Figure 92. SIHP # 50-80-09-2268 Feature D, earthen mound, view to southwest (Zapor et al. 2018:79)

Figure 93. SIHP # 50-80-09-2268 Feature D, stacked stone wall, view to southwest (Zapor et al. 2018:79)

Figure 94. Culvert of SIHP # 50-80-09-2268, Waiahole Ditch, northwest of (outside) the project area, view to southwest

Figure 95. Representative photo of SIHP # 50-80-09-2268, Waiahole Ditch outside (northwest) of the project area, view to east

Figure 96. Portion of SIHP # 50-80-09-2268, Waiahole Ditch outside (north) of project area, with date “1920” inscribed on basalt and mortar culvert, view to northeast

Figure 97. Portion of SIHP # 50-80-09-2268, Waiahole Ditch in northeastern project area, view to southwest

Figure 98. Representative photo of SIHP # 50-80-09-2268, Waiahole Ditch construction outside (northwest) of the project area, view to west

Figure 99. Representative photo of SIHP # 50-80-09-2268, Waiahole Ditch (left) in central project area, view to southwest

Figure 100. Representative photo of SIHP # 50-80-09-2268, Waiahole Ditch in southwest project area, dry-stacked basalt, view to north

Figure 101. Representative photo of SIHP # 50-80-09-2268, Waiahole Ditch in southwest project area, view to north

there is a formal concrete and mortared cut basalt blocks portion of the ditch with various components for water control, related to the pump station building that is southeast of the project area (see SIHP # 50-80-08-5593 Feature 2A discussion for description).

Portions of the Waiahole Ditch within and surrounding the project area have additional components related to water control including culverts, metal pipes, sluice gates, and bridges. The first designated feature of the Waiahole Ditch for the current project, **SIHP # 50-80-09-2268 Feature E**, consists of a culvert associated with the ditch, documented in the southwest portion of the project area (Figure 102 through Figure 105). The culvert consists of mortared cut basalt blocks, two to three courses high, constructed around a largely buried concrete drain pipe (see Figure 102). Both sides of the tunnel are faced, and a concrete slab extends over top of the culvert. The concrete slab is approximately 6.5 m long and 1.5 m wide (Figure 103). The faces of the culvert are approximately 3.5 m wide, and the height of the exposed portion is 1.3 m. The observed portion of the mouth of the pipe is 50 cm in diameter. These components are in fair condition. The southeast portion of the concrete slab is damaged due to partial collapse.

SIHP # 50-80-09-2268 Feature F of the ditch system was identified as part of a two-course mortared basalt portion of the ditch in the central portion of the southwest project area (Figure 106 through Figure 111). Feature F consists of a portion of the ditch with pipes, cross beams, and sluice gate components. A metal pipe extends north-south within the ditch, and two metal cross beams extend perpendicular across the ditch face, positioned under the metal pipe directly overlying the ditch surface (see Figure 107). The metal pipe extends beyond both of the cross beams. The metal cross beams are 10 cm wide and are spaced 7.1 m apart. Additionally, a channel extends southeast from the main ditch, which is blocked by a sluice gate feature, the wooden gate of which is still intact (see Figure 108 and Figure 109). The main ditch measures 1.2 m wide, and the channel extending from it is 0.7 m wide, widening to 1.7 m as it extends to the southeast. Depths of the ditch range from 40 to 80 cm, due to the accumulation of sediment in the base of the ditch. The sluice gate component is 0.7 m wide and 0.5 m tall. Notches for a second sluice gate are present in the concrete approximately 12 cm from the intact sluice gate component. The wood of this second sluice feature is no longer intact. Additional sluice notches were noted inside the main ditch as well, approximately 0.5 m southwest of the channel portion. A representative plan view and profile were completed for this section of the ditch (see Figure 110 and Figure 111). All of these components including this portion of the Waiahole Ditch are in fair condition.

SIHP # 50-80-09-2268 Feature G, a second, similar portion of the ditch was documented approximately 18 m northeast of Feature F (Figure 112 and Figure 113). Feature G consists of a mortared cut basalt portion of the ditch, with three pipes (one parallel and two perpendicular), and sluice gate remnants. Here the ditch is oriented north-south and measures 1.3 m wide and ranges from 33 cm to 45 cm deep. Note that much sediment has accumulated in the base of the ditch. A channel extends east off the main ditch which measures 0.7 m wide and 67 cm deep. The same metal pipe detailed above extends parallel along the east edge of the ditch. Additionally, two 5 cm pipes extend perpendicular across the ditch 30 cm north of the east-extending channel, spaced 1.2 m apart. There are notches for two sluice gate features in the east-extending channel.

SIHP # 50-80-09-2268 Feature H consists of a metal drainage flume feature documented in the northern portion of the southwest project area (Figure 115 and Figure 114). Feature H is

Figure 102. SIHP # 50-80-09-2268 Feature E, culvert and bridge components of the Waiahole Ditch in southern project area, view to northeast

Figure 103. SIHP # 50-80-09-2268 Feature E bridge overlying culvert of Waiahole Ditch in southern project area, view to east

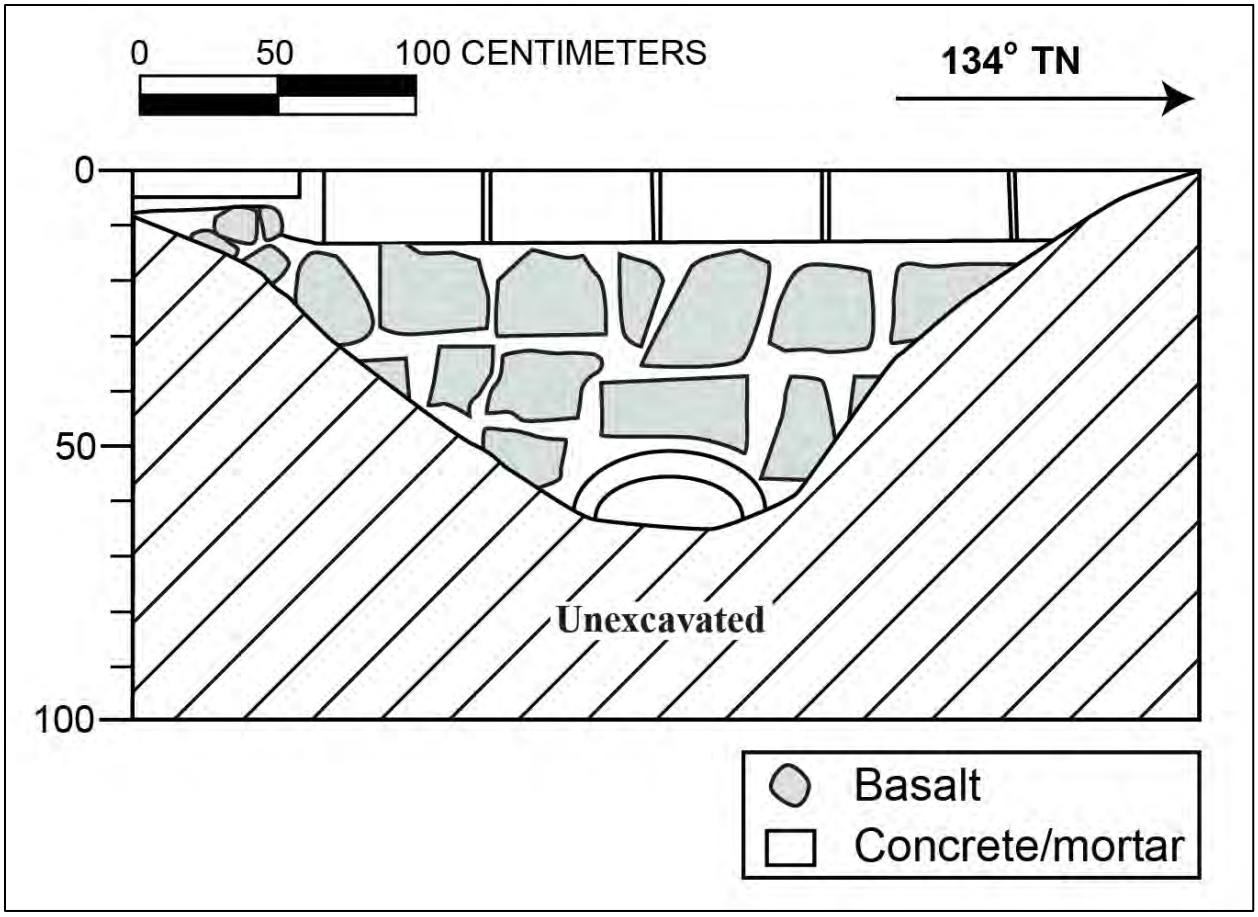

Figure 104. SIHP # 50-80-09-2268 Feature E southwest face of culvert profile

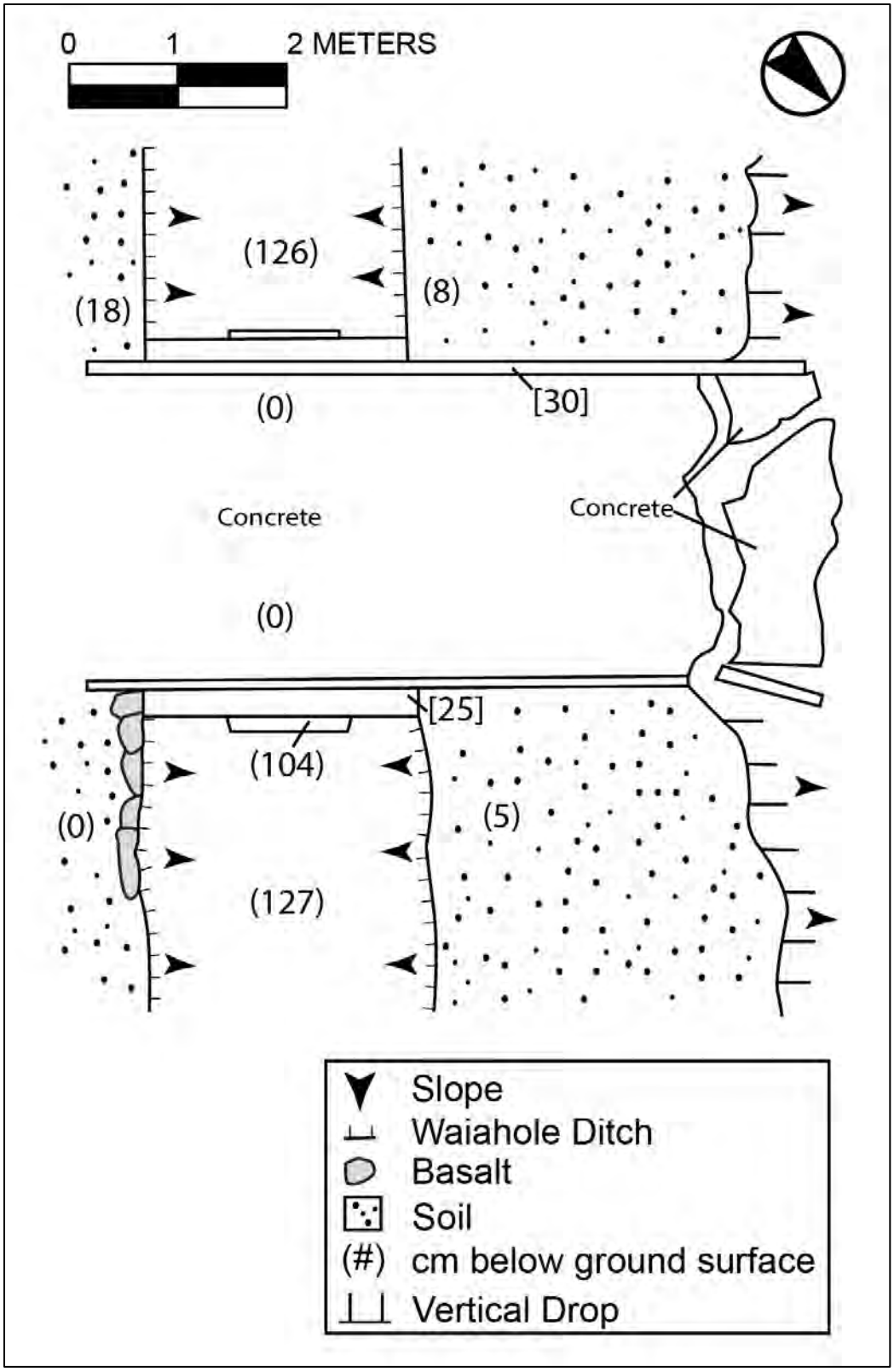

Figure 105. SIHP # 50-80-09-2268 Feature E culvert and ditch plan map

Figure 106. SIHP # 50-80-09-2268 Feature F, basalt and mortar-lined ditch, with metal cross beam (right background), view to north

Figure 107. SIHP # 50-80-09-2268 Feature F, basalt and mortar ditch portion, with metal pipe and cross beam, view to south

Figure 108. Plan view of SIHP # 50-80-09-2268 Feature F, showing pipe, southeast channel, and sluice gate components

Figure 109. SIHP # 50-80-09-2268 Feature F, close-up of southeast channel and sluice gate component, view to north

