
Draft
Archaeological Monitoring Plan
Kamehameha Schools Kaka‘ako Block I,
Honolulu Ahupua‘a, Honolulu (Kona) District, O‘ahu,
TMKs: [1] 2-1-056:002, 007, and 008

Prepared for
Kamehameha Schools

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Management Summary

Reference	Archaeological Monitoring Plan for Kamehameha Schools Kaka'ako Block I, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu, TMKs: [1] 2-1-056:002, 007, and 008 (Tulchin and Hammatt 2014b)
Date	August 2014
Project Number (s)	Cultural Surveys Hawai'i Inc. (CSH) Job Code: KAKAAKO 105
Investigation Permit Number	CSH presently operates under Hawai'i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) permit No. 14-04, issued per Hawai'i Administrative Rules (HAR) Chapter 13-282.
Agencies	State of Hawai'i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD)
Project Location	The project area is in downtown Honolulu in the area known as Kaka'ako, which is on the southern coastline of O'ahu. The project area is within the block bounded by Ala Moana Boulevard, Koula and Auahi Streets. The Diamond Head border adjoins the former Bank of Hawaii property on the corner of Ward Avenue and Ala Moana Boulevard.
Land Jurisdiction	Private, Kamehameha Schools
Project Description	<p>The Block I project, known as Vida at 888 Ala Moana Boulevard, is a mixed-use joint development between Kobayashi Group and The MacNaughton Group on land presently owned by Kamehameha Schools.</p> <p>The Kobayashi Group and The MacNaughton Group will be responsible for implementation of this Mitigation Plan.</p> <p>Project details include:</p> <ul style="list-style-type: none"> • The project will include a 400-foot tall, 38-story mixed-use building consisting of approximately 265 residential units over 20,000 square feet of ground floor commercial space • Structured parking for cars of above-grade parking on Levels 2, 3 and 4 • Amenity Podium at Level 5 • Landscaping and open spaces occur at the ground floor and Amenity Level <p>Ground-disturbing construction activities associated with the Project will include (i) the demolition of existing structures, foundation slabs, and utility lines, (ii) the construction of new foundations, building</p>

	footings, and retaining walls, and (iii) the installation of new utility lines (water, electrical, sewer and drainage).
Project Acreage	3.4 acres
Historic Preservation Regulatory Context	<p>CSH recently completed an archaeological inventory (AIS) survey of the project area (Tulchin et al. 2014b). In order to mitigate adverse impacts to subsurface archaeological historic properties identified within the project area, it was recommended that project construction proceed under an archaeological monitoring program. Under Hawai'i State historic preservation legislation, "Archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities which may adversely affect historic properties" [Hawai'i Administrative Rules (HAR) Chapter 13-279-3]. This monitoring program will facilitate documentation of all previously- and newly-identified subsurface historic properties (non-burial and burial) during project construction.</p> <p>At the request of Kamehameha Schools, CSH has prepared this archaeological monitoring plan. It was prepared in accordance with HAR 13-279-4, governing archaeological monitoring plans and in support of the proposed project's historic preservation review under Hawai'i Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-284 and 13-279-4.</p>
Historic Properties Potentially Affected	<p>Six archaeological historic properties were identified during the Archaeological Inventory Survey (AIS) of the project area (Tulchin et al. 2014b):</p> <ul style="list-style-type: none"> • State Inventory Survey of Historic Properties (SIHP) # 50-80-14-7578, an early to mid-twentieth century cultural layer • SIHP # 50-80-14-7579, an early twentieth century cultural layer • SIHP # 50-80-14-7580, pre-Contact to post-Contact cultural layer with a historic burial cluster • SIHP # 50-80-14-7581, a pre-Contact traditional Hawaiian bundle burial • SIHP # 50-80-14-7582, disarticulated human skeletal remains within a non-burial context • SIHP # 50-80-14-7583, disarticulated human skeletal remains within a non-burial context
Recommended Monitoring	Based on the results of the AIS, on-site monitoring will occur for all excavations extending over 30 cm below the surface. A change to on-call monitoring will occur only following consultation with, and written concurrence from, SHPD.

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Section 1 Introduction

1.1 Project Background

At the request of Kamehameha Schools (KS), Cultural Surveys Hawai'i, Inc. (CSH) has prepared this Archaeological Monitoring Plan for Kamehameha Schools Kaka'ako Block B, Honolulu Ahupua'a, Honolulu (Kona) District, Island of O'ahu, TMKs: [1] 2-1-056:002, 007, and 008. Note that the Kobayashi Group and The MacNaughton Group will be responsible for implementation of this mitigation plan.

The project area is in downtown Honolulu in the area known as Kaka'ako, which is on the southern coastline of O'ahu. The project area is within the block bounded by Ala Moana Boulevard, Koula and Auahi Streets. The Diamond Head border adjoins the former Bank of Hawaii property on the corner of Ward Avenue and Ala Moana Boulevard. The project area is shown on a U. S. Geological Survey (U.S.G.S.) topographic map (Figure 1), a Hawai'i Tax Map Key (TMK) (Figure 2), and on an aerial photograph (Figure 3).

The Block I project, known as Vida at 888 Ala Moana Boulevard, is a mixed-use joint development between Kobayashi Group and The MacNaughton Group on land presently owned by Kamehameha Schools (Figure 4).

Project details include:

- The project will include a 400-foot tall, 38-story mixed-use building consisting of approximately 265 residential units over 20,000 square feet of ground floor commercial space
- Structured parking for cars of above-grade parking on Levels 2, 3 and 4
- Amenity Podium at Level 5
- Landscaping and open spaces occur at the ground floor and Amenity Level

Ground-disturbing construction activities associated with the Project will include (i) the demolition of existing structures, foundation slabs, and utility lines, (ii) the construction of new foundations, building footings, and retaining walls, and (iii) the installation of new utility lines (water, electrical, sewer and drainage).

1.2 Historic Preservation Regulatory Context

CSH recently completed an archaeological inventory (AIS) survey of the project area (Tulchin et al. 2014b). In order to mitigate adverse impacts to subsurface archaeological historic properties identified within the project area, it was recommended that project construction proceed under an archaeological monitoring program. Under Hawai'i State historic preservation legislation, "Archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities which may adversely affect historic properties" [Hawai'i Administrative Rules (HAR) Chapter 13-279-3]. This monitoring program will facilitate documentation of all previously- and newly-identified subsurface historic properties (non-burial

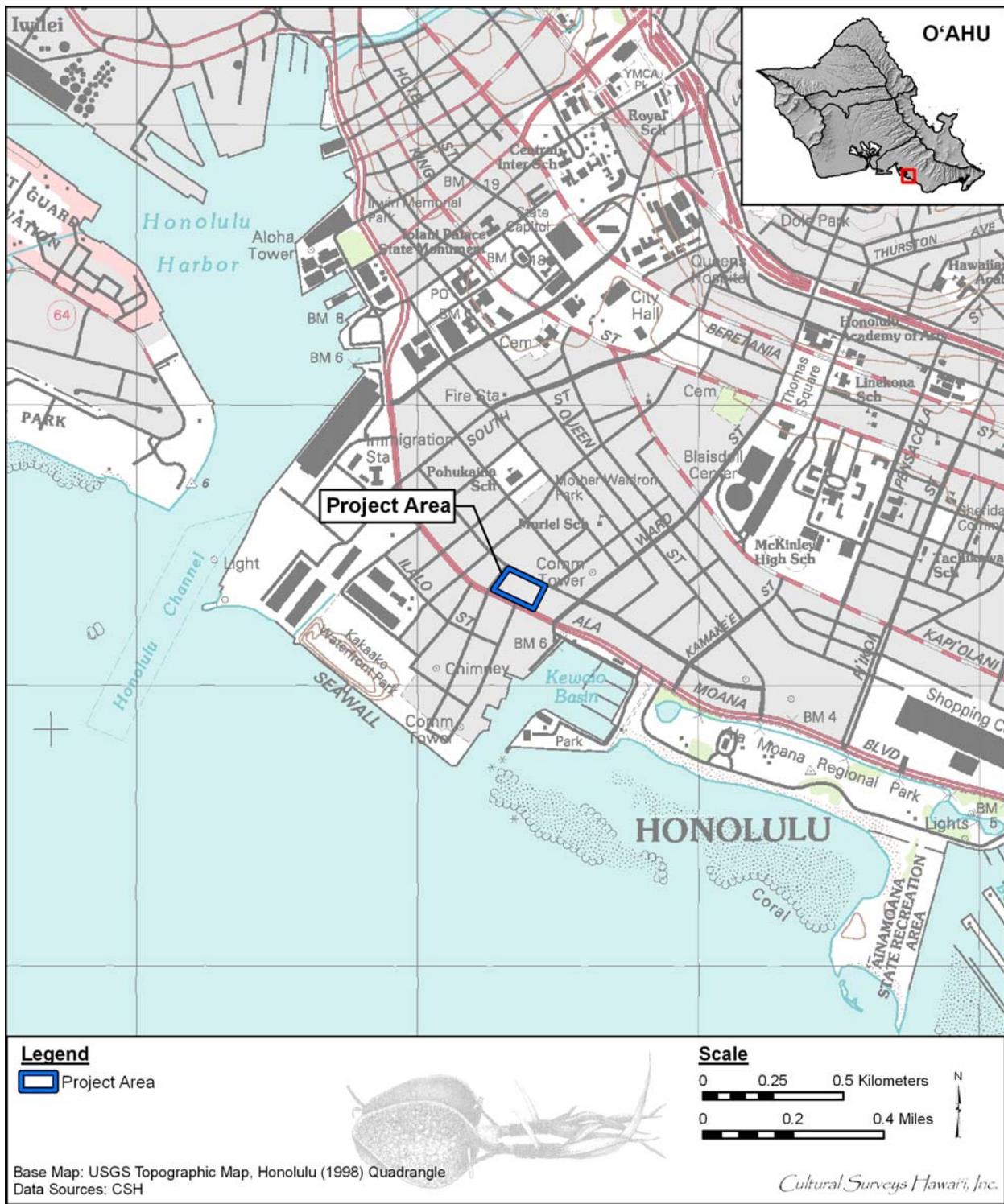


Figure 1. 1998 Honolulu USGS 7.5-Minute Series Topographic Quadrangle showing the project area location

