactly what the current "draft proposal" would accomplish through the authorization for "kapu lands" and the empowerment of OHA and the 'Aha Councils as managing agents.

In recent years there has been a movement to revive the old Hawaiian religion, and to use it to assert political demands. For example, we have been told that Mauna Kea is a sacred place and there should be no telescopes there; we have been told that Makua is a sacred place and there should be no military training there; we have been told that taro is the elder brother in the genealogy of ethnic Hawaiians and there should be no patenting or genetic modification of it. For a large webpage describing and analyzing the use of Hawaiian religion for political purposes, see: <http://tinurl.com/2n4hv> .

With all due respect to today's so-called "traditional practitioners" I would point out that the old religion was abolished in 1819 by order of the three most powerful leaders of the Kingdom of Hawaii -- King Liholiho Kamehameha II, Queen Ka'ahumanu (wife of Kamehameha the Great and regent for the boy King), and High Priest Hewahewa. These leaders were exercising self-determination on behalf of their people. They abolished the old religion BEFORE the American missionaries ever arrived in Hawaii. When the kapu was broken in a public ceremony and the order was given to destroy all the heiau and burn the wooden idols, a civil war broke out. The diehard deadenders defending the old religion were killed in the Battle of Kuamo'o and the issue was settled. Wasn't it?

Today's "traditional practitioners" are creating a new religion

*Conklin, H-3 testimony 1/22/08, page 5 of 6*



containing some reinvented elements of the old religion but lacking the old religion's comprehensiveness. For example, today's cultural practitioners (hopefully) do not practice human sacrifice, the death penalty for women who eat bananas or coconuts, or the exclusion of women to a separate dwelling during the days of their monthly menstrual cycle. Yet such practices were essential components of a thoroughly integrated seamless religion.

The religion of today's "traditional practitioners" has no continuity with the pre-contact old religion. It is not the religion of Hawaii's truly indigenous people; rather, it is a religion no more nor less deserving of respect or political deference than any "new age" or mainstream Western or Asian religion. Anyone is welcome to practice the newly reinvented Hawaiian religion; but nobody should be allowed to claim special privileges or land management rights based on it. In any case, no race or religion should be endowed with supremacy or governmental authority in our multiracial, multicultural society.

I object most strenuously to any kapu or system of land management and access control that would treat people differently based on race or religion. I object for myself, because I share the deep love for the 'aina and respect for the gods that is expressed by some "cultural practitioners" and because I demand for myself the same rights of expression and access they have. I also object on behalf of all the people of Hawaii -- both those with native blood and those without -- who want to be treated with equal respect under the law, in a spirit of unity and aloha. I object out of fear that the Halawa-Lulukū Interpretive Development Project will become another brick in the wall of "Hawaiian Apartheid -- Racial Separatism and Ethnic Nationalism in the Aloha State" (title of my book: see <http://tinurl.com/2a9faa> ).

*Conklin, H-3 testimony 1/22/08, page 6 of 6*

Estelle Drew  
46-313 Halualani Place  
Kaneohe, Hawaii 96744

To: HLID Office and Trustee Haunani Apoliona  
From: Estelle Drew, Ha'iku Valley resident  
Subject: Comments on Halawa-Luluku Interpretive Development Plan Project

I wish to offer my support for the HLID project, especially for Haiku Valley and our historic sites in that area.

I am 85 years old, and have lived all of my life in Haiku, ~~Haiku~~. *Heeja, Kaneohe, Koolau poke* We were born and raised there, ~~in Haiku~~ the military came in and said they had to build the navy station up mauka in our valley. *We welcomed them. We also had cultural access into the valley from the day the military moved in.*

Now that they have built a new highway through that valley, and closed down the Naval Station, they should return the land to the people. That's why I support a cultural preserve in Haiku Valley.

The highway has affected our wahi kapu, some of which we used to bury our 'ohana. It has affected the whole valley just by its presence.

This plan must fully correct the negative impact of the highway upon our valley. Please make sure there is enough funding for an educational program to teach our keiki and everyone else about the history of our people in this valley.

Mahalo.

To: Halawa-Lulukū Interpretive Development Project  
c/o Office of Hawaiian Affairs

From: Leilani Jones-Tollefsen

Subject: H-3 Interpretive & Mitigation Plan – January 2008

I support this plan regarding the adverse effects it has had on the cultural and historic areas of Ha`iku Valley, Halawa Valley, and Lulukū due to the building of the highway.

I was born and raised in Kaneohe (Ha`iku Valley) and still reside here. My parents, grandparents and their parents parent were born here too. We respect and appreciate the history and cultural part of our Valley. It has always been so very precious to us.

Since the building of the highway, our family burial sites and artifacts have been greatly disturbed. I`m concerned about this and would like to see the coast guard`s OMEGA station be habited with the artifacts to be put on display with the histories of the areas.

Ha`iku Valley has a rich history associated with it and with all the areas in the Koolaupoko that have been affected by the highway. Questions like where are you going to put all of the artifacts? Where are you going to tell the history of these lands? How are going to “interpret” the historic sites?

These questions should be answered. Hopefully one day soon the planning of making this happen will take place.

Thank you for allowing me the opportunity to express my feelings.



## KO'OLAUPOKO HAWAIIAN CIVIC CLUB

January 22, 2008

Mr. Kina Akana  
Halawa-Luluku Interpretive Development Project  
Honolulu, HI 96813

Re: Comment on HLID Plan

Dear Mr. Akana:

The Ko'olaupoko Hawaiian Civic Club strongly supports a comprehensive cultural mitigation plan for the lands affected by interstate H-3 freeway project and wish to voice our support for all the mitigation measures requested by your Working Group in this plan.

We would also like to have more information on the interpretive aspect of this plan, and ask clarification as to what laws and parameters governed this project. We would appreciate a detailed response on these questions.

For your information, our civic club specifically voted in support of the establishment of the Ha'iku Valley Cultural Preserve portion of this plan.

Mahalo for this opportunity to comment.

Me kealoha pumehana,

MANEALANI CYPHER

President

P. O. Box 664  
Kaneohe, HI 96744  
Ph. (808) 235-8111  
koolaupokohcc.org

To: Halawa-Luluku Interpretive Development Project  
c/o Office of Hawaiian Affairs

From: Ilona Lopes

Subject: H-3 Interpretive & Mitigation Plan – January 2008

I was born and raised Kaneohe, and now live in Waianae but my ties and heritage still hold strong as Kaneohe (Ha`iku)is and always have been my roots. As I have aged, I've come to respect and appreciate the history of Ha`iku.

Because of the bad impacts these lands have had since the highway was built, much of our historical and family burial grounds were disturbed by far. Many precious items were removed from this land.

I'm really concerned about what's going to happen with Ha`iku Valley. I hope there will be enough money to fund this project that your group called for.

Because Ha`iku Valley is where I used to swim in the ponds and rivers that flowed from the Mountains, it is so precious to me and numerous other family members of mine. The highway has really caused a lot of disturbance to the area and to our kupuna burial sites.

There is so much to be answered with all the areas in the Koolaupoko being affected. I would like to see the OMEGA station in Ha`iku Valley be used to house all of the artifacts that was removed from the area when the highway was being built. What was once disturbed can be put back in place in Ha`iku Valley (Coast Guard Omega Station) which is now vacant.

I understand billions of dollars was spent on the highway. I'm sure there would be enough money to do the right thing to help this Valley heal and put back all that was once disturbed and removed.

Thank you for this opportunity to offer my feelings on this matter.

# Luluku Farmers' Association

45-559C Luluku Road  
Kane'ohe, HI 96744  
(808) 330-3277

January 22, 2008

HLID Working Group  
677 Ala Moana Blvd, Suite 811  
Honolulu, HI 96813

RE: Statement from Luluku Farmers' Association

Aloha kakou,

Luluku Farmers' Association ("LFA") is submitting this letter asking support from the working group that the adverse affects from the construction of the H-3 to the farmers' association and the most recent condemnation of ten acres of agricultural land leased by the LFA be recognized. The LFA is asking that any *kuleana* of the responsible parties involved, such as the Federal Highways Administration ("FHWA") and the Department of Transportation ("DOT"), that theses concerns be recognized and addressed.

The LFA is in support of the Halawa, Haiku and Luluku restoration projects. You will find that our goals, objectives and commitment to serve the community runs parallel to this project in many ways. It is our hope that relationships and partnerships that come forth from this project will help us all to accomplish our goals efficiently and in a way that is *pono*. It is not our wish to disrupt any of the working group's goals and objectives but to have it be recognized and stated that the LFA has been and continues to be adversely affected by the construction of the H-3.

Mahalo,

Luluku Farmers' Association

## APPENDIX C

## References

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## APPENDIX C

## References

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APPENDIX D  
Expenditure Summary – Phasing Plan by Focus Areas

APPENDIX B

2008 Final IDP

EXPENDITURE SUMMARY - PHASING PLAN BY FOCUS AREAS  
 HALAWA-LUKUKU INTERPRETIVE DEVELOPMENT PLAN  
 December 12, 2008

HALAWA VALLEY			Phase No. 1 (FY 2010)				Phase No. 2 (FY 2011)				Phase No. 3 (FY 2012)				Phase No. 4 (FY 2013)			
Proj. No.	Project Title	Total Project Cost	Phase No. 1 Cost	Design (10%)	Construction Management 15%	Total Phase 1 Cost + 15% Contingency	Phase No. 2 Cost	Design (10%)	Construction Management 15%	Total Phase 2 Cost + 15% Contingency	Phase No. 3 Cost	Design (10%)	Construction Management 15%	Total Phase 3 Cost + 15% Contingency	Phase No. 4 Cost	Design (10%)	Construction Management 15%	Total Phase 4 Cost + 15% Contingency
1	Gate beyond 3rd gate control arch. signs	\$2,875	\$2,000	\$200	\$300	\$2,875												
2	Banyan removal at Hale o Pepe	\$7,188	\$5,000	\$500	\$750	\$7,188												
3	Composting toilets at Hale o Pepe 2 ea @ \$5,000 ea.	\$14,375	\$10,000	\$1,000	\$1,500	\$14,375												
4	Prepare educational displays (e.g. poster art) on freeway pCans telling real story of the destruction brought about by H-3. Interactive displays - audio visual	\$71,875	\$20,000	\$2,000	\$3,000	\$28,750	\$20,000	\$2,000	\$3,000	\$28,750	\$10,000	\$1,000	\$1,500	\$14,375				
5	Ironwood trees removal at Hale o Pepe	\$17,250	\$12,000	\$1,200	\$1,800	\$17,250												
6	Road with Fence from Entry to 1st Gate	\$0	\$0	\$0	\$0	\$0												
7	Potable water system from Halawa Rd	\$910,800	\$633,600	\$63,360	\$95,040	\$910,800												
8	Nursery 15-20,000 s.f.	\$2,158,250	\$1,500,000	\$150,000	\$225,000	\$2,158,250												
9	Terrace Wall Restoration at Hale o Pepe	\$575,000	\$400,000	\$40,000	\$60,000	\$575,000												
10	Stream clearing and trash removal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
28	Misc Signs (e.g. Kapu, No Entry)	\$7,188	\$2,000	\$200	\$300	\$2,875	\$1,000	\$100	\$150	\$1,438	\$1,000	\$100	\$150	\$1,438	\$1,000	\$100	\$150	\$1,438
11	Resource center -hāhau (30 x 60) @ Hale o Pepe	\$846,875					\$450,000	\$45,000	\$67,500	\$846,875								
12	Solar collectors for power at Hale o Pepe	\$43,125					\$30,000	\$3,000	\$4,500	\$43,125								
13	Rock wall repair & upright rock Hale o Pepe	\$28,750					\$20,000	\$2,000	\$3,000	\$28,750								
14	Tree removal on arch. site (various)	\$71,875					\$50,000	\$5,000	\$7,500	\$71,875								
15	Walking Path along stream from Halawa Rd	\$455,400					\$316,800	\$31,680	\$47,520	\$455,400								
16	Caretakers home @ 1,800 SF X \$300/ s.f.						\$0	\$0	\$0	\$0								
17	Non-potable irrigation and 5000 gal. tank	\$915,831					\$637,100	\$63,710	\$95,565	\$915,831								
18	Parking Area @ \$5,000/sqft X 30 stalls	\$215,625					\$150,000	\$15,000	\$22,500	\$215,625								
27	Storage for equipment and supplies	\$14,375					\$5,000	\$500	\$750	\$7,188	\$5,000	\$500	\$750	\$7,188				
19	Restore native species in North Halawa Valley; Formulate program for the reforestation of native plants in North Halawa Valley	\$71,875									\$50,000	\$5,000	\$7,500	\$71,875				
20	Visitor Center at Halawa Road 4,000 +/- s.f.	\$2,300,000									\$1,800,000	\$180,000	\$240,000	\$2,300,000				
21	Kitchen for Visitor Center 1000 s.f. x 500										\$0	\$0	\$0	\$0				
22	Acquire "chipper"															\$0	\$0	\$0
23	Camping area, with composting toilets, for spiritual, religious and cultural practice (to be determined)	\$28,750													\$20,000	\$2,000	\$3,000	\$28,750
24	Quince grass control-eradication	\$71,875													\$50,000	\$5,000	\$7,500	\$71,875
25	Non-potable well (to be determined)	\$431,250													\$300,000	\$30,000	\$45,000	\$431,250
26	Construct education Center in North Halawa Valley at Bridge 17, program facility to accommodate 50-60 persons in classroom environment utilizing hāhau type structures with electricity (solar)	\$1,868,750													\$1,300,000	\$130,000	\$195,000	\$1,868,750
<b>HALAWA TOTALS</b>		<b>\$10,927,156</b>	<b>\$2,584,600</b>	<b>\$258,460</b>	<b>\$387,690</b>	<b>\$3,715,363</b>	<b>\$1,679,900</b>	<b>\$167,990</b>	<b>\$251,985</b>	<b>\$2,414,856</b>	<b>\$1,666,000</b>	<b>\$166,600</b>	<b>\$249,800</b>	<b>\$2,394,875</b>	<b>\$1,671,000</b>	<b>\$167,100</b>	<b>\$250,650</b>	<b>\$2,402,063</b>

LULUKU AGRICULTURAL TERRACES

Proj. No.	Project Title	Total Project Cost	Phase No. 1 Cost	Design (10%)	Construction Management 15%	Total Phase 1 Cost + 15% Contingency	Phase No. 2 Cost	Design (10%)	Construction Management 15%	Total Phase 2 Cost + 15% Contingency	Phase No. 3 Cost	Design (10%)	Construction Management 15%	Total Phase 3 Cost + 15% Contingency	Phase No. 4 Cost	Design (10%)	Construction Management 15%	Total Phase 4 Cost + 15% Contingency
1	Access A/C road from Lulukū Road + drainage + EC	\$1,423,125	\$990,000	\$99,000	\$148,500	\$1,423,125												
2	Access Road (Clear&Grub) 4 ac	\$34,500	\$24,000	\$2,400	\$3,600	\$34,500												
3	Parking Area 15 cars @ 5000' C&G and Gravel + EC	\$107,813	\$75,000	\$7,500	\$11,250	\$107,813												
4	Construct a ford across stream for light trucks	\$718,750	\$500,000	\$50,000	\$75,000	\$718,750												
5	Hazardous material evaluation for dump site	\$14,375	\$10,000	\$1,000	\$1,500	\$14,375												
6	"Chipper"		\$0	\$0	\$0	\$0												
7	Tractor - (2)er - small		\$0	\$0	\$0	\$0												
8	Loi wall and stone restoration	\$1,518,000	\$1,058,000	\$105,600	\$158,400	\$1,518,000												

9	Loi restoration - irrigation water 4" and 2" mains	\$4,600,000	\$1,600,000	\$160,000	\$240,000	\$2,300,000	\$1,600,000	\$160,000	\$240,000	\$2,300,000									
10	Develop Interpretive signs and storyboards under covered hiisu.	\$7,188					\$5,000	\$500	\$750	\$7,188									
11	Utility and storage bldg or container 20 X 30	\$172,500									\$120,000	\$12,000	\$18,000	\$172,500					
12	Visitor Complex	\$0																	
	A. Resource Center @ 1000 sf covered area with storage	\$359,375									\$250,000	\$25,000	\$37,500	\$359,375					
	B. Visitor center display boards 2 to 3 boards 4x8'	\$7,188									\$5,000	\$500	\$750	\$7,188					
	C. Maintenance shed 20 X 40	\$460,000					\$320,000	\$32,000	\$48,000	\$460,000									
	D. Visitor Center 3,500 s.f.	\$1,257,813									\$875,000	\$87,500	\$131,250	\$1,257,813					
	E. Commercial kitchen (1000 sf with storage and equipment)	\$0									\$0	\$0	\$0	\$0					
	F. Off-On-site power and potable water	\$359,375					\$250,000	\$25,000	\$37,500	\$359,375									
13	Irui site with water	\$7,188									\$5,000	\$500	\$750	\$7,188					
14	Hi relocation site (clear, grub, drainage)	\$8,625									\$8,000	\$600	\$900	\$8,625					
15	Vegetation - develop restoration program and maintenance program for native plants	\$71,875													\$50,000	\$5,000	\$7,500	\$71,875	
16	Land acquisition, approx. 15 acres to be added to Parcel 20 to Luku Stream	\$4,312,500									\$1,500,000	\$150,000	\$225,000	\$2,158,250	\$1,500,000	\$150,000	\$225,000	\$2,158,250	
	<b>LULUKU TOTALS</b>	<b>\$15,440,188</b>	<b>\$4,255,000</b>	<b>\$425,500</b>	<b>\$638,250</b>	<b>\$6,116,563</b>	<b>\$2,175,000</b>	<b>\$217,500</b>	<b>\$326,250</b>	<b>\$3,126,563</b>	<b>\$2,761,000</b>	<b>\$276,100</b>	<b>\$414,150</b>	<b>\$3,968,938</b>	<b>\$1,550,000</b>	<b>\$155,000</b>	<b>\$232,500</b>	<b>\$2,228,125</b>	
		\$15,440,188				\$6,116,563				\$3,126,563				\$3,968,938				\$2,228,125	

KUKUI O KANE

Proj. No.	Project Title	Total Project Cost	Phase No. 1 Cost	Design (10%)	Construction Management 15%	Total Phase 1 Cost + 15% Contingency	Phase No. 2 Cost	Design (10%)	Construction Management 15%	Total Phase 2 Cost + 15% Contingency	Phase No. 3 Cost	Design (10%)	Construction Management 15%	Total Phase 3 Cost + 15% Contingency	Phase No. 4 Cost	Design (10%)	Construction Management 15%	Total Phase 4 Cost + 15% Contingency
1	Decel lane 500 ft @\$500 lf					\$0				\$0								
2	Pedestrian Path Gravel 8 ft x 3000 ft x 25'w					\$0				\$0								
3	Parking Area 3 cars @ \$5000 ea.					\$0				\$0								
4	Accel lane 600 ft @\$500 lf					\$0				\$0								
5	Topographic survey 2 ac @ \$3500/ac					\$0				\$0								
	<b>KUKUI O KANE TOTAL</b>	<b>\$0</b>				<b>\$0</b>				<b>\$0</b>								

HAIKU VALLEY

Proj. No.	Project Title	Total Project Cost	Phase No. 1 Cost	Design (10%)	Construction Management 15%	Total Phase 1 Cost + 15% Contingency	Phase No. 2 Cost	Design (10%)	Construction Management 15%	Total Phase 2 Cost + 15% Contingency	Phase No. 3 Cost	Design (10%)	Construction Management 15%	Total Phase 3 Cost + 15% Contingency	Phase No. 4 Cost	Design (10%)	Construction Management 15%	Total Phase 4 Cost + 15% Contingency
1	Archaeological Inventory Survey, Interim Site Preservation Plan and Cultural Impact Assessment (Sites 332 & 333)			\$0	\$0	\$0												
2	Interim site preservation (site stabilization, site protection by fencing, and vegetation removal) to protect site #332 & 333)			\$0	\$0	\$0												
3	Preparation of site preservation plan (to include site stabilization and restoration, as required)							\$0	\$0	\$0								
4	Implement Preservation Plan (estimate)										\$0	\$0	\$0					
5	Secure Omega Station from vandalism (secure ground level doors and entry points and 2nd level entry doors)			\$0	\$0	\$0												
6	Clear debris from interior and exterior of Omega Station			\$0	\$0	\$0												
7	Re-establish power and water to Omega Station (3500 ft) + facility charges (@\$50,000)							\$0	\$0	\$0								
8	Interior renovation of ground floor Omega Station (lighting, windows, doors, flooring-elec.) @\$250/ft (no a/c)										\$0	\$0	\$0					
9	Resurface parking area @\$20/sy															\$0	\$0	\$0
10	Landscaping of building exterior															\$0	\$0	\$0
11	Second floor renovation 7236 s.f. (prep, vertical access plan)															\$0	\$0	\$0
	<b>HAIKU TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

TOTALS BY PHASE	Total Project Cost	Phase No. 1 Cost	Design (10%)	Construction Management 15%	Total Phase 1 Cost + 15% Contingency	Phase No. 2 Cost	Design (10%)	Construction Management 15%	Total Phase 2 Cost + 15% Contingency	Phase No. 3 Cost	Design (10%)	Construction Management 15%	Total Phase 3 Cost + 15% Contingency	Phase No. 4 Cost	Design (10%)	Construction Management 15%	Total Phase 4 Cost + 15% Contingency
	\$26,367,344	\$6,839,600	\$683,960	\$1,025,940	\$9,831,925	\$3,654,900	\$385,490	\$578,235	\$5,541,419	\$4,427,000	\$442,700	\$664,050	\$6,383,813	\$3,221,000	\$322,100	\$483,150	\$4,630,188

APPENDIX E

Minutes of the Board of Trustee, Office of Hawaiian Affairs, April 3, 2008

PHONE (808) 594-1888

FAX (808) 594-1865

## BOARD OF TRUSTEES

Haunani Apoliona, Chairperson  
 Walter M. Heen, Vice-Chairperson  
 Rowena Akana, Trustee At-Large  
 Donald B. Cataluna, Kaaui/Niihau Trustee  
 Robert K. Lindsey, Jr., Hawaii Trustee  
 Colette Y. Machado, Molokai/Lana'i Trustee  
 Boyd P. Mossman, Maui Trustee  
 Oswald Stender, Trustee At-Large  
 John Waihe'e IV, Trustee -at-Large

LIEUTENANT GOVERNOR'S  
OFFICE

**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
 711 KAPI'OLANI BOULEVARD, SUITE 500  
 HONOLULU, HAWAII 96813

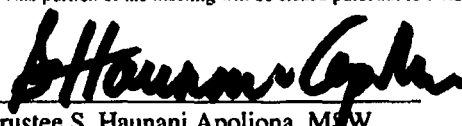
'08 MAR 27 AM 10:08

**MEETING OF THE BOARD OF TRUSTEES****DATE:** Thursday, April 3, 2008 **TIME:** 10:00 a.m.**PLACE:** OHA Board Room, Suite 500**AGENDA**

- I. Call to Order
- II. Approval of Minutes
  - A. March 20, 2008
- III. Community Concerns\*
- IV. Unfinished Business
  - A. Administrator's Update on Ho'oulu Lāhui Aloha and OHA Activities
- V. New Business
  - A. Committee on Beneficiary Advocacy and Empowerment
    1. OHA Legislative Positions (April 2, 2008)
    2. BAE 08-06: Preliminary Draft of the Halawa-Lulukou Interpretive Development Plan
  - B. Resolution Honoring the life of Raymond Kaleoalohapoinaolehelemanu Kane
- VI. Beneficiary Comments\*
- VII. Executive Session\*\*
  - A. Legal advisory by Board attorneys Patton Boggs, LLC., Re: questions and issues pertaining to Board's powers, duties and responsibilities under its S.310 initiative. *Pursuant to HRS 92-5 (a)(4). By teleconference call at 10:15 a.m.*
  - A. Attorney-Client legal advisory by OHA Attorney Jon Van Dyke, Esquire, Re: questions and issues pertaining to Board's duties, rights, obligations and liabilities with respect to the Molokai Water Case – Kukui (Molokai), Inc. *Pursuant to HRS 92-5(a)(4).*
  - B. Attorney-Client legal advisory by OHA's Board Counsel and Attorney William Meheula, Esquire, Re: questions and issues pertaining to the Board's rights and obligations with respect to ceded lands. *Pursuant to HRS 92-5(a)(4).*
  - C. Approval of Executive Session minutes of: 3/20/08.
- VIII. Announcements/FYI
- IX. Adjournment

\*NOTICE: Persons wishing to provide testimony are requested to submit 10 copies of their testimony to the Administrator, at 711 Kapi'olani Blvd., Suite 500, Honolulu, HI. 96813 or fax to 594-1865, 48 hours prior to the scheduled meeting. Testimony may be faxed through neighbor island offices. Persons wishing to testify orally may do so at the meeting, provided that oral testimony shall be limited to five minutes.

\*\*This portion of the meeting will be closed pursuant to HRS 92-4 and 92-5. For further information, please call 594-1886.

  
 Trustee S. Haunani Apoliona, M.A.  
 Chairperson, Board of Trustees

March 25, 2008  
 Date

**State of Hawai'i  
Office of Hawaiian Affairs  
711 Kapi'olani Blvd., Suite 500  
Honolulu, HI 96813**

**Minutes of the Office of Hawaiian Affairs Board of Trustees  
Thursday, April 3, 2008**

**I. Call to Order**

The meeting of the Office of Hawaiian Affairs Board of Trustees was called to order by Chairperson Apoliona at 10:00 a.m. Those present were as follows:

Trustee Haunani Apoliona, BOT Chairperson	
Trustee Walter M. Heen, BOT Vice-Chairperson	
Trustee Rowena Akana	Arrived at 10:05 a.m.
Trustee Donald B. Cataluna	
Trustee Robert K. Lindsey	Excused
Trustee Colette Y. Machado	
Trustee Boyd P. Mossman	Arrived at 10:05 a.m.
Trustee Oswald Stender	
Trustee John Waihe'e IV	Arrived at 10:05 a.m.
Clyde Namu'o, OHA Administrator	
Robert Klein, BOT Attorney	Excused
Lisa Cataldo, Esq.	In for Klein

**Staff Present**

Nathan Takeuchi, Trustee Aide	Malia Schneider, Trustee Aide
Winona Rubin	Bobbi Ray, Trustee Aide
Melissa Beimes, Trustee Aide	Lei-Ann Durant, Trustee Aide
Crayn Akina, Trustee Aide	Winona Gaison, Trustee Aide
Marion Shim, Trustee Aide	Kira Higa, Trustee Secretary
Kina Akana, HLID	Albert Tiberi, LS
Dean Mark, OBS	Ernest Kimoto, LS
Grant Arnold, NRLC	Hau'oli Akaka, EDN
Jim McMahon, LS	Jonathan Scheuer, LM
Kai Markell, NRLC	Merlyn Akuna, ADM
Mona Bernardino, ADM	Nola Ota
Stanton Enomoto, ADM	
Martha Ross, Washing DC Bureau	

**Guest Present**

William Meheula, Esq.  
Jon Van Dyke, Esq.  
Darryl Nirenberg, Esq.  
Larry Roberts, Esq.

**Community Present**

None

Chairperson Apoliona called the meeting to order at 10:00 a.m. For the record, Vice-Chair Heen, Trustees Cataluna, Machado, Stender, and Chairperson Apoliona were present, constituting a quorum to begin



business. Trustee Lindsey requested to be excused. Chairperson Apoliona requested a motion to waive the 72-hour rule on agenda items V.A.1. and 2.

**Motion**

Trustee Machado:

I would like to move waiving the 72-hour rule for items V. New Business A. Committee on Beneficiary Advocacy and Empowerment 1. OHA Positions and 2. BAE 08-06: Preliminary Draft of the Halawa-Luluku Interpretive Development Plan.

Trustee Cataluna:

Second.

There was no discussion on the motion; Chairperson Apoliona called for a roll call vote.

TRUSTEE	1	2	'AE (YES)	A'OLE (NO)	KANALUA (ABSTAIN)	EXCUSED
TRUSTEE ROWENA AKANA						Not Present at Vote
TRUSTEE DONALD CATALUNA		2	Yes			
TRUSTEE WALTER HEEN			Yes			
TRUSTEE ROBERT LINDSEY						Excused
TRUSTEE COLETTE MACHADO	1		Yes			
TRUSTEE BOYD MOSSMAN						Not Present at Vote
TRUSTEE OSWALD STENDER			Yes			
TRUSTEE JOHN WAIHE'E IV						Not Present at Vote
CHAIRPERSON HAUNANI APOLIONA			Yes			
<b>TOTAL VOTE COUNT</b>			5	0	0	3

MOTION:  UNANIMOUS  PASSED  DEFERRED  FAILED  FILED

Motion is approved.

Chairperson Apoliona requested a motion to approve the minutes for March 20, 2008.

**II. Approval of Minutes**

**A. March 20, 2008**

**Motion**

Trustee Machado: Madame Chair, I would like to move to approve the Board of Trustees meeting minutes for March 20, 2008.

Trustee Cataluna: Second.

There was no discussion on the motion; Chairperson Apoliona called for a roll call vote.

TRUSTEE	1	2	'AE (YES)	A'OLE (NO)	KANALUA (ABSTAIN)	EXCUSED
TRUSTEE ROWENA AKANA						Not Present at Vote
TRUSTEE DONALD CATALUNA		2	Yes			
TRUSTEE WALTER HEEN			Yes			
TRUSTEE ROBERT LINDSEY						Excused
TRUSTEE COLETTE MACHADO	1		Yes			
TRUSTEE BOYD MOSSMAN						Not Present at Vote
TRUSTEE OSWALD STENDER			Yes			
TRUSTEE JOHN WAIHE'E IV						Not Present at Vote
CHAIRPERSON HAUNANI APOLIONA			Yes			
<b>TOTAL VOTE COUNT</b>			<b>5</b>	<b>0</b>	<b>0</b>	<b>3</b>

MOTION:  UNANIMOUS  PASSED  DEFERRED  FAILED  FILED

Minutes are approved as circulated.

**III. Community Concerns**

None

**IV. Unfinished Business**

**A. Administrator's Update on Ho'oulu Lāhui Aloha and OHA Activities**

Administrator Namu'o requested this time to present a brief update on the Hana Market Place project. Administrator Namu'o summarized the project, informing the Board that this is a long standing project with Administration trying to bring resolution to the matter of an EDA (Economic Development Administration) grant which OHA guaranteed. The amount of the grant is approximately \$1.6 million dollars with the stipulation that if the project was not completed, OHA would guarantee the grant which was provided to the non-profit Hina Malailena. Administrator Namu'o requested Albert Tiberi, OHA Staff Attorney to present a brief report.

Mr. Tiberi reported that OHA is still waiting for a response from the EDA, in which OHA identified a possible resolution. An appraisal was submitted to the EDA, 9 months ago last July with no response to date. Included with the appraisal were release documents to free the EDA's interest from this project. The release would include removing EDA's oversight on the project and allow OHA or another party to pursue the project without any EDA oversight. Administrator Namu'o stated that once the response comes in from the EDA, he could offer more options for Trustees to consider in the near future.

Trustee Akana asked a few questions related to Senator Inouye's letter, the statute of limitations on the grant and the involvement with the church, relating to the issue of back rents. Mr. Tiberi stated he will circulate a letter of support from Senator Inouye, requested by OHA for help with the EDA. Secondly, the statute of limitation on such a project is 10 years once the project is completed and that remains an issue that needs further addressing. With respect to the church, their expectations are that all back issues be resolved including the back rents.

Vice-Chair Heen stated he was very disturbed by the time frame this project has taken and expressed great interest that OHA find a resolution immediately. Chairperson Apoliona requested Mr. Tiberi to brief Vice-Chair Heen on the history on the matter and requested Administration to prepare for an update on the matter at the May Board of Trustees meeting.

Chairperson Apoliona requested a motion to resolve into Executive Session pursuant to HRS 92-5(a)(4) to consult with the Board's attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities and liabilities.

**Motion**

Trustee Machado:

So moved Madame Chair. **(to resolve into Executive Session pursuant to HRS 92-5(a)(4) to consult with the Board's attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities and liabilities).**

Vice-Chair Heen: **Second.**

There was no discussion or objections to the motion; all members present voted "aye" to resolve into Executive Session.

**The Board resolved into Executive Session at 10:18 a.m.**

**VII. Executive Session**

**A. Legal advisory by Board attorneys Patton Boggs, LLC, Re: questions and issues pertaining to the Board's powers, duties and responsibilities under its S.310 initiative. Pursuant to HRS 92-5(a)(4). By teleconference call at 10:15 a.m.**

**The Board reconvened into Open Session at 11:08 a.m.**

Chairperson Apoliona continued with open session business and requested a motion for item V.A.1.

**V. New Business**

**A. Committee on Beneficiary Advocacy and Empowerment**

**1. OHA Legislative Positions (April 2, 2008)**

**Motion**

Trustee Machado: Madame Chair, your Committee on Beneficiary Advocacy and Empowerment, having met on April 2, 2008, and after full and free discussion, recommends approval of the following action:

**Motion to approve Administration's recommendations for OHA 2008 legislative positioning and position changes on the matrix dated April 2, 2008, as follows:**

Resolution No.	Titles	Pos
<b><u>HB2807 HD2 SD1</u></b>	Important Agricultural Lands; Tax Incentives -TSUJI	<b>SA</b>
<b><u>HCR032</u></b>	ENCOURAGING DEPARTMENT OF EDUCATION SCHOOLS TO UTILIZE THE SERVICES OF VOLUNTEER HAWAII TO INCREASE COMMUNITY AWARENESS, SUPPORT, AND INVOLVEMENT - MIZUNO	<b>S</b>
<b><u>HCR035</u></b>	REQUESTING THE STATE AND COUNTIES TO COMPILE AN INVENTORY OF ABANDONED, EXCESS, AND UNDERUTILIZED PROPERTIES UNDER THEIR RESPECTIVE JURISDICTION - MIZUNO	<b>S</b>
<b><u>HCR037</u></b>	Teen Pregnancy; Keiki Caucus -KEIKI	<b>S</b>
<b><u>HCR038</u></b>	RECOMMENDING THAT FINE ARTS BE A HIGH SCHOOL GRADUATION REQUIREMENT - MIZUNO	<b>S</b>
<b><u>HCR048</u></b>	Department of Education management review - FINNEGAN	<b>M</b>
<b><u>HCR055</u></b>	AUTHORIZING THE LEASE OF EASEMENT COVERING PORTION OF SUBMERGED LANDS AT HONOULIULI, EWA, OAHU, FOR	<b>O</b>

	DRAINAGE CHANNEL PURPOSES - SAY (BR)	
<b>HCR063</b>	Renewable Energy Land Classification Study -KARAMATSU	S
<b>HCR088</b>	Commemorating Queen Liliuokalani's Birthday -BERG	S
<b>HCR097</b>	Language Access Month -FILIPINO	S
<b>HCR119</b>	University of Hawaii; Public Health - LEE	SA
<b>HCR122</b>	Hawaiian Language; Hawaii State Teacher Standards-BERG	S
<b>HCR125</b>	Condominium Leasehold Expirations; Affordable Housing; Auditor-	S
<b>HCR126 HD1</b>	Anger Management; BOE Programs (HD 1) - TAKAMINE	S
<b>HCR149</b>	Hawaii Public Housing Authority; Request for Proposals - SHIMABUKURO	S
<b>HCR149</b>	Hawaii Public Housing Authority; Request for Proposals - SHIMABUKURO	S
<b>HCR151</b>	State and county environmental assessment process exemption for easements and right-of-ways - HERKES	O
<b>HCR152</b>	Auditor - HERKES	S
<b>HCR157</b>	UH-Hilo; Graduate Degree Program; Cultural Resource Management -	S
<b>HCR161</b>	Special Education; Rights of Parents-AWANA	S
<b>HCR172</b>	Punchbowl Homes; HPHA; Auditor - LUKE	S
<b>HCR190</b>	Shelter Admission; Youth Services; Child Welfare Services; Study -	S
<b>HCR214</b>	Performance Audit of Private Mainland Prisons - M. OSHIRO	S
<b>HCR215</b>	Kukui Gardens and Mayor Wright Homes; Development; Master Plan -	S
<b>HCR219</b>	Kawai Nui Marsh; Ho'olaulima ia Kawai Nui - CHONG	SA
<b>HCR220</b>	Urging the transfer of Pu'u o Kapolei to the DLNR Historic Preservation Division - AWANA	SA
<b>HCR226</b>	Health Professional Shortage Areas; John A. Burns School of Medicine -	NC
<b>HCR238</b>	REQUESTING THE OFFICE OF LANGUAGE ACCESS TO CONDUCT A FEASIBILITY STUDY ON ESTABLISHING A STATEWIDE CENTRALIZED LANGUAGE ACCESS RESOURCE CENTER - MIZUNO (BR)	S
<b>HCR243</b>	Ornamental Reef Fish; Administrative Rules; Creation - MCKELVEY	S
<b>HCR245</b>	Urge Cruise Industry to Participate in Cruise Industry Study - YAMANE	S
<b>HCR248</b>	Ala Wai Watershed; Conservation Land Trust - SAY	S
<b>HCR258</b>	Vegetation overgrowth; Kahala Beach; plan and coordination -	S
<b>HCR262</b>	Waikiki Marine Life Conservation District and surrounding areas; enhance sustainability - NISHIMOTO (BR)	S
<b>HCR263</b>	Study of Environmental Review Process - MORITA	S
<b>HCR264</b>	Hawaii State Geological Survey - MORITA	S
<b>HCR277</b>	Center for Nursing; Supply - LEE	SA
<b>HCR283</b>	Kuleana lands; amendment of law; study - TOKIOKA	SA
<b>HCR291</b>	Historic Preservation Division; Hawaii Heritage List - CHING	S
<b>HCR347</b>	DLNR; Rules; Ornamental Reef Fishery Industry - ITO	SA
<b>HCR365</b>	East Maui; Traditional Riparian Rights - CARROLL	S
<b>SCR003</b>	AUTHORIZING THE LEASE OF EASEMENT COVERING PORTION OF SUBMERGED LANDS AT HONOULIULI, EWA, OAHU, FOR DRAINAGE CHANNEL PURPOSES - HANABUSA (BR)	O
<b>SCR007 SD1</b>	Abandoned and Underutilized Public Property; Human Services -	S
<b>SCR017</b>	Ornamental Reef Fish; Administrative Rules; Creation-BAKER	S

<b>SCR028</b>	Teen Pregnancy; Keiki Caucus - CHUN OAKLAND	<b>S</b>
<b>SCR029 SD1</b>	Keiki Caucus - CHUN OAKLAND	<b>S</b>
<b>SCR030</b>	Keiki Caucus - CHUN OAKLAND	<b>S</b>
<b>SCR050</b>	Renewable Energy Land Classification Study -	<b>S</b>
<b>SCR060</b>	State Payroll; Efficiency Study -NISHIHARA	<b>S</b>
<b>SCR061</b>	Hawaii Public Housing Authority; Request for Proposals - CHUNOAKLAND	<b>S</b>
<b>SCR064</b>	Language Access Month - CHUN OAKLAND	<b>S</b>
<b>SCR066</b>	State and county environmental assessment process exemption for easements and right-of-ways - KOKUBUN	<b>O</b>
<b>SCR089</b>	Leasehold Conversion; Affordable Housing; Auditor Report-	<b>S</b>
<b>SCR091</b>	Department of Education management review - HEMMINGGS	<b>O</b>
<b>SCR092</b>	Special Education; Rights of Parents - CHUN OAKLAND	<b>S</b>
<b>SCR094</b>	University of Hawaii; Public Health - BAKER	<b>SA</b>
<b>SCR106</b>	Shelter Admission; Youth Services; DHS; Study - CHUN OAKLAND	<b>S</b>
<b>SCR110</b>	Anger Management; DOE Programs -SAKAMOTO	<b>S</b>
<b>SCR122</b>	Hawaiian Language; Hawaii State Teacher Standards -SAKAMOTO	<b>S</b>
<b>SCR127</b>	Maui North Shore Heritage Park; Legacy Lands - TSUTSUI	<b>S</b>
<b>SCR128</b>	Punchbowl Homes; HPHA; Auditor - FUKUNAGA	<b>S</b>
<b>SCR136</b>	Auditor - KOKUBUN	<b>S</b>
<b>SCR138 SD1</b>	Financial and Management Audit; Office of Hawaiian Affairs	<b>O</b>
<b>SCR141</b>	Haleakala Trail - SLOM	<b>S</b>
<b>SCR147</b>	Kawai Nui Marsh; Ho'olaulima ia Kawai Nui - TOKUDA	<b>SA</b>
<b>SCR152</b>	Kukui Gardens and Mayor Wright Homes; Development; Master Plan -	<b>S</b>
<b>SCR202</b>	Richardson School of Law to conduct study of Adult Carehomes-IHARA	<b>S</b>
<b>SCR206</b>	Commemorating Queen Liliuokalani's Birthday - ENGLISH	<b>S</b>

**Policy Matters**

Bill Numbers	Bill Titles	Pos
<b>HCR174 HD1</b>	Task Force; Native Hawaiian Child Custody Proceedings/OHA -	
<b>SCR133 SD1</b>	DHS Task Force; Native Hawaiian Child Custody Proceedings/OHA -	
<b>HCR345</b>	Televised Meetings; Office of Hawaiian Affairs - ITO	

**Position Changes**

Bill Numbers	Bill Titles	Pos
<b>HB1968 HD1</b>	Sunshine Law; Public Meetings; Board Members -SONSON	<b>SA-O</b>

Trustee Mossman: **Second.**

There was no discussion on the motion; Chairperson Apoliona called for a roll call vote.

TRUSTEE	1	2	'AE (YES)	A'OLE (NO)	KANALUA (ABSTAIN)	EXCUSED
TRUSTEE ROWENA <b>AKANA</b>			<b>Yes</b>			

TRUSTEE DONALD	CATALUNA			Yes			
TRUSTEE WALTER	HEEN			Yes			
TRUSTEE ROBERT	LINDSEY						Excused
TRUSTEE COLETTE	MACHADO	1		Yes			
TRUSTEE BOYD	MOSSMAN		2	Yes			
TRUSTEE OSWALD	STENDER			Yes			
TRUSTEE JOHN	WAIHE'E IV			Yes			
CHAIRPERSON HAUNANI	APOLIONA			Yes			
TOTAL VOTE COUNT				8	0	0	1

MOTION:  UNANIMOUS  PASSED  DEFERRED  FAILED  FILED

Motion is approved.

**2. BAE 08-06: Preliminary Draft of the Halawa-Luluku Interpretive Development Plan**

**Motion**

Trustee Machado:

Madame Chair, your Committee on Beneficiary Advocacy and Empowerment, having met on April 22, 2008, and after full and free discussion, recommends approval of the following action:

**Motion to accept and approve the Preliminary Draft of the Halawa-Luluku Interpretive Development Plan and recommend approval by the State Department of Transportation.**

Trustee Mossman:

**Second.**

Trustee Stender thanked Kahikina Akana, HLID Manager, for his report. Trustee Stender suggested a more consistent report format be used rather than varying styles; in addition, pointed out a few arithmetic errors. Finally, Trustee Stender suggested he prepare a budget with regards to the bunker becoming a museum since the topic keeps being raised. Administrator Namu'o responded that a preliminary cost has been projected to be within \$3-\$5 million dollars and informed the Trustees that the site is not within the jurisdiction of HLID. Further, information relating to the museum was distributed at the BAE Committee on April 2, report titled: Preliminary Draft, Interpretive Development Plan.

There was no further discussion on the motion; Chairperson Apoliona called for a roll call vote.

TRUSTEE	1	2	'AE (YES)	A'OLE (NO)	KANALUA (ABSTAIN)	EXCUSED
TRUSTEE ROWENA AKANA			Yes			
TRUSTEE DONALD CATALUNA			Yes			
TRUSTEE WALTER HEEN			Yes			
TRUSTEE ROBERT LINDSEY						Excused
TRUSTEE COLETTE MACHADO	1		Yes			
TRUSTEE BOYD MOSSMAN		2	Yes			
TRUSTEE OSWALD STENDER			Yes			
TRUSTEE JOHN WAIHE'E IV			Yes			
CHAIRPERSON HAUNANI APOLIONA			Yes			
<b>TOTAL VOTE COUNT</b>			<b>8</b>	<b>0</b>	<b>0</b>	<b>1</b>

MOTION: [] UNANIMOUS [] PASSED [] DEFERRED [] FAILED [] FILED

Motion is approved.

Chairperson Apoliona requested a motion for item B.

**B. Resolution Honoring the life of Raymond Kaleoalohapoinaoleohelemanu Kane**

**Motion**

Trustee Akana: **Move to approve a resolution honoring the life of Raymond Kaleoalohapoinaoleohelemanu Kane.**

Vice-Chair Heen: **Second.**

There was no discussion on the motion; Chairperson Apoliona called for a roll call vote.

TRUSTEE	1	2	'AE (YES)	A'OLE (NO)	KANALUA (ABSTAIN)	EXCUSED
TRUSTEE ROWENA AKANA	1		Yes			



TRUSTEE DONALD	CATALUNA			Yes			
TRUSTEE WALTER	HEEN		2	Yes			
TRUSTEE ROBERT	LINDSEY						Excused
TRUSTEE COLETTE	MACHADO			Yes			
TRUSTEE BOYD	MOSSMAN			Yes			
TRUSTEE OSWALD	STENDER			Yes			
TRUSTEE JOHN	WAIHE'E IV			Yes			
CHAIRPERSON HAUNANI	APOLIONA			Yes			
TOTAL VOTE COUNT				8	0	0	1

MOTION:  UNANIMOUS  PASSED  DEFERRED  FAILED  FILED

Motion is approved.

#### VI. Beneficiary Comments

None

Chairperson Apoliona requested a motion to resolve into Executive Session pursuant to HRS 92-5(a)(4) to consult with the Board's attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities and liabilities.

#### Motion

Trustee Machado:

So moved Madame Chair. **(to resolve into Executive Session pursuant to HRS 92-5(a)(4) to consult with the Board's attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities and liabilities).**

Vice-Chair Heen:

**Second.**

There was no discussion or objections to the motion; all members present voted "aye" to resolve into Executive Session.

The Board resolved into Executive Session at 11:08 a.m.

#### VII. Executive Session

- B. Attorney-Client legal advisory by OHA Attorney Jon Van Dyke, Esquire, Re: questions and issues pertaining to Board's duties, rights, obligations and liabilities with respect to the Moloka'i Water Case – Kukui (Moloka'i) inc. Pursuant to HRS 92-5(a)(4).**
- C. Attorney-Client legal advisory by OHA's Board Counsel and Attorney William Meheula, Esquire, Re: questions and issues pertaining to the Board's rights and obligations with respect to ceded lands. Pursuant to HRS 92-5(a)(4).**
- D. Approval of Executive Session minutes of: 3/20/08.**

The Board reconvened into Open Session at 12:31 p.m.

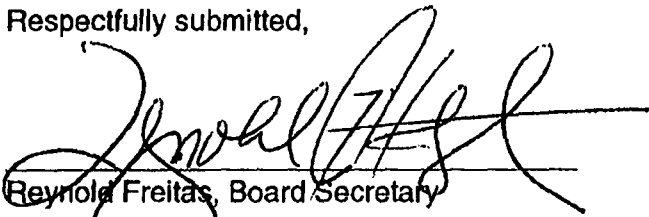
**VIII. Announcements/FYI**

None

**IX. Adjournment**

Chairperson Apoliona asked for a motion to adjourn. It was moved by Trustee Waihe'e, seconded by Trustee Cataluna. Hearing no objections, Chairperson Haunani Apoliona adjourned the meeting of the Board of Trustees at 12:32 p.m.

Respectfully submitted,

  
Reynold Freitas, Board Secretary

As approved by the Board of Trustees on Thursday, April 17, 2008.

  
Trustee S. Haunani Apoliona, MSW  
Chairperson, Board of Trustees

APPENDIX F  
GLOSSARY

## HAWAIIAN WORDS \*

'āina	Lit. land
'aha	Lit. meeting, assembly, gathering, convention, court, party
ahupua'a	land division usually extending from the uplands to the sea
aloha 'āina	love of the land
'auwai	ditch, canal
hālau	long house, as for canoes or hula construction; meeting house
heiau	pre-Christian place of worship, shrine
honu	general name for turtle and tortoise
'ili	land section, next in importance to ahupua'a and usually a subdivision of an ahupua'a
imu	underground oven
iwi	bone, carcass
kahua	gathering place
kalo	taro
kapu	taboo, prohibition
kauhale	household
kōkua	help, aid, assistance, relief, assistant, associate, deputy, helper
kuleana	right, privilege, concern, responsibility
kupuna	grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle
lo'i	irrigated terrace, especially for taro
luakini	temple, church, cathedral, tabernacle
mahele	portion, division, section, zone, lot, piece, quota
makai	on the seaside, in the direction of the sea
Manō	shark
māno	water source
mauka	inland, towards the mountain
'ōpio	youth, juvenile
poi	The Hawaiian staff of life, made from cooked taro corms, pounded and thinned with water
pono	goodness, uprightness, morality, correct or proper procedure
Pueo	Hawaiian short-eared owl
uala	sweet potato
wahi kapu	sacred place

\* Definitions from Hawaiian-English Dictionary, Mary Kawena Pukui and Samuel H. Elbert, 1986

## PLACE NAMES\*

'Aiea	land sections, mill, village, bay, stream, field, recreation center, and schools, west of Honolulu O'ahu
Aiwahine	Ili in North Hālawā Valley
Alamihi	Ili in Kāne'ōhe ahupua'a
'Ewa	plantation, plantation town, elementary school, and quadrangle west of Pearl Harbor, O'ahu. <i>Lit.</i> , crooked.
Ha'ikū	valley, Kāne'ōhe quad., O'ahu. <i>Lit.</i> , speak abruptly or sharp break.
Hālawā	land section, district park, elementary school, town, and stream, Waipahu quad., O'ahu (Ii 70). <i>Lit.</i> , curve.
Halekou	fishpond, Mōkapu, O'ahu. <i>Lit.</i> , kou-wood house.
Hale o Papa	heiau in North Hālawā Valley
He'eia	Village, elementary school, playground, land divisions, stream, and fishpond covering 88 acres, Kāne'ōhe and Mōkapu quads., O'ahu
Ho'oleina'iwa	Ili in Kāne'ōhe
Ho'omaluhia Park	City Park in Luluku
Honolulu	Capital of the State of Hawai'i. <i>Lit.</i> , protected bay.
Iholena	Ili in North Hālawā Valley
'Ioleka'a	Valley and stream, He'eia, O'ahu. <i>Lit.</i> , rolling rat.
Kahalu'u	Land division, Ko'olaupoko District
Kahekili Heiau	Heiau located in Ha'ikū Valley
Kāne Ame Kanaloa Heiau	Heiau located in Ha'ikū Valley
Kaulehu Cave	Burial feature in Ha'ikū Valley
Ka Wai Ola	Monthly newspaper published by the Office of Hawaiian Affairs. <i>Lit.</i> , the living water
Kahua'uli	Ili in Kāne'ōhe
Kailua	Second largest city in the Hawaiian islands, land division, schools, bay, beach park, field, ditch, and stream, Mōkapu quad., O'ahu. <i>Lit.</i> , two seas.
Kalāheo	Land section, subdivision, school, avenue, and playground, Kailua, O'ahu. <i>Lit.</i> , the proud day.
Kalihemo	Ili in North Hālawā Valley
Kamakāhukilani	Kamakāhukilani Von Oelhoffen (1935-1999), Kanaka Maoli educator, poet, and activist.
Kamana Iki Stream	The eastern and smaller tributary of Moanalua Valley, O'ahu. <i>Lit.</i> , the small branch.
Kamana Nui Stream	The western tributary of Moanalua Valley, O'ahu. <i>Lit.</i> , the large branch.
Kāne	The leading of the four great Hawaiian gods.
Kāne'ōhe	Quadrangle, land section, playground, village, bay, beach park, harbor, school, ranch, stream, county park, Marine Air Corps station, and golf course, O'ahu. <i>Lit.</i> , bamboo husband.
Kapalai	Ili in North Hālawā Valley

Kapulehu	Ili in North Hālawā Valley
Kea'ahala	Stream, land sections, and playground, Kāne'ohē quad., O'ahu. <i>Lit.</i> , the pandanus root.
Ke'apuka	Land section and stream, Kāne'ohē quad., O'ahu
Keawalau o Pu'uoloa	Pearl Harbor
Ko'olau	Windward mountain range, O'ahu. <i>Lit.</i> , windward.
Ko'olau Poko	District, southern windward O'ahu. <i>Lit.</i> , short Ko'olau.
Kukui o Kāne	Located in Kāne'ohē, <i>Lit.</i> the light of Kāne
Kuou	Ili in Kāne'ohē
Likelike (Highway)	Highway named for Princess Miriam Likelike
Lulukū	Land section and stream, Kāne'ohē area, O'ahu. <i>Lit.</i> , destruction.
Mahinui	Mountain, fishpond, and stream, Mōkapu quad., O'ahu. <i>Lit.</i> , great champion.
Mākapu	Peninsula, elementary school, point, quadrangle, and land division, Kailua, O'ahu. <i>Lit.</i> , taboo district.
Moanalua	Land division
Na'ili'ili	Ili in North Hālawā Valley
O'ahu	Most populous of the Hawaiian Islands.
Pepēhia	Ili in North Hālawā Valley
Pū'ōhala	Land section, playground, and elementary school, Kāne'ohē, O'ahu. <i>Lit.</i> , passing gust or passing blaze.
Pu'u Kahuāuli	Peak, Moanalua, Honolulu. <i>Lit.</i> , dark site hill.
Pu'u Kaiwipo'o	Hill, 'Aiea, O'ahu. <i>Lit.</i> , the skull hill.
Pu'u Keahiakahoe	Cliff, Kāne'ohē quad., O'ahu, that overlooks Ka-māna Nui and Ka-māna Iki valleys. <i>Lit.</i> , the fire of Ka-hoe Hill.
Pu'u Lanihuli	Peak along the Ko'olau Summit back of Kāne'ohē
Pu'u 'Ua'u	Hill, 'Aiea, O'ahu. <i>Lit.</i> , dark-rumped petrel hill.
Pu'ua	Peak along ridge between Aiea and North Hālawā Valley
Pu'ulunui	Ili of North Hālawā Valley
Punalu'u	Fishpond, Kāne'ohē, O'ahu. <i>Lit.</i> , spring dived for.
Waipao	Ili of North Hālawā Valley
Wanawana	Ili of North Hālawā Valley

\* Place names from Place Names of Hawai'i, Mary Kawena Pukui, Samuel H. Elbert, and Esther T. Mookini, 1974

## ABBREVIATIONS AND ACRONYMS

AHCP	Advisory Council on Historic Preservation
AIRFA	American Indian Religious Freedom Act
ARCH	Ahupua'a Restoration Council of He'eia
BM	Bishop Museum
BWS	Board of Water Supply
CCH	City and County of Honolulu
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
FHWA	Federal Highway Administration
H-NPO	Hālawā Nonprofit Organization
HDOT	Hawai'i State Department of Transportation
HLID	Hālawā-Luluku Interpretive Development
IDP	Interpretive Development Plan
KMAS	Kāne'ohe Marine Air Station also Marine Corps Base Hawai'i
L-NPO	Luluku Nonprofit Organization
ME	Mitigation Element
MOA	Memorandum of Agreement
NAGPRA	Native American Graves Protection and Repatriation Act
NPS	National Park Service
OHA	Office of Hawaiian Affairs
OMEGA (Station)	Very low frequency radio navigational system formerly in Ha'ikū Valley
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
STIP	Statewide Transportation Improvement Program
WG	Working Group of the HLID Project

**OFFICE OF HAWAIIAN AFFAIRS**

**CONTRACT NUMBER 2550**

**CONTRACT BETWEEN**

**OFFICE OF HAWAIIAN AFFAIRS**

**AND**

**DEPARTMENT OF TRANSPORTATION**

**STATE OF HAWAII**

**(Halawa-Luluku Interpretive Development Project)**

**AGREEMENT**

THIS AGREEMENT, made and entered into as of JUNE 29, 2010, by and between the OFFICE OF HAWAIIAN AFFAIRS, a body corporate existing under the Constitution and laws of the State of Hawai'i by its Chief Executive Officer, CLYDE W. NAMU'O, and its Chief Operating Officer, STANTON ENOMOTO, respectively, acting on behalf of the Board of Trustees, whose principal place of business and mailing address is 711 Kapi'olani Boulevard, Suite 500, Honolulu, Hawai'i, 96813, hereinafter referred to as "OHA," and the DEPARTMENT OF TRANSPORTATION, STATE OF HAWAI'I, hereinafter called "HDOT".

WITNESSETH:

WHEREAS, a Memorandum of Agreement (MOA) pursuant to regulations implementing Section 106 of the National Historic Preservation Act and relating to the construction of Interstate Route H-3 had been previously entered into on July 21, 1987 by the Federal Highway Administration, U.S. Department of Transportation (FHWA); the State Historic Preservation Officer, State of Hawaii (SHPO); and the Advisory Council on Historic Preservation (ACHP) in consultation with and the concurrence of OHA and HDOT to mitigate adverse impacts created by and resulting from the construction of the H3 freeway (see Exhibit "A" attached hereto and made a part hereof); and

WHEREAS, said MOA required that any adverse impact of H-3 on the Luluku Discontiguous Archaeological District and any historic property within the highway corridor eligible for inclusion in the National Register of Historic Places, be mitigated through the development and implementation of, among other measures an Interpretive Development Plan (IDP); and

WHEREAS, HDOT and OHA entered into an agreement dated August 10, 1999 whereby OHA would prepare and implement the Halawa Luluku Development Project (the "Project") in



three phases:

1. Preliminary Design of IDP
2. Final Design of the IDP
3. Implementation of the IDP

WHEREAS, OHA with the assistance of the Project's working group made up of concerned community members and the general public, after several years of research, dialogue, interpretation, and planning in collaboration with the public, helped develop an IDP for the mitigation of impacts caused by the construction of Interstate H-3 on Project lands and this IDP has been approved by HDOT and FHWA which satisfies the requirement to complete the IDP; and

WHEREAS, the completed and approved IDP reclassifies the phases for the project as Phase 1- Planning, Phase 2- Design and Development and Phase 3- Implementation; and

WHEREAS, the approved IDP by HDOT and FHWA represents completion of Phase 1 of the IDP; and

WHEREAS, HDOT and Federal funding currently exists to proceed to Phases 2 and 3; and

WHEREAS, HDOT and FHWA desire that OHA continue with Phases 2 and 3 of the IDP and OHA agrees to continue with the Project if financial compensation is made by HDOT; and

WHEREAS, the parties hereto desire to enter into a Cooperative Agreement to memorialize their mutual understandings of the responsibilities of HDOT and OHA relative to Phases 2 and 3; and

WHEREAS, the parties mutually agree that this Cooperative Agreement shall supersede that certain Contract No. 1385 dated August 10, 1999 by and between OHA and HDOT.

NOW, THEREFORE, in consideration of mutual promises, the parties hereto agree to

the following:

**1. Scope of Services.** Subject to the availability of sufficient HDOT and FHWA funding for Phases 2 and 3 of the Project as defined by the IDP, OHA shall act as HDOT's project manager as described in Paragraph 3.A below, for Phases 2 and 3 of the Project which includes design and construction of mitigation measures as described in the IDP and as will be further defined during the design and development phase.

**2. Term of Agreement.** This Agreement shall be in effect for three years following the date of execution and shall be extended as necessary upon mutual written consent of the parties hereto to permit the continued operation of OHA's HLID office to oversee the design and implementation of the Project until completed or unless either party terminates this agreement pursuant to paragraph 14 below.