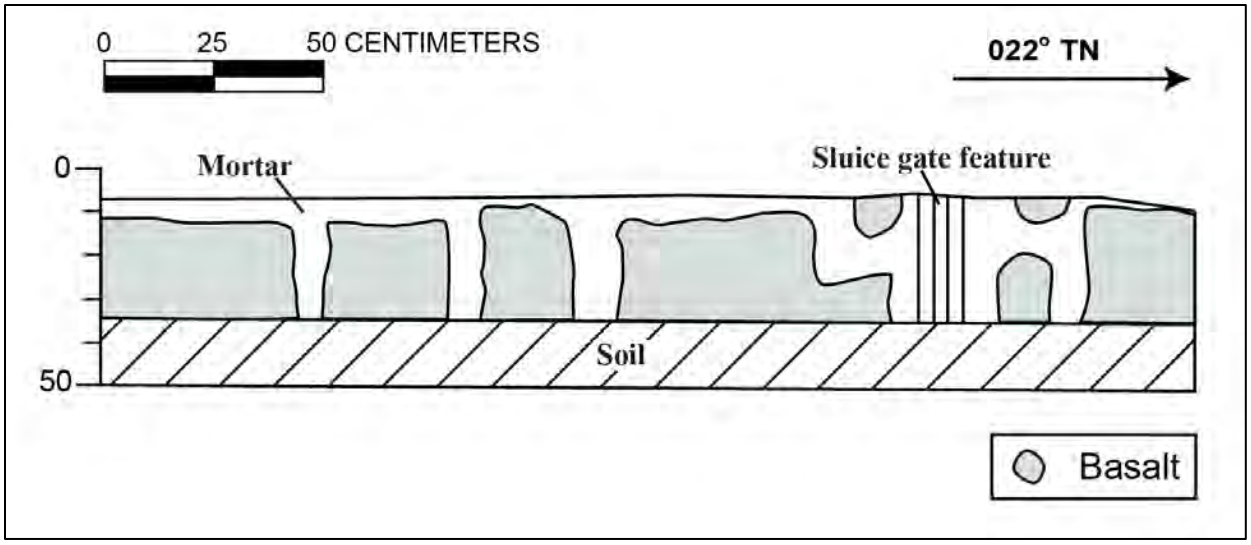

Figure 110. SIHP # 50-80-09-2268 Feature F, west wall of ditch representative profile

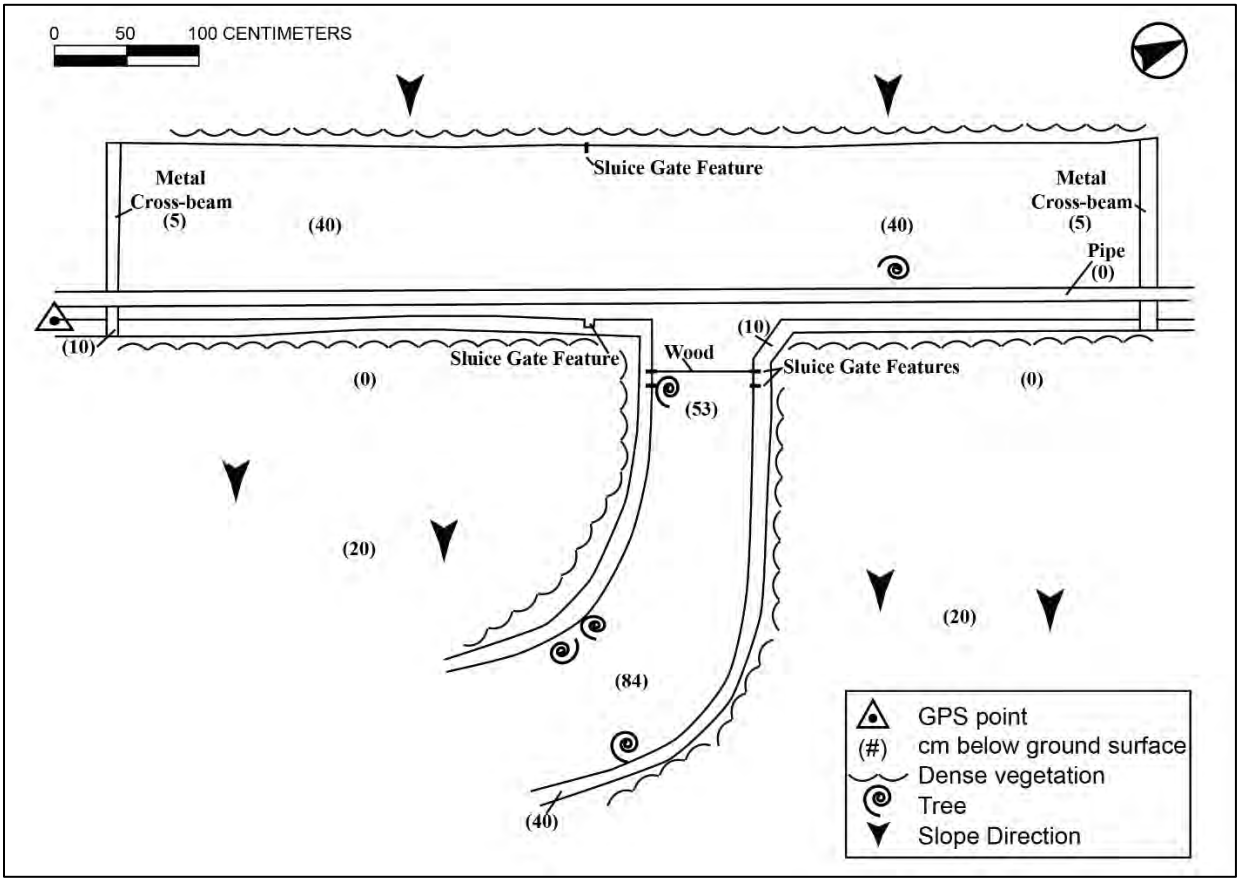

Figure 111. SIHP # 50-80-09-2268 Feature F plan map

Figure 112. SIHP # 50-80-09-2268 Feature G, showing sluice gate component and two metal pipes, view to east

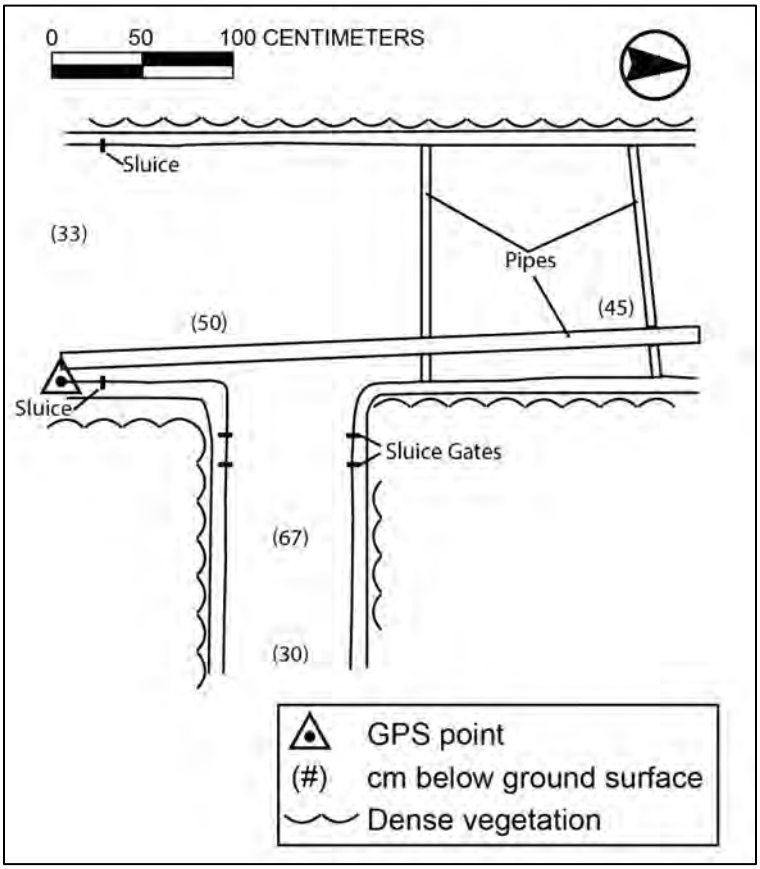

Figure 113. SIHP # 50-80-09-2268 Feature G plan map

Figure 114. Overview of SIHP # 50-80-09-2268 Feature H (left)

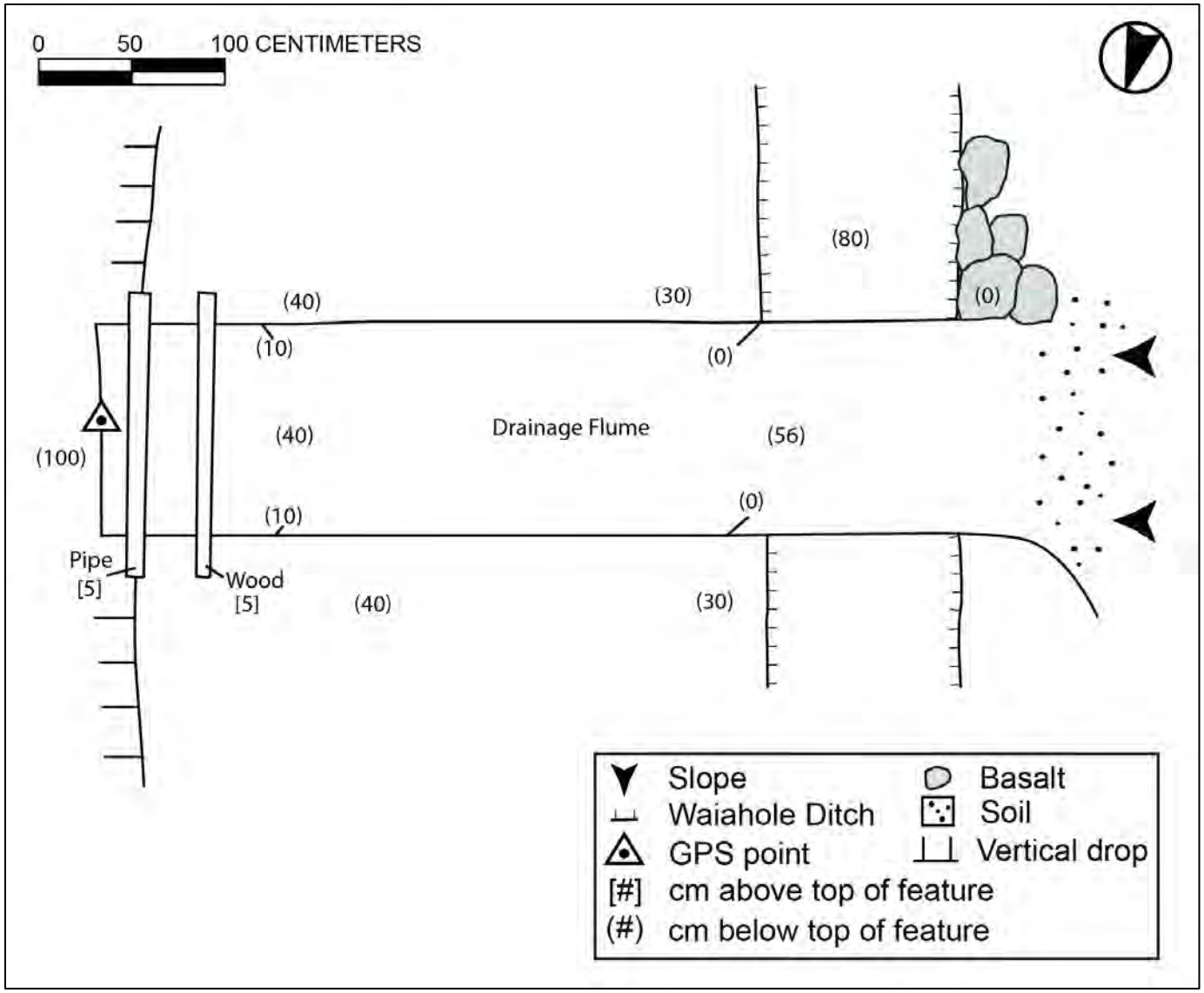

Figure 115. SIHP # 50-80-09-2268 Feature H plan map

oriented northeast-southwest and measures 1.1 m wide and 5.0 m long, and a maximum 56 cm deep (Figure 116). The flume extends toward a vertical drop, at one time funneling water into the gulch below. A decaying wood portion extends perpendicular over the northeast end of the metal chute. Approximately 20 cm from the wood, a metal pipe extends perpendicular over the top of the flume. At the southwest end of the chute, on the south side, there is a pile of mortar and basalt cobbles measuring 1 m wide and 90 cm tall (Figure 117). The flume extends over top of the Waiahole Ditch.

SIHP # 50-80-09-2268 Feature I consists of a portion of the ditch with several associated features, constructed to carry the water over the gulch in the area. This bridge component has four mortared basalt block pillars (Figure 119 through Figure 121). At one time an elevated metal half pipe connected the pillars, the middle of which appears to have collapsed. In the north end a portion of the metal in between the two pillars was still visible, and an incised line was noted, possibly a former space for a sluice gate or similar component (see Figure 120). The middle portion of this feature has largely collapsed, and with much of the footings obscured by earth. Approximately 3.5 m to the south, a basalt and mortar headwall and culvert were observed, measuring 2.5 m long, 20 cm wide, and 95 cm tall.

SIHP # 50-80-09-2268 Feature J is similar to Feature I, another area of components to carry the ditch over gulches in the area. The first component consists of four mortared basalt block pillars connected by an elevated concrete bridge (Figure 122 through Figure 124). The concrete has been entirely filled in with soil and is overgrown, and portions of the pillars are also obscured. A 12-cm metal pipe extends the entire length of this feature and beyond, resting on top of the *makai*/south pillars. The letters “B M +” are inscribed in the mortared surface of the northwestern pillar. Approximately 2 m east of this bridge component is a culvert constructed of mortared basalt, which measures 55 cm tall and 105 cm wide (see Figure 123). Only 80 cm of length is exposed, the remainder covered with earth; however, the tunnel appears to extend toward the ditch wall. Overall, the bridge components of Features J and K span an area approximately 53 m long.