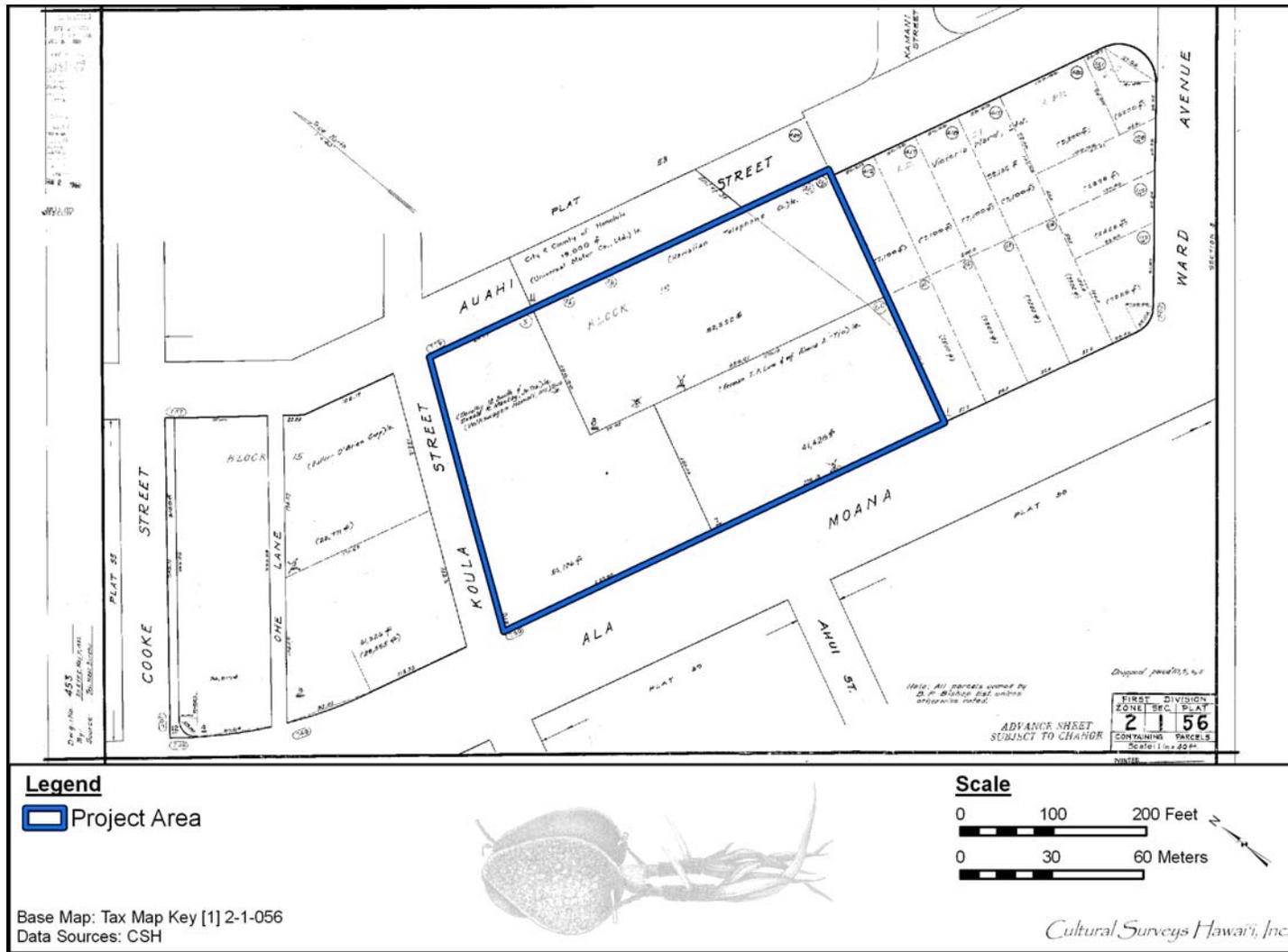


Figure 2. Tax Map Key (TMK) [1] 2-1-056, showing the project area location (Hawai'i TMK Service 2013)

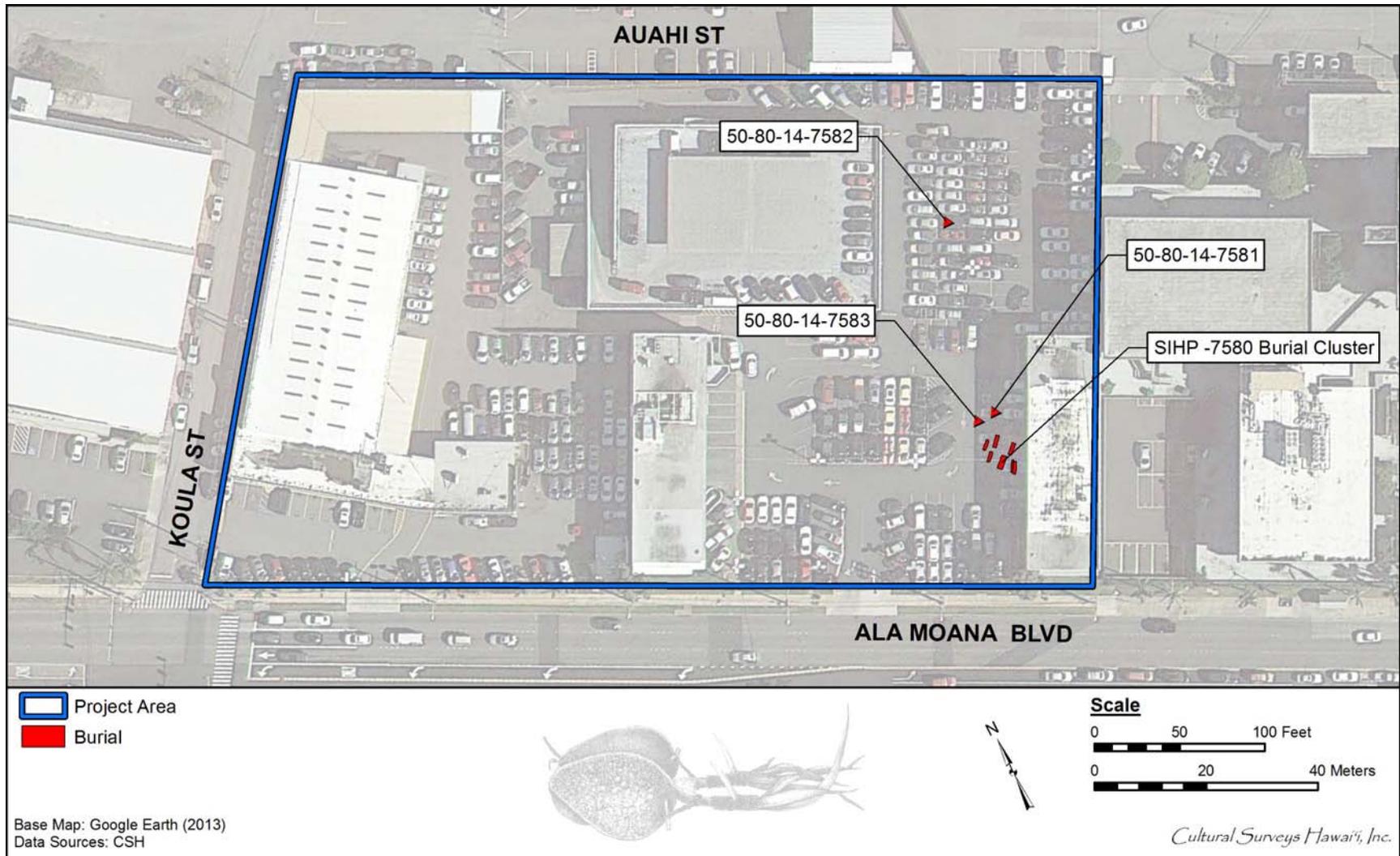


Figure 3. Aerial photograph showing the project area and the location of the SIHP #'s 7580, -7581, -7582, and -7583 (source: Google Earth 2013)

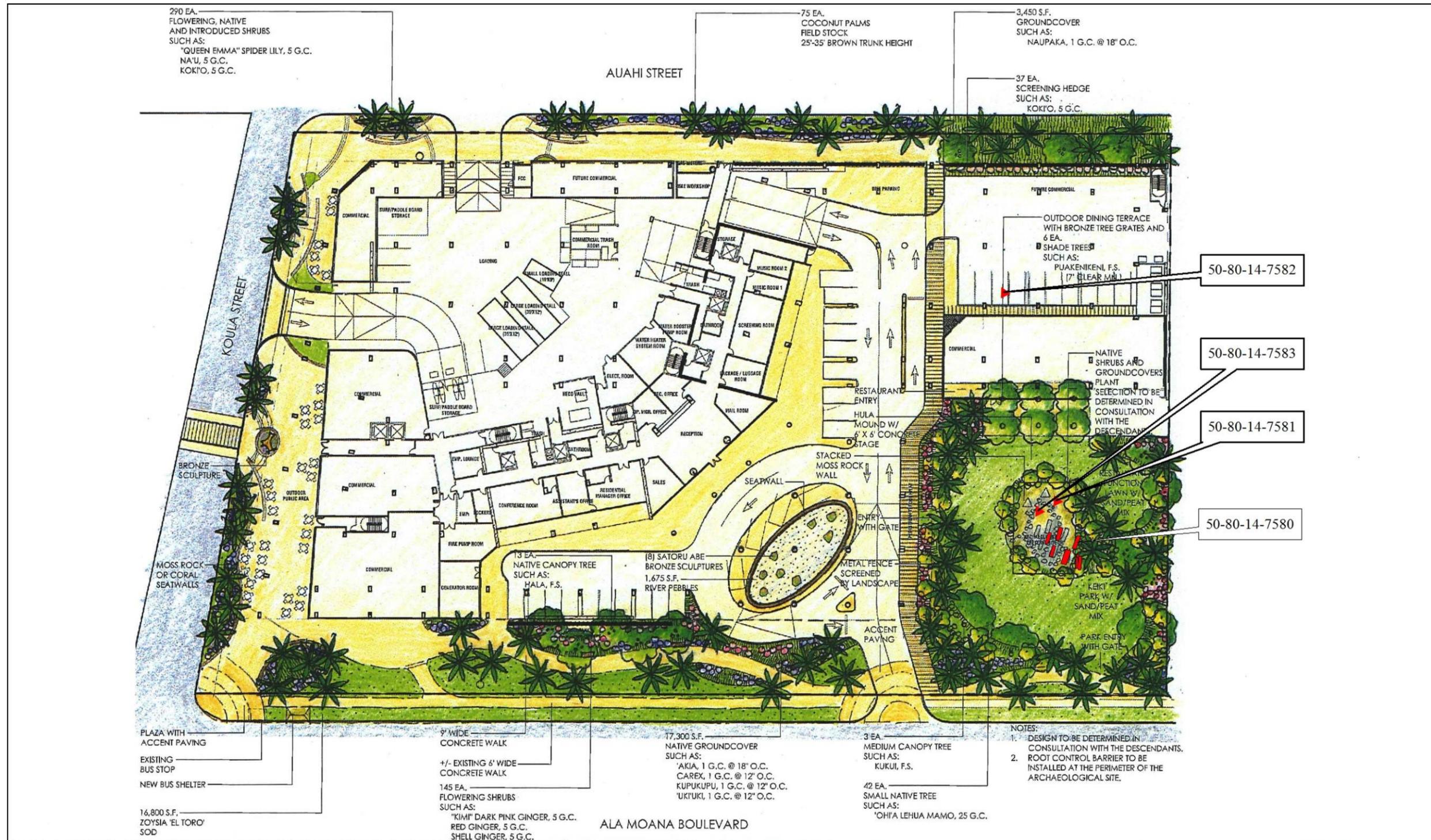


Figure 4. Block I Landscape Plan detailing proposed redevelopment (source: Arquitectonica 2014) showing the location of SIHP #'s 7580, -7581, -7582, and -7583

and burial) during project construction.