**3. Responsibilities of the Parties.**

A. Subject to the availability of HDOT and FHWA funding, OHA shall perform the following functions and responsibilities:

- (1) As Project Manager, OHA shall be responsible for coordination and management of Project design and construction activities.
- (2) OHA shall also develop a Stewardship and Management plan (the "Plan") that will guide the management and stewardship of the Project after completion of the Implementation phase. The Plan shall be approved by HDOT and FHWA and shall guide the organization(s) selected to manage the project for HDOT once the Implementation phase is complete.
- (3) OHA shall identify the specific projects from the list enumerated in the IDP to be undertaken in Phases 2 and 3 of the project and coordinate with HDOT for procurement of necessary services and

materials as described in section 3.B.(2) below.

(4) OHA shall assist with the development of the scope of work of the selected projects to be undertaken in Phases 2 and 3 and shall serve on any procurement committees which HDOT forms to procure any goods and services required for the Project.

(5) Subject to HDOT's approval as detailed in Paragraph 8 Subcontracting or Assignment of Agreement herein, OHA may elect to procure with approval from HDOT and coordinate the services of Native Hawaiian organizations or consultants that it deems necessary to the execution of the Project. To the extent OHA elects to procure for services related to the Project, any related contract, architectural drawings and building plans shall be submitted to HDOT and FHWA for approval.

(6) OHA shall obtain the prior approval of HDOT and FHWA for any consultant and contractor selections, and all expenditures which shall be subject to the following procedure:

(a) OHA shall submit its (1) proposed HLID annual expenditure report, and (2) proposed HLID annual administrative costs to HDOT no later than 90 days prior to the start of each fiscal year.

Upon submission of the proposed expenditure reports and/or administrative costs by OHA to HDOT, HDOT shall complete its review and provide written approval within 30 calendar days of receipt. If HDOT does not approve the expenditure reports and/or administrative costs, HDOT and OHA shall work to resolve the matter in a reasonable amount of time. No work shall be performed by OHA

until and unless HDOT has provided written approval of the annual expenditure report and OHA's proposed administrative costs report.

(b) Any unplanned expenditures or increases in planned expenditures shall be submitted to HDOT as a supplemental expenditure report. No supplemental work shall be performed by OHA until HDOT has approved of, in writing, the supplemental expenditure report. HDOT shall complete its review of any supplemental expenditure reports and provide written approval within 30 calendar days of receipt of OHA's submission of the supplemental report.

(c) OHA shall prepare and submit a quarterly progress report which provides a summary of the work progress which shall include, but not be limited to, the costs incurred and the work performed on both a quarterly and cumulative basis. OHA shall submit the quarterly progress reports no later than the 20<sup>th</sup> day of the month following the end of the quarter.

(d) As soon as reasonably possible, OHA shall report to HDOT any event that OHA believes may materially affect OHA's ability to proceed with the work required by the Agreement. HDOT, in consultation with OHA, shall determine the course of action to be taken in response to OHA's report.

(e) OHA may be reimbursed for administrative costs for this project, including costs for the services of non-HLID OHA employees, subject to pre-approval by HDOT.

B. HDOT's responsibilities:

(1) HDOT will monitor and review OHA's work for conformity with Federal and State standards and procedures, and shall reimburse OHA for all of its authorized expenses.

(2) HDOT, in coordination with OHA's HLID office, shall be responsible for procuring all materials, equipment, labor and professional services, including without limitation the services of architects, engineers, contractors, surveyors and consultants that are required for Phases 2 and 3 of the Project. HDOT will contract with these vendors and contractors to provide the necessary materials, equipment and services and shall be responsible for payment to these providers.

(3) HDOT, in coordination with OHA's HLID office, will be responsible for technical review and approval of all engineering, architectural and building specifications, designs, and plans. HDOT, in coordination with OHA's HLID office, shall also be responsible for all other studies, assessments, or reporting that may be required by federal, state or local law and for obtaining all necessary governmental approvals including, without limitation, all building and use permits necessary to complete Phases 2 and 3 of the project.

(4) OHA shall not be responsible for maintaining the Halawa Stream and the Halawa Access Road.

(5) HDOT shall maintain a minimum balance of ONE HUNDRED FIFTY THOUSAND AND NO/100 DOLLARS (\$150,000.00) on deposit with OHA as HLID funds to eliminate the need for OHA to use its non-HLID funds to finance expenses incurred under this Agreement. OHA shall draw against HLID funds for all expenses necessary and proper to meet its responsibilities under the terms of this Agreement. OHA shall submit receipts for all work expenses previously

authorized by HDOT in meeting its responsibilities under the terms of this Agreement. HDOT shall as soon as reasonably practical, but no later than 45 days after expense submittal, replenish this HLID Fund on deposit with OHA for the amount of these receipts.

**C. Joint Responsibilities:**

(1) Monthly review meetings. The parties shall meet once a month at a minimum, to review the progress of the Project and to address and resolve issues and concerns related to the project.

**4 . Use and Occupancy Provisions.** OHA and its sub-contractors shall prepare and execute right of entry and/or use and occupancy agreements with HDOT, prior to using or occupying the property for any work authorized by HDOT in implementing the Project.

**5. Procurement Standards.** The employment of contractors and administration of the Project by OHA and HDOT shall be in conformance with Chapter 103D of the Hawaii Revised Statutes and Section 3-122, Subchapter 7, Hawaii Administrative Rules C (“HAR”), Title 3, Department of Accounting and General Services, Title 3, Subtitle II regarding professional services, and 23 CFR-172 governing the administration of engineering and design-related service contracts. Competitive negotiation shall be employed and Disadvantaged Business Enterprise (DBE) firms shall be considered.

**6. Project Funds.** This agreement is to be funded completely by HDOT and Federal funds administered by FHWA. The parties have no obligation to complete the work and services contemplated by this Agreement if these funds are exhausted and no additional funding becomes available. The parties acknowledge that the original approved budget for this Project was ELEVEN MILLION AND NO/100 DOLLARS (\$11,000,000.00) of which approximately \$8.5 million remains unspent and available.

**7. Financing.** This Agreement is financed by State funds and Federal funds administered by FHWA. Eligibility of costs for Federal reimbursement shall be as prescribed in 48 CFR 31 (Federal Acquisition Regulations).

Ninety percent (90%) of the cost of this Project is Federally funded. It is covenanted and agreed to, by and between the parties hereto, that as to the portion of the obligation under this contract to be payable out of Federal funds, that this contract shall be construed to be an agreement to pay such portion to OHA only out of Federal funds if and when such Federal funds shall be received from the Federal government for the purpose of such payment, and that this contract shall not be construed to be a general agreement to pay such portion in all events out of any funds other than those which may be so received from the Federal government

**8. Subcontracting or Assignment of Agreement.** OHA shall not subcontract or assign all or any part of the work under this agreement without the prior written consent of HDOT, and any consent by HDOT to subcontract, assign, or otherwise dispose of any portion of this Agreement shall not be construed to relieve OHA of any responsibility for the fulfillment of the Agreement.

The parties understand OHA may subcontract or assign all or part of the work required by this agreement to a subsidiary Limited Liability Company. Approval by HDOT for such an assignment shall not be unreasonably withheld.

**9. Prosecution of the Work.** HDOT and OHA acknowledge to each other that in drafting this Agreement, the parties did not anticipate all possible circumstances or contingencies that might arise, and therefore this Agreement may need to be supplemented or amended from time to time as the Project progresses. The parties agree that they shall cooperate in good faith with each other with regard to this Agreement and the execution of the work contemplated hereunder, in order to fulfill the intended purpose of this Agreement. HDOT and OHA shall mutually resolve all questions regarding the manner of performance and progress of the work,

compliance with the Agreement provisions, compensation, and any other question which may arise under the Agreement. Any irreconcilable differences shall be resolved to the extent provided with Paragraph No. 16 below.

**10. Alterations or Revisions to the Agreement.** HDOT and OHA reserve the right to increase or decrease the scope of services to be provided by OHA under the Agreement. Any such amendment, however, must be agreed to, in writing, by both parties.

**11. Time of Completion and Extension Thereof.** OHA shall complete the work within the three years from the date of execution of this Agreement. Any delay in the progress of the work which may adversely affect the completion of work within the required time shall be promptly reported to HDOT in writing. If OHA's work is delayed by conditions beyond its control, OHA shall, subject to approval by HDOT, be entitled to a reasonable extension of time to complete its work. Additionally HDOT may, upon request by OHA and regardless of cause, extend the completion date of the Agreement at HDOT's sole discretion.

**12. Accounting Records.** OHA shall maintain accounting records and other evidence pertaining to costs incurred, and shall make such materials available for audit by authorized representatives of HDOT and FHWA.

**13. Publication and Ownership.** Maps, records, and reports resulting from this Project shall be provided to HDOT. HDOT reserves the right to publish the results or, if already published by OHA, shall, upon request, be furnished the number of copies requested. The maps, records and reports published by either OHA or HDOT shall contain a statement of the cooperative relationship of OHA, HDOT, and FHWA in the program.

Upon termination or completion of this Agreement, all maps, records, reports, equipment, structures, improvements, and any incidentals purchased with Project funds shall become the property of HDOT. OHA may obtain and keep copies of all maps, records, and reports pertaining to this Project.



**14. Terminations.** The Agreement may be terminated by OHA or HDOT without cause at any time by delivering written notice to the other party of such termination at least eighteen months before the effective date of termination (“the Termination Period”); provided, however that the parties may agree to shorten the termination period by written agreement. During the Termination Period, the parties shall continue with all of their obligations under this Agreement, which shall continue in full force and effect. Completion of this Agreement shall be upon implementation of the Interpretive Development Plan to the extent of available funding as identified herein.

The Agreement may also be terminated by OHA or HDOT for cause by delivering written notice to the other party of such termination at least THIRTY (30) days before the effective date of termination. For cause termination would be based on a failure of either party to fulfill any obligation as described in this Agreement. Termination is HDOT’s sole remedy in the event that OHA fails to complete the work through its own fault.

**15. Dispute Resolution.** Should any irreconcilable differences between OHA and HDOT arise during the Project, the disagreement shall be presented to FHWA for resolution as provided in the 1987 Memorandum of Agreement which is attached hereto as Exhibit “A”.


**16. Scope of Payment.** Except as otherwise provided herein, the amount set forth in this Agreement and any subsequent amendment to this Agreement shall be deemed full compensation for all work performed by OHA. Said compensation shall include all services, materials, supplies, equipment, overhead, incidentals and operating expenses.

**17. Reimbursements.** As long as the services of OHA and its subcontractors are authorized and performed in a satisfactory manner, HDOT will make reimbursements based upon the receipts and timesheets rendered and the costs that were incurred, subject to the financing provisions set forth in Paragraphs 6 and 7 above as well as any applicable federal, state and county laws.


IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the day and year first above written

OFFICE OF HAWAIIAN AFFAIRS

Date: June 25, 2010

By   
CLYDE W. NAMU'O  
Its Chief Executive Officer


Date: June 24, 2010

By   
STANTON ENOMOTO  
Its Chief Operating Officer

"OHA"


DEPARTMENT OF TRANSPORTATION,  
STATE OF HAWAII

Date: 6-29 2010

By   
BRENNON T. MORIOKA, Ph.D, P.E.  
Its Director of Transportation

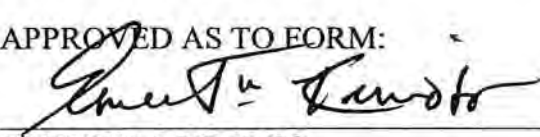
"HDOT"

APPROVED AS TO CONTENT:

  
RICHARD PEZZULO  
OHA's Chief Financial Officer

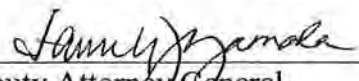
Date: 6-23, 2010

APPROVED AS TO FORM:

  
ERNEST M. KIMOTO  
OHA's Corporate Counsel

Date: June 23, 2010

APPROVED AS TO FORM:

  
Deputy Attorney General  
Land Transportation Division

Date: June 29, 2010

STATE OF HAWAI'I )  
 ) ss.  
CITY AND COUNTY OF HONOLULU )

On this 27<sup>th</sup> day of June, 2010, in the First Circuit of the State of Hawai'i, before me personally appeared CLYDE W. NĀMU'O, to me personally known or proved to me on the basis of satisfactory evidence of his signature and identity to be the aforesaid person, who, by me duly sworn or affirmed, did say that he is he is the Chief Executive Officer of OFFICE OF HAWAIIAN AFFAIRS, a body corporate and instrumentality of the State, and that in the absence of a seal, said instrument was signed in behalf of said corporation by authority of its Board of Trustees, and the said CLYDE W. NĀMU'O acknowledged said instrument to be the free act and deed of said corporation.

I hereby certify that the instrument to which this notary acknowledgment is attached is entitled CONTRACT 2550 between OFFICE OF HAWAIIAN AFFAIRS and DEPARTMENT OF TRANSPORTATION, STATE OF HAWAI'I, and dated June 25, 2010 at the time of notarization. The entire instrument, including the notary acknowledgement page(s) and attachment(s), if any, consists of ONE HUNDRED THIRTY-TWO (132) pages.



[Signature]  
Notary Public, State of Hawai'i  
Print Name: S.E. Okamoto  
My commission expires: 5/29/14

STATE OF HAWAI'I )  
 ) ss.  
CITY AND COUNTY OF HONOLULU )

On this 27<sup>th</sup> day of June, 2010, before me personally appeared RICHARD PEZZULO, Chief Financial Officer for and in behalf of STANTON ENOMOTO, Chief Operating Officer, to me known, who being by me duly sworn, did say that he is the Chief Financial Officer of the Office of Hawaiian Affairs, a body corporate and said instrumentality of the State and that in the absence of a seal that said instrument was signed in behalf of said corporation by authority of its Board of Trustees, and the said Chief Financial Officer, for and in behalf of the Chief Operating Officer, acknowledged said instrument to be the free act and deed of said corporation.

I hereby certify that the instrument to which this notary acknowledgment is attached is entitled CONTRACT 2550 between OFFICE OF HAWAIIAN AFFAIRS and DEPARTMENT OF TRANSPORTATION, STATE OF HAWAI'I, and dated June 25, 2010 at the time of notarization. The entire instrument, including the notary acknowledgement page(s) and attachment(s), if any, consists of ONE HUNDRED THIRTY-TWO (132) pages.



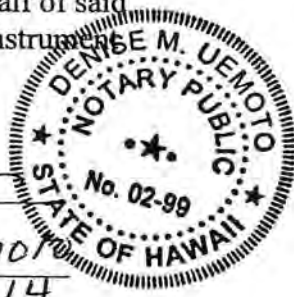
[Signature]  
Notary Public, State of Hawai'i  
Print Name: S.E. Okamoto  
My commission expires: 5/29/14

STATE OF HAWAI'I )  
) ss.  
CITY AND COUNTY OF HONOLULU )

On this 29<sup>th</sup> day of June, 2010, before me personally appeared BRENNON T. MORIOKA, Ph.D, P.E. to me known, who being by me duly sworn, did say that he is the Director of the DEPARTMENT OF TRANSPORTATION, a body corporate of the State of Hawaii, and that in the absence of a seal that said instrument was signed in behalf of said body corporate by authority of its Directors, and the said Director acknowledged said instrument to be the free act and deed of said Department.

Denise M. Uemoto

Notary Public, State of Hawai'i  
Print Name: DENISE M. UEMOTO  
My commission expires: 3-17-2014



Doc. Date: 6-29-10 # Pages: 132  
Denise M. Uemoto First Circuit  
Doc. Description OHA CONTRACT  
#2550 between OHA and  
DOT (HAIAWA-LIUKU)



Denise M. Uemoto 6-29-10  
Notary Signature Date

**NOTARY CERTIFICATION**

**EXHIBIT "A"**

Memorandum of Agreement entered into on July 21, 1987

by and among Federal Highway Administration;

U.S. Department of Transportation (FHWA);

State Historic Preservation Officer, State of Hawaii (SHPO);

and Advisory Council on Historic Preservation (ACHP)

**EXHIBIT "B"**

Final Interpretive Development Plan

OFFICE OF HAWAIIAN AFFAIRS  
HĀLAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT  
CONTRACT # 2550.01  
FIRST AMENDMENT TO CONTRACT #2550  
BETWEEN  
OFFICE OF HAWAIIAN AFFAIRS  
AND  
DEPARTMENT OF TRANSPORTATION, STATE OF HAWAI'I

**AGREEMENT**

THIS AGREEMENT, made and entered into as of this 20<sup>th</sup> day of June, 2012 by and between the OFFICE OF HAWAIIAN AFFAIRS, a body corporate, existing under the Constitution and the Laws of the State of Hawai'i, by its Ka Pouhana, Chief Executive Officer, Kamana'opono Crabbe, Ph.D., acting by and on behalf of the Board of Trustees, whose principal place of business and mailing address is 711 Kapi'olani Boulevard, Suite 500, Honolulu, Hawai'i, 96813, hereinafter referred to as "OHA," and the DEPARTMENT OF TRANSPORTATION, STATE OF HAWAI'I, hereinafter called "HDOT".

**W I T N E S S E T H :**

WHEREAS, OHA and HDOT entered into that certain Contract No. 1385 on August 10, 1999; and

WHEREAS, OHA and HDOT entered into that certain Contract No. 2550 dated June 25, 2010 ("Agreement") which replaced Contract No. 1385; and

WHEREAS, HDOT and FHWA desire that OHA continue with Phase 2- Design and Development and Phase 3- Implementation and OHA agrees to continue with the Project if financial compensation is made by HDOT; and

WHEREAS, the Parties hereto desire to amend their existing June 25, 2010 agreement to document their mutual understandings heretofore.

NOW, THEREFORE, in consideration of the mutual promises hereinafter set forth, the Parties agree as follows:

SECTIONS 3.A.(1)-(5) Responsibilities of Parties which appear on pages 3 through 4 of that certain Agreement dated June 25, 2010 states as follows:

**3. Responsibilities of the Parties.**

A. Subject to the availability of HDOT and FHWA funding, OHA shall perform the

following functions and responsibilities:

(1) As Project Manager, OHA shall be responsible for coordination and management of Project design and construction activities.

(2) OHA shall also develop a Stewardship and Management plan (the "Plan") that will guide the management and stewardship of the Project after completion of the Implementation phase. The Plan shall be approved by HDOT and FHWA and shall guide the organization(s) selected to manage the project for HDOT once the Implementation phase is complete.

(3) OHA shall identify the specific projects from the list enumerated in the IDP to be undertaken in Phases 2 and 3 of the project and coordinate with HDOT for procurement of necessary services and materials as described in section 3.B.(2) below.

(4) OHA shall assist with the development of the scope of work of the selected projects to be undertaken in Phases 2 and 3 and shall serve on any procurement committees which HDOT forms to procure any goods and services required for the Project.

(5) Subject to HDOT's approval as detailed in Paragraph 8 Subcontracting or Assignment of Agreement herein, OHA may elect to procure with approval from HDOT and coordinate the services of Native Hawaiian organizations or consultants that it deems necessary to the execution of the Project. To the extent OHA elects to procure for services related to the Project, any related contract, architectural drawings and building plans shall be submitted to HDOT and FHWA for approval.

The aforementioned SECTIONS 3.A.(1)-(5) Responsibilities of Parties which appear on pages 3 through 4 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**3. Responsibilities of the Parties.**

A. Subject to the availability of HDOT and FHWA funding, OHA shall perform the following functions and responsibilities:



(1) As Project Manager, OHA shall be responsible for coordination and management of Project design and construction activities. OHA and its subcontractor(s) shall be responsible for the day to day project activities (project direction, project related meetings with applicable government agencies, professional service providers, vendors, and community) towards project completion.

(2) OHA shall also develop a Stewardship and Management Plan (the "Plan") that will guide the management and stewardship of the Project after completion of the Implementation Phase. The Plan shall be approved by HDOT and FHWA and shall guide the organization(s) selected to manage the project for HDOT once the Implementation Phase is complete. The Plan shall be delivered by a date mutually agreed upon by OHA, HDOT and FHWA in the Project Schedule. The Project Schedule, in the form of a living document, will inform HDOT and FHWA of OHA's project deliverables, milestones and estimated completion.

(3) OHA shall identify and evaluate the conceptual project types offered in the Interpretive Development Plan (IDP) that will inform Phases 2 and 3 (Design & Development and Implementation, respectively) of the Project and coordinate with HDOT for procurement of necessary services and materials as described in section 3.B.(2) below.

(4) OHA may elect to procure professional services, including without limitation the services of qualified design and engineering consultants (e.g. architects, engineers, surveyors and specialty consultants) that are required for Phases 2 and 3 of the Project. OHA and HDOT may also agree in writing that OHA will procure other services, materials, and labor including services, materials and labor identified as HDOT responsibilities in section 3.B.2 and 3.B.3. If procured by OHA, OHA will contract with these vendors to provide the necessary services, materials, and labor and shall be responsible for payment to these providers using HLID funds.

OHA shall develop the scope of work of the selected projects to be undertaken in Phases 2 and 3 and shall serve, along with one HDOT representative, on any procurement committee

formed to procure any goods and services required for the Project.

(5) To the extent OHA elects to procure for services related to the Project, any related contract, architectural drawings and building plans shall be submitted to HDOT and FHWA for approval. HDOT and FHWA will take reasonable effort to provide approvals within THIRTY (30) days of submission to ensure project deliverables, milestones and estimated completion per the Project Schedule.

SECTIONS 3.B.(2)-(5) Responsibilities of the Parties which appear on pages 6 through 7 of that certain Agreement dated June 25, 2010 states as follows:

**3. Responsibilities of the Parties.**

**B. HDOT's responsibilities:**

(2) HDOT, in coordination with OHA's HLID office, shall be responsible for procuring all materials, equipment, labor and professional services, including without limitation the services of architects, engineers, contractors, surveyors and consultants that are required for Phases 2 and 3 of the Project. HDOT will contract with these vendors and contractors to provide the necessary materials, equipment and services and shall be responsible for payment to these providers.

(3) HDOT, in coordination with OHA's HLID office, will be responsible for technical review and approval of all engineering, architectural and building specifications, designs, and plans. HDOT, in coordination with OHA's HLID office, shall also be responsible for all other studies, assessments, or reporting that may be required by federal, state or local law and for obtaining all necessary governmental approvals including, without limitation, all building and use permits necessary to complete Phases 2 and 3 of the project.

(4) OHA shall not be responsible for maintaining the Hālawā Stream and the Hālawā Access Road.

(5) HDOT shall maintain a minimum balance of ONE HUNDRED FIFTY

THOUSAND AND NO/100 DOLLARS (\$150,000.00) on deposit with OHA as HLID funds to eliminate the need for OHA to use its non-HLID funds to finance expenses incurred under this Agreement. OHA shall draw against HLID funds for all expenses necessary and proper to meet its responsibilities under the terms of this Agreement. OHA shall submit receipts for all work expenses previously authorized by HDOT in meeting its responsibilities under the terms of this Agreement. HDOT shall as soon as reasonably practical, but no later than 45 days after expense submittal, replenish this HLID Fund on deposit with OHA for the amount of these receipts.

The aforementioned SECTIONS 3.B.(2)-(5) Responsibilities of the Parties which appear on pages 6 through 7 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**3. Responsibilities of the Parties.**

**B. HDOT's responsibilities:**

(2) Unless otherwise agreed to by the Parties in writing, HDOT will assign one HDOT representative to participate on any procurement committee formed to procure any goods and services required for the Project in coordination with OHA. HDOT will procure other non-professional services, materials, and labor not specifically identified as OHA responsibilities in section 3.A.4.

(3) HDOT, in coordination with OHA, will be responsible for technical review and approval of all engineering, architectural and building specifications, designs, and plans. HDOT, in coordination with OHA, shall also be responsible for all other studies, assessments, or reporting that may be required by federal, state or local law and for obtaining all necessary governmental approvals including, without limitation, all building and use permits necessary to complete Phases 2 and 3 of the project.

(4) OHA shall not be responsible for maintaining the Hālawa Stream and the Hālawa Access Road. Unless prohibited or limited in scope by applicable building and/ or use

permits required by section (3) above, HDOT shall apply for a revision to the Conservation District Use Permit (CDUP) (which presently states that the access roads and temporary bridges shall be removed) to request that the bridges remain in place to allow continued access to Hālawā Valley. If requested CDUP revisions are approved, HDOT will upgrade and maintain the TWENTY (20) bridges in Hālawā Valley to allow for continued access. OHA shall not be responsible for the integrity, safety and the maintenance of the TWENTY (20) bridges. If CDUP is revised to allow the retention of the access roads, HDOT will be responsible for the maintenance of all access roads. HDOT shall grant OHA use of the bridges and access roads for the purposes set forth in Phases 2 and 3 of the IDP to allow for activities that may require such access.

(5) HDOT shall maintain on deposit, funds totaling THREE HUNDRED THOUSAND AND NO/100 DOLLARS (\$300,000.00) with OHA to be known as HLID funds. These HLID funds approximate monthly HLID expenditures and are necessary to eliminate the need for OHA to use its non-HLID funds to finance expenses incurred under this Agreement. OHA may draw against HLID funds for all expenses necessary and proper to meet its responsibilities under the terms of this Agreement. OHA shall submit receipts for all work expenses previously authorized by HDOT in meeting its responsibilities under the terms of this Agreement. HDOT shall as soon as reasonably practical, but no later than (FORTY-FIVE) 45 days after expense submittal, replenish HLID funds on deposit with OHA for the amount of these receipts.

The deposit with OHA under the Cooperative Agreement dated August 10, 1999 was ONE HUNDRED THOUSAND AND NO/100 DOLLARS (\$100,000.00). The deposit with OHA under the Cooperative Agreement dated June 25, 2010 was ONE HUNDRED FIFTY THOUSAND AND NO/100 DOLLARS (\$150,000.00). The deposit with OHA under this Agreement is THREE HUNDRED THOUSAND AND NO/100 DOLLARS (\$300,000.00) and is

commensurate with projected monthly HLID expenditures to be incurred during the implementation of the current Project phase.

SECTION 3.C. Responsibilities of the Parties – Joint Responsibilities which appears on page 7 of that certain Agreement dated June 25, 2010 states as follows:

**3. Responsibilities of the Parties.**

C. Joint Responsibilities:

(1) Monthly review meetings. The parties shall meet once a month at a minimum, to review the progress of the Project and to address and resolve issues and concerns related to the Project.

The aforementioned SECTION 3.C. Responsibilities of the Parties – Joint Responsibilities which appears on page 7 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**3. Responsibilities of the Parties.**

C. Joint Responsibilities:

(1) Monthly review meetings. The Parties shall meet once a month at a minimum, to review the progress of the Project and to address and resolve issues and concerns related to the Project.

(2) Work with HDOT to determine the feasibility of acquiring additional land located south of and adjacent to Parcel 20 up to the Luluku Stream by working with the adjacent land owners Ko'olau Land Partners and the City and County of Honolulu for access. (Exhibit 1 Attached).

(3) Work with Queen Emma Foundation and their tenant, Hawaiian Cement, regarding access and easements for the Hālawa Access Road.

SECTION 6. Project Funds which appears on page 7 of that certain Agreement dated June 25, 2010 states as follows:

**6. Project Funds.** This agreement is to be funded completely by HDOT and Federal funds administered by FHWA. The parties have no obligation to complete the work and services contemplated by this Agreement if these funds are exhausted and no additional funding becomes available. The parties acknowledge that the original approved budget for this Project was ELEVEN MILLION AND NO/100 DOLLARS (\$11,000,000.00) of which approximately \$8.5 million remains unspent and available.

The aforementioned SECTION 6. Project Funds which appears on page 7 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**6. Project Funds.** This Agreement is to be funded completely by HDOT and Federal funds administered by FHWA. The Parties will deliver Phase I of the Interpretive Development Plan by a date mutually agreed upon by OHA, HDOT, and FHWA in the Project Schedule. The Project Schedule, in the form of a living document, will inform HDOT and FHWA of OHA's Project deliverables, milestones, and estimated completion dates within the available budget. The Parties acknowledge that the original approved budget for this Project was ELEVEN MILLION AND NO/100 DOLLARS (\$11,000,000.00) of which approximately \$7.6 million remains unspent and available.

The original budgetary limits totaling ELEVEN MILLION AND NO/100 DOLLARS (\$11,000,000.00) for Project expenses as stated in the original Agreement dated August 10, 1999, Contract #1385, were as follows:

- a. Reimbursable costs to OHA for its administrative costs and other expenses incurred on the project - \$500,000.00; and
- b. Preliminary Design of Interpretive Development - \$500,000.00; and
- c. Final Design of Interpretive Development Plan - \$500,000.00; and
- d. Implementation of Interpretive Development Plan - \$9,500,000.00.

For the purposes of satisfying Department of Accounting and General Services payment

APPENDIX D 2012 Cooperative Agreement #2550.01

processing requirements, phase limits are now included in this amendment totaling ELEVEN MILLION AND NO/100 DOLLARS (\$11,000,000.00) for Project expenses and are modified to reflect current project estimates as follows:

"Original Budget" - August 10, 1999			Proposed Budget from OHA - March 2012		
Item	Budget	Percent	Item	Budget	Percent
A. Preliminary Design of IDP	500,000.00	4.5%	Phase I - Planning	2,648,150.38	24.1%
B. Final Design of IDP	500,000.00	4.5%	Phase II - Design & Devel.	3,862,023.77	35.1%
C. Implementation of IDP	9,500,00.00	86.4%	Phase III - Implementation	3,077,038.48	28.0%
Other Reimbursable Cost	500,000.00	4.5%	Project Contingencies	1,412,787.37	12.8%
Total	11,000,000.00	100.0%	Total	11,000,000.00	100.0%
Expenditures from "Original Budget" - May 31, 2011			Expenditures as of February 29, 2012		
Item	Budget	Percent	Item	Budget	Percent
A. Preliminary Design of IDP	1,321,568.99	12.0%	Phase I - Planning	2,648,150.38	24.1%
B. Final Design of IDP	691,664.04	6.3%	Phase II - Design & Devel.	672,775.56	6.1%
C. Implementation of IDP	605,380.59	5.5%	Phase III - Implementation	-	0.0%
Other Reimbursable Cost	469,809.92	4.3%	Project Contingencies	-	0.0%
Total	3,088,423.54	28.1%	Total	3,320,925.94	30.2%

- a. Phase 1- Planning - \$2,648,150.38; and
- b. Phase 2- Design and Development - \$3,862,023.77; and
- c. Phase 3- Implementation - \$3,077,038.48; and
- d. Contingencies - \$1,412,787.37.

To minimize payment delays, the Parties agree to periodically review and, if necessary, adjust phase limits.

SECTION 7. Financing which appears on page 8 of that certain Agreement dated June 25, 2010 states as follows:

**7. Financing.** This Agreement is financed by State funds and Federal funds

administered by FHWA. Eligibility of costs for Federal reimbursement shall be as prescribed in 48 CFR 31 (Federal Acquisition Regulations).

Ninety percent (90%) of the cost is payable out of Federal funds. It is covenanted and agreed, by and between the parties hereto, that as to the portion of the obligation under this contract to be payable out of Federal funds, that this contract shall be construed to be an agreement to pay such portion to OHA only out of Federal funds if and when such Federal funds shall be received from the Federal government for the purpose of such payment, and that this contract shall not be construed to be a general agreement to pay such portion in all events out of any funds other than those which may be so received from the Federal government.

The aforementioned SECTION 7. Financing which appears on page 8 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**7. Financing.** This Agreement is financed by State funds and Federal funds administered by FHWA. Eligibility of costs for Federal reimbursement shall be as prescribed in 48 CFR 31 (Federal Acquisition Regulations) and 23 CFR (Highways).

Ninety percent (90%) of the cost is payable out of Federal funds. It is covenanted and agreed, by and between the Parties hereto, that as to the portion of the obligation under this Agreement to be payable out of Federal funds, that this Agreement shall be construed to be an agreement to pay such portion to OHA only out of Federal funds if and when such Federal funds shall be received from the Federal government for the purpose of such payment, and that this Agreement shall not be construed to be a general agreement to pay such portion in all events out of any funds other than those which may be so received from the Federal government.

Projected Project budgets shall be created, developed and maintained by OHA and its subcontractors. FHWA and HDOT shall be given THIRTY (30) days to review and comment on projected budgets prior to OHA Board of Trustees budget approval. Approval of the budget shall constitute approval of identified, project-related actions therein and serve as notification



that OHA and its subcontractors may proceed with project execution. In the event that there is a challenge to any budget item request that may prohibit approval, the Parties agree to an additional THIRTY (30) day period to allow discussion in order to arrive at a reasonable solution that enables the successful deliverance of the Project.

SECTION 8. Subcontracting or Assignment of Agreement which appears on page 8 of that certain Agreement dated June 25, 2010 states as follows:

**8. Subcontracting or Assignment of Agreement.** OHA shall not subcontract or assign all or any part of the work under this agreement without the prior written consent of HDOT, and any consent by HDOT to subcontract, assign, or otherwise dispose of any portion of this Agreement shall not be construed to relieve OHA of any responsibility for the fulfillment of the Agreement.

The parties understand OHA may subcontract or assign all or part of the work required by this agreement to a subsidiary Limited Liability Company. Approval by HDOT for such an assignment shall not be unreasonably withheld.

The aforementioned SECTION 8. Subcontracting or Assignment of Agreement which appears on page 8 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**8. Subcontracting or Assignment of Agreement.** OHA shall not subcontract or assign all or any part of the work under this Agreement without the prior written consent of HDOT and any consent by HDOT to subcontract, assign, or otherwise dispose of any portion of this Agreement shall not be construed to relieve OHA of any responsibility for the fulfillment of the Agreement.

SECTION 17. Reimbursements which appears on page 10 of that certain Agreement dated June 25, 2010 states as follows:

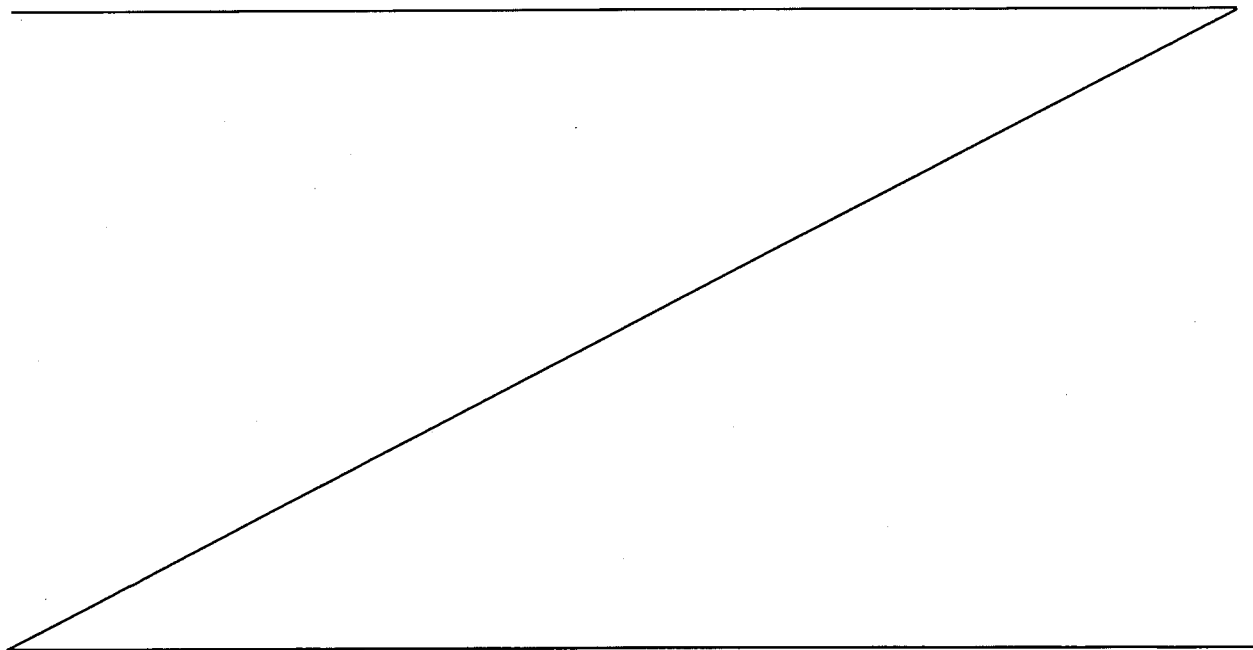
**17. Reimbursements.** As long as the services of OHA and its subcontractors are

authorized and performed in a satisfactory and timely manner, HDOT will make reimbursements based upon the receipts and timesheets rendered and the costs that were incurred, subject to the financing provisions set forth in Paragraphs 6 and 7 above as well as any applicable federal, state and county laws.

The aforementioned SECTION 17. Reimbursements which appears on page 10 of that certain Agreement dated June 25, 2010 is hereby amended to state as follows:

**17. Reimbursements.** As long as the services of OHA and its subcontractors are authorized and performed in a satisfactory manner, HDOT will make reimbursements based upon the receipts and timesheets rendered and the costs that were incurred, subject to the financing provisions set forth in Paragraphs 6 and 7 above as well as any applicable federal, state and county laws. HDOT shall take reasonable effort to remit payment on OHA billings within SIXTY (60) days of receipt.

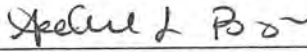
Except as set forth herein, no other amendments to the original June 25, 2010 Contract No. 2550, are made. All other provisions contained therein remain unchanged in full force and effect.



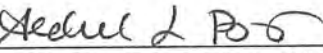
IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the day and year first above written

OFFICE OF HAWAIIAN AFFAIRS

Date: June 20, 2012

By   
for KAMANA O'OPONO CRABBE, Ph.D.  
Its Ka Pouhana, Chief Executive Officer

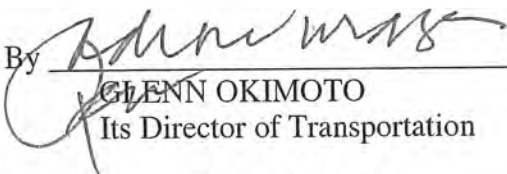
Date: June 20, 2012

By   
for AEDWARD LOS BANOS  
Its Chief Operating Officer

OHA"

DEPARTMENT OF TRANSPORTATION,  
STATE OF HAWAII

Date: Aug. 24 2012

By   
GLENN OKIMOTO  
Its Director of Transportation

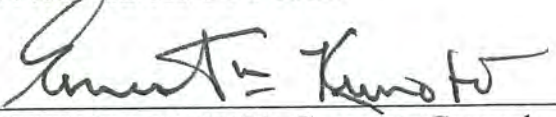
CONTRACTOR"

APPROVED AS TO CONTENT:

  
HAWLEY ALAMODIN, Chief Financial Officer

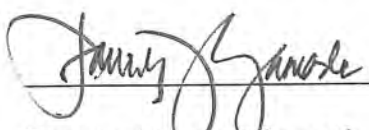
Date: June 19, 2012

APPROVED AS TO FORM:

  
ERNEST M. KIMOTO, Corporate Counsel

Date: 6-19, 2012

APPROVED AS TO FORM:

  
Deputy Attorney General  
Land Transportation Division

Date: 8/14, 2012

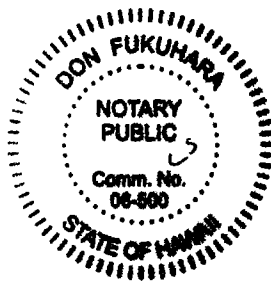
STATE OF HAWAI'I )  
 ) ss.  
CITY AND COUNTY OF HONOLULU )

On this \_\_\_\_\_ day of \_\_\_\_\_, 2012, before me personally appeared KAMANA 'OPONO CRABBE, Ph.D., to me known, who being by me duly sworn, did say that he is the Ka Pouhana, Chief Executive Officer of the OFFICE OF HAWAIIAN AFFAIRS, a body corporate and instrumentality of the State, and that in the absence of a seal that said instrument was signed in behalf of said corporation by authority of its Board of Trustees, and the said KAMANA 'OPONO CRABBE, Ph.D. acknowledged said instrument to be the free act and deed of said organization.

\_\_\_\_\_  
Notary Public, State of Hawai'i  
Print Name: \_\_\_\_\_  
My Commission expires: \_\_\_\_\_

STATE OF HAWAI'I )  
 ) ss.  
CITY AND COUNTY OF HONOLULU )

On this 24 day of August, 2012, before me personally appeared JADINE URASAKI to me known, who being by me duly sworn, did say that he is the Deputy Director of the DEPARTMENT OF TRANSPORTATION, a body corporate of the State of Hawaii, and that in the absence of a seal that said instrument was signed in behalf of said body corporate by authority of its Director, and the said Deputy Director acknowledged said instrument to be the free act and deed of said Department.



[Signature]  
\_\_\_\_\_  
Notary Public, State of Hawai'i  
Print Name: DON FUKUHARA  
My Commission expires: August 27, 2014

Doc. Description: Approval for  
Amendment no. 1  
\_\_\_\_\_  
Doc. Date: Aug. 14, 2012 No. Pages: 20  
DON FUKUHARA FIRST  
\_\_\_\_\_  
Notary Printed Name Notary Initials

**DRAFT- North Hālawā Valley (Site 2137, Areas 1-5)  
Mason Treatment Recommendations  
'Ewa District, O'ahu, Hawai'i**

Prepared for:

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In collaboration with:

Hālawā-Luluku Interpretive Development Project  
Office of Hawaiian Affairs  
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Honolulu, HI, 96817

December 17, 2019

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## Introduction

This report represents the opinions and recommendations of Fields Masonry for cultural masonry work at Site 2137, Areas 1-5 in the Hālawā portion of the H-3 corridor, as part of the Hālawā-Lulukū Interpretive Development (HLID) project. No features in Area 6 were recommended for treatment in consultation with Hālawā stewards, Nā Kūpuna a me Nā Kākoʻo o Hālawā, Inc. (NKNKHI).

A Condition Assessment of Site 2137 was drafted in November 2017 by Keala Pono, LLC, the archaeological firm contracted for the HLID project. This assessment [as of August 2018, under review by the State Historic Preservation Division (SHPD)] was informed by field observations and conversations with NKNKHI starting in August of 2017. Previous archaeological findings as reported in 2004 in *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawā Valley, Oʻahu Volumes 2a-2c* by Leslie L. Hartzell et al., also provided significant background information for Keala Pono's assessment.

In addition to the archaeological findings, this report for cultural masonry work was also informed by field observations and conversations with NKNKHI that began in June 2017. Simultaneously, certified arborist Kapalikū Schirman of Hui Kū Maoli Ola conducted an assessment of the existing trees and vegetation that pose an impact on the archaeological features of this Site 2137. The arborist's final report, *Botanical Resource Management Survey and Assessment*, is included as Appendix B of this document.

Fields Masonry's overall assessment of Site 2137 is that it functioned as a habitation site as evidenced by the agricultural terraces that once provided food and medicine to the inhabitants. The significant features indicate it likely was particularly used for the care of women, which classifies it as a Hale O Papa.

### Fields Masonry

Billy Fields is a native Hawaiian practitioner who specializes in historical and cultural restoration. His company, Fields Masonry, has repaired, restored and built sites throughout the State of Hawai'i since 1989 as a licensed masonry contractor. Some of those sites include: walls, fishponds, heiau and burial platforms.

In the process of restoring Hawaiian drystack rock walls we are working with only one source material, rocks. Our ancestors devised a system of building with rocks which lasted for hundreds of years. This system, under the direction of a Kahuna Kuhikuhi Pu'u One (professional architect), included proper wall angles, niho (base stone), gravity, and the skill and integrity of the masons.

Fields Masonry perpetuates these practices through uhaū humu pōhaku, the art of Hawaiian drystack masonry, by conducting workshops throughout the state with the nonprofit organization Hui Ho'oniho. This cultural foundation and strong work ethic qualify Fields Masonry to offer expert recommendations and opinions.

## Treatment Recommendations

In collaboration with the HLID team, this report was compiled to include treatment recommendations for cultural masonry work on the archaeological features of Site 2137. The US Dept. of Interior offers *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (2017)* to aid in project assessment and identifying the appropriate treatment type for historic buildings. The four treatment types discussed are as follows:

**Preservation** – *is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. The Standards for Preservation require retention of the greatest amount of historic fabric along with the building's historic form.*

**Rehabilitation** – *is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.*

**Restoration** – *is defined as the actor or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The Restoration Standards allow for the depiction of a building at a particular time in its history by preserving materials, features, finishes, and spaces from its period of significance and removing those from other periods.*

**Reconstruction** – *is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location. The Reconstruction Standards establish a limited framework for recreating a vanished or non-surviving building with new materials, primarily for interpretive purposes.*

For the purposes of this report, “buildings” is interpreted here to refer to the stonework and archaeological features of Site 2137. There are no written guidelines specifically for ancient Hawaiian drystack rock walls. Preservation and Rehabilitation were the only treatment types identified as relevant for the selected features in this report.

Fields Masonry interpreted the features and made treatment recommendations based on the expertise and perspective of a Hawaiian cultural master mason which will naturally differ from how an archaeologist interprets and thereby designates a feature. Regardless of the specific

designation or interpretation assigned by archaeologists or other professionals, the method of “treating” a Hawaiian rock wall will incorporate components of *preservation* and *rehabilitation* as part of the process. Any work that required stabilization or less was designated as *preservation*. If more work and material were recommended, it was designated *rehabilitation*. These are the two treatment types identified in this report for treatment of the features of Site 2137.

The following sections list each feature recommended for assessment and are grouped in order by area number. A short description of the feature’s physical and functional qualities are included as well as the recommended treatment type. The recommended design dimensions of the feature are described and the type of labor, including arborist work, time required per recommendation, as well as material and equipment needed to perform the work have also been included. Appendix A includes a set of drawings representing the current conditions of the features recommended for *rehabilitation*. Typical wall sections are also provided for construction purposes.

## Site 2137



Figure 1: North Hālawā Valley, Site 2137<sup>1</sup>

<sup>1</sup>North Hālawā Valley, Site 2137 Map from: Hartzell, Leslie L., Susan A. Lebo, Heidi A. Lennstrom, Shannon P. McPherron, and Deborah I. Olszewski (Editors), *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawā Valley, O'ahu Volumes 2a-2c: Site Reports*. Department of Anthropology, B.P. Bishop Museum, Honolulu, 2004.

### Area 1

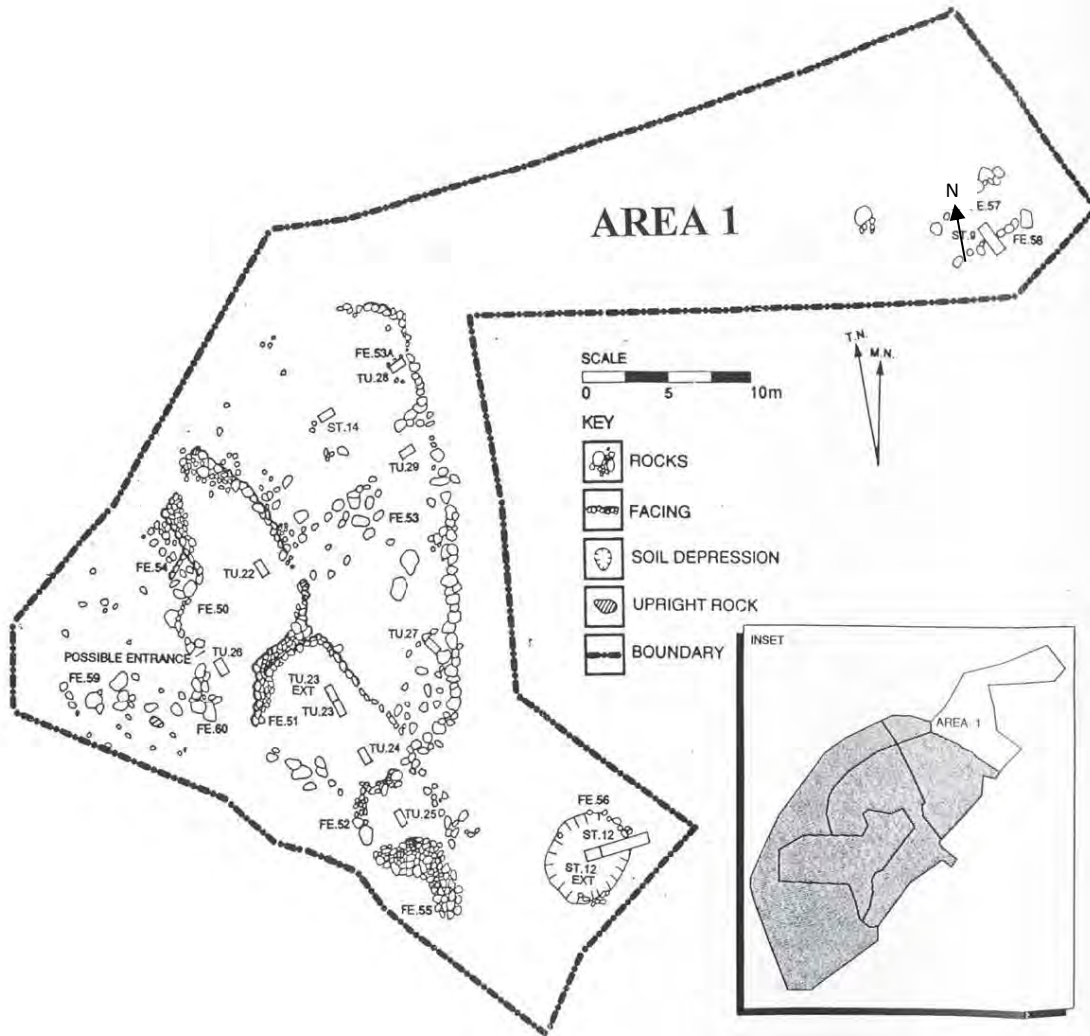


Figure 2: Site 2137, Area 1<sup>2</sup>

<sup>2</sup> Site 2137, Area 1 Map from: Hartzell et al, *Activities and Settlement in an Upper Valley*.

**Site 2137, Area 1****Features 50, 51, 53, & 53a - Rehabilitation****Description:**

In Keala Pono's Preservation Plan, Feature 53 is the only feature in Area 1 identified for rehabilitation, however, Features 50, 51, 53 and 53a are considered in this report to be part of one complex and should be included in the rehabilitation process to complete this significant feature enclosure. The walls are in poor condition and all require major rock realignment, re-erecting and filling of hakahaka in walls. Features 50, 51, 53, and 53a are located on a slight to moderate incline with noticeable soil erosion and pig-rooted damage.

Several functions for these features have been suggested by Keala Pono, one of which includes a heiau. Fields Masonry concurs with this particular assessment. The birthing stone, as identified by the community, which sits within these features suggests this is an enclosure, thereby supporting Keala Pono's suggestion.

Keala Pono's report states that the majority of walls were six feet in height and four feet wide. These dimensions were not observed in field studies conducted by Fields Masonry. Due to branches falling, erosion, and pig damage, these walls were lower in height when surveyed.

**Recommendations for Treatment of Features 50, 51, 53, and 53a: Rehabilitation**

It is suggested that all walls are rebuilt to complete this enclosure. See sheet 2 of Appendix A for drawings.

**Recommended Design Dimensions:**

- *Feature 50:* 53.5' long x 3' high x 4' wide cap, 15° face (Freestanding)
- *Feature 51:* 37.5' long x 3' high x 4' wide cap, 15° face (Freestanding)
- *Feature 53:* 126.5' long x 3' high x 4' wide cap, 15° face (Freestanding)
- *Feature 53a:* 17.5' long x 3' high x 4' wide cap, 15° face (Freestanding)

**Labor**

- 1 Mason Foreman - 120 days
- 4 Masons - 120 days
- 4 Laborers - 120 days
- Arborist (See Appendix B)

**Material**

- One-man rock - 80 cubic yards
- Hakahaka (fill) - 40 cubic yards
- Hakahaka ('ili'ili) - 20 cubic yards

**Equipment**

Equipment such as a mini-excavator and Bobcat track loader are not able to access these features. Transport of one-man rock and hakahaka will be labor intensive as it will need to be done manually. Building materials such as batter boards and metal stakes will also need to be carried to building feature.

**Photos of Area 1, Features 51, 53, & 53A**

*Figure 3: Area 1 - Feature 51 (Facing W)*



*Figure 4: Area 1 - Feature 53, with "birthing stone" in foreground (Facing E)*





Figure 5: Area 1 - Feature 53, "birthing stone" in middle left background (Facing N)



Figure 6: Area 1 - Feature 53A, "birthing stone" lower right (Facing NE)

### Area 2

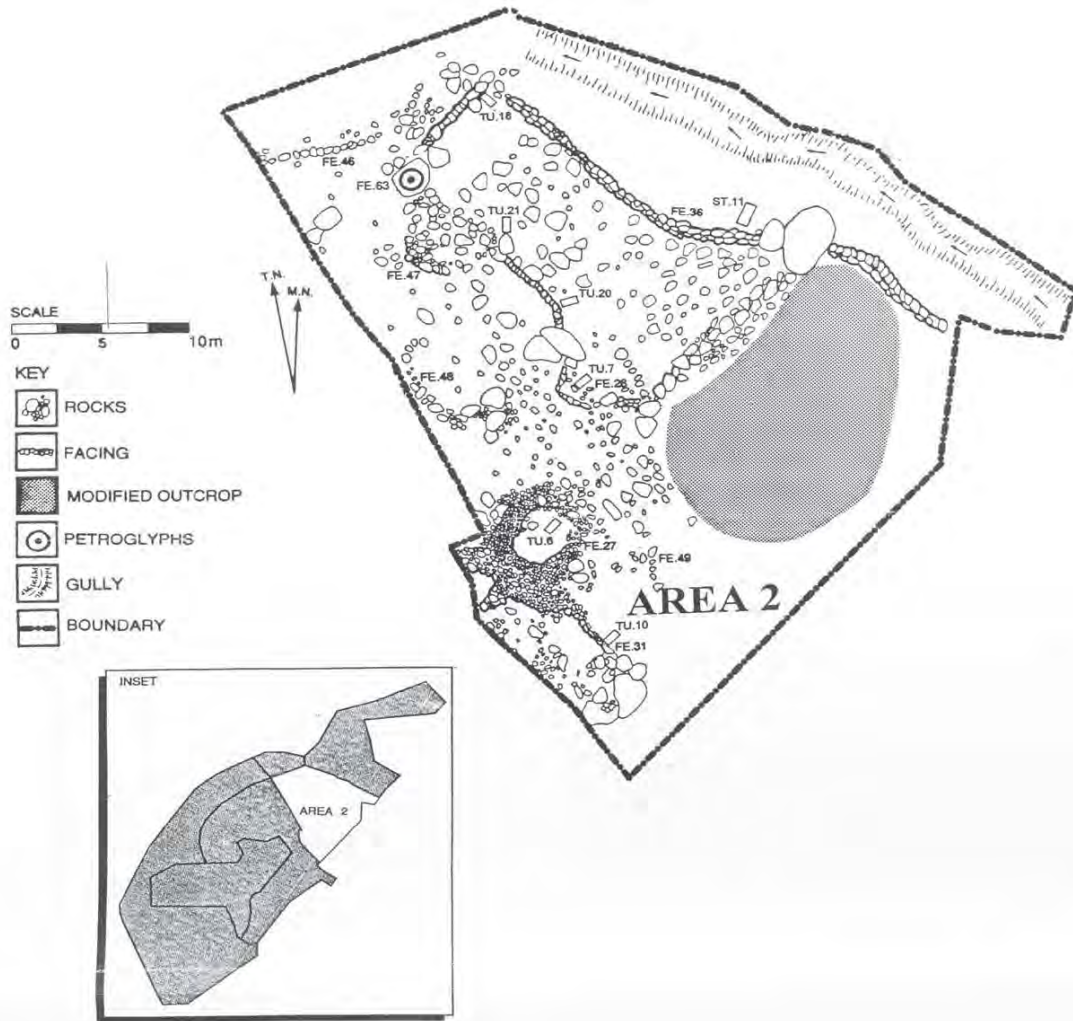


Figure 7: Site 2137, Area 2<sup>3</sup>

<sup>3</sup> Map from: Hartzell et al, *Activities and Settlement in an Upper Valley*.

**Site 2137, Area 2****Feature 27 - Rehabilitation****Description:**

Feature 27 is a walled enclosure constructed with rocks of all sizes. A large fallen banyan tree obstructed visibility of this feature during field studies conducted by Fields Masonry.

**Recommendations for Treatment of Feature 27: Rehabilitation**

Stabilize existing rocks for safety, removal of trees and clearance of vegetation. See sheet 3 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 62' long x 6' high x 2' wide cap, 15° face (Freestanding)

**Labor:**

- 1 Mason Foreman - 5 days
- 2 Masons - 5 days
- 2 Laborers - 5 days
- Arborist (See Appendix B)

**Materials:**

- Use existing rocks on site.

**Equipment:**

- N/A

**Photos of Area 2, Feature 27**



*Figure 8: Area 2 - Feature 27 (Facing ENE)*



Figure 9: Area 2 - Feature 27 (Facing NE)



Figure 10: Area 2 - Feature 27 (Facing W)

**Site 2137, Area 2****Feature 28 - Rehabilitation****Description:**

Feature 28 is part of an enclosure, which includes Feature 36, that appears to be a freestanding or hakahaka style wall. Feature 28 is the mauka wall of this enclosure and its function suggests a soil and rock fall retention feature. This wall is in fairly good condition and requires some re-stacking of fallen stones, as well as tree and brush removal to prevent further deterioration.

**Recommendations for Treatment of Feature 28: Rehabilitation**

Tree and brush removal is recommended for the rehabilitation of Feature 28. Realignment and re-stacking of fallen rocks would enhance this feature's visual prominence and improve the safety from rock fall and further deterioration. See sheet 4 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 47' long x 3' high x 2' wide cap, 15° face (Freestanding)

**Labor:**

- 1 Mason Foreman - 10 days
- 2 Masons - 10 days
- 2 Laborers - 10 days
- Arborist (See Appendix B)

**Materials:**

- One-man rock - 4 cubic yards
- Hakahaka (fill) - 2 cubic yards
- Hakahaka ('ili'ili) - 2 cubic yards

**Equipment:**

- N/A

**Photos of Area 2, Feature 28**



*Figure 11: Area 2 - Feature 28 (Facing ENE)*



Figure 12: Area 2 - Feature 28 (Facing ESE)



Figure 13: Area 2 - Feature 28 (Facing ESE)



**Site 2137, Area 2****Feature 31 - Preservation****Description:**

Feature 31 is a terrace composed of stacked boulders and cobbles incorporating a natural boulder concentration on the south side. This feature is connected to Feature 27 with potential uses including agriculture and erosion control.

**Recommendations for Treatment of Feature 31: Preservation**

Stabilize and realign loose rocks. Tree removal and vegetation clearance will contribute to the preservation of the area.

**Recommended Design Dimensions:**

- 17' long x 2.5' high x 3.5 wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 5 days
- 2 Masons - 5 days
- 2 Laborers - 5 days
- Arborist (See Appendix B)

**Materials:**

- Use existing rocks found at and around feature.

**Equipment:**

- N/A

**Photos of Area 2, Feature 31**



*Figure 14: Area 2 - Feature 31 (Facing NE)*

**Site 2137, Area 2****Feature 36 - Rehabilitation****Description:**

Feature 36 is constructed of larger boulders and cobbles and serves as a boundary wall and a locale for small-scale rituals. This wall, consisting of two separate sections is approximately 126' long in total, stacked 5 courses high in some places on the northeast side and double filled with two to three courses on the other side.

Feature 36 includes a stone (referred to by the community as the Kū stone) that can be described as one of the most noteworthy features in the northern portion of Area 2. Keala Pono's Preservation Plan states the structure is thought to have functioned as a locale for small-scale rituals because of its association with the petroglyphs on Feature 63, a nearby boulder in Area 2. Fields Masonry agrees with this assessment.

**Recommendations for Treatment of Feature 36: Rehabilitation**

Because of its steep location, no machinery can access this feature. Rehabilitation of this wall will be labor intensive, as all rock material will have to be hand carried to this feature. Rocks from the immediate surrounding area should be gathered for safer walking, and used to rehabilitate the existing wall. When time permits, the wall can be reinforced in sections and re-stacked with existing rocks in the immediate area. See sheet 5 of Appendix A for drawings.