SIHP # 50-80-09-2268 Feature K of the ditch system consists of a culvert and tunnel feature with intact metal sluice gate, along the northern boundary of the project area (Figure 125 through Figure 126). Feature K extends southeast off the ditch, extending under the access road, though the feature could not be identified on the other side of the road. Two concrete patches were noted in the road, which appear to have been used to cover collapsed portions of the tunnel. It is possible the entire tunnel has collapsed. The observable portion of the feature—from the head gate to the end of the second concrete patch—spans 3 m in length and is a maximum of 0.7 m wide. The first, fragmented concrete slab measures 95 cm long and 75 cm wide. The second concrete slab, which is in the middle of the road, measures 1.6 m long by 0.7 m wide. The head wall of Feature I measures 0.9 m long. Overall the feature is in fair condition, as portions of the concrete are fragmented and collapsing.

5.2.4 Significance

SIHP # 50-80-09-2268, Waiahole Ditch and associated features, has been previously assessed by a variety of studies under various criteria. See Section 7 for a full discussion of prior significance assessments. SIHP # 50-80-09-2268 is assessed as significant under HAR §13-284-6 Criteria a, c, and d. The Waiahole Ditch has yielded information on agricultural history of the area and contributed greatly to the development and evolution of the ‘Ewa Plain throughout its history,

Figure 116. SIHP # 50-80-09-2268 Feature H, drainage flume, along north edge of project area, view to northeast

Figure 117. Mortar and basalt pile south end of SIHP # 50-80-09-2268 Feature H, drainage flume, view to west

Figure 118. Collapsed bridge component of SIHP # 50-80-09-2268 Feature I, view to south

Figure 119. Collapsed bridge component of SIHP # 50-80-09-2268 Feature I, view to southwest

Figure 120. Close-up plan view showing metal portion, collapsed bridge component of SIHP # 50-80-09-2268 Feature I

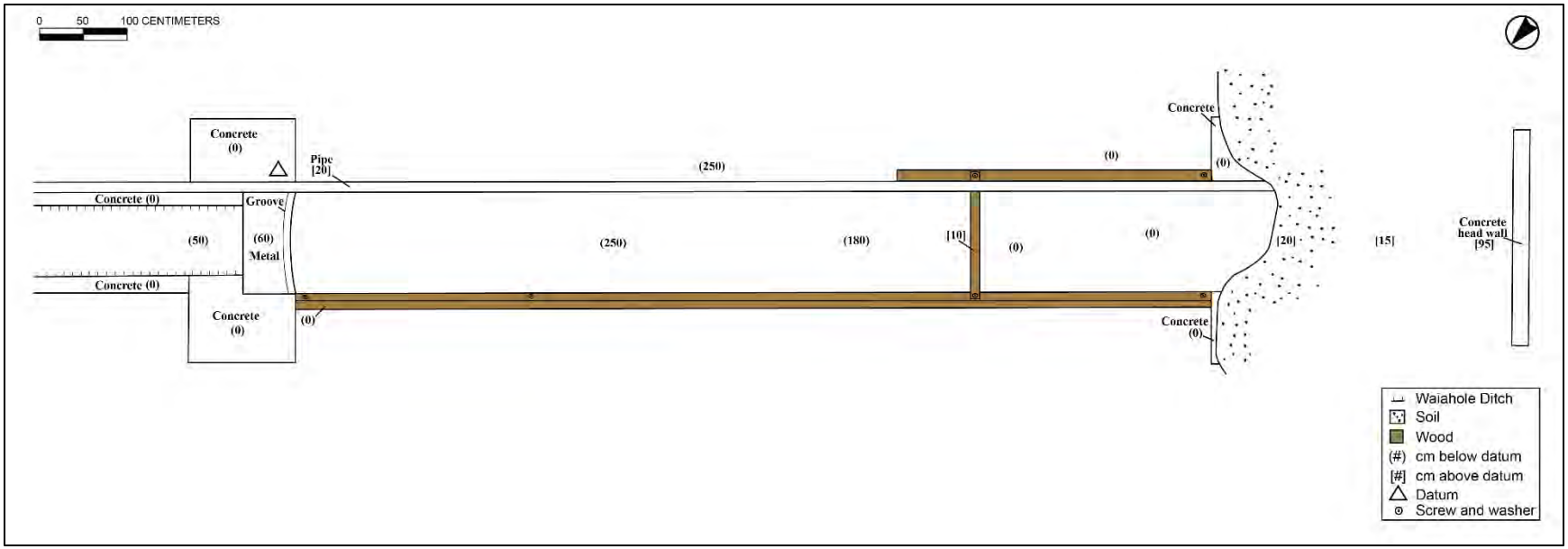

Figure 121. Plan map of SIHP # 50-80-08-2268 Feature I, showing portion of the Waiahole Ditch, collapsed bridge components, and head wall

Figure 122. Overview of bridge component of SIHP # 50-80-09-2268, Feature J, view to southwest

Figure 123. Culvert component of SIHP # 50-80-09-2268 Feature J documented east of bridge component, view to north

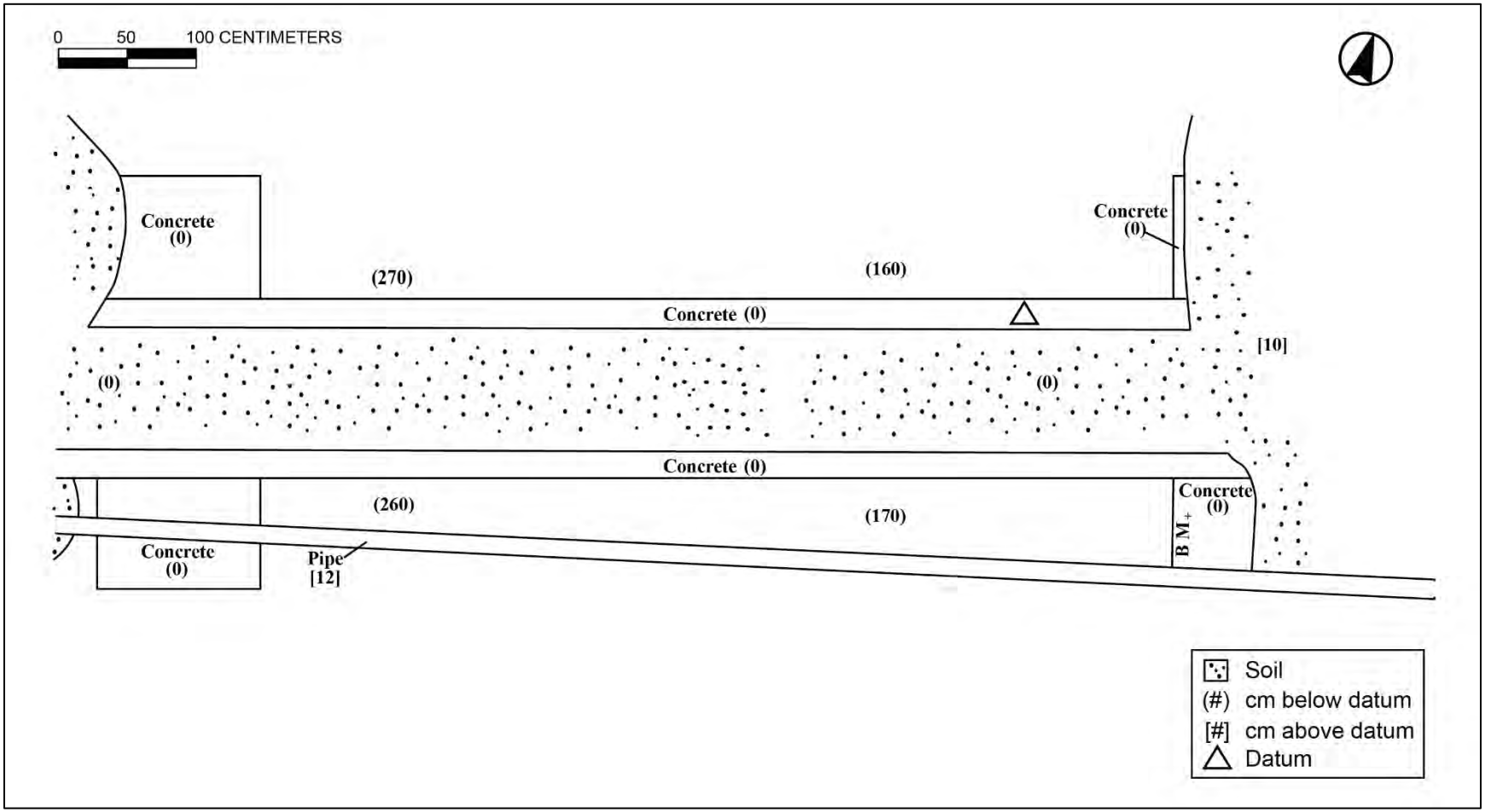

Figure 124. Plan map of SIHP # 50-80-09-2268 Feature J, bridge component

Figure 125. SIHP # 50-80-09-2268 Feature K, culvert and tunnel feature, view to north

Figure 126. SIHP # 50-80-09-2268 Feature K, showing culvert with intact sluice gate, view to east

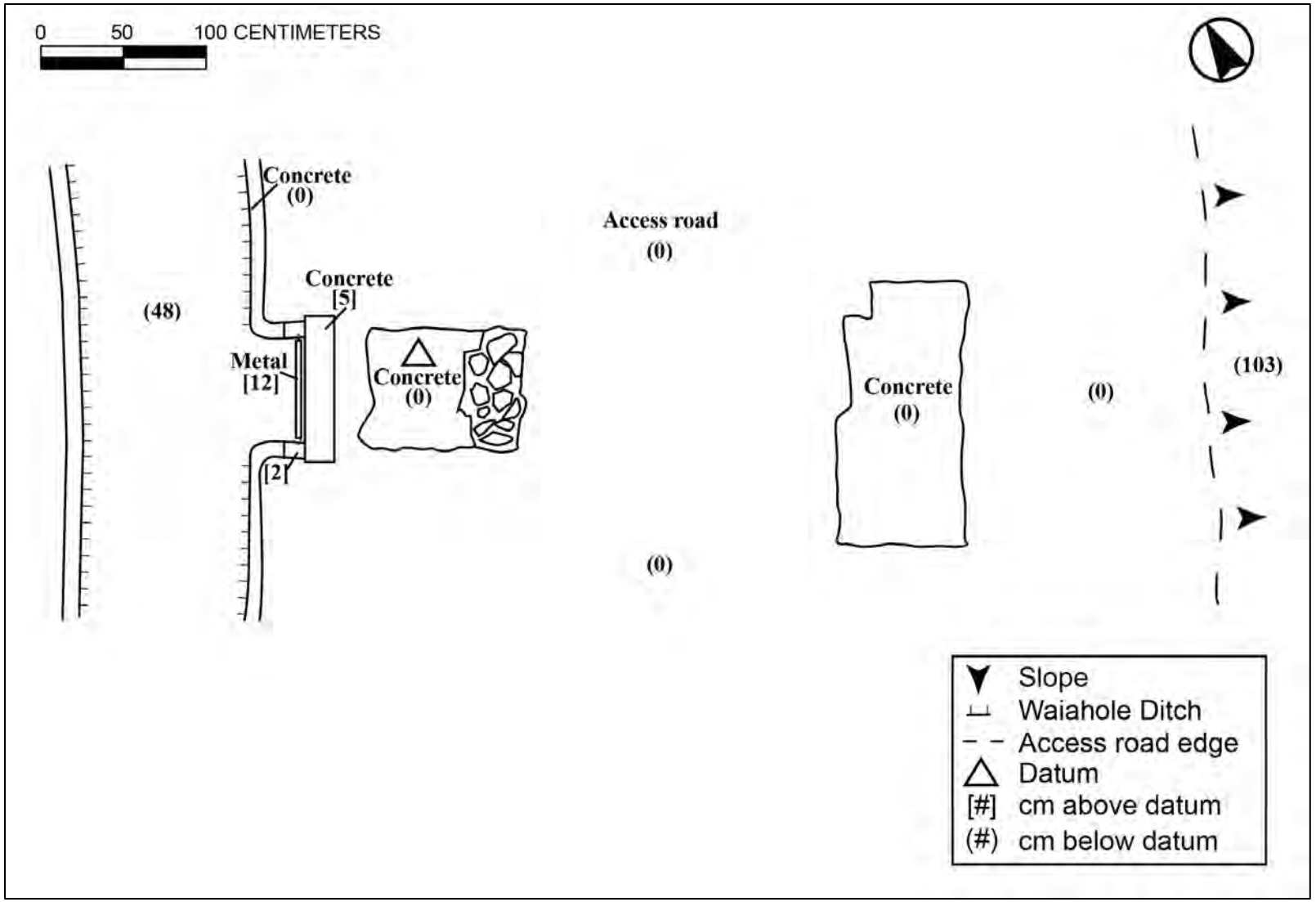

Figure 127. Plan map of SIHP # 50-80-09-2268 Feature K

and may continue to yield additional information on plantation-era history on O‘ahu. However, within the project area, the historic property only retains sufficient integrity of location, which is also diminished in portions of the project area due to erosion and neglect. While there are some portions that retain some integrity of design, materials, and workmanship within the project area, this integrity is diminished. The overall ditch is significant, however, the remnant portion of SIHP # 50-80-09--2268 within the project area does not retain sufficient integrity to be considered significant.