At the request of Kamehameha Schools, CSH has prepared this archaeological monitoring plan. It was prepared in accordance with HAR 13-279-4, governing archaeological monitoring plans and in support of the proposed project's historic preservation review under Hawai'i Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-284 and 13-279-4.

1.3 Environmental Setting

1.3.1 Natural Environment

The project area is within a topographic section of O'ahu called the Honolulu Plain, an area generally less than 4.5 m, or 15 ft above sea level (Davis 1989:5). The Honolulu Plain is stratified with late-Pleistocene coral reef substrate overlaid with calcareous marine beach sand or terrigenous sediments, and stream fed alluvial deposits (Armstrong 1983:36). The top soil stratum consists of Fill land, mixed (F1), "containing areas filled with material dredged from the ocean and hauled from nearby areas" (Foote et al. 1972).

The modern Hawaiian shoreline configuration is primarily the result of 1) rising sea level following the end of the Pleistocene (Macdonald et al. 1983; Stearns 1978), 2) the mid- to late Holocene ca. 1.5-2.0 m high-stand of the sea (see summary in Dye and Athens 2000:18-19), and 3) pre-Contact and post-Contact human landscape modification. At the end of the Pleistocene, between approximately 20,000 and 5-6,000 years ago, water previously locked in glacial ice returned to the world's oceans, and the sea level rose over 100 m to approximately its current level. In the vicinity of the current project area, rising sea levels flooded the previously dry, earlier Pleistocene reef deposits, which had formed hundreds of thousands of years previously when sea level was comparable to modern levels. When sea levels reached approximately modern levels, the now coastal regions became depositional environments where for tens of thousands of years previously, during the lower sea levels, they had been erosional environments.

A high stand of the sea for the Hawaiian Islands, ca. 1.5 to 2.0 m above present sea level, has been well documented between 4,500 and 2,000 years ago (Athens and Ward 1991; Fletcher and Jones 1996; Grossman and Fletcher 1998; Grossman et al. 1998; Harney et al. 2000; Stearns 1978). During this high stand, there appears to have been an increase in coral reef production and the production of detrital reef sediments. Littoral environments appear to have been augmented substantially by the deposition of marine sediments. "What this means is that the great shoreline sand berms must have developed around the islands at this time because this was when calcareous sand was being produced and delivered to the shorelines in large quantities" (Dye and Athens 2000:19).

The Honolulu coastline was likely greatly affected by the deposition of marine sediments during this elevated sea level. The subsequent drop in sea level to its present level, ca. 2,000 years ago, most likely created a slightly erosional regime that may have removed sediments deposited during the preceding period of deposition (Dye and Athens 2000:19). However, the net gain in sediments would have been substantial. In 1911, it was estimated that about one-third of the Honolulu Plain was a wetland (Hawaiian Territory Sanitary Commission report in Nakamura 1979:65). Pre-Contact Hawaiians used the lagoonal/estuary environment of the Honolulu plain to construct fishponds. Fishpond walls served as sediment anchors for the accumulation of detrital

reef sediments. They also likely affected long shore sedimentary transport, resulting in new littoral deposition and erosion patterns. In the post- Western Contact period, when the fishponds were no longer utilized, they became obvious locations for the deposition of fill. These reclaimed/landfill areas provided valuable new land near the heart of growing urban Honolulu.

The undeveloped natural condition of the vicinity consisted of low-lying marshes, tidal flats, fishponds, and reef areas. Beginning in the late nineteenth century, these low-lying areas were filled in and then developed, which permanently changed the area into its present fully-urbanized character. Foote et al. (1972) show the entire project area as being Fill land, mixed (FL) (Figure 5). The authors provide the following description of this soil series:

Fill land, mixed (FL)—This land type occurs mostly near Pearl Harbor and in Honolulu, adjacent to the ocean. It consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. [Foote et al. 1972:31]

In this area of the Honolulu District, rainfall averages less than 30 inches per year (Armstrong 1983:62). Northeasterly trade winds prevail throughout the year, although their frequency varies from more than 90% during the summer months to 50% in January; the average annual wind velocity is approximately 10 miles per hour (Wilson Okamoto 1998). Vegetation within the project area is limited to a few ornamental trees in grass parking lot dividers and along the project area margins.

1.3.2 Built Environment

The project area is located within central Honolulu and is surrounded by modern urban development including asphalt paved streets, concrete sidewalks, and utility infrastructure. A majority of the project area consists of asphalt paved parking lots, with several existing buildings, structures and associated infrastructure (see Figure 3).

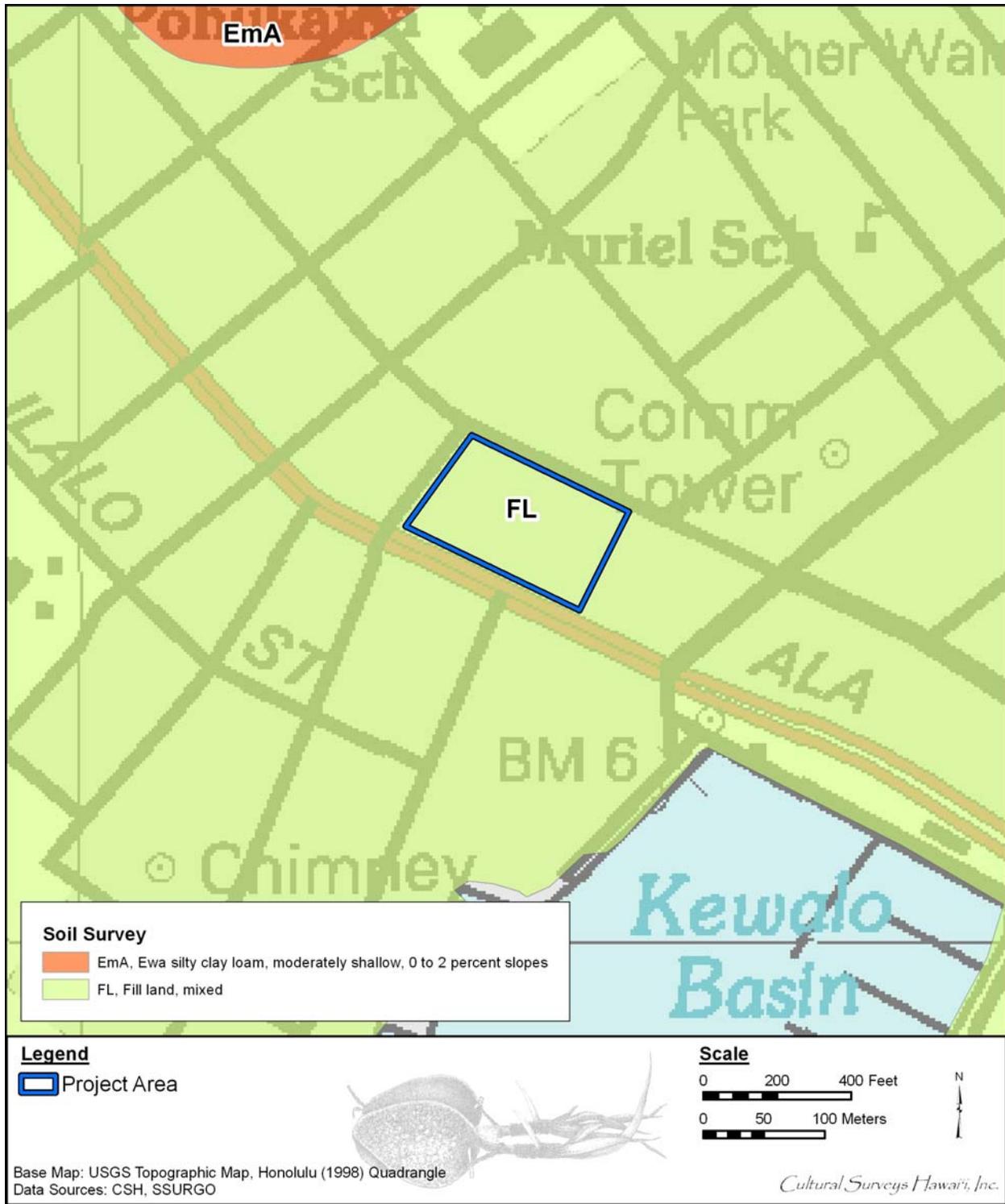


Figure 5. Soil survey geographic (SSURGO) database overlay (source: Foote et al. 1972)

Section 2 Background Research

2.1 Traditional and Historical Background

2.1.1 Mythological and Traditional Accounts

2.1.1.1 Brief Overview for Kaka'ako

The current urban district known as Kaka'ako is significantly larger than the traditional area of the same name, which is described in mid-nineteenth century documents and maps as a small *'ili* (traditional land unit). In addition to Kaka'ako, the present Kaka'ako area included lands once known as Ka'ākaukukui, Kukuluāe'ō, and Kewalo, and even smaller areas—possibly portions of *'ili*—called Kawaiaha'ō, Honuakaha, Pu'unui, Ka'ala'a, 'Āpua, and 'Auwaiolimu. The current project area is within the *'ili* of Ka'ākaukukui.

The original location and extent of an area called Kaka'ako was, based on maps and ethnographic information, close to present day South Street. The ethnographer Henry Kekahuna (1958:4), who was born in Hawai'i in 1891 and was a long-time resident of Honolulu, placed it “on the Ewa side of Kuloloia Stream where the Honolulu Iron Works and Fort Armstrong are now,” an area now covered by One Waterfront Plaza.

2.1.1.2 Place Names

Place name translations presented without attribution in this subsection are from *Place Names of Hawaii* (Pukui et al. 1974). The researchers for this book based their interpretations not only on literal (phonetic) translations of the words, but also on oral traditions and historic documents. In this work, the place names of geographic features and *ahupua'a* names are translated; however, *'ili* names (small land divisions within *ahupua'a*) are not usually presented.

Thomas Thrum also published a short paper on place names in the 1922 edition of Lorrin Andrews' *A Dictionary of the Hawaiian Language* (2003), based only on the phonetic translations of the place names. This work does have a large number of translated *'ili* names. Because there are no oral or written documents to confirm Thrum's interpretations, Mary Pukui (Pukui et al. 1974:136) cautioned that Thrum's translations were sometimes “unreliable.” Thrum's translations will be presented here since it is our only source for many *'ili* names, but Pukui's cautionary note for these interpretations should be kept in mind.