It is recommended that proper protocols are exercised to re-erect a Kū stone. This ceremonial task should be conducted with Hālawa stewards and a qualified cultural practitioner who knows the oli (chants) for such a task.

**Recommended Design Dimensions:**

- 36-A - 48' long x 4' high x 2' wide cap, 15° face (Freestanding)
- 36-B - 78' long x 4' high x 2' wide cap, 15° face (Freestanding)

**Labor:**

- 1 Mason Foreman - 60 days
- 4 Masons - 60 days
- 4 Laborers - 60 days
- Arborist (See Appendix B)

**Materials:**

- Use existing rocks in immediate vicinity. When existing rock supply is exhausted a new material assessment to be made to complete this feature. See Rock Procurement section.

**Equipment:**

- N/A

**Photos of Area 2, Feature 36**

*Figure 15: Area 2 - Feature 36, "Kū stone" in center (Facing ENE)*



*Figure 16: Area 2 - Feature 36 (Facing SE)*



Figure 17: Area 2 - Feature 36, Kū Stone in foreground (Facing WNW)



Figure 18: Area 2 - Feature 63, Petroglyph Rock (Facing E)

**Site 2137, Treatment Area 2****Feature 46 - Rehabilitation****Description:**

Feature 46 is an alignment of boulders loosely placed along a steep cliff. Keala Pono's Preservation Plan suggests that this alignment functioned as a modern trail marker with which Fields Masonry concurs.

**Recommendations for Treatment of Feature 46: Rehabilitation**

Realign existing boulders and improve the existing trail with brush and tree removal. See sheet 6 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 24' long x 2' high x 2' wide cap, 15° face (Freestanding)

**Labor:**

- 1 Mason Foreman - 5 days
- 2 Masons - 5 days
- 2 Laborers - 5 days
- 1 Excavator Operator - 5 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 6 cubic yards
- Hakahaka (fill) - 3 cubic yards
- Hakahaka ('ili'ili) - 2 cubic yards

**Equipment:**

- Mini-Excavator - 5 days

**Photos of Area 2, Feature 46**



*Figure 19: Area 2 - Feature 46 (Facing NNW)*

**Site 2137, Area 2****Feature 47 - Rehabilitation****Description:**

Feature 47 is a small half-moon shaped double terrace. The close proximity of this feature to habitat enclosures suggests it was a traditional medicinal garden.

**Recommendations for Treatment of Feature 47: Rehabilitation**

Re-stack entire terrace and incorporate medicinal plants. See sheet 7 of Appendix A for drawings.

Stewards and community members are encouraged to propagate medicinal plants for future use and education.

**Recommended Design Dimensions:**

- 47-A - 21' long x 2.5' high x 2' wide cap, 20° face (Kīpapa)
- 47-B - 21' long x 2.5' high x 2' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 10 days
- 2 Masons - 10 days
- 2 Laborers - 10 days
- 1 Excavator Operator - 5 days
- Arborist (See Appendix B)

**Materials:**

- One-man rock - 4 cubic yards
- Hakahaka (fill) - 1 cubic yard
- Hakahaka ('ili'ili) - 1 cubic yard

**Equipment:**

- Mini-Excavator - 5 days



**Photos of Area 2, Feature 47**



*Figure 20: Area 2 - Feature 47 (Facing ENE)*

**Site 2137, Area 2****Feature 48 - Rehabilitation****Description:**

Feature 48 consists of a terrace associated with agriculture. The lower portion of the terrace (48-A) stands at 2' while the upper portion of terrace (48-B) stands at 4'.

**Recommendations for Treatment of Feature 48: Rehabilitation**

Stabilize large rocks and realign. See sheet 8 of Appendix A for drawings. Tree removal and vegetation clearance will contribute to the preservation of the area.

**Recommended Design Dimensions:**

- 48-A - 20' long x 2' high x 2' wide cap, 20° face (Kīpapa)
- 48-B - 20' long x 4' high x 2' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 10 days
- 2 Masons - 10 days
- 2 Laborers - 10 days
- Arborist (See Appendix B)

**Materials:**

- Use existing rocks in immediate vicinity. After tree removal and vegetation clearance, new material assessment to be made.

**Equipment:**

- N/A

**Photos of Area 2, Feature 48**



*Figure 21: Area 2 - Feature 48 (Facing ESE)*

**Site 2137, Area 2****Feature 49 - Rehabilitation****Description:**

Although Feature 49 is recommended for preservation in Keala Pono's Preservation Plan, it is recommended for rehabilitation in this report. This kīpapa wall should be rehabilitated for the purpose of retaining the soil and the angle of the slope.

**Recommendations for Treatment of Feature 49: Rehabilitation**

Restore entire wall for slope retention, tree removal, and vegetation clearance. See sheet 9 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 9' long x 1' high x 2.5' wide cap, 15° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 3 days
- 2 Masons - 3 days
- 2 Laborers - 3 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 1 cubic yard
- Hakahaka (fill) - 1/2 cubic yards
- Hakahaka ('ili'ili) - 1/2 cubic yards

**Equipment:**

- N/A

**Photos of Area 2, Feature 49**



*Figure 22: Area 2 - Feature 49 (Facing E)*



*Figure 23: Area 2 - Feature 49 (Facing ESE)*

Area 3

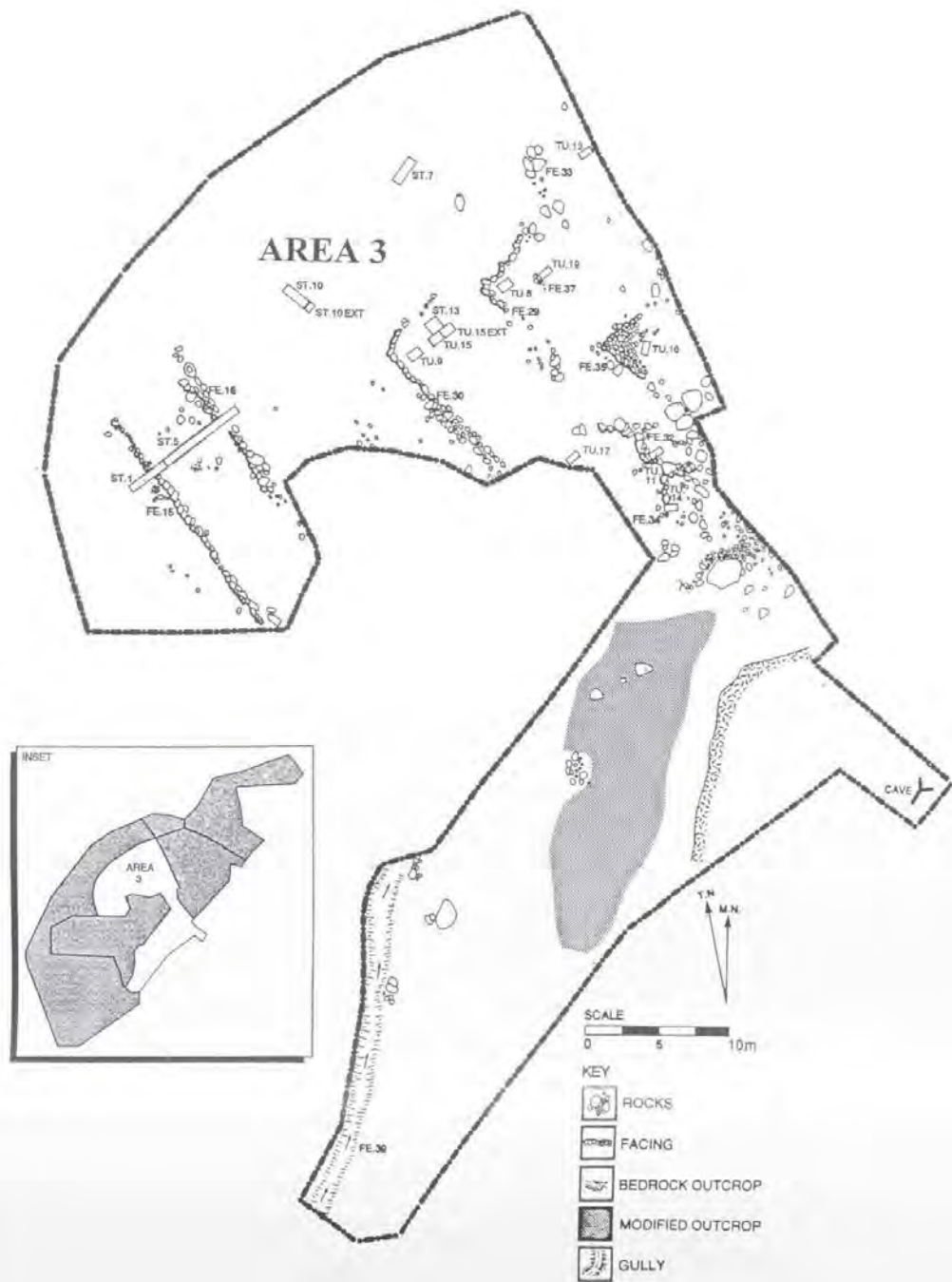


Figure 24: Site 2137, Area 3<sup>4</sup>

<sup>4</sup> Map from: Hartzell et al, *Activities and Settlement in an Upper Valley*.

**Site 2137, Area 3****Feature 15 - Rehabilitation****Description:**

Feature 15 is a terrace composed of boulders and cobbles. The existing wall is a typical kīpapa style wall, retaining earth for agricultural purposes.

**Recommended Treatment of Feature 15: Rehabilitation**

It is recommended that the entire terrace be re-stacked for soil retention. See sheet 10 of Appendix A for drawings. Remove the existing trail that cuts through Feature 15 & 16 and reroute according to stewards' needs.

This feature also has potential as a prime location for a classroom where the stewards and the community can learn the art of uhau humu pōhaku while contributing to the preservation of the area. Features 15 & 16 are also recommended features for food production and steward sustainability.

**Recommended Design Dimensions:**

- 60' long x 2.5' x 2' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 15 days
- 2 Masons - 15 days
- 2 Laborers -15 days
- 1 Excavator Operator - 15 days
- Arborist (See Appendix B)

**Materials:**

- One-man rock - 60 cubic yards
- Hakahaka (fill) - 5 cubic yards
- Hakahaka ('ili'ili) - 1 cubic yard

**Equipment:**

- Mini Excavator - 15 days

**Photos of Area 3, Feature 15**



*Figure 25: Area 3 - Feature 15 (Facing N)*



**Site 2137, Area 3****Feature 16 - Rehabilitation****Description:**

Feature 16 is a terrace composed of boulders and cobbles. The existing wall is a typical kīpapa style wall retaining earth which will help with erosion control.

Both size and location suggest this terrace was a prime area for food production like kalo (taro) and 'uala (sweet potato) in previous habitation. With rehabilitation, this function could be restored.

**Recommendations for Treatment of Feature 16: Rehabilitation**

Re-stack the entire terrace for soil retention. See sheet 11 of Appendix A for drawings. Remove existing coconut tree in Feature 16 and replant.

This area would be another ideal spot for an uhau humu pōhaku classroom. Features 15 & 16 are excellent features for the production of food and steward sustainability.

**Recommended Design Dimensions:**

- 50' long x 2.5' x 2' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 15 days
- 2 Masons - 15 days
- 2 Laborers - 15 days
- 1 Excavator Operator - 15 days
- 1 Boom truck/back hoe operator - 2 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 60 cubic yards
- Hakahaka (fill) - 5 cubic yards
- Hakahaka ('ili'ili) - 1 cubic yard

**Equipment:**

- Mini-Excavator - 15 days
- Boom truck/Back hoe - 2 days

**Photos of Area 3, Feature 16**



*Figure 26: Area 3 - Feature 16 (Facing SSE)*

**Site 2137, Area 3****Feature 29 - Rehabilitation****Description:**

Feature 29 is a terrace that is no longer recognizable as such. It has been extensively damaged from gradual erosion, wild pigs and unrecorded human modifications. This terrace appears to be U shaped and unfinished.

**Recommendations for Treatment of Feature 29: Rehabilitation**

Re-stack entire terrace, realign and level for future agricultural uses. See sheet 12 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 39' long x 3' high x 2' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 5 days
- 2 Masons - 5 days
- 2 Laborers - 5 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 3 cubic yards
- Hakahaka (fill) - 1 cubic yard
- Hakahaka ('ili'ili) - 1 cubic yard

**Equipment:**

- N/A

**Photos of Area 3, Feature 29**



*Figure 27: Area 3 - Feature 29 (Facing N)*

**Site 2137, Area 3****Feature 30 - Rehabilitation****Description:**

Feature 30 is a terrace consisting of an L-shaped retaining wall built with stacked boulders and cobbles. A portion of the interior contains pavement of cobbles and pebbles, indicating that the area was a habitation feature. Keala Pono's Preservation Plan states that charcoal and an imu were found in a previous archaeological excavation. Fields Masonry agrees with this assessment.

**Recommendation for Treatment of Feature 30: Rehabilitation**

Re-stack the entire terrace, realign and level for future use. See sheet 13 of Appendix A for drawings.

The terrace could be a potential site for a new hale pili and use of the imu cooking area could be restored.

**Recommended Design Dimensions:**

- 50' long x 3' high x 2' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 15 days
- 2 Masons - 15 days
- 2 Laborers - 15 days
- 1 Excavator Operator - 15 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 15 cubic yards
- Hakahaka (fill) - 2 cubic yards
- Hakahaka ('ili'ili) - 1 cubic yard

**Equipment:**

- Mini-Excavator - 15 days

**Photos of Area 3, Feature 30**



*Figure 28: Area 3 - Feature 30 (Facing SSE)*



*Figure 29: Area 3 - Feature 30 (Facing ENE)*

**Site 2137, Area 3****Feature 33 - Preservation****Description:**

Feature 33 is listed in Keala Pono's Preservation Plan as a preservation item. It is a terrace overgrown with a dead noni tree, shrubs and grass. Keala Pono's Preservation Plan suggests that this terrace, together with Feature 29 and 30, once made up a single terrace. Fields Masonry agrees.

**Recommendations for the Treatment of Feature 33: Preservation**

Tree and brush removal will be necessary.

This feature can be used for native food production and a classroom for uhu humu pōhaku.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- Arborist (See Appendix B)

**Material:**

- To be determined after vegetation clearance.

**Equipment:**

- N/A

**Photos of Area 3, Feature 33**



*Figure 30: Area 3 - Feature 33 (Facing N)*



**Site 2137, Area 3****Feature 34 - Preservation****Description:**

Feature 34 is a terrace constructed with boulders and cobbles stacked one to two courses high with a relatively level interior. This feature is listed for preservation, including vegetation clearance, and tree removal. This terrace likely had an agricultural function.

**Recommendations for Treatment of Feature 34: Preservation**

Tree and brush removal will contribute to the preservation of the feature which can be used in the future as an agricultural terrace.

This feature can be used for native food production and a classroom for uhaū humu pōhaku.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- Arborist (See Appendix B)

**Material:**

- To be determined after vegetation clearance.

**Equipment:**

- N/A

**Photos of Area 3, Feature 34**



*Figure 31: Area 3 - Feature 34 (Facing N)*

**Site 2137, Area 3****Feature 35 - Preservation****Description:**

Feature 35 is described in Keala Pono's report as a terrace of rock and cobble of all different sizes. However, Fields Masonry interprets its proximity to Feature 29 and 30 as an indication that the rocks were intended for future use for these nearby features.

**Recommendations for Treatment of Feature 35: Preservation**

Gather all loose rock in the vicinity and stack on mound for future use on existing terraces as building materials.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- 1 Mason Foreman - 16 hours
- 1 Mason - 16 hours
- 1 Laborer - 16 hours
- Arborist (See Appendix B)

**Materials:**

- Use existing rocks at feature.

**Equipment:**

- N/A

**Photos of Area 3, Feature 35**



*Figure 32: Area 3 - Feature 35 (Facing E)*

### Area 4

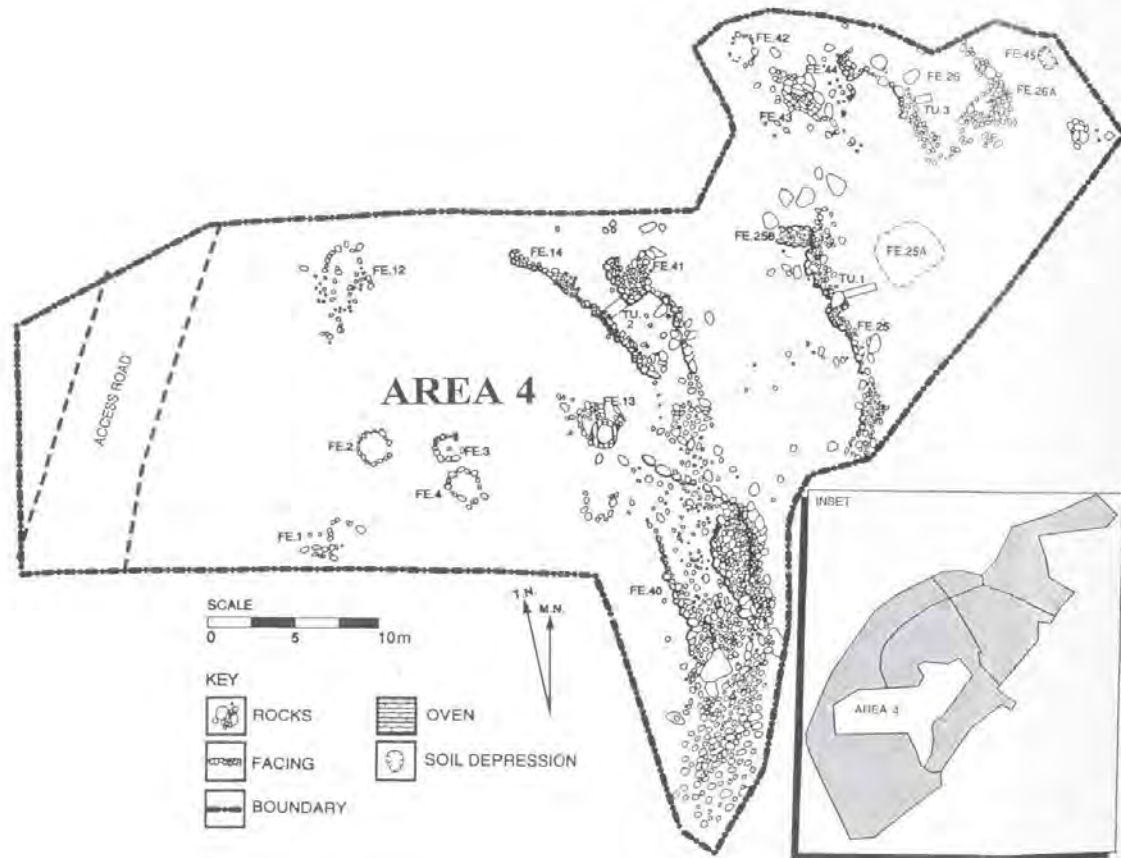


Figure 33: Site 2137, Area 4<sup>5</sup>

<sup>5</sup> Map from: Hartzell et al, *Activities and Settlement in an Upper Valley*.

**Site 2137, Area 4****Feature 14 - Rehabilitation****Description:**

Feature 14 is a terrace constructed of stacked boulders and cobbles. Keala Pono's Preservation Plan states that during archaeological examination, charcoal and fire cracked rocks were found indicating that this is a possible imu, or household cooking site. Fields Masonry also observed this during field studies. The presence of the imu indicates a possible historical occupation, which may have included food preparation and/or a hale mua, or men's eating area.

**Recommendation for Treatment of Feature 14: Rehabilitation**

Re-stack portions of the wall, realign and level terrace. See sheet 14 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 50' long x 2.5' high x 3' wide cap, 20° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 10 days
- 2 Masons - 10 days
- 2 Laborers - 10 days
- 1 Excavator Operator - 5 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 4 cubic yards
- Hakahaka (fill) - 1 cubic yard
- Hakahaka ('ili'ili) - 1 cubic yard

**Equipment:**

- Mini-Excavator - 5 days

**Photos of Area 4, Feature 14**



*Figure 34: Area 4 - Feature 14 (Facing NNE)*



*Figure 35: Area 4 - Feature 14 (Facing NNW)*

**Site 2137, Area 4****Feature 26 & 26a - Preservation****Description:**

Features 26 & 26a make up a U-shaped terrace constructed with boulders and cobbles. They are listed in Keala Pono's Preservation Plan as historical habitation features. Fields Masonry agrees.

**Recommendations for Treatment of Feature 26 & 26A: Preservation**

Trees and vegetation should be removed and cleared.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- Arborist (See Appendix B)

**Material:**

- N/A

**Equipment:**

- N/A



**Photos of Area 4, Feature 26**



*Figure 36: Area 4 - Feature 26 (Facing NNE)*



*Figure 37: Area 4 - Feature 26 (Facing SW)*

**Site 2137, Area 4****Feature 40 & 41- Rehabilitation****Description:**

Feature 40 is a double terrace that is constructed with stacked boulders and cobbles. This double terrace retains the slope of the area and provided a planting area approximately 8' wide between the terraces. An 'auwai or irrigation channel borders the top of the upper terrace and runs into Feature 38, which creates a water diversion to a planting area between the terraces. Feature 41 is mauka of Feature 14 and at the NW end of Feature 40. Feature 41 would complete and enhance the functions of Features 14 and 40 as a possible household cooking and food preparation site, as was its likely function in the past

**Recommendation for Treatment of Feature 40 & 41: Rehabilitation**

Restack entire length of Feature 40. Restack the two terrace walls to encourage native food source planting. Investigate 'auwai water source and possible re-activation. Restack the terrace walls and backfill of Feature 41, level area for future use. See sheet 15 of Appendix A for drawings.

**Recommended Design Dimensions:**

- 40-A - 110' long x 8' to 12' high x 2' wide cap, 28° face (Kīpapa)
- 40-B - Lower terrace 110' long x 3' high x 2' wide cap, 15° face (Kīpapa)
- 41 – 36' long x 3' high x 2' wide cap, 15° face (Kīpapa)

**Labor:**

- 1 Mason Foreman - 75 days
- 4 Masons - 75 days
- 4 Laborers - 75 days
- 1 Excavator Operator - 65 days
- 1 Bobcat Track Loader Operator - 65 days
- Arborist (See Appendix B)

**Material:**

- One-man rock - 96 cubic yards
- Hakahaka (fill) - 40 cubic yards
- Hakahaka ('ili'ili) - 21 cubic yards

**Equipment:**

- Mini-Excavator - 65 days
- Bobcat Track Loader - 65 days

**Photos of Area 4, Feature 40**



*Figure 38: Area 4 - Feature 40 (Facing NE)*



*Figure 39: Area 4 - Feature 40 (Facing S)*

**Site 2137, Area 4****Feature 43 - Preservation****Description:**

Feature 43 is a rock mound composed of rock of various sizes and appears to be a stockpile for future use.

**Recommendation for Treatment of Feature 43: Preservation**

Trees and vegetation should be removed and cleared. Stockpile the rock material at the feature location for future use at other features.

This feature is in close proximity to Area 3 Features 15 & 16, scheduled to be rehabilitated, and this material should be used at those features. There is no sheet drawing included for this feature.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- Arborist (See Appendix B)

**Material:**

- Use existing rocks at feature.

**Equipment:**

- N/A

**Photos of Area 4, Feature 43**



*Figure 40: Area 4 - Feature 43 (Facing E)*

**Site 2137, Area 4****Feature 44 - Preservation****Description:**

Feature 44 is a small platform built with boulders, cobbles, and cement. Fields Masonry agrees with Keala Pono's suggestion that this feature was a 20<sup>th</sup> century walkway.

**Recommendations for Treatment of Feature 44: Preservation**

No masonry is required, only tree and vegetation clearance. There is no sheet drawing included for this feature.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- Arborist (See Appendix B)

**Material:**

- N/A

**Equipment:**

- N/A

**Photos of Area 4, Feature 44**



*Figure 41: Area 4 - Feature 44 (Facing E)*

**Site 2137, Area 4****Feature 45 - Preservation****Description:**

This is a depression of undetermined function.

**Recommendations for Treatment of Feature 45: Preservation**

No masonry is required, only tree and vegetation clearance.

**Recommended Design Dimensions:**

- N/A

**Labor:**

- Arborist (See Appendix B)

**Material:**

- N/A

**Equipment:**

- N/A



**Photos of Area 4, Feature 45**



*Figure 42: Area 4 - Feature 45 (Facing E)*

### Area 5

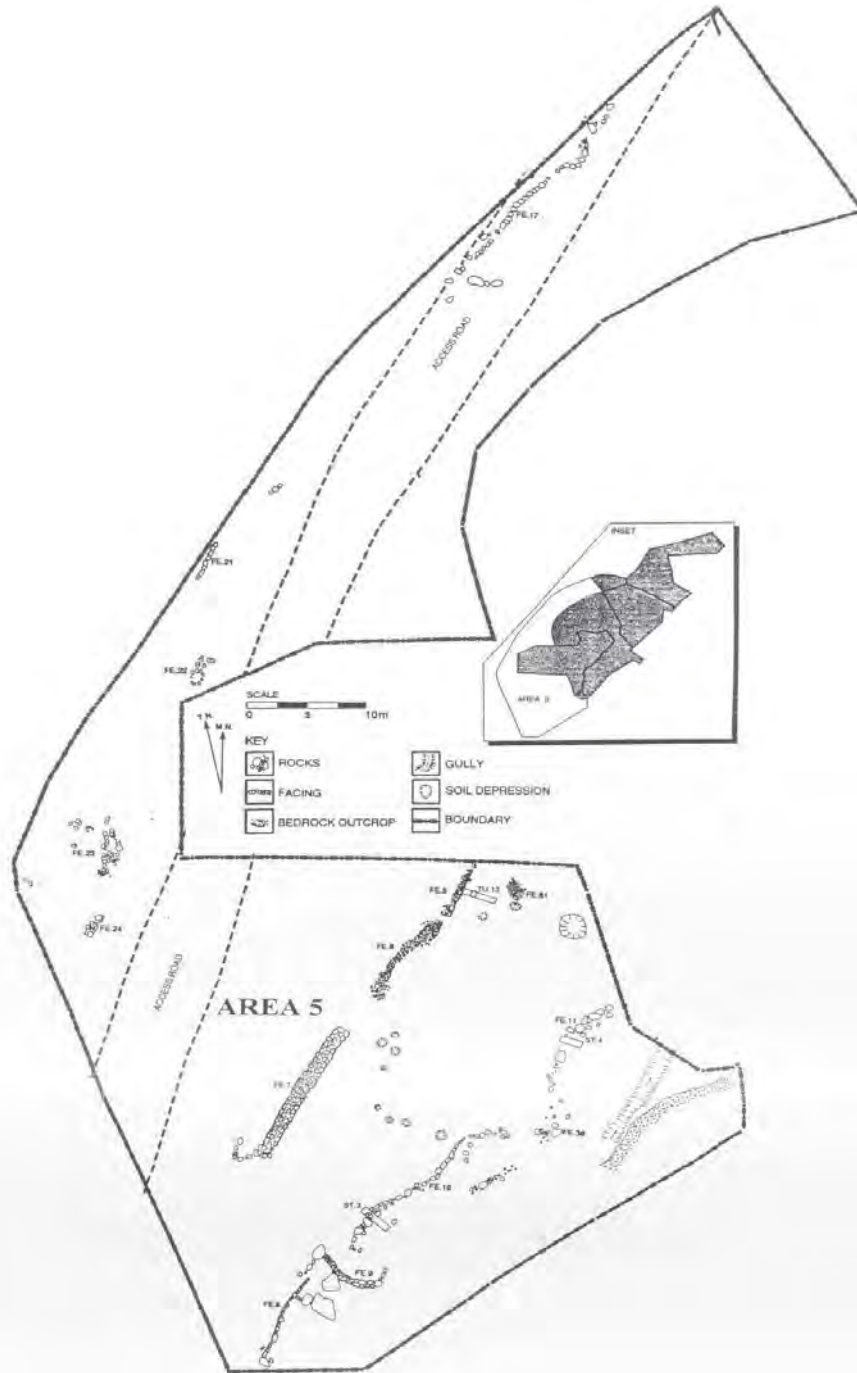


Figure 43: Site 2137, Area 5<sup>6</sup>

<sup>6</sup> Map from: Hartzell et al, *Activities and Settlement in an Upper Valley*.

**Site 2137, Area 5****Feature 7 - Rehabilitation****Description:**

Feature 7 is a dry stacked wall that has been re-stacked to some extent. There is a large tree stump growing in the center of the wall.

**Recommendations for Treatment of Feature 7: Rehabilitatin**

The tree stump should be removed to ensure the integrity of the wall remains intact. A small portion of wall on each side of the stump is required to be deconstructed for the successful removal of the stump. Tree and vegetation removal are also recommended. Restack and align rocks. See sheet 16 of Appendix A for drawings.

This wall is located in a flat and easy to traverse area; during rehabilitation work, this wall could be used as a classroom for stewards and the community to learn the art of uhau humu pōhaku. This recommendation is suggested because of the area, access, and the recent re-stacking efforts of Feature 7.

**Recommended Design Dimensions:**

- 55' long x 2' high x 3' wide cap, 15° face (Freestanding)

**Labor:**

- 1 Mason Foreman - 40 hours
- 2 Masons - 40 hours
- 2 Laborers - 40 hours
- Excavator Operator - 8 hours
- Arborist (See Appendix B)

**Material:**

- One-man rock - 1 cubic yard
- Hakahaka (fill) - 1 cubic yard

**Equipment:**

- Mini-Excavator - 8 hours

**Photos of Area 5, Feature 7**



*Figure 44: Area 5 - Feature 7 (Facing NW)*



*Figure 45: Area 5 - Feature 7 (Facing W)*

**Site 2137, Area 5****Feature 38 - Preservation****Description:**

Feature 38 is described as a mound of rocks. This mound of rocks looks like a water diversion for an 'auwai that is now dry. As an 'auwai it could aid in irrigation for food production or water diversion during heavy rains.

**Recommendations for Treatment of Feature 38: Preservation**

Stockpile the rock material at the feature location for future use.

In the future, this feature could be restacked as a hakahaka style wall to function as a water diversion barrier. In this case, a larger boulder from the existing area should be used and larger niho stones placed at base of wall.

Feature 38 also offers the community an opportunity to be educated about uhau humu pōhaku. The rehabilitation process could encourage stewards and the community to learn more about Hawaiian dry stacking techniques and protocols.

**Design Dimensions:**

- Rock pile area approximately 8' wide x 3' high

**Labor:**

- 1 Mason Foreman - 16 hours
- 2 Mason - 16 hours
- 2 Laborers - 16 hours
- Excavator Operator - 8 hours
- Arborist (See Appendix B)

**Material:**

- One-man rock - 1 cubic yard
- Hakahaka (fill) - 1/2 cubic yard

**Equipment:**

- Mini-Excavator - 8 hours

**Photos of Area 5, Feature 38**



*Figure 46: Area 5 - Feature 38 (Facing S)*

### Mason Recommendations Summary

Area	Feature(s)	Finished Dimension (L x H x W)	Treatment	Labor	Material	Equipment	Drawing	
1	50	53.5' x 3' x 4'	Rehab	1 Mason Foreman - 120 days 4 Masons - 120 days 4 Laborers - 120 days Arborist	One-man rock - 80 cubic yards Hakahaka (fill) - 40 cubic yards Hakahaka ('ili'ili) - 20 cubic yards	Terrain not accessible to equipment	Appendix A:2	
	51	37.5' x 3' x 4'						
	53	126.5' x 3' x 4'						
	53a	17.5' x 3' x 4'						
2	27	62' x 6' x 2'	Rehab	1 Mason Foreman - 5 days 2 Masons - 5 days 2 Laborers - 5 days Arborist	Use existing rocks on site.	N/A	Appendix A:3	
	28	47' x 3' x 2'	Rehab	1 Mason Foreman - 10 days 2 Masons - 10 days 2 Laborers - 10 days Arborist	One-man rock - 4 cubic yards Hakahaka (fill) - 2 cubic yards Hakahaka ('ili'ili) - 2 cubic yards	N/A	Appendix A:4	
	31	17' x 2.5' x 3.5'	Preserve	1 Mason Foreman - 5 days 2 Masons - 5 days 2 Laborers - 5 days Arborist	Use existing rocks on site.	N/A	N/A	
	36	48' x 4' x 2'	78' x 4' x 2'	Rehab	1 Mason Foreman - 60 days 4 Masons - 60 days 4 Laborers - 60 days Arborist	Use existing rocks on site. When existing rock supply is exhausted a new assessment of material should be made to complete this feature.	N/A	Appendix A:5
	46	24' x 2' x 2'	Rehab	1 Mason Foreman - 5 days 2 Masons - 5 days				Appendix A:6

				2 Laborers - 5 days 1 Excavator Operator - 5 days Arborist	One-man rock - 6 cubic yards Hakahaka (fill) - 3 cubic yards Hakahaka ('ili'ili) - 2 cubic yards	Mini-Excavator - 5 days	
	47	21' x 2.5' x 2'	Rehab	1 Mason Foreman - 10 days 2 Masons - 10 days 2 Laborers - 10 days 1 Excavator Operator - 5 days Arborist	One-man rock - 4 cubic yards Hakahaka (fill) - 1 cubic yard Hakahaka ('ili'ili) - 1 cubic yard	Mini-Excavator - 5 days	Appendix A:7
		21' x 2.5' x 2'					
	48	20' x 2' x 2'	Rehab	1 Mason Foreman - 10 days 2 Masons - 10 days 2 Laborers - 10 days Arborist	Use existing rocks in immediate vicinity. After tree removal and vegetation clearance, new material assessment to be made.	N/A	Appendix A:8
		20' x 4' x 2'					
	49	9' x 1' x 2.5'	Rehab	1 Mason Foreman - 3 days 2 Masons - 3 days 2 Laborers - 3 days Arborist	One-man rock - 1 cubic yard Hakahaka (fill) - 1/2 cubic yard Hakahaka ('ili'ili) - 1/2 cubic yard	N/A	Appendix A:9
3	15	60' x 2.5' x 2'	Rehab	1 Mason Foreman - 15 days 2 Masons - 15 days 2 Laborers - 15 days 1 Excavator Operator - 15 days Arborist	One-man rock - 60 cubic yards Hakahaka (fill) - 5 cubic yards Hakahaka ('ili'ili) - 1 cubic yard	Mini-Excavator - 15 days	Appendix A:10
	16	50' x 2.5' x 2'	Rehab	1 Mason Foreman - 15 days 2 Masons - 15 days 2 Laborers - 15 days 1 Excavator Operator - 15 days 1 Boom Truck/Back Hoe Operator - 2 days Arborist	One-man rock - 60 cubic yards Hakahaka (fill) - 5 cubic yards Hakahaka ('ili'ili) - 1 cubic yard	Mini-Excavator - 15 days Boom Truck/Back Hoe - 2 days	Appendix A:11
	29	39' x 3' x 2'	Rehab				N/A

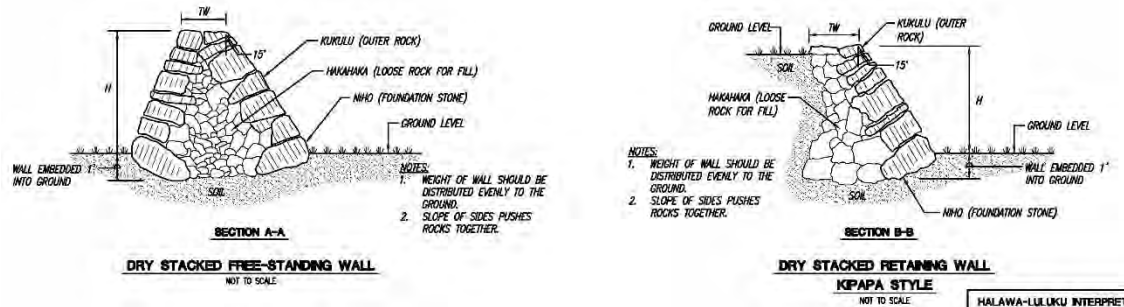


				1 Mason Foreman - 5 days 2 Masons - 5 days 2 Laborers - 5 days Arborist	One-man rock - 3 cubic yards Hakahaka (fill) - 1 cubic yard Hakahaka ('ili'ili) - 1 cubic yard		Apendix A:12
	30	50' x 3' x 2'	Rehab	1 Mason Foreman - 15 days 2 Masons - 15 days 2 Laborers - 15 days 1 Excavator Operator - 15 days Arborist	One-man rock - 15 cubic yards Hakahaka (fill) - 2 cubic yards Hakahaka ('ili'ili) - 1 cubic yard	Mini-Excavator - 15 days	Appendix A:13
	33	N/A	Preserve	Arborist	To be determined after vegetation clearance	N/A	N/A
	34	N/A	Preserve	Arborist	To be determined after vegetation clearance	N/A	N/A
	35	N/A	Preserve	1 Mason Foreman - 16 hours 1 Masons - 16 hours 1 Laborers - 16 hours Arborist	Use existing rocks at feature	N/A	N/A
4	14	50' x 2.5' x 3'	Rehab	1 Mason Foreman - 10 days 2 Masons - 10 days 2 Laborers - 10 days 1 Excavator Operator - 5 days Arborist	One-man rock - 4 cubic yards Hakahaka (fill) - 1 cubic yard Hakahaka ('ili'ili) - 1 cubic yard	Mini-Excavator - 5 days	Appendix A:14
	26/26a	N/A	Preserve	Arborist	N/A	N/A	N/A
	40	110' x 8'-12' x 2' 110' x 3' x 2'	Rehab	1 Mason Foreman - 60 days 4 Masons - 60 days 4 Laborers - 60 days 1 Excavator Operator - 60 days 1 Bobcat Track Loader Operator - 60 days Arborist	One-man rock - 90 cubic yards Hakahaka (fill) - 30 cubic yards Hakahaka ('ili'ili) - 15 cubic yards	Mini-Excavator - 60 days Bobcat Track Loader - 60 days	Appendix A:15

	41	36' x 3' x 2'	Rehab	1 Mason Foreman - 15 days 2 Masons - 15 days 2 Laborers - 15 days 1 Excavator Operator - 5 days 1 Bobcat Track Loader Operator - 5 days Arborist	One-man rock - 6 cubic yards Hakahaka (fill) - 10 cubic yards Hakahaka ('ili'ili) - 6 cubic yards	Mini-Excavator - 5 days Bobcat Track Loader - 5 days	Appendix A:15
	43	N/A	Preserve	Arborist	Use existing rocks at feature	N/A	N/A
	44	N/A	Preserve	Arborist	N/A	N/A	N/A
	45	N/A	Preserve	Arborist	N/A	N/A	N/A
5	7	55' x 2' x 3'	Rehab	1 Mason Foreman - 40 hours 2 Masons - 40 hours 2 Laborers - 40 hours 1 Excavator Operator - 8 hours Arborist	One-man rock - 1 cubic yard Hakahaka (fill) - 1 cubic yard	Mini-Excavator - 8 hours	Appendix A:16
	38	8' x 3' pile	Preserve	1 Mason Foreman - 16 hours 2 Masons - 16 hours 2 Laborers - 16 hours 1 Excavator Operator - 8 hours Arborist	One-man rock - 1 cubic yard Hakahaka (fill) - 1/2 cubic yard	Mini-Excavator - 8 hours	N/A

## Discussion

### Typical Wall Section



[Place holder image for updated wall sections]

### Cultural Protocols

It is recommended that appropriate cultural protocols are implemented during mason work for all of Site 2137 features, as is typically required for this type of work. For Fields Masonry, we pule or pray in the morning before starting work and pīkai, or sprinkle salt water for purification after work is done each day. Specific prayers and protocols are up to the construction team performing the work.

### Rock Procurement

Concerning existing materials, *The Secretary of Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* requires that no building materials are introduced from outside the immediate project area as also recommended by Keala Pono and the community. It is recommended that rock be collected from rock mounds in Site 2137 and fallen rocks on Hālawa access road.

Rocks should be stockpiled and sorted into various sizes for efficient building practices. A designated, non-sensitive area should be selected for stockpiling and separating stones near the borders of Area 4 and Area 5 across the street of trailblazer access road. This should also serve as the staging area for equipment. Wattles are needed for containing the staging area.

Loose rock from features in need of rehabilitation would be gathered with the goal of repairing and creating a safer walking and working area for the stewards and the community. Gathering or removal of rubble from wall bases would help expose the foundation, or niho stones which would also be beneficial when re-setting damaged wall sections marked for rehabilitation. Any extra rocks needed for rehab should be gathered from the stockpiles. The estimated labor, time and equipment for rock procurement is as follows:

**Labor:**

- 6 Laborers - 60 days

**Equipment:**

- Flat-bed dump truck (Example: Ford F-350 dump 4x4)
- Bobcat Track Loader

The recommendation of gathering stones in Hālawā valley would eliminate outside building materials and encourage using the same rock of existing features. The cost of trucking and selecting rocks of the right size would also be greatly reduced. The gathering process would also benefit stewards of the area and the community, by teaching them the correct protocols to collect rocks with respect to the sensitivity of the area they are working and in correlation with Hawaiian values.

To be thorough, several rock sources were investigated for feature rehabilitation at Site 2137. Hawaiian Cement Quarry, located at the entrance of Hālawā Valley and Ameron Kapa'a Quarry, on the windward side of O'ahu, both do not produce stonewall sized rock for wall building or rehabilitation purposes. General excavation contractors on O'ahu are able to produce rock wall building materials. These contractors take excavated rock from certain building sites and resell the rock to builders. Should the rock gathered at Hālawā be insufficient, this is the recommended solution.

## Methods/Techniques and Equipment

The methods and techniques recommended for the rehabilitation and preservation of Hālawā Valley selected features should include the use of batter boards. The batter boards are a very important step in rehabilitation and stabilization of dry stack stone work. The design of the batter boards and the integrity of the mason combined with gravity are key factors that keep the wall in place.

The batter boards can be constructed in place with the use of a pre-constructed jig that is set at a pre-determined degree. The general rule of thumb for wall face angles is no less than 15 degrees for hakahaka walls and between 15 and 20 degrees for kīpapa walls.

A mini excavator and a bobcat track loader are essential to dig footings, move large boulders and remove tree stumps. Other tools needed for this project include: Stone hammer, 'ō'ō digging bar, builder's level, transit, shovels, pickaxe and wheelbarrows.

## Conclusion

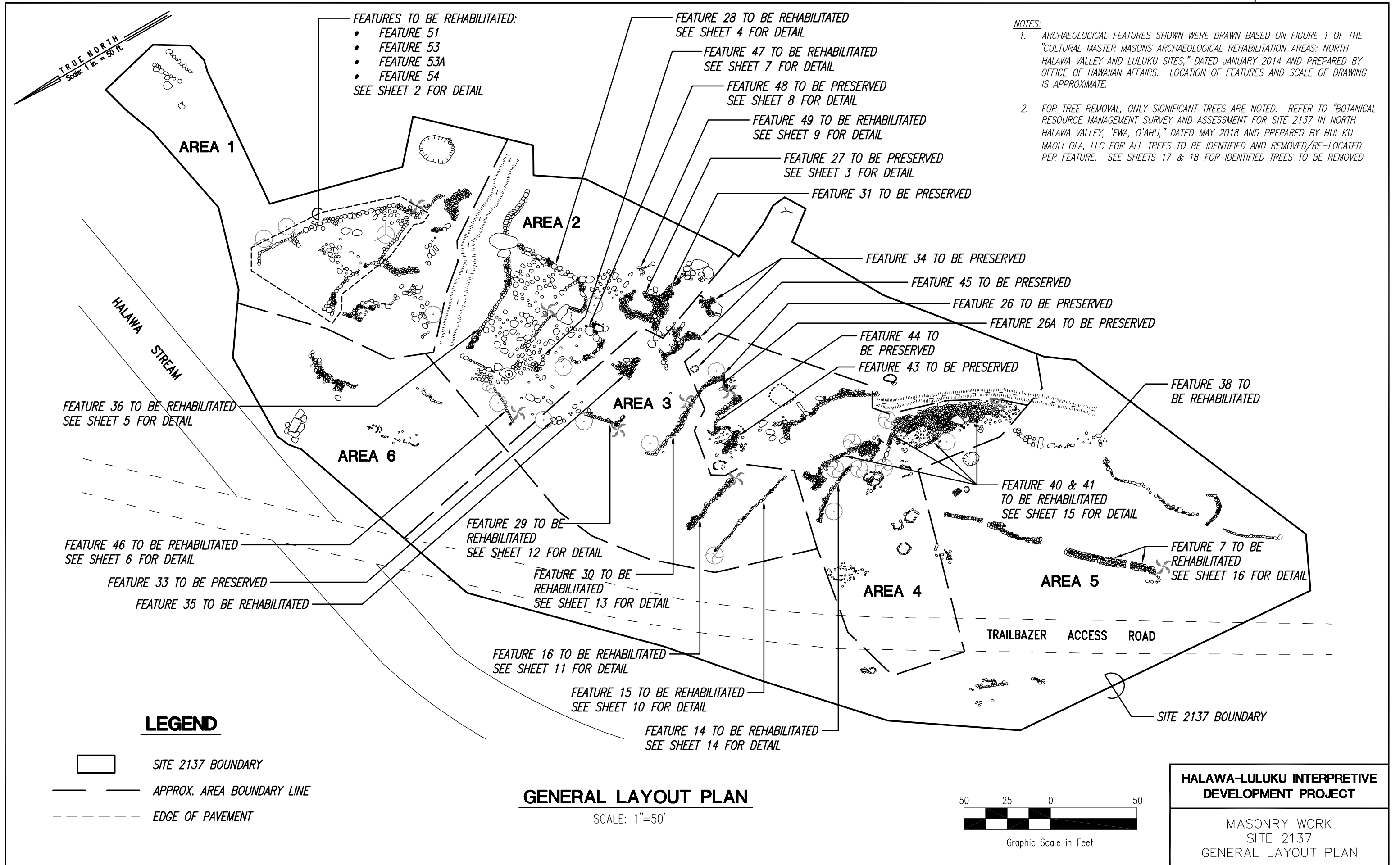
North Hālawā Site 2137 has a strong cultural foundation of ancient engineering in the art of uhau humu pōhaku, or dry stack masonry. With the use of existing rock on site from previous rock fall and erosion, the inhabitants built house sites, places of worship, agricultural planting terraces and a sacred birthing area.

The potential of Site 2137 is endless. Expert masons should possess a strong cultural foundation to perform the rehabilitation or preservation of features. North Hālawā has the potential of being a jewel with long term stewardship. The treatment of this unique site built on a steep landscape would unveil engineering techniques used in ancient times. Fields Masonry highly recommends the treatments specified for the selected features.

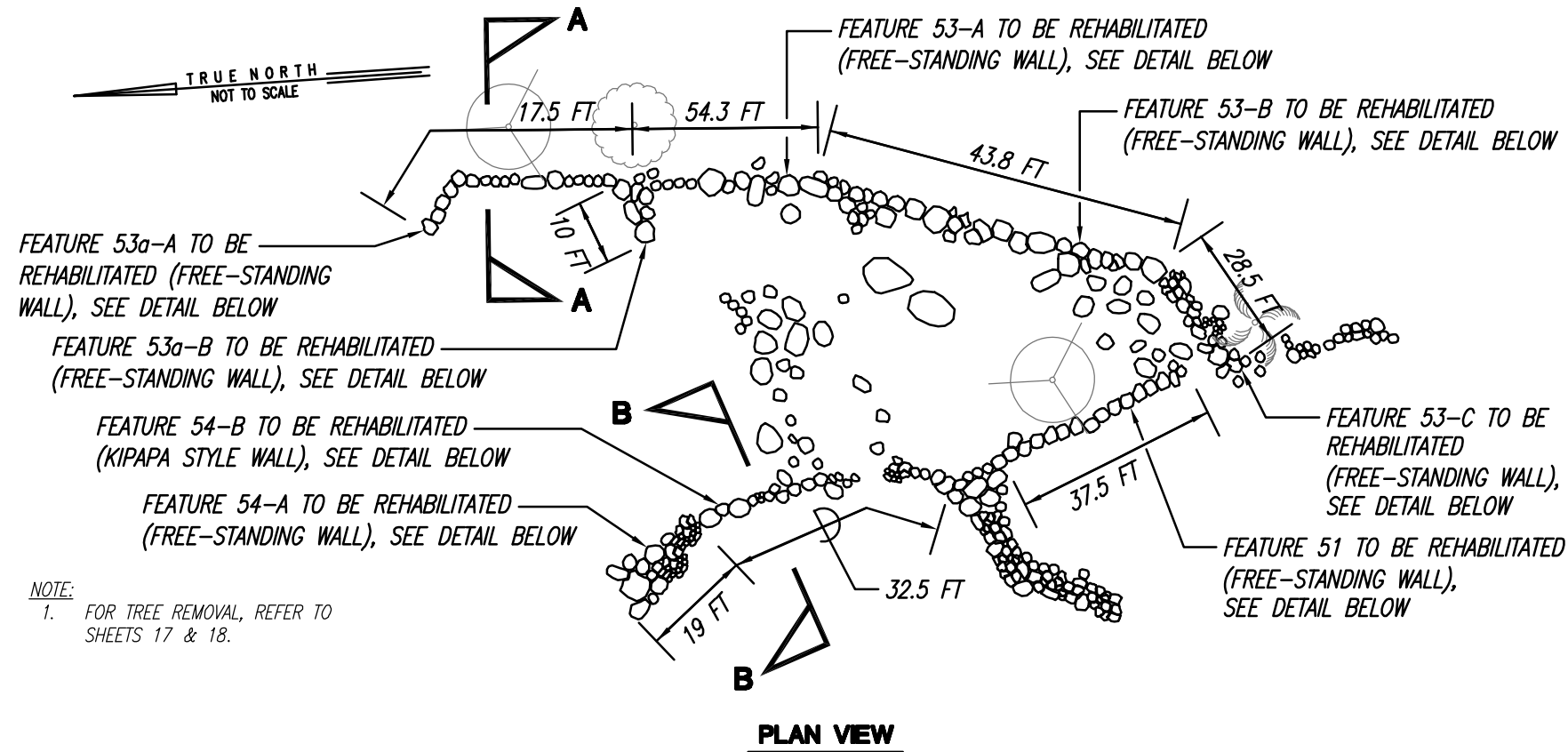
## Glossary

<b>‘Auwai</b>	Irrigation ditch or canal.
<b>Hakahaka</b>	Technique of wall construction, freestanding.
<b>Hakahaka (fill)</b>	Rocks, 6” x 6” in size or smaller; used for fill of dry masonry wall.
<b>Hakahaka (‘ili‘ili)</b>	Rocks, 2” x 2” or smaller in size and used on the cap of a wall.
<b>Hale mua</b>	Eating house for men.
<b>Hale pili</b>	House made of pili grass.
<b>Heiau</b>	Pre-Christian place of worship, or shrine. Some Heiau were elaborately constructed stone platforms, others were simple earth terraces.
<b>‘Ili‘ili</b>	Small stones 2” x 2” used to top a wall.
<b>Imu</b>	Underground oven.
<b>Kalo</b>	Taro.
<b>Kīpapa</b>	Technique of wall construction used in terracing where only one side of the wall is finished. The other side is usually built into an earthen embankment.
<b>Mauka</b>	Inland, mountainside.
<b>Niho</b>	Foundation stone at base of hakahaka and kīpapa wall.
<b>‘Ō‘ō</b>	A digging stick used to pry and move heavier stones.
<b>Oli</b>	Chant or prayer.
<b>Pīkai</b>	To purify by sprinkling with salt and water.
<b>Pule</b>	To pray, prayer.
<b>One-man rock</b>	Approximately 12” x 12” in size. One man can comfortably carry with no help.
<b>Pōhaku</b>	Rock, stone.
<b>‘Uala</b>	Sweet potato.
<b>Uhau humu pōhaku</b>	The art of Hawaiian dry stack masonry.