Section 6 Summary and Interpretation

At the request of Tetra Tech, Inc., and on behalf of AES Distributed Energy, CSH has prepared this AISR for the AES West O‘ahu Solar project, Honouliuli Ahupua‘a, ‘Ewa District, O‘ahu, TMK: [1] 9-2-002:007 (por.). The project area is on undeveloped lands in the southeastern foothills of the Wai‘anae Range, northeast of Pu‘u Makakilo and the Makakilo subdivision and about 600 m northwest of the intersection of the H-1 Freeway and the Kualaka‘i Parkway.

Background research indicates little traditional land use in the portion of Honouliuli Ahupua‘a in which the project area is situated. Large settlements were primarily concentrated near the coast, near marine and estuarine resources, or in the irrigated lowlands suitable for wetland cultivation. Any evidence of traditional land use in the area was likely wiped out by historic agricultural and ranching activities that lasted through the mid-twentieth century. The northeast portion of the project area and much of the surrounding land was occupied by Oahu Sugar Company fields by 1925. The Waiahole Ditch, constructed for much needed irrigation of the sugarcane fields, is known to extend through the current project area. Small plantation-related residential camps were the only settlements found in the upper slopes in the early twentieth century, with “Pump Camp 5” existing within the project area, according to historic maps. Various roads and fence lines related to agricultural and/or ranching activities in the region are known to have existed in the project area at one time. Archaeological studies in the vicinity of the project area have documented various plantation-era historic properties including walls, alignments, mounds, ditches and other irrigation features, as well as portions of the Waiahole Ditch (SIHP # 50-80-09-2268).

Fieldwork included 100% pedestrian inspection of the project area, GPS data collection, and documentation of surface historic properties. Two previously identified historic properties were documented within the project area: SIHP # 50-80-08-5593, historic irrigation and plantation infrastructure, and SIHP # 50-80-09-2268, the Waiahole Ditch System. The AIS documented two features of SIHP # 50-80-08-5593: drain-pipes (Feature 1) and a complex of components related to the pump house and mill located just southeast of the project area (Features 2A through 2E). No indications of traditional land use were observed. No remnants of Pump Camp 5 were identified. The majority of the SIHP # 50-80-08-5593 features were identified extending through the northern portion of the project area.

The Waiahole Ditch System (SIHP # 50-80-09-2268) and associated components were identified extending through the western portion of the project area. The AIS documented seven remnant features of SIHP # 50-80-09-2268: a culvert and bridge (Feature E), two ditch portions with metal pipes and sluice gate components (Features F and G), a metal drainage flume (Feature H), two bridge components (Features I and J), and a culvert feature with sluice gate (Feature K). The remnant portion of SIHP # 50-80-09-2268 within the project area is at the far west end of the ditch system. It is not a portion of the continuous transmission line Waiahole Ditch (most of which is still in use), but rather extends from a reservoir fed directly from the ditch that extends from Windward O‘ahu. From the reservoir, Ko‘olau water is fed into various ditches. While the remnant of the ditch within the project area is undoubtedly part of the Waiahole Ditch System as a whole, the portion within the project area and its components are in remnant condition. Additional portions of the remnant ditch and associated components are still extant in the vicinity, outside the project area.

The results of this AIS correspond with the history of the slopes of Honouliuli Ahupua‘a, representing historic agriculture, ranching, and related activities throughout the twentieth century.

Section 7 Significance Assessments

Historic property significance is evaluated and assessed based on the five State of Hawai‘i historic property significance criteria. To be considered significant, a historic property must possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and meet one or more of the following broad cultural/historic significance criteria (in accordance with HAR §13-284-6):

a. Be associated with events that have made an important contribution to the broad patterns of our history;

b. Be associated with the lives of persons important in our past;

c. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value;

d. Have yielded, or is likely to yield, information important for research on prehistory or history; or

e. Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

Two previously identified historic properties were documented within the project area. Table 4 lists the historic properties along with their significance assessments and specific mitigation commitments. These mitigation commitments are included in this AISR for the review and concurrence of the SHPD.

SIHP # 50-80-08-5593, historic irrigation system and plantation infrastructure, was previously assessed by Dega et al. (1998) as significant under Hawai‘i State historic property significance Criteria a (be associated with events that have made an important contribution to the broad patterns of our history) and d (has yielded, or may be likely to yield, information important for research on prehistory or history). The current study assesses SIHP # 50-80-08-5593 as significant only under Criterion d. This historic property has yielded information on land utilization and agricultural history of the ‘Ewa Plain. However, it is not associated with specific, impactful events in the area, unlike the Waiahole Ditch, which immeasurably altered the entirety of the landscape. Much of the irrigation system has been buried and destroyed by erosion and livestock. Therefore, the historic property possesses diminished but sufficient integrity of location, design, materials, and workmanship, for which it’s significant.

SIHP # 50-80-09-2268, The Waiahole Ditch System, has a long history of significance evaluation (Table 5).

- The Bishop Museum Public Archaeology Section Applied Research Group (Goodman and Nees 1991) conducted archaeological reconnaissance and inventory surveys of 3,600 acres in the uplands of Waiawa Ahupua‘a, and touched on the Waiahole Ditch (SIHP # 50-80-09-2268) as it crossed their project area (Goodman and Nees 1991:64). The only

Table 4. Archaeological historic property integrity, significance, and project-specific mitigation commitments

SIHP #	Formal Type/ Description	Integrity							Significance	Mitigation Commitments
		Location	Design	Setting	Materials	Workmanship	Feeling	Association		
50-80-08-5593	Historic irrigation system and plantation infrastructure	Y	Y	N	Y	Y	N	N	d	No further work
50-80-09-2268	Waiahole Ditch System	Y	N	N	N	N	N	N	a, c, and d	No further work

Table 5. Significance evaluations for portions of the Waiahole Ditch

Study or Review	General Location	Evaluation in terms of HAR criteria	Evaluation in terms of National/Hawai‘i Register of Historic Places (NRHP/HRHP) criteria
Goodman and Need 1991	3,600 acres in uplands of Waiawa Ahupua‘a	Significance not evaluated: “significance […] has been realized through field and archival research and no further work is recommended”	
Hammatt et al. 1996	1,339 acres within portions of Waipio and Waiawa Ahupua‘a	Significance not evaluated: “If the portion of the Waiahole Ditch which crosses the two parcels of the project area is ever to be impacted by future development, the State Historic Preservation Division should be notified beforehand, so that appropriate mitigative measures, if necessary, can be established.”	
Dega et al. 1998	Proposed University of Hawai‘i West O‘ahu Campus project	Significance not evaluated: “The Waiahole Ditch System has previously been assessed as significant” (refers to Goodman and Nees 1991)	
Tulchin and Hammatt 2004	86-acres at Pālehua in Makakilo	Not evaluated under HAR criteria	Significant under NRHP and HRHP Criterion A and D
Tulchin et al. 2009	Koa Ridge project	HAR significance not evaluated	Significant under NRHP and HRHP Criteria A, C, and D
SHPD acceptance letter for Tulchin et al. 2009	Koa Ridge project	SHPD acceptance letter for this study makes no reference to site significance.	
Hunkin and Hammatt 2009	Makakilo Dr Extension project	HAR significance not evaluated	Significant under NRHP and HRHP Criteria A, C, and D
SHPD review letter for Hunkin and Hammatt 2009	Makakilo Dr Extension project	HAR significance not evaluated	Significant under NRHP and HRHP Criteria A, B, and D
Shideler and Hammatt 2018	Koa Ridge project	HAR significance not evaluated	Evaluated integrity; supports significance assessment made in Tulchin et al. 2009 as significant under NRHP and HRHP Criteria A, C, and D

Study or Review	General Location	Evaluation in terms of HAR criteria	Evaluation in terms of National/Hawai‘i Register of Historic Places (NRHP/HRHP) criteria
SHPD review letter for Shideler and Hammatt 2018	Koa Ridge project	Assessed as significant pursuant to HAR §13-284-6 Criteria a, c, and d	NRHP and HRHP significance not addressed
Zapor et al. 2018	Makakilo Dr Extension project	Assessed as significant pursuant to HAR §13-275-6, under Criteria a, c, and d	Evaluated for listing on the NRHP and HRHP pursuant to 36 CFR 60.4 and HAR §13-198-8

discussion of significance is in their statement “The significance of the following sites has been realized through field and archival research and no further work is recommended: State Sites […] 2268; B4-15 (the Waiahole Ditch)” (Goodman and Nees 1991:137). Thus, while the Waiahole Ditch is assigned an SIHP #, there is really no discussion of significance of the Waiahole Ditch in the Goodman and Nees (1991) study.

- A Hammatt et al. (1996) archaeological inventory survey of 1,339 acres of Castle & Cooke lands within portions of Waipio and Waiawa Ahupua‘a discusses that portion of the Waiahole Ditch within the Koa Ridge area west of the H-2 Freeway. At the time of that study, it was anticipated that a portion of the ditch (which conveyed large volumes of water of significant import) would not be impacted. While the significance of the Waiahole Ditch was noted, the significance was not formally evaluated. It was simply asserted that “If the portion of the Waiahole Ditch which crosses the two parcels of the project area is ever to be impacted by future development, the State Historic Preservation Division should be notified beforehand, so that appropriate mitigative measures, if necessary, can be established” (Hammatt et al. 1996:55).
- The Dega et al. study asserts (1998:22), “The Waiahole Ditch System has previously been assessed as significant (see Goodman and Nees 1991).” The Dega et al. study offers no further discussion of the significance of the Waiahole Ditch System (and avoids any substantive comment regarding the conclusion of the referenced Goodman and Nees 1991 study).
- A Tulchin and Hammatt 2004 AIS of an approximately 86-acre proposed Pālehua Community Association project identified a portion of the Waiahole Ditch System. SIHP # 50-80-09-2268 was evaluated as significant under NRHP and HRHP Criteria A and D (Tulchin and Hammatt 2004:65).
- The Tulchin et al. (2009:66–68) archaeological inventory survey addresses that portion of the Waiahole Ditch within the Koa Ridge project area east of the H-2 Freeway crossing a small northern tributary gulch of Pānakauahi Gulch. Two features have been designated for the Waiahole Ditch during the Koa Ridge project (but without any letter or numeric designations): one for the main ditch including both the open ditch and Pānakauahi siphon and one feature designation including two 1-m long basalt boulder support walls.

  The 2009 archaeological inventory survey provides the following assessment of significance:

  > SIHP # 50-80-09-2268 is assessed as significant under Criterion A (associated with events that have made an important contribution to the broad patterns of our history), Criterion C (embody the distinctive characteristics of a type period or method of construction), and Criterion D (have yielded, or may be likely to yield information important in prehistory or history) of the National and Hawai‘i Registers of Historic Places evaluation criteria. [Tulchin et al. 2009:66]

  The integrity of SIHP # 50-80-09-2268, Waiahole Ditch was not assessed at the time of identification (Hammatt et al. 1996:47–50; Tulchin et al. 2009:89–91). The SHPD acceptance letter for this study dated 10 February 2009 (LOG NO. 2009.0605, DOC. NO. 0902WT21) makes no reference to historic property significance.

- An archaeological inventory survey for a Makakilo Drive Extension project (Hunkin and Hammatt 2009) discusses a portion of the Waiahole Ditch and concludes, “The SIHP # 50-80-09-2268 alignment continues to be significant under criteria A, C, and D” with reference to the criteria established for the NRHP and HRHP (Hunkin and Hammatt 2009:65).

  The SHPD acceptance letter for this AIS dated 18 August 2009 (LOG NO. 2008.3209, DOC. NO. 0908NM28) asserts that SIHP # 50-80-09-2268, the Waiahole Ditch System is eligible for listing on the NRHP and HRHP under Criteria A, B, and D (the AIS declares significance under Criteria A, C, and D and the acceptance letter specifies A, B, and D).

- A preservation plan for the Koa Ridge project (Shideler and Hammatt 2018) addressed a portion of the SIHP # 50-80-09-2268, Waiahole Ditch System. The report evaluated the significance of the Waiahole Ditch System as follows:

  > SIHP # -7046 is evaluated as possessing integrity of location, design, materials, and workmanship. The setting is evaluated as lacking integrity as the character of the place as a locus of agriculture has been lost and the vegetation is much different. The feeling of agricultural life of the historic property has been lost. The historic property has lost its association with the events and activities of agriculture.
  >
  > The relationship of the historic property to the local history of agriculture and the integrity of location, design, materials, and workmanship is evaluated as supporting the site significance assessment made in 2009. [Shideler and Hammatt 2018:20]

  So while not spelled out per se in the 2018 preservation plan, the preservation plan supports the significance assessment made in 2009 “assessed as significant under Criterion A\[…] Criterion C […] and Criterion D of the NRHP and HRHP evaluation criteria.”

  The SHPD acceptance letter for this preservation plan dated 28 February 2018 (Log No. 2018.00220, Doc. No. 1802JA04) asserts slightly differently that “Site 2268 retains integrity of location, design, materials, and workmanship and is assessed as significant under HAR §13-284-6 Criteria a, c, and d.”

- A supplemental archaeological inventory survey for the Makakilo Drive Extension project (Zapor et al. 2018) further documented previously identified components of the Waiahole Ditch and documented one newly identified feature. Zapor et al. (2018) assess the ditch as significant pursuant to HAR §13-275-6, under Criteria a, c, and d.

Based on the findings of this AIS report, SIHP # 50-80-09-2268 is assessed as significant under HAR §13-284-6 Criteria a, c, and d. The historic property has yielded information on the agricultural history of the area and contributed greatly to the development and evolution of the ‘Ewa Plain throughout its history. However, within the project area, the historic property only retains sufficient integrity of location, which is also diminished in portions of the project area due to erosion and neglect. While there are some portions that retain some integrity of design, materials, and workmanship within the project area, this integrity is very diminished. While the overall ditch is significant, the remnant portion of SIHP # 50-80-09-2268 within the project area does not retain sufficient integrity to be considered significant.

Section 8 Project Effect and Mitigation Commitments

8.1 Project Effect

Two historic properties (SIHP #s 50-80-08-5593 and 50-80-09-2268) were identified within the project area (the same as identified in a prior Dega et al. 1998 study). The portion of SIHP # 50-80-09-2268 within the project area does not retain sufficient integrity to be considered significant, and therefore no further work is recommended for the historic property. This is in keeping with the conclusions of the Dega et al. 1998 study and the SHPD review(s) that accepted that study (see Appendix A).

Sufficient information regarding the location, extent, function, and age of the portion of SIHP # 50-80-08-5593 within the project area has been generated by the current archaeological inventory survey investigation to mitigate any adverse effect caused by the proposed project.

Therefore, pursuant to HAR §13-284-7, the project-specific effect determination is “No historic properties affected.”

8.2 Mitigation Commitments

The proposed project will have no effect on significant historic properties within the project area, therefore no mitigation commitments are required.

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Appendix A SHPD Acceptance of the Dega et al. 1998 AIS

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

MICHAEL D. WILSON, CHAIRPERSON
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ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

February 3, 1999

Mr. Michael Dega, MA
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 777
Honolulu, Hawaii 96813

LOG NO: 22959
DOC NO: 9901EJ28

Dear Mr. Dega:

SUBJECT: **Historic Preservation Review of An Archaeological Inventory Survey of the University of Hawai'i, West O'ahu Campus, District of 'Ewa, Island of O'ahu, Hawaii'i (1998 Dega et al.)**
Honouliuli, 'Ewa, O'ahu
TMK: 9-2-002:001 por.; 9-2-004:005 por.

Thank you for the submittal of the replacement pages for the above report which completes the historic preservation review for this project. We can now conclude that the inventory survey was successfully executed. The report has been added to our library for public use.

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

FEB 9 1999

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
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HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

June 15, 1998

LOG NO: 21708
DOC NO: 9806SC02

Mr. Michael Dega, MA
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 777
Honolulu, Hawai'i, 96813

Dear Mr. Dega:

SUBJECT: Chapter 6E-8 Historic Preservation Review of a Draft Report on an Archaeological Inventory Survey of the Proposed University of Hawai'i, West O'ahu Campus Hono'uli'uli, 'Ewa, O'ahu
TMK: 9-2-002: 001 por.; 9-2-004: 005 por.

Thank you for the recent submission of a draft report documenting the results of an archaeological inventory survey of a 998-acre property near Makakilo, O'ahu (*An Archaeological Inventory Survey of the University of Hawai'i, West O'ahu Campus, District of 'Ewa, Island of O'ahu, Hawai'i [TMK: 9-2-2: 1 por.; 9-2-4: 5 por.]*. 1998. Dega et al.). We provide the following comments.

We believe that the survey was conducted acceptably, with a total of 2 historic sites found: 2268, the Waiahole Ditch, a historic irrigation feature; 5593, a complex of water transport and irrigation features related to 20th century sugar cane production. Before we can accept the report as final, however, we would like to see several minor corrections made. Once we receive these revisions (and they may be submitted on separate pages), we anticipate accepting the report and concluding that the survey was successfully executed.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:amk

JUN 15 1998

M. Dega
Page 2

ATTACHMENT I: SPECIFIC COMMENTS ON A REPORT ON THE INVENTORY SURVEY OF THE PROPOSED WEST O'AHU CAMPUS SITE SCIENTIFIC CONSULTANT SERVICES, INC.

Research Results

Page 17, Paragraph 2: The Waiahole Ditch system has a SIHP No. (50-80-09-2268) and was previously reported in Goodman & Nees (1991. *Archaeological Reconnaissance and Inventory Surveys of 3,500 Acres in Waiawa Ahupua'a, 'Ewa, O'ahu*). Please add this information and also indicate the location of the site in the project area on Figure 2. Also, could you please provide a summary statement of the numbers and types of features that compose SIHP No. 5593?

Page 18, Figure 7: Is this flume part of SIHP 2268 or 5593?

Page 20, Settlement Pattern: While the project area appears to contain only post-contact sites relating exclusively to commercial agriculture, a couple of additional points should be made in this discussion: (1) Were traditional habitation sites in 'Ewa permanent or temporary? (2) Were agricultural sites of any kind reported in some of the studies you cite? For example, you refer to Wolforth's (1998) recently presented evidence for buried pondfields at the West Loch project area.

Recommendations

General: This section will need to be divided into two, separately headed parts: Significance Assessments and Recommendations.

Page 21, Paragraph 4: In view of the above comments, this section will need to be revised to reflect the presence of two, not one, historic sites in the project area.

Attachment G
Cultural Impact Assessment Report

FINAL
Cultural Impact Assessment for the West Oahu Solar Project, Honouliuli Ahupua‘a, ‘Ewa District, O‘ahu TMK: [1] 9-2-002:007

Prepared for
AES Distributed Energy

Prepared by
Kellen Tanaka, B.S.,
David W. Shideler, M.A.,
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: HONOULIULI 172)

May 2020

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Management Summary

Reference	Cultural Impact Assessment for the West Oahu Solar Project, Honouliuli Ahupua‘a, ‘Ewa District, O‘ahu, TMK: [1] 9-2-002:007 (Tanaka et al. 2020)
Date	May 2020
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: HONOULIULI 172
Agencies	State of Hawai‘i, Department of Health, Office of Environmental Quality Control (DOH/OEQC) and State of Hawai‘i, Land Use Commission (LUC)
Land Jurisdiction	State of Hawai‘i
Project Proponent	AES Distributed Energy
Project Location	The project area is on undeveloped lands located in the southeastern foothills of the Wai‘anae Range, northeast of Pu‘u Makakilo and the Makakilo subdivision and about 600 m northwest of the intersection of the H-1 freeway and the Kualakai Parkway. The project area is depicted on a portion of the 2013 Ewa and Schofield Barracks U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Project Description	The West Oahu Solar project consists of an approximately 12.5-megawatt (MW) ground-mounted solar photovoltaic system, coupled with a 50 MW-hour battery energy storage system (BESS) and related interconnection and ancillary facilities. The solar photovoltaic system would include a series of panels arranged into arrays consisting of evenly spaced rows. The panels would be mounted on a racking system installed on posts. The battery storage system would consist of containerized lithium-ion battery units and inverters distributed throughout the project area. The project would connect to a substation via underground electrical conduit. The substation would be constructed adjacent to and would interconnect with an existing Hawaiian Electric Company (HECO) 46kV transmission line that traverses the site. The project would be accessed via the existing gated entry off Kualakai Parkway (near the intersection with Interstate H-1) and would utilize a network of existing and new onsite access roads. Some road improvements may be needed to facilitate access within the project area. In addition, some site grading would be needed to accommodate the project facilities and to comply with stormwater and civil engineering requirements. In December 2019, CSH was notified of a slight modification to the project area to include additional areas along the perimeter of the project area, as well as maintenance of the existing roadways approaching the project area from the southeast.
Project Acreage	The project area is approximately 101.62 acres (41.12 hectares)

Document Purpose	This cultural impact assessment (CIA) was prepared to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the proposed project’s potential effect on cultural beliefs, practices, and resources. Through document research and cultural consultation efforts, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts to cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control’s *Guidelines for Assessing Cultural Impacts*) which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance Criterion e, pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that “have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity” (HAR §13-275-6 and §13-284-6). The document will likely also support the project’s historic preservation review under HRS §6E and §6E-8, and HAR §13-275 and §13-284. The document is also intended to support the discretionary land use permitting process including a State Special Use Permit (SUP) from the Land Use Commission (LUC).
Results of Background Research	Background research for this study yielded the following results, presented in approximate chronological order: 1. Honouliuli is the largest *ahupua‘a* (land division usually extending from the uplands to the sea) in the *moku* (district) of ‘Ewa. Honouliuli translates literally as “dark water,” “dark bay,” or “blue harbor,” and thus is named for the waters of Pearl Harbor which marks the eastern boundary of the *ahupua‘a* (Jarrett 1930:22). Another source translates Honouliuli as “The blue bays or inlets” (*Saturday Press*, 11 August 1883). Honouliuli appears in the “Mo‘olelo of Lepeamoa,” the chicken-girl of Pālama, where Honouliuli is the name of the husband of the chiefess Kapālama, and grandfather of Lepeamoa (Westervelt 1923:164–184). 2. Generally, Honouliuli was described as very hot and dry. Evidence for drought-like conditions are further supported by the relative lack of traditional rain names associated with Honouliuli Ahupua‘a. The Nāulu rain is the only known associated rain name for Honouliuli. Due to the lack of rainwater, freshwater resources were accessed via a karstic system. 3. In traditional Hawaiian times, the areas of exposed coral (Pleistocene limestone) outcrop were undoubtedly more extensive.

	According to McAllister (1933), holes and pits in the coral were generally accessed for water, while larger pits, often containing soil, were used for cultivation. McAllister additionally remarked that at the time of his 1930s survey *mai‘a* (banana; *Musaceae*) and *kō* (sugarcane; *Saccharum officinarum*) were being cultivated within the pit caves (sinkholes) (McAllister 1933:109). 4. The traditional *ka‘ao* (legends) associated with the area speak of the *akua* (godly) brothers, Kāne and Kanaloa. It was their supernatural feat of hurling *pōhaku* (stone) across the island that determined the boundaries of land divisions (Sterling and Summers 1987:1). Additional *mo‘olelo* (stories) speak of Hi‘iaka and her travels across the plains of ‘Ewa. In particular, the *wahi pana* (storied place) of Kaupe‘a (located south of the current project area) is described. Kamakau describes Kaupe‘a as a wide plain where a grove of *wiliwili* (*Erythrina sandwicensis*) stands (Kamakau 1991a:47). This plain is an *ao kuewa*, a realm belonging to homeless souls. In general, the *kama‘āina* (native born) of both Honouliuli Ahupua‘a and ‘Ewa District made a point to avoid this place. 5. Pu‘uokapolei is a prominent hill located on the ‘Ewa coastal plain that was the primary landmark for travelers on the trail running from Pearl Harbor to Wai‘anae. A *heiau* (pre-Christian place of worship) was once on the summit of the hill, however, by the time of McAllister’s survey of O‘ahu it had been destroyed (McAllister 1933:108). The hill was also used as a point of solar reference or as a place for celestial observations of the winter and summer solstice. A ceremony at a *heiau* on Pu‘uokapolei provides a vantage point to capture the sun setting directly behind Pu‘ula‘ila‘i, a peak farther west in the Wai‘anae Range. A coinciding ceremony at Kūpalaha Heiau in Waikīkī captures the same essence as the sun sets behind Pu‘uokapolei. 6. Additional *heiau* located within Honouliuli included Pu‘u Ku‘ua located at Palikea, in addition to two unidentified *heiau*. These two unidentified *heiau* are located at the foot of Pu‘u Kanehoa and Pu‘u Kuina, respectively. 7. In later historic times, a network of trails encircled and crossed the Wai‘anae Range, allowing passage from West Loch to the Honouliuli lowlands, past Pu‘uokapolei and Waimānalo Gulch to the Wai‘anae coast and onward circumscribing the shoreline of O‘ahu (‘Ī‘ī 1959:96–98). The main trail along the south shore of O‘ahu would have been approximately 1.5 km to the southeast. A main trail extending up the central valley of O‘ahu would have been approximately 3 km to the east. The 1825 Malden map shows

	a trail extending from the main trail along the south shore of O‘ahu into the uplands in the Pālehua area as passing just a couple hundred meters to the southwest of the project area. 8. The rich resources of Pu‘uloa—the fisheries in the lochs, the shoreline fishponds, the numerous springs, and the irrigated lands along the streams—made ‘Ewa a prize for competing chiefs. ‘Ewa Moku was also a political center and home to many chiefs in its day. Oral accounts of *ali‘i* (royalty) recorded by Hawaiian historian Samuel Kamakau date back to at least the twelfth century. *Ali‘i* associated with Honouliuli and greater ‘Ewa Moku included Kākuhihewa, Keaunui, Lakona, Mā‘ilikūkahi, and Kahahana. 9. In early historic times, the population of Honouliuli was concentrated at the western edge of West Loch in the vicinity of Kapapapuhi Point in the “Honouliuli Taro Lands.” This area was clearly a major focus of population due to the abundance of fish and shellfish resources in close proximity to a wide expanse of well-irrigated bottomland suitable for wetland taro cultivation. 10. Early foreign accounts describe the southwest coast of O‘ahu, including Honouliuli Ahupua‘a, as an area “a little distance from the sea, the soil is rich and all the necessaries of life are abundantly produced” (Vancouver 1798:215). A sailor among Vancouver’s crew observed, however, that “from the number of houses within the harbour it should seem to be very populous; but the very few inhabitants who made their appearance were an indication of the contrary” (Vancouver 1798:216). 11. Following the Māhele of 1848, 99 individual land claims in the *ahupua‘a* of Honouliuli were registered and awarded by King Kamehameha III. No *kuleana* land claims were made for land within the current project area or vicinity. The vast majority of the Land Commission Awards (LCA) were located in Honouliuli near the taro lands of the *‘ili* (land division, smaller than an *ahupua‘a*) of Pu‘uloa and the Pu‘uloa Salt Works. The largest award (Royal Patent 6071, LCA 11216, *‘Āpana* [parcel] 8) in Honouliuli Ahupua‘a was granted to Miriam Ke‘ahi-Kuni Kekau‘onohi on January 1848 (Native Register 1848) who acquired a deed to all unclaimed land within the *ahupua‘a*, including the present project area. 12. Beginning with the time of Western Contact, however, Hawaiian populations were introduced to many virulent western diseases which began to decimate the native populations. Thus, four years following the 1832 census, the ‘Ewa population had dropped to 3,423 (Schmitt 1973:9, 36), “a decrease of 592 in 4 years” (Ewa

	Station Reports 1836). Between 1848 and 1853, there was a series of epidemics of measles, influenza, and whooping cough that often wiped out whole villages. 13. With the increasing foreign interests on O‘ahu Island during the last half of the nineteenth century, an array of agricultural enterprises were attempted. In 1871, John Coney rented the lands of Honouliuli to James Dowsett and John Meek, who used the land for cattle grazing. In 1877, James Campbell purchased most of Honouliuli Ahupua‘a for a total of $95,000. 14. By 1889, the Ewa Plantation Company was established and lands throughout Honouliuli were designated for sugarcane cultivation. Sugar production exploded with the successful drilling of an artesian well by James Campbell on the ‘Ewa Plain. Campbell’s first well was named Waianiani (“crystal waters”) by the *kama‘āina* of Honouliuli (Nellist 1925). By 1930, Ewa Plantation had drilled 70 artesian wells to irrigate cane lands; artesian wells provided fresh water to Honouliuli for nearly 60 years (Ho‘okuleana 2014). 15. In 1897, B.F. Dillingham established the Oahu Sugar Company (OSC) on 12,000 acres leased from the estates of John Papa ‘Ī‘ī, Bishop, and Robinson. The Oahu Sugar Company had over 900 field workers, composed of 44 Hawaiians, 473 Japanese, 399 Chinese, and 57 Portuguese. The first sugar crop was harvested in 1899, ushering in the sugar plantation era in Waipahu (Ohira 1997). Prior to commercial sugar cultivation, these lands were described as being “of near desert proportion until water was supplied from drilled artesian wells and the Waiahole Water project” (Condé and Best 1973:313). 16. The Waiahole Water Company was formally incorporated in 1913 and was originally a subsidiary of the Oahu Sugar Company. The Waiahole Ditch was designed by engineer Jorgen Jorgensen, with recommendations by engineer J.B. Lippencott and assisted by W.A. Wall. Upon its completion in 1916, the Waiahole Ditch was 35 km (21.9 miles) long and cost $2.3 million. The 32 million gallons of daily water enabled the O‘ahu Sugar Company to grow to “some 20 square miles […] ranging in elevation from 10 ft at the Waipio Peninsula […] to 700 ft at the Waiahole Ditch” (Condé and Best 1973:313). The ditch system is included on the state inventory of archaeological sites as Site no. 50-80-09-2268. The Waiahole Ditch System crossed through the western portion of the present project area. 17. The early twentieth century saw the lands of Honouliuli heavily utilized by both civilians and the U.S. military for transportation.

	The U.S. Government began acquiring the coastal lands of ‘Ewa for development of a naval base at Pearl Harbor. In 1901, the U.S. Congress formally ratified annexation of the Territory of Hawaii, and the first 1,356.01 acres of Pearl Harbor land were transferred to U.S. ownership. 18. In 1937, 18 miles of roads were built in the coastal Honouliuli area, and in 1939-1940 the U.S. bought 3,500 acres of land in this area (Landrum et al. 1997:62–67), to build several other military camps and installations, including Barbers Point Naval Air Station. 19. Following the Japanese Navy’s attack on Pearl Harbor on 7 December 1941, the Territory of Hawaii was declared under martial law and the writ of *habeas corpus* (the requirement for a person under arrest to be brought before a judge or into court) was suspended (U.S. Department of the Interior 2014:6–7). Persons of Japanese and European ancestry in Hawai‘i suspected of disloyalty to the United States were rounded up and imprisoned by the U.S. military and the Federal Bureau of Investigations (FBI) (U.S. Department of the Interior 2014:xii). In 1943, the Honouliuli Internment Camp was constructed to intern citizens, resident aliens, and prisoners of war. Located in Honouliuli Gulch, east of the project area, the camp was the “last, largest, and longest-used World War II confinement site in Hawai‘i,” holding approximately 320 internees and nearly 4,000 prisoners of war (U.S. Department of the Interior 2014:xiv).
Results of Community Consultation	CSH attempted to contact 70 Hawaiian organizations, agencies, and community members. Of the 12 people that responded, one provided written testimony and three *kama‘āina* (Native-born) and/or *kūpuna* (elders) participated in formal interviews for more in-depth contributions to the CIA. Consultation was received from community members as follows: 1. Christian Kaimanu Yee, *kama‘āina* and knowledgeable of *mo‘olelo* and *wahi pana* 2. Shad Kāne, member of Kapolei Hawaiian Civic Club, Chair of the O‘ahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Ali‘i Ai Moku of the Kapuāiwa Chapter of the Royal Order of Kamehameha Ekahi, and ‘Ewa Moku Representative on the State Aha Moku Advisory Committee. 3. Tom Berg, former Councilman, District 1 4. Lynette Paglinawan, cultural practitioner, educator, teaches a course on Native Hawaiian Healing at University of Hawai‘i West O‘ahu On 24 January 2020, an *In-Progress Draft Cultural Impact Assessment for the West O‘ahu Solar Project* was provided via email to two parties representing the Aha Moku Council, two parties at Nā Ala Hele, two

	parties at the State Historic Preservation Division (SHPD) History and Culture Branch, and Office of Hawaiian Affairs (OHA). The parties were invited to review and comment, or provide notification of their intent to comment, prior to the reports inclusion in the Draft Environmental Assessment. CSH followed up with the seven parties via email on 25 February 2020, and has not received any comments or notification of an intent to comment to date.
Impacts and Recommendations	Based on information gathered from the community consultation, participants voiced their concerns in a cultural context. 1. Mr. Shad Kāne stated he is not in opposition to the proposed project. He noted the project area has been previously disturbed by sugarcane production. 2. Mr. Tom Berg stated that the project has been “proposed on a pueo (owl) foraging and breeding ecosystem.” He noted that records indicate that per earliest colonial contact, the *pueo* is most abundant on the slopes from Pu‘u Kapua‘i to West Loch, in the area where the project is slated. He added that “Hunehune Gulch, Kaloi Gulch, and Honouliuli Gulch are migratory routes used by the pueo to go from mountain to sea to court, mate, forage, and raise their brood.” He stated that the proposed project will “encroach on prime pueo habitat-considered to be graded A+—“a ten (10)”—when it comes to the degree of pueo habitat in use on this project site.” 3. Mr. Berg added that the *pueo* has “a direct connection to Native Hawaiian family lineage in Ewa Beach,” noting the *pueo* is the *‘aumakua* for the Michael Lee family and their accounts which go back over seven generations are documented at the State Archives Building in Honolulu. 4. Mr. Berg also stated that the project site is “inhabited by the ōpe‘ape‘a [Hawaiian hoary bat, *Lasiurus cinereus semotus*] at various times of the seasons,” noting that in 1910, the State of Hawai‘i documented *‘ōpe‘ape‘a* within a half-mile of the project area. 5. Mr. Berg stated his concern that the “property in question will not receive the proper protocol to conclude no endangered species inhabit the area.” Mr. Berg recommended that “a thorough and complete protocol is adopted to repeat the inventory exercise for pueo and ‘ōpe‘ape‘a over the course of a calendar year would be in order so the project does not inadvertently contribute to more endangered species habitat loss.” He also recommended inquiring with Dr. Melissa Price and Dr. Javier Cotin of the Project Pueo Biologist Team and Department of Fish and Wildlife (DOFAW) Biologist Afsheen Siddiqi regarding *pueo* protocol. 6. Mr. Berg also expressed his concern for the possible negative aspects of light at an adjacent parcel. He expressed concern that a

	solar panel may reflect neighboring lighting operations into “the flight patterns of migrating birds and the *‘ōpe‘ape‘a* and *pueo* in particular need to be addressed.” 7. Ms. Lynette Paglinawan stated that “the area from Waimānalo Gulch over to Kapolei to the location of University of Hawai‘i West O‘ahu (UHWO) was known by very early residents there to be the place where “*ao kuewa*,” wandering spirits, congregated from *makai* [toward the sea] to *mauka* [toward the mountains] up Pālehua and especially near the cluster of *wiliwili* [*Erythrina sandwicensis*] trees in Kaupe‘a.” She expressed her concerns regarding the effects that the proposed project will have on the *ao kuewa*, which she believes are attracted to energy. She also expressed her concerns of the effect of the spirits on the solar panels, noting “that’s high energy. It will be like going to the game room.” She also noted that UHWO experiences numerous electrical problems due to the presence of these spirits. 8. Ms. Paglinawan noted that “this area where the University [of Hawai‘i West O‘ahu] is located has a lot of trails that go from *mauka-makai*, come from Honolulu going towards Nānākuli.” She stated that project proponents should be mindful of the locations of ancient trails, noting that the ancient trails are still used by spirits to travel from *mauka* to *makai* within Honuliuli Ahupua‘a. 9. Ms. Paglinawan recommended planting “a wall of trees” surrounding the proposed project area as restitution to the spirits who may be displaced by the proposed project. She also noted that planting of “a wall of trees” around the proposed project area would have other benefits including the production of oxygen and providing a habitat for Native Hawaiian birds. 10. Ms. Paglinawan also expressed her concerns regarding the psychological impacts for the people that encounter the spirits, noting trauma on workers at the UHWO, as well as, families who live in the area. She was particularly concerned for the children who encounter these spirits, noting her belief that children “see many more things than adults do.” 11. Project construction workers and all other personnel involved in the construction and related activities of the project should be informed of the possibility of inadvertent cultural finds, including human remains. In the event that any potential historic properties are identified during construction activities, all activities will cease and the SHPD will be notified pursuant to HAR §13-280-3. In the event that *iwi kūpuna* (Native Hawaiian skeletal remains) are identified, all earth moving activities in the area will stop, the area will be cordoned off, and the SHPD and Police Department will be notified pursuant to HAR §13-300-40. In addition, in the event of an inadvertent discovery of human remains, the completion of a burial

	treatment plan, in compliance with HAR §13-300 and HRS §6E-43, is recommended. 12. In the event that *iwi kūpuna* and/or cultural finds are encountered during construction, project proponents should consult with cultural and lineal descendants of the area to develop a reinterment plan and cultural preservation plan for proper cultural protocol, curation, and long-term maintenance.
Analysis	The following analysis is a summary of Section 8.4. Based on information gathered from the cultural and historical background and community consultation, no culturally significant resources were identified within the project area. At present, there is no documentation or testimony indicating traditional or customary Native Hawaiian rights are currently being exercised “for subsistence, cultural and religious purposes and possessed by ahupua‘a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778” (Hawai‘i State Constitution, Article XII, Section 7) within the project area. While no cultural resources, practices, or beliefs were identified as currently existing within the project area, Honouliuli Ahupua‘a maintains a rich cultural history in the exercising of traditional or customary Native Hawaiian rights within the project *ahupua‘a*. Honouliuli Ahupua‘a is the largest *ahupua‘a* in the *moku* of ‘Ewa. The environment of Honouliuli is very hot and dry. These environmental limitations forced ingenuity and innovation. *Kama‘āina* of Honouliuli used agricultural sinkholes that accumulated water within them via a subterranean water or karst system; this water also contained nutrient-rich sediment allowing plants such as *kalo, kī*, and *noni* to survive. The post-Contact period brought numerous changes to the *ahupua‘a* of Honouliuli. Traditional agricultural was rapidly replaced by large-scale commercial ventures. The discovery of artesian water beneath the ‘Ewa plains by James Campbell in 1879 led to the establishment of sugarcane plantations in Honouliuli including the Oahu Sugar Company. Much of the *mauka* (upland) lands in western Honouliuli, including ridges and deep gulches, were unsuitable for commercial sugar cultivation and remained pasture land for grazing livestock. The Donn 1906 map suggests the present project area was at the edge of sugarcane cultivation at that time (see Figure 15). By 1920, however, much of the lands of Honouliuli were used for commercial sugarcane cultivation (Frierson 1972:18). The project area is situated between Pu‘u Kapua‘i which is located 0.5 km to the northwest and Pu‘u Makakilo located 1.2 km to the southwest. These are understood as “very late cones [of the Wai‘anae volcano] […] composed of a varied mixture of cinder, spatter and lava flows” (Macdonald et al. 1983:429). Pukui et al. (1974:199) translate “Pu‘u Kapua‘i” as “footprint hill,” however, the association with that name is

	unknown. “Pu‘u Makakilo” is translated as “observing eyes” (Pukui et al. 1974:201). The association of this name is also unknown. The project area is also located between two deeply dissected gulches, Kalo‘i Gulch which is located 300 m to the southwest and Honouliuli Gulch located 700 m to the northeast of the project area. These gulches are at a comparable elevation and are believed to rarely run with water. The name “Ka-lo‘i” translates to “the taro patch” (Pukui et al. 1974:77). Sterling and Summers (1978:35) associate Kalo‘i Gulch with a number of vignettes regarding the “Waihuna” or “Punahuna” hidden spring. It was also noted that the hidden spring “had been one of the principal sources of water for all that country, which was quite heavily populated before the smallpox epidemic of 1840” (Ida E.K. von Holt in Sterling and Summers 1978:35). In traditional times, trails were well used for travel within the *ahupua‘a* between *mauka* and *makai* (shore) and laterally between *ahupua‘a*. A historical trail system existed on O‘ahu extending from Honolulu to Wai‘anae. A cross-*ahupua‘a* (east-west) trail passed through Honouliuli north of Pu‘uokapolei, and continued along the coast to Wai‘anae following the route of the modern Farrington Highway. Early historic maps depict a trail that branches off the cross-*ahupua‘a* trail into the uplands in the Pālehua area. The 1825 Malden map (see Figure 7) shows a trail extending into the Pālehua area a couple hundred meters to the southwest of the project area. A 1919 map (see Figure 16) shows an unimproved road alignment just south of the project area, understood as the Pālehua Road, approximating a traditional Hawaiian footpath into the uplands. However, a 1922 map (see Figure 17 and Figure 18 showing annotations), shows the Pālehua trail as arcing through the western portion of the project area before arcing north of Pu‘u Makakilo. This trail may have always been somewhat braided. The trail appears to only be depicted on the 1922 map (see Figure 17 and Figure 18) and appears to have been largely under Sugar Cane Field 30 in the 1925 map (Figure 19). This trail was not identified on the ground in either of the AIS studies of this area (Dega et al. 1998 and Welser et al. 2019). Interviewee Lynette Paglinawan stated that “this area where the University [of Hawai‘i West O‘ahu] is located has a lot of trails that go from *mauka-makai*, come from Honolulu going towards Nānākuli.” She noted that “spirits travel on ancient trails” which they use to “go from *mauka* going down to *makai*.” She added that these “ancient trails are still in use,” noting that people who live in homes that have been built on or near these ancient pathways have experienced “strange happenings” which she believes are due to the *‘uhane* (spirits) which still use these ancient trails to travel from *mauka* to *makai*. Ms. Paglinawan stated that as a result of the development of the *moku* of ‘Ewa including the *ahupua‘a* of Honouliuli, “we destroyed the habitat of

	the *ao kuewa* which is the *wiliwili* trees." She recommended planting "a wall of trees" surrounding the proposed project area which would provide a home for the displaced spirits. She also discussed the types of plants that were previously found in the area which include *noni* plants, coconut trees, *lauhala* trees, and *‘ulu* trees. She noted that these plants were "very plentiful but sparse not like a big grove where it's like a park of trees, it was interspersed throughout." The "Ewa Karst" which consists of limestone caves formed in the uplifted coral was undoubtedly more extensive during traditional Hawaiian times. Where not covered by alluvium or stockpiled material, this Pleistocene limestone outcrop has characteristic dissolution "pit caves" (Mylroie and Carew 1995) which were sometimes also used as burial caves. Burials have been encountered in the coastal areas of the Honouliuli Ahupua‘a, however, previous archaeological studies (Dega et al. 1998) within the project area have not documented any burials within the project area nor within the vicinity of the project area. An archaeological inventory survey conducted for the University of Hawai‘i West O‘ahu Campus that encompassed the entirety of the project area (Dega et al. 1998) identified no surface Hawaiian features. Dega et al. (1998:i) noted several plantation-era "flumes, aqueducts, ditches, pumps, and other irrigation features occurring within the heavily modified landscape of the project area." The features represented an irrigation complex (State Inventory of Historic Places [SIHP] # 50-80-08-5593) which was used for sugarcane cultivation from the 1920s through more recent times. A portion of the Waiahole Ditch System (SIHP # 50-80-09-2268) was also documented crossing through the northwest section of the project area and continuing southwest through the lower agricultural fields. In written testimony provided to CSH via email on 19 August 2019, Mr. Tom Berg, former City Councilman, stated the project has been "proposed on a pueo (owl) foraging and breeding ecosystem." The *pueo*, which are found on all of the main Hawaiian islands, are listed by the State of Hawai‘i as endangered on the island of O‘ahu (DLNR 2005). The Department of Land and Natural Resources (DLNR) states that *pueo* are most commonly found in "open habitats such as grasslands, shrublands, and montane parklands, including urban areas and those actively managed for conservation" (DLNR 2005). Mr. Berg also noted that records indicate that per earliest colonial contact, the *pueo* is most abundant on the slopes from Pu‘u Kapua‘i to West Loch, adding that "Hunehune Gulch, Kaloi Gulch, and Honouliuli Gulch are migratory routes used by the pueo to go from mountain to sea to court, mate, forage, and raise their brood." He also noted *pueo* are not forest dwellers, preferring "scrub, open fields/dirt landscapes with some grass." He stated that the proposed project will "encroach on prime pueo habitat-

	considered to be graded A+—“a ten (10)”—when it comes to the degree of pueo habitat in use on this project site.” Mr. Berg also stated that the project site is “inhabited by the ōpe‘ape‘a at various times of the seasons.” He noted that in 1910, the State of Hawai‘i documented *‘ōpe‘ape‘a* within a half-mile of the project area. *‘Ōpe‘ape‘a* is “the only land mammal native to the Hawaiian archipelago” and is found on all of the main Hawaiian islands except for Ni‘ihau (DLNR 2005:3-13). Mr. Berg stated his concern that the “property in question will not receive the proper protocol to conclude no endangered species inhabit the area.” He recommended that “a thorough and complete protocol is adopted to repeat the inventory exercise for pueo and ‘ōpe‘ape‘a over the course of a calendar year would be in order so the project does not inadvertently contribute to more endangered species habitat loss.” He also recommended inquiring with Dr. Melissa Price and Dr. Javier Cotin of the Project Pueo Biologist Team and Department of Fish and Wildlife (DOFAW) Biologist Afsheen Siddiqi regarding *pueo* protocol. Mr. Berg also expressed his concern for the possible negative aspects of lighting operations at an adjacent parcel which may reflect off of a solar panel into “the flight patterns of migrating birds and the *‘ōpe‘ape‘a* and *pueo* in particular need to be addressed.”
Ka Pa‘akai Analysis	In Ka Pa‘akai v. Land Use Commission, 94 Hawai‘i 31, 74, 7 P.3d 1068, 1084 (2000), the Court held the following analysis also be conducted: 1. The identity and scope of valued cultural, historical, or natural resources in the project area, including the extent to which traditional and customary native Hawaiian rights are exercised in the project area; 2. The extent to which those resources—including traditional and customary native Hawaiian rights—will be affected or impaired by the proposed action; and 3. The feasible action, if any, to be taken by the LUC to reasonably protect native Hawaiian rights if they are found to exist. Based on information gathered from the cultural and historical background, and the community consultation, culturally significant resources have been identified within the *ahupua‘a*. Although not within the project area, documentation and testimony indicates traditional or customary Native Hawaiian rights are possessed and are currently being exercised within the *ahupua‘a* by *ahupua‘a* tenants who are descendants of Native Hawaiians who inhabited the Hawaiian Islands prior to 1778 (Hawai‘i State Constitution, Article XII, Section 7). While no cultural resources, practices, or beliefs were identified as currently existing within the project area, Honouliuli Ahupua‘a maintains a rich cultural history in

	the exercising of traditional or customary Native Hawaiian rights within the project *ahupua‘a*. The proposed action will not affect or impair traditional and customary Native Hawaiian rights exercised in the *ahupua‘a* in which the project area is located. Therefore no action needs to be taken by the LUC to reasonably protect native Hawaiian rights as a result of this project. Therefore, the information provided in the CIA demonstrates the proposed project will not have any adverse effect on traditional and customary Native Hawaiian rights within the *ahupua‘a*.

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Section 1 Introduction

1.1 Project Background

At the request of Tetra Tech, Inc., and on behalf of AES Distributed Energy, Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this cultural impact assessment (CIA) for the West Oahu Solar Project, Honouliuli Ahupua‘a, ‘Ewa District, O‘ahu, TMK: [1] 9-2-002:007 (por.). The project area is on undeveloped lands in the southeastern foothills of the Wai‘anae Range, northeast of Pu‘u Makakilo and the Makakilo subdivision and 600 m northwest of the intersection of the H-1 Freeway and the Kualakai Parkway. The project area is depicted on a portion of the 2013 Ewa and Schofield Barracks U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), a tax map plat (Figure 2), and a 2018 aerial photograph (Figure 3).

The West Oahu Solar Project consists of an approximately 12.5-megawatt (MW) ground-mounted solar photovoltaic system, coupled with a 50 MW-hour battery energy storage system (BESS) and related interconnection and ancillary facilities. The solar photovoltaic system would include a series of panels arranged into arrays consisting of evenly spaced rows. The panels would be mounted on a racking system installed on posts. The battery storage system would consist of containerized lithium-ion battery units and inverters distributed throughout the project area.

The project would connect to a substation via underground electrical conduit. The substation would be constructed adjacent to and would interconnect with an existing Hawaiian Electric Company (HECO) 46kV transmission line that traverses the site. The project would be accessed via the existing gated entry off Kualakai Parkway (near the intersection with Interstate H-1) and would utilize a network of existing and new onsite access roads. Some road improvements may be needed to facilitate access within the project area. In addition, some site grading would be needed to accommodate the project facilities and to comply with stormwater and civil engineering requirements.

In December 2019, the project area was slighty modified to include additional areas along the perimeter of the project area, as well as maintenance of the existing roadways approaching the project area from the southeast.

1.2 Document Purpose

This CIA was prepared to comply with the State of Hawai‘i’s environmental review process under Hawai‘i Revised Statutes (HRS) §343, which requires consideration of the proposed project’s potential effect on cultural beliefs, practices, and resources. Through document research, this report provides information compiled to date pertinent to the assessment of the proposed project’s potential impacts to cultural beliefs, practices, and resources (pursuant to the Office of Environmental Quality Control’s *Guidelines for Assessing Cultural Impacts*) which may include traditional cultural properties (TCPs). These TCPs may be significant historic properties under State of Hawai‘i significance Criterion e, pursuant to Hawai‘i Administrative Rules (HAR) §13-275-6 and §13-284-6. Significance Criterion e refers to historic properties that “have an important value to the Native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s

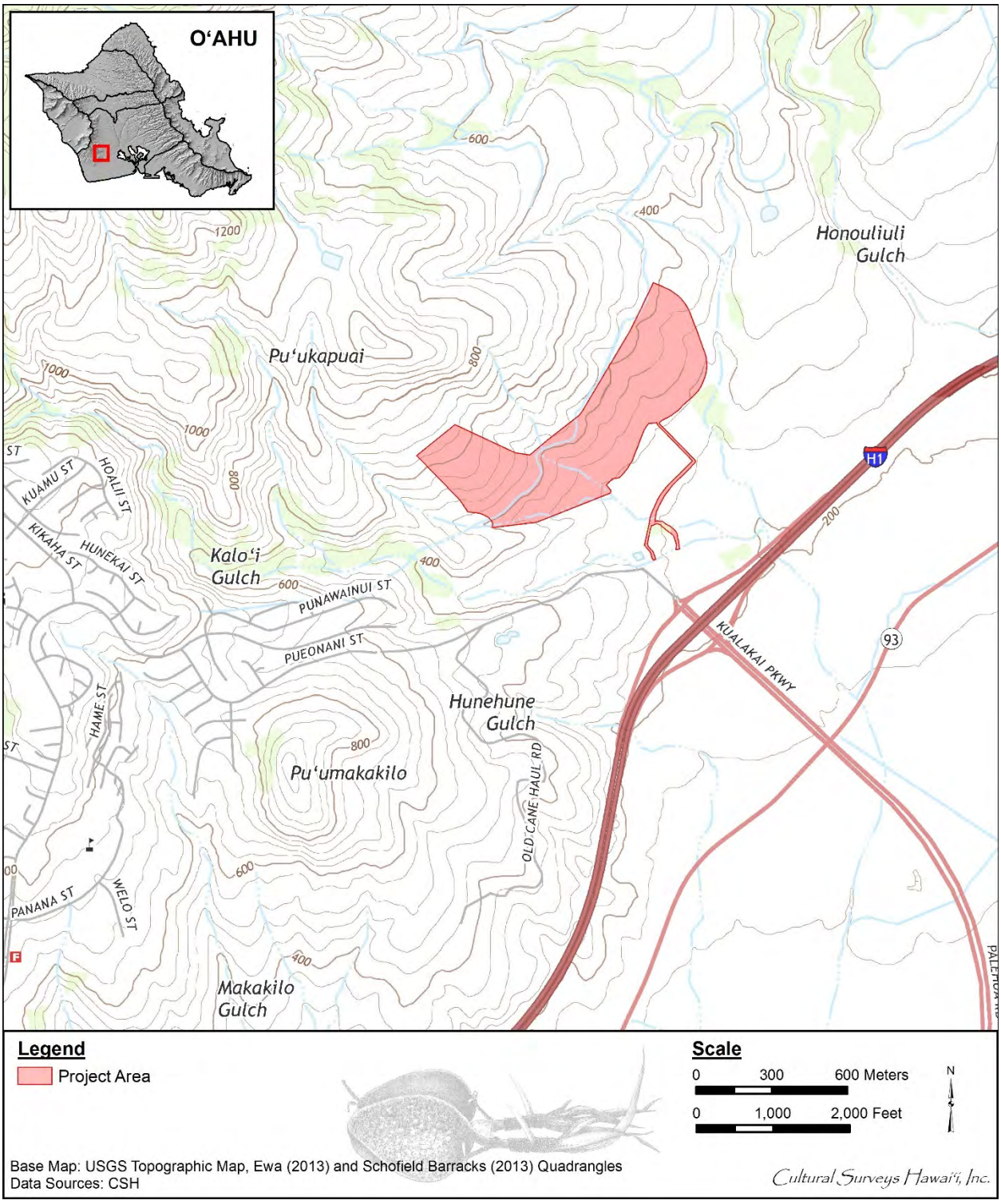

Figure 1. Portion of the 2013 Ewa and Schofield Barracks USGS 7.5-minute topographic quadrangles showing the location of the project area

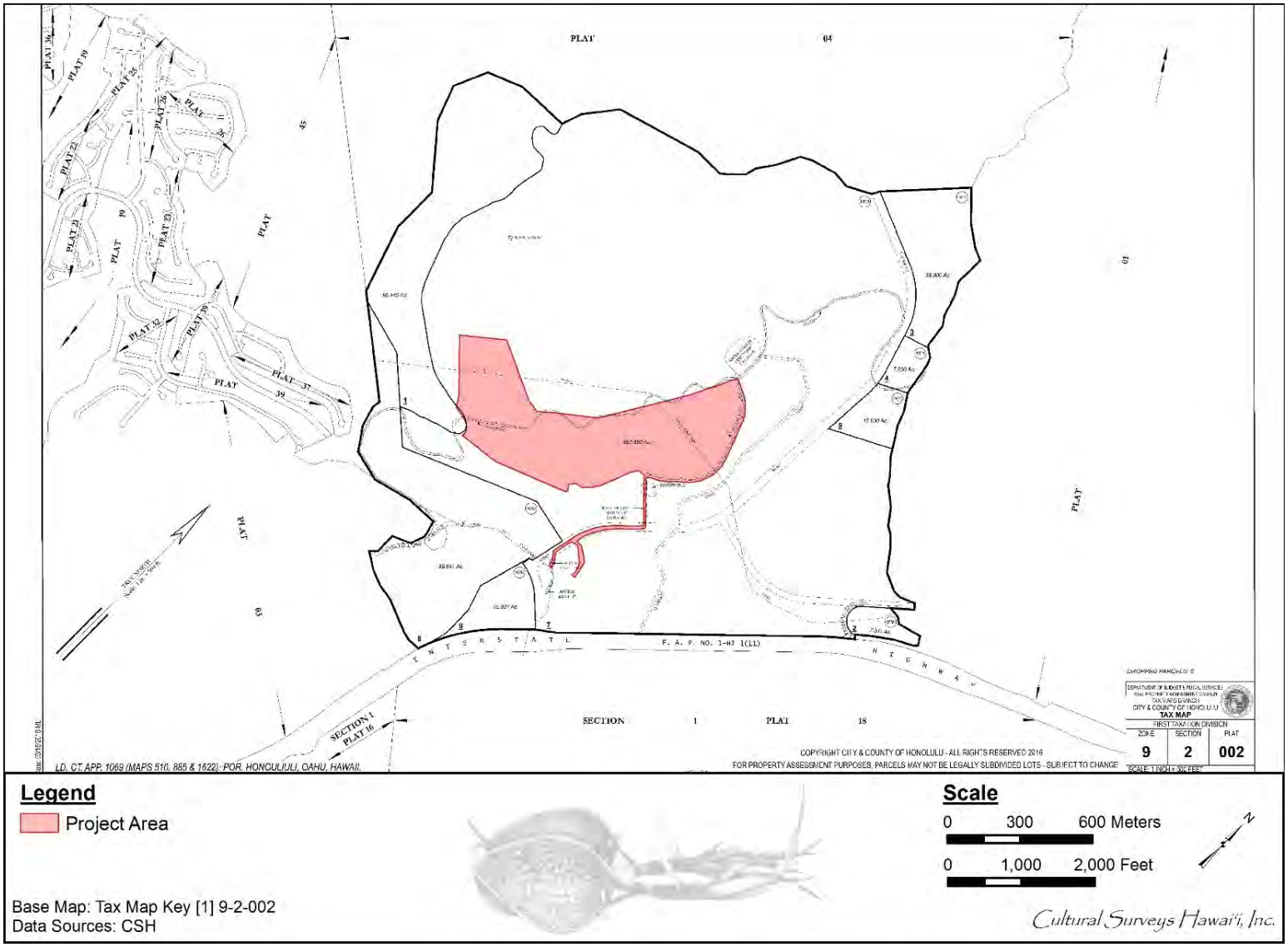

Figure 2. Tax Map Key (TMK) [1] 9-2-002 showing the location of the project area (Hawai‘i TMK Service 2014)

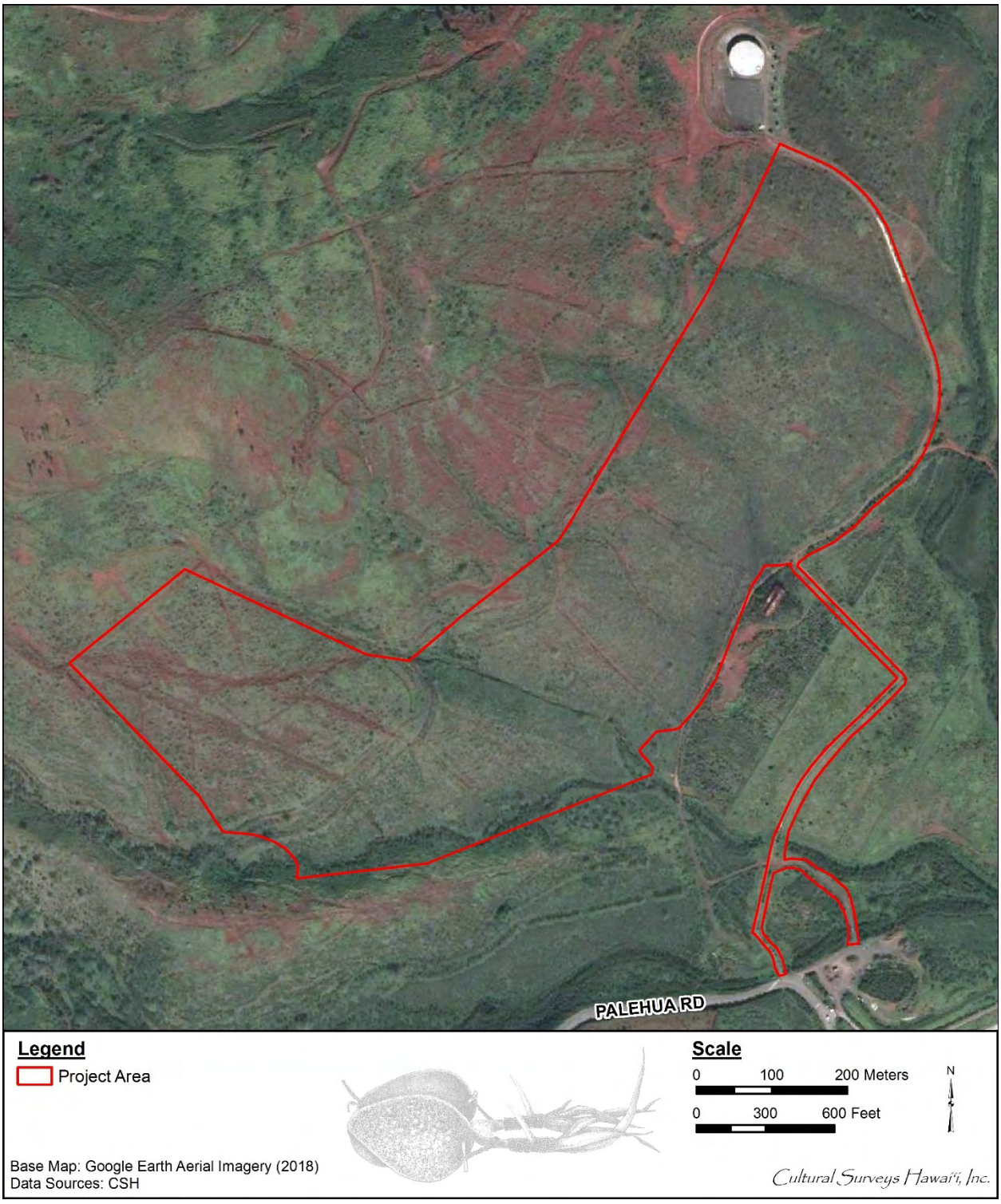

Figure 3. Aerial photograph of the project area (Google Earth 2018)

history and cultural identity" (HAR §13-275-6 and §13-284-6). The document will likely also support the project's historic preservation review under HRS §6E and HAR §13-275 and §13-284. The document is also intended to support the project's environmental review and the discretionary land use permitting process including a State Special Use Permit (SUP) from the Land Use Commission (LUC).

1.3 Scope of Work

The scope of work for this cultural impact assessment includes the following:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.
2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 *Ka Lepo* (Soils)

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area's soils consist of Kawaihapai clay loam, 2 to 6% slopes (KIB), Mahana silty clay loam, 6 to 12% slopes, eroded (McC2), Mahana silty clay loam, 12 to 20% slopes, eroded (McD2), Mahana silty clay loam, 20 to 35% slopes, eroded (McE2), Molokai silty clay loam, 7 to 15% slopes (MUC) and Molokai silty clay loam, 15 to 25% slopes (MUD) soils (Figure 4).

Kawaihapai series soils are described as follows:

> This series consists of well-drained soils in drainageways and on alluvial fans on the coastal plains on the islands of Oahu and Molokai. These soils formed in alluvium derived from basic igneous rock in humid uplands. They are nearly level to moderately sloping. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 30 to 50 inches. […] These soils are used for sugarcane, truck crops, and pasture. The natural vegetation consists of kiawe, koa haole, lantana, and bermudagrass. [Foote et al. 1972:63–64]

Further, Kawaihapai clay loam, 2 to 6% slopes soils (KIB), are described as having slow runoff and a slight erosion hazard (Foote et al. 1972).

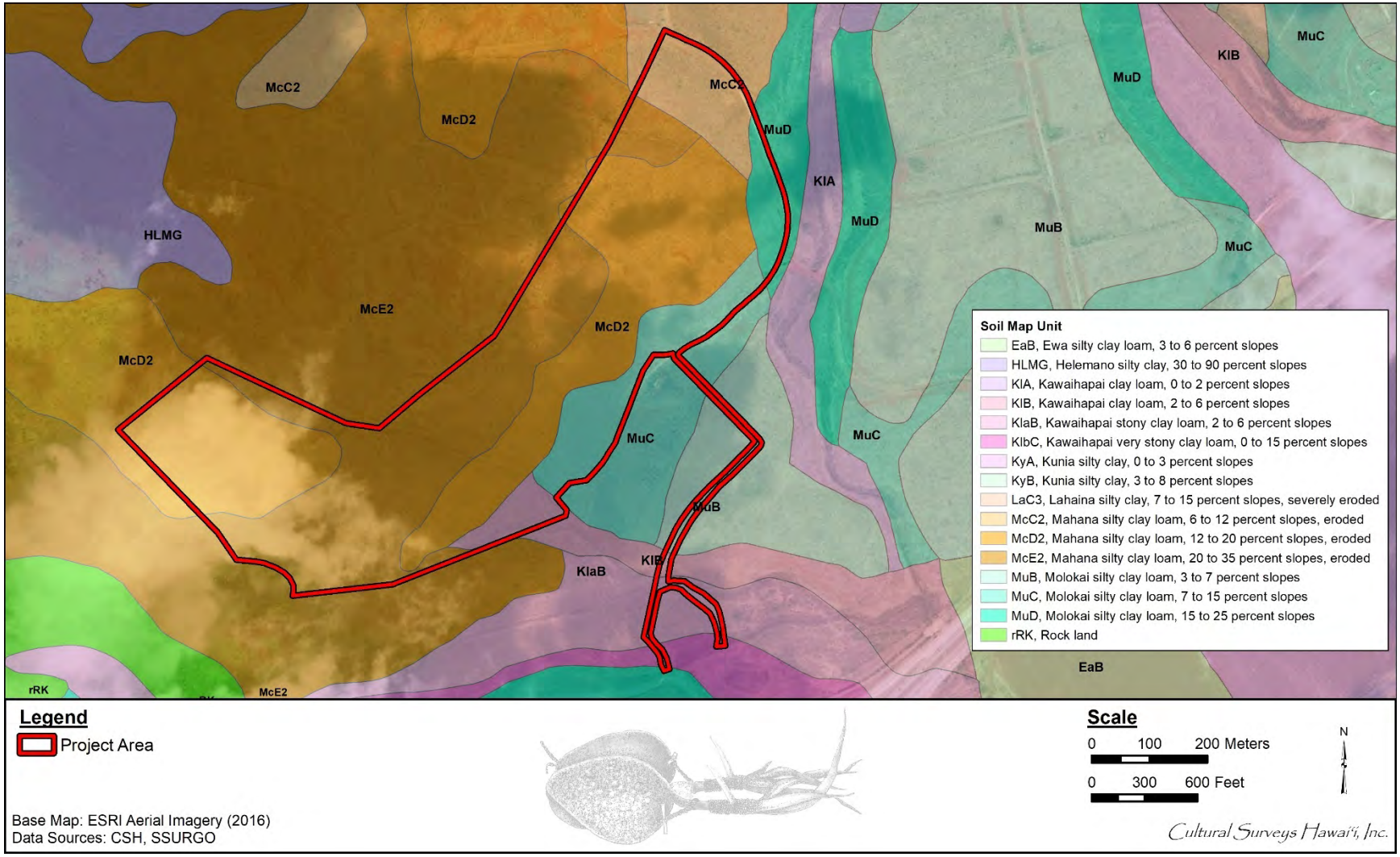

Figure 4. ESRI Aerial Imagery (2016) with overlay of Soil Survey of the State of Hawaii (Foote et al. 1972; USDA SSURGO 2001), indicating soil types within and surrounding the project area