Pukui et al. (1974) do not give a meaning for the place name **Kaka'ako**, but the Hawaiian word *kākā'āko* can be translated as “dull, slow” (Pukui and Elbert 1986:110). Thrum (1923:639) translated the word as “prepare the thatching” (*kākā* = to chop, beat, or thresh; *ako* = thatch). If Thrum's translation is correct, it could be related to the fact that salt marshes, such as areas like Kaka'ako, were excellent places to gather tall *pili* grass, which Hawaiians traditionally used to thatch their houses.

According to Kekahuna (1958:4), **Ka'ākaukukui** was “a beautiful sand beach that formerly extended along Ala Moana Park to Kewalo Basin, a quarter mile long reef extended along the shore.” Pukui et al. (1974) describe Ka'ākaukukui as a [f]illed-in reef. The name means “the right (or north) light,” and it may have referred to a maritime navigation landmark. Thrum (1923:635) translates it as “radiating place for lamp.” In the early twentieth century, it was translated as “to the right of the

lighthouse” by the squatters who lived in the area (Gessler 1938:187). This would have been an accurate description of the area at that time as Ka‘ākaukukui was east, or “to the right,” of the Honolulu Lighthouse in the harbor. However, this is probably a historic, not an ancient, interpretation as the Honolulu Lighthouse was not built until 1869 (Dean 1991:7).

Kukuluāe‘o, translates literally as the “Hawaiian stilt (bird),” *Himantopus himantopus*, and from the word *kukuluāe‘o*, which means “to walk on stilts.” Pukui et al. (1974) described the area as “formerly fronting Ke-walo Basin” and “containing marshes, salt ponds, and small fishponds,” an environment well suited for this type of bird (Griffin et al. 1987:36). Kekahuna (1958:4) described it as “the land on the upland side of Ka‘ākaukukui. Salt was formerly made there.”

Kewalo literally means “the calling (as an echo).” Land Commission and other historic-era documents identify it as the area between Cooke and Sheridan streets, *mauka* of Queen Street and the coastal sections of Ka‘ākaukukui, Kukuluāe‘o, and Kālia. According to Pukui et al. (1974:109), “outcasts (*kauwā*) intended for sacrifice were drowned here” (see *mo‘olelo* below). Kekeahuna (1958) said that at one time it also had a sand beach as a part of the area where various sports such as surfing were held.

2.1.1.3 Mo‘olelo Associated with Place Names

The present study area is generally located in a region known as Ka‘ākaukukui. It is *makai* (seaward) of Kewalo on early historic maps and west of the land called Kukuluāe‘o. The names Ka‘ākaukukui and Kukuluāe‘o do not appear in any citations in *Hawaiian Island Legends Index* or in the index to *Fornander’s Collection of Hawaiian Antiquities and Folklore*. There are a few mentions of the place names Kewalo and Kaka‘ako in various legends and traditions. Kaka‘ako and Kukuluāe‘o are mentioned in some post-contact Chants.

From these legendary accounts it can be seen that Ka‘ākaukukui, Kukuluāe‘o, and Kewalo were traditionally noted for their fishponds and salt pans, for the marsh lands where *pili* grass and other plants could be collected, for ceremonial sites such as Pu‘ukea Heiau, Kewalo Spring, and Kawailumalumai Pond at which sacrifices were made, and for their trails that allowed transport between the more populated areas of Waikīkī and Honolulu. Important chiefs were born in the area and conducted religious rites, and commoners traveled to the area to procure food and other resources; some commoners probably also lived in the area, possibly adjacent to the ponds and the trails.

Kaka‘ako is mentioned in Thrum’s version of the legend of Kū‘ula, the god presiding over the fish, and his son ‘Ai‘ai, who was the first to teach the Hawaiians how to make various fishing lines and nets, the first to set up a *ko‘a kū‘ula*, a rock shrine on which the fishermen would place their first catch as an offering to Kū‘ula, and the first to set up *ko‘a ia*, fishing stations where certain fish were known to gather. Leaving his birthplace in Maui, ‘Ai‘ai traveled around the islands, establishing *ko‘a kū‘ula* and *ko‘a ia*. On O‘ahu, he landed first at Makapu‘u in Ko‘olaupoko, then traveled clockwise around the island.

Aiai came to Kalia [Waikīkī] and so on to **Kakaako**. Here he was befriended by a man named Apua, with whom he remained several days, observing and listening to the murmurs of the chief named Kou. This chief was a skillful haiku [*Katsuwonus pelamis*; bonito] fisherman, his grounds being outside of Mamala

until you came to Moanalua. There was none so skilled as he, and generous withal, giving akus to the people throughout the district. [Thrum 1998:242]

Ka'ākaukukui is briefly mentioned in the legend of Hi'iaka, beloved sister of the Hawaiian volcano goddess, Pele. Hi'iaka and her companions had been traveling around O'ahu on the land trails, but decided to travel from Pu'uloa (on Pearl Harbor in 'Ewa) to Waikīkī by canoe. At Pu'uloa, Hi'iaka met a party who were planning on traveling to the house of the chiefess Pele'ula in Waikīkī. Hi'iaka recited a chant, telling the people that although they were going by land and she was going by sea they would meet again in Kou (ancient name of Honolulu). One portion of the chant mentions the place Ka'ākaukukui, with reference to a pool, possibly a reference to the salt ponds of the area:

<i>A pehea lā au, e Honoka'upu, ku'u aloha</i>	And what of me, O Honoka'upu, my love
<i>I ka welelau nalu kai o Uhi, o 'Ōa</i>	Upon the crest of the surf at Uhi and 'Ōa
<i>'O nā makai ke ao (pō) o pōina</i>	Eyes in the living realm (night) of oblivion
<i>Ma hea lā wau, e ke aloha lā</i>	Where am I, O my love
<i>'O Kou ka papa</i>	Kou is the coral flat

<i>'O Ka'ākaukukui ka loko</i>	Ka'ākaukukui is the pool
<i>'O ka 'alamihi a'e nō</i>	Some 'alamihi indeed
<i>'O ka lā a pō iho</i>	Wait all day until night
<i>Hui aku i Kou nā maka.</i>	Friends shall meet in Kou.

[Ho'oulumāhie 2006a:297; Ho'oulumāhie 2006b:277]

The exact meaning of the word 'alamihi within this chant is unknown. 'Alamihī is the name of a native Hawaiian small black crab (*Metopograpsus thukuhar*), a scavenger often associated in Hawaiian sayings with corpse-eating (Pukui and Elbert 1986:18). *Alamihī* is also used as a place name that can mean "path [of] regret" (Pukui et al. 1974:9).

2.1.1.4 Trails

John Papa 'Ī'ī addresses some of the place names mentioned previously while discussing early nineteenth century trails in the Honolulu/Waikīkī area. Because this area was characterized by ponds, marshlands, and *lo'i*, any trails near the coastline must have run on a sand berm raised above surrounding wetlands and coral flats. Regarding the middle trail (probably close to the current alignment of Queen Street), walking from Waikīkī to Honolulu, 'Ī'ī stated,

The trail from Kalia led to Kukuluaeo, then along the graves of those who died in the smallpox epidemic of 1853, and into the center of the coconut grove of Honuakaha. On the upper side of the trail was the place of Kinau, the father of Kekauonohi. ['Ī'ī 1959:89]

The grave site referred to is the Honuakaha Cemetery at the *makai* corner of Halekauwila and South streets, *makai* of Kawaiaha'o Church. Honuakaha was a settlement located generally between Punchbowl and South streets, on the *makai* side of Queen Street. On the lower, coastal trail, walking from Honolulu towards Waikīkī, 'Ī'ī stated, "From the makai side of Kaoaopa was a trail to the sea at Kakaako, where stood the homes of the fishermen. Below the trail lived Hehehewa and his fellow kahunas" ('Ī'ī 1959:91).

2.1.2 Early Post-Contact History and Population Centers

The *ili* of Ka'ākaukukui is between two traditional population centers, Kou (Honolulu) and Waikīkī, on the southern shore of O'ahu. In Waikīkī, a system of irrigated taro *lo'i* (irrigated fields) fed by streams descending from Makiki, Mānoa and Pālolo valleys blanketed the plain, and networks of fishponds dotted the shoreline. Similarly, Kou—the area of downtown Honolulu surrounding the harbor—possessed shoreward fishponds and irrigated fields watered by ample streams descending from Nu'uanu and Pauoa valleys. The pre-Contact population and land use patterns of Ka'ākaukukui may have derived from its relationship to these two densely populated areas; it may have participated in some of the activities associated with them. Thus, the attempt to reconstruct the region—as it existed for Hawaiians during the centuries before Western Contact and the modern urbanization that has reconfigured the landscape—must begin with accounts of Kou and Waikīkī.

Waikīkī is actually the name of a large *ahupua'a* (traditional land division) encompassing lands stretching from Honolulu to Maunalua Bay. Within that *ahupua'a*, by the time of the arrival of Europeans during the late eighteenth century, the area today known as Waikīkī had long been a center of population and political power on O'ahu. According to Martha Beckwith (1940:383), by the end of the fourteenth century, Waikīkī had become “the ruling seat of the chiefs of O'ahu.” The pre-eminence of Waikīkī continued into the eighteenth century and is confirmed by the decision of Kamehameha, in the midst of unifying control of the islands, to reside there after winning control of O'ahu by defeating the island's chief, Kalanikūpule.

Chiefly residences were only one element of a complex of features sustaining a large population that characterized Waikīkī up through the pre-Contact period. Beginning in the fifteenth century, a vast system of irrigated taro fields was constructed, extending across the littoral plain from Waikīkī to lower Mānoa and Pālolo valleys. This field system, an impressive feat of engineering design traditionally attributed to the chief Kalamakua, took advantage of streams descending from Makiki, Mānoa, and Pālolo valleys, which also provided ample fresh water for the Hawaiians living in the *ahupua'a*. Water was also available from springs in nearby Mō'ili'ili and Punahou. Closer to the Waikīkī shoreline, coconut groves and fishponds dotted the landscape. A continuous zone of population and cultivation, from the shoreline of present day Waikīkī Beach, extended north well into Mānoa Valley. The western and eastern bounds of this zone are less clear, and there are no specific references to Waikīkī's abundance reaching into the Kewalo region (Handy and Handy 1972).

A basic description of Honolulu and Kou, up to western contact, is given by E. S. Craighill and Elizabeth Handy:

What is now Honolulu was originally that flatland area between the lower ends of Nu'uanu and Pauoa Valleys and the harbor. [W.D.] Westervelt . . . wrote that ‘Honolulu was probably a name given to a very rich district of farm land near what is now . . . the junction of Liliha and School Streets, because its chief was Honolulu, one of the high chiefs at the time of Kakuhihewa’. . . . It is probable that the chief referred to by Westervelt took his name from the harbor and adjoining land. The original name of the land where the town grew when the harbor became a haven for foreign ships was Kou. . . . The number of *heiau* in

this area indicates that it was a place of first importance before the era of foreign contact. [Handy and Handy 1972:479]

Rev. Hiram Bingham, arriving in 1820, described Honolulu as still a Native “village” on the brink of Western-induced transformations:

We can anchor in the roadstead abreast of Honolulu village, on the south side of the island, about 17 miles from the eastern extremity. . . . Passing through the irregular village of some thousands of inhabitants, whose grass thatched habitations were mostly small and mean, while some were more spacious, we walked about a mile northwardly to the opening of the valley of Pauoa, then turning southeasterly, ascending to the top of Punchbowl Hill, an extinguished crater, whose base bounds the northeast part of the village or town. . . . Below us, on the south and west, spread the plain of Honolulu, having its fishponds and salt making pools along the seashore, the village and fort between us and the harbor, and the valley stretching a few miles north into the interior, which presented its scattered habitations and numerous beds of kalo (arum esculentum) in its various stages of growth, with its large green leaves, beautifully embossed on the silvery water, in which it flourishes. [Bingham 1847:92-93]

The Ka‘ākaukukui region would have been in Bingham’s view as he stood atop “Punchbowl Hill” looking toward Waikīkī to the south; it would have comprised part of the area he describes as the “plain of Honolulu” with its “fishponds and salt making pools along the seashore.”

Another visitor to Honolulu in the 1820s, Captain Jacobus Boelen, hints at the possible pre-Contact character of Honolulu and its environs, including the Kewalo area:

It would be difficult to say much about Honoruru. On its southern side is the harbor or the basin of that name (which as a result of variations in pronunciation [*sic*] is also written as Honolulu, and on some maps, Honoonoono). The landlocked side in the northwest consists mostly of taro fields. More to the north there are some sugar plantations and a sugar mill, worked by a team of mules. From the north toward the east, where the beach forms the bight of Whytete, the soil around the village is less fertile, or at least not greatly cultivated. [Boelen 1988:62]

Boelen’s description implies the Ka‘ākaukukui region and the present project area are within a “not greatly cultivated” region of Honolulu perhaps extending from Pūowaina (Punchbowl Crater) at the north through Kaka‘ako to the Kālia portion of Waikīkī in the east.

An early, somewhat generalized depiction of the pre-Contact Native Hawaiian shaping of Waikīkī, Honolulu, and the Ka‘ākaukukui region is given on an 1817 map (Figure 6) by Otto von Kotzebue, commander of the Russian ship *Rurick*, who visited O‘ahu the previous year. The map shows taro *lo‘i* (illustrated by the rectangles representing irrigated fields) massed around the streams descending from Nu‘uanu and Mānoa valleys. The depicted areas of population and habitation concentration (illustrated by the trapezoids) probably reflect an early post-Contact shift of Hawaiians to the area around Honolulu harbor—the only sheltered landing on O‘ahu and the center of increasing trade with visiting foreign vessels. Kamehameha himself had moved from Waikīkī to Honolulu in 1809.

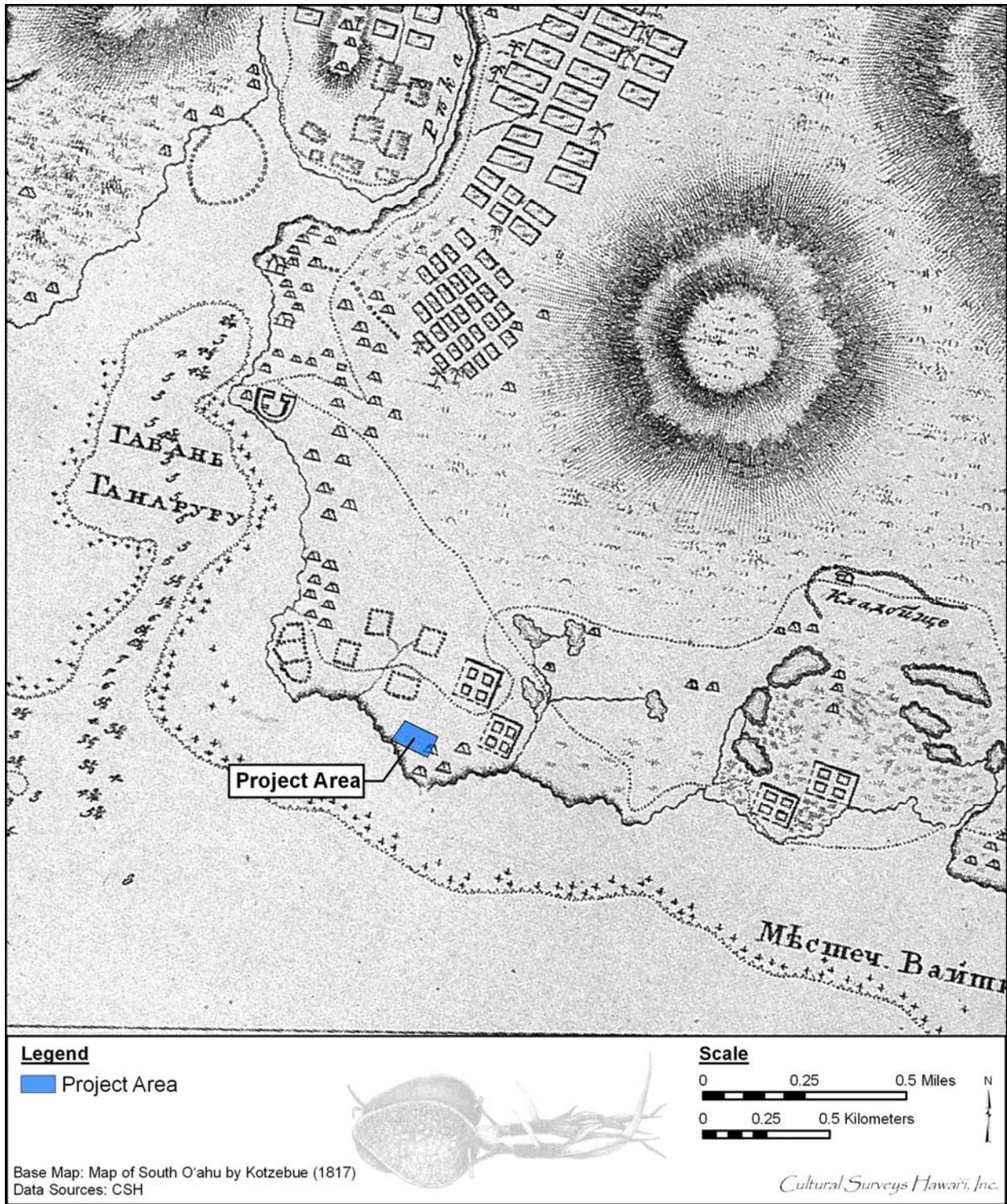


Figure 6. 1817 map of South O'ahu by Otto von Kotzebue, showing taro *lo'i*, fishponds, and salt pans in Honolulu and Waikiki; note the presence of traditional Hawaiian habitation within and in the vicinity of the project area (map reprinted in Fitzpatrick 1986:48-49)

Kotzebue's map illustrates that the land between Pūowaina (Punchbowl Crater) and the shoreline—which would include the Ka'ākaukui area—formed a “break” between the heavily populated and cultivated centers of Honolulu and Waikīkī; the area is only characterized by fishponds, salt ponds, trails connecting Honolulu and Waikīkī, and occasional taro *lo'i* and habitation sites. However, habitation sites are depicted within and in the vicinity of the project area (see Figure 6). An 1855 map of Honolulu by Joseph de la Passe, a lieutenant aboard the French vessel *L'Eurydice*, also illustrates sparse coastal habitation within the project area (Figure 7).

A clearer picture of Ka'ākaukui and the project area develops with accounts dating to the first half of the nineteenth century by other Honolulu visitors and/or settlers. Gorman D. Gilman, who arrived in Honolulu in 1841, recalled in a memoir the limits of Honolulu during the early 1840s:

The boundaries of the old town may be said to have been, on the *makai* [seaward] side, the waters of the harbor; on the *mauka* [inland] side, Beretania street; on the Waikīkī side [i.e., the area just beyond Punchbowl Street], the barren and dusty plain, and on the Ewa [west] side, the Nuuanu Stream. [Gilman 1904:97]

Gilman further described the “barren and dusty plain” beyond (east of) Punchbowl Street:

The next and last street running parallel [he had been describing the streets running *mauka-makai*, or from the mountains to the shore] was that known as Punchbowl Street. There was on the entire length of this street, from the *makai* side to the slopes of Punchbowl, but one residence, the two-story house of Mr. Henry Diamond, *mauka* of King Street. Beyond the street was the old Kawaiaha'o church and burying ground. A more forsaken, desolate looking place than the latter can scarcely be imagined. One, to see it in its present attractiveness of fences, trees and shrubbery, can hardly believe its former desolation, when without enclosure, horses and cattle had free access to the whole place. [Gilman 1904:89]

That the environs of the missionary enclave and Kawaiaha'o Church were indeed “forsaken” and “desolate looking” in the 1820s when the missionaries first settled there is confirmed in the memoirs of the American missionary C.S. Stewart who, arriving on Maui after living at the mission, declared Lahaina to be “like the delights of an Eden” after “four weeks residence on the dreary plain of Honoruru” (Stewart 1970:177). It is likely these descriptions of the Honolulu plain also include the area now known as Kaka'ako. The barrenness of the Kaka'ako area is illustrated in two sketches, one made in 1834 (Figure 8) when Kawaiaha'o church was still a long grass-thatched building and one made in 1850 (Figure 9) after the grass hut had been replaced by a large coral stone structure with a steeple. Between Kawaiaha'o Church and the sea are only a few scattered huts along the shore and aligned along the inland trail (now covered by King Street). An 1887 photograph (Figure 10 and Figure 11) of the area also shows the marshy nature of the area, with only scattered houses near the ponds or near the shore *makai* of Kawaiaha'o Church.

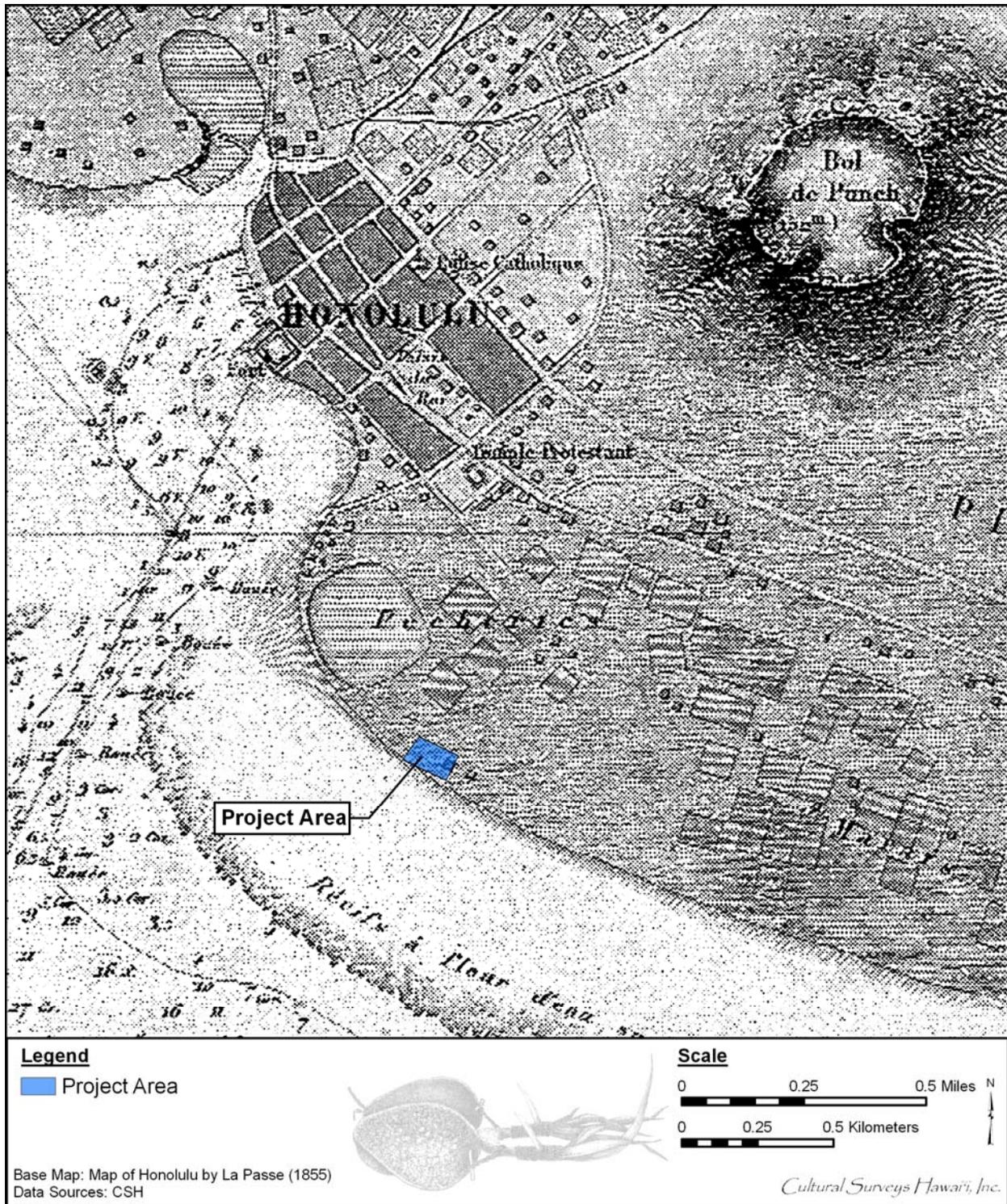


Figure 7. 1855 map of Honolulu by Lt. Joseph de La Passe of the French vessel *L'Eurydice*; note the project area is indicated within an area of coastal habitation (reprinted in Fitzpatrick 1986:82-83)

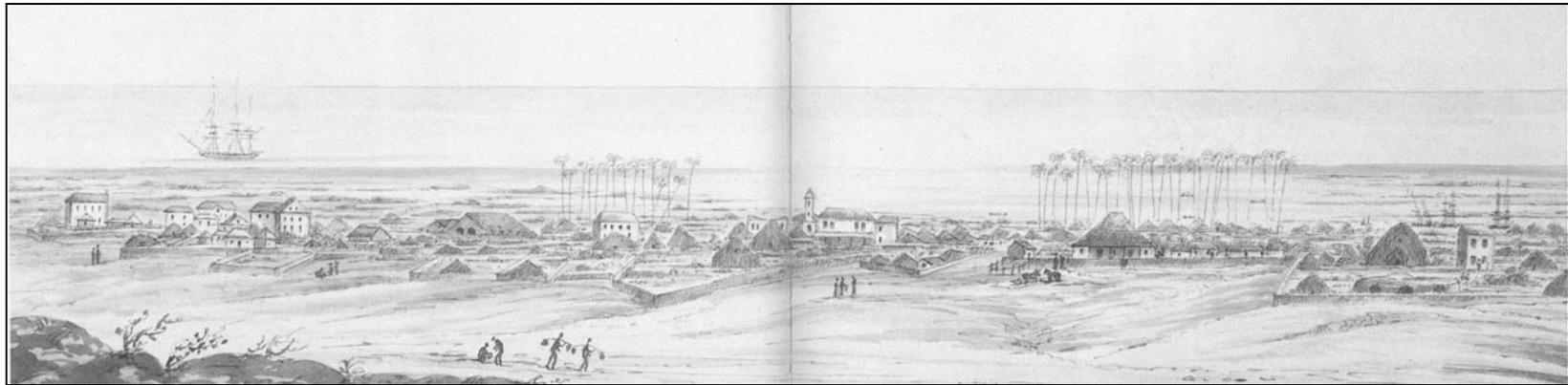


Figure 8. Portion of 1834 sketch by anonymous illustrator entitled “Town of Honolulu: Island of Woahoo: Sandwich Islands” (original sketch at Bishop Museum; reprinted in Grant 2000:64-65); project area would be *makai* of Kawaiaha‘o Church, at this time a long grass-thatched structure

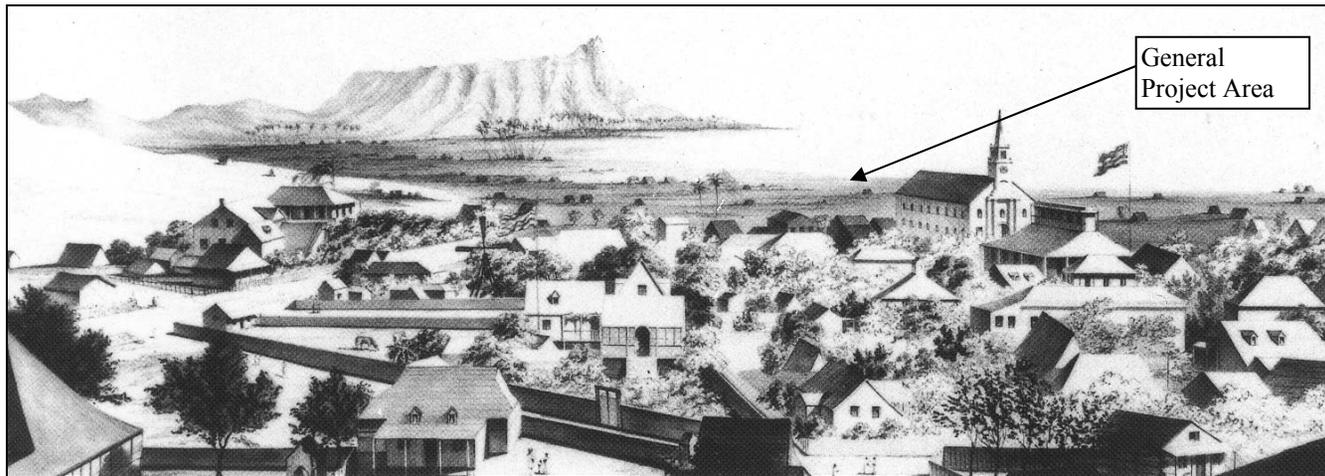


Figure 9. 1850 sketch by Paul Emmert (original sketch at Hawaiian Historical Society; reprinted in Grant 2000:5); the project area would be *makai* of the Kawaiaha‘o Church, by this time a stone structure with a steeple

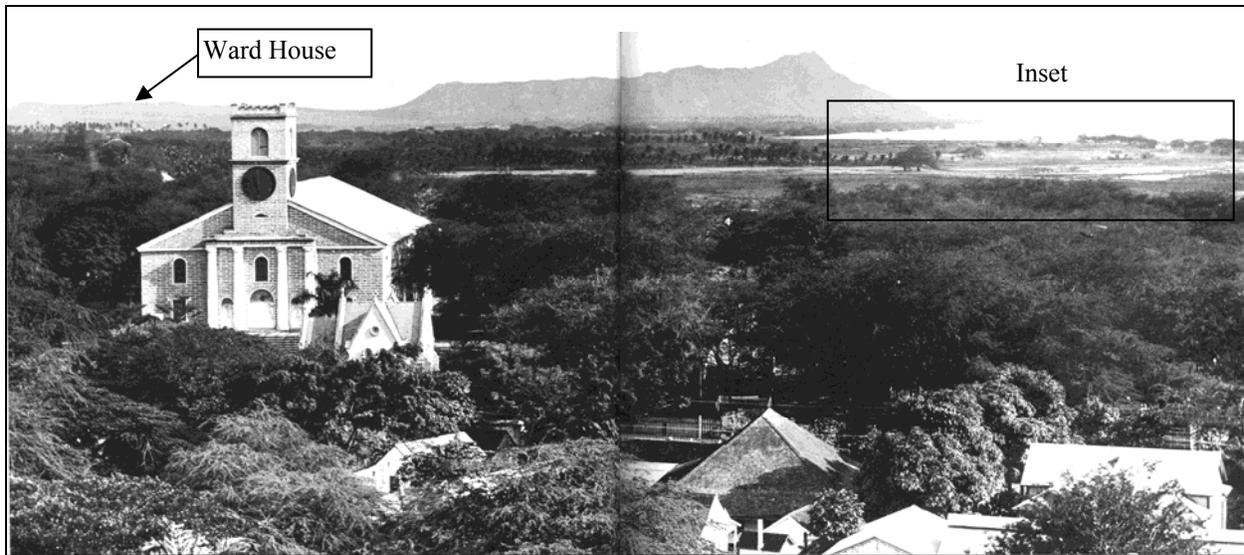


Figure 10. 1887 (ca.) photograph of Honolulu and Waikīkī; Kawaiahaʻo Church in left foreground; the cupola on the roof of the Ward's House on the *mauka* end of Old Plantation can be seen in the upper left of the photograph; the project area is within the marshlands seen in the right upper background (original photograph at Hawai'i State Archives, Henry L. Chase Collection; reproduced in Stone 1983:84-85)



Figure 11. Enlarged inset section on 1887 (ca.) photograph (Figure 10 above) showing marshlands and scattered huts along the coast near the project area

2.1.3 Mid-Nineteenth Century to Twentieth Century

2.1.3.1 The Māhele and Land Commission Awards

Among the first descriptions of Ka'ākaukukui by Hawaiians are the testimonies recorded during the 1840s in documents associated with Land Commission Awards (LCA) and awardees of the Māhele—the division of Hawaiian lands—which introduced private property into Hawaiian society. The LCA records indicate the traditional Hawaiian usage of the region and its environs may have been confined to salt making and farming of fishponds, with some wetland agriculture in those areas *mauka* or toward Waikīkī at the very limits of the field system descending from Makiki and Mānoa valleys. However, the testimonies do indicate the area was occupied and shaped by Hawaiians before the nineteenth century. The LCA records also reveal that midway through the nineteenth century taro cultivation, traditional salt making, and fishpond farming activities continued within the Ka'ākaukukui area. These activities and the land features that supported them would subsequently be eliminated/or buried by urbanization during the remainder of the nineteenth century. The LCA records and historic maps and archival photographs document more precisely traditional Hawaiian settlement and subsequent historic land usage within and around the present project area.

The 'ili of Ka'ākaukukui (LCA 7713) was awarded to Victoria Kamāmalu, the sister of Kamehameha IV and Kamehameha V. Ka'ākaukukui consisted of three non-contiguous sections, a type of 'āina (land) called a *lele*. An early surveyor for the Hawaiian Government Survey office explains about *lele* in general, and Ka'ākaukukui in particular:

There were two features of the ili, referred to by the terms *lele* . . . the ili often consisted of several distinct sections of land—one, for instance, on the seashore, another on dry, open land, or *kula*, another in the regularly terraced and watered kalo patch or *aina loi* district, and another still in the forest, thus again carrying out the equable division system which we have seen in the ahupuaa.

These separate pieces were called, *lele*, i.e., 'jumps,' and were most common on Oahu. . . . Kaakaukukui held Fisherman's Point and the present harbor of Honolulu; then kalo land near the present Kukui street, and also a large tract of forest at the head of Pouoa [Pauoa] Valley. . . .

These different pieces were called variously, either by their own individual name or by that of the whole ili, thus puzzling one sadly when attempting to obtain information with respect to them. [Lyons 1894:1697]

There were no smaller *kuleana* awards to commoners within this award. The award also included the southern portion of the 'ili of Pu'unui and a large fishpond (labeled Loko Ka'ākaukukui) surrounded by land in the 'ili of 'Auwaiolimu. Loko Ka'ākaukukui was probably a fishpond fed by spring water, but the other ponds in her award, Loko Kaimukana, Loko Kalokoeli, and possibly Loko Kuimeki, were probably salt ponds filled by tidal waters. This land does not seem to have been used in this period for habitation.

There are three LCAs shown on maps on the northwestern border of Ka'ākaukukui. In the Māhele testimony, these awards are listed as within the 'ili of Kaka'ako.

LCA 4457 to Ana Kaloa was inhabited by her family since the days of Kamehameha I; it had four fishponds, an *'auwai* and a house enclosed by a fence.

LCA 3455 to Kaule for Liliha, a house lot (*pahale*) bound by the sea and the mouth of a stream (*muliwai*), was inherited from Kamehameha I.

LCA 247, a house lot, was claimed by Charles Kana'ina for W.C. Lunalilo, who received his land before the Māhele from his mother (*mamua loa*). Kana'ina was a friend to Kamehameha II and married his fifth wife Kekauluohi. Their son was Lunalilo, who became the sixth monarch of Hawai'i.

An 1876 map of the *'ili* of Ka'ākaukukui and Pu'unui (Figure 12) shows the project area just *mauka* of the coastline with an area of salt pans to the northwest; there are no *kuleana* lots to commoners and no habitations. All habitation lots near Ka'ākaukukui are located in clusters near Queen Street, most in the settlement at Honuakaha, or further inland along King Street, as shown on a 1884 map (Figure 13) and a 1887 map (Figure 14).

2.1.3.2 Kaka'ako Salt Works and the Salt Pans of Kewalo and Kukuluāe'o

As noted in the Land Commission Award testimony, much of the land in Ka'ākaukukui and Kukuluāe'o was used to produce salt. The Hawaiians used *pa'akai* (salt) for a variety of purposes, to flavor food, to preserve fish by salting, for medicines, and for ceremonial purposes. David Malo described the traditional method of making salt:

O ka paakai kekahi mea e pono ai, he mea e ono ai, ka ia, a me ke koekoe o ka paina ana, he mea hana ia ka paakai, ma kekahi aina, aole i hana a ma kekahi aina, o ke kai makai, e kii aku no ka wahine, a lawe mai ma ke poi, a ke kai hooholo ia mai kekahi ma kauwahi mai.

E waiho kela kai ma kekahi poho paha, he ekaha paha, he kahe ka paha, a liu malaila, alaila lawe ana kauwahi e, a paakai iho la no ia, o ka papa laau ka mea kui poi. [Malo 2006:73]

Translation

Pa'akai (salt) is another beneficial item. It is used to make fish delicious and tasteless foods edible. Pa'akai is made at a particular place, [but] it [salt] is not actually made from this spot, rather it [salt water] came from the sea. A woman went to get some when the sea crashed [upon the rocks] and she ran back [the salt water] to this particular spot.

That salt water (kai) is placed in, perhaps, a depression (poho) or a 'Bird's nest' (ēkeha) or rock basin (kāheka) and allowed to evaporate (liu). Then it is taken to another spot and is formed into pa'akai. Wooden boards (papa lā'au) are used to pound poi (mashed cooked kalo corms) on. [Malo 2006:95]

In 1903, Nathaniel Emerson translated David Malo's articles on early Hawaiian life. In his publication, the translations are not literal, but include information that Emerson added to clarify the accounts. In Emerson's translation,

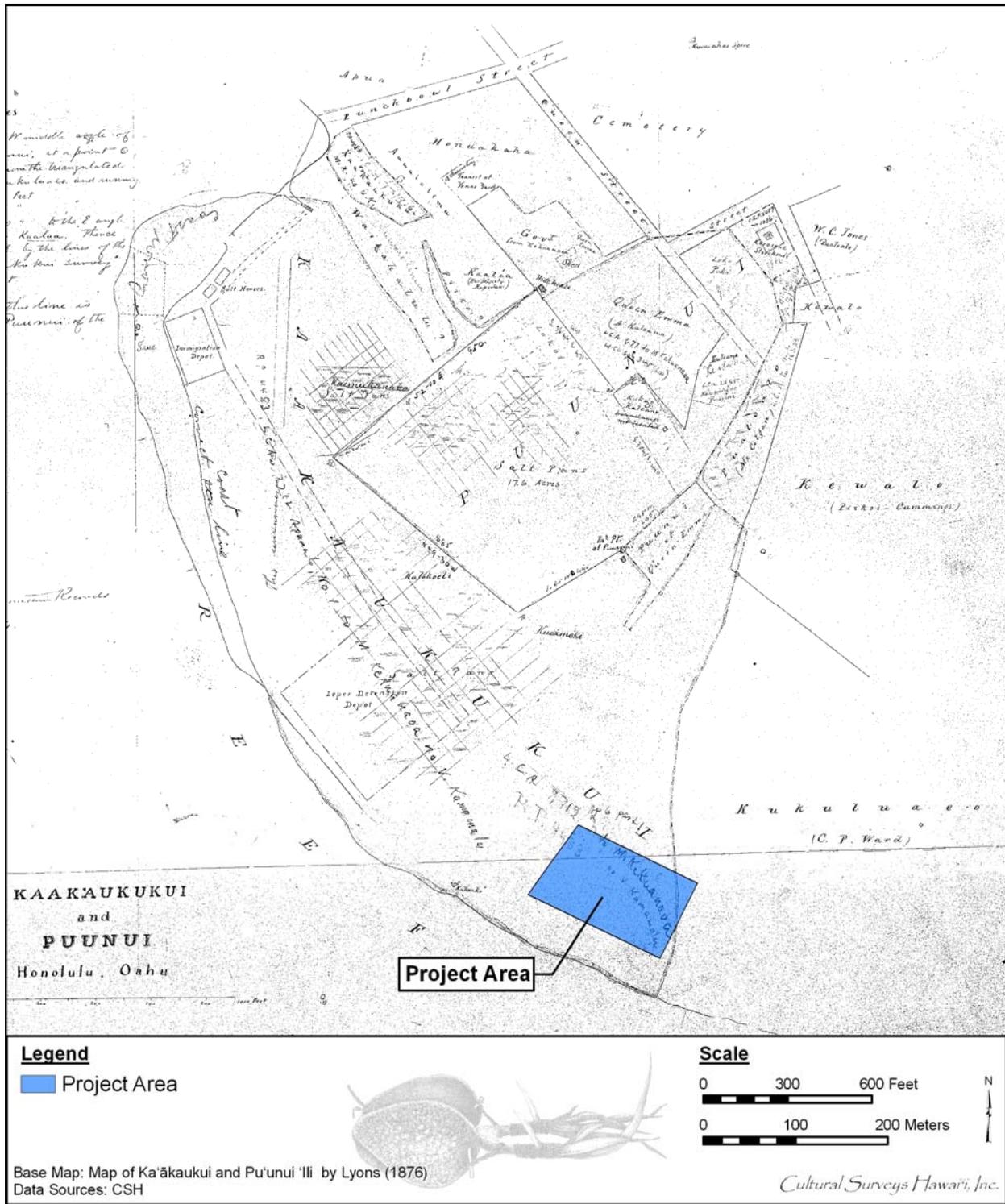


Figure 12. 1876 map of Ka'ākaukui and Pu'unui 'Ili by C.J. Lyons

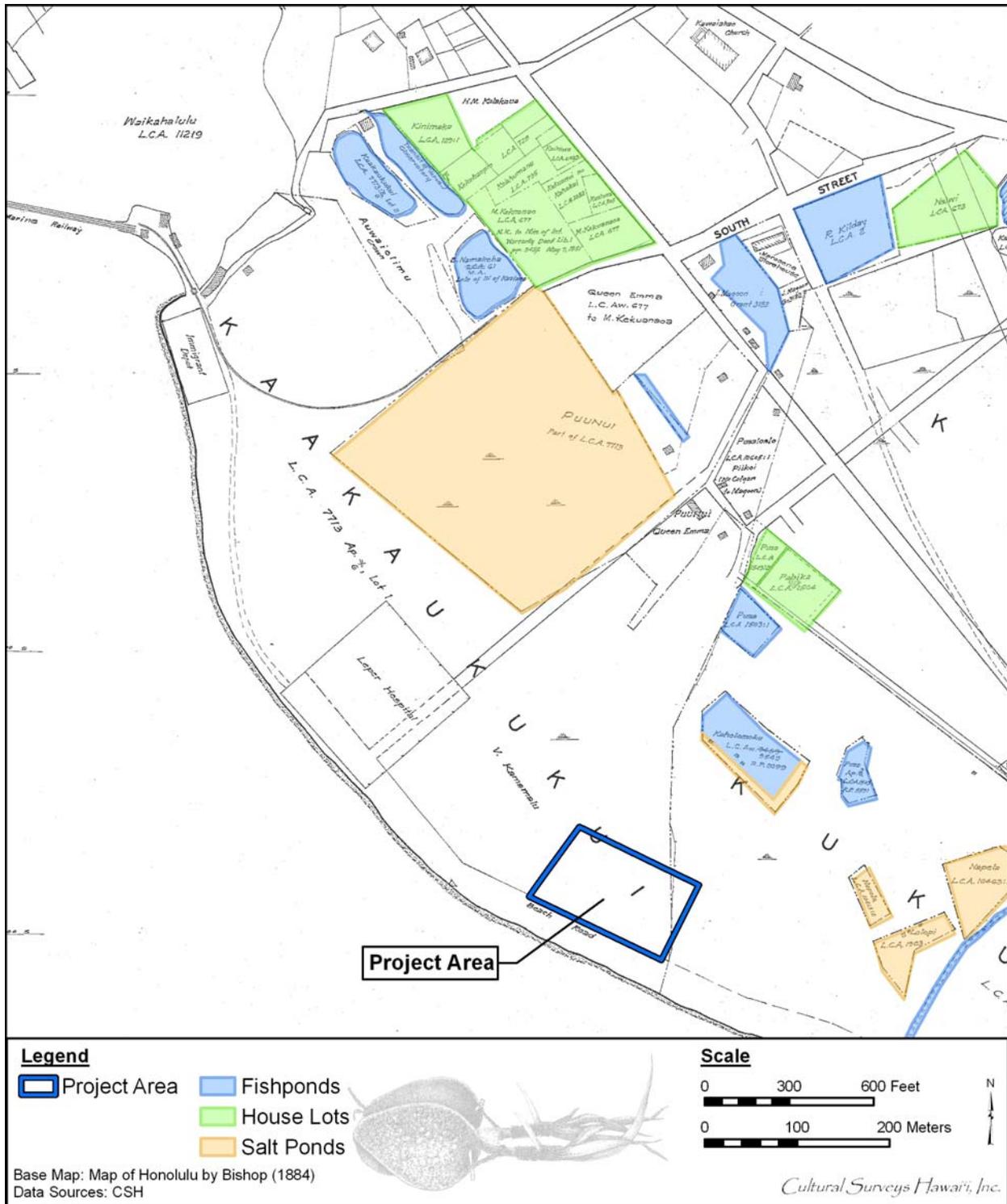


Figure 13. 1884 map of Honolulu, Kewalo Section (portion) by Sereno Bishop showing the locations of LCA parcels, fishponds, salt lands, and house lots; note the absence of houses within the project area

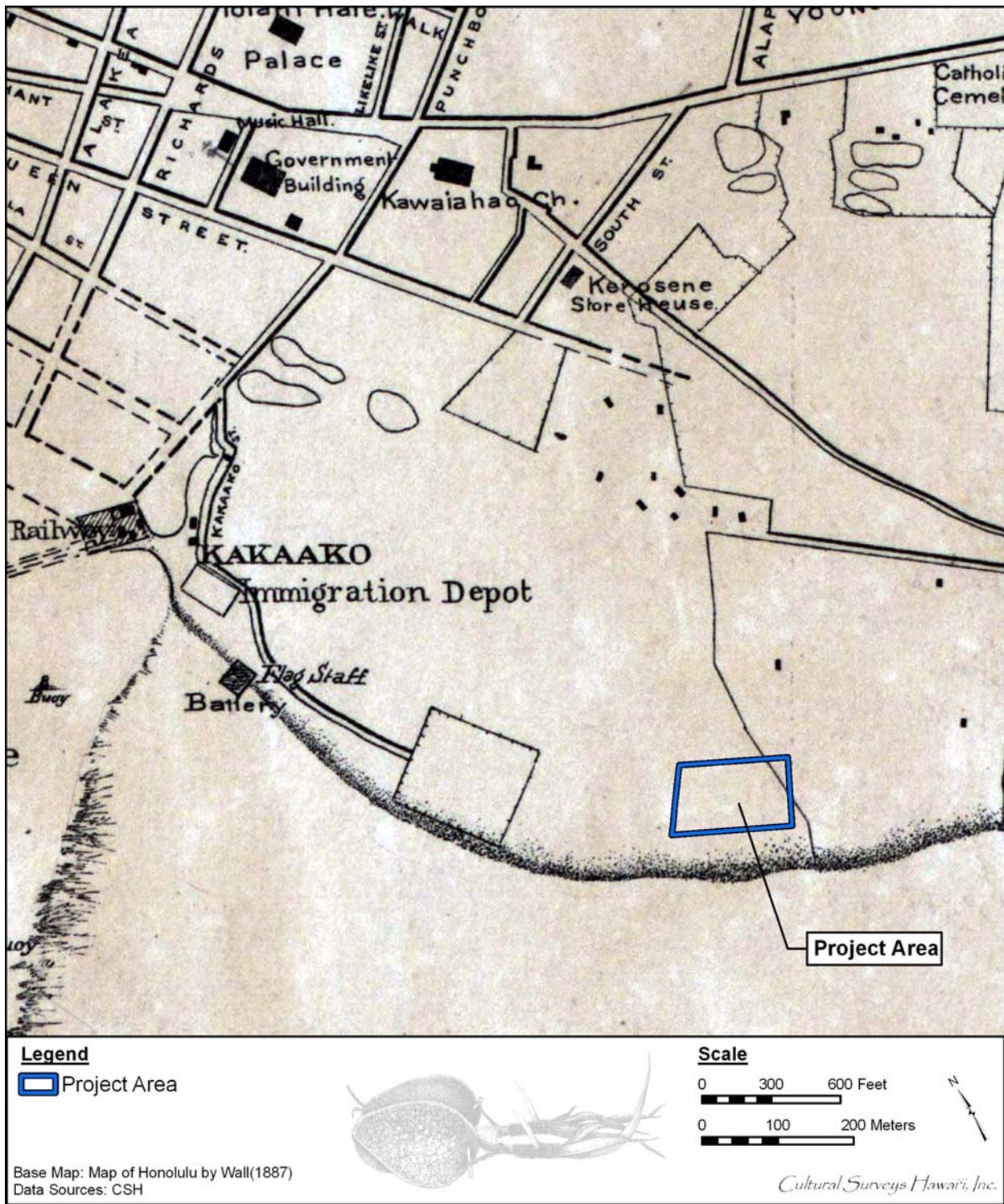


Figure 14. 1887 map of Honolulu (portion) by W.A. Wall (copy at Library of Congress, Geography and Map Division), showing project area location

Salt was one of the necessities and was a condiment used with fish and meat, also as a relish with fresh food. Salt was manufactured in certain places. The women brought sea-water in calabashes, or conducted it in ditches to natural holes, hollows and shallow ponds (kekaha) on the sea-coast, where it soon became strong brine from evaporation. Thence it was transferred to another hollow or shallow vat, where crystallization into salt was completed. [Malo 1951:123]

Captain Cook was the first to note the method of making salt in prepared “saltpans.”

Amongst their arts, we must not forget that of making salt, with which we were amply supplied, during our stay at these islands, and which was perfectly good of its kind. Their saltpans are made of earth, lined with clay; being generally six or eight feet square, and about eight inches deep. They are raised upon a bank of stones near the high-water mark, from whence the salt water is conducted to the foot of them, in small trenches, out of which they are filled, and the sun quickly performs the necessary process of evaporation. . . . Besides the quantity we used in salting pork, we filled all our empty casks, amounting to sixteen puncheons, in the Resolution only. [Cook 1784:151]

In the years following the discovery of the Islands by Captain Cook in 1778, British and American fur traders who stopped at Hawai'i on their way to China often stocked up on food and water and salt which was used to cure the seal and mammal pelts collected from the Northwest Coast. During Kotzebue's visit in 1816 and 1817, he noted that “Salt and sandalwood were the chief items of export” (in Thrum 1904:50).

The journals of none mention the object of call other than for refreshments, though one, 3 some years later, records the scarcity and high price of salt at the several points touched at, with which to serve them in the curing of furs obtained on the coast. In all probability salt was the first article of export trade of the islands and an object, if not the object, of these pioneer fur-traders' call. [Thrum 1904:45]

The missionary William Ellis, on a tour of the Hawaiian Islands in 1822 and 1823, also noted salt pans and recorded the final step of crystallization.

The natives of this district (Kawaihae) manufacture large quantities of salt, by evaporating the sea water. We saw a number of their pans, in the disposition of which they display great ingenuity. They have generally one large pond near the sea, into which the water flows by a channel cut through the rocks, or is carried thither by the natives in large calabashes. After remaining there for some time, it is conducted into a number of smaller pans about six or eight inches in depth, which are made with great care, and frequently lined with large evergreen leaves, in order to prevent absorption. Along the narrow banks or partitions between the different pans, we saw a number of large evergreen leaves placed. They were tied up at each end, so as to resemble a narrow dish, and filled with sea water, in which the crystals of salt were abundant. [Ellis 1827:403-404]

In an article on Hawaiian salt works, Thomas Thrum (1924) discussed the large salt works at Ālia Pa'akai (Salt Lake in Moanalua) and at Pu'uloa on the western loch of

Pearl Harbor. Kamakau (1961:409) reported “The king and Isaac of Pu‘uloa are getting rich by running the salt water into patches and trading salt with other islands.” The salt was sent to Russian settlements in the Pacific Northwest, where it was used to pack salmon (*Hawaiian Gazette*, 29 January 1897). Thrum also mentioned a salt works in Kaka‘ako.

Honolulu had another salt-making section in early days, known as the Kakaako salt works, the property of Kamehameha IV, but leased to and conducted by E.O. Hall, and subsequently E.O. Hall & Son, until comparatively recent years. This enterprise was carried on very much after the ancient method of earth salt pans as described by Cook and Ellis. [Thrum 1924:116]

In the testimony for LCA 1903, Lolopi claimed two *ālia* (salt beds), 15 *ho‘oliu* (drains), two *poho kai* (depressions where salt is gathered) and one salt *kula* (dryland or non-cultivated land). Four separate types of salt features are mentioned, 1) the ponds near the shore that fill with salt water at high tide (*ālia*), 2) the drains (*ho‘oliu*) where the salt water is transferred to smaller clay-lined or leaf-lined channels, 3) the natural depressions (or modified depressions) in the rocks along the shore where salt formed naturally, and 4) the salt *kula*, which was waste land, not suitable for agriculture as it was impregnated with salt. Lolopi did not live near his salt lands, but Pahiha, claimant of LCA 1504, did have a house near his fishpond and salt bed. The house was probably a simple grass hut, similar to those shown on an 1838 sketch entitled “Honolulu Salt Pans, Near Kakaako” and the one shown on an 1845 sketch of the “Old Salt Pans” (Figure 15 and Figure 16).

The export of salt declined in the late nineteenth century. Thrum (1924:116) stated that the apex of the trade was in 1870, but by 1883, he noted that “pulu, salt and oil have disappeared entirely” from the list of yearly exports (Thrum 1884:68). By 1916, only one salt works, the Honolulu Salt Company, was still in operation. Salt continued to be manufactured for local use. The Kaka‘ako Salt Works appears on maps as late as 1891 and a page in Victoria Ward’s ledger for 1883 notes a yearly income of \$651.50 received from her “Salt Lands” in Kukuluaē‘o (Hustace 2000:50).

In a 1906 article, Rev. Westervelt (1906:43-46) explained the Chinese method of salt evaporation at the Honolulu salