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Prepared For:
Honeywell Technology Solutions Inc.

September 2012
FINAL—Archaeological Monitoring Report for Construction of an A-Side Remote Block Change Antenna at Kaena Point Satellite Tracking Station, Ka‘ena Ahupua‘a, Waialua District and Keawa‘ula Ahupua‘a, Wai‘anae District, Island of O‘ahu, Hawai‘i

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Prepared By:
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ARCHAEOLOGICAL monitoring was conducted for ground disturbing activity associated with construction of a Hawaii Tracking Station A-Side Remote Block Change Antenna on TMK: (1) 6-9-003:005 at Kaena Point Satellite Tracking Station, Ka’ena Ahupua’a, Waialua District and Keawa’ula Ahupua’a, Wai‘anae District, on the island of O’ahu, Hawai‘i. Full time archaeological monitoring was carried out at the onset of the project, and this was reduced to once a week spot check monitoring in consultation with the State Historic Preservation Division. Ground disturbing work consisted primarily of grading, grubbing, augering, and trenching. No archaeological resources were encountered.
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INTRODUCTION

At the request of Honeywell Technology Solutions Inc., Keala Pono Archaeological Consulting, LLC has conducted archaeological monitoring for construction of a Hawaii Tracking Station (HTS) A-Side Remote Block Change (RBC) antenna on TMK: (1) 6-9-003:005 at Kaena Point Satellite Tracking Station (KPSTS), Ka’ena Ahupua’a, Waialua District and Keawa’ula Ahupua’a, Wai‘anae District, on the island of O‘ahu, Hawai‘i. Archaeological monitoring was conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the Secretary of Interior’s Guidelines for Historic Preservation, and the State Historic Preservation Division (SHPD) Rules Governing Standards for Archaeological Monitoring Studies and Reports (§ 13-279-4).

The archaeological monitoring report presents the results of monitoring during construction of the HTS A-Side RBC antenna at KPSTS. The primary focus of the monitoring was on the identification and appropriate treatment of historic properties that might be affected by construction.

The report begins with a description of the project site and an historical overview of land use, Hawaiian traditions, and archaeology in the area. The next section presents methods used in the archaeological monitoring, and the following section details the monitoring results. Project results are summarized and recommendations are made in the final section. Hawaiian words and technical terms are defined in the glossary at the end of the document.

Nature and Location of the Undertaking

KPSTS is located on the western tip of O‘ahu Island, on Kuaokalā Ridge, overlooking Ka‘ena Point (Figure 1). The installation straddles Ka‘ena Ahupua’a in Waialua and Keawa‘ula Ahupua’a in Wai‘anae Districts. Rainfall averages approximately 30–40 inches per year at KPSTS (Juvik and Juvik 1998). Soils are of the Rock Land-Stony Steep Land Association (Foote et al. 1972). Vegetation at KPSTS typically consists of grasses and landscaped trees along roadways, with pockets of wooded areas dominated by koa haole and Christmas berry.

A new HTS A-side RBC antenna was erected at KPSTS, the construction of which included demolition of an existing helipad, an adjacent parking lot near Building 10, and a legacy antenna facility (Figures 2 and 3). The new antenna is located at the former helipad site. A new cable trough between Building 10 and the new antenna was also completed.

The helipad was relocated approximately 230 ft. northwest of the new antenna. This relocation involved clearing and grubbing of all vegetation at the new helipad site, re-grading, soil compaction, and repaving. Two short road realignments next to the proposed antenna and new helipad were also required. The clearing, grubbing, and excavation for the realignments largely occurred in previously disturbed or currently paved areas. The total project area covered 3.05 acres, although only 1.10 acres were impacted by ground disturbing activity.

Once the new A-Side antenna is operational, one of the existing legacy Automated Remote Tracking Station (ARTS) radomes will be demolished. Demolition may involve partial or complete removal of the existing antenna, radome, pedestal, and foundation. Two alternative facilities are proposed for demolition (see Figure 2):

- Alternative 1 – Demolition of the legacy ARTS Side-A (60-ft dish) antenna, Building 39005
- Alternative 2 – Demolition of the legacy ARTS Side-B (46-ft dish) antenna, Building 39006
Figure 1. Location of the project area on the west end of O‘ahu Island.
Figure 2. Location of the RBC construction and proposed demolition areas on a USGS topographic map.
Figure 3. Location of construction activity (adopted from Acquisition Civil/Environmental Engineering Space and Missile Systems Center 2010:8). Note that the legacy antenna is west of the new helipad and not shown.
CULTURAL CONTEXT

This section includes information on mo’olelo and traditional and historic land use of Ka’ena and Keawa’ula Ahupua’a. A summary of previous archaeological research that took place on KPSTS is presented as well.