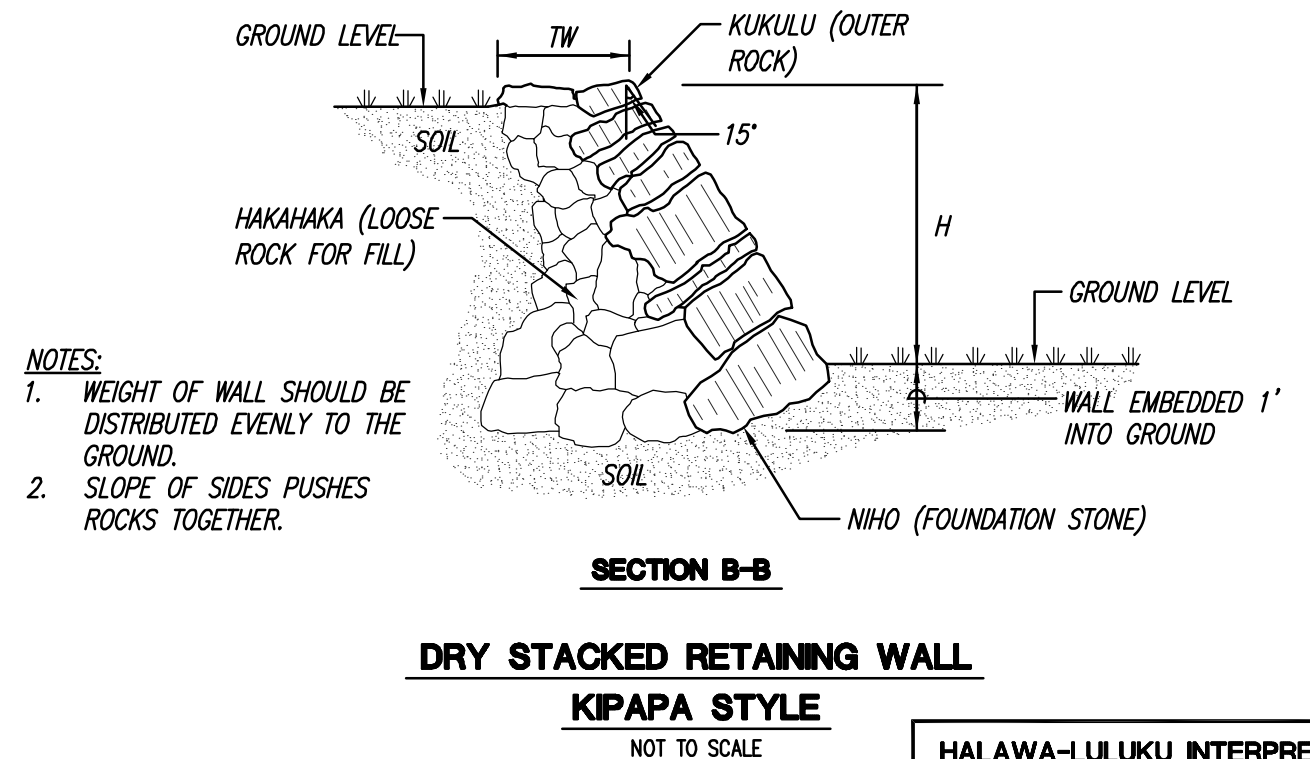
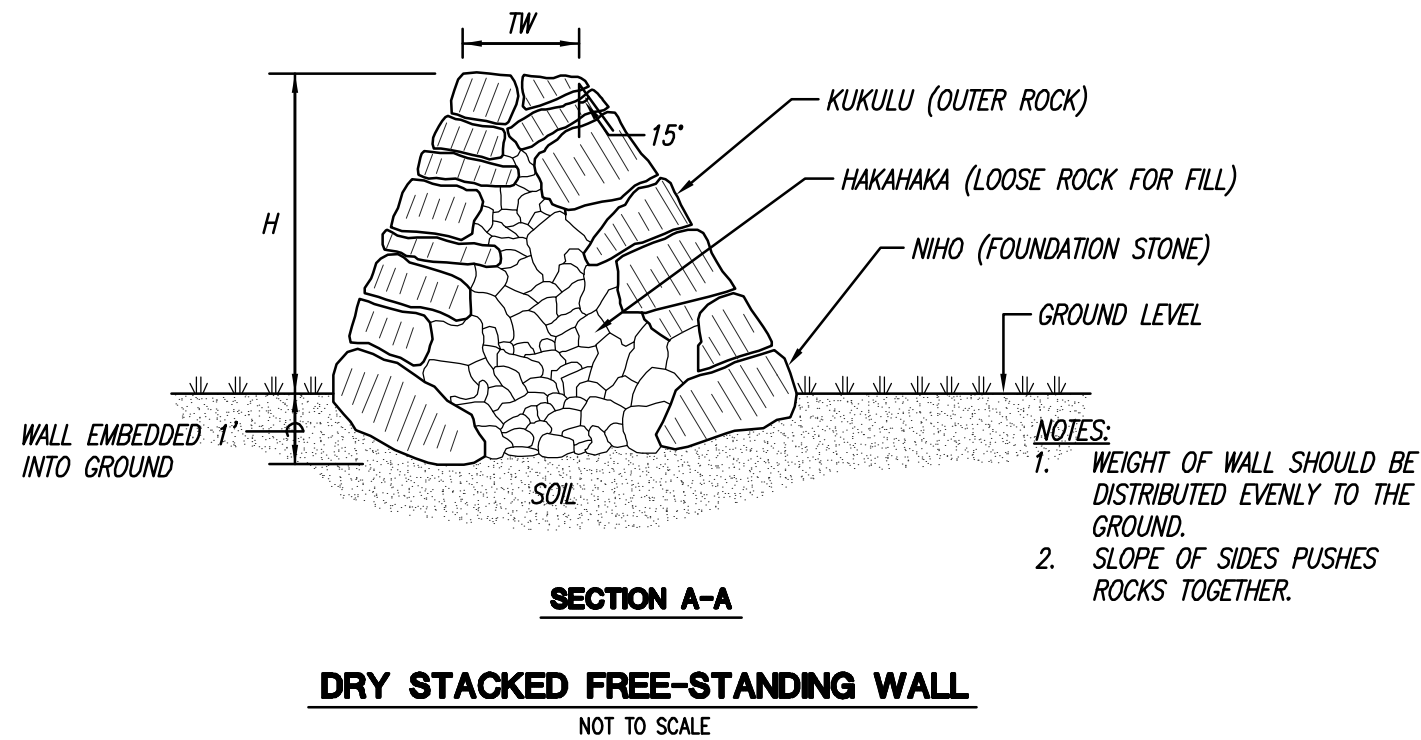
**Appendix A: Plan Drawings for Cultural Master Mason Work**







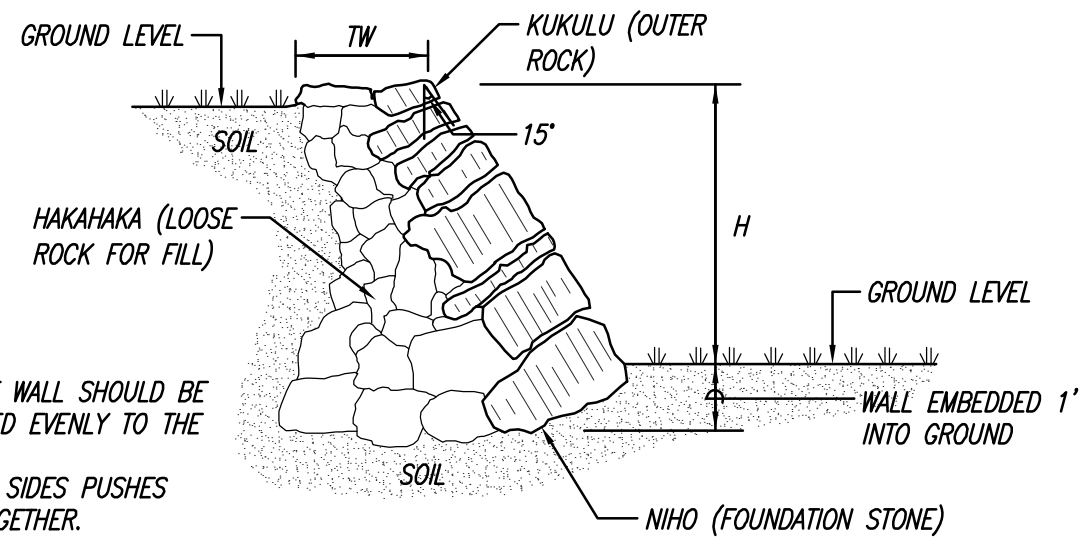
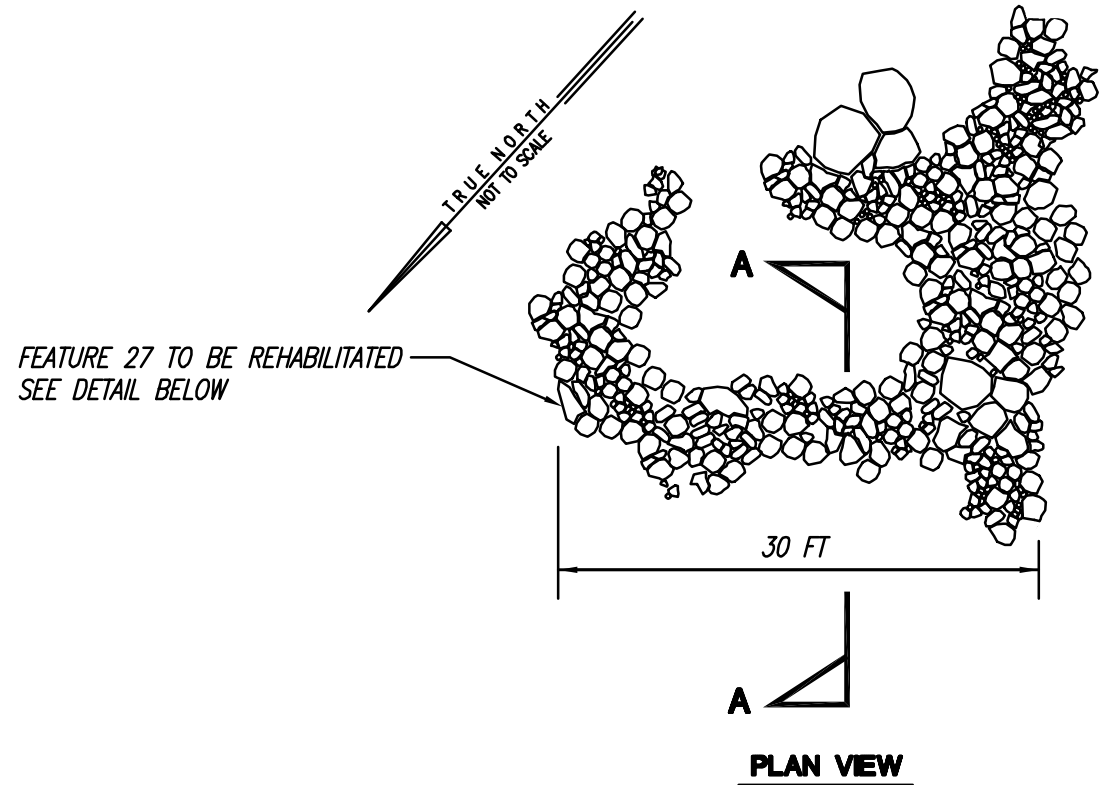
AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
1	51	FREE-STANDING WALL	3 FT	4 FT
	53	53-A (FREE-STANDING WALL)	6 FT	4 FT
		53-B (FREE-STANDING WALL)	6 FT	4 FT
		53-C (FREE-STANDING WALL)	6 FT	4 FT
	53a	53a-A (FREE-STANDING WALL)	6 FT	4 FT
		53a-B (FREE-STANDING WALL)	6 FT	4 FT
	54	54-A (FREE-STANDING WALL)	3 FT	4 FT
		54-B (KIPAPA STYLE WALL)	3 FT	4 FT



**FEATURE 51, 53, 53A & 54 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**

MASONRY WORK  
SITE 2137  
FEATURE 51, 53, 53A & 54  
REHAB PLAN



**NOTES:**

1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

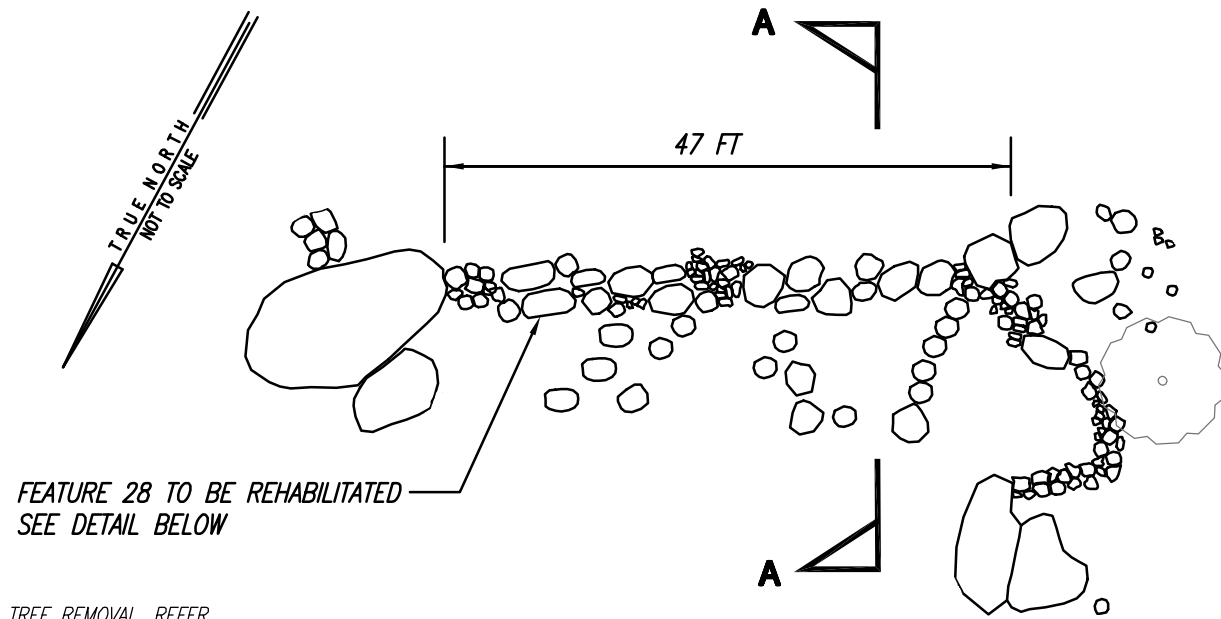
**SECTION A-A**  
**DRY STACKED RETAINING WALL**  
**KIPAPA STYLE**  
 NOT TO SCALE

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	27	KIPAPA STYLE WALL	6 FT	2 FT

**FEATURE 27 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**

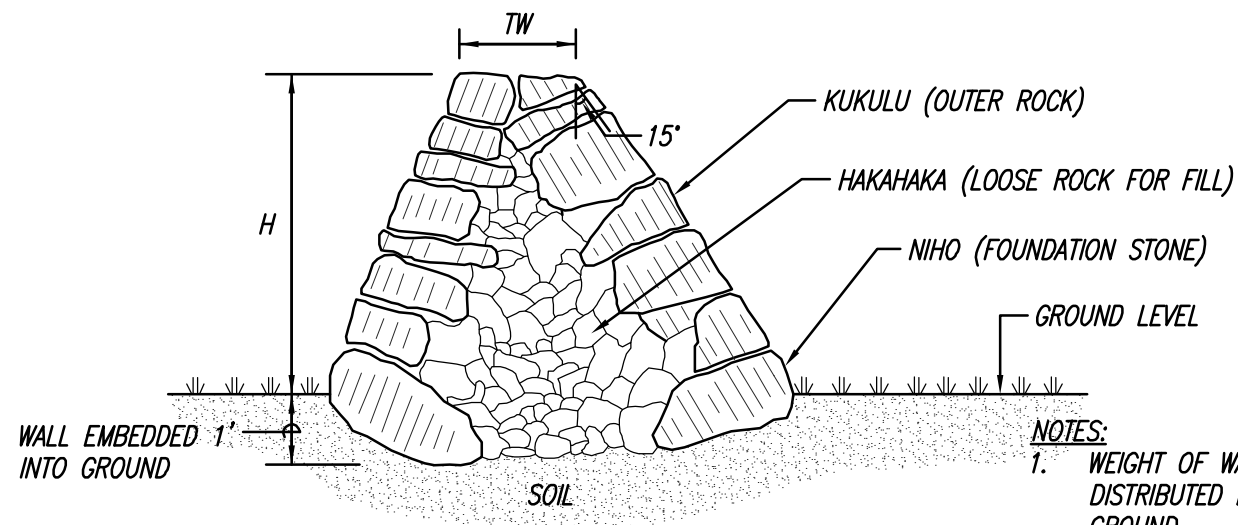
MASONRY WORK  
 SITE 2137  
 FEATURE 27 REHAB PLAN



**PLAN VIEW**

**NOTE:**  
1. FOR TREE REMOVAL, REFER TO SHEETS 17 & 18.

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	28	FREE-STANDING WALL	3 FT	2 FT



**SECTION A-A**

**NOTES:**  
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.  
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

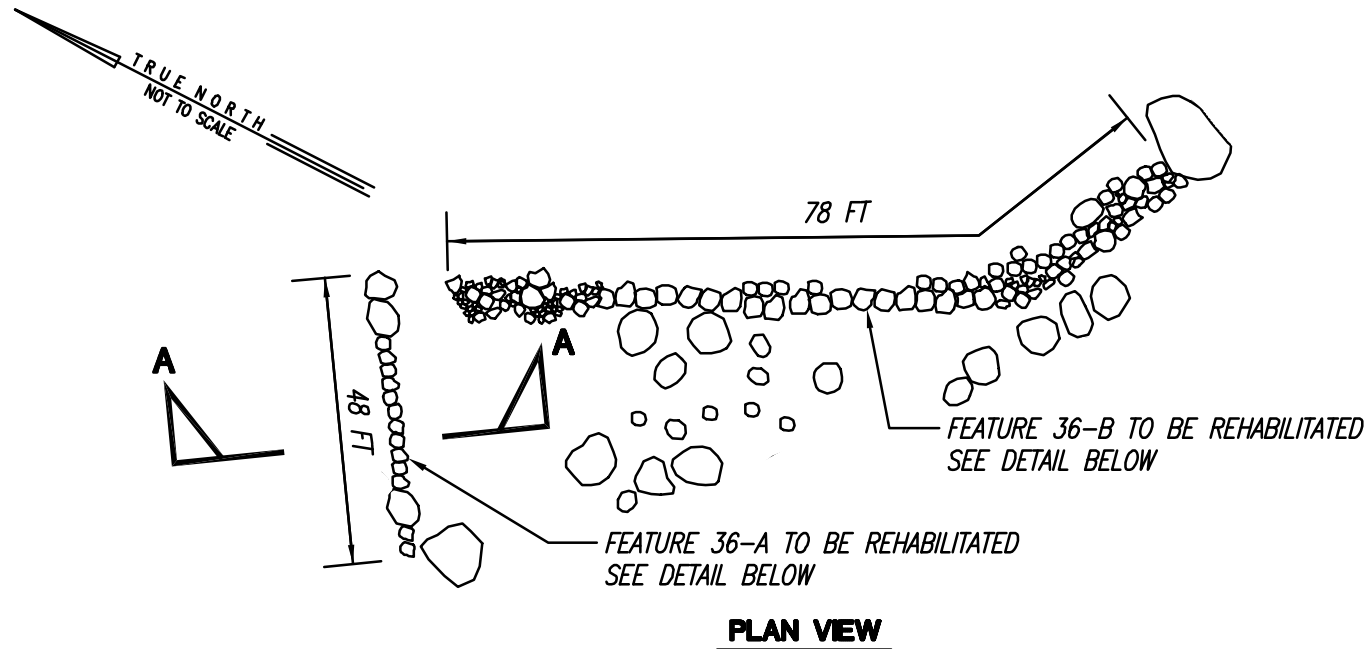
**DRY STACKED FREE-STANDING WALL**

NOT TO SCALE

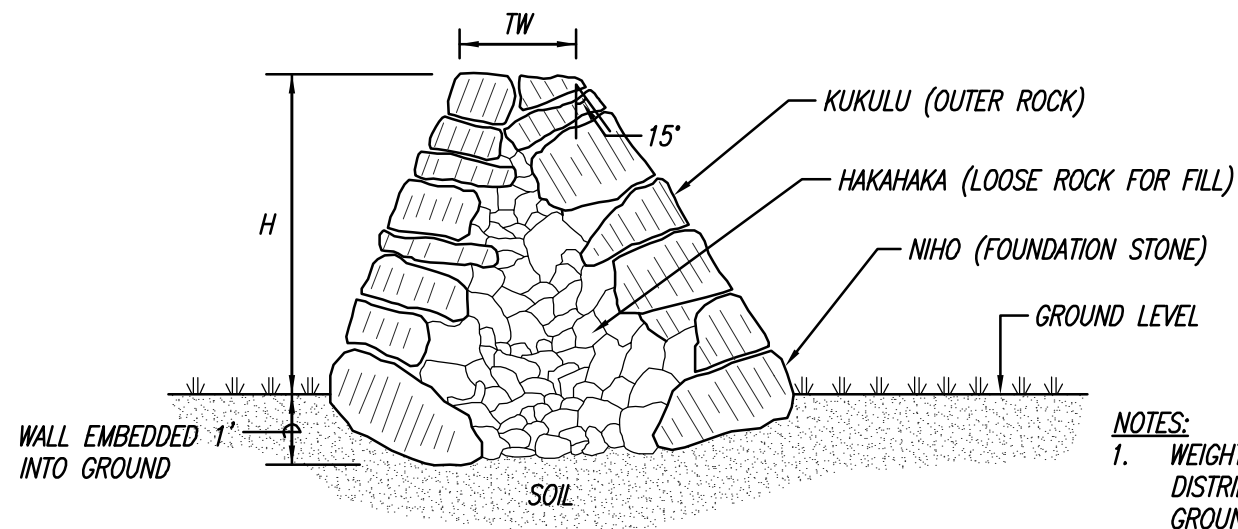
**FEATURE 28 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**

MASONRY WORK  
SITE 2137  
FEATURE 28 REHAB PLAN



**PLAN VIEW**



**SECTION A-A**

**DRY STACKED FREE-STANDING WALL**

NOT TO SCALE

**NOTES:**

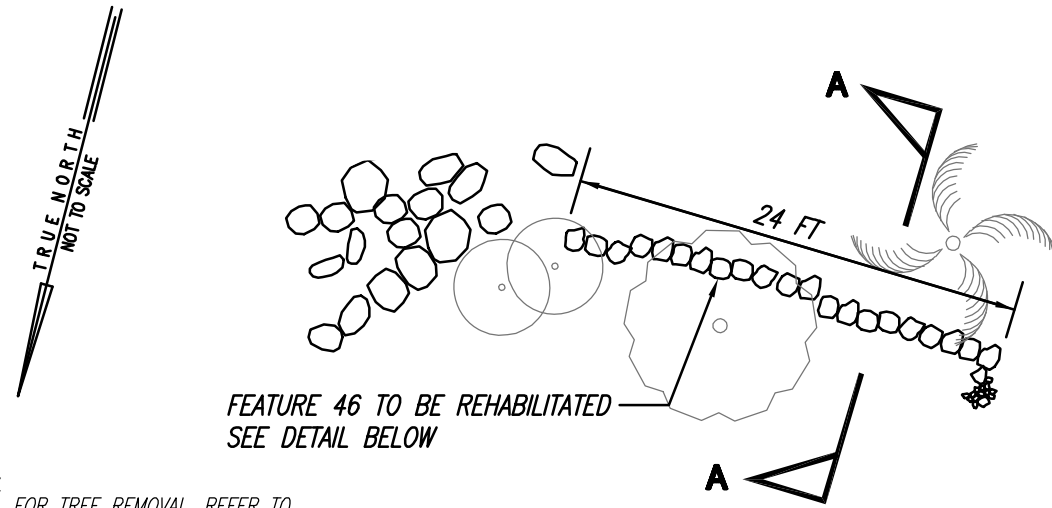
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	36	36-A (FREE-STANDING WALL)	4 FT	2 FT
		36-B (FREE-STANDING WALL)	4 FT	2 FT

**FEATURE 36 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**

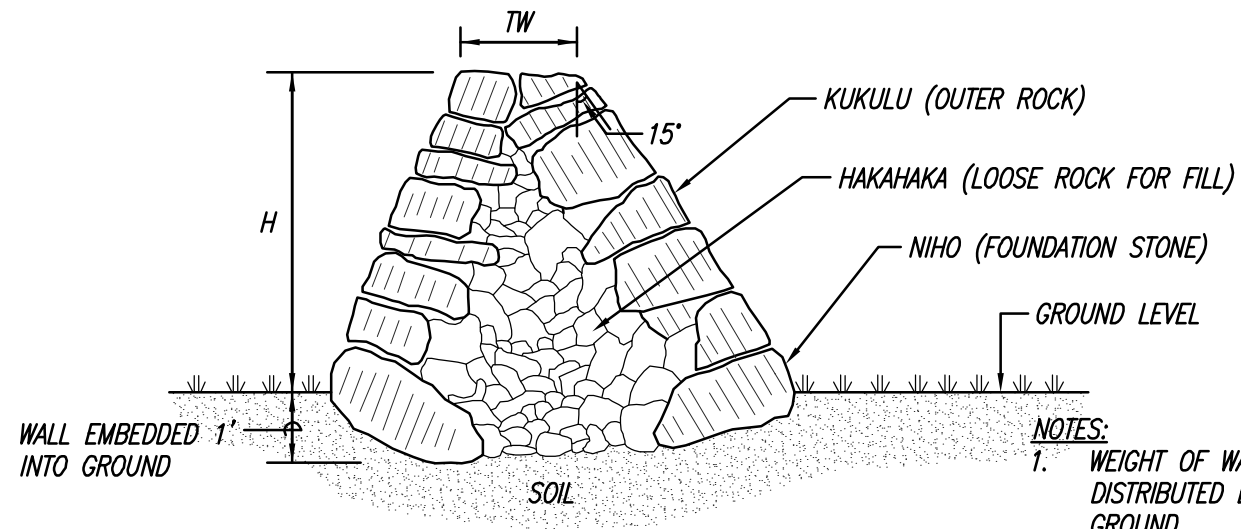
MASONRY WORK  
SITE 2137  
FEATURE 36 REHAB PLAN



NOTE:  
1. FOR TREE REMOVAL, REFER TO SHEETS 17 & 18.

**PLAN VIEW**

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	46	FREE-STANDING WALL	2 FT	2 FT



**SECTION A-A**

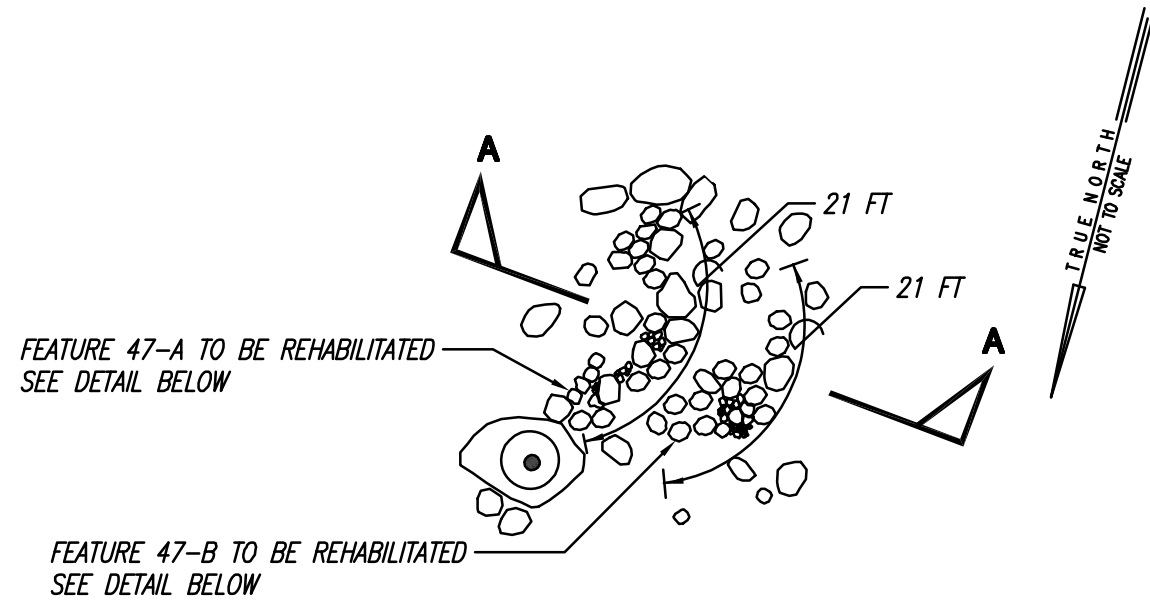
**DRY STACKED FREE-STANDING WALL**

NOT TO SCALE

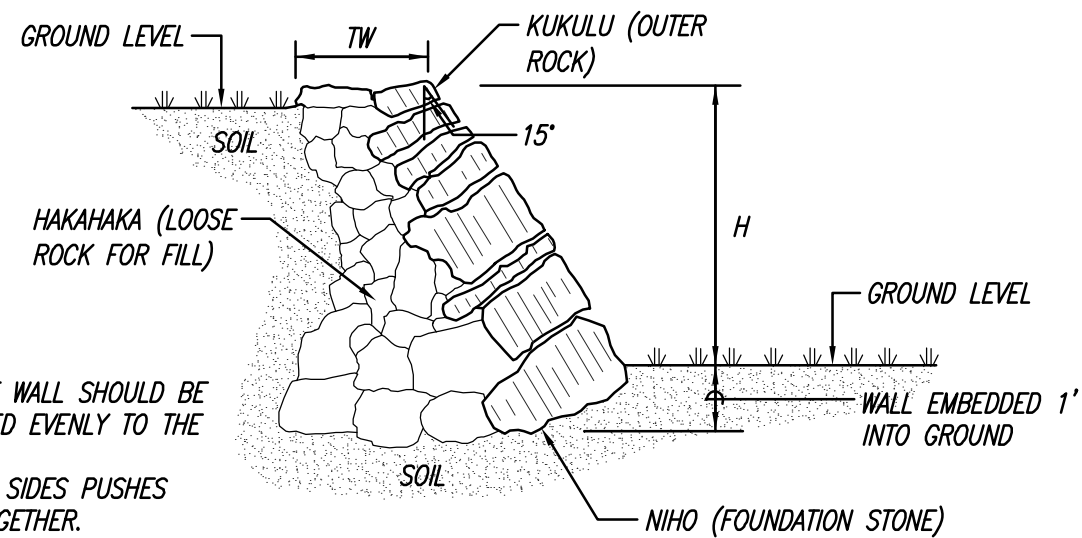
NOTES:  
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.  
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

**FEATURE 46 REHAB PLAN**

<p><b>HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT</b></p>
<p>MASONRY WORK SITE 2137 FEATURE 46 REHAB PLAN</p>



**PLAN VIEW**



**NOTES:**

1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

**SECTION A-A**

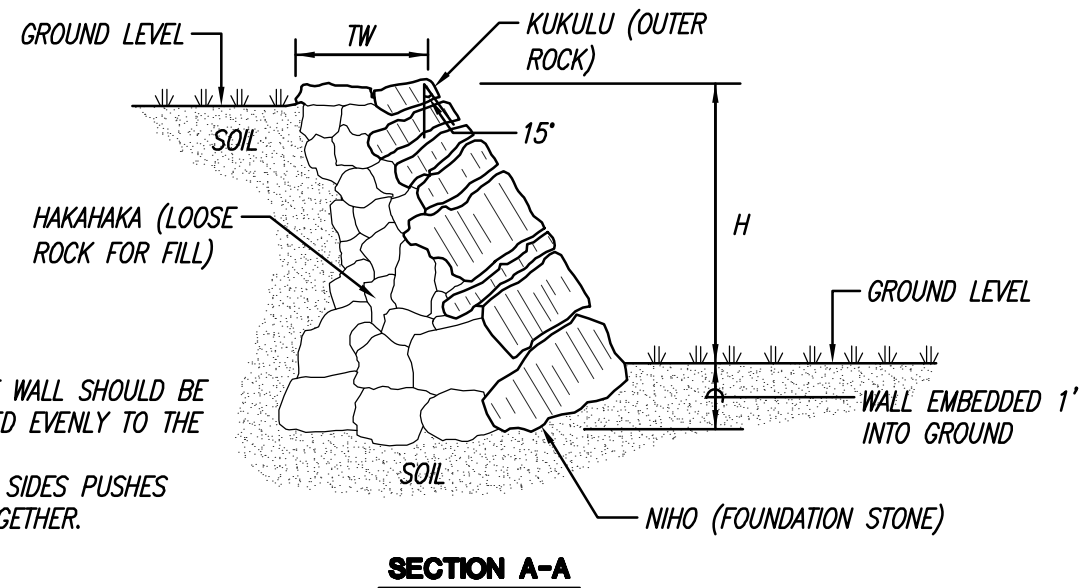
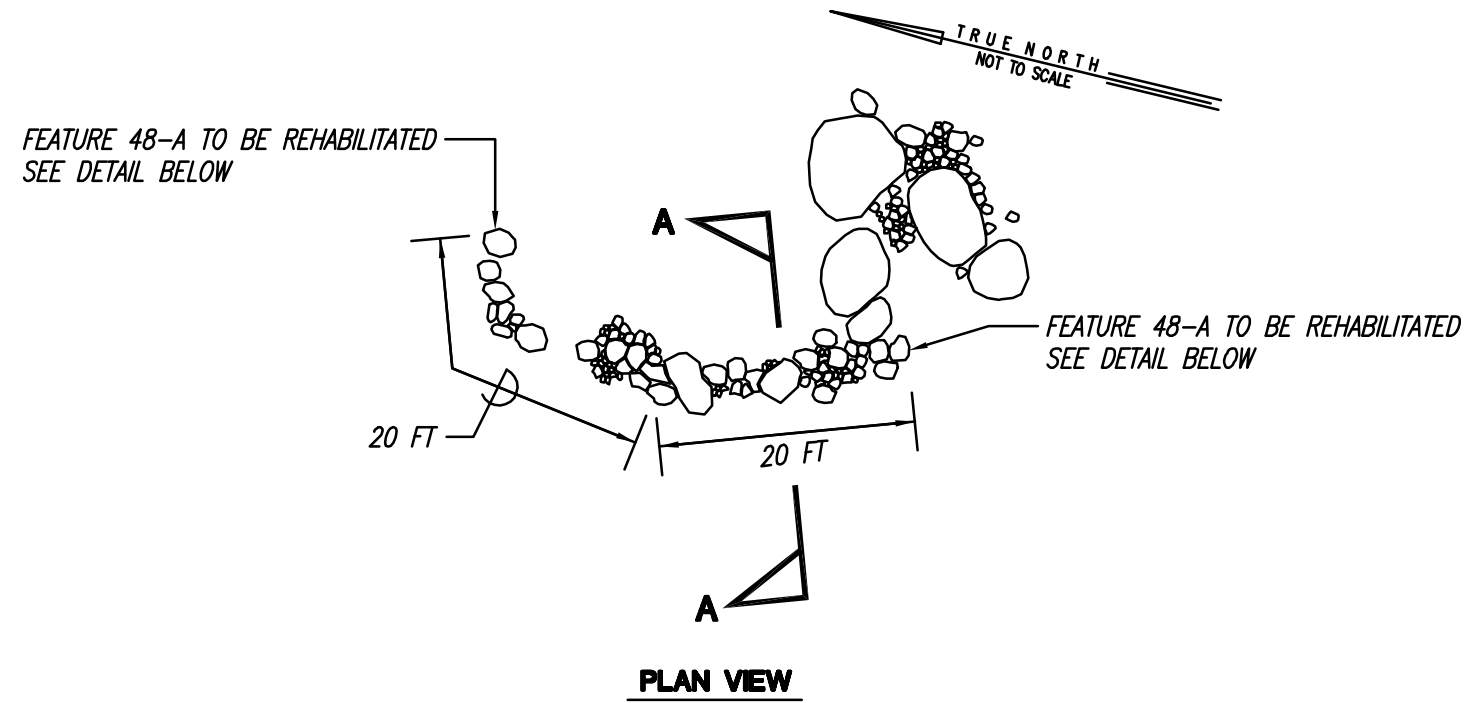
**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	47	47-A (KIPAPA STYLE WALL)	2.5 FT	2 FT
		47-B (KIPAPA STYLE WALL)	2.5 FT	2 FT

**FEATURE 47 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

MASONRY WORK  
SITE 2137  
FEATURE 47 REHAB PLAN



**NOTES:**

1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

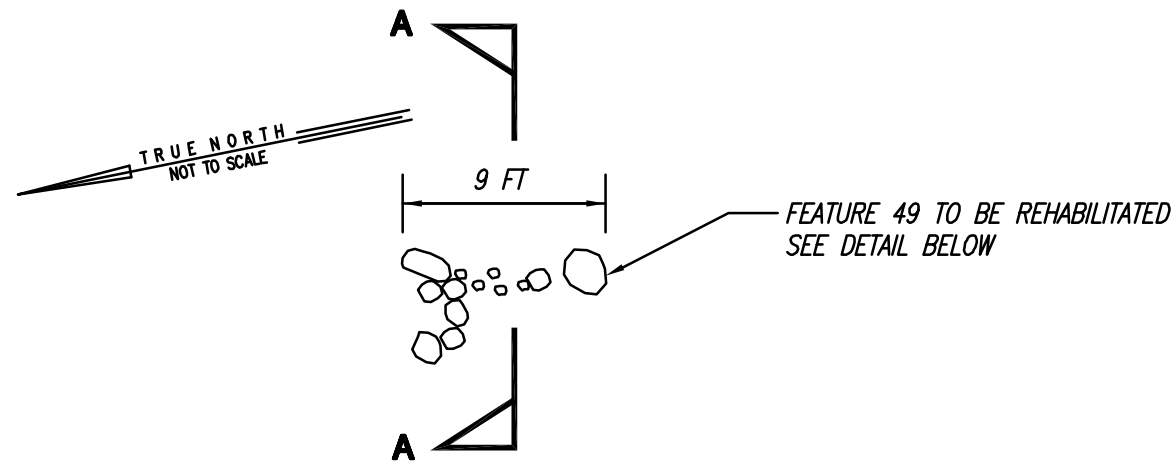
**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	48	48-A (KIPAPA STYLE WALL)	2 FT	2 FT
		48-B (KIPAPA STYLE WALL)	2 FT	2 FT

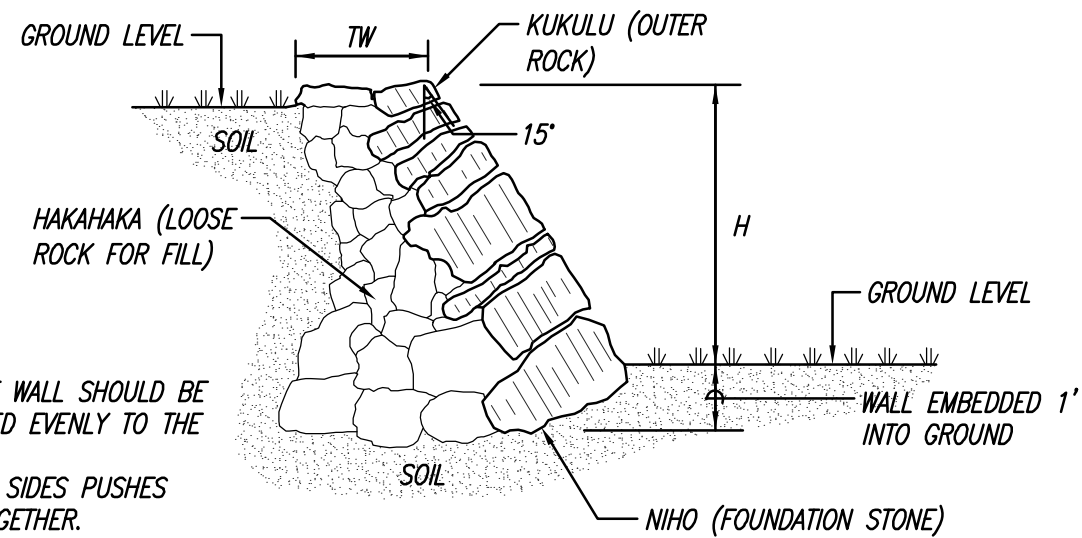
**FEATURE 48 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

MASONRY WORK  
SITE 2137  
FEATURE 48 REHAB PLAN



**PLAN VIEW**



**NOTES:**

1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

**SECTION A-A**

**DRY STACKED RETAINING WALL**

**KIPAPA STYLE**

NOT TO SCALE

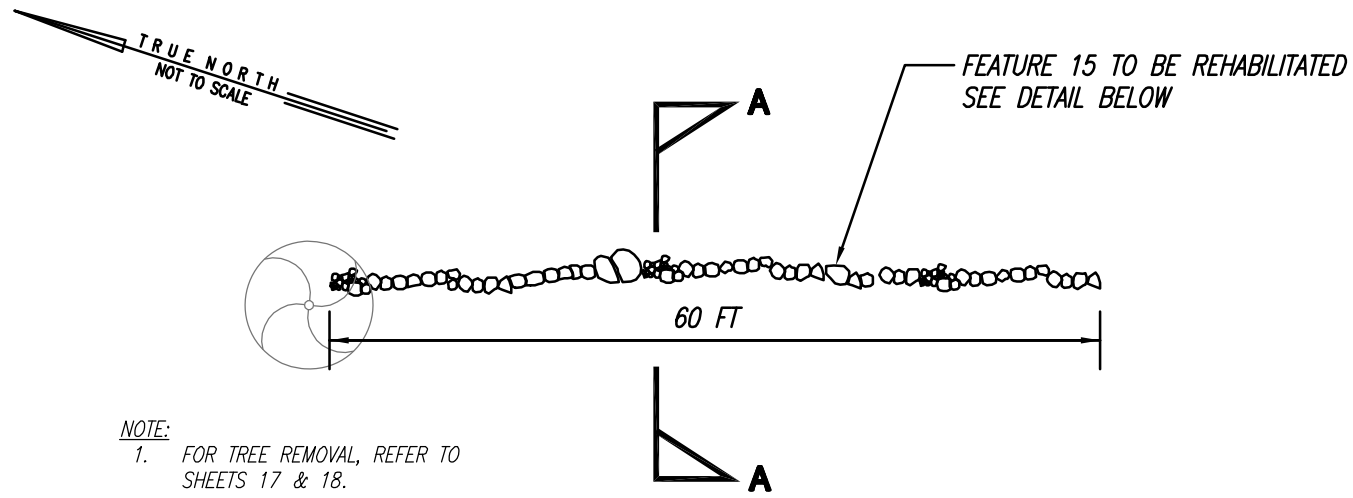
AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
2	49	KIPAPA STYLE WALL	1 FT	2.5 FT

**FEATURE 49 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

MASONRY WORK  
SITE 2137  
FEATURE 49 REHAB PLAN

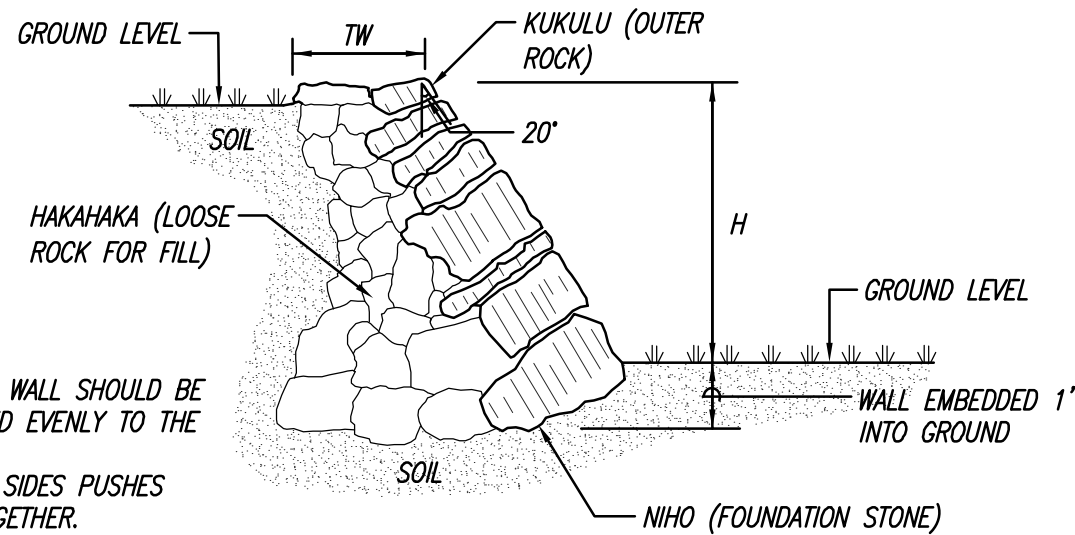




**NOTE:**  
1. FOR TREE REMOVAL, REFER TO SHEETS 17 & 18.

**PLAN VIEW**

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
3	15	KIPAPA STYLE WALL	2.5 FT TO 8 FT	2 FT



**NOTES:**  
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.  
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

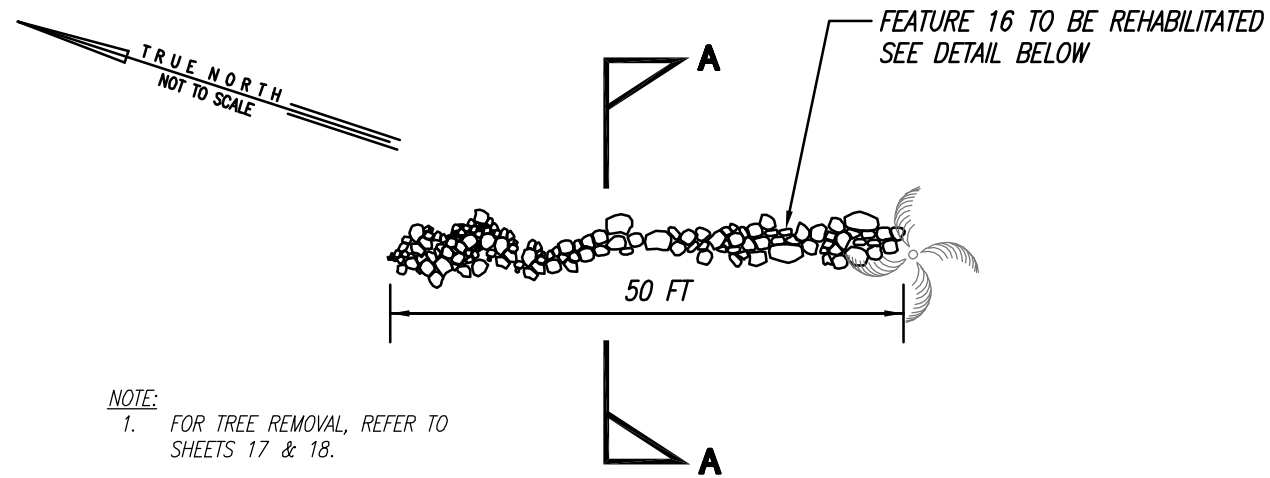
**SECTION A-A**

**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

**FEATURE 15 REHAB PLAN**

**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

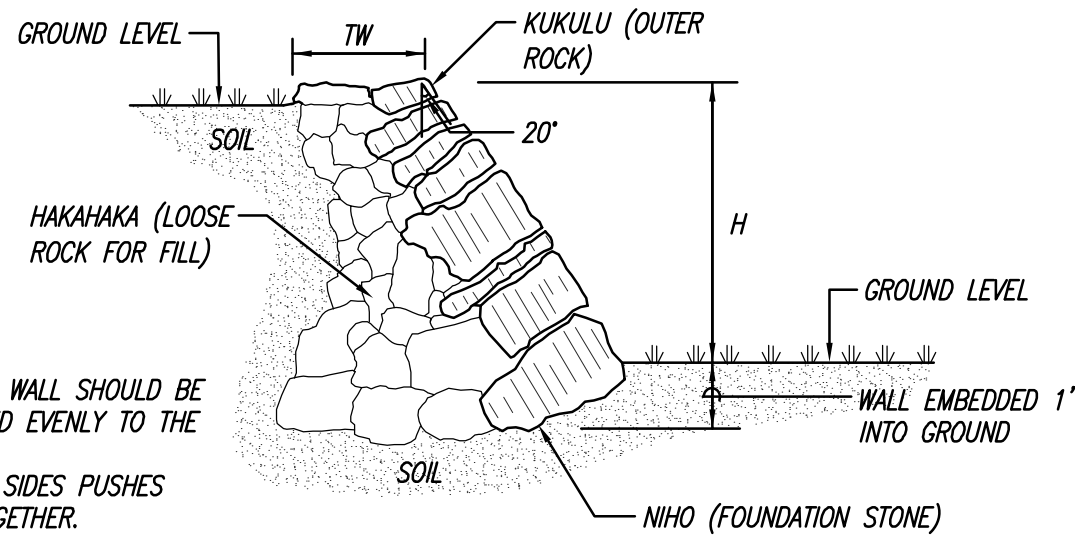
MASONRY WORK  
SITE 2137  
FEATURE 15 REHAB PLAN



NOTE:  
1. FOR TREE REMOVAL, REFER TO SHEETS 17 & 18.

**PLAN VIEW**

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
3	16	KIPAPA STYLE WALL	2.5 FT TO 8 FT	2 FT



NOTES:  
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.  
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

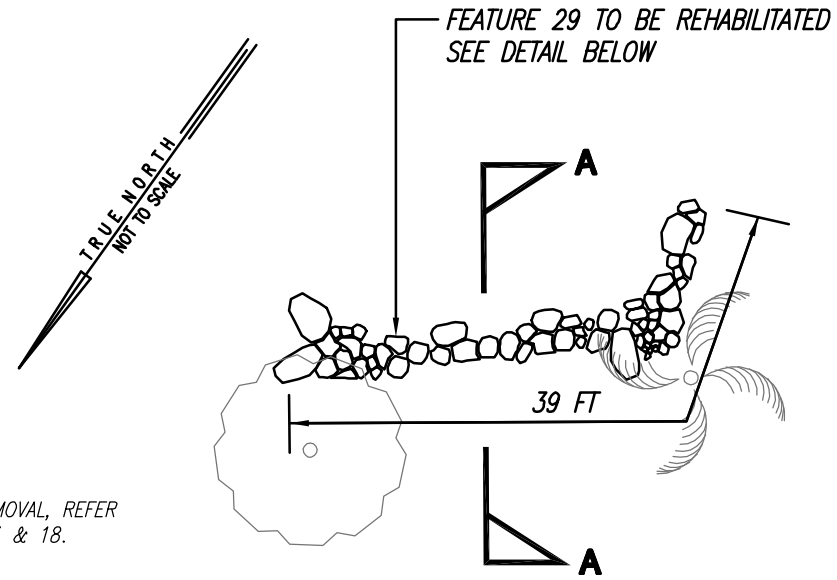
**SECTION A-A**

**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

**FEATURE 16 REHAB PLAN**

HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT

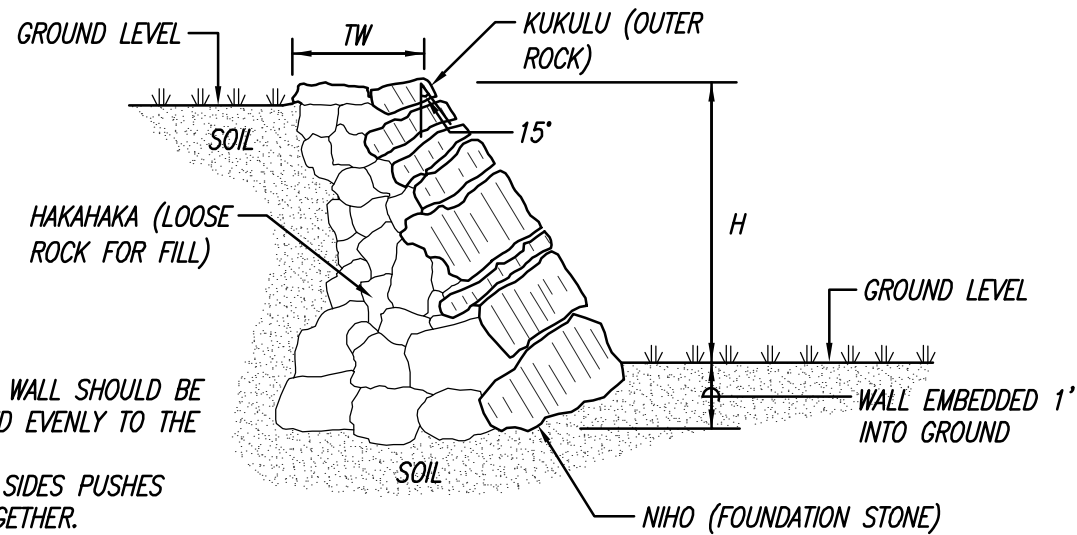
MASONRY WORK  
SITE 2137  
FEATURE 16 REHAB PLAN



**NOTE:**  
1. FOR TREE REMOVAL, REFER TO SHEETS 17 & 18.

**PLAN VIEW**

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
3	29	KIPAPA STYLE WALL	3 FT	2 FT



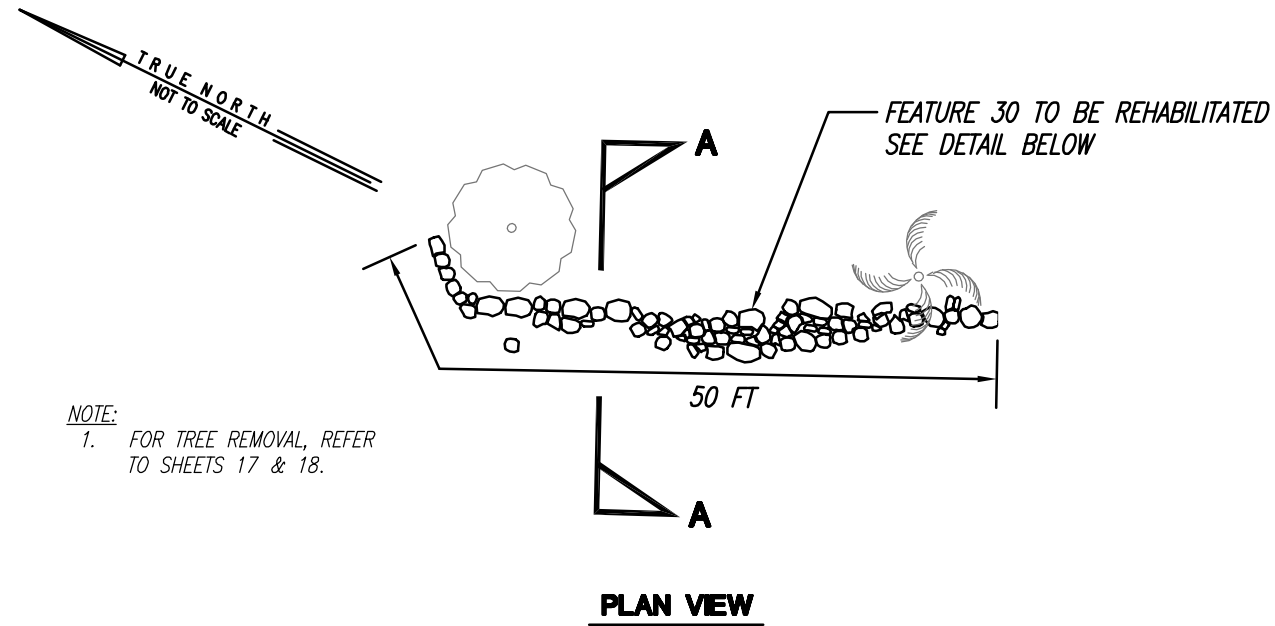
**NOTES:**  
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.  
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

**SECTION A-A**

**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

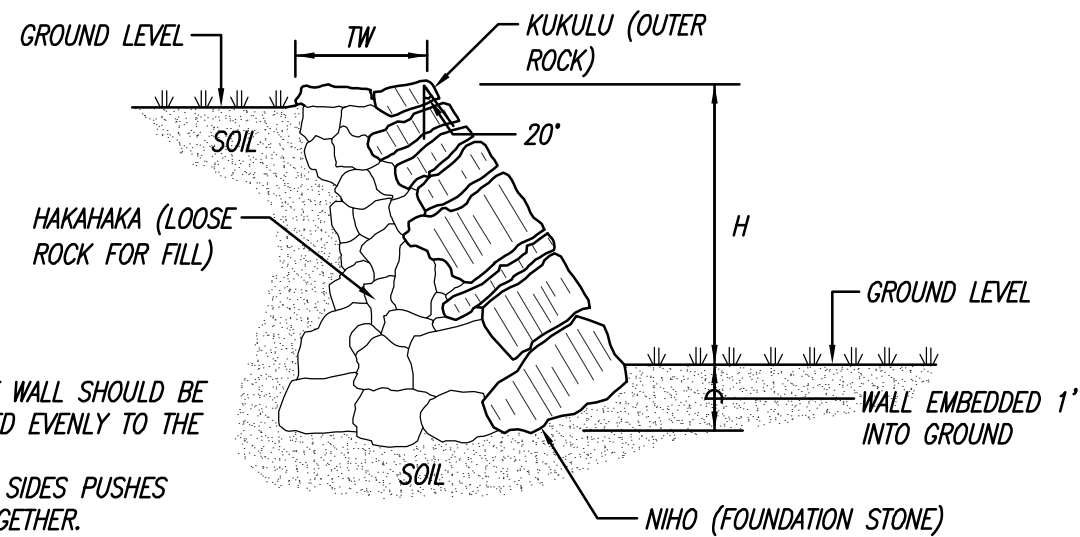
**FEATURE 29 REHAB PLAN**

<p><b>HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT</b></p>
<p>MASONRY WORK SITE 2137 FEATURE 29 REHAB PLAN</p>



NOTE:  
1. FOR TREE REMOVAL, REFER TO SHEETS 17 & 18.

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
3	30	KIPAPA STYLE WALL	3 FT	2 FT



NOTES:  
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.  
2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

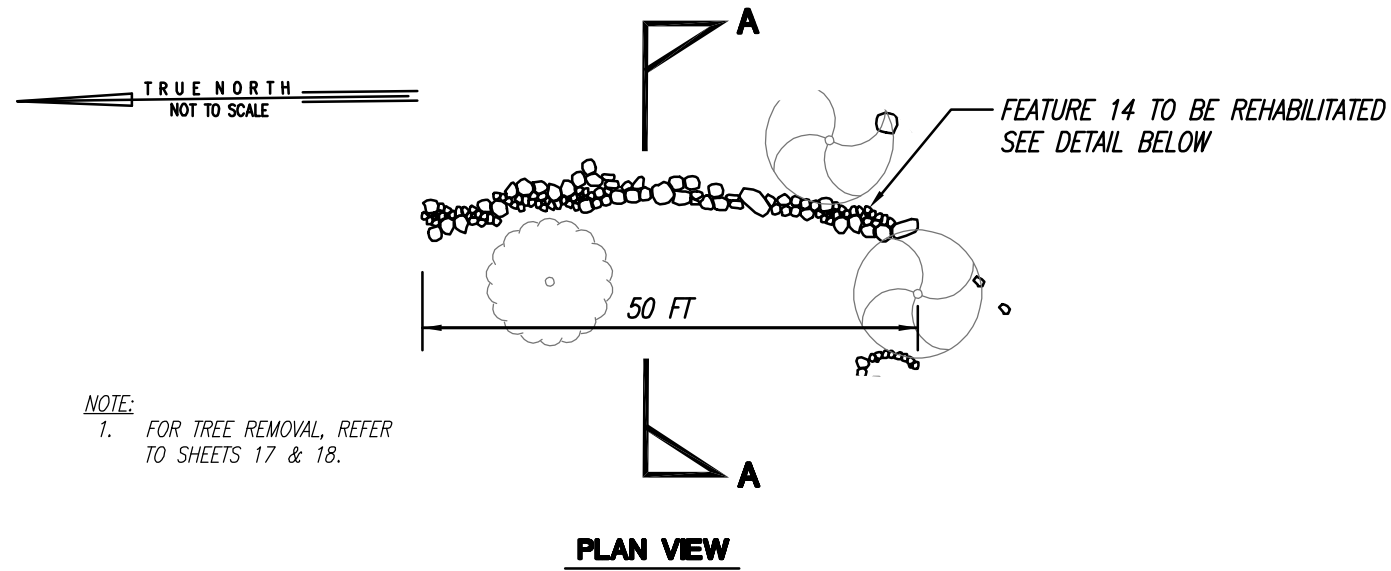
**SECTION A-A**

**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

**FEATURE 30 REHAB PLAN**

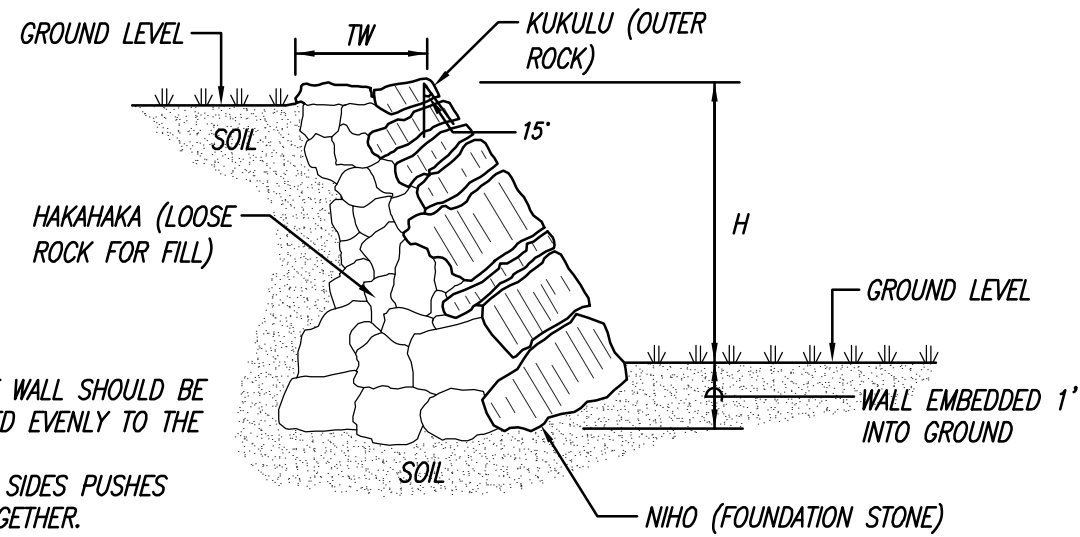
**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

MASONRY WORK  
SITE 2137  
FEATURE 30 REHAB PLAN



NOTE:  
1. FOR TREE REMOVAL, REFER  
TO SHEETS 17 & 18.

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
4	14	KIPAPA STYLE WALL	2.5 FT	3 FT



NOTES:  
1. WEIGHT OF WALL SHOULD BE  
DISTRIBUTED EVENLY TO THE  
GROUND.  
2. SLOPE OF SIDES PUSHES  
ROCKS TOGETHER.