Mo’olelo and Traditional Land Use

Ka’ena and Keawa’ula Ahupua’a have a rich traditional history. They were storied places visited by the renowned mythical fisherman, Maui, as well as Hi’iaka, sister of Pele, and Pele herself. Leina a ka ‘uhane were located here, where souls of the dead would make their final leap to the netherworld. A place where the soul could be restored to its body also was located in the area. It is important to note, however, that most of the mo’olelo presented here took place in the setting of coastal Ka’ena and Keawa’ula, while the project area sits atop the ridge overlooking the coast. While the mo’olelo are relevant to the project site, they did not directly take place there, unless otherwise noted.

Ka’ena Ahupua‘a, Waialua District

Place names often shed light on traditional views of an area and can provide important contextual information. Several conflicting accounts inform on the naming of Waialua District. Thrum (in Sterling and Summers 1978:88) states that Waialua translates to “two waters,” thus many believe that the name derived from Waialua’s two streams. However, Thrum believed that the district was named after a taro patch, and a common saying was that if you traveled to Waialua and did not see this taro patch, then you did not really see Waialua. Pukui (in Sterling and Summers 1978:88) asserted that the district was named for the cruel chief Waia, grandson of Wakea. Waia carried out his evil deeds at Waialua, and there was so much suffering there that the district was named Waialua, or “doubly disgraceful.” Another source attributed the name to Waialua Pool at Kemo’o (Awai in Sterling and Summers 1978:88).

Ka’ena literally means “the heat” (Pukui et al. 1974:61). Ka’ena Ahupua’a is said to have been named after a relative of Pele who came to Hawai‘i with her from Kahiki (Pukui et al. 1974:61). Handy and Handy described Ka’ena as “probably the poorest ahupua’a in land resources on Oahu,” although the area was known for its rich deep sea fishing grounds (1991:467). Sweet potato was grown on the western slopes of the Wai’anae mountains and small amounts of taro were cultivated in Uluhulu Gulch, watered from a spring to the west (Handy and Handy 1991:467).

Pu’u Pueo, or “owl hill,” overlooks Ka’ena Point (Pukui et al. 1974:205). The pu‘u was a leina a ka ‘uhane, or jumping off point where spirits took their final leap into the netherworld (Emerson 2005:100). A heiau Kukuianiani, or “flickering light,” once stood on the hill (Pukui et al. 1974:205).

Another leina a ka ‘uhane was located on the coastal flat of Ka’ena. Known as Leina Kauhane, the site was marked by terracing with pavements of black pebbles (Sterling and Summers 1978:94). Leina Kauhane is described in a 1933 newspaper article:

Among Hawaiians it was a belief that as soon as the soul left the body, it traveled west. “Travels west” is a euphemistic term for dying among many other peoples. Kaena Point is the western extremity of Oahu. As the newly released soul approached the point, it was met by the souls of ancestors or friends who had preceded it. They might send it back to the body if death were not real. On the other hand, if the disintegration were to be final, they conducted it to Leinakauhane, whence the soul would make its plunge into the
sea on its way to eternity (Honolulu Advertiser in Sterling and Summers 1978:94).

‘Ālau Gulch runs down the center of KPSTS. This translates as “many rocks” (Pukui et al. 1974:10). To the east is Manini Gulch, which was named for a reef fish (Pukui et al. 1974:145). It was here that a manini fish was offered to Hi‘iaka here in exchange for answering a riddle she posed (Pukui et al. 1974:145).

Kuaokalā is a land division, ridgeline, and name of a heiau in KPSTS. This translates to “back of the sun” (Pukui et al. 1974:119). A mo‘olelo recounts the tale of Ka‘aniau, the ghost of a dead woman who lived on the ridge (Sterling and Summers 1978:98). Pele and Hi‘iaka arrived in the area, looked up to Kuaokalā, and saw Ka‘aniau. Through prayer they brought Ka‘aniau back to life and asked her for a canoe so they could travel to Kaua‘i. Ka‘aniau showed them where an old deteriorated canoe lay abandoned and they restored it in one day’s time and departed for Kaua‘i.

It is unclear whether Kuaokalā Heiau is also known as Mokaena Heiau, or these were two separate structures. At 1,200 ft elevation, McAllister described Mokaena Heiau as the highest heiau on O‘ahu. It is located on the Wai‘anae side of the ridge above Ka‘ena Point and is composed of an adjoining series of two platforms and an enclosure. McAllister described the heiau as “surprisingly inconspicuous” (1933:127). Sterling could not relocate it in the 1970s but suspected it had been destroyed by military activity (Sterling and Summers 1978:97).

McAllister stated that the heiau was said to have been built by settlers from Kaua‘i (1933:127). However, Fornander (1917) related that menehune constructed Kuao̩kalā Heiau, and they were commissioned by a man named Kahano-a-Newa. When the sun disappeared and darkness fell, Kahano-a-Newa made the sun return again (Fornander 1917). McAllister noted a legend that involved menehune (1933:127). When Maui was fishing at Ka‘ena, he caught a huge red kūmū and dragged it up to the heiau so that a trail was left from Pōhaku o Kaua‘i to Kuaokalā Heiau. Maui left the fish on the heiau and the menehune cut it into small pieces. When the ocean rose, the pieces were consumed by the tide and now the kūmū are small.

Another account asserted that the heiau at Kuaokalā was one of two temples on O‘ahu that were used for sun worship (Nakuina in Sterling and Summers 1978:98). The other O‘ahu sun heiau was located where Kapi‘olani Park now stands, and both were only used by a select few.

Rasmussen (2007:21) stated that “The presence of two heiau is suggested by the descriptions of the visual orientation of Kuaokalā Heiau toward Ka‘ena Point in contrast to Mokaena Heiau, which is oriented toward the north…”

Ka‘ena is mentioned in several mo‘olelo. It is said that Maui tried to unite O‘ahu and Kaua‘i Islands at Ka‘ena Point (Emerson 2005:104). Maui cast his magic fishing hook into the sea and snared Kaua‘i Island. The hook only caught a piece of the island, however, and a large boulder was flung into the sky. The boulder landed on Ka‘ena Point and is now known as Pōhaku o Kaua‘i.

Pele made a stop at Pōhaku o Kaua‘i as she followed the call of music to where hula was being performed at Hā‘ena, Kaua‘i (Emerson 2005:3–4). At first she thought that it was Pōhaku o Kaua‘i that was tricking her with the music. The pōhaku greeted her when she arrived, but Pele answered that she was going to kill him because he had deceived her with his music. The pōhaku replied that it was not him, and that the song was coming from across the sea. Pele realized that the sound resonated from Kaua‘i and continued on.

Hi‘iaka later petitioned Pōhaku o Kaua‘i for help in obtaining a canoe (Emerson 2005:105–106, 156–157). The pōhaku responded that he had no canoe, for his vessel was destroyed in a storm
while he was fishing. Hi‘iaka asked for a plank instead, and Pōhaku o Kaua‘i acceded to her request. She then asked for an ama, or outrigger, and the pōhaku replied that he had none. He gave her a block of wiliwili instead, and with these materials, Hi‘iaka fashioned a makeshift canoe and sailed away in search of her lover, Lohiau. Once the two were reunited, they returned to O‘ahu, where Hi‘iaka immediately paid her respects to Pōhaku o Kaua‘i.

Another mo‘olelo recounted the tale of Kawelo, a warrior from Kaua‘i who aspired to conquer the men of ‘Aikanaka (Pukui 1994:100–107). He traveled to O‘ahu where he had heard of a powerful sacred fish known as the Traveling Uhu that was occasionally seen in the waters off Ka‘ena Point. Kawelo set out to catch the feared uhu and its arrival was marked by a storm. Kawelo netted the giant uhu and it dragged the canoe out to sea but Kawelo would not cut the net. Kawelo killed the uhu with powerful prayers, left a piece on a heiau in Wai‘anae, and set out to defeat the ‘Aikanaka men.

**Keawa‘ula Ahupua‘a, Wai‘anae District**

The name of the Wai‘anae District translates to “mullet water” (Pukui et al. 1974:220), referring to the area’s richness in mullet, a prized eating fish. Keawa‘ula literally means “the red harbor” (Pukui et al. 1974:105). It is thought to have been named for the red cuttlefish, or mūhe‘e, that frequent the seas there, making the ocean appear red. The ahupua‘a was known for rich fishing grounds for ‘ahi and aku (I‘i 1959:98).