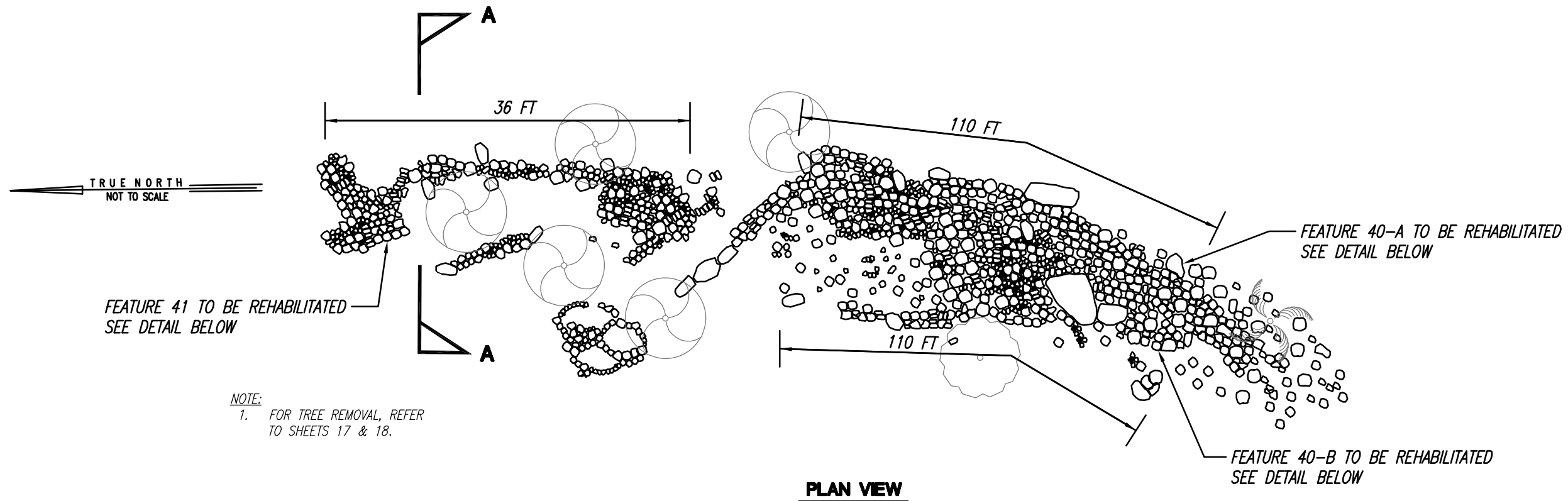
**SECTION A-A**

**DRY STACKED RETAINING WALL  
KIPAPA STYLE**  
NOT TO SCALE

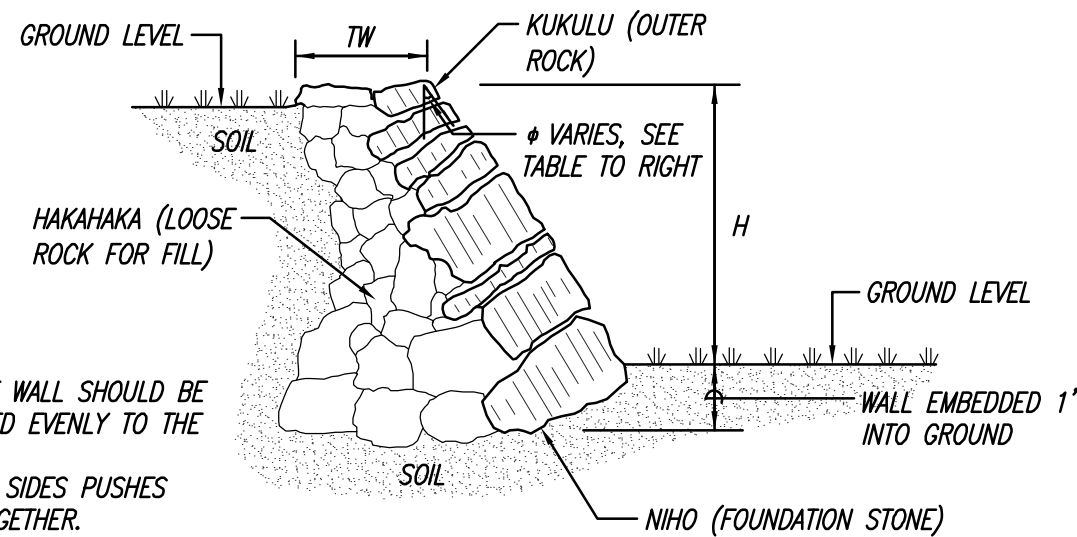
**FEATURE 14 REHAB PLAN**

HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT

MASONRY WORK  
SITE 2137  
FEATURE 14 REHAB PLAN



**PLAN VIEW**



**SECTION A-A**

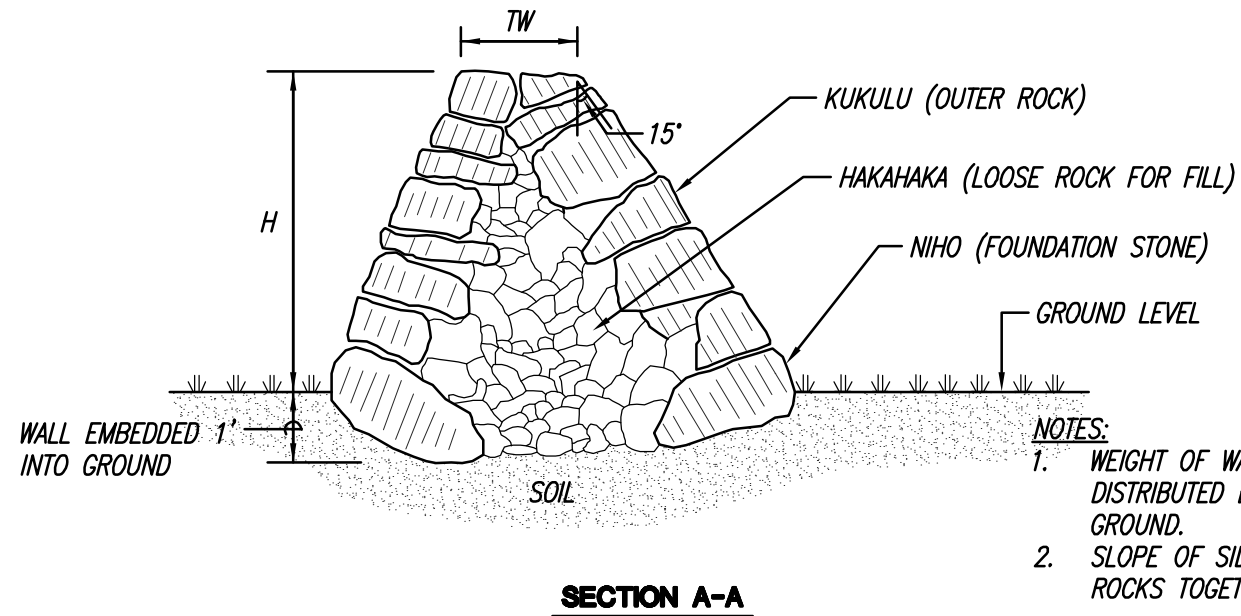
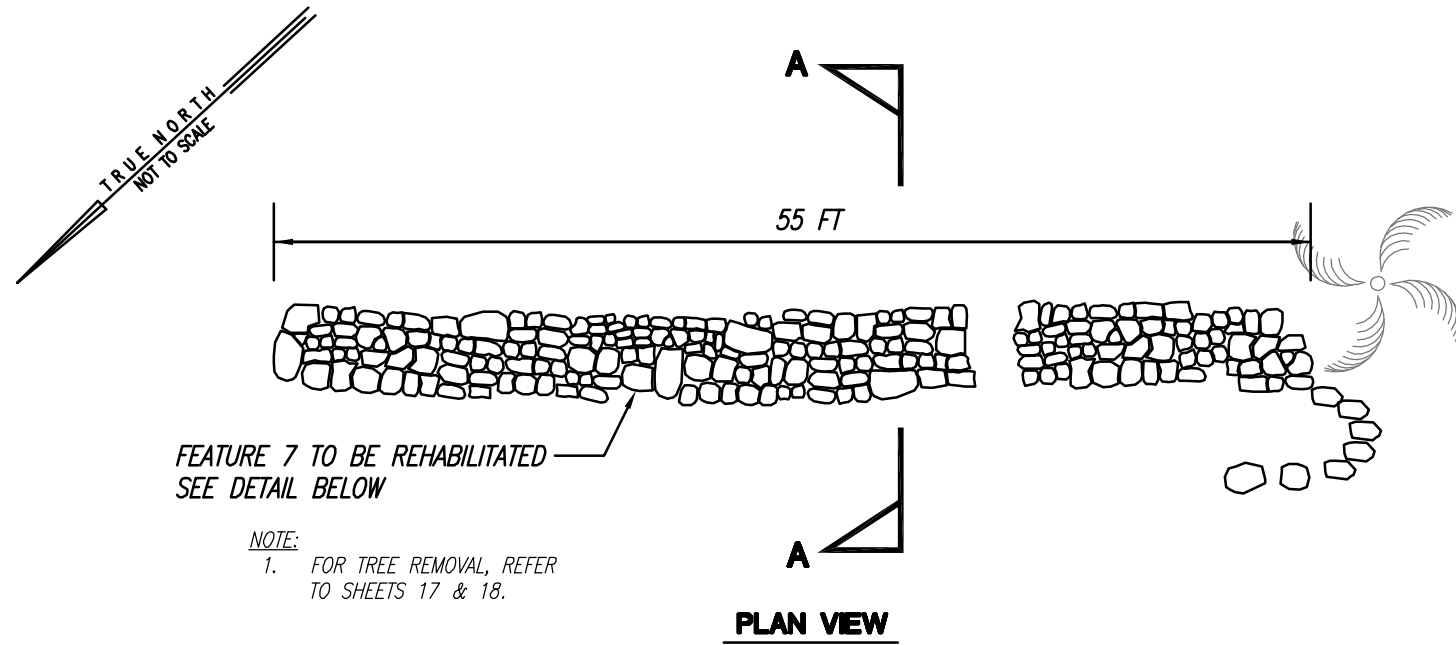
**DRY STACKED RETAINING WALL  
KIPAPA STYLE  
NOT TO SCALE**

- NOTES:**
1. WEIGHT OF WALL SHOULD BE DISTRIBUTED EVENLY TO THE GROUND.
  2. SLOPE OF SIDES PUSHES ROCKS TOGETHER.

AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)	ANGLE (φ)
4	40	40-A (KIPAPA STYLE WALL)	8-12 FT	2 FT	28°
		40-B (KIPAPA STYLE WALL)	3 FT	2 FT	15°
	41	KIPAPA STYLE WALL	3 FT	2 FT	15°

**FEATURE 40 & 41 REHAB PLAN**

<b>HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT</b>
MASONRY WORK SITE 2137 FEATURE 40 & 41 REHAB PLAN



**DRY STACKED FREE-STANDING WALL**  
NOT TO SCALE

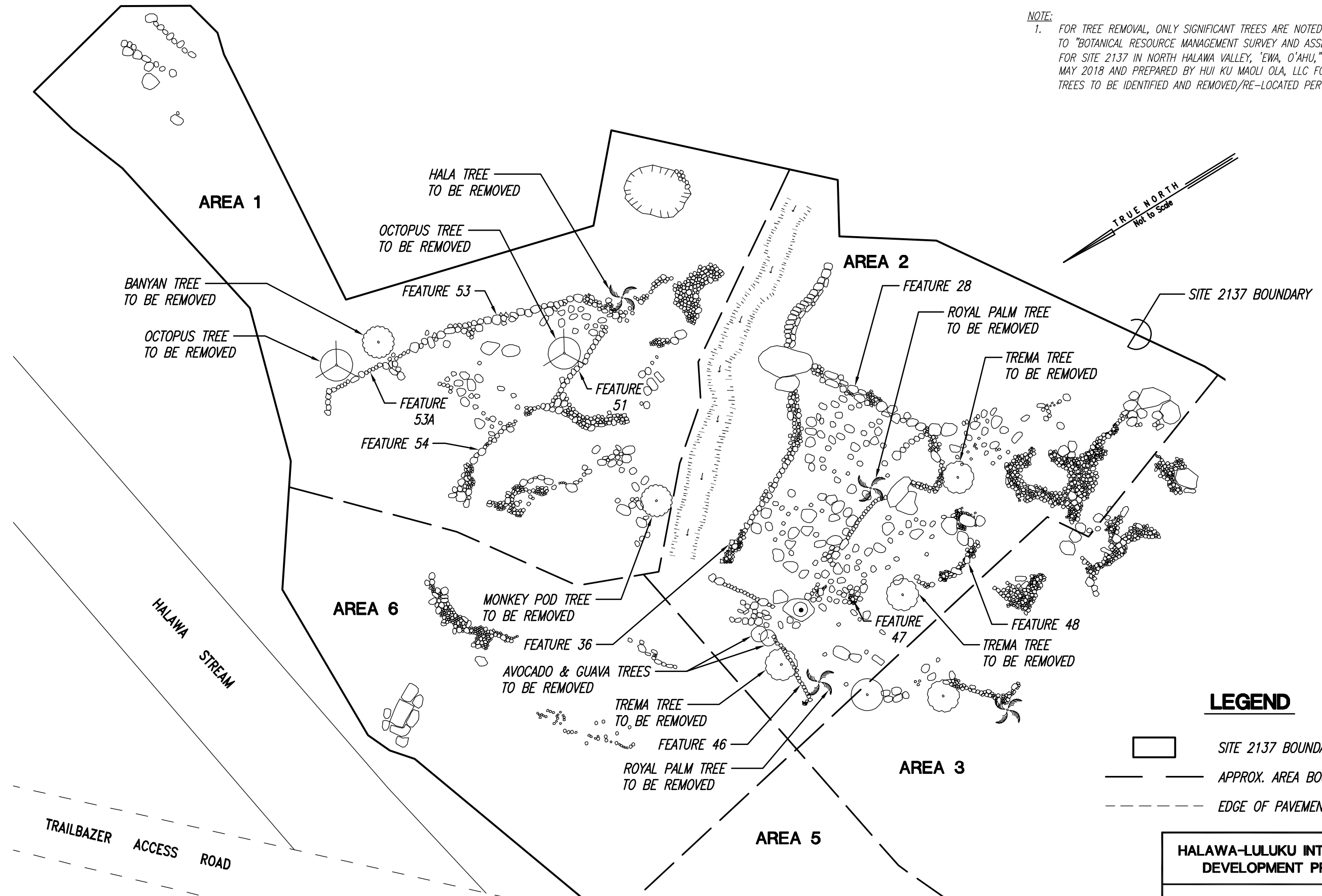
AREA	FEATURE #	DESCRIPTION	HEIGHT (H)	TOP WIDTH (TW)
5	7	FREE-STANDING WALL	2 FT	3 FT

**FEATURE 7 REHAB PLAN**

HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT

MASONRY WORK  
SITE 2137  
FEATURE 7 REHAB PLAN

**NOTE:**  
 1. FOR TREE REMOVAL, ONLY SIGNIFICANT TREES ARE NOTED. REFER TO "BOTANICAL RESOURCE MANAGEMENT SURVEY AND ASSESSMENT FOR SITE 2137 IN NORTH HALAWA VALLEY, 'EWA, O'AHU," DATED MAY 2018 AND PREPARED BY HUI KU MAOLI OLA, LLC FOR ALL TREES TO BE IDENTIFIED AND REMOVED/RE-LOCATED PER FEATURE.

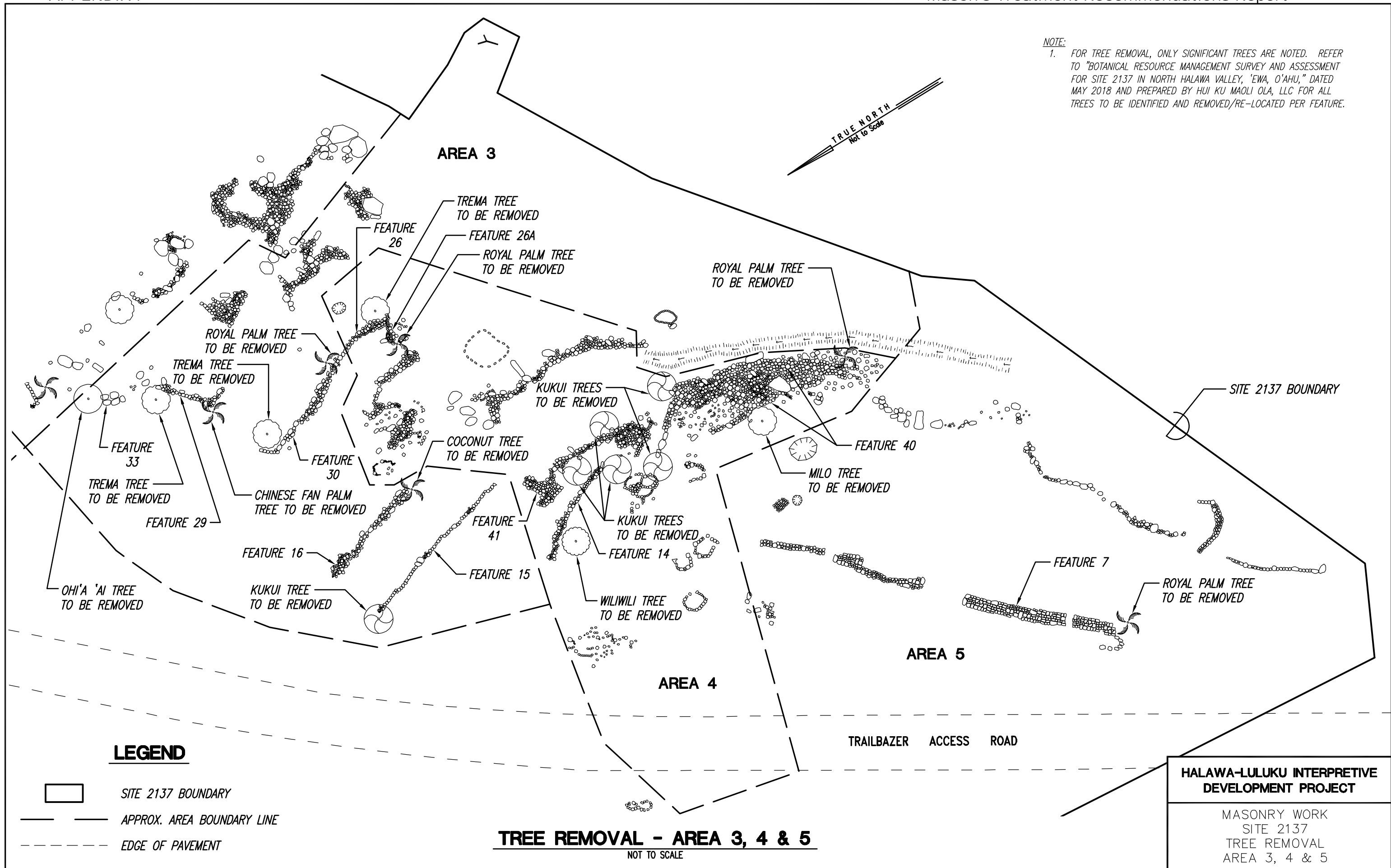


**TREE REMOVAL - AREA 1 & 2**  
 NOT TO SCALE

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**  
 MASONRY WORK  
 SITE 2137  
 TREE REMOVAL - AREA 1 & 2



**NOTE:**  
 1. FOR TREE REMOVAL, ONLY SIGNIFICANT TREES ARE NOTED. REFER TO "BOTANICAL RESOURCE MANAGEMENT SURVEY AND ASSESSMENT FOR SITE 2137 IN NORTH HALAWA VALLEY, 'EWA, O'AHU," DATED MAY 2018 AND PREPARED BY HUI KU MAOLI OLA, LLC FOR ALL TREES TO BE IDENTIFIED AND REMOVED/RE-LOCATED PER FEATURE.



**TREE REMOVAL - AREA 3, 4 & 5**  
 NOT TO SCALE

**Appendix B: Botanical Resource Management Survey and Assessment for  
Site 2137 in North Hālawā Valley, 'Ewa, O'ahu**

# Botanical Resource Management Survey and Assessment for Site 2137 in North Hālawā Valley, 'Ewa, O'ahu

Prepared for:

Fields Masonry  
Kaloko, Kona, Hawai'i

Prepared by:

Kapalikū Schirman, Hui Kū Maoli Ola, LLC  
Waipao, He'eia, O'ahu

May 18, 2018

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VEGETATION REMOVAL COST PROJECTIONS	11
CONCLUSION	11
SITE PLANT SPECIES LIST	13

## TABLES

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## Introduction

Hui Kū Maoli Ola, LLC was contracted by Fields Masonry to perform a botanical survey of Site 2137, a cultural rehabilitation site, in North Hālawā, 'Ewa, O'ahu. Fields Masonry commissioned Hui Kū Maoli Ola, LLC because of the unique knowledge base the company possesses. A strong Hawaiian cultural lens needed to be utilized when making appropriate recommendations for the site. Understanding cultural connectivity to plant species both from a utilitarian perspective and a spiritual one was necessary when considering making suggestions for species removal. This cultural foundation combined with a strong ecological background are the skill sets that qualifies Hui Kū Maoli Ola, LLC to offer recommendations.

The intent of this botanical survey is to identify and make recommendations on species removal in relation to the rehabilitation efforts of the Site. This study is not meant to be a comprehensive botanical inventory, rather it serves to offer expert opinion on how to ensure long term archaeological restoration success. Due to the lack of consistent management until recent times, many species have grown in and around rock features identified as culturally relevant and significant. Deterioration has occurred from the negative affects of root systems and falling limbs on dry stack masonry terraces and features. Within Site 2137, each feature identified as a rehabilitation site in the Hālawā-Lulukū Interpretive Development (HLID) Project will be addressed with recommendations made.

## Methodology

Topographic maps were examined to determine terrain characteristics, access, boundaries, and reference points. Prior to undertaking the field studies, a search was made of the pertinent literature and rare plant databases to familiarize the principal investigator with other botanical studies conducted in the general area. A walk-through survey method was used. The initial survey onsite in North Hālawā took place on October 19th, 2017 with four subsequent visits, the last being on May 14th, 2018. Various contractors and Project Leads were introduced to place by Mahi La Pierre of the Office of Hawaiian Affairs (OHA) on the first day. The field survey included the areas identified within the Hālawā-Lulukū Interpretive Development Project.

Notes were made on plant associations and distribution, disturbances, topography, substrate types, exposure, drainage, proximity to cultural feature, etc. Plant identifications were made in the field; plants that could not be positively identified were photo documented and described for later determination in the BISH herbarium, and for comparison with the recent taxonomic literature.

Each species was rated on four criteria: 1) risk to archaeological feature 2) cultural relevance 3) health and strength of plant and 4) invasive properties. A scoring matrix was created to evaluate the appropriateness of species removal. Each plant scoring poorly in the matrix was determined to be a high risk and suitable for elimination. This matrix is attached as Table 2.

## Vegetation

The Hālawā Valley site is dominated by non-native biomass. Many of the trees found in the project site are typically found throughout similar ecosystems across the islands. There is a range of species that portray a broad array of characteristics. As a result, a matrix was needed to appropriately identify and classify each species (Table 2.) Included in the species surveyed are a range of native plants, polynesian introduced species, naturalized species and invasive species. The matrix is intended to provide recommendations for the overall campus; independent of the rock features to be preserved or rehabilitated. It is a tool to aid in decision making about removal, relocation, or leaving particular plants in place during development. In particular, special consideration is given to native plant species as priorities over non-native species.

Native plants are defined as either endemic (found only in Hawai'i) or indigenous (naturally found in Hawai'i as well as other places). Plants are considered to have arrived and occur naturally in Hawai'i if it originally reached Hawai'i without the aid of humans. An example of a native plant on site would be Loulu (*Pritchardia hillibrandii*). One of the most dominant plant species on site is Kukui (*Aleurites moluccana*). Kukui is classified as a Polynesian Introduction. Plants in this classification arrived to Hawai'i by early settlers of Hawai'i. These species were brought primarily for their cultural use in everyday living. Naturalized species are wide spread and appear to be "naturally" occurring. They spread readily on their own through dispersal mechanisms suitable for Hawai'i's environment. The final classification of species found in the project site is invasive. Generally invasive species

possess aggressive characteristics: fast growth, adaptability to a wide range of habitats, and fast colonization. It is possible for a Polynesian Introduced and Naturalized species to display invasive properties.

For the purpose of this study, only large tree species were included and identified as posing threats. The primary threats to cultural stone features are from falling limbs, disruptive root damage and the potential for these two occurring in the future. A few trees identified later in the report, although at a distance from the archaeological feature, posed risks to community members due to the overall health of the tree. In this case, a tree would be selected for removal. Smaller herbaceous and viney species, such as maile pilau (*Paedaria scandens*), were not included because their root systems are not considered risks to the archaeological features. Non-native naturalized laua'e (*Phymatosorus grossus*) has significant value to many modern *hālau hula* (hula schools/groups). On site, this species can create destructive root masses that break walls apart. It should be limited to small managed pockets if desired.

## Results

Following the initial introduction to the project site and preliminary survey of tree species, further consultations with Project Leads about the goals of the survey, and analysis of the species with the provided matrix, determinations were made about each tree growing within the project features. The features analyzed do not represent a comprehensive evaluation of all features within the campus. Rather, this study serves to provide recommendations only on the features identified as candidates for rehabilitation. For future work around additional features outside of the scope of this study, in consultation with the matrix (Table 2) and comparative analysis with the following recommendations for similar features, responsible decisions can be made for management of select species.

Table 1, which follows on page 6, provides specific recommendations for each feature. For the purposes here, the feature is the primary concern. Long term success and longevity of the restoration is the priority. Cultural practice associated with given species is acknowledged and taken into consideration when making suggestions. Utilization of any species for cultural purposes is preferred method of removal. This study does not take into account unknown special case situations. For example, if an *'iewe* (afterbirth, placenta) was planted along with the tree. In this case, acceptions can

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be made and adjustments discussed with the master mason. It is also important to note that no endangered, threatened or rare species were found on the survey of the campus. All were, relatively speaking, common species.

**Table 1: Recommendations by Feature**

FEATURE NUMBER	SPECIES TO BE REMOVED	SIZE	QUANTITY	ACTION
7	<i>Royal Palm</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Orange</i>	<i>L</i>	<i>1</i>	<i>Relocate/Rem ove</i>
	<i>Ulu</i>	<i>S</i>	<i>4</i>	<i>Relocate/Rem ove</i>
14	<i>Wauke</i>	<i>S</i>	<i>10</i>	<i>Rem ove</i>
	<i>Noni</i>	<i>S</i>	<i>3</i>	<i>Rem ove</i>
	<i>Kukui</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
	<i>Royal Palm</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>African Tulip</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
	<i>Wiliwili</i>	<i>S</i>	<i>1</i>	<i>Relocate/Work Around</i>
15	<i>Kukui</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
16	<i>Niu</i>	<i>L</i>	<i>1</i>	<i>Relocate/Rem ove</i>
26	<i>Trema</i>	<i>L</i>	<i>2</i>	<i>Rem ove</i>
	<i>Ulu</i>	<i>S</i>	<i>4</i>	<i>Relocate/Rem ove</i>
	<i>Royal Palm</i>	<i>L</i>	<i>2</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
	<i>Royal Palm</i>	<i>M</i>	<i>7</i>	<i>Rem ove</i>
26A, 34, & 45	<i>Ulu, Trem a, Octopus Tree , Guava, 'Ōhi'a'ai Mix</i>	<i>M</i>	<i>20</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>XL</i>	<i>3</i>	<i>Rem ove</i>
27, 31, & 49	<i>Trema</i>	<i>L</i>	<i>6</i>	<i>Rem ove</i>
	<i>Kukui, Trem a, Octopus tree mix</i>	<i>M</i>	<i>20</i>	<i>Rem ove</i>



FEATURE NUMBER	SPECIES TO BE REMOVED	SIZE	QUANTITY	ACTION
28	<i>Octopus Tree</i>	<i>M</i>	<i>1</i>	<i>Rem ove</i>
	<i>Royal Palm</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
	<i>Kukui</i>	<i>M</i>	<i>1</i>	<i>Rem ove</i>
	<i>Ōhi'a 'Ai</i>	<i>S</i>	<i>20</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>M</i>	<i>15</i>	<i>Rem ove</i>
	<i>Kukui</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>L</i>	<i>2</i>	<i>Rem ove</i>
29	<i>Chines e Fa n Palm</i>	<i>M</i>	<i>1</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>M</i>	<i>2</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>African Tulip</i>	<i>S</i>	<i>3</i>	<i>Rem ove</i>
30	<i>Trema</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Royal Palm</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Papaya</i>	<i>S</i>	<i>2</i>	<i>Rem ove</i>
	<i>Mango</i>	<i>S</i>	<i>1</i>	<i>Relocate/Rem ove</i>
33	<i>Dead Non i</i>	<i>M</i>	<i>1</i>	<i>Rem ove</i>
35	<i>Ulu</i>	<i>S</i>	<i>5</i>	<i>Relocate/Rem ove</i>
	<i>Trema</i>	<i>M</i>	<i>2</i>	<i>Rem ove</i>
	<i>Noni</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
36	<i>Kukui</i>	<i>L</i>	<i>6</i>	<i>Prune</i>
	<i>Monkey Pod</i>	<i>L</i>	<i>1</i>	<i>Prune/Rem ove</i>
	<i>Kukui</i>	<i>L</i>	<i>6</i>	<i>Rem ove</i>
	<i>Royal Palm</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
	<i>Various Sm all Diam eter Tree s</i>	<i>S</i>	<i>25</i>	<i>Rem ove</i>
	<i>Java Plum</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Dead Christmas berry</i>	<i>L</i>	<i>2</i>	<i>Rem ove</i>

FEATURE NUMBER	SPECIES TO BE REMOVED	SIZE	QUANTITY	ACTION
38	<i>Royal Palm</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
40	<i>Royal Palm</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Kukui</i>	<i>L</i>	<i>7</i>	<i>Rem ove</i>
	<i>Kukui</i>	<i>XL</i>	<i>1</i>	<i>Rem ove</i>
	<i>'Ulu</i>	<i>L</i>	<i>7</i>	<i>Rem ove</i>
	<i>Noni</i>	<i>S</i>	<i>7</i>	<i>Rem ove</i>
	<i>Papaya, Wauke, Noni, Tulip, Kukui, Guava Mix</i>	<i>S</i>	<i>17</i>	<i>Rem ove</i>
	<i>Mulberry</i>	<i>S</i>	<i>1</i>	<i>Rem ove</i>
	<i>Milo</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Kō</i>	<i>M</i>	<i>1</i>	<i>Relocate/Rem ove</i>
41	<i>Banyan</i>	<i>M</i>	<i>1</i>	<i>Rem ove</i>
	<i>Wauke, Noni, Tulip Mix</i>	<i>S</i>	<i>10</i>	<i>Rem ove</i>
43	<i>'Ulu</i>	<i>M</i>	<i>2</i>	<i>Relocate/Rem ove</i>
	<i>Royal Palm</i>	<i>L</i>	<i>3</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>L</i>	<i>3</i>	<i>Rem ove</i>
	<i>Trema</i>	<i>M</i>	<i>6</i>	<i>Rem ove</i>
	<i>Guava</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
44	<i>Trema</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>'Ulu, 'Ōhi'a'ai, African Tulip, Royal Palm Mix</i>	<i>S/M</i>	<i>15</i>	<i>Rem ove</i>
46	<i>Trema</i>	<i>XL</i>	<i>7</i>	<i>Rem ove</i>
	<i>Avocado</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Guava</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Royal Palm</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
47	<i>Trema</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Guava</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Noni, Kukui, Octopus Tree s</i>	<i>M</i>	<i>4</i>	<i>Rem ove</i>
48	<i>Trema</i>	<i>L</i>	<i>2</i>	<i>Rem ove</i>
	<i>Split Hala</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>

FEATURE NUMBER	SPECIES TO BE REMOVED	SIZE	QUANTITY	ACTION
51 (portion)	<i>Kukui</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Octopus Tree</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Guava</i>	<i>M</i>	<i>5</i>	<i>Rem ove</i>
53	<i>Christmas berry</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Guava</i>	<i>M</i>	<i>5</i>	<i>Rem ove</i>
	<i>Banyan</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Avocado</i>	<i>S</i>	<i>2</i>	<i>Rem ove</i>
	<i>Octopus Tree</i>	<i>M</i>	<i>1</i>	<i>Rem ove</i>
	<i>Octopus Tree</i>	<i>L</i>	<i>3</i>	<i>Rem ove</i>
	<i>Kukui</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Hala</i>	<i>L</i>	<i>3</i>	<i>Rem ove</i>
53A	<i>Octopus Tree</i>	<i>L</i>	<i>1</i>	<i>Rem ove</i>
	<i>Avocado</i>	<i>S</i>	<i>8</i>	<i>Rem ove</i>
54 (portion)	<i>Guava</i>	<i>M</i>	<i>10</i>	<i>Rem ove</i>

## Discussion

Hawaiian cultural understanding and world perspective is a key component to doing any work within this project site. To follow the appropriate protocols, including movement across the site, interaction with the space and self are of the utmost importance to the long term success of this project. A solid Hawaiian cultural knowledge foundation should be required of any contractor working within this sacred site. With the proper protocols in place, the project should go smoothly, without injury and delays.

Beyond cultural acumen, the contractor should provide vocational expertise and hold a license C-27 or C-27a from the State of Hawaii. The company should be able to demonstrate at a minimum 3 relevant projects around sacred sites in Hawaii. Projects should be similar in scope.

## Removal Techniques

Selected plant species need to be manually removed with sensitivity to the preservation of existing rock features, in particular to the sites not chosen for rehabilitation. With the thinning of the canopy, allowing light levels to change, will invite the understory seed bank to germinate. This is being brought up because of the importance of having a means to maintain this anticipated flush of weed species. Cleared areas provide an opportunity for alien species, in particular undesirable grasses, to establish and/or erosion to occur.

Trees should be cut, with limbs being lowered safely to the ground where applicable. This will prevent any damage to both known and unknown archaeological features. Once on the ground, limbs can either be hauled out to chip or chipped in place. Any limbs or trunks 12 inches or less in diameter need to be chipped. The chips can be left on site to be used as mulch in areas approved by the master mason or may be hauled off site if preferred. Logs must be processed and hauled out. When hauling vegetation out of the site, extreme care must be given not to disrupt, scratch or dislodge any stones. Pathways to be approved by master stone mason. There will be no stockpiling of vegetation allowed. This is to ensure archaeological features are protected. In the more difficult to reach areas, it is important that all vegetation still gets hauled out. Cultural sites are still being learned and discovered on the campus and burying unknown features is undesirable. In addition, by not filling up approved areas, space is maintained for community stewards to stockpile and compost.

All stumps are to be cut to 6 inches from soil level and edges rounded off. Leaving the stumps in the ground minimizes erosion risks by leaving the native soils undisturbed. If approved, stumps bigger than 2 inches in diameter shall be treated with Garlon 4a according to chemical label. Application needs to be made immediately after cut is made. This ensures regrowth will not occur. In the case that chemical use is not a viable or desirable option, holes can be drilled into the stumps and rock salt applied. This is not as effective of a process, but does have moderate success rates.

In the case a species is growing directly out of a feature to be rehabilitated, the contractor shall work closely and under the guidance of the master stone mason. Where determined by the mason that stumps shall be removed, the contractor must remove and appropriately dispose of the stump. Mechanical means using equipment is acceptable, if and only if, approved by the master mason ahead of time.

## Vegetation Removal Cost Projections

Due to the inaccessability, various tree sizes, and culturally sensitive removal processes, it is anticipated that bids for this project will have a wide range. It is recommended OHA follows through with due diligence in reviewing contractor qualifications as required in the RFP. This will eliminate unqualified contractor and reduce the pool of bids. It is likely that only a small set of licensed contractors fit the experience level necessary for work in, on and around cultural sites of this importance.

The driving factor determining cost in the project is not cultural experience. Rather, it is the inaccessability of the *ma uka* portion of the project to the use of machinery. Another big cost driver is the need to cut and lower each limb in a manner not to disrupt, destroy, damage or affect in any way the existing cultural features. The following table provides a close estimate of what OHA should anticipate bids to come in at:

Estimated cost to remove listed vegetation: low	\$192,000
Estimated cost to remove listed vegetation: high	\$253,000

## Conclusion

Site 2137 in North Hālawā Valley has the potential to be a prized resource for the Hawaiian and broader communities. Limitless possibilities exist for experiential learning and cultural practice. While establishing long term stewardship of this unique site, future generations can benefit through reciprocating *mana* (supernatural or divine power) while in the space. Botanically speaking, many Polynesian Introductions and Hawaiian *kinolau* (many forms taken by a supernatural body) already exist on the site. As shown in the study, several of these species unfortunately need to be removed (potentially salvaged) in order to appropriately rehabilitate many of the rock features. Despite removing the trees listed, there are still numerous other specimens that can remain. The study also concludes that many of the typical invasive trees dominate the environment in lower North Hālawā. Ultimately, despite out of the scope for this study, it is recommended to remove all of these invasive species. Due to the significance of this site, this plan calls for experts with a strong cultural

foundation to perform the removal. Working with anything less could risk irreversible damage to cultural features. Following the proper process and protocols will ensure this project benefits the community for generations to come.

### SITE PLANT SPECIES CHECKLIST

The following is a list of vascular plant species noted during a walk-through survey of Site 2137 in North Hālawā Valley, ‘Ewa, O‘ahu. A total of 24 taxa were noted during the survey, including 1 endemic, 1 indigenous, 9 Polynesian introductions and 13 naturalized. Plants are divided into two main groups: dicots, and monocots. Within these groups, species are arranged alphabetically by family, genus, and species. Each entry includes scientific name, Hawaiian name, common name (if available), matrix score and recommendation. The matrix scores are recorded from the left to the right column. How the species scores in each column is written down. Once all categories have been scored, the total is added up to give a final rating.

**Table 2: Species of Concern Decision Matrix**

STATUS KEY:	INVASIVENESS:	Cultural Relevance	Threat to Feature	Plant Health/Strength	Row Value
H= <i>Endemic Species and Indigenous Hawaiian Species</i>	<i>No to Low Risk: present but not a major disruptor</i>	<i>High: species is core to historic and present cultural use and identity</i>	<i>Low Risk: Smaller tree with non-aggressive root system with more vertical growth</i>	<i>Generally Healthy and Strong</i>	1
P= <i>Polynesian Intro. (Introduced by Polynesians prior to 1778)</i>	<i>Moderate Risk: Wide spread but not disruptive in Hālawā ecosystem</i>	<i>Moderate: species has historic cultural value and is used in modern practice</i>	<i>Moderate Risk: trees are generally outside of feature falling limbs and roots could reach feature</i>	<i>Light Pruning Needed to Remove Commonly Found Dead wood</i>	2
N= <i>Naturalized Species (Introduced by man after the arrival of Capt. Cook in 1778)</i>	<i>High Risk: Wide spread and aggressive. Very disruptive</i>	<i>Low: no historically significant cultural practice known</i>	<i>High Risk: trees should be removed due to large disruptive root system</i>	<i>Large Dead Limbs Common and Brittle</i>	3

Family	Genus and Species	Hawaiian Name	Common Name	Scoring Across Matrix	Total Score	Recommendation
<b>DICOTYLEDONES</b>						
ANACARDIACEAE						
	<i>Mangifera indica</i>	<i>Manakō, Men ek e</i>	<i>Mango</i>	3,1,3,3,2	12	<i>Rem oval or Pus h to Boundary</i>
	<i>Schinus terebinthifolius</i>	<i>Wili Laiki</i>	<i>Christmas berry</i>	3,3,3,3,2	14	<i>Rem ove All</i>
ARALIACEAE						
	<i>Schefflera actinophylla</i>	<i>He'e</i>	<i>Octopus Tree</i>	3,3,3,3,3	15	<i>Rem ove All</i>
BIGNONIACEAE						
	<i>Spathodea campanulata</i>		<i>African Tulip Tree</i>	3,2,3,3,2	13	<i>Rem ove All</i>
EUPHORBIACEAE						
	<i>Aleurites molucanna</i>	<i>Kukui</i>	<i>Cand len ut Tree</i>	2,3,1,3,2	11	<i>Rem ove Disruptive Tree s</i>
FABACEAE						
	<i>Erythrina sandwicensis</i>	<i>Wiliwili</i>	<i>Wiliwili</i>	1,1,1,3,2	8	<i>Rel oc ate</i>
	<i>Samanea saman</i>	<i>Ohai, Pū 'Ohai</i>	<i>Monkeypod Tree</i>	3,2,1,3,3	12	<i>Rem ove All</i>
LAURACEAE						
	<i>Persea americana</i>	<i>Pea</i>	<i>Avocado</i>	3,1,3,2,2	11	<i>Rel oc ate/Rem ove/ Rem ain</i>



MALVACEAE						
	<i>Thespesia populnea</i>	<i>Milo</i>	<i>Portia Tree</i>	2,2,1,2,1	8	<i>Relocate/Remove</i>
MORACEAE						
	<i>Artocarpus altilis</i>	<i>Ulu</i>	<i>Breadfruit</i>	2,1,1,2,2	8	<i>Relocate/Remove/Remove</i>
	<i>Broussonetia papyrifera</i>	<i>Wauke</i>	<i>Paper Mulberry</i>	2,1,1,3,1	8	<i>Remove Disruptive Trees</i>
	<i>Ficus microcarpa</i>		<i>Chinese Banyan</i>	3,3,3,3,3	15	<i>Remove All</i>
	<i>Morus spp.</i>		<i>Mulberry</i>	3,1,3,1,1	9	<i>Relocate/Remove</i>
MYRTACEAE						
	<i>Eugenia malaccensis</i>	<i>Ōhi'a 'ai</i>	<i>Mountain Apple</i>	2,2,1,3,1	9	<i>Remove Disruptive Trees</i>
	<i>Psidium guajava</i>	<i>Kuawa</i>	<i>Guava</i>	3,2,3,3,1	12	<i>Remove All</i>
	<i>Syzigium cumini</i>		<i>Java Plum</i>	3,3,3,3,3	15	<i>Remove All</i>
RUBIACEAE						
	<i>Morinda citrifolia</i>	<i>Noni</i>	<i>Indian Mulberry</i>	2,1,1,2,1	7	<i>Relocate/Remove/Remove</i>
ULMACEAE						
	<i>Trema orientalis</i>		<i>Gunpowder Tree</i>	3,3,3,3,3	15	<i>Remove All</i>

Family	Genus and Species	Hawaiian Name	Common Name	Scoring Across Matrix	Total Score	Recommendation
<b><i>MONOCOTYLEDONES</i></b>						
AGAVACEAE						
	<i>Cordyline fruticosa</i>	<i>Lā ʻi, Kī</i>	<i>Ti Leaf</i>	<i>2,1,1,1,1</i>	<i>6</i>	<i>Relocate/Remove/Remove</i>
ARECACEAE						
	<i>Cocos nucifera</i>	<i>Niu</i>	<i>Coconut Tree</i>	<i>2,1,1,2,1</i>	<i>7</i>	<i>Remove Disruptive Trees</i>
	<i>Livistona chinensis</i>		<i>Chinese Fan Palm</i>	<i>3,2,3,3,1</i>	<i>12</i>	<i>Remove All</i>
	<i>Roystonea spp.</i>		<i>Royal Palm</i>	<i>3,3,3,3,3</i>	<i>15</i>	<i>Remove All</i>
PANDANACEAE						
	<i>Pandanus tectorius</i>	<i>Hala, Pū Hala</i>	<i>Corkscrew Pine</i>	<i>1,1,1,3,2</i>	<i>8</i>	<i>Remove Disruptive Trees</i>
POACEAE						
	<i>Saccharum officinarum</i>	<i>Kō</i>	<i>Sugar Cane</i>	<i>2,1,1,1,1</i>	<i>6</i>	<i>Remove Disruptive Plants</i>

# HALAWA-LULUKU DEVELOPMENT FEASIBILITY REPORT

## North Halawa Valley

Honolulu  
Oahu, Hawaii  
November 2019

Prepared for:  
Halawa-Luluku Interpretive Development Project  
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**Disclaimer: This report is only for conceptual purposes for the Halawa-Luluku Interpretive Development project. The content presented in this report will not determine actual designs or use of the project sites. This report is only meant to provide insight for the stakeholders in consideration of future growth.**

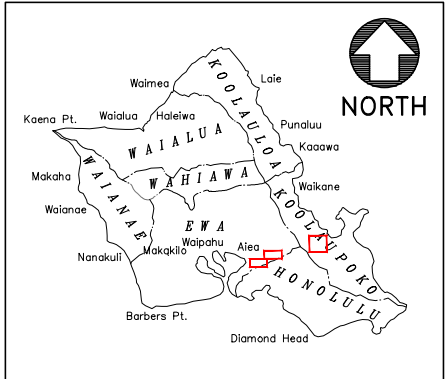
## *Section 1 Introduction*

The Halawa-Lulukū Development Feasibility Report (North Halawa Valley) is based on the Interpretive Development Plan (IDP) set forth by the Halawa-Lulukū Interpretive Development (HLID) team, acting on behalf of the Office of Hawaiian Affairs (OHA). The IDP was created by the HLID team to initiate the mitigation process of the impacts to cultural and archaeological resources caused by the construction of Interstate H-3. There are two project areas within the HLID project, Lulukū and North Halawa Valley. For the purposes of the feasibility report, a report will be done for each project area. Reference can be made to the “PROJECT DESCRIPTIONS: North Halawa Valley and Lulukū Project Areas,” dated October 24, 2014; for the background and development of the HLID project and the IDP.

The purpose of the Halawa-Lulukū Development Feasibility Report (North Halawa Valley) is to investigate the feasibility of incorporating various elements within the North Halawa Valley project area to assist the selected Stewards (Stewards) with their respective visions. The objective of this report is to provide site layout alternatives based on discussions with the Stewards and coordination with representatives from the Federal Highway Administration (FHWA) / State of Hawaii Department of Transportation (HDOT) and OHA. The project elements presented in this report are based off the IDP for the project area, with input from FHWA/HDOT and the Stewards. Each project element will be explored and options for implementing the element within the project site will be discussed. These various project elements are incorporated into different feasible site layouts, put together through consultations with the stakeholders on what elements are most desirable, the feasibility of implementing the project element, and the budgetary expenses for installation, operation, and maintenance of each element. The cost estimates presented in this report are based on rough budgetary estimates and are subject to change.

As part of the HLID project, the Stewards will develop a work plan to sustain the North Halawa Valley project area. To assist the community group, this feasibility report is intended to provide a basis to move forward towards goals and visions for the project area. At this time, the feasible project alternatives presented in this report will be based on the current capacity of the Stewards. Looking towards future growth projections, provisions to support expansion of the North Halawa Valley project area will also be discussed in this report. Site layouts presented in the feasibility report are conceptual and subject to alterations moving forward.

Refer to Figure 1 for overall HLID project location map.



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FIGURE 1  
OVERALL PROJECT LOCATION MAP

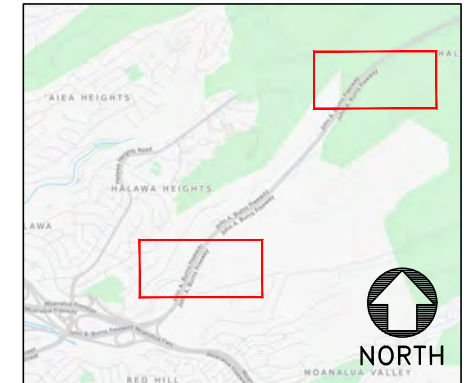
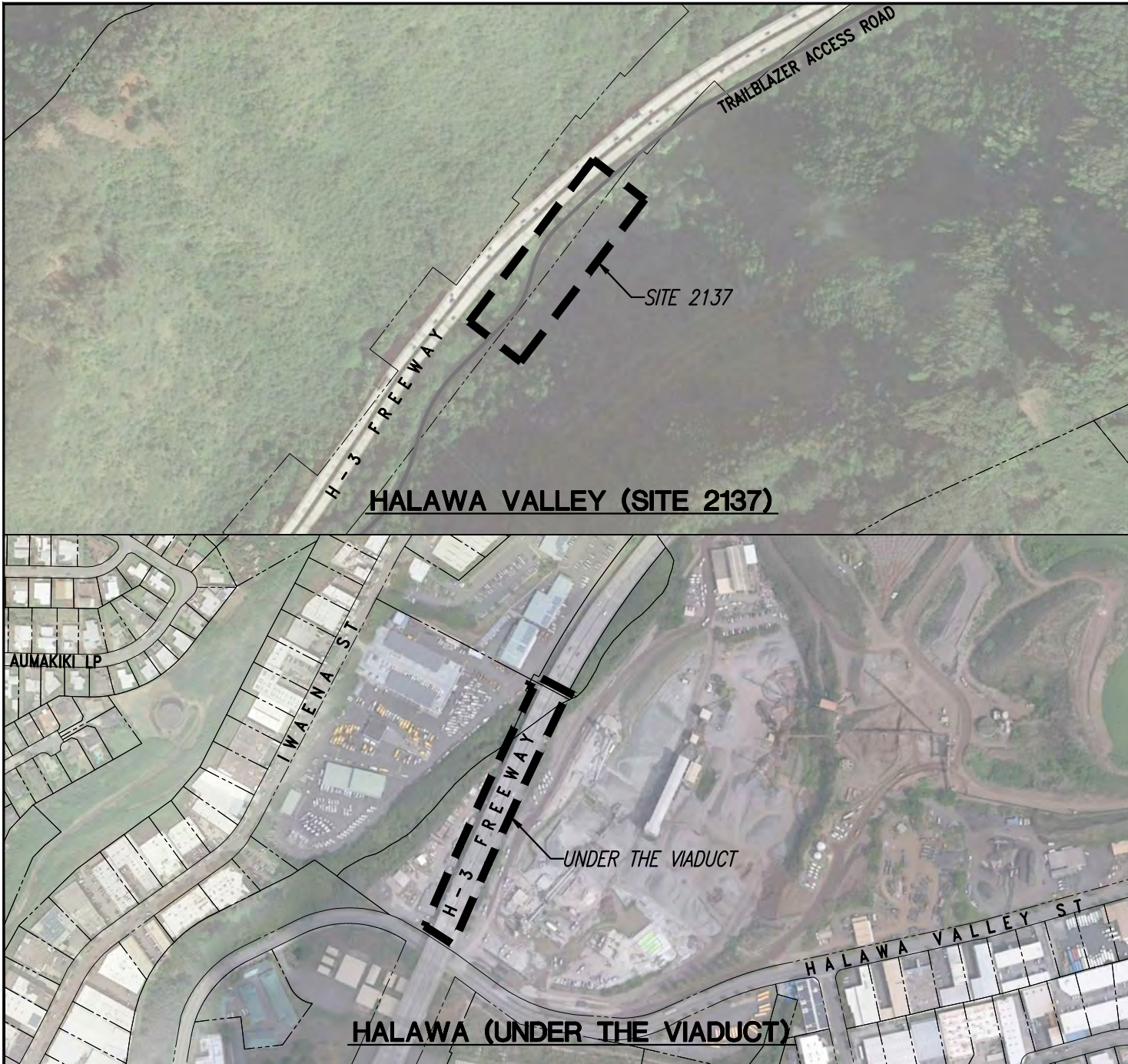


## *Section 2 Existing Site Conditions*

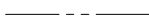

The North Halawa Valley project area is inclusive of two separate project sites. The first project site, referred to as “Under the Viaduct,” is located just off Halawa Valley Street near the entrance to Hawaiian Cement. This site is part of Tax Map Key (TMK): (1)9-9-010: 010 and (1)9-9-073: 028. The limits of the project include the eight (8) bays underneath the Interstate H-3 separated by the viaduct support pillars and within the freeway right-of-way. The project site has been previously disturbed, with a majority of the surface area being impervious with asphalt pavement. The current zoning designation of TMK (1)9-9-010:010 is general agriculture district (AG-2) and TMK (1)9-9-073: 028 is intensive industrial district (I-2). Currently this area is rented out by various tenants and used as commercial office space, materials storage and baseyards.

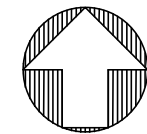
The second project site, referred to as Site 2137, is located mauka of the first project site along the Trailblazer Access Road. This site is part of TMK: (1)9-9-011: 002 and is confined to the boundaries of archaeological Site 2137, known as Hale O Papa. The current zoning designation of TMK (1)9-9-011: 002 is restricted preservation district (P-1). According to the State of Hawaii Department of Land and Natural Resources (DLNR), the project site is within the resource subzone of the conservation district. Currently this area is cared for by Na Kupuna a me Na Kakoo o Halawa Inc. (NKNKHI). This group is recognized as the Stewards for the North Halawa Valley project area and occasionally has work days and provides cultural/educational sessions and tours for various community groups. Consultation was done with the Stewards to advise which project elements were conceptually incorporated for the feasible site layouts.

Refer to Figure 2 for location and vicinity map for the North Halawa Valley project area.



**LEGEND**

-  PROPERTY LINE
-  PROJECT AREA



NORTH  
Scale : 1"=500'



Graphic Scale in Feet



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FIGURE 2  
LOCATION AND VICINITY MAP  
FOR NORTH HALAWA VALLEY

## ***Section 3 Project Elements***

Project elements were defined based on scope items and discussion with the stakeholders. In the following sections, there will be a description of each project element that explains the intended use for the project site. The options explored to meet the criteria of the project element will also be presented, along with a cost estimate and the permitting needed to construct the project element on-site.

### ***3.1 Administrative Center***

The administrative center would provide office space for the Stewards, as well as a possible meeting space or educational space for visitors. For the purposes of this report, the administrative center was considered to be located in the Under the Viaduct area. However, the actual location of the administrative center can be adaptive to be located either Under the Viaduct or at Site 2137. Placing the administrative center Under the Viaduct, would provide connection and access to utilities such as electricity, water and sewer. The administrative center has the versatility to be located under any of the eight (8) bays underneath the viaduct and each bay has sufficient space to provide the structure along with parking spaces. For the administrative center, the option would be to provide a modular building. The modular building would be easy to transport and situate on-site, which would make it a suitable and cost-effective option.

#### ***3.1.1 Option 1 – Base***

The base option for the proposed administrative center would consist of an administrative office, a minimal gathering area, and a restroom facility. This module (trailer) would be 12-feet by 44-feet (528 square feet) and provide a gathering space approximately 264 square feet to serve about 17 people, one administrative office with 2-3 occupants, and one unisex restroom. Refer to Figure 3 for a concept drawing of this base option for the administrative center.

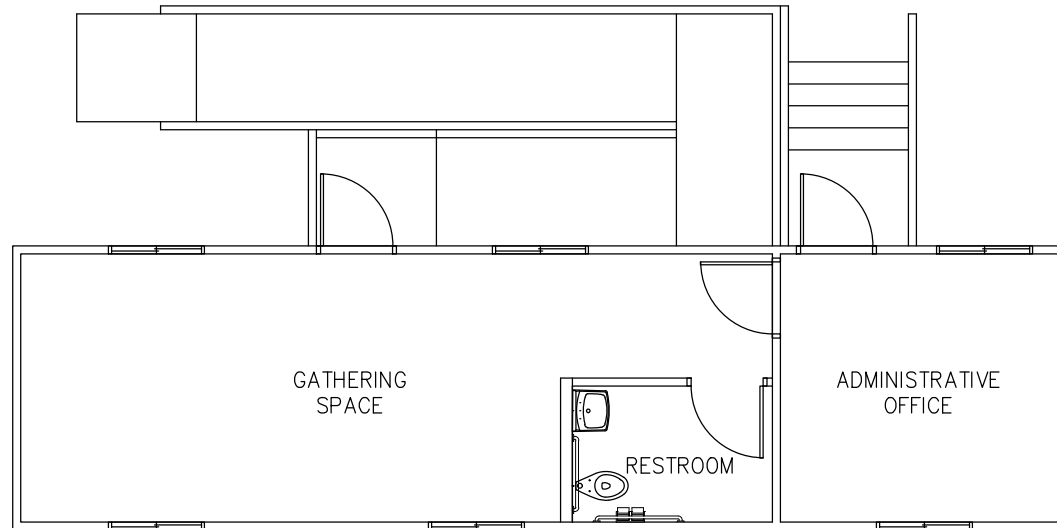
#### ***3.1.2 Option 1 – Expanded***

Expansion of the base option would be possible by adding additional modules and providing larger spaces. By including additional modules, the Stewards and visitors will be provided with more features such as educational classrooms, larger office spaces, and a restroom facility with a shower. Expansion of the administrative center would provide more options for utilizing the modules for multi-purpose uses. With this modular building set-up, future expansion of the working area would be simple in terms of adding additional modules in accordance with growth and needs of the working group. Refer to Figure 4 for a concept drawing of an expanded option for the administrative center, which provides a structure sized 48-feet by 64-feet (3,072 square feet).


### 3.1.3 *Cost Estimate*

Below is a rough magnitude cost estimate for the administrative center options mentioned above. The cost presented below is for material cost and installation cost, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

<b>Site Location</b>	<b>Option</b>	<b>Cost Estimate</b>
Under the Viaduct	Base Option	\$460,000
Under the Viaduct	Expanded Option	\$1,200,000



FLOOR PLAN  
NOT TO SCALE

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<b>FIGURE 3</b> <b>HALAWA - UNDER THE VIADUCT</b> <b>ADMINISTRATIVE CENTER - BASE OPTION</b>	



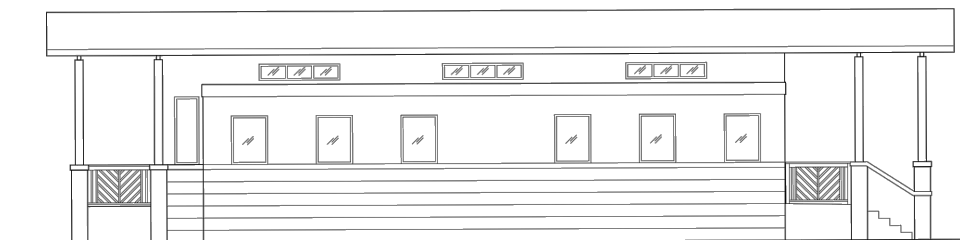
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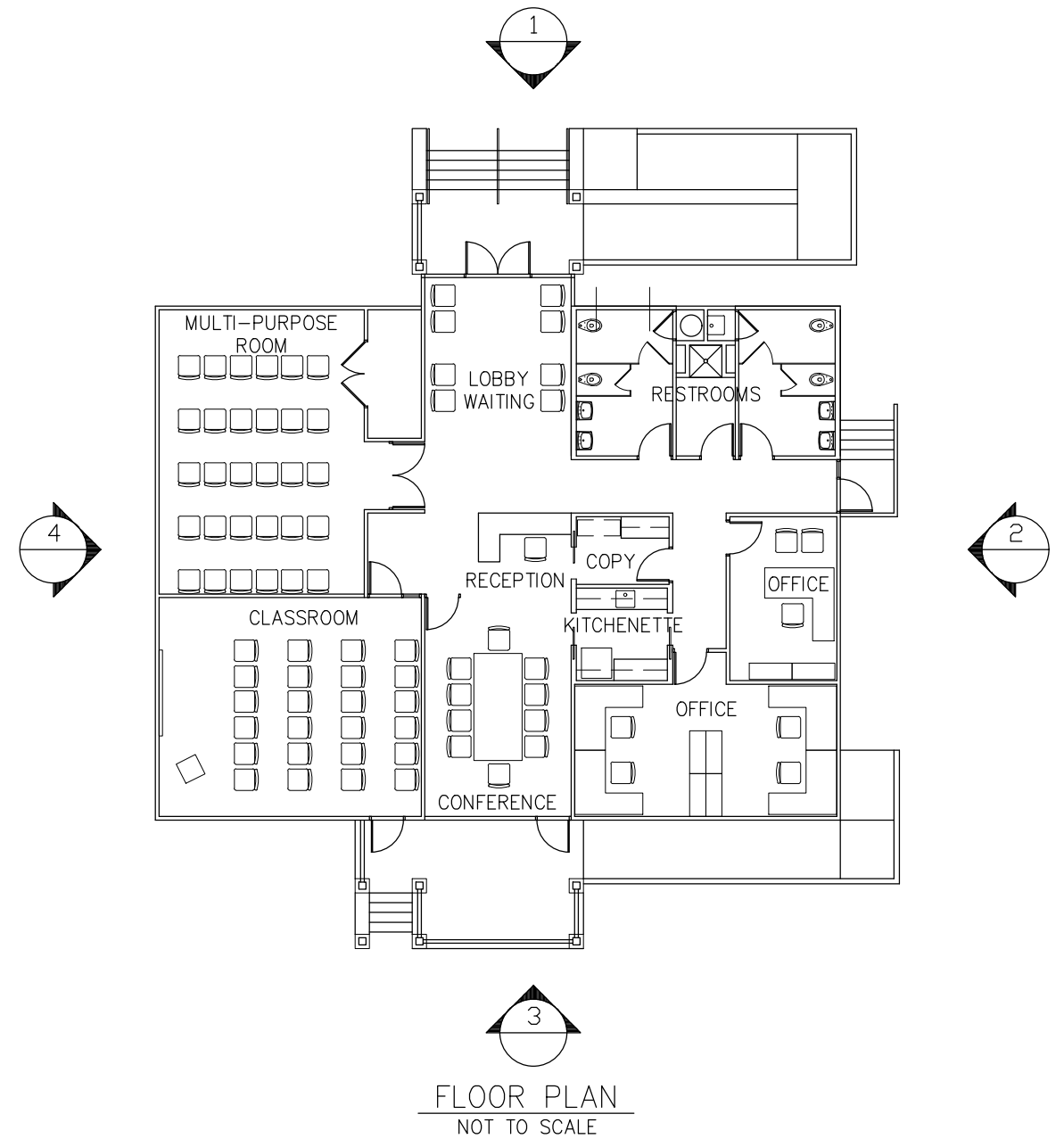
2 ELEVATION  
NOT TO SCALE



3 ELEVATION  
NOT TO SCALE



4 ELEVATION  
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 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-010:010

**FIGURE 4**  
**HALAWA - UNDER THE VIADUCT**  
**ADMINISTRATIVE CENTER - EXPANDED OPTION**

## 3.2 *Halau*

The halau would provide a gathering and learning space for the Stewards and visitors. This structure would provide shelter for people from the elements, such as rain and sun, while engaging in cultural practices. It would be sited at Site 2137 and positioned off the access roadway area. Construction of the halau would be subject to building code regulations and will require a building permit. Also depending on the site work that will be needed for the structure, a grading permit may be required. In addition, the structure would need to be designed to address the flood zone risk of Site 2137 and assure there is “no rise” within the floodplain. One option to address the flood zone risk is to elevate the finish floor and structural supports above the flood zone to allow flood water to flow underneath the structure, while also providing a strong enough support to withstand the forces of storm runoff and erosion. Alternatively, the halau provided would be an open pavilion-like structure and would be sited at grade with the anticipation of allowing flood water to flow freely over and through the structure.

Although the upper Halawa Valley area has a restricted entry and is in a secluded area, trespassers and hunters have found their way into the remote areas of the valley and have left behind graffiti and have vandalized man-made structures. Ideally, any new structures should be secured.

### 3.2.1 *Option 1*

An option that would be explored for the halau would be a structure that is open on all sides with a roof covering. The pavilion-like structure would provide a more permanent and larger meeting space compared to the current tent structure on the existing site. This structure would be approximately 20-feet by 40-feet to accommodate a group up to fifty people. The roof of the halau could also be used to collect rain water in a water catchment system, for non-potable water use on-site. Being that this type of halau would be open on all sides, there would be no provisions to secure or lock the structure when not in-use. Refer to Figure 5 for a concept drawing of the open halau structure.

### 3.2.2 *Option 2 – Base*

A second option for a halau structure would be an enclosed structure. The base option for this halau would be a simple modular building that would include a meeting area, storage, small water catchment system, and restroom. This enclosed structure would allow the option to secure and lock the building when not in-use. Refer to Figure 6 for a concept drawing of this base option for the enclosed halau structure.

### 3.2.3 *Option 2 – Expanded*

Expansion of this base option would be possible by adding additional modules to provide more space and features for the Stewards and visitors. A more complex enclosed halau structure may include additional features such as a small office, small kitchen area, storage room and a restroom with a shower/changing room. Also expansion of the halau structure could provide use of utilities via an off-grid system; for off-grid sewer, water, and electricity services. Refer to Figure 7 for a concept drawing

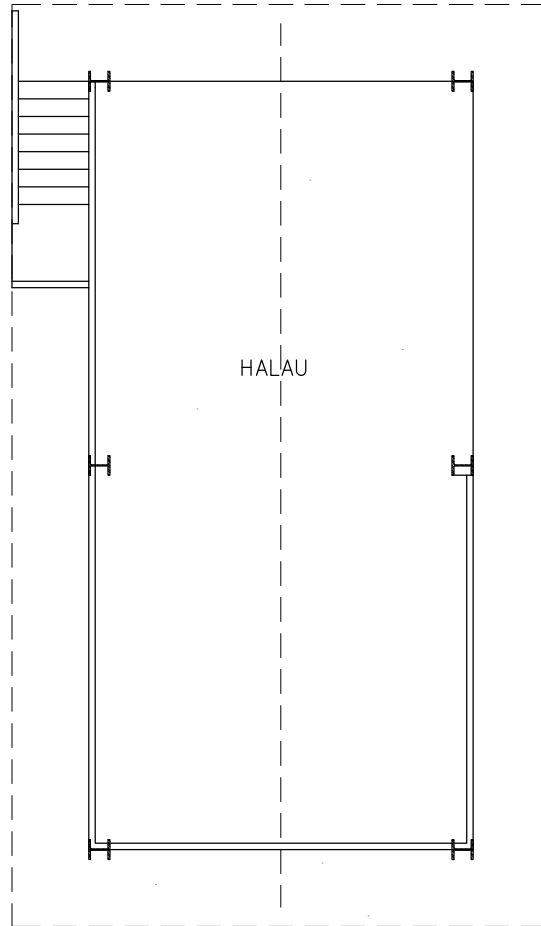
of the expanded option for the enclosed halau structure; a more complex halau with more features.

### 3.2.4 *Cost Estimate*


Below is a rough magnitude cost estimate for the halau options mentioned above. The cost presented below is for material cost and installation cost, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

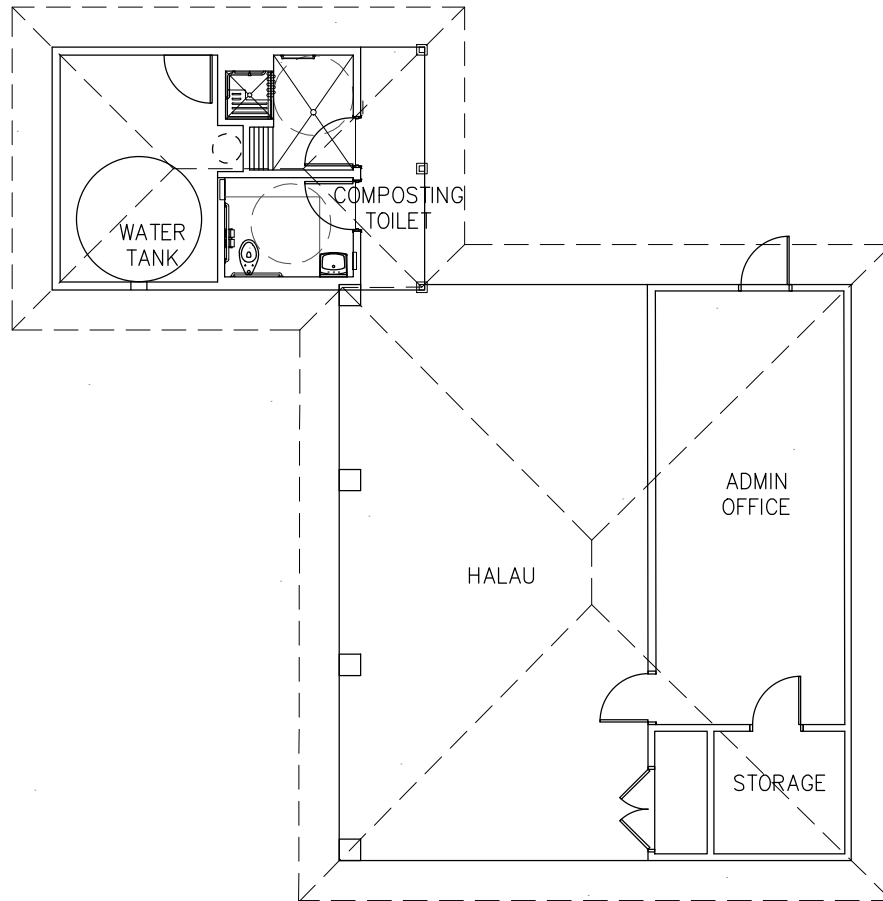
<b>Site Location</b>	<b>Option</b>	<b>Cost Estimate</b>
Halawa Valley (Site 2137)	Open Structure Halau	\$360,000
Halawa Valley (Site 2137)	Enclosed Structure Halau – Base Option	\$625,000
Halawa Valley (Site 2137)	Enclosed Structure Halau – Expanded Option	\$1,700,000






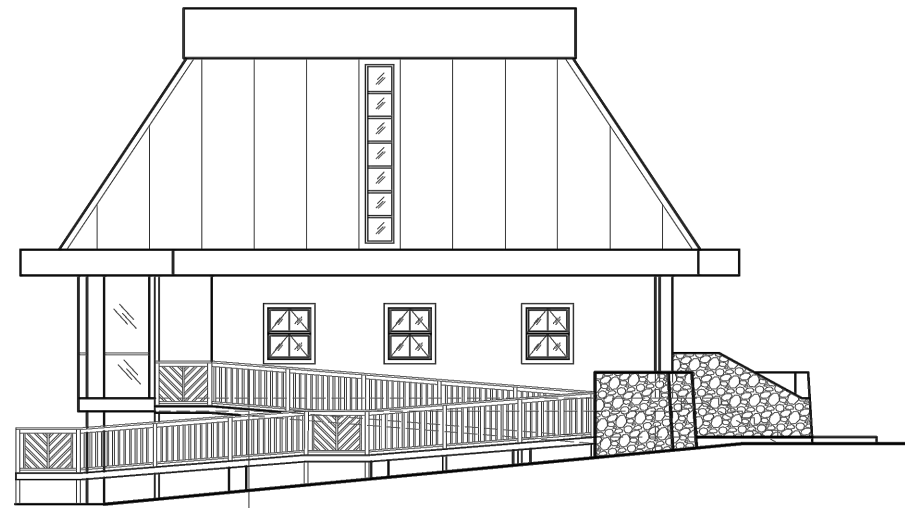
FLOOR PLAN  
NOT TO SCALE

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<b>FIGURE 5 HALAWA - SITE 2137 OPEN STRUCTURE HALAU</b>	

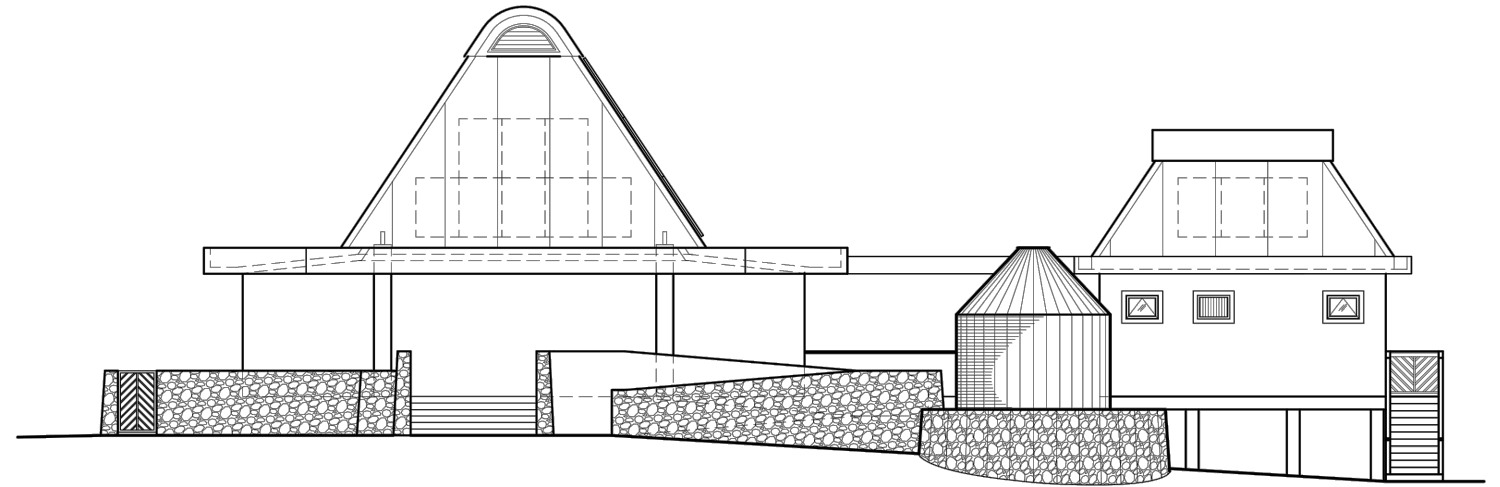


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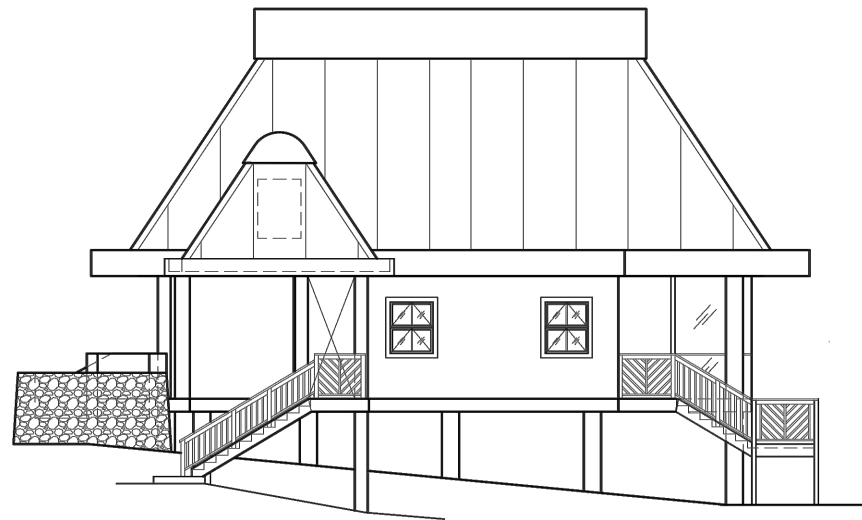
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<b>FIGURE 6</b> <b>HALAWA - SITE 2137</b> <b>ENCLOSED STRUCTURE HALAU - BASE OPTION</b>	



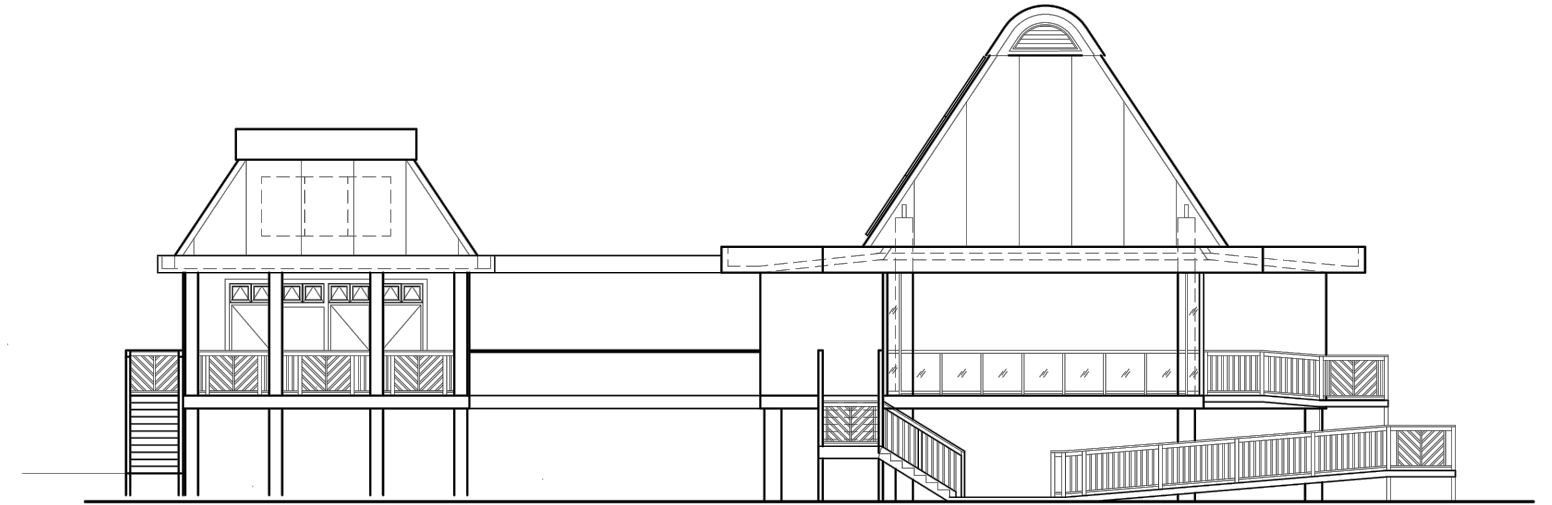
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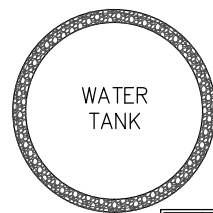
2 ELEVATION  
NOT TO SCALE



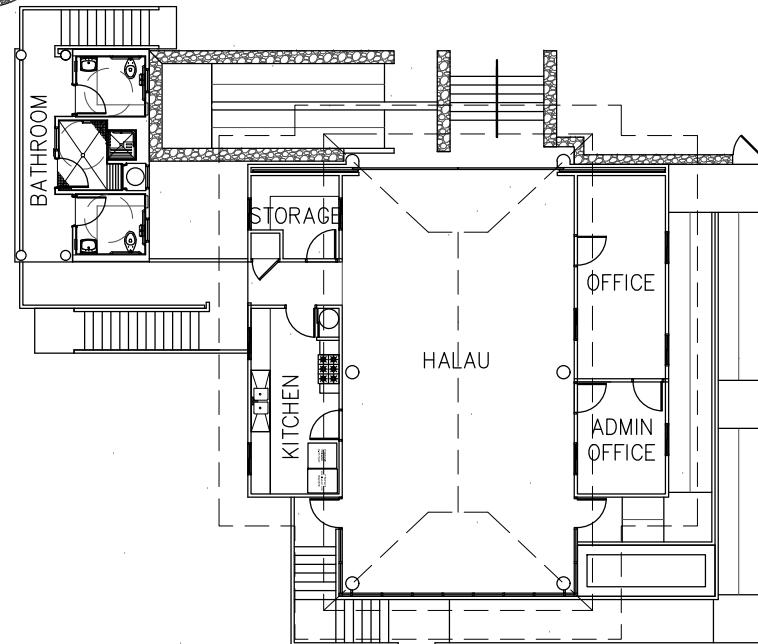
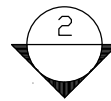
3 ELEVATION  
NOT TO SCALE



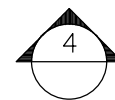
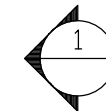
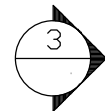
4 ELEVATION  
NOT TO SCALE



WATER  
TANK



FLOOR PLAN  
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**FIGURE 7  
 HALAWA - SITE 2137  
 ENCLOSED STRUCTURE HALAU -  
 EXPANDED OPTION**

### 3.3 Storage

On-site storage at Site 2137 can be provided for the Stewarts to store garden supplies, equipment, and tools necessary to upkeep the site. Currently, storage needs are met with a steel shipping container.

#### 3.3.1 Option 1

Retaining the existing steel shipping storage container will be considered as an “no action” option. The container does not show any signs of deterioration and does provide ample storage space for the Stewarts at this time. Utilizing the existing storage space is a no cost alternative.

#### 3.3.2 Option 2

Depending on what will be included in the halau structure, there is an option to incorporate a room or closet for storage space within the halau structure. This would be part of the expanded option for the halau and would permit security features to be provided for the storage area.

#### 3.3.3 Option 3

Installation of a new storage facility was also considered as an option for Site 2137. This option would entail removal of the existing shipping storage container and replacing the old container with a permanent storage facility. The facility would include features such as ventilation and lighting with provisions for security features.

#### 3.3.4 Cost Estimate

Below is a rough magnitude cost estimate for the storage options mentioned above. The cost presented below is for material cost and installation cost, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate
Halawa Valley (Site 2137)	Utilize Existing Storage Container on-site (No Action)	\$0
Halawa Valley (Site 2137)	Include Storage Space within Halau	\$150,000
Halawa Valley (Site 2137)	Permanent Secure Storage Facility with Lighting	\$500,000

### 3.4 Parking

Parking can be provided at both project sites, Under the Viaduct area and at Site 2137. There will be ample room to provide parking stalls for the minimum number of stalls required by the Honolulu’s Land Use Ordinance. For parking facilities that provide 1 to 25 parking spaces, the Americans with Disabilities Act (ADA) requires one assessable parking space.

### 3.4.1 *Under the Viaduct Area*

The area Under the Viaduct is currently paved with an existing driveway access from Halawa Valley Street. Parking in this area can be easily provided by striping the existing pavement. Depending on the size and usage of other project elements that may also be located Under the Viaduct, a minimum of ten parking spaces with one assessible parking space shall be provided for the proposed administrative center.

### 3.4.2 *Site 2137*

Parking can also be provided at Site 2137. Level areas off the access road can be paved over to allow parking for vehicles. Increasing the impervious area within the project site will be subject to drainage improvements and storm water quality compliance measures. Alternatively, gravel parking could be provided in those open areas. A gravel parking area will be cost-efficient and contribute less impervious area compared to a paved parking area. A minimum of ten parking stalls including one handicap stall and one loading stall will be provided for Site 2137.

### 3.4.3 *Cost Estimate*

Below is a rough magnitude cost estimate for the parking area options mentioned above. The cost presented below is for material cost and implementation of the parking area, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate
Under the Viaduct	Add Striping to Existing Pavement	\$2,000
Halawa Valley (Site 2137)	Paved Parking Area	\$20,000
Halawa Valley (Site 2137)	Gravel Parking Area	\$10,000

## 3.5 *Trash Receptacles*

Trash receptacles can be provided for both project areas Under the Viaduct and in Halawa Valley. At Site 2137, there will be a smaller size trash bin to collect the waste in the valley. On a weekly basis or depending on the usage of the area, the trash will need to be transported from Halawa Valley to the Under the Viaduct area, where a larger trash receptacle will be located. The City and County's Refuse Division only collects trash for households, so the refuse will have to be disposed of by other means.

### 3.5.1 *Option 1*

A trash receptacle can be provided at the Under the Viaduct area, near the administrative center. Depending on the needs and estimated trash accumulation of the Stewards, the front-end load trash receptacle can range in sizes from 2 to 8 cubic yards. If more trash volume is projected, then a roll-off container with a capacity of 10 to 40 cubic yards could alternatively be provided. If the Stewards decide to utilize a trash receptable, they

would need to coordinate with a private trash disposal company to pick-up their trash weekly or monthly for a fee.

### 3.5.2 *Cost Estimate*

Below is a rough magnitude cost estimate for the range in costs for a trash receptacle of varying capacities. The cost presented below is for the structure only; maintenance fees for coordination for trash pick-up will be the responsibility of the Stewards, if they choose to utilize a trash receptacle on their project site. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate
Under the Viaduct	Trash Receptacle (2 to 8 cubic yards)	\$200 to \$600
	Trash Receptacle (10 to 40 cubic yards)	\$500 to \$1,000

## 3.6 *Sewer Service Connection*

For restroom and other wastewater operations, alternatives for wastewater services were investigated. Wastewater services will be explored for Under the Viaduct area, as well as in Halawa Valley at Site 2137. Alternate site layouts will include structures at both locations. The wastewater and greywater can both be treated using the same system, if desired.

### 3.6.1 *Under the Viaduct Area*

Connection to the existing sewer system will be the most desirable option for buildings that will be located underneath the H-3 viaduct area. As-builts show that there is an existing 6-inch VCP sewer lateral that runs along the fence line from an existing 8-inch VCP sewer main within Halawa Valley Street. A sewer connection permit will be required to connect to the City's sewer system. Depending on where the new sewer connection will be located, construction of a new lateral or extension of the existing sewer lateral will also require a trenching permit, for any trenching work done in the City's right-of-way, from City and County Department of Planning and Permitting (DPP).

Refer to Figure 8 for the proposed sewerline connection Under the Viaduct.

### 3.6.2 *Site 2137*

As for Site 2137, running a new sewer line along the Trailblazer Access Road to connect to the City's existing sewer system would require approximately 9,800 linear feet of new sewer piping. Cost and construction of a sewer line of this magnitude would outweigh the feasibility of this option.

An option for wastewater services at Site 2137 would be to provide a septic tank system. Per Hawaii Administrative Rules (HAR) §11-62, for an Individual Wastewater System (IWS), a septic tank and the effluent from the septic tank needs to be discharged into a

soil absorption system, sand filter, irrigation system, or another treatment unit approved by the Director of Department of Health (DOH). IWS's are allowed in flood zones, but the specific design requirements would require additional field tests and further discussions with DOH.

A septic tank is an underground, water-tight container usually made of concrete, fiberglass, or plastic. The tank allows the solids in the wastewater to settle to the bottom of the tank forming sludge, while the oil and grease float to the top forming scum. The remaining liquid effluent flows out the tank and into another treatment method. It is uncertain what DOH will dictate as acceptable because the soil is relatively impermeable, and the site is in the vicinity of Halawa Stream, but the most likely economical option for the second treatment will be a seepage pit. A seepage pit is a tank with perforated sides, or bricks stacked on top of each other, forming a cylinder. The wastewater would then percolate out of the sides and into the soil, similar to a cesspool.

The septic tank would need to be periodically pumped to clean out the sludge and scum by a licensed septic pumper. It is generally recommended the tanks be cleaned once a year.

To obtain approval for an IWS, a permit application is required to be sent to DOH Wastewater Branch. Further field investigations and discussions with DOH would be required to determine appropriate treatment methods. The IWS permit is discussed in more detail in Appendix A of this report.

### 3.6.3 *Cost Estimate*

Below is a rough magnitude cost estimate for the sewer service connection options mentioned above. The cost presented below is for the material cost and installation cost of the infrastructure only, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate
Under the Viaduct	Connection to Exist. Sewer	\$50,000
Site 2137	Connection to Exist. Sewer	\$9,000,000
	Septic Tank System	\$20,000 to \$60,000 \$200 to \$700 per septic pumping

### 3.7 *Off-Grid Toilets*

Because the cost of a septic system and sewer connection may not be feasible, off-grid toilet options were investigated. A site constraint to consider is the project site is located within the floodplain. Because of this, the bottom of the toilets/composting units should be elevated and/or flood-proofed.

Off-grid toilets would be subject to the same permitting requirements as a septic system, described in Section 3.6.2 of this report.

### 3.7.1 *Option 1*

A composting toilet is a type of toilet that treats human waste by using a natural biological process to convert human waste into a reusable end-product. This type of toilet does not require connections to septic tanks or sewer systems and is therefore ideal for off-grid areas such as national parks, camp grounds, and rural areas.

Waterless composting toilets are the most widely-used type of composting toilets since they do not require a water source. Waste is collected in a container beneath the toilet. The container contains a bulking material which mixes with the waste and oxygen, allowing bacteria to convert the material into a safe and usable liquid fertilizer. Solar panels and ventilation fans can be installed to control the odors of the compost toilets.

Manufacturers provide large capacity units with compost bins of 80 cubic feet, capable of handling 60 visits a day or 22,000 visits a year. One or two toilet units are available with prefabricated structures, which would save on construction costs. The composting bin would require approximately four feet of vertical space below the toilet.

Regular maintenance would include adding bulking material to the compost chamber and raking the compost pile. Periodic maintenance would include the cleaning of the fan and cleaning of the compost chamber approximately once a year.

### 3.7.2 *Option 2*

Portable toilets (Porta Potties) can be brought on-site and used as a short-term solution to accommodate larger groups and events. Portable toilets typically use a chemical to minimize odors and need to be pumped frequently. However, the cost for renting the portable toilets would likely outweigh the compost toilet options in the long run.

### 3.7.3 *Cost Estimate*

Below is a rough magnitude cost estimate for the off-grid toilet options mentioned above. The cost presented below is for material cost and installation cost, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate
Halawa Valley (Site 2137)	Waterless Composting Toilet (Large Capacity)	\$200,000 (Prefabricated two toilet unit including the structure) \$100,000 (Prefabricated single toilet unit including the structure)
Under the Viaduct and Halawa Valley (Site 2137)	Portable Toilets (Porta Potties)	\$200 to \$500 per day



### 3.8 *Water Service Connection*

For operations requiring water, alternatives for water services were investigated and explored for Under the Viaduct area, as well as in Halawa Valley at Site 2137.

#### 3.8.1 *Under the Viaduct Area*

Connection to the existing water system will be an alternative for buildings that will be located underneath the H-3 viaduct area. As-builts show that there is an existing 1-inch water lateral from the existing 8-inch ductile iron water main within Halawa Valley Street. The water meter is located within the sidewalk area fronting the project area parcel. A request to connect to the existing water meter will need to be sent to the Honolulu Board of Water Supply. Depending on where the new water connection will be located, construction of a new lateral or extension of the existing water lateral will require a trenching permit, for any trenching work done within the City's right-of-way, from City and County Department of Planning and Permitting (DPP).

Refer to Figure 8 for the proposed waterline connection Under the Viaduct.

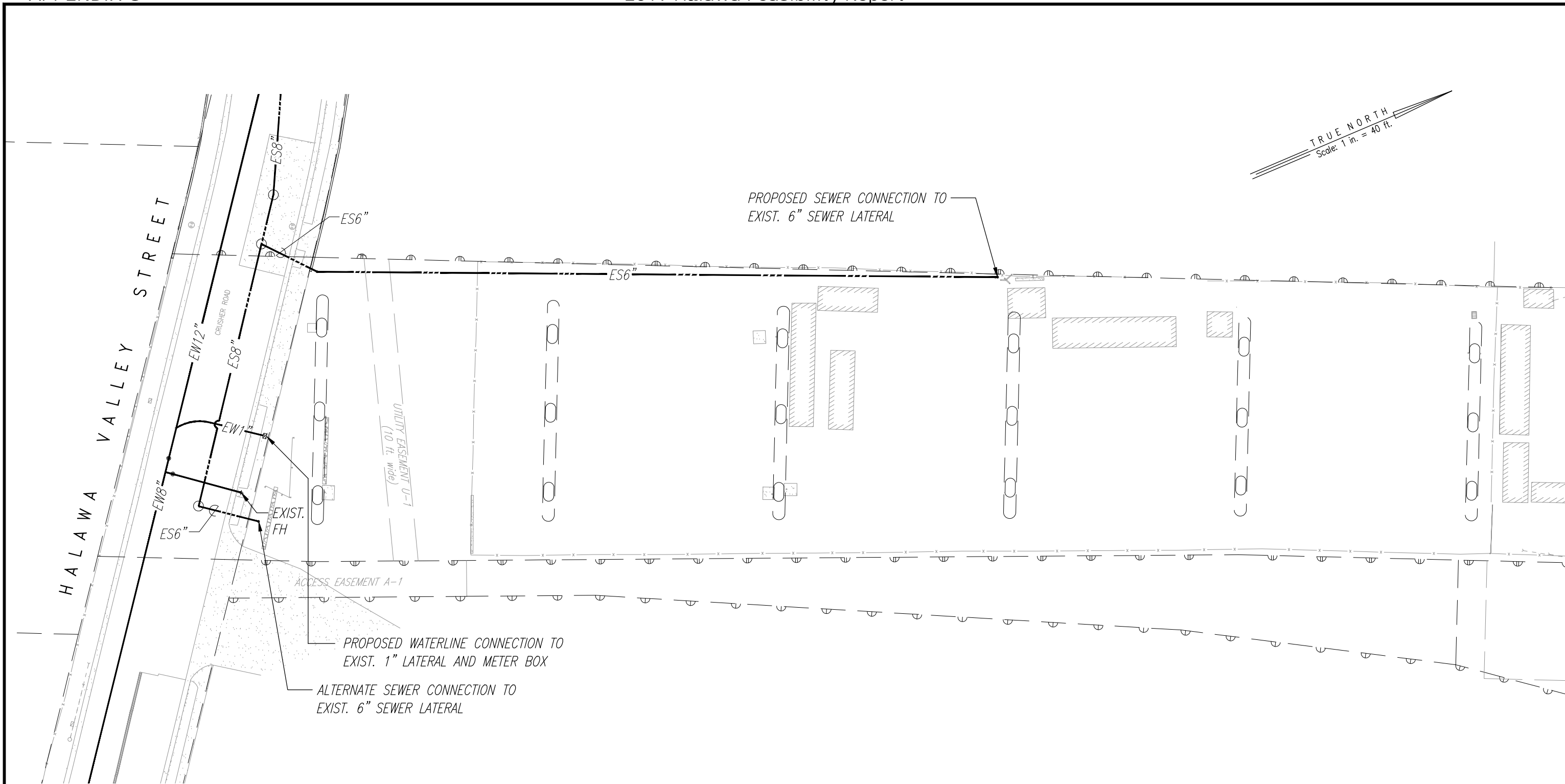
#### 3.8.2 *Site 2137*

As for Site 2137, running a new water line along the Trailblazer Access Road to connect to the City's existing water system would require approximately 9,800 linear feet of new water piping. Cost and construction of this waterline along with the required appurtenances would outweigh the feasibility of this option. Therefore, connection to the existing water system for this project area will not be a viable option and remote alternatives for water accommodations will be explored.

#### 3.8.3 *Cost Estimate*

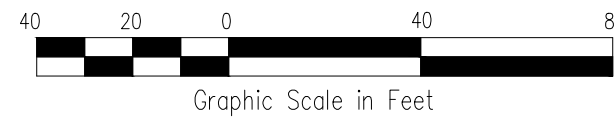
Below is a rough magnitude cost estimate for the water service connection options mentioned above. The cost presented below is for the material cost and installation cost of the infrastructure only; mobilization costs, and other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

<b>Site Location</b>	<b>Option</b>	<b>Cost Estimate</b>
Under the Viaduct	Connection to Exist. Water	\$50,000
Halawa Valley (Site 2137)	Connection to Exist. Water	\$8,000,000



**HALAWA - UNDER THE VIADUCT  
UTILITY CONNECTION**

SCALE: 1"=40'



**Community Planning and Engineering, Inc.**  
 Engineering Design | Construction Management | Infrastructure Planning  
 1286 Queen Emma Street Honolulu, Hawaii

**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

HALAWA, OAHU, HAWAII

OWNER: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION  
 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-011:002

**FIGURE 8  
HALAWA - UNDER THE VIADUCT UTILITY  
CONNECTION**

### 3.9 *Rain Catchment*

Site 2137 in Halawa Valley will have an option to utilize rain catchment from the buildings that will be located on the site. The rain water collected will be for non-potable usages such as irrigation.

Rain water collected from the structures' roofs, can be drained and collected into a water tank. The most economical type of roofing material used for water catchment is non-toxic painted or enameled galvanized steel. Elastomeric coatings can also be used over other materials, but this type of coating will need to be repainted every seven years. The gutter would be made of aluminum, PVC, or plastic. Screens would be used to keep large debris out of the catchment system. A simple first flush system, consisting of a downspout chamber collecting sediment before reaching the tanks, would be installed to reduce contamination. The tanks will be placed on concrete pads or compacted gravel.

#### 3.9.1 *Option 1*

One option for the rain catchment tank material is polyethylene. The maximum size of a polyethylene tank is 4,000 to 5,000 gallons. If more storage is needed, additional tanks can be brought to the site and the tanks can be connected with piping. Polyethylene tanks are more expensive than corrugated steel tanks, but the polyethylene tanks are likely more durable and offer more mobility and flexibility.

#### 3.9.2 *Option 2*

An alternative tank material is corrugated steel. Tank sizes ranging from 1,000 gallons to 10,000 gallons would be reasonable for this project. In terms of initial cost, a corrugated steel tank would be more economical than a polyethylene tank. However, over time, the corrugated steel tank may require more maintenance since it is more likely to corrode and leak, which would also affect the quality of the water.

#### 3.9.3 *Cost Estimate*

Below is a rough magnitude cost estimate for the rain catchment storage tank options mentioned above. The cost presented below is for material cost and installation cost of a 5,000-gallon tank, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate (for a 5,000 gallon tank)
Halawa Valley (Site 2137)	Polyethylene Water Storage Tank	\$30,000
	Corrugated Steel Water Storage Tank	\$20,000

### **3.10 Water Storage Tank**

There will be no access to a nearby waterline at Site 2137 in Halawa Valley, therefore alternatives for an on-site water storage tank were investigated. The water tank will store potable water for usages such as washing hands, shower needs, kitchen needs, and drinking water. It should be noted that wastewater treatment will have to be provided if fixtures are installed that produce wastewater.

It is recommended that green or black polyethylene tanks be used to reduce the exposure of sunlight and algae growth. Locally, polyethylene tanks have capacities of up to 5,000 gallons, however a tank that size likely wouldn't be able to be moved once installed, so potable water would have to be delivered to the site. Logistically, portable smaller capacity tanks would be simpler. Multiple tanks could be connected together if more capacity is required.

Corrugated steel tanks are also an option, but leaks and corrosion may become an issue, which would lead to the water becoming non-potable.

#### **3.10.1 Option 1**

It is assumed that pressurized water lines would be desired on-site. This can be achieved by installing a booster pump. The pump could be powered by batteries and solar panels or the pump can be tied into the electrical system. The inlet end of the pump would connect to the water tank and the outlet would connect to the structures. The pump would detect the pressure in the water line and turn on/off to keep the specified pressure in the system. However, if large groups are anticipated, the pump would have to turn and off more often, which may cause excessive wear and tear over time. Also, the water pressure will be lower if multiple water fixtures are in use at the same time.

If desired by the Stewards, a pressurized well tank in addition to the booster pump can be installed for the water storage tank. Well tanks have capacities ranging from 20 gallons to over 100 gallons. The well tanks contain a diaphragm which expands and compresses, which helps keep pressure in the system. This allows the pump to cycle less frequently, extending the life of the pump, as well as providing a more stabilized pressure when multiple fixtures are in use at the same time.

#### **3.10.2 Option 2**

If having a pressurized water system is not a priority, a gravity fed water storage tank can service the Halawa Valley area. Due to the topography of the site, a water tank could be elevated ten feet above the ground and the water could be accessed by a valve on the tank or installing piping. However, the piping would produce a water pressure of approximately 4 psi which would not be sufficient for most uses. By comparison, the Board of Water Supply requires a minimum pressure of 40 psi in pipelines.

### 3.10.3 Cost Estimate

Below is a rough magnitude cost estimate for the water storage tank options mentioned above. The cost presented below is for material cost and installation cost of a 1,000-gallon tank structure and appurtenances, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

Site Location	Option	Cost Estimate (for a 1,000 gallon tank)
Halawa Valley (Site 2137)	Water Storage Tank w/ Booster Pump	\$22,000
	Water Storage Tank w/ Booster Pump and Well Tank	\$25,000
	Gravity Fed Water Storage Tank	\$16,000

## 3.11 Electrical Service through Grid Power

Both project areas are planning to have a structure on-site and will mostly likely require electrical power for operations. With the proposed layout of the Under the Viaduct area, electrical demands are estimated to require a total connected load of approximately 60 amps, or 130 amps if structure will accommodate air conditioning. At Site 2137, the estimated electrical demands will require a total connected load of approximately 40 amps. For these estimated electrical demand services, alternatives for electrical service through grid power were investigated and explored for Under the Viaduct area, as well as in Halawa Valley at Site 2137.

### 3.11.1 Under the Viaduct Area

An existing HECO power system is available nearby the Under the Viaduct area. The site is adjacent to asphalt and cement facilities that are likely connected to the grid, but the exact point of connection and cost is pending further HECO coordination. Approximate distance for connection is expected to be between 50 and 1000 feet. Exterior pole-mounted lights, for Under the Viaduct area, is recommended to provide a measure of safety and security around the parking lot(s). An estimated number of light poles required for the site is 7 light poles to be installed and spaced evenly throughout the site.

In addition, with grid power connection, an option for security cameras (CCTV) can be installed around the Under the Viaduct site. The cameras will be able to feed video recordings to a TV screen in a security office in the administration building.

### 3.11.2 Site 2137

An existing HECO power system is not available nearby Site 2137. Therefore, providing electrical service through grid power would require new electrical poles to be installed roughly 7,500 feet to the nearest point of connection, through the mountains. Installing an excess number of electrical poles and wiring will outweigh the feasibility

of this option and this will not be a viable option for this project area and remote alternatives for electrical power accommodations will be explored.

### 3.11.3 *Cost Estimate*

Below is a rough magnitude cost estimate for providing electrical services through grid power. The cost presented below is for material cost and installation cost to provide connection to the existing HECO power system, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change, pending further coordination with HECO at the time of construction.

Site Location	Option	Cost Estimate
Under the Viaduct	Grid Power	\$100,000*
	w/ Site Lighting	\$45,000 (Additional)
	w/ CCTV system	\$25,000 (Additional)
Halawa Valley (Site 2137)	Grid power	Not Feasible

\*Subject to change pending HECO coordination.

## 3.12 *Electrical Service through Renewable Power*

Due to the potential of high costs to provide electricity through grid power, an alternate option of renewable power was explored for both project sites.

### 3.12.1 *Under the Viaduct*

The area Under the Viaduct is not well situated for renewable power. The H-3 Viaduct above the site blocks sunlight and prevents wind turbines from being mounted high enough to harness the stronger winds. Pursuing renewable energy sources at this site is not recommended.

### 3.12.2 *Site 2137*

Site 2137 does not have excessive tree cover, allowing for the possibility of utilizing solar or wind power to offset grid power costs or forego connecting to the grid entirely.

Building roofs at the site or an open clearing away from trees or the H-3 viaduct could be used for mounting a solar photovoltaic (PV) system of up to approximately 5kW. Installation costs are approximately \$4 per watt. Installation of a 5kW system would cost roughly \$20,000, providing approximately 6,000 kWh per year. In addition, exterior pole-mounted lights are recommended, for Site 2137, to provide a measure of safety and security along the driveway and parking lot. To reduce site power usage and trenching costs, it is recommended to use solar PV powered light poles. A set of 7 poles would be provided throughout the site, at a cost of \$6,000 per pole.

Wind power is also an option in this area, however it is expected that Halawa Valley has slower wind speeds, which may be suboptimal for wind power generation. If desired, one or more wind turbines could be installed on towers to reach above the tree

line. Additionally, it is unknown at this time if the Department of Transportation would raise concerns with a 30 foot or taller wind turbine being erected next to the H-3 Viaduct. A 2.5 kW wind turbine system would cost roughly \$20,000, and be expected to generate approximately 4,500 kWh per year. These figures are subject to change, pending further coordination with DOT and with a local wind turbine installer.

An alternate for solar and wind power generation at Site 2137 would be utilizing a generator on-site to provide electrical power. A generator could be provided as a back-up for the solar or wind power generation options or be a stand-alone option. Sizing of the generator will vary depending on the estimated use on-site.

Due to the high cost of connecting this remote site to the power grid, it is recommended to add a battery storage system in addition to all the options mentioned above. Cost for a 27 kWh battery system, including installation, is approximately \$20,000.

### 3.12.3 *Cost Estimate*

Below is a rough magnitude cost estimate for providing electrical services through renewable power generation. The cost presented below is for material cost and installation cost of the renewable power system, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change, at the time of construction.

Site Location	Option	Cost Estimate
Under the Viaduct	Renewable Power	Not Recommended
Site 2137*	Solar PV System	\$20,000
	w/ Site Lighting	\$42,00 (Additional)
	Wind Power	\$20,000
	Generator	\$50,000

\*Battery storage is recommended in addition to the options (\$20,000)

## 3.13 *Telephone, Internet and Cable Television Service*

Options for telephone, internet, and cable television services were also looked in to for usage at both site locations, Under the Viaduct and Site 2137.

### 3.13.1 *Option 1*

Spectrum (formerly Oceanic Time Warner Cable, providing telephone, internet, and cable TV) service is available for both sites, although it will require installing additional utility poles.

For Under the Viaduct area, Spectrum service is available from approximately 1,000 feet mauka, along the H-3. Rough cost for Spectrum service is \$35,000; rough cost to install supporting utility poles is \$6,000 per pole, or \$30,000 for 5 that would be anticipated.

For Site 2137, Spectrum service would be available via connection from Under the Viaduct area. For the service to reach the site, it will require overhead pole lines to be installed, approximately 7,500 feet in length. Rough cost for Spectrum service is \$135,000, which would run on the same poles installed by HECO.

### **3.13.2 Option 2**

Hawaiian Telcom (providing telephone and internet) service is also available for both sites, although the nearest point of connection is pending further Hawaiian Telcom coordination and consultation.

For Under the Viaduct area, depending on the connection point for Hawaiian Telcom service, a rough cost for the service is \$15,000 and a rough cost to install supporting utility poles is \$6,000 per pole, or \$30,000 for 5 that would be anticipated in worst case.

For Site 2137, Hawaiian Telcom service would be available via connection from Under the Viaduct area and will require overhead infrastructure to be installed. Rough cost for Hawaiian Telcom service is \$75,000, which would run on the same poles installed by HECO.

### **3.13.3 Option 3**

Viasat (providing internet) service via satellite signal is not recommended for Under the Viaduct, as the H-3 Viaduct will block satellite signals and since cable utility service is available within 1000 feet.

Although, Viasat is an available option for Site 2137 for satellite internet service, with an installation cost of \$100, and \$175 per month for service. Business service package includes unlimited data (though it slows after 75GB in a month), 35MB/second download speed, and 4MB/second upload speed. Satellite TV from Viasat is also an available option if desired, with an install cost of \$100 to \$300, and service cost of roughly \$80/month.

Based on installation costs, Viasat is the recommended alternative for providing satellite internet service for Site 2137. Internet speeds are slower than a cable connection, but still acceptably fast for video streaming.

### **3.13.4 Cost Estimate**

The table on the following page, shows a rough magnitude cost estimate for providing telephone, internet, and cable television services. The cost presented on the following page is for the installation of the respective service, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change, pending further coordination with the service companies at the time of construction.



Site Location	Option	Cost Estimate
Under the Viaduct	Spectrum	\$65,000
	Hawaiian Telcom	\$45,000
	Viasat	Not Recommended
Halawa Valley (Site 2137)	Spectrum	\$135,000
	Hawaiian Telcom	\$75,000
	Viasat	\$300 + \$80 per month (TV) \$100 + \$175 per month (Internet)

### 3.14 Gas Service

For operations requiring gas, alternatives for gas services were investigated.

Based on preliminary site investigations, there are no known gas lines in the area near the viaduct area and Site 2137. Therefore, to provide gas services for the Stewards, a gas tank would need to be present on-site. The gas tank would need to be refilled and maintained when required.

A gas tank can be installed Under the Viaduct and in Halawa Valley. However, because Halawa Valley is in a flood zone, if a tank were to be installed at Site 2137, the tank will need to be flood-proofed. Generally, flood-proofing involves strapping and anchoring the tank to a concrete base to ensure the tank doesn't float away.

#### 3.14.1 Option 1

A permanent large capacity gas tank can be installed at either or both locations. Because of its size and potential danger, more restrictions and requirements are needed for large capacity tanks than the smaller tanks. A separate entity, such as Hawaii Gas, would also have to refill the tanks on-site since the tanks would not be portable. This option would likely cost more but would be the easiest for user maintenance. The cost for refilling a tank at Site 2137 may also be higher than refilling a tank Under the Viaduct.

A Honolulu Fire Department (HFD) Permit for Tank Installation would have to be obtained for tanks with capacities of more than 60 gallons.

#### 3.14.2 Option 2

If the demand of the gas tank usage is low, an alternate option would be portable propane gas tanks. These portable tanks could also be used to provide gas to the site. The maximum portable size would be a 100-pound (23.6 gallon) tank, which is approximately 4-feet tall and 1.5-feet in diameter, however multiple tanks can be placed on-site if more capacity is needed. The placement and regulations of the portable tanks are much less restrictive than the large gas tanks. The portability of the tanks would allow the Stewards to refill the tanks at local hardware stores.

### 3.14.3 Cost Estimate

Below is a rough magnitude cost estimate for providing gas services via propane gas tank options. The cost presented below is for material cost and installation cost to provide a propane gas tank on-site, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change, at the time of construction.

Site Location	Option	Cost Estimate
Under the Viaduct and Halawa Valley (Site 2137)	Large Capacity Permanent Propane Gas Tank	\$7,000
	Small Capacity Portable Propane Gas Tank	\$4,000

## 3.15 Nursery

A nursery would consist of a propagation area to grow Native Hawaiian plants, which could be used for landscaping, food, medicine, utilitarian objects, education, and other uses.

### 3.15.1 Under the Viaduct

A plant nursery requires a good amount of direct sunlight, room to grow and an abundant source of water. A water source Under the Viaduct can likely be provided but the site would lack direct sunlight. Artificial lighting is very costly to purchase, operate and maintain and may not be a viable option. Observations of existing plantings Under the Viaduct shows that plants do not perform well. Placing a nursery in this area would not be an economically viable ideal and therefore not recommended.

### 3.15.2 Site 2137

A nursery is also not recommended for Site 2137. In addition to the need for sunlight, a nursery would require a flat area, which would likely be located adjacent to the freeway. Unfortunately, the freeway would block direct sunlight to the nursery for a portion of the day. It is also expected that water will be limited in its availability at Site 2137. The existing landscaped areas could be expanded to accommodate a limited quantity of plant material however, given the amount of available water, manpower, and space, a nursery would not be economically viable for this area as well.

## 3.16 Landscaping

Landscaping would provide privacy and improve the aesthetics for the Halawa sites. It could also help with the maintenance by acting as a dust screen or weed barrier.

### 3.16.1 Under the Viaduct

The landscape scope for the Under the Viaduct area is to plant screening trees on both sides of the freeway bay to block the view of the adjacent properties and filter the dust that blows into the site. Landscape planting directly under the freeway should be minimized because plantings directly under a freeway typically will not grow well due

to existing site conditions. The constant shade and dust will subject the plant material to stress, which is ideal for infestation of aphids, etc.

The plants considered for this dust screen planting along the existing chain link fence will be palm trees since they do grow naturally in the understory of large shade trees and can tolerate some shade. Assuming water and electricity is provided to the site, irrigation can be provided with an automatic conventional irrigation system with a 120-volt automatic irrigation controller.

### **3.16.2 Site 2137**

The proposed landscape design for Site 2137 would develop a sustainable gathering space(s) that is usable, mud free and relatively weed free. Gathering spaces on the site can be identified and cleared of weeds. Then, a layer of gravel over a weed barrier could be placed to raise the ground above the mud and keep the weeds to a manageable level. The gravel/weed barrier will let air and water pass through and protect any archaeological items beneath. The landscape scope for this project area is to plant a hedge along the front of the site along the access road. A native tree will be planted at the entry point to identify the entry.

### **3.16.3 Cost Estimate**

Below is a rough magnitude cost estimate for landscaping for both project areas. The cost presented below is for the material and planting of the vegetation, any other additional costs will be taken into consideration when developing a feasible site layout for the project area. The cost is subject to change at the time of construction.

<b>Site Location</b>	<b>Option</b>	<b>Cost Estimate</b>
Under the Viaduct	Landscaping	\$50,000
Halawa Valley (Site 2137)	Landscaping	\$15,000

## *Section 4 Feasible Project Alternatives*

Feasible project alternatives for both Under the Viaduct area and Site 2137 were developed, to include select project elements based on input from the stakeholders. The feasibility of each alternative presented below is based off of budgetary constraints, construction/mobility factors, and the capacity of management for the Stewards. The alternative site layouts are suggestive and can be altered to include or not include certain project elements.

### *4.1 Under the Viaduct Area*

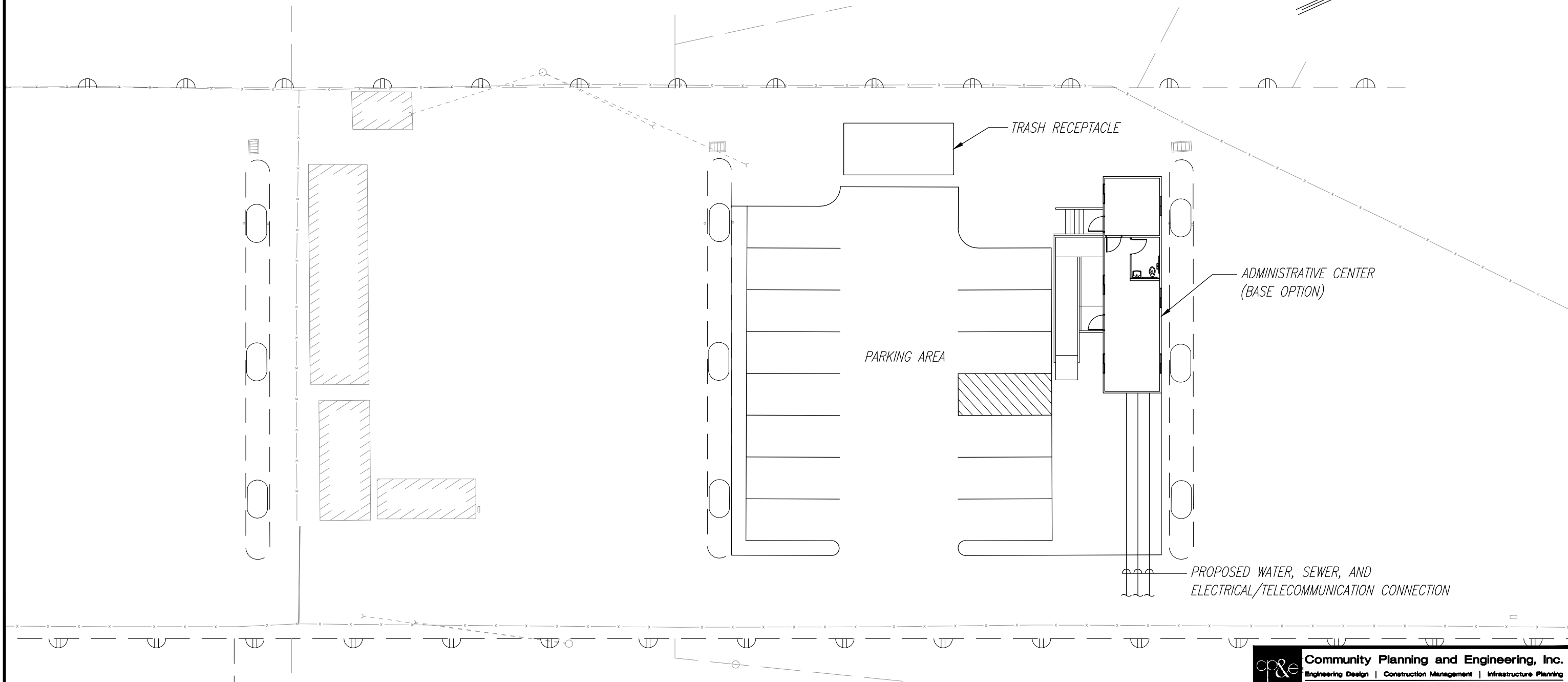
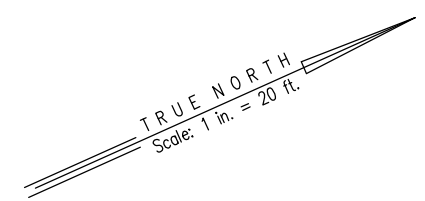
The Under the Viaduct area compasses the eight (8) bays underneath the Interstate H-3, located off of Halawa Valley Street near the entrance of Hawaiian Cement. This area has been previously disturbed, with a majority of the surface area being impervious with asphalt pavement. Utilizing this area will provide the Stewards access to utilities such as electricity, sewer, and water services.

#### *4.1.1 Alternative 1*

This site layout is aimed to provide the bare essential needs of the Stewards Under the Viaduct area. The layout will include the following project elements: a modular building (inclusive of administrative office, a meeting space, and restroom facility), trash receptacles, and parking. In addition, the modular building set-up would require connection to existing utilities for electrical, telecommunication, sewer, and water services. Being that the option for utility services would require off-grid alternatives for Site 2137, this alternative will allow the Stewards to utilize and easily access these services Under the Viaduct. This site layout will also provide the Stewards and visitors a common area to meet before heading up valley to Site 2137. This area would provide parking for visitors and the option to carpool to minimize the traffic flow heading into Halawa Valley. See the table below for a breakdown of the estimated cost. Incidental construction cost will include factors, such as, but not limited to, construction management, archaeological monitoring, geotechnical monitoring, construction surveying, and mobilization.

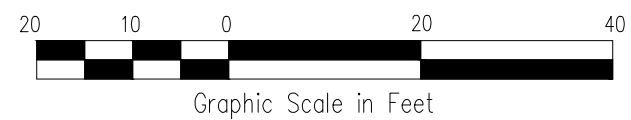
<b>Project Element</b>	<b>Cost</b>
Modular Building	\$460,000
Parking (Striping)	\$2,000
Trash Receptacles (8 cubic yard Dumpster Only)	\$600
Sewer Service Connection	\$50,000
Water Service Connection	\$50,000
Electricity Service Connection	\$100,000
Telecommunication Service Connection	\$65,000
Incidental Construction Cost	\$315,000
<b>Estimated Total Cost</b>	<b>\$1,042,600</b>

Refer to Figure 9 for site plan Alternative 1 for Under the Viaduct area.



**HALAWA - UNDER THE VIADUCT  
SITE PLAN ALTERNATIVE 1**

SCALE: 1"=20'



**Community Planning and Engineering, Inc.**  
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 1286 Queen Emma Street Honolulu, Hawaii

**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

HALAWA, OAHU, HAWAII

OWNER: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION  
 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-010:010

**FIGURE 9  
HALAWA - UNDER THE VIADUCT  
SITE PLAN ALTERNATIVE 1**

## 4.2 *Halawa Valley (Site 2137)*

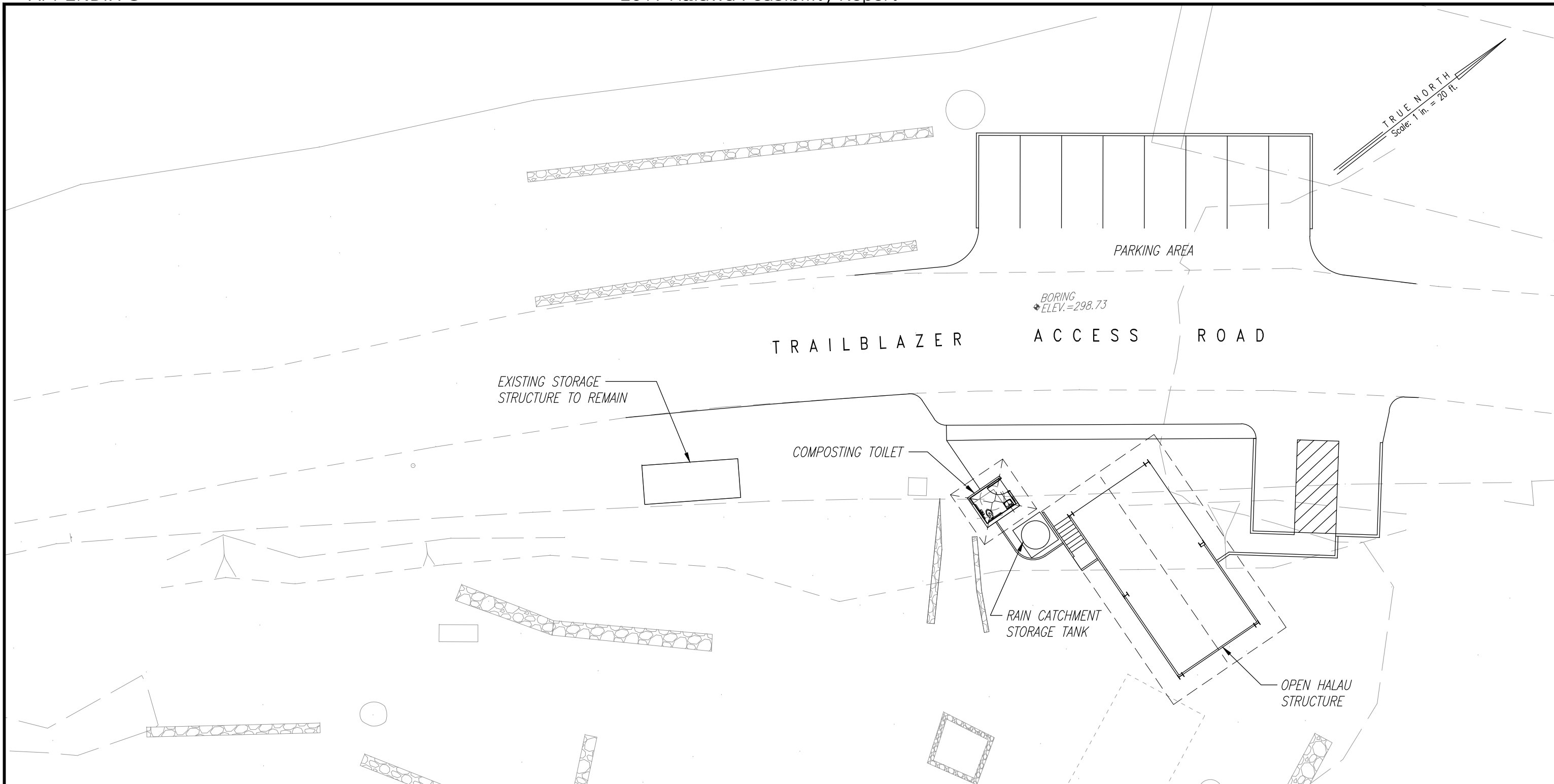
Halawa Valley, referred to as “Site 2137,” is located mauka of the Under the Viaduct project area along the Trailblazer Access Road. This area has been minimally disturbed and is covered with natural vegetation. The project site is in a remote area, where access to existing utilities would be infeasible, leaving the only consideration being off-grid measures. All structures for Site 2137 will be positioned closely to the roadway to preserve the existing site as much as possible.

### 4.2.1 *Alternative 1*

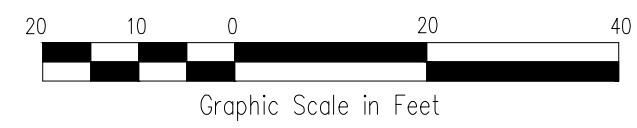
This alternative site layout is aimed to provide the bare essential needs of the Stewards up in the valley at Site 2137. Alternative 1 will include the following project elements: an open structure halau, rain catchment, composting toilet, and parking. This alternative will provide an open structure halau, which would be a more permanent structure than the current set-up of the ez-corner tents. Although this structure would not have provisions to be secured, it would provide a covered and stable area to meet under. A rain catch storage tank would be provided near the halau to collect rain water from the roof area and store the water for non-potable uses. Also, a single composting toilet will be provided for the Stewards and visitor use while up at the site. In addition, a designated parking area would be provided off the access road. This alternative will provide the Stewards with more permanent structures than what is currently on-site while also managing a budget to implement such elements. Refer to the table below for a breakdown of the estimate cost for Alternative 1. Incidental construction cost will include factors, such as, but not limited to, construction management, archaeological monitoring, geotechnical monitoring, construction surveying, and mobilization.

<b>Project Element</b>	<b>Cost</b>
Open Structure Halau	\$360,000
Rain Catchment Storage Tank (5,000 gallon)	\$30,000
Composting Toilet (Single)	\$100,000
Parking (Gravel)	\$10,000
Incidental Construction Cost	\$220,000
<b>Estimated Total Cost</b>	<b>\$720,000</b>

Refer to Figure 10 for site plan Alternative 1 for Site 2137.



**HALAWA - SITE 2137**  
**SITE PLAN ALTERNATIVE 1**  
 SCALE: 1"=20'



**Community Planning and Engineering, Inc.**  
 Engineering Design | Construction Management | Infrastructure Planning  
 1286 Queen Emma Street Honolulu, Hawaii

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**  
 HALAWA, OAHU, HAWAII  
 OWNER: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION  
 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-011:002

**FIGURE 10**  
**HALAWA - SITE 2137**  
**SITE PLAN ALTERNATIVE 1**

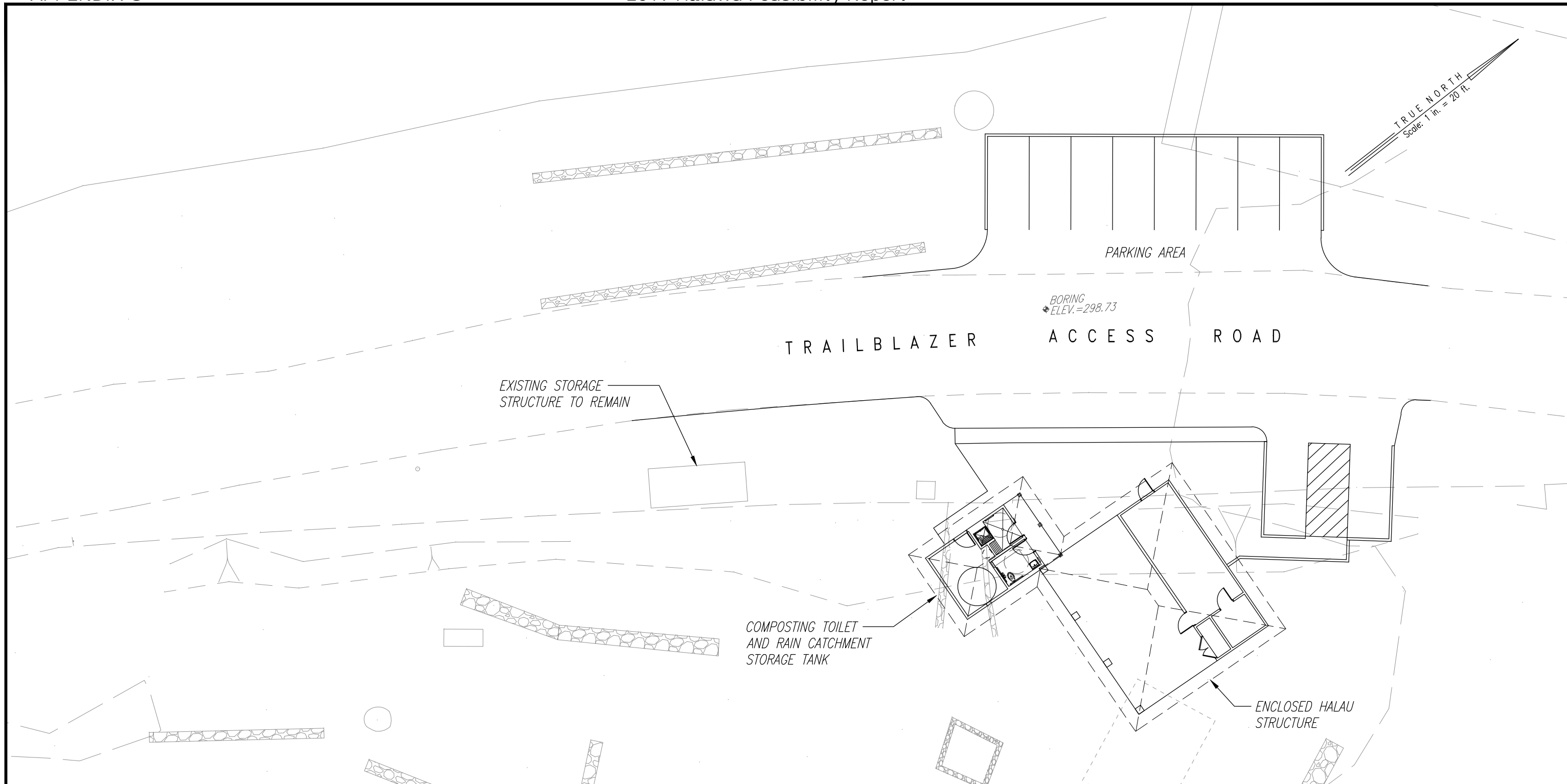
#### 4.2.2 *Alternative 2*

This alternative site layout will provide something more complex than the previous alternative, but still restraining from a few project elements. Alternative 2 will include the following project elements: an enclosed halau structure, composting toilet, rain catchment storage tank, and parking. The enclosed halau structure would provide a meeting area, as well as provisions for the structure to store items overnight and be secured. As part of the halau structure, double composting toilets would be provided. Also, this alternative will provide a rain catchment storage tank to collect rain water from the roof and store the water for non-potable uses. Alternative 2 is looking to provide the Stewards with project elements that would provide more functionality than Alternative 1, while keeping the budgetary cost in mind. Refer to the table below for a breakdown of the estimate cost for Alternative 2. Incidental construction cost will include factors, such as, but not limited to, construction management, archaeological monitoring, geotechnical monitoring, construction surveying, and mobilization.

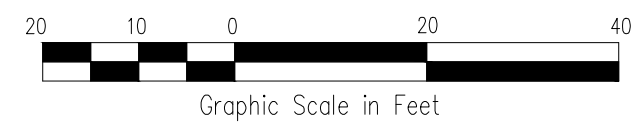
<b>Project Element</b>	<b>Cost</b>
Enclosed Halau Structure	\$625,000
Composting Toilet (Double)	\$200,000
Rain Catchment Storage Tank (5,000 gallon)	\$30,000
Parking (Gravel)	\$10,000
Incidental Construction Cost	\$372,000
<b>Estimated Total Cost</b>	<b>\$1,237,000</b>

Refer to Figure 11 for site plan Alternative 2 for Site 2137.





**HALAWA - SITE 2137**  
**SITE PLAN ALTERNATIVE 2**  
 SCALE: 1"=20'



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HALAWA, OAHU, HAWAII

OWNER: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION  
 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-011:002

**FIGURE 11**  
**HALAWA - SITE 2137**  
**SITE PLAN ALTERNATIVE 2**

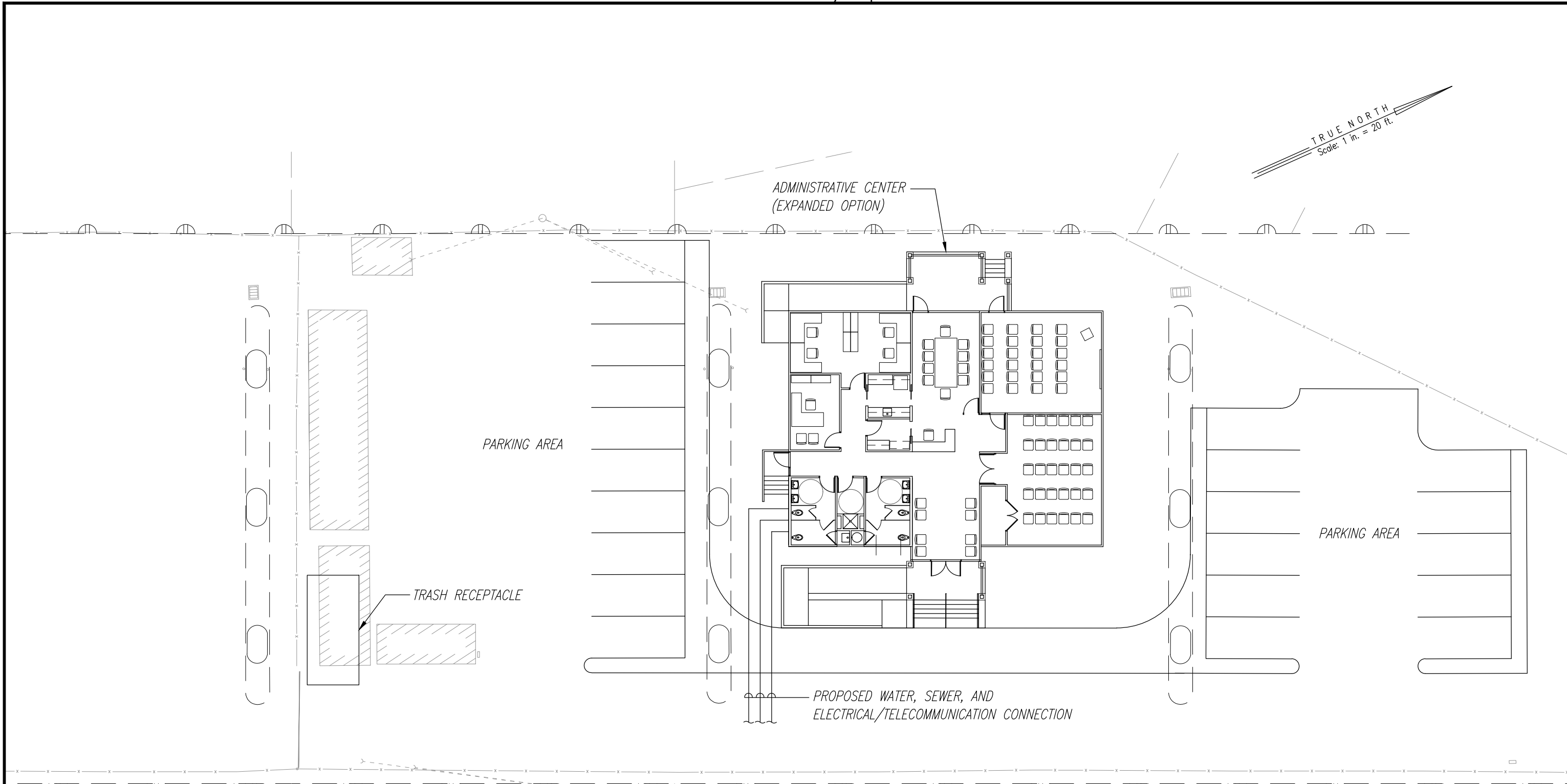
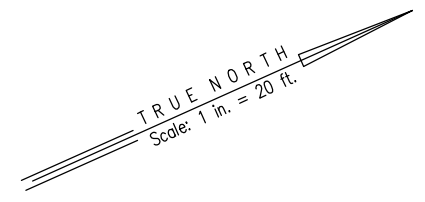
## *Section 5 Future Growth Projections*

As the Stewards works towards their goals and visions for the North Halawa Valley area, they will concurrently need to look at future expansion of their working area. Looking towards the future growth projections of the working group, an overall site layout was developed for Under the Viaduct area, as well as Site 2137. These site layouts would be inclusive of all the project elements discussed in the previous section. The site layouts presented are only conceptual and will be subject to further coordination and consultation.

For Under the Viaduct area, the overall site layout would include the following project elements: a modular building (inclusive of a large administrative office working space, educational classrooms, a lobby area, and a restroom facility with showers), trash receptacles, and parking. In addition, this modular building on-site would have connections to existing utilities for electrical, sewer, and water services. The overall site layout would provide a large enclosed area and sufficient space to have multi-purpose uses for educational classes, meeting areas, and office spaces. The modular building would also provide sufficient space for a restroom and shower facility for the Stewards and visitors to use and wash off after spending time up valley. Refer to the table below for a breakdown of the estimate cost for the overall site layout for the Under the Viaduct area. Incidental construction cost will include factors, such as, but not limited to, construction management, archaeological monitoring, geotechnical monitoring, construction surveying, and mobilization.

<b>Project Element</b>	<b>Cost</b>
Modular Building	\$1,200,000
Parking (Striping)	\$2,000
Trash Receptacles (8 cubic yard Dumpster Only)	\$600
Sewer Service Connection	\$50,000
Water Service Connection	\$50,000
Electricity Service Connection	\$100,000
Telecommunication Service Connection	\$65,000
Incidental Construction Cost	\$624,000
<b>Estimated Total Cost</b>	<b>\$2,091,600</b>

Refer to Figure 12 for the overall site layout for Under the Viaduct area.



**HALAWA - UNDER THE VIADUCT  
ULTIMATE SITE LAYOUT**

SCALE: 1"=20'



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**HALAWA-LULUKU INTERPRETIVE  
DEVELOPMENT PROJECT**

HALAWA, OAHU, HAWAII

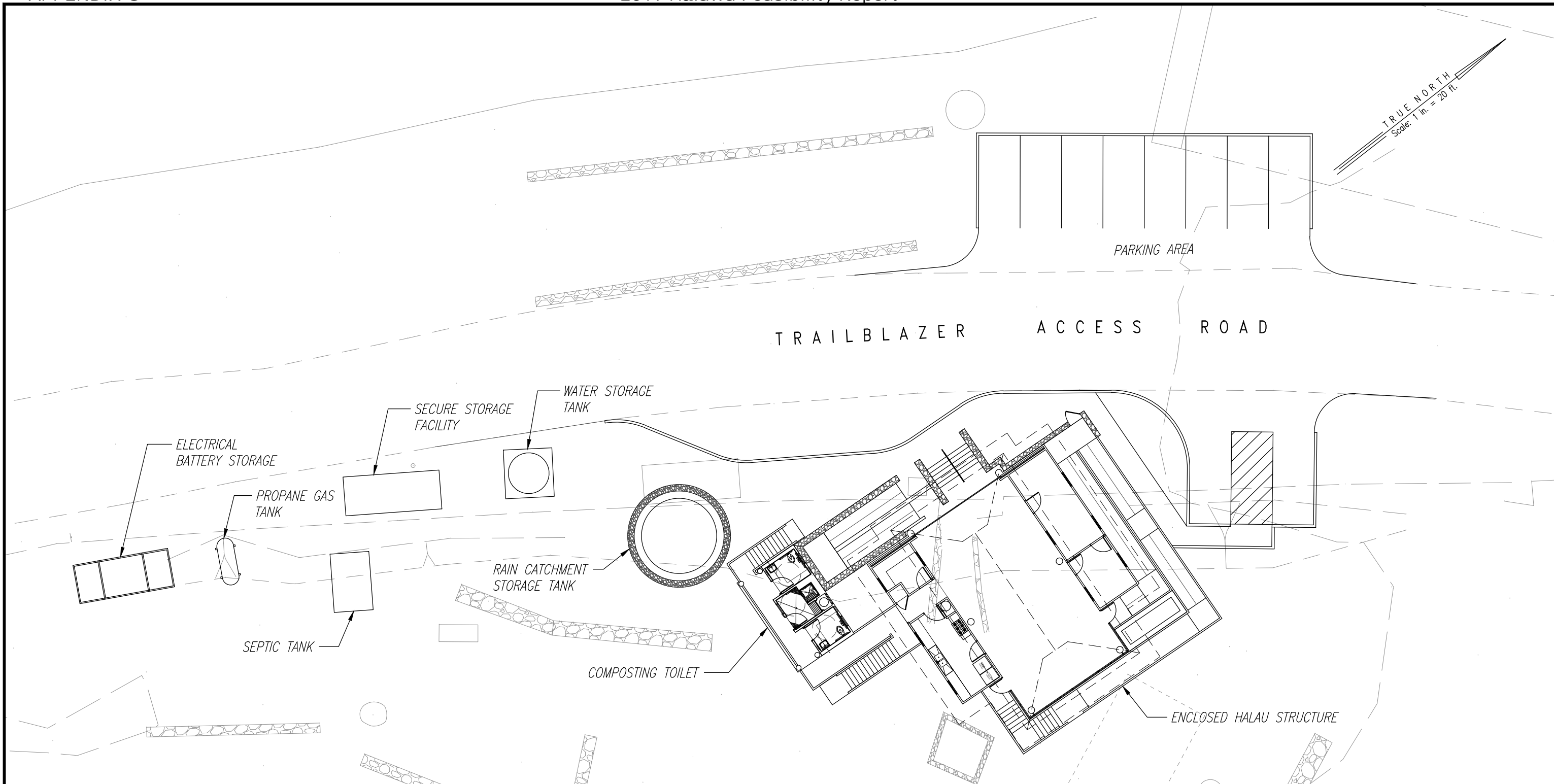
OWNER: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION  
 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-010:010

**FIGURE 12  
HALAWA - UNDER THE VIADUCT  
ULTIMATE SITE LAYOUT**

For Site 2137, the overall site layout would include the following project elements: an enclosure halau structure (inclusive of meeting area, office space, kitchen area, and storage), a secured storage facility, composting toilet, rain catchment storage tank, water storage tank, electricity through solar panels, and parking. This overall site layout would encompass a majority of the project elements into one common area with the halau structure. Looking into future projected growth with the Stewards, a site layout of this magnitude may be required to support the needs and functionality of the Stewards. Refer to the table below for a breakdown of the estimate cost for the overall site layout for Site 2137. Incidental construction cost will include factors, such as, but not limited to, construction management, archaeological monitoring, geotechnical monitoring, construction surveying, and mobilization.

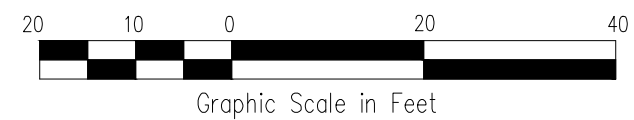
<b>Project Element</b>	<b>Cost</b>
Enclosed Halau Structure	\$1,700,000
Secured Storage Facility with Lighting	\$500,000
Composting Toilet (Double)	\$200,000
Rain Catchment Storage Tank	\$30,000
Water Storage Tank (w/booster pump and well tank)	\$25,000
Electricity (Solar PV System with Site Lighting and Battery Storage)	\$82,000
Septic Tank System	\$60,000
Parking (Gravel)	\$10,000
Incidental Construction Cost	\$1,100,000
<b>Estimated Total Cost</b>	<b>\$3,707,000</b>

Refer to Figure 13 for the overall site layout for Site 2137.



**HALAWA - SITE 2137  
ULTIMATE SITE LAYOUT**

SCALE: 1"=20'



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 1286 Queen Emma Street Honolulu, Hawaii

**HALAWA-LULUKU INTERPRETIVE DEVELOPMENT PROJECT**

HALAWA, OAHU, HAWAII

OWNER: STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION  
 DEVELOPER: OFFICE OF HAWAIIAN AFFAIRS  
 TAX MAP KEY: 9-9-011:002

**FIGURE 13  
HALAWA - SITE 2137  
ULTIMATE SITE LAYOUT**

## *Section 6 Summary*

The Halawa-Lulukū Interpretive Development Project was set out to initiate the mitigation process of the impacts to cultural and archaeological resources cause by the construction of the Interstate H-3. Through this feasibility report, various project elements were explored to determine the feasibility of incorporating such elements within the North Halawa Valley project area. The project elements and site layout alternatives presented in this report were aimed to assist the working community group (Stewards) with their vision for the North Halawa Valley project area. Through the exploration of the project elements and site layout alternatives for the project area, in addition to consultation with the stakeholders, a recommended site layout alternative was chosen. The recommended alternative was based on budgetary constraints, construction/mobility factors, and the capacity of management for the Stewards.

For the North Halawa Valley project area, the recommended alternative is summarized in the following table along with cost estimates:

<b>North Halawa Valley (Site 2137)</b>	
<b>Project Element</b>	<b>Cost</b>
Open Structure Halau	\$360,000
Rain Catchment Storage Tank (5,000 gallon)	\$30,000
Composting Toilet (Single)	\$100,000
Parking (Gravel)	\$10,000
Incidental Construction Cost	\$220,000
<b>Estimated Total Cost</b>	<b>\$720,000</b>

For the purposes of this planning report, the alternative presented above will be the recommended alternative moving forward into the design phase of this HLID project for the North Halawa Valley project area. The estimated cost for the recommended alternative is a rough budgetary estimate and is subject to change. During the design phase, collaboration and coordination will be required between the design team and Stewards to develop a viable final design. Due to budgetary cost restraints and possible unforeseen conditions during design and construction, certain elements of the recommended site layout may be changed or altered.

## *Section 7 References*

1. Halawa-Luluku Interpretive Development Team, Office of Hawaiian Affairs, 2014. *PROJECT DESCRIPTIONS: North Halawa Valley and Luluku Project Areas.*
2. HAR §11-50. Food Safety Code, Department of Health (2017).
3. HAR §11-62. Wastewater Systems, Department of Health (2016).
4. Hawaii State Department of Health, Wastewater Branch, 2009. *Guidelines for the Resuse of Gray Water.*
5. Keala Pono Archaeological Consulting, LLC, 2015. *FINAL – Archaeological Condition Assessment Plan for Selected Sites along the Interstate H-3 Highway Corridor; Halawa Ahupua`a and Luluku (Kane`ohe Ahupua`a), `Ewa and Ko`olaupoko Districts, Island of O`ahu, Hawai`i.*
6. Maccomber, Patricia S.H., 2010. *Guidelines on Rainwater Catchment Systems of Hawaii.*
7. City and County of Honolulu, Department of Planning and Permitting, 2017. *Storm Water BMP Guide for New and Redevelopment.*
8. Water Resources Research Center and Engineering Solutions, Inc., 2008. *Onsite Wastewater Treatment Survey and Assessment.*

## ***Appendix A – Permitting***

There will be several Federal, State, and City and County of Honolulu permits and approvals that will need to be obtained to complete the project. The permits and approvals listed below may be required for the proposed project. Further consultation with the permitting agencies will be done in the design phase to determine if the permit/approval is required based on the chosen site layout and project elements. It is assumed that the nearby streams would not be altered. However, if the streams are altered, additional federal and local permits would be required.

### ***State of Hawaii Permitting***

#### ***Department of Health, Compliance Branch***

The DOH Compliance Assistance Branch does not have permitting requirements but provides guidance to which agency within DOH should be consulted based on the scope of the proposed work.

#### ***Department of Health, Clean Water Branch***

##### ***National Pollutant Discharge Elimination System (NPDES)***

The DOH CWB has a responsibility to protect Hawaii's coastal and inland water resources. An NPDES permit from the CWB is required before any discharge of flow is released into State waters. Either a general or individual NPDES permit may be required for the discharge of dewatering effluent, stormwater, or wastewater. A Notice of Intent (NOI) must be submitted to the CWB a response shall be received within thirty days.

##### ***Section 401 Water Quality Certification (WQC)***

The DOH CWB is authorized under Section 401 of the Federal Clean Water Act to administer the Section 401 WQC program in Hawaii. A WQC is required to apply for a Federal license or permit to conduct any activity including but not limited to the construction or operation of facilities which may result in any discharge into nearshore or inland waters.

Some activities including maintenance, utility line activities, temporary construction, and dewatering may be granted coverage under the Blanket Section 401 WQC developed by the 2012 Department of the Army NWP file number WQC0804.

#### ***Department of Health, Wastewater Branch***

##### ***Plans Approval***

DOH Wastewater Branch is responsible for the review and approval of planning/environmental documents, wastewater project plans and specifications, final construction inspections of wastewater projects, and assisting in enforcement activities in the joint Federal-County-State Wastewater Construction Grants



Program, the State Revolving Fund Program, and for regulating wastewater systems in accordance with Administrative Rule, Chapter 11-62, entitled, “Wastewater Systems.”

***Individual Wastewater System (IWS) Permit***

A State Department of Health Individual Wastewater System permit is required to construct a new individual wastewater system. This permit involves owner, engineer, and contractor certifications/inspections, a site evaluation, percolation tests, approval of construction, site, and floor plans, approval of an operations manual, and approval of a sludge disposal plan.

***State Historic Preservation Division (SHPD)***

***Section 106***

Any federally funded projects are subject to Section 106 Protection of Historic Properties of the National Historic Preservation Act (NHPA). The NHPA requires Federal Agencies to take into account the effects of the project on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the project. The Federal Agency may also seek public comments.

***Chapter 6E-8***

Under Hawaii Revised Statutes (HRS) Chapter 6E-8 “Review of Effect of Proposed State Projects”, SHPD shall be consulted to determine its potential to effect historic property, aviation artifact, or a burial site. A written concurrence from SHPD is required prior to commencement of construction.

***Disability and Communication Access Board (DCAB)***

***Plan Review***

DCAB reviews and provides recommendations on all State and County plans and specifications for buildings, facilities, and sites, as required under Hawaii Law HRS Chapter 103-50, in order to ensure that they are designed and constructed to be accessible to persons with disabilities.

***Office of Conservation and Coastal Lands (OCCL)***

***Conservation District Use Application (CDUA)***

A Conservation District Use Permit is required for any work activities within an area designated as the conservation district. The Conservation District is established by the State Land Use Commission and includes large areas of mountain and shoreline lands, virtually all traditional Hawaiian fishponds, and most submerged offshore lands. Maps displaying the boundaries of the Conservation District are available at DLNR.

## ***Office of Environmental Quality Control (OEQC)***

### ***Environmental Assessment (EA) or Environmental Impact Statement (EIS)***

Under the State's environmental review law, activities that trigger Chapter 343, HRS are required to prepare an EA or an EIS.

## ***Department of Transportation, Highways***

### ***Lane Use / Occupancy Permit***

A HDOT Lane Use / Occupancy Permit is required if there is a need to occupy a lane for construction activities adjacent to or within the HDOT Highways right-of-way.

### ***Permit to Construct Within a State Highway***

HDOT requires permits for the routine construction projects within the state highway right-of-way. This permit includes utility service connections, minor repairs, or minor adjustment of utilities. Permit applications are reviewed by the O'ahu District Office and require two sets of construction plans (including a traffic control plan), insurance, a minimum permit fee of \$10, minimum bond of \$1,000, and two sets of plans.

## ***City and County of Honolulu Permitting***

### ***Department of Planning and Permitting***

#### ***Building Permit***

According to Revised Ordinances of Honolulu (ROH) Chapter 18, Section 18-3.1, a building permit is required for the following:

- (1) Erect, construct, enlarge, alter, repair, move, improve, remove, convert or demolish any building or structure;
- (2) Any electrical work;
- (3) Install, remove, alter, repair or replace any plumbing, fire sprinkler, gas or drainage piping work or any fixture, gas appliance, or water heating or treating equipment; or
- (4) Construct, reconstruct or improve any sidewalk, curb or driveway in any public street right-of-way

#### ***Flood Determination in General Floodplain District***

Prior to processing any development plans for approval, a request for flood determination within the project area shall be submitted to DPP. This will determine the flood hazard district requirements and may initiate a flood study to be conducted for the project site.

***Grading Permit***

Projects with grading in excess of 50 cubic yards of cut or fill, or cut or fill of more than 3 feet would require a grading permit. Construction plans would have to be submitted to DPP for review and approval.

***Grubbing Permit***

Projects requiring clearing and grubbing of the site prior to any grading work being conducted will require a grubbing permit. Construction plans would have to be submitted to DPP for review and approval.

***Sewer Connection Permit***

A Sewer Connection Application is required for projects that will increase sewage flow to the municipal sewer system. This includes new sewer connections from unsewered lots and new commercial buildings.

DOH also requires a rejected City and County of Honolulu sewer connection application before their review of IWS permits.

***Storm Water Quality***

DPP requires different levels of storm water quality measures depending on the project's area of disturbance. Prior to starting work, an Erosion and Sediment Control Plan (ESCP) will have to be developed. The ESCP is a plan to prevent and control erosion and sediment discharge from the construction site. The project sites would likely be classified under a category 3 or 4. For project in those categories, construction drawings with a Best Management Practices (BMP) site plan, BMP design details, and other drawings must be included.

The projects sites would also be considered a priority B1 or B2 under the City's Water Quality Rules. Priority B1 projects are any new development that results in 5,000 square feet or more impervious area and/or parking lots with 20 stalls or more. Priority B2 projects are new developments that results in 500 to 5,000 square feet of impervious area. The design requirements for Priority B1 projects are stricter than Priority B2 projects. The runoff for Priority B1 projects must be kept on-site as much as possible and the runoff not retained on-site must be treated. This can be done by installing infiltration basins, permeable pavement, vegetative swales, bioretention, etc. A Storm Water Quality Report (SWQR) must also be prepared by a Certified Water Pollution Plan Preparer (CWPPP) and be approved by the DPP Director. Priority B2 projects, on the other hand, are not required to retain the runoff on-site. Also, the project would only need to a Storm Water Quality Checklist (SWQC) prepared by a CWPPP to be approved by the DPP Director. An Operations Manual (O&M) Plan would have to be prepared detailing how the BMP measures will be maintained.

***Trenching Permit***

If there is trenching of any public street, sidewalk, or thoroughfare, a trenching permit will be required. Trenching may be required for sewer or water connections. An ESCP would be needed with the trenching permit. Clearances from other City departments and utility companies having underground installations would have to be obtained. Bond and insurance are also required.

***Department of Transportation Services******Street Usage Permit***

A street usage permit is required for all work performed within the City and County of Honolulu right-of-way, parking on City and County of Honolulu roadways for construction related activities, and roadway closure for construction related activities. Some construction activities may be subject to a required traffic control plan. Permit fees are required only when construction obstructs or uses metered parking spaces including on-street parking and municipal parking lots.

***Honolulu Fire Department (HFD)******Permit for Tank Installation***

A permit or license shall be obtained from the HFD's Fire Prevention Bureau to install or operate equipment in connection with the storage, handling, use, or sale of flammable or combustible liquids regulated, such as propane, for tanks with capacities of over 60 gallons.

## *Appendix B – Agency Responses*



2019 Halawa Feasibility Report
DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET \* HONOLULU, HAWAII 96813
Phone: (808) 768-8209 \* Fax: (808) 768-4210

SEWER CONNECTION APPLICATION

APPLICATION NO.: 2019/SCA-0109

STATUS: Approved

\$15,878.40

DATE RECEIVED: 01/16/2019

IWDP APP. NO.:

Estimated Wastewater System Facility Charge\*

PROJECT NAME: 2019/SCA-0109 Hawala-Luluku Interpretive Development Project

LOCATION:

Table with 4 columns: Zone, Section, Plat, Parcel. Values: 4, 5, 041, 009

8,799,120 Sq. Ft.

SPECIFIC LOCATION: 99-1100 Halawa Valley Street

APPLICANT: Camacho, Frank
1286 Queen Emma Street
Honolulu, Hawaii 96813

DEVELOPMENT TYPE: Schools (other)

SEWER CONNECTION WORK DESIRED:

OTHER USES: Administrative Building
Tours with 100 Students
2 Employees

NON-RESIDENTIAL AREA: s.f.

APPROXIMATE DATE OF CONNECTION: 03/31/2020

PROPOSED UNITS

EXISTING UNITS

UNITS TO BE DEMOLISHED

No. of New Units: 0

No. of Existing Units: 0

No. of Units to be Demolished: 0

Studios:

Studios:

Studios:

1-Bedroom:

1-Bedroom:

1-Bedroom:

2-Bedroom:

2-Bedroom:

2-Bedroom:

3-Bedroom:

3-Bedroom:

3-Bedroom:

4-Bedroom:

4-Bedroom:

4-Bedroom:

5-Bedroom:

5-Bedroom:

5-Bedroom:

6-Bedroom:

6-Bedroom:

6-Bedroom:

REMARKS

APPROVAL DATE: 01/28/2019

Valid 2-years after approval date. Construction plans shall be completed and approved within this 2-year period. Construction shall commence within 1-year after approval of plans.

EXPIRATION DATE: 01/27/2021

\* Applicable WSFC shall be collected at the prevailing rate in accordance with ROH 1990, Chapter 14, Sections 14-10.3, 14-10.4, 14-10.5 and Appendix 14-D.

REVIEWED BY: Jon Coloma

Handwritten signature of Jon Coloma

Site Development Division, Wastewater Branch

**BOARD OF WATER SUPPLY**

CITY AND COUNTY OF HONOLULU  
630 SOUTH BERETANIA STREET  
HONOLULU, HI 96843  
www.boardofwatersupply.com



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ROSS S. SASAMURA, Ex-Officio  
JADE T. BUTAY, Ex-Officio

ERNEST Y. W. LAU, P.E.  
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.  
Deputy Manager and Chief Engineer

Mr. Laine Okimoto  
Community Planning and Engineering, Inc.  
1286 Queen Emma Street  
Honolulu, Hawaii 96813

Dear Mr. Okimoto:

Subject: Your Email Dated May 21, 2019 Requesting Comments on the Availability of Water for the Proposed Office Buildings at Halawa Under the Viaduct, and at Luluku at Parcel 20 of the H-3 Right of Way, Tax Map Key: 9-9-010: 010; Near 4-5-041: 017

Thank you for your email regarding the proposed office buildings.

The existing water system is adequate to accommodate the proposed office building at the Halawa project site, under the viaduct (Tax Map Key [TMK]: 9-9-010: 010). However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply (BWS) reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

The developer will be allowed to connect to the existing 16-inch waterline for the Luluku Site.

The existing water system cannot provide adequate fire protection to accommodate the proposed office/meeting building at the Luluku project site (near TMK 4-5-041: 017). The BWS Water System Standards (WSS) require a fire hydrant to be located fronting the property and provide a fire flow of 2,000 gallons per minute for commercial developments. The nearest fire hydrant, fire hydrant W-01331, is located approximately 2,034 feet from the property. Therefore, the developer will be required to install the necessary water system improvements to provide adequate fire protection in accordance with our WSS. The construction drawings should be submitted to BWS for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.  
Manager and Chief Engineer

## *Appendix C – Reports*



**GEOTECHNICAL EXPLORATION REPORT  
FOR HALAWA - LULUKU INTERPRETIVE DEVELOPMENT PROJECT  
NORTH HALAWA VALLEY PROJECT AREA  
HALAWA, OAHU, HAWAII**

For:

Community Planning & Engineering, Inc.  
1286 Queen Emma Street  
Honolulu, HI 96813

By:



Geotechnical • Environmental • Construction Management  
Testing • Inspection • Drilling & Sampling

CORPORATE HEADQUARTERS  
94-547 Ukee Street, Suite No. 210  
Waipahu, Hawaii 96797

Tel: (808) 676-6677 - Fax: (808) 676-7733 - Email: [Secretary@pscconsultants.com](mailto:Secretary@pscconsultants.com)  
[www.psc-hawaii.com](http://www.psc-hawaii.com)

**GEOTECHNICAL EXPLORATION REPORT  
FOR HALAWA - LULUKU INTERPRETIVE DEVELOPMENT PROJECT  
NORTH HALAWA VALLEY PROJECT AREA  
HALAWA, OAHU, HAWAII**

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**GEOTECHNICAL EXPLORATION REPORT  
FOR HALAWA - LULUKU INTERPRETIVE DEVELOPMENT PROJECT  
NORTH HALAWA VALLEY PROJECT AREA  
HALAWA, OAHU HAWAII**

July 16, 2019

PSC Job No. 216301.10 – Halawa Project Area

## **INTRODUCTION**

This report presents the results of our Geotechnical Study for the North Halawa Valley Project Area portion of the proposed Halawa-Luluku Interpretive Development (HLID) Project at the North Halawa Valley project area in Halawa, Oahu, Hawaii. The project site is shown on the Project Location Map, Plate 1. Our work was performed in accordance with the scope of work outlined in our proposal dated January 25, 2016.

The purpose of the HLID project is to mitigate some of the impacts to cultural and archaeological resources caused by the construction of Interstate H-3 based off the 1987 Memorandum of Agreement (MOA) between the Federal Highways Administration (FHWA), State Historic Preservation Division (SHPD), and Advisory Council on Historic Preservation (ACHP) which mandates prescribed mitigation actions for Interstate H-3 construction.

The scope of the project area has been defined to include certain portions of Luluku and North Halawa Valley. Through years of community outreach and the accumulation of archaeological data, an Interpretive Development was created to clearly identify impacts to cultural and archaeological resources caused by Interstate H-3 and to express the vision of the Working Group for healing the land as well as the community. The project is divided into the two project areas (North Halawa Valley and Luluku). This report reflects the North Halawa Valley Project Area site.

On the basis of the information provided to us, the North Halawa Valley project area will generally include construction of an Education Center, Utilities, Parking, Maintenance Building, Storage, Trash Receptacle/Stall, Nursery, Aquaponics, Meeting House, Composting Toilets, Water Catchments, Water Tank, Trails/Erosion Control, Flood Warning System, Outdoor Nursery/Aquaponic, Dining House, Potable/Non-Potable Water Source, Grid Power, Stewardship Residence, Grey Water Treatment and Hale Pana Pono.

This report summarizes the findings from our field exploration and laboratory testing and presents our geotechnical engineering recommendations for feasibility planning derived from our analysis for the proposed North Halawa Valley Project Area. These recommendations are intended for planning and design input only.

Community Planning and Engineering, Inc. is the planner for this project and the clients include the Federal Highway Administration (FHWA), Historic Preservations Division (SHOPO) and the Advisory Council of Historic Preservation (ACHP).

### **PURPOSE AND SCOPE**

Our Geotechnical Report for the proposed project provides a general overview of the subsurface conditions at the North Halawa Valley Project Area site. The subsurface information obtained will be used for the development of geoenvironmental recommendations for the site improvements including building foundations, and road and parking areas.

Our work was done in general accordance with our proposal dated January 25, 2016. The scope of work included the following:

1. Coordinate and schedule the soil investigation;
2. Secure clearances from various agencies and companies to obtain drilling access permits;
3. Drill two borings to depths up to 16 feet below the existing ground surface;
4. Provide a field engineer to monitor the drilling operation, obtain soil samples at selected depth intervals, and maintain a log of the soils encountered within each boring;
5. Perform laboratory tests on selected samples to determine the relevant engineering properties of the near surface soils;
6. Analyze the field and laboratory data; and
7. Provide a written report summarizing our findings and recommendations.

### **FIELD EXPLORATION**

Our field exploration program consisted of drilling and sampling two borings at the proposed North Halawa Valley project area. Borings 1 and 2 were drilled to approximately 10 feet and 16 feet below the existing ground surface. The locations of the borings drilled are shown on Plate 2. Boring locations considered vehicular traffic, overhead obstructions, existing parking and roadways, existing walkways, buried lines, and accessibility of drilling rigs and trucks.

The borings were advanced using a truck-mounted drill rig equipped with 4-inch solid-stem augers. Samples of the surface soils were obtained at selected levels using a 3.0-inch O.D. by 2.4-inch I.D. split barrel Modified California (MC) sampler. The samplers were driven 18 inches using 140-lb hammer falling 30 inches. The number of blows required to drive the sampler for the last 12 inches are presented on the Log of Borings on Plates 4 and 5.

Our field engineer classified the soils in the field by visual/manual methods. Soils are classified in accordance with the Unified Soil Classifications System shown on Plate 3. Graphic presentations of the materials encountered are presented on the Log of Borings.

### **SITE DESCRIPTION**

The project site for the proposed Education Center, Utilities, Parking, Maintenance Building, Storage, Trash Receptacle/Stall, Nursery, Aquaponics, Meeting House, Composing Toilets, Water Catchments, Water Tank, Trails/Erosion Control, Flood Warning System, Outdoor Nursery/Aquaponic, Dining House, Potable/Non-Potable Water Source, Grid Power, Stewardship Residence, Grey Water Treatment and Hale Pana Pono are generally located along the Halawa Valley area in Oahu Hawaii. The project site consisted generally of construction roads and fenced in areas that run along H-3.

A topographic survey plan was not provided at the time this report was prepared; however, based on our field observations the general topography of the project site was flat paved road way adjacent to the viaduct. At the time of our field exploration, the project site was generally covered by construction roads, paved and fenced in areas.

### **SUBSURFACE CONDITIONS**

Our borings at the North Halawa Valley Project Area generally encountered alluvial soils consisting of very stiff to hard clayey sands and gravel sand mixtures extending down to the maximum depth explored of about 16 feet below the existing ground surface. Boring No. 1 was drilled in a pavement area and encountered a pavement structure overlying the alluvial soils consisting of about 16 inches of asphalt and about 5 inches of medium dense sandy gravel fill material.

We did not encounter groundwater in the borings at the time of our field exploration. However, it should be noted that groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

## LABORATORY TESTING

### Moisture Content

Moisture Content (ASTM D2216) determinations were performed on selected samples as an aid in the classification and evaluation of soil properties. The test results are presented on the Logs of Borings at the appropriate sample depths.

### Gradation Test

Two sieve analyses tests (ASTM C136) were performed on selected soil samples to evaluate the gradation of the material. The results are used to classify the soil. The test results are summarized on the Logs of Borings at the appropriate sample depth. Graphic presentation of the Gradation test results is provided on Plate 6.

### Atterberg Limits

Two Atterberg Limits tests (ASTM D4318) were performed on selected soil samples to evaluate the liquid and plastic limits. The results are used to help classify the soil and to obtain an indication of the expansion and shrinkage potential of the spoil with changes in moisture content. The test results are summarized on the Logs of Borings at the appropriate sample depth. Graphic presentation of the Atterberg Limits test result is provided on Plate 6.

## DISCUSSION AND RECOMMENDATIONS

### **Site Preparation**

At the onset of earthwork, the area within the contract grading limits should be cleared of trees, vegetation, debris, rubbish, boulders and other deleterious materials. These materials should be removed and properly disposed of offsite.

Areas to receive fill should be scarified to a depth of about 8 inches, moisture-conditioned to at least 2 percent above the optimum moisture content and compacted to a minimum of 90 percent relative compaction. Relative compaction refers to the in-place, dry density of soil expressed as percentage of the maximum dry density of the same soil established in accordance with ASTM Test designation D 1557. The optimum moisture content is the moisture content corresponding to the maximum compacted dry density.

Soft or yielding areas encountered during site preparation should be over-excavated to expose firm soil surface and stabilized by backfilling with select material placed in 8-inch thick, loose lifts and compacted to a minimum of 90 percent relative compaction. It is important that the scarification and recompaction operations be performed in the presence of a representative of PSC Consultants, LLC (PSC).

### **Fills and Backfills**

In general, the excavated on-site soils should be suitable for use as general fill materials, provided that they are free of vegetation, deleterious materials, and rock fragments greater than 3 inches in largest dimension. It should be noted that the project site is located in a high rainfall environment throughout the year; therefore, the in-situ soils will constantly be in a very moist to wet condition and drying or aerating the excavated materials may be necessary prior to their use as general fill.

Imported fill materials should consist of select granular fill material, such as crushed basalt or coral. The select granular fill should be well-graded from coarse to fine with particles no larger than 3 inches in largest dimension and should contain between 10 and 30 percent particles passing the No. 200 sieve. The material should have a laboratory CBR value of 20 or more and should have a maximum swell of less than 1 percent when tested in accordance with ASTM D1883.

Aggregate base materials should consist of crushed basaltic aggregates and should conform to Section 31 of the City and County of Honolulu, Department of Public Works, “Standard Specifications for Public Works Construction,” dated September 1986. Imported fill materials should be tested for conformance with these recommendations prior to delivery to the project site for the intended use.

### **Fill Placement and Compaction Requirements**

As mentioned above, the project site is located in a high rainfall environment throughout the year; therefore, the in-situ soils will constantly be in a very moist to wet condition and drying or aerating the excavated materials may be necessary prior to their use as general fill.

General fill materials should be placed in level lifts not exceeding 8 inches in loose thickness, moisture-conditioned to at least 2 percent above the optimum moisture content and compacted to at least 90 percent relative compaction. Select granular fill materials should be placed in level lifts of about 8 inches in loose thickness, moisture-conditioned to above the optimum moisture, and compacted to at least 90 percent relative compaction.

Aggregate base and subbase course materials should be moisture conditioned to above the optimum moisture content, placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a

minimum of 95 percent relative compaction.

Relative compaction refers to the in-place, dry density of soil expressed as percentage of the maximum dry density of the same soil established in accordance with ASTM Test designation D 1557. The optimum moisture content is the moisture content corresponding to the maximum compacted dry density.

Compaction should be accomplished by sheepfoot rollers, vibratory rollers, or other types of acceptable compaction equipment. Water tamping, jetting, or ponding should not be allowed to compact the fills. Where compaction is less than required, additional compactive effort should be applied with adjustment of moisture content as necessary, to obtain the specified compaction. It should be noted that excessive vibrations from compaction equipment may soften the on-site soils with high in-situ moisture contents; therefore, vibrations should be carefully controlled during compaction efforts.

### **Excavations**

Based on the anticipated grading and our field exploration, excavation for this project will generally consist of excavations for pavement structure, foundations, and infrastructure installation. Some of the excavations may encounter boulders and clusters of cobbles within the alluvial soils. It is anticipated that most of the materials may be excavated with normal heavy excavation equipment. However, deep excavations and boulder excavations may require the use of hoerams.

The above discussions regarding the rippability of the subsurface materials are based on field data from the borings drilled at the site. Contractors should be encouraged to examine the site conditions and the subsurface data to make their own reasonable and prudent interpretation.

### **Building Foundations**

Based on the information provided and the subsurface conditions encountered at the project site, a shallow foundation system consisting of spread and/or continuous footings may be used to support the proposed building structure. Due to the varying consistency and high in-situ moisture contents of the on-site soils, we recommend placing a minimum 18-inch thick layer of select granular fill material below the foundations to provide a firm and unyielding bearing layer. The select granular fill should also extend a minimum of 18 inches beyond the perimeter of the foundations.

An allowable bearing pressure of up to 2,500 pounds per square foot (psf) may be utilized for the design of building foundations bearing on the 18-inch thick layer of select granular fill material. This bearing value is for supporting dead-plus-live loads and may be increased by one-third (1/3) for transient loads, such as those caused by wind or seismic forces.



Footings subgrades should be recompacted to a firm surface prior to the placement of the geotextile fabric and select granular fill material. Soft and/or loose materials encountered at the bottom of footing excavations should be over-excavated to expose the underlying firm materials. The over-excavation should be backfilled with select granular fill material compacted to a minimum of 90 percent relative compaction. It should be noted that excessive vibrations from compaction equipment may soften the on-site soils with high in-situ moisture contents; therefore, vibrations should be carefully controlled during compaction efforts.

In general, the bottom of footings should be embedded a minimum of 24 inches below the lowest adjacent finished grades. Footings located adjacent to planned (or existing) retaining walls should be embedded deep enough to avoid surcharging the retaining wall foundations. Foundations next to utility trenches should be embedded below a one horizontal to one vertical (1H:1V) imaginary plane extending upward from the bottom edge of the utility trench, or the foundation should be extended to a depth as deep as the inverts of the utility lines. This requirement is necessary to avoid surcharging adjacent below-grade structures with additional structural loads and to reduce the potential for appreciable foundation settlement.

If foundations are designed and constructed in strict accordance with our recommendations, we estimate total settlements of the foundations to be less than 1 inch. Differential settlements between adjacent footings supported on similar materials may be on the order of 0.5 inches or less.

Lateral loads acting on the structures may be resisted by friction between the base of the foundation and the bearing materials and by passive earth pressure developed against the near-vertical faces of the embedded portion of foundations. A coefficient of friction of 0.4 may be used for footings bearing directly on the 18-inch thick layer of select granular fill material. Resistance due to passive earth pressure may be estimated using an equivalent fluid pressure of 300 pounds per square foot per foot of depth (pcf) assuming the soils around the footings are well compacted. Unless covered by pavements or slabs, the passive pressure resistance in the upper 12 inches below the finished grade should be neglected.

### **Concrete Slabs-On-Grade**

Based on the results of our field exploration, the near-surface soils exhibit a moderate expansion potential when subjected to moisture fluctuations. Therefore, we recommend placing a minimum 12-inch thick layer of non-expansive select granular fill material below the slab to reduce moisture changes in the slab subgrade soils. Placement of the non-expansive select granular fill layer would reduce the potential for future distress to the lightly loaded slabs-on-grade resulting from shrinking and swelling of the on-site soils due to changes in the moisture content. The layer of select granular fill would also serve as a protective layer or working platform since the site is located in a high

rainfall environment. The non-expansive select granular fill should be compacted to a minimum of 90 percent relative compaction.

Prior to placing the non-expansive select granular fill, we recommend scarifying the subgrade soils to a depth of about 8 inches, moisture-conditioning the soils to at least 2 percent above the optimum moisture content and compacting to a minimum of 90 percent relative compaction. The underlying subgrade soils and select granular fill should be wetted and kept moist until the final placement of slab concrete. Where shrinkage cracks are observed after compaction of the subgrade, we recommend preparing the soils again as recommended. Saturation and subsequent yielding of the exposed subgrade due to inclement weather and poor drainage may require over-excavation of the soft areas and replacement with engineered fill.

For interior building slabs (not subjected to vehicular traffic or machinery vibration), we recommend placing a minimum 4-inch thick layer of cushion fill consisting of open-graded gravel (ASTM C33, No. 67 gradation) below the slabs and above the non-expansive select granular fill layer. The open-graded gravel cushion fill would provide uniform support of the slabs and would serve as a capillary moisture break. To reduce the potential for future moisture infiltration through the slab and subsequent damage to floor coverings, an impervious moisture barrier is recommended on top of the gravel cushion fill layer. Flexible floor coverings, such as carpet or sheet vinyl, should be considered because they can better mask minor slab cracking.

Where the slabs will be subjected to equipment vibration and/or vehicular traffic, we recommend placing the floor slab over 6 inches of aggregate subbase in lieu of the 4-inch thick layer of cushion fill mentioned above. The aggregate subbase should consist of crushed basaltic aggregates compacted to a minimum of 95 percent relative compaction. Where slabs are intended to function as rigid pavements, a minimum slab thickness of 6 inches may be used for preliminary design purposes. Provisions should be made for proper load transfer across the slab joints that will be subject to vehicular traffic.

We anticipate exterior concrete walkways may be required for the proposed project. We recommend supporting concrete walkways on a minimum 12-inch thick layer of non-expansive select granular fill. The select granular fill should be compacted to at least 90 percent relative compaction. Control joints should be provided at intervals equal to the width of the walkways with expansion joints at right-angle intersections. The thickened edges of slabs adjacent to unpaved areas should be embedded at least 12 inches below the lowest adjacent grade.

It should be emphasized that the areas adjacent to the slab edges should be backfilled tightly against the edges of the slabs with relatively impervious soils. These areas should also be graded to divert water away from the slabs and to reduce the potential for water ponding around the slabs.

## Pavements

We anticipate that asphaltic concrete (flexible) pavements are planned for the access roadway and parking areas. While traffic loading has not been specified, we anticipate that the vehicle loading for the access road and parking areas will consist primarily of passenger vehicles with some light trucks.

We have assumed that the pavement subgrade will consist of the on-site granular material, medium dense to dense. As discussed above, the project site is located in a high rainfall environment throughout the year and the in-situ soils will constantly be in a very moist to wet condition. Aggregate base course with nominal maximum size of 1.5 inches should be used.

Based on the site conditions encountered and the above assumptions, we recommend using the following pavement sections for preliminary design purposes:

### Flexible Pavement Section

2.0-Inch	Asphaltic Concrete
<u>10.0-Inch</u>	<u>Aggregate Base Course</u>
12.0-Inch	Total Pavement Thickness

The above pavement section is based on the assumption that the actual pavement subgrade soils will be similar to the soils generally encountered during our field exploration and that adequate drainage will be provided for the paved areas. The pavement subgrade soils should be scarified to a minimum depth of about 8 inches, moisture-conditioned to about 2 percent above the optimum moisture content and compacted to no less than 90 percent relative compaction.

Prior to placing the aggregate base course materials, the triaxial geogrid should be placed over the finished subgrade soils and rolled out flat and tight with no folds in accordance to the manufacturer's recommendations. Adjacent rolls of triaxial geogrid should be overlapped a minimum of 12 inches. Aggregate base course materials should consist crushed basaltic aggregates with a 1.5-inch maximum nominal size and should conform to Section 31 of the City and County of Honolulu, Department of Public Works, "Standard Specifications for Public Works Construction," dated September 1986.

CBR and density tests and/or field observations should be performed on the actual subgrade used for the road construction to confirm the adequacy of the above pavement section.

### **Road and Walkway Drainage**

Subdrains should be provided where there is a possibility that runoff from rainfall or irrigation could saturate the subsurface soils. Exposed surface soils should be protected from erosive runoff by providing surface drains, diversion berms, sloping surface, concrete curbs, dry wells and other flood control devices.

### **Utility Trenches**

Granular bedding consisting of 6 inches of No. 3B Fine gravel is recommended under the pipes. Free draining granular materials, such as No. 3B fine gravel (ASTM C 33, No. 67 gradation) should also be used for the trench backfill above and at sides of the pipes to provide support around the pipes and to reducing the potential for damaging the pipes.

## **CONCLUSIONS**

Clayey sands with relatively high in-situ moisture contents will be a likely soil profile for this portion of the North Halawa Valley Project Area and the HLID project. Conventional earthwork and construction methods may be used for the proposed project grading.

In general, the excavated on-site soils should be suitable for use as general fill materials, provided that they are free of vegetation, deleterious materials, and rock fragments greater than 3 inches in largest dimension. It should be noted that the project site is located in a high rainfall environment throughout the year; therefore, the in-situ soils will constantly be in a very moist to wet condition and drying or aerating the excavated materials may be necessary prior to their use as general fill.

The information and recommendations presented in this report have been based upon the existing materials encountered at the site, and during construction PSC Consultants, LLC (PSC) should be notified in the event that soil conditions change so we can modify or amend our recommendations as necessary.

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July 16, 2019  
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### LIMITATIONS

The analysis and recommendations submitted in this report are based, in part, upon information obtained from two test borings and laboratory tests. Variations of subsoil conditions may occur, and the nature and extent of these variations may not become evident until construction is underway. If variations then appear evident, it will be necessary to reevaluate the recommendation provided in this report.

PSC Consultants LLC selected the boring locations in this report. The boring locations were located by taping from existing features and structures shown on the plans. The physical locations and elevations of the test boring should be considered accurate only to the degree implied by the methods used.

This report has been prepared for the exclusive use of Community Planning and Engineering, Inc., and their consultants for specific application to this project in accordance with generally accepted geotechnical engineering principles and practices. It may not contain sufficient data or proper information to serve the structural/civil engineer for their design work or a contractor wishing to bid on this project. No warranty is expressed or implied.

The owner/client should be aware that unanticipated soil/rock and cavity/soft spot conditions are commonly encountered. Unforeseen soil/rock conditions, hard layers, soft deposits, and cavities may occur in localized areas and may require probing or corrections in the field (which may result in construction delays) to attain a properly constructed project.

The findings in this report are valid as of the present date. However, changes in the soil conditions, either natural or manmade, can occur with the passage of time. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review by the controlling agencies and is valid for a period of two years.

Respectfully submitted:  
PSC CONSULTANTS, LLC

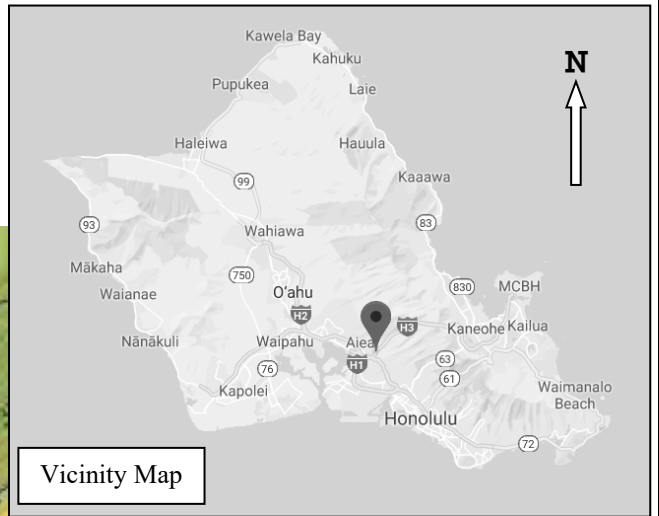
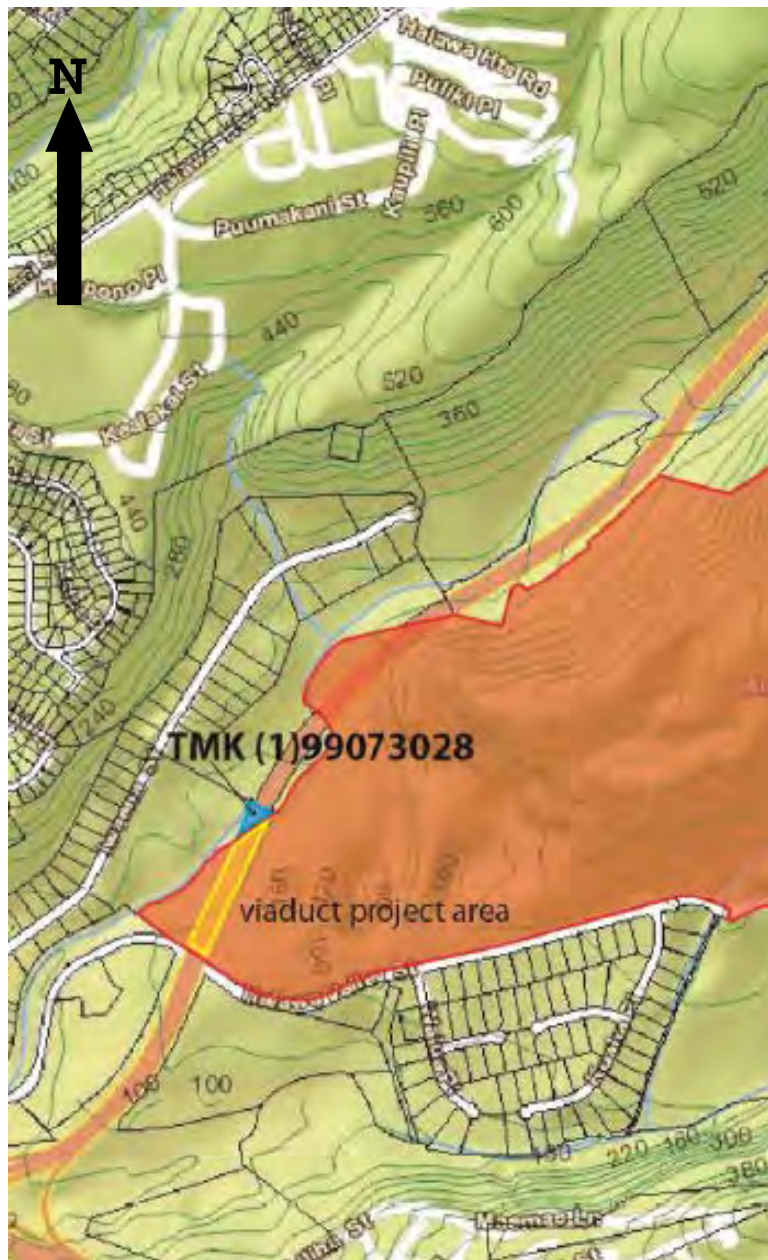


Derrick S. Chan, P.E.  
President



This work was prepared by  
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Encl.: Plate 1	Project Location and Vicinity Map
Plate 2	Boring Location Map
Plate 3	Unified Soil Classification System
Plate 4	Log of Boring B-1
Plate 5	Log of Boring B-2
Plate 6	Grain Size Distribution
Plate 7	Atterberg Limits Data



Reference: Halawa Valley and Luluku Project Plans  
NOT TO SCALE

### Project Location and Vicinity Map



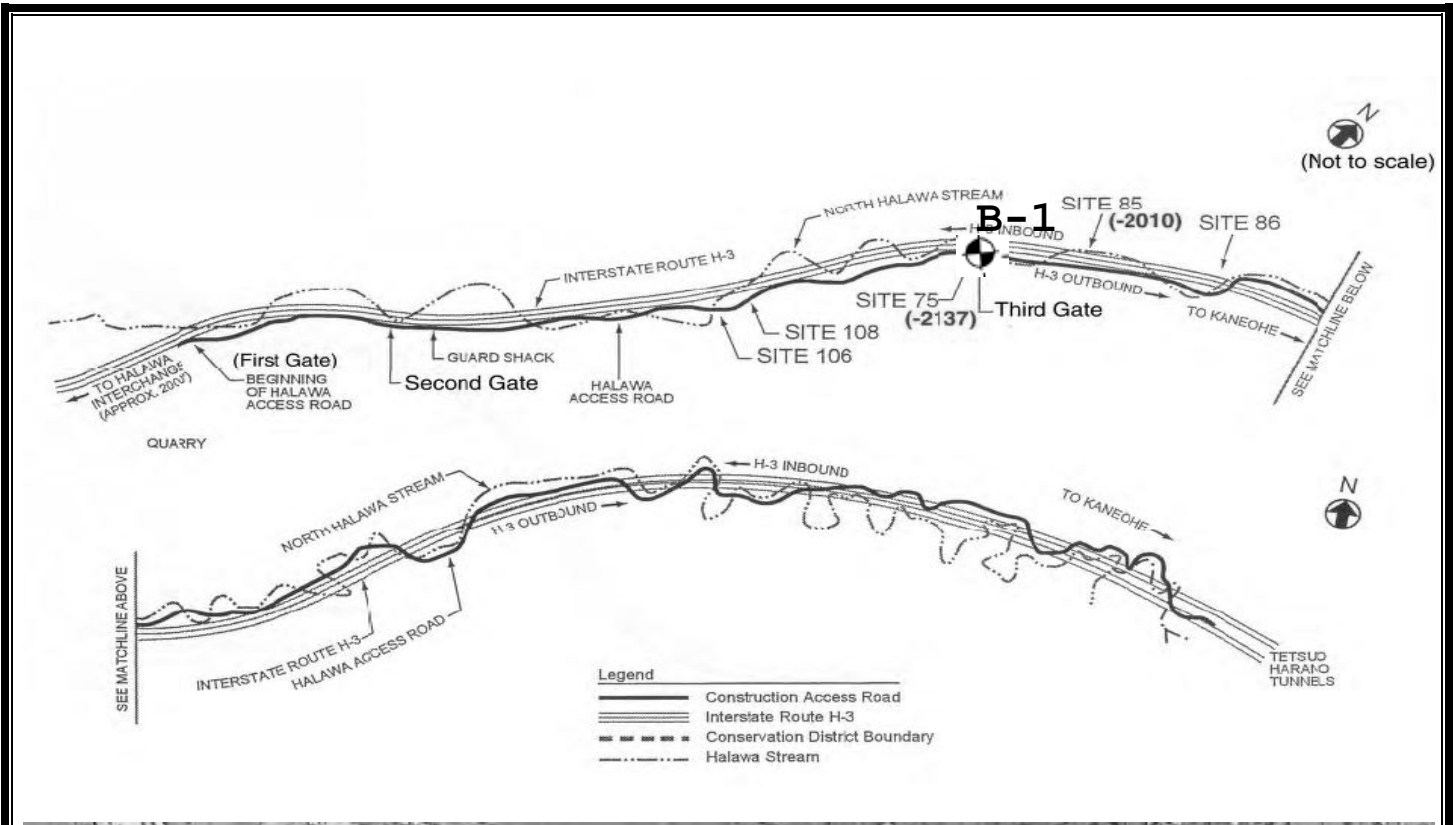
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SOILS, FOUNDATION, AND GEOLOGICAL ENGINEERS

North Halawa Valley Project Area  
Community Planning & Engineering, Inc.  
Halawa - Luluku Interpretive Development Project  
Halawa, Oahu, Hawaii

DATE: July 16, 2019

PROJECT NO. 216301.10

PLATE NO. 1



LEGEND  
 [Symbol] Boring Location

Reference: Halawa Valley and Luluku Project Plans  
 NOT TO SCALE

**Boring Location Map**

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### SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
<b>COARSE GRAINED SOILS</b>  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	<b>GRAVEL AND GRAVELLY SOILS</b>  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	<b>CLEAN GRAVELS</b>  (LITTLE OR NO FINES)		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<b>GRAVELS WITH FINES</b>  (APPRECIABLE AMOUNT OF FINES)		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<b>GRAVELS WITH FINES</b>  (APPRECIABLE AMOUNT OF FINES)		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		<b>GRAVELS WITH FINES</b>  (APPRECIABLE AMOUNT OF FINES)		<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	<b>SAND AND SANDY SOILS</b>  50% OR MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	<b>CLEAN SANDS</b>  (LITTLE OR NO FINES)		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		<b>CLEAN SANDS</b>  (LITTLE OR NO FINES)		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		<b>SANDS WITH FINES</b>  (APPRECIABLE AMOUNT OF FINES)		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
		<b>SANDS WITH FINES</b>  (APPRECIABLE AMOUNT OF FINES)		<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES
<b>FINE GRAINED SOILS</b>  50% OR MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	<b>SILTS AND CLAYS</b>  LIQUID LIMIT LESS THAN 50			<b>ML</b>	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	<b>SILTS AND CLAYS</b>  LIQUID LIMIT GREATER THAN OR EQUAL TO 50			<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY
				<b>OH</b>	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
<b>HIGHLY ORGANIC SOILS</b>				<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

### Unified Soil Classification System



**CONSULTANTS, LLC**  
SOILS, FOUNDATION, AND GEOLOGICAL ENGINEERS

North Halawa Valley Project Area  
Community Planning & Engineering, Inc.  
Halawa - Luluku Interpretive Development Project  
Halawa, Oahu, Hawaii

DATE: July 16, 2019

PROJECT NO. 216301.10

BORING LOCATION:	DRILLER: Valley Well	<b>BORING NO. B-1</b>
BORING ELEVATION (ft): N/A	LOGGED BY: DSC	
DATE (S) DRILLED: 9/12/2017	TYPE RIG: Mobile B-59	

OTHER LAB TESTS	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	CORE RECOVERY (%)	R.Q.D. (%)	NUMBER OF BLOWS/12"	SAMPLER TYPE & NUMBER	DEPTH IN FEET	GRAPHIC SYMBOL	U.S.C.S.	GEOTECHNICAL DESCRIPTION
										Asphalt
N/A					40	MC	0-1		GM	Gray SILTY GRAVEL with some sand, moist, medium dense (fill)
							1-3		SC	Brownish gray CLAYEY SAND with some gravel, wet, medium dense
SA, PI		11.1			26	MC	3-5		SC	Brownish gray CLAYEY SAND with some gravel, wet, medium dense
N/A					Refusal	NR	10			Refusal. Boring Terminated at 10'. No Ground Water Encountered.
							15			
							20			

**SAMPLE TYPE**

D&M - Dames & Moore    SPT - Standard Penetration  
 CB - Core Barrel        SH - Shelby Tube  
 AUG - Auger Cuttings    NR - No Recovery

**OTHER LABORATORY TESTS**

MD - Moisture/Density        UC - Unconfined Compression  
 CON - Consolidation Test      SG - Specific Gravity  
 PI - Atterberg Limits        SA - Sieve Analysis

**LOG OF BORING**



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**North Halawa Valley Project Area**  
**Community Planning & Engineering, Inc.**  
**Halawa - Luluku Interpretive Development Project**

DATE: July 16, 2019

PROJECT NO.: 216301.10

BORING 6 HLID HALAWA PROJECT AREA 216301.20 GPJ PSCSTANDARD.GDT 12/5/18

BORING LOCATION:	DRILLER: Valley Well	<b>BORING NO. B-2</b>
BORING ELEVATION (ft): N/A	LOGGED BY: DSC	
DATE (S) DRILLED: 9/12/2017	TYPE RIG: Mobile B-59	

OTHER LAB TESTS	DRY UNIT WEIGHT (pcf)	MOISTURE CONTENT (%)	CORE RECOVERY (%)	R.Q.D. (%)	NUMBER OF BLOWS/12"	SAMPLER TYPE & NUMBER	DEPTH IN FEET	GRAPHIC SYMBOL	U.S.C.S.	GEOTECHNICAL DESCRIPTION
N/A					65	MC	0-5		SP	Asphalt 5" Reddish brown SAND with some silt and basaltic gravel, medium dense to dense, dry
SA, PI		10.8			50	MC	5-10		GM	Brown SILTY GRAVEL with some clay and basaltic gravel, medium dense, moist
N/A					60+	NR	10-15			
N/A					23	MC	15-16		GM	Brown SILTY GRAVEL with some clay and basaltic gravel, medium dense, moist
										Boring Terminated at 16'. No Ground Water Encountered.

BORING 6 HLID HALAWA PROJECT AREA 216301.20.GPJ PSCSTANDARD.GDT 12/5/18

**SAMPLE TYPE**

D&M - Dames & Moore    SPT - Standard Penetration  
 CB - Core Barrel        SH - Shelby Tube  
 AUG - Auger Cuttings    NR - No Recovery

**OTHER LABORATORY TESTS**

MD - Moisture/Density        UC - Unconfined Compression  
 CON - Consolidation Test    SG - Specific Gravity  
 PI - Atterberg Limits        SA - Sieve Analysis

**LOG OF BORING**

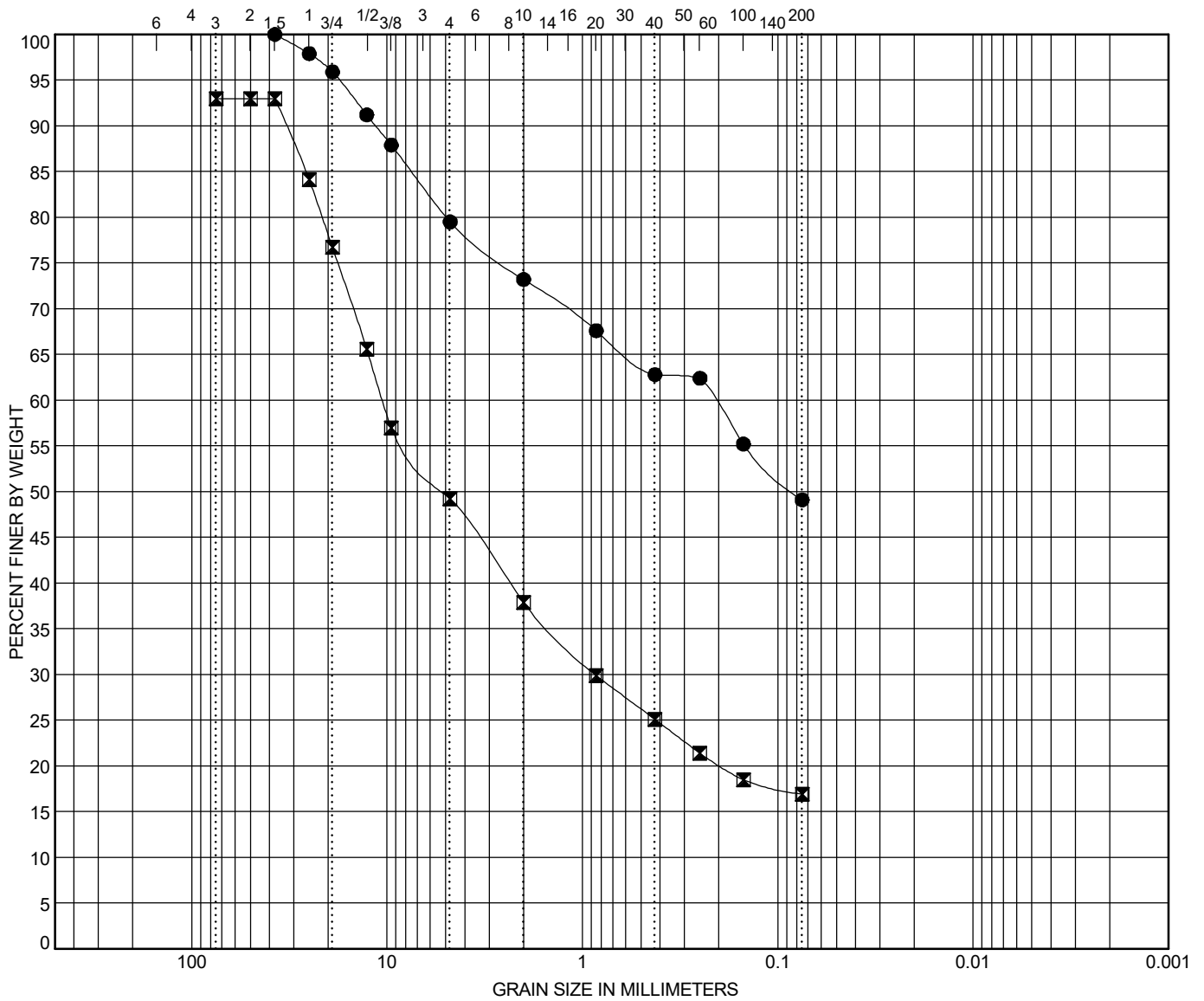


**CONSULTANTS, LLC**  
 SOILS, FOUNDATION, AND GEOLOGICAL ENGINEERS

**North Halawa Valley Project Area**  
**Community Planning & Engineering, Inc.**  
 Halawa - Luluku Interpretive Development Project

DATE: July 16, 2019

PROJECT NO.: 216301.10




COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● B-1 @ DEPTH 5ft.	CLAYEY SAND with GRAVEL SC	41	24	17		
■ B-2 @ DEPTH 5ft.	SILTY GRAVEL with SAND GM	42	26	16		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-1 @ DEPTH 5ft.	37.5	0.211			20.5	30.4	49.1	
■ B-2 @ DEPTH 5ft.	75	10.512	0.859		43.8	32.3	16.9	

**GRAIN SIZE DISTRIBUTION**

 <p><b>CONSULTANTS, LLC</b> SOILS, FOUNDATION, AND GEOLOGICAL ENGINEERS</p>	North Halawa Valley Project Area Community Planning & Engineering, Inc. Halawa - Luluku Interpretive Development Project Halawa, Oahu, Hawaii
	Date: July 16, 2019      Project No.: 216301.10

210301 SIEVE - MAMALAOHA HILID HALAWA PROJECT AREA 216301.20.GPJ TEST PIT.GDT 11/14/18



## *Appendix D – Data Cut Sheets*

**West Oahu Aggregate Co., Inc.**

Prices Effective 7/1/18

855 Umi Street

Honolulu, HI 96819

Ph. 808-847-7780/Fax 808-847-7782

www.woahawaii.com

**PRICE LIST**

YARDS DIMENSIONS	BIN COST	DUMP FEE	SUBTOTAL	TAX	TOTAL
10 (18'L X 8'W X 3'H)	350.95	287.95	638.90	30.10	\$669.00
10 (11'L X 8'W X 5H)	350.95	287.95	638.90	30.10	\$669.00
15 (13'L X 8'W X 5.5'H)	360.50	287.95	648.45	30.55	\$679.00
20 (16'L X 8'W X 5'H)	376.73	287.95	664.68	31.32	\$696.00
30 (22'L X 8'W X 6'H)	401.56	287.95	689.51	32.49	\$722.00
40 (24'L X 8'W X 6'H)	436.90	287.95	724.85	34.15	\$759.00

**The above pricing includes up to:**

- 5 tons of construction debris & \$57.59 per ton thereafter
- 4 tons of green waste & \$48.17 per ton thereafter
- 2 tons of household debris & \$95.36 per ton thereafter

**A second invoice will be generated if a bin exceeds the 5-ton weight limit.****Additional charges for the following:**

- \$150.00 relocation fee
- \$32.25 standby fee, per 15 minutes (after the first 15 min.)
- \$55.00 per each mattress
- \$98.00 per ton, for loads containing carpets (2-ton minimum charge).
- \$125.00 fee to reload unacceptable materials
- \$75.00 per car tire
- \$125.00 per truck tire
- \$100.00 fee for graffiti cleaning/removal.
- **\$20.00 per day, per bin, for bins kept beyond 10 calendar days**

**Additional Handling Fees for Unacceptable Materials:**

- \$100.00 Minimum cleaning fee for Hazardous Materials, i.e. gas, paint, oxygen, chemicals, etc.
- \$75.00 Auto parts (each item)
- \$100.00 Each appliance, i.e. refrigerators, freezers, AC units, washing machines, dryers, water heaters, etc.
- \$50.00 Each battery
- \$50.00 Each Computer, copy machine, printer or each miscellaneous electronic equipment, etc.

**NOTE:**

- Please call our office if you need to keep a bin longer than 10 calendar days.
- It is the customer's responsibility to contact our office to schedule a pick-up.
- Do not mix Green Waste with any other debris. Green Waste is defined by West Oahu Aggregate as anything that grows above the ground (trimmings, grass, etc.). All soil must be removed from green waste before placing in bin.
- All tree stumps can be no larger than 2' x 2' in size and should not be mixed with any other waste material.

**NO SOIL IS ALLOWED IN BIN – UNLESS TESTED FOR CONTAMINANTS & FALLS BELOW HAWAII EAL LEVELS**

By accepting the delivery of the rental bin, you acknowledge and agree to the terms stated above.

We at West Oahu Aggregate thank you and appreciate your business!

## Below Ground Septic Tanks - Two Compartment

CAPACITY (GAL)	SIZE (IN.)	FOB POINTS (1)
1000	102 x 60 x 58	CIFP,Tn
1250	116 x 55 x 66	CIFP,Tn
1500	143 x 55 x 66	CIFP,Tn



Septic Tank

## Below Ground Septic Tanks - Single Compartment

CAPACITY (GAL)	SIZE (IN.)	FOB POINTS (1)
300	54(DIA) x 51H	CIFP,Tn
500	60(DIA) x 64H	CI,Tn
500	101 x 51 x 42	IPF,Tn
750	96 x 52 x 58	PIC
1000	86 x 65 x 68	H
1000	102 x 60 x 58	IPF,Tn
1250	116 x 55 x 66	IPF,Tn
1250	86 x 76 x 68	H
1500	143 x 55 x 66	IPF,Tn

## Bruiser Septic Tanks - Single Compartment

CAPACITY (GAL)	SIZE (IN.)	FOB POINTS (1)
1000	60 x 102 x 58	NIPC,Tn
1250	55 x 116 x 66	NIPC
1500	55 x 133 x 66	NIPC,Tn

## Bruiser Septic Tanks - Two Compartment

CAPACITY (GAL)	SIZE (IN.)	FOB POINTS (1)
1000	60 x 102 x 58	NIPC,Tn
1250	55 x 116 x 66	NIPC
1500	55 x 133 x 66	NIPC,Tn

## Below Ground Water Storage Tanks

CAPACITY (GAL)	SIZE (IN.)	FOB POINTS (1)
325	54 Dia x 51H	CIPF,Tn
550	64 Dia x 64H	CI,Tn
600	101 x 51 x 58	IPF,Tn
1000	86 x 65 x 68	H
1200	102 x 60 x 58	CIPF,Tn
1250	86 x 76 x 68	H
1700	143 x 55 x 66	CIPF,Tn



Underground Water Tank

## Septic & Water Tank Accessories

Item	
Manhole Extension	15 H x 20
Manhole Extension	24 H x 20
20" Lid & 12" Riser	
Septic & Water Tank Lid	20
Septic & Water Tank Lid	24

## Septic Tank Plumbing Kits

Item	
Service Weight Sanitary	Schedule 40 Sanitary (2 ea)
Service Weight or Schedule 40	Service Weight Tee & Gasket (1 ea)

**IMPORTANT-** Review tank handling, installation & use guidelines, pg. 20.

- The degree of translucency varies with wall thickness and tank color.
- Tank sizes are nominal. Capacities indicate approximate volume.
- Calibrations on molded tanks indicate approx. vol.
- Tanks UV stabilized for outdoor use.
- Go to chemtainer.com for updated product information.



# Material Selection

## A brief description of our materials:

(Always refer to our Chemical Resistance Chart at [chemtainer.com](http://chemtainer.com) before selecting tank materials.)

### 1) Polyethylene

A high quality thermoplastic that has outstanding resistance to both physical and chemical degradation. The overall general toughness and excellent chemical resistance to a wide array of wet and dry industrial chemicals and food products make polyethylene ideally suited for storage tanks and containers. Polyethylene is translucent and its natural color ranges from slightly off white to creamy yellow, depending on wall thickness and type. Ultraviolet light stabilizers are added for use in outdoor applications. Colors are available on request for a nominal up charge.

#### A) Linear Polyethylene

Linear Polyethylene has superior mechanical properties, high stiffness, excellent low temperature impact strength and excellent environmental stress crack resistance. The linear polyethylene used by Chem-Tainer Industries meets specifications contained in FDA regulation 21CFR177.1520 (c) 3.1 and 3.2 and so may be used as an article or a component of articles intended for use in contact with food, subject to any limitations in the regulations. Maximum operating temperature for linear polyethylene is 140° F. weldable.

#### B) Crosslinkable Polyethylene

Crosslinkable polyethylene is a high density polyethylene that contains a crosslinking agent which reacts with the polyethylene during molding, forming a crosslinked molecule similar to a thermoset plastic. This reaction improves toughness and environmental stress crack resistance. Crosslinked Polyethylene (XLPE) is not weldable and does not meet FDA requirement 21CFR177.1520. Maximum operating temperature of crosslinked polyethylene is 150° F. Available only in limited sizes and styles. Please contact sales office.

### 2) Polypropylene

Polypropylene is a rigid plastic that has a higher operating temperature limit than polyethylene: 212° F. It offers good chemical resistance, has a high resistance to stress crack, and is autoclavable. Polypropylene (PP) is not recommended for applications in sub-freezing temperature or where high impact strength is needed. A rough, irregular interior surface is common characteristic of molded polypropylene. Available only in limited sizes and styles. Please contact sales office.



# Model M54 Double Specification Sheet

## NSF Certification

The Clivus Model M54 is certified by the National Sanitation Foundation under Standard 41 (day-use, park).

## Capacity

The M54 Double is comprised of two M54 Composters set side by side.

### VOLUME FOR EACH M54:

Solids storage capacity: 81 cubic feet; 604 US gallons

Liquid storage capacity: 40 cubic feet; 300 US gallons

Daily capacity at average temp. >65°F: 60 visits

Annual capacity at average temp. >65°F: 22,000 visits. Total annual capacity for M54 Double: 44,000 visits

## Specifications and Materials

### DIMENSIONS

**Kit Shipping Dimensions:** Length: 122"; Width: 85.5"; Height: 114"

### Pre-fabricated Shipping Dimensions (2 pcs):

Base: Length: 118"; Width: 65"; Height: 48"

Building: Length: 122"; Width: 85.5"; Height: 114"

**Shipping Weight:** 4,800 lbs (ships in several pieces; maximum weight of any piece is 2,400 pounds)

### Assembled Building Dimensions:

Outside Length: 118"; Width: 132"; Height: 110"

### Building Enclosure (inside)

Inside Length: 84"; Inside Width: 61.5"

### Composter Base

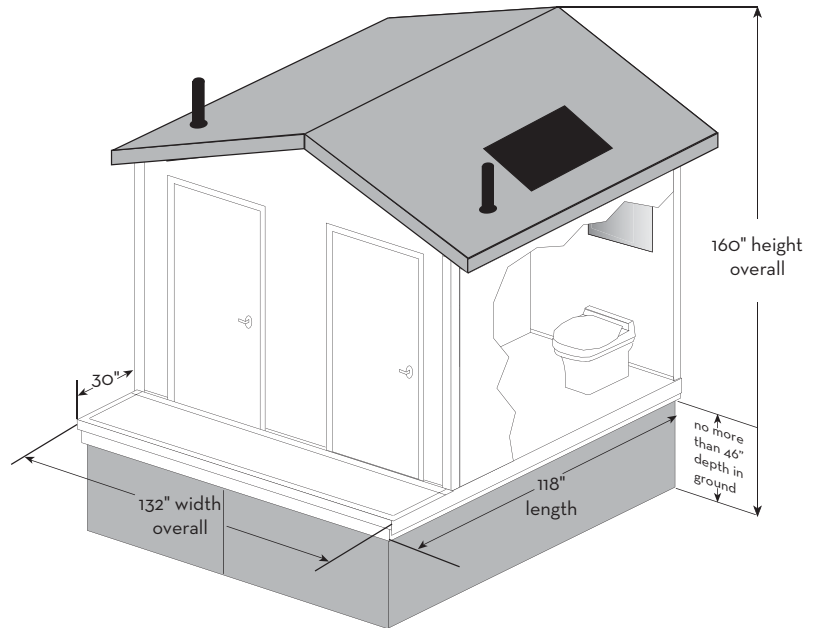
Length: 118"; Width: 65"; Height: 48"

### MATERIALS

#### Composter Base

Composter Base is rotationally molded high-density linear polyethylene resin that conforms with the following specifications:

- Density (ASTM TEST 4883): 0.942 g/cm<sup>3</sup>
- Tensile Strength at Yield (ASTM D638): 2,950 psi
- Dart Impact (-40°C, 250 mils thickness): 108 ft-lbs
- Env. Stress Crack Resistance, 100% Igepal (D1693): 550 hrs



### Building

Building walls are eight structural insulated panels (SIP) with expanded polystyrene core with fiberglass reinforced plastic over OSB interior finish and OSB exterior surface finished with 1" rough-sawn pine board-and-batten (other exterior finishes optional). Doors are 24 gauge cold rolled steel with zinc coating, factory painted medium gloss white, foamed-in-place polyurethane core; steel hinges; adjustable strike; frame milled from 5/4 kiln-dried pine; door opening: 36" x 80". Fixed window is 36" x 24" frosted lexan. Standard exterior is board and batten and custom painted.

Roof is two structural insulated panels (SIP) of 4" virgin expanded polystyrene faced with white fiberglass reinforced panels inside and OSB plywood outside for application of asphalt shingles or other finish.

Floor is expanded polystyrene core with 7/16" plywood underside with painted .016 aluminum skin and 7/16" plywood top surface with .08" non-skid rubber coating surface.

Standard package ships as a kit. Pre-fabrication is an option.

### VENTILATION

DC: 12V fan. Maximum free air is 100 cfm. Power input is 5 watts. CSA & UL approved. DC fan is powered by an optional photo-voltaic system customized for location and site requirements. Call for quotation. AC fan also available.

### TOILETS

Waterless toilets constructed of impact resistant fiberglass with sanitary white finish. Seat and lid are made of plastic; the liner is rotationally molded polyethylene. Grab bars and toilet paper holder included.

Toilet Height: 18"; Width: 18.5"; Length: 24.25"

### ADA COMPLIANT

The M54 Trailhead conforms to the requirements for universal access of the Americans with Disabilities Act .



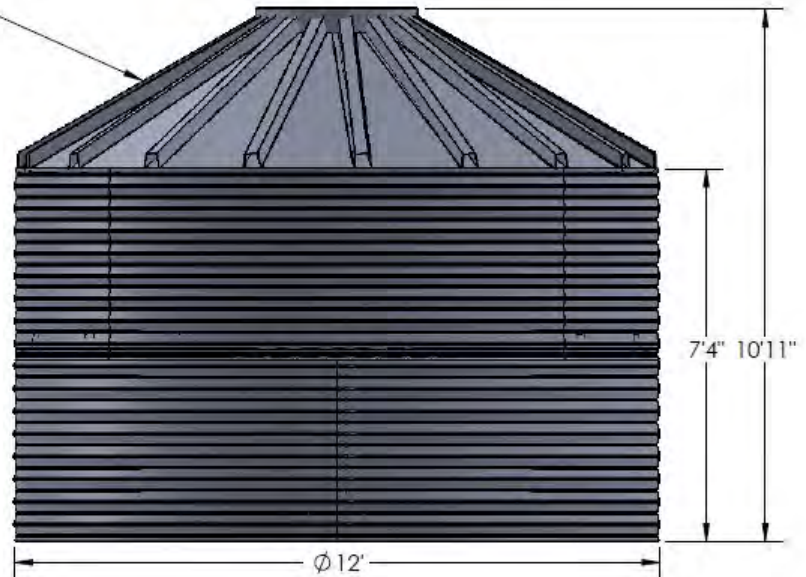
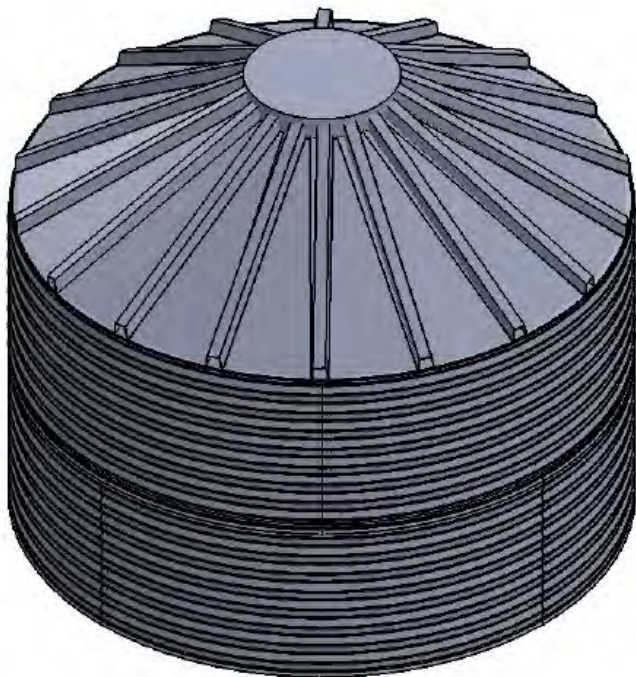
Dan Peters

Tel: 678-771-0098

E-Mail: Dan@RainHarvest.com

RainHarvest Systems  
4475 Alicia Lane  
Cumming, GA 30028

30° ROOF CONFIGURATION



## WATER STORAGE TANK PROJECT DATA SHEET

### PART I – GENERAL SUMMARY:

A) Section includes: Requirements, including, but not limited to:

- Contain Water Systems Inc. Water Storage Tank.
- Interior Components.
- Accessories necessary for a complete installation.

B) Related work:

- Refer to water tank manufacturer drawings.
- Refer to civil documents.
- Refer to mechanical documents.

### PART II – SUBMITAL DOCUMENTS:

- Accessory Specifications – Tank Manufacturer approved.
- Warranty Documents – Tank warranty must be 20 years minimum.
- Shop Drawings.

- Submittal Drawings.
- Coordination Drawings.
- Operations & Maintenance Data.

### **PART III – QUALITY ASSURANCE:**

- Water Tank specifications & Warranties – To be a manufactured water storage tank meeting the above & below design requirements. Must have a minimum 20 year warranty, must have a minimum 40 mil liner for structural integrity, must have an NSF 61 approved potable liner for potential client application switchover in the future, must have minimal G115 Galvanizing on the tank walls & **tank roofs**, Estimations must be compliant with all AWWA Codes & Standards, OSHA Codes & Standards, Seismic Zones 4 Standards (Highest Seismic). All Tanks must come with a minimum 165 MPH Wind Rating. All other project code requirements must be listed here. Tanks must meet AWWA Standards & 2012 IBC Minimum.

### **PART IV - DELIVERY, STORAGE & HANDLING:**

- Deliver Water Storage Tank, Systems & Accessories in original manufacturers packaging. Take necessary precautions to prevent damage to the system. Protect from damage during delivery, storage & handling.

### **PART V – PRODUCTS & MATERIALS:**

#### **A) Water Tank Engineering**

## **WATER SYSTEMS ENGINEERING**

---

### **WATER TANK COMPLETE WITH ROOF SCOPE AND SPECIFICATIONS PROJECT SPEC MUST INCLUDE: 20 YEAR WARRANTY, G115 GALVANIZING, MINIMUM 40 MIL NSF 61 APPROVED POTABLE WATER LINER WITH REINFORCMENTS & MINIMUM 165 MPH WIND LOADS.**

- Estimation exceeds AWWA D103-09 Codes & Standards (American Water Works Association - Standards for bolted steel tanks) CWSI estimations are in compliance with all OSHA Codes & Standards, Seismic Zones 4D (most stringent) ASCE Structural design considerations, 165 MPH Wind Rating. 30 PSF Live Roof Loads. Designed to IBC 2015. NBC 2015, NSF 61 / ANSI Standards are also included.
- This water storage tank is a water storage product that uses a G115 corrugated galvanized steel cylindrical tank in conjunction with a liquid-tight 40 MIL NSF 61 Approved PVC liner. The tanks are built with a conical galvanized G115 steel roof. Tanks are designed to be constructed and anchored to a concrete foundation.
- The tank is designed to store water with a density of 62.4 lbs / cubic foot.
- Wall sheets are continuous 4" pitch x 1/2" depth corrugated galvanized steel with a minimum yield strength of 40,000 psi and a minimum tensile strength of 55,000 psi for 20 and 18 gauge

sheets. All heavier gauges have a minimum yield strength of 50,000 psi and a minimum tensile strength of 65,000 psi. The wall sheets are manufactured from G115 galvanized steel conforming to ASTM A653. Wall sheets have a 44" nominal coverage. Wall sheets have a coverage length of 9' 4-1/2" long. The wall sheets are connected with GR8.2 bolts along both the vertical and horizontal seams.

- a. Vertical seams are punched for a staggered, double, triple or quad row connection at 2" on center.
  - b. Horizontal seams are a single lap connection with spacing of 9-3/8".
- Tanks are supplied with anchor brackets which bolt at the vertical seams and the center of the wall sheets.
  - Water tank roofs have either a 30 degree slope, flat roof, dome roof, inverted roof or open top roof design and are made up of self-supporting roof sheets, and are designed for 30 PSF roof snow loads minimum.
  - 12' through 48' diameter 30 degree roof panels are triangular in shape and have formed structural ribs along the radial edges to provide stiffness and strength. The 12' through 48' 30 degree roof panels extend past the eave to allow for drainage and are attached to the wall sheets with top ring angle sections that bolt around the entire circumference of the tank opening.
  - The 27' through 48' diameter 30 degree roof panels are manufactured from G115 galvanized steel conforming to ASTM A653 GR40.
  - The 15' to 48' diameter tanks come with formed steel roof ladder rungs that bolt between the roof ribs of a single panel, extending from eave to peak.
  - The center opening for the 33' through 48' diameter tanks the opening is 53" in diameter.
  - Each 15' through 48' diameter water tank comes complete with one roof panel complete with an inspection hatch, to be located at the eave next to the roof ladder. 24" minimum.
  - The 21' through 48' diameter roofs inspection hatch is circular with a 24" diameter.
  - Water tanks are designed for 165 MPH wind speed, UBC Exposure C. With engineering packages to exceed higher seismic zones.
  - Water tanks are designed for Seismic Zone 3 as standard. (Most stringent).
  - All bolts and nuts are galvanized with JS-500 coating. Roof bolts are hex-head and have factory installed PVC washers under a wide-flange shoulder. Wall sheet bolts have slotted round heads with PVC washers for ease of installation and minimal interaction with the liner.
  - All bolts meet SAE Grade 8.2 or stronger.
  - The liner shall be made from a flexible NSF 61 Approved Potable PVC material capable of containing water. Minimum liner thickness shall be 0.040 inches & reinforced to comply with a 65 year life expectancy. All seams in tank liners are factory welded.
  - The liner shall be suspended around the inside perimeter of the tank structure at the eaves with liner clips.
  - Erection and installation manuals are supplied with each tank.

## **B) Valve & Drain Fittings**

## **C) Overflow Piping**

## **D) Clean Out**

## **E) Pump**

**PART VI – EXECUTION & PREPERATION:****A) Install Water Storage System** In accordance with manufacturer's specifications & instructions.

- Tanks to be field erected on customer supplied foundation. Engineering & design by others.
- Foundation recommendations are available from CWS.
- Water must be provided for the leak test at the expense of the customer. Water for the leak test should be considered as a part of the installation cost. If water is not made available to fill the tank immediately upon completion of the construction than the client will be responsible for re-mob costs for the repair. Water testing is a part of the completion of the tank.
- CWSI is installing a NSF 61 Approved Potable Water Liner, however, all potable systems must be disinfected prior to use. Without proper disinfecting within a 72 hour period the liner is no longer considered NSF 61 / ANSI Potable compliant. Additionally, all potable water storage tank customers must consult with a professional conveyance contractor to include U.V sterilization, chlorine rinse upon initial use, water circulation system, aerator and ozone generator. Without a proper system in place as mentioned above - this water storage tank is not considered compliant with NSF 61 / ANSI Potable Water Storage Standards and should not be used for human, animal or food irrigation consumption. Quality Control Steel provides a NSF 61 Potable Water Storage Tank but cannot guarantee the quality of water added nor the usability of the water without the proper conveyances listed above.

**B)** Foundation should be designed to support the weight of the water storage tank (full) & should be designed to meet local building codes.

**C)** Plumbing code

**D)** Piping

**E)** Refer to mechanical drawings

**F)** Refer to civil drawings

**G)** Refer to site drawing

**PART VII – FINAL NOTES AND WARNINGS:**

- Twenty Year Manufacturer's Structural Warranty on materials and workmanship when assembled by CWSI or certified experts.
- One year Manufacturer's Workmanship Warranty when assembled by CWSI or certified experts.
- One year structural warranties are available for tanks sold as supply only and installed by others.
- All Water Tanks are installed as per manufactures installation instructions and therefore a Water Test and a Sign Off by the customer are required at the completion of the installation with the understanding the water tank has been installed to the best of CWS's ability and within the guidelines set out by the manufacture.
- Further mobilizations to site for potential Warranty work will be as per standard warranty description guidelines.
- Permits, soils testing, foundation engineering, or inspections if required, are not included in this proposal, unless otherwise stated.

# Vertical Water Storage Tanks

## IW Series

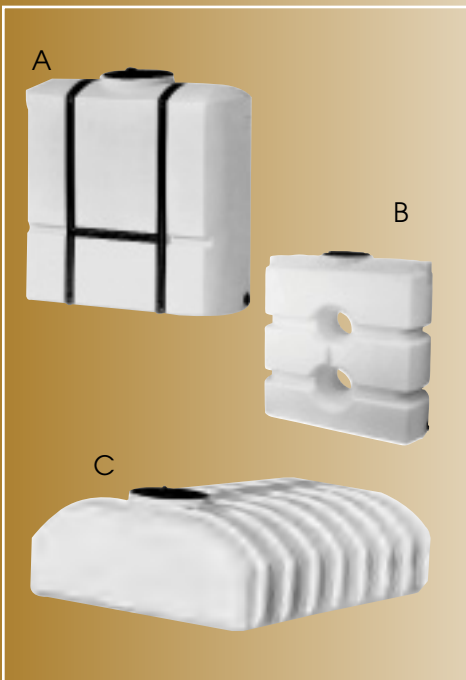
- Economical way to store potable (drinking) water for Residential and Commercial applications.
- Resin complies with U.S. Food and Drug Administration regulation 21CFR 177.1520(1) 3.1 and 3.2 for storage of potable water. These tanks are designed for water use only.
- Green color reduces algae growth and blends with the environment.
- Comes complete with threaded inlet /outlets and a vented twist entry.



CAPACITY (GAL)	SIZE DIA. X HT (IN.)	VENTED MANWAY (IN)	FOB POINTS (1)
45	18 x 51 (3)	4	CIP,Tn
65	23 x 42	8	CIPF,Tn
100	23 x 64	8	CIPF,Tn
110	35 x 36 (5)	8	CIPF,Tn
130	23 x 76	8	C
165	31 x 58	8	CIPF,Tn
200	31 x 72	16	CIP,Tn
300	35 x 81	16	CIP,Tn
500	64 x 42	16	CIPF,Tn
500	46 x 76	16	CFP,Tn
550	45 x 94	16	CF
650	56 x 70	16	C
750	46 x 119	16	CIP,Tn
850	48 x 124	16	CIP,Tn
1000	64 x 81	16	CIPF,Tn
1000	69 x 74	16	C
1500	64 x 121	16	CIPF,Tn
1550	87 x 65	16	CIP,Tn
1700	86 x 74	16	Tn
2000	64 x 144	16	CIPF,Tn
2500	95 x 89	16	CI,Tn
3000	95 x 107	16	CI,Tn
4000	95 x 140	16	CI,Tn
4000	102 x 125	16	C
5000	102 x 152	16	CIP,Tn
10000	141 x 160	16	C

(1) Subject to stocking inventory  
 (3) 45 Gal. has inverted calibrations  
 (5) 110 Gal. has side indents for fork lift handling

45 - 165 Gals: have 1" inlet and 1.5" outlet standard 300 Gals and up: have 1.5" inlet and 2" outlet standard. Outlets are located close to top and bottom, in line.



# Specialty Water Tanks

- 375 and 400 gallon tanks allow fit through conventional doorway. The 400 gallon tank is designed to be free standing and self-supporting.

CAPACITY (GAL)	SIZE W X H X L (IN.)	OUTLET SPECS.	VENTED MANWAY (IN.)	FOB POINTS (1)
375 (A)	30 x 60 x 62	1.25"	16	CIP,Tn
400 (B)	29 x 65 x 60	1.25"	16	CIP,Tn
1250 (C)	80 x 35 x 132	2"	16	CIP,Tn
1500 (C)	81 x 41 x 130	2"	16	CIP,Tn
2400 (C)	90 x 51 x 149	2"	16	CIP,Tn

(1) Subject to stocking inventory

**IMPORTANT - Review tank handling, installation & use guidelines, pg. 20.**  
 • The degree of translucency varies with wall thickness and tank color.  
 • Tank sizes are nominal. Capacities indicate approximate volume.  
 • Calibrations on molded tanks indicate approx. vol. • Tanks UV stabilized for outdoor use.  
 • Go to chemtainer.com for updated product information.

# Material Selection

## A brief description of our materials:

(Always refer to our Chemical Resistance Chart at [chemtainer.com](http://chemtainer.com) before selecting tank materials.)

### 1) Polyethylene

A high quality thermoplastic that has outstanding resistance to both physical and chemical degradation. The overall general toughness and excellent chemical resistance to a wide array of wet and dry industrial chemicals and food products make polyethylene ideally suited for storage tanks and containers. Polyethylene is translucent and its natural color ranges from slightly off white to creamy yellow, depending on wall thickness and type. Ultraviolet light stabilizers are added for use in outdoor applications. Colors are available on request for a nominal up charge.

#### A) Linear Polyethylene

Linear Polyethylene has superior mechanical properties, high stiffness, excellent low temperature impact strength and excellent environmental stress crack resistance. The linear polyethylene used by Chem-Tainer Industries meets specifications contained in FDA regulation 21CFR177.1520 (c) 3.1 and 3.2 and so may be used as an article or a component of articles intended for use in contact with food, subject to any limitations in the regulations. Maximum operating temperature for linear polyethylene is 140° F. weldable.

#### B) Crosslinkable Polyethylene

Crosslinkable polyethylene is a high density polyethylene that contains a crosslinking agent which reacts with the polyethylene during molding, forming a crosslinked molecule similar to a thermoset plastic. This reaction improves toughness and environmental stress crack resistance. Crosslinked Polyethylene (XLPE) is not weldable and does not meet FDA requirement 21CFR177.1520. Maximum operating temperature of crosslinked polyethylene is 150° F. Available only in limited sizes and styles. Please contact sales office.

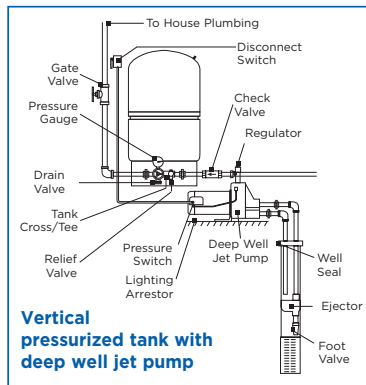
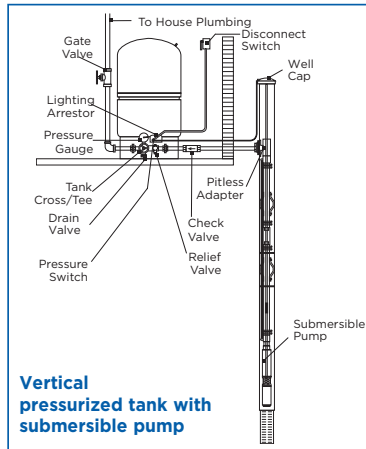
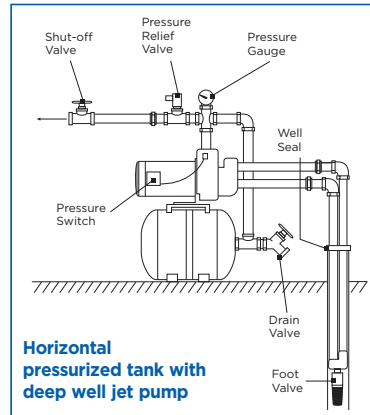
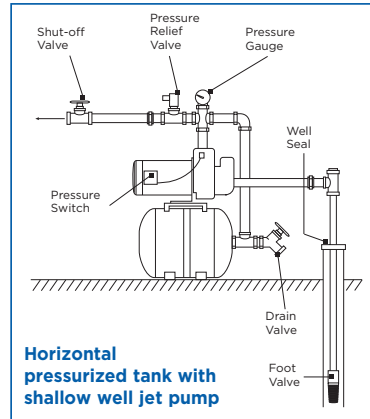
### 2) Polypropylene

Polypropylene is a rigid plastic that has a higher operating temperature limit than polyethylene: 212° F. It offers good chemical resistance, has a high resistance to stress crack, and is autoclavable. Polypropylene (PP) is not recommended for applications in sub-freezing temperature or where high impact strength is needed. A rough, irregular interior surface is common characteristic of molded polypropylene. Available only in limited sizes and styles. Please contact sales office.





Typical Tank Installations



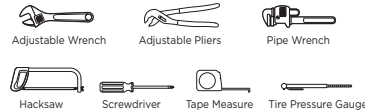
Tank Selection Guide

Tank Volume	2	4-4 1/2	6-9	14-16	20-24	25-29	30-36	37-46	47-65	85-96	109-120
<b>Water Worker</b>	<b>HT-2B</b>	<b>HT-4B</b>	<b>HT-8B</b>	<b>HT-14B</b>	<b>HT-20B</b>	<b>HT-30B</b>	<b>HT-32B</b>	<b>HT-44B</b>	<b>HT-62B</b>	<b>HT-86B</b>	<b>HT119B</b>
Champion	-	-	-	CH3001	CH4202	CH6000	CH8003	CH10050	CH12051	CH17002	CM22050
Challenger	PJR6	PJR15	PJR25	PC44	PC66	PC88	PC122	PC144	PC211	PC266	PC366
Con-Aire	-	-	-	CA15	-	CA42	-	CA82T	CA120	CA220	-
Flo-Tec	FP7105	FP7100	-	-	FP7110	-	FP7120	FP7125	-	FP7130	FP7135
Goulds Hydro-Pro	VP6	V15P	V25P	V45	V60	V80	V100	V140	V200	V250/V260	V350
H2 Pro	PJR6	PJR15	PJR25	WWT-14	WWT-20	WWT-25	WWT-35	WWT-45	WWT-65	WWT-85	WWT-120
Mark Series	CM1001	CM1002	CM1003	CM3001	CM4202	-	CM8003	CM10050	CM12051	CM17002	CM22050
Pro-Source/Plus	-	-	-	PS30	PS42/PSP19	-	PS82/PSP32/PSP35	PS120	PS200/PSP50/PSP62	PS220/PSP85	PSP119
Red Lion	RL2	RL4	RL8	RL14	RL20	-	RL33	RL44	RL62	RL81	RL119
Standard Galvanized	5	12	18	30	42	82	82	120	220	220	315
State Perma-Air	PIL-2	PIL-5	PIL-7	PAD-14	PAD-20	-	PAD-31/PAD-36	-	PAD-52	PAD-86	PAD-119
Wel Flo	-	WF15	WF25	WF45	WF60	WF80	WF100	WF140	WF200	WF240	WF360
WellMate	WM-8L	WM-18L	WM-25L	WM-4	WM-6	-	WM-9	WM-14	WM-20	WM-25	WM-35
Well-Rite	PJR6	PJR15	PJR25	WR45	WR60	WR80	WR120	WR140	WR200	WR260	WR360
Well-X-Trol	WX-101	WX-102	WX-103	WX-201	WX-202	WX-202XL	WX-203	WX-250	WX-251	WX-302	WX-119

Additional Parts Required For Installation



Recommended Tools



Drawdown

Model No	Water Worker Capacity (gal.)	Drawdown (gallons)		
		20/40	30/50	40/60
HT-2B	2.0	0.73	0.62	0.54
HT-4B	4.4	1.61	1.36	1.18
HT-8B	7.4	2.78	2.35	2.03
HT-6HB	5.3	1.94	1.64	1.42
HT-14HB	14.0	5.12	4.33	3.75
HT-14B	14.0	5.12	4.33	3.75
HT-20B	20.0	7.31	6.18	5.35
HT-30B	26.0	8.78	7.42	6.43
HT-32B	32.0	-	9.89	8.57
HT-44B	44.0	16.09	13.60	11.78
HT-62B	62.0	22.67	19.17	16.60
HT-86B	86.0	31.44	26.58	23.03
HT-119B	119.0	43.51	36.79	31.86

Well Tank Selection Guide

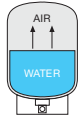


www.waterworkerdiy.com

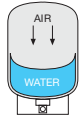
## Tank Operation

All well systems require a pre-pressurized well tank to provide a buffer of stored water. Without supplemental storage, small water uses like running a faucet or flushing a toilet would cause rapid pump cycling. This can lead to potential pump failure - an expensive repair or replacement often costing thousands of dollars.

**1.** As the pump fills the tank with water, the air above the diaphragm is compressed. This increases the pressure in the tank and causes the pressure switch to turn off the pump.



**2.** When water is drawn from the tank, pressure inside the tank decreases until the pressure switch starts the pump. The amount of water delivered between pump cycles is called drawdown. The greater the drawdown capacity, the less the pump needs to run, saving energy and money, and extending pump life.

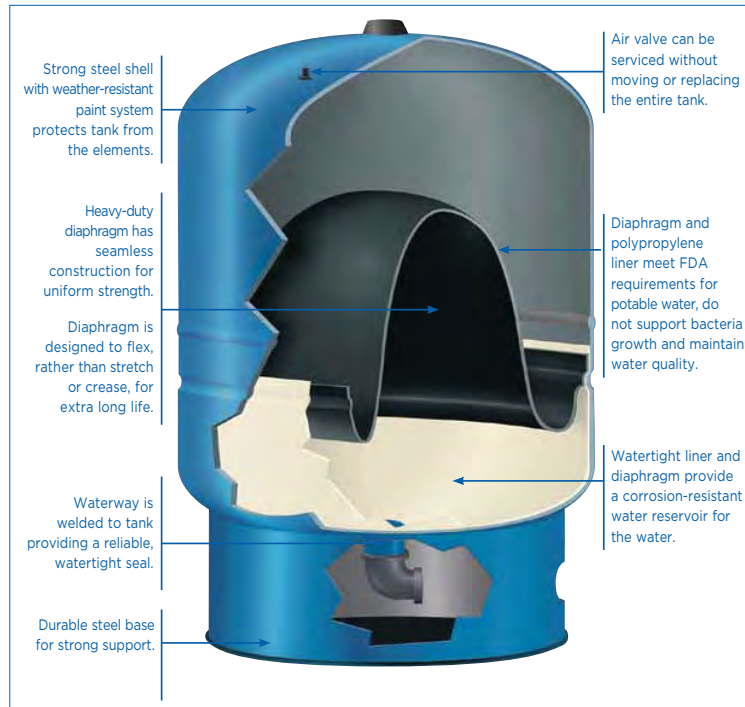


**3.** As water is drawn from the tank, the reduced pressure starts the pump and refills the tank.



## Tank Features

Water Worker® Well Tanks are made in the USA, easy to install and specifically designed for years of dependable, trouble-free, energy-saving operation.



## Tank Selection

Count the number of water fixtures and select the closest tank size according to the chart.

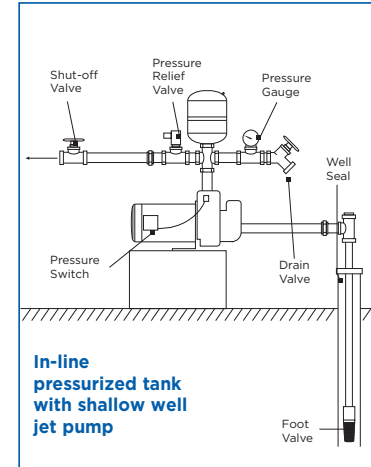
**Example:** For a home with 3 sinks, 3 toilets, a dishwasher, shower, bathtub, washing machine and an outside faucet, (11 water fixtures) the correct tank size would be: HT-44B.

There are no disadvantages to having a larger well tank. The larger the tank, the fewer pump cycles - extending pump life and saving electricity. Larger tank sizes will also increase the water storage volume to provide more consistent pressure.

Number of Water Fixtures	WaterWorker Capacity (gal)	Model No.	Epoxy Tank Equivalent (gal)
2	2.0	HT-2B	—
2	4.4	HT-4B	12
2	5.3	HT-6HB	12
3	7.4	HT-8B	20
4	14	HT-14B	30
4	14	HT-14HB	30
6	20	HT-20B	42
6	20	HT-20HB	42
8	26	HT-30B	—
10	32	HT-32B	82
14	44	HT-44B	120
20	62	HT-62B	—
28	86	HT-86B	220
40	119	HT-119B	315

The design of a Water Worker tank is much more efficient than an epoxy tank. This allows a smaller Water Worker tank to deliver the equivalent performance as compared to a much larger galvanized or epoxy tank.

## Typical Tank Installation



**In-line pressurized tank with shallow well jet pump**



MC#7230 (05/12)

# SCALA2

# PERFECT WATER PRESSURE

## FULLY INTEGRATED - COMPACT DESIGN - EASY TO INSTALL



**GRUNDFOS SCALA2** is a fully integrated water booster pump delivering perfect water pressure to all taps. It features pump, motor, tank, sensor, drive and non-return valve in one compact unit that installs quickly and easily.

With its intelligent pump control, SCALA2 adjusts performance to any demand – and with its water-cooled motor, it offers one of the lowest noise levels in its class. The result is maximum comfort with minimum effort.

### Key features

- Intelligent pump control
- Water-cooled, permanent magnet motor
- Dry running protection
- Self-priming
- User friendly control panel
- Outdoor-ready
- Easy sizing and selection



## APPLICATIONS

SCALA2 is designed for pressure boosting in single family houses and apartments.

**Boosting from mains:** Increases the water pressure delivered by city mains.

**Boosting from tanks:** Increases water pressure from roof tanks, break tanks and ground tanks, including rainwater tanks.

**Boosting from wells:** Pumps water from a depth of up to 26 feet (8 meters).

**Indoor and outdoor installation:** NEMA 3

## BENEFITS

**Perfect water pressure:** Intelligent pump control adjusts operation to ensure perfect water pressure at all times.

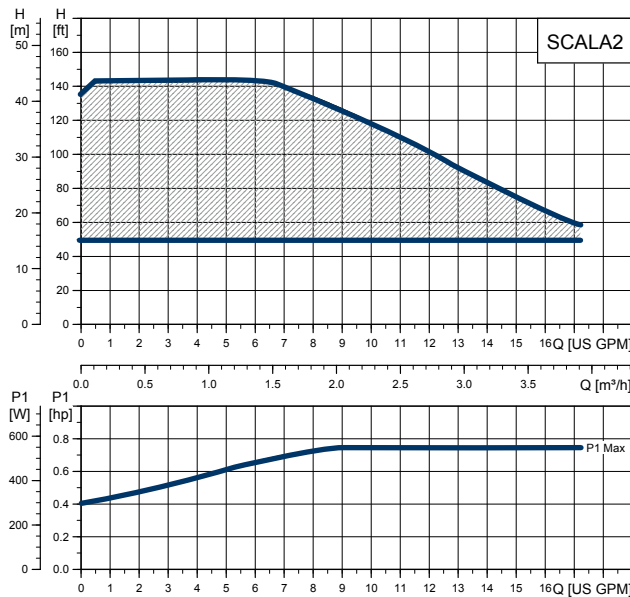
**Low noise:** With a noise level of 47 dB(A) in typical use, SCALA2 is one of the quietest boosters in its class.

**Easy selection:** One variant for all domestic applications.

**Easy installation:** Compact, all-in-one solution for perfect installation in no time.

**Easy to operate:** User-friendly control panel for easy set-up.

## PERFORMANCE CURVE



## TECHNICAL DATA

Max. ambient temperature 131°F / 55°C

Max. liquid temperature 113°F / 45°C

Max. system pressure 145 psi / 10 bar

Enclosure rating NEMA 3

Floors Max. 3

Taps Max. 8

Dimensions H: 11.9 in / 302 mm

L: 15.9 in / 403 mm

W: 7.6 in / 193 mm

Weight 22 lbs / 10 kg

## LPG

## STEEL PORTABLE



## SPECIFICATIONS

## STANDARD

MODEL/SIZE (LBS)	4.25	11	20	30	40	43.5	60*	100*
HEIGHT (IN)	11.8	16.6	17.2	23.7	29.3	32.5	44.1	48
LPG CAPACITY (GAL)	1	2.6	4.7	7.1	9.4	10.3	14.2	23.6
WATER CAPACITY (LBS)	12	26.2	47.6	71.5	95.2	103.6	143	239
NOMINAL TARE WEIGHT (LBS)	11	13.3	17.0	23.3	28.7	33.9	48.1	68
CYLINDER DIAMETER (IN)	9.1	9.1	12.3	12.3	12.3	12.3	12	14.7
CYLINDER VOLUME (CU. IN)	332	725	1,318	1,980	2,635	2,868	3,955	6,616
COLLAR DIAMETER (IN)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
COLLAR HEIGHT (IN)	4	4	4	4	4	5.1	5.1	5.1
FOOTRING DIAMETER (IN)	9.1	7.8	7.8	7.8	7.8	12	12	14.5
HORIZONTAL DESIGN	-	-	Available	Available	Available	-	-	-
VALVE	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-510 NO OPD	CGA-510 NO OPD	CGA-510 NO OPD
STANDARD SPECIFICATION	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BW260	DOT-4BW240

## METRIC

MODEL/SIZE (LBS)	4.25	11	20	30	40	43.5	60*	100*
HEIGHT (MM)	300	427	450	602	744	825.5	1,120	1,219
LPG CAPACITY (L)	3.8	9.8	17.3	26.9	35.6	39	53.8	86.7
WATER CAPACITY (KG)	5.4	11.9	21.6	32.4	42.2	47	65	108.4
NOMINAL TARE WEIGHT (KG)	5	6.0	7.7	10.5	13.0	15.4	21.8	30.8
CYLINDER DIAMETER (MM)	231	231	312	312	312	312	305	373
CYLINDER VOLUME (L)	5.4	11.9	21.6	32.4	42.2	47	65	108.4
COLLAR DIAMETER (MM)	165	165	165	165	165	165	165	165
COLLAR HEIGHT (MM)	102	102	102	102	102	130	130	130
FOOTRING DIAMETER (MM)	231	198	198	198	198	305	305	368
HORIZONTAL DESIGN	-	-	Available	Available	Available	-	-	-
VALVE	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-510 NO OPD	CGA-510 NO OPD	CGA-510 NO OPD
STANDARD SPECIFICATION	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BA240	DOT-4BW260	DOT-4BW240

All dimensions are approximate.

\*Available with cap and flange

## LPG

## ALUMINUM PORTABLE



## SPECIFICATIONS

## STANDARD

MODEL/SIZE (LBS)	6	10	20	30	40
HEIGHT (IN)	22.5	15.9	20.2	25.9	32.1
LPG CAPACITY (GAL)	1.4	2.4	4.7	7.1	9.4
WATER CAPACITY (LBS)	15	23.8	47.6	71.5	95.2
NOMINAL TARE WEIGHT (LBS)	8.1	9.7	13.0	16.5	19.5
CYLINDER DIAMETER (IN)	6.3	10.3	12.3	12.3	12.3
CYLINDER VOLUME (CU. IN)	415	664	1,318	1,999	2,635
COLLAR DIAMETER (IN)	5.7	7.9	7.9	7.9	7.9
COLLAR HEIGHT (IN)	6.5	5.5	5.5	5.5	5.5
FOOTRING DIAMETER (IN)	6.2	8	8	8	8
HORIZONTAL DESIGN	-	Available	Available	Available	Available
VALVE	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD
STANDARD SPECIFICATION	DOT-4E260	DOT-4E240	DOT-4E240	DOT-4E240	DOT-4E240

## METRIC

MODEL/SIZE (LBS)	6	10	20	30	40
HEIGHT (MM)	571	404	513	658	814
LPG CAPACITY (L)	5.4	9.1	17.3	26.9	35.6
WATER CAPACITY (KG)	6.8	10.8	21.6	32.4	43.2
NOMINAL TARE WEIGHT (KG)	3.7	4.4	5.9	7.5	8.8
CYLINDER DIAMETER (MM)	160	261	312	312	312
CYLINDER VOLUME (L)	6.8	10.8	21.6	32.7	43.5
COLLAR DIAMETER (MM)	144.8	200	200	200	200
COLLAR HEIGHT (MM)	165	140	140	140	140
FOOTRING DIAMETER (MM)	158	203	203	203	203
HORIZONTAL DESIGN	-	Available	Available	Available	Available
VALVE	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD	CGA-791 w/OPD
STANDARD SPECIFICATION	DOT-4E260	DOT-4E240	DOT-4E240	DOT-4E240	DOT-4E240

All dimensions are approximate.