Ka-ho‘iho‘ina-Wākea, or “Wākea’s turning back place,” was an area where spirits of a person who had just died would travel to (Pukui et al. 1974:105). If the person’s ‘aumakua did not deem the individual ready to die, then the spirit would be returned back to the body.

It is said that a woman named Kaihukoa moved to Wai‘anae and married Kaena, an ali‘i of Wai‘anae (Fornander in Sterling and Summers 1978:87). Kaihukoa transformed herself into the fishing grounds off of Ka‘ena Point and brought the ulua, kahala, and mahimahi there.

There is a cave in Keawa‘ula known as Poha Cave, where fresh water would flow into the ocean (McAllister 1933:124). Fishermen would collect drinking water by diving down to the flow with an upturned calabash and filling it with fresh water before returning to the surface.

**Historic Land Use**

Perhaps the earliest historic reference to Keawa‘ula was made in 1826 by the missionary Levi Chamberlain (Chamberlain 1826:490). He mentioned in his journal the presence of a school:

> About 12 o’clock we arrived at Keavaula, an indifferent village, but the place of a school, containing 24 scholars nearly all destitute of books and but five acquainted with the letters.

During the 1848 Māhele, 210 acres of Keawa‘ula were awarded to La‘amaikahiki, and the remainder was listed as government land. Two Land Commission Awards (LCAs) were found for Keawa‘ula. LCA 5557 was made to Kaio for 10 acres at Kikiolo (Indices 1929:274). LCA 5999 of 10.9 acres was awarded to Lonoahilei at Kopiliole (Indices 1929:293). Both parcels, under the requirements for kuleana land, are assumed to have been used for cultivation of crops. Given the climate conditions of the area, it is likely that dryland crops were cultivated. Ka‘ena Ahupua‘a was claimed by Victoria Kamāmalu, but the ahupua‘a became government lands when she exchanged the property to pay debts on other land holdings.
Ranching was prevalent in Keawa‘ula between the 1860s and 1930s. In 1864 the government portion of land was leased to Joseph and John Booth for 25 years for ranching until their deaths in 1873. At that time the lease was transferred to Samuel Andrews. In 1889, he received an additional 21 years on the lease; however, it appears that he transferred the lease to L.L. McCandless around 1901. McCandless extended the lease until 1920 and continued to lease the lands until 1925 on a “tenancy at will” basis. The land was put out to bid by the State in 1925 and McCandless was outbid by James Frank Woods from Kohala on the island of Hawai‘i. After two years, Woods signed the lease over to McCandless who then retained the lease until his death in 1940.

In 1898, the Oahu Railway and Land Company completed a railway that extended from Kahuku around Ka‘ena Point to the Ewa Plantation in Wai‘anae. The railway was built to serve the sugar plantations in Wai‘anae. Many Japanese workers were brought in for the construction and maintenance of the railway. These workers gave Keawa‘ula Beach its common name of “Yokohama Beach” (Hammatt et al. 1993:15). In addition to the sugar plantations, the railway was also utilized by the livestock industry, commercial vegetable growers, and for movement into and out of the area generally. Between 1942 and 1946 the railroad company and the City and County of Honolulu had an agreement to transport refuse to Keawa‘ula from Kapālama. In 1946 a tsunami destroyed the railway leaving only remnants behind.

The U.S. military began acquiring land in nearby Mākua Valley in 1929. Maneuvers were conducted as early as 1932. In 1941, with the onset of World War II, the military acquired all of Keawa‘ula, Kahanahāïki, and Mākua valleys under martial law. These areas were used for extensive training maneuvers. KPSTS was initially constructed between 1958 and 1959, additional buildings were added through the mid-1960s, and new antenna systems were built in the 1970s.

In 1921, under the Governor’s Executive Order 105, a 12-acre area was created as a beach park fronting the government portion of Keawa‘ula. In the 1970s, the State of Hawai‘i turned the area into the Ka‘ena Point State Park and constructed the Ka‘ena Point access road.

Previous Archaeology

KPSTS has been well studied archaeologically (Table 1). The following is a summary of archaeological publications that report on work carried out at KPSTS. Project summaries are presented chronologically.

Archaeological reconnaissance was completed for the entire KPSTS installation (Hammatt and Borthwick 1987). Pedestrian survey identified nine archaeological sites, although only one (Mokaena Heiau), was determined to be clearly pre-Contact. The other sites were possibly pre-Contact features that were later disturbed, a World War II site, and a ranching site.

An archaeological inventory survey was conducted for a fiber optic corridor that ran from Mokulē‘ia to KPSTS (Hammatt et al. 1993). No new sites were recorded within the installation.

An archaeological assessment was carried out for an upgrade of the water distribution system at KPSTS (Jourdane and Dye 2006). A rock alignment was found in the vicinity of Building 41 but it was thought to be a modern construction.

An archaeological assessment was conducted to collect data for an updated Integrated Cultural Resources Management Plan (Rasmussen 2007). All archaeological sites within KPSTS were assessed. Two new sites were found: Temporary Site 1 is the rock alignment identified by Jourdane and Dye (2006). This is now interpreted as a possibly pre-Contact habitation site or retaining wall. Temporary Site 2 is a World War II gun emplacement that overlooks Keawa‘ula.
Table 1. Previous Archaeology at KPSTS

<table>
<thead>
<tr>
<th>Author and Year</th>
<th>Work Completed</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammatt and Borthwick 1987</td>
<td>Reconnaissance</td>
<td>Nine New Sites</td>
</tr>
<tr>
<td>Hammatt et al. 1993</td>
<td>Archaeological Inventory Survey</td>
<td>No New Sites</td>
</tr>
<tr>
<td>Jourdane and Dye 2006</td>
<td>Archaeological Assessment</td>
<td>No New Sites</td>
</tr>
<tr>
<td>Rasmussen 2007</td>
<td>Archaeological Assessment</td>
<td>Two New Sites</td>
</tr>
<tr>
<td>McElroy 2010a</td>
<td>Archaeological Assessment</td>
<td>No New Sites</td>
</tr>
<tr>
<td>McElroy2010b</td>
<td>Documentation of Cold War-Era Cable Tray</td>
<td>No New Sites</td>
</tr>
<tr>
<td>McElroy2011</td>
<td>Archaeological Monitoring Plan</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Three studies were conducted in anticipation of the current project: an archaeological assessment, documentation of a Cold War-era cable tray, and an archaeological monitoring plan. An archaeological assessment and impact analysis was carried out for the areas proposed for construction (McElroy 2010a). This included a surface inspection of the Area of Potential Effect (APE), in which no new archaeological sites were found. Known Cold War era resources included a metal cable tray and two radome buildings, all of which are less than 50 years old. At the request of SHPD, the cable tray was documented with maps and photographs (McElroy 2010b). SHPD determined that the project will have no adverse effect on historic properties (Aiu 2010). An archaeological monitoring plan (McElroy 2011) was accepted by SHPD before construction commenced.

Cultural and Archaeological Sites in the Project Vicinity

Previous surveys of KPSTS have identified several archaeological sites, most of which are post-Contact in origin or possibly pre-Contact but disturbed. The most noteworthy site is Mokaena Heiau on the Wai’anae side of the ridge above Ka’ena Point. This important heiau is approximately 500 m southeast of Demolition Alternative Site 2 (Figure 4). Also in the vicinity of Demolition Alternative Site 2 is Site -3708, which consists of earthen terraces and retaining walls (Tomonari-Tuggle 2008:34). This site is located roughly 500 m northwest of Demolition Alternative Site 2.

Two traditional Hawaiian archaeological sites have been identified near Demolition Alternative Site 1 and the RBC Construction Site. Archaeological Site -3718 is located ca. 180 m northeast of the RBC Construction Site. This site was recorded by Hammatt and Borthwick (1987:44) and is described as a series of discontinuous rock alignments and concentrations, generally 6 to 8 ft-long and covering a 30 x 50 ft area. An adze was observed in the southern portion of the site. Site -3720, also recorded by Hammatt and Borthwick (1987:42), consists of a 30 ft-long discontinuous boulder alignment situated roughly 180 m northwest of Demolition Alternative Site 1. Although both sites are considered possible traditional Hawaiian sites and potentially eligible for National Register of Historic Places listing under Criterion D, neither of them are within the three proposed project areas.

Archaeological Implications and Anticipated Archaeological Remains

Historical and archaeological data have several implications for the potential of archaeological remains in the area affected by construction:
Figure 4. Archaeological sites (blue dots) in the vicinity of APEs (red squares).
Ka‘ena Point has a rich history passed down through generations by *mo‘olelo* and other oral tradition. Most of the *mo‘olelo* involve the flats below the project site, which is far removed from the ridge top where construction will take place.

Surface archaeological sites on the ridge top include a *heiau*, earthen terraces, walls, and rock alignments. The closest of these to the APE is a complex of alignments that lie 180 m away. No surface archaeological sites occur within the APE.

Aside from surface architecture, other evidence of traditional Hawaiian use of the area might include isolated artifacts or buried cultural deposits. Given the absence of surface architecture in the APE, the great distance to the nearest known archaeological site, and previous disturbance to the area, the probability of encountering artifacts or buried cultural deposits is low.

Cold War-era structures occur near the APE but they are less than 50 years old. Building 10 is a Cold War-era structure that lies within the APE. It was constructed in 1959 and is therefore more than 50 years old. The Control Area cluster of buildings, which includes Building 10 (HQ), 11, 13, 14, 16, 18, 19, and 39000, was not recommended for nomination as an historic district in the report titled *Final Determination of Eligibility for Historic and Cold War Era Evaluation and Survey at Ka‘ena Point Satellite Tracking Station Oahu, Hawaii* (EA Engineering Science and Technology, Inc. March 2012). The SHPD reviewed and accepted this determination report on March 21, 2012 (Log No. 2011.07.11, Doc. No. 1203MG30). In addition, a metal cable tray was documented in full (McElroy 2010b). SHPD determined that the project will have no adverse effect on historic properties (Aiu 2010).
METHODS

Archaeological monitoring was conducted between 28 February and 22 November 2011. One archaeological monitor was present per day. Monitors included Juanita Aguereberre, BA, Kelley Uyeoka, MA, and Windy McElroy, PhD. McElroy served as Principal Investigator for this project, overseeing all aspects of fieldwork.

Before commencement of fieldwork, the archaeological monitoring plan (McElroy 2011) was approved by SHPD. On 22 and 24 February 2011, a blessing and ground-breaking ceremony were conducted on site. On 28 February 2011, before the start of the first work day, the Principal Investigator and archaeological monitor met with the construction team to discuss the monitoring plan to ensure that they understood the purpose of the monitoring and that the monitor has the authority to halt construction activity.

In consultation with SHPD, two levels of effort were called for during this project. For the first two weeks, from 28 February to 14 March 2011, full time archaeological monitoring was conducted, in which all ground disturbing activity was monitored by an archaeologist. By 14 March 2011, 65% of the ground disturbance had been completed and no cultural material or deposits were found. The nature of subsurface deposits indicated that the occurrence of intact subsurface cultural remains was unlikely, and the level of effort was reduced to spot check monitoring. This was carried out from 14 March to 22 November, 2011, and consisted of once a week field checks of open excavations and monitoring of ongoing ground disturbance. A total of 10 days of full time and 25 days of spot check monitoring were conducted during the course of the project.

Ground disturbing work consisted of clearing, grubbing, grading, augering, soil compaction, and excavations for antenna footings, utility lines, roads, and fence posts. Bulldozers and excavators were the primary heavy equipment used for the excavations (Figures 5 and 6).

Representative profiles were drawn and photographed. Sediments were described using Munsell Soil Color Charts and a sediment texture flow chart (Thien 1979). The scale in all field photographs is marked in 10 cm increments. The north arrow on all maps points to magnetic north. Throughout this report rock sizes follow the conventions outlined in Field Book for Describing and Sampling Soils: Gravel >7 cm; Cobble 7–25 cm; Stone 25–60 cm; Boulder >60 cm (Schoeneberger 2002:2-35). No material was collected and no laboratory analyses were conducted.
Figure 5. Grubbing and grading with bulldozer, excavator, and loader. View is to the west.

Figure 6. Grading with the bulldozer. View is to the northeast.
RESULTS

Archaeological monitoring was conducted for all ground disturbing activity for the first two weeks of the project, and once a week spot checks were carried out for the remainder of construction. No cultural material or deposits were found during monitoring. Several areas showed signs of previous disturbance in the form of buried utility lines (Figure 7).

A total of 17 stratigraphic profiles were drawn during the course of the archaeological monitoring. A sample of six profiles are displayed here, representative of the stratigraphy exposed throughout the project area (Table 2, Figures 8 and 9). Stratigraphy generally consisted of one or more layers of fill with a native red dirt deposit below.

Profile 1 was drawn at an area that was grubbed and excavated alongside the road to the west of the new helipad (see Figures 8 and 9). The area was excavated to 65 cmbs (centimeters below surface) and stratigraphy consisted of two layers of fill with a basal layer of native red dirt (Figure 10).

Profile 3 was taken on the north side of the RBC antenna excavation (see Figures 8 and 9). Footings here were excavated to 116 cmbs. Two layers of native red dirt were exposed (Figure 11). Utility lines were found within the basal layer, indicating previous disturbance.

Profile 8 was drawn at an excavation on the east side of the RBC antenna site (see Figures 8 and 9). The trench was excavated to 165 cmbs. Stratigraphy consisted of two layers of fill with a native red dirt deposit below (Figure 12).

Profile 10 was taken along Road B, northwest of Building 10 (see Figures 8 and 9). Excavations extended to 120 cmbs and stratigraphy was composed of a layer of fill atop the native soil (Figure 13).

Profile 13 was drawn at a deep excavation along Road B, where the topography slopes sharply up to Building 10 (see Figures 8 and 9). The trench was excavated to 390 cmbs and five stratigraphic layers were exposed. They included three upper fill layers, with two underlying native soil deposits (Figure 14). The native soils were similar in color, grading from a slightly grayer color above to a brown hue below.

Profile 17 was taken from the easternmost excavation, past the hairpin turn on Road B (see Figure 8). Excavations extended to 80 cmbs and stratigraphy consisted of a fill layer with a basal deposit of native soil (Figure 15).
Figure 7. Excavation for antenna footings, showing buried utility lines. Orientation is to the southwest.

Table 2. Sediment Descriptions

<table>
<thead>
<tr>
<th>Profile</th>
<th>Layer</th>
<th>Depth (cmbs)</th>
<th>Color</th>
<th>Description</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>0–18</td>
<td>2.5YR 3/6</td>
<td>Loam; fine roots; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>18–38</td>
<td>5YR 3/1</td>
<td>Silt loam; moderate roots; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>38–65+</td>
<td>7.5YR 4/6</td>
<td>Sandy loam; base of excavation.</td>
<td>Native Soil</td>
</tr>
<tr>
<td>3</td>
<td>I</td>
<td>0–24</td>
<td>7.5YR 2.5/3</td>
<td>Loam; fine roots; smooth, clear boundary.</td>
<td>Native Soil, Disturbed</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>24–116+</td>
<td>2.5YR 3/4</td>
<td>Silt loam, mottled; fine roots; buried utility lines; base of excavation.</td>
<td>Native Soil, Disturbed</td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>0–10</td>
<td>7.5YR 2.5/3</td>
<td>Loam; moderate roots; few basalt cobbles and gravel; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>10–102</td>
<td>2.5YR 3/4</td>
<td>Silty clay loam; broken, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>102–165+</td>
<td>2.5YR 3/3</td>
<td>Silt loam; base of excavation.</td>
<td>Native Soil</td>
</tr>
<tr>
<td>Profile</td>
<td>Layer</td>
<td>Depth (cmbs)</td>
<td>Color</td>
<td>Description</td>
<td>Interpretation</td>
</tr>
<tr>
<td>---------</td>
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<td>--------------</td>
<td>-------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>10</td>
<td>I</td>
<td>0–40</td>
<td>7.5YR 3/4</td>
<td>Loam; moderate roots; few basalt cobbles and gravel; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>40–120+</td>
<td>2.5YR 3/4</td>
<td>Silty clay loam; base of excavation.</td>
<td>Native Soil</td>
</tr>
<tr>
<td>13</td>
<td>I</td>
<td>0–48</td>
<td>10YR 3/2</td>
<td>Loam; moderate roots; few basalt cobbles and gravel; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>48–104</td>
<td>10R 4/6</td>
<td>Silty clay loam; fine roots; few basalt cobbles and gravel; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>104–200</td>
<td>2.5YR 4/1</td>
<td>Clay loam; wavy, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>200–286</td>
<td>10YR 5/1</td>
<td>Loam; wavy, gradual boundary.</td>
<td>Native Soil</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>286–390+</td>
<td>10YR 5/2</td>
<td>Silt loam; base of excavation.</td>
<td>Native Soil</td>
</tr>
<tr>
<td>17</td>
<td>I</td>
<td>0–30</td>
<td>5YR 5/4</td>
<td>Silt loam; many basalt cobbles and gravel; smooth, abrupt boundary.</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>30–80+</td>
<td>7.5YR 4/3</td>
<td>Silt loam; base of excavation.</td>
<td>Native Soil</td>
</tr>
</tbody>
</table>
Figure 8. Locations of stratigraphic profile drawings on a USGS topographic map.
Figure 9. Construction plans, showing locations of stratigraphic profiles. Profile 17 is to the east (not shown).
Figure 10. Profile 1, west face drawing and photograph.
Figure 11. Profile 3, north face drawing and photograph.
Figure 12. Profile 8, northwest face drawing and photograph.
Figure 13. Profile 10, north face drawing and photograph.
Figure 14. Profile 13, west face drawing and photograph.
Figure 15. Profile 17, east face drawing and photograph.
**SUMMARY AND CONCLUSION**

In summary, archaeological monitoring was conducted for ground disturbing activity associated with construction of an HTS RBC on TMK: (1) 6-9-003:005 at KPSTS on O‘ahu. Full time archaeological monitoring was carried out for the onset of the project, and this was reduced to weekly spot check monitoring, in consultation with SHPD. No surface or subsurface archaeological remains were found. Soils generally consisted of one or more upper layers of fill with a native red dirt deposit below. Several areas were previously disturbed, as evidenced by the occurrence of buried utility lines.
**GLOSSARY**

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>'ahi</td>
<td>Tuna fish, such as <em>Thunus albacares</em>, the yellowfin tuna, an important food item.</td>
</tr>
<tr>
<td>ahupua'a</td>
<td>Traditional Hawaiian land division usually extending from the uplands to the sea.</td>
</tr>
<tr>
<td>aku</td>
<td>The bonito or skipjack, <em>Katsuwonus pelamis</em>, a prized eating fish.</td>
</tr>
<tr>
<td>ali'i</td>
<td>Chief, chiefess, monarch.</td>
</tr>
<tr>
<td>ama</td>
<td>Outrigger.</td>
</tr>
<tr>
<td>'aumakua</td>
<td>Family or personal gods. The plural form of the word is 'aumākua.</td>
</tr>
<tr>
<td>Christmas berry</td>
<td>The ornamental tree <em>Schinus terebinthifolius</em> known for its bright red berry-like fruits.</td>
</tr>
<tr>
<td>heiau</td>
<td>Place of worship and ritual in traditional Hawai`i.</td>
</tr>
<tr>
<td>kahala</td>
<td>The amberjack or yellowtail fish, <em>Seriola dumerilii</em>.</td>
</tr>
<tr>
<td>koa haole</td>
<td>An historically introduced small tree, <em>Leucaena glauca</em>.</td>
</tr>
<tr>
<td>kuleana</td>
<td>Right, title, property, portion, responsibility, jurisdiction, authority, interest, claim, ownership.</td>
</tr>
<tr>
<td>kāmū</td>
<td>The goatfish <em>Parupeneus porphyreus</em>.</td>
</tr>
<tr>
<td>leina a ka 'uhane</td>
<td>A place where spirits leaped into the netherworld.</td>
</tr>
<tr>
<td>Māhele</td>
<td>The 1848 division of land.</td>
</tr>
<tr>
<td>mahimahi</td>
<td>The dolphin fish, <em>Coryphaena hippurus</em>, a prized eating fish.</td>
</tr>
<tr>
<td>manini</td>
<td>The common reef fish <em>Acanthurus triostegus</em>, a variety of surgeonfish.</td>
</tr>
<tr>
<td>menehune</td>
<td>Small people of legend who worked at night to build structures such as fishponds, roads, and heiau.</td>
</tr>
<tr>
<td>moʻolelo</td>
<td>A story, myth, history, tradition, legend, or record.</td>
</tr>
<tr>
<td>mūheʻe</td>
<td>The cuttlefish <em>Sepioteuthus arctipinnis</em>.</td>
</tr>
<tr>
<td>pōhaku</td>
<td>Rock, stone.</td>
</tr>
<tr>
<td>puʻu</td>
<td>Hill, peak, cone, mound.</td>
</tr>
<tr>
<td>uhu</td>
<td>Parrot fish, such as <em>Scarus perspicillatus</em>.</td>
</tr>
<tr>
<td>ulua</td>
<td>Certain varieties of crevalle, jack, or pompano, an important food fish in traditional Hawai`i also used in sacrifices in place of a man.</td>
</tr>
<tr>
<td>wiliwili</td>
<td>The tree <em>Erythrina sandwicensis</em>, found in dry environments. The lightweight wood was traditionally used for surfboards, canoe outriggers, and net floats.</td>
</tr>
</tbody>
</table>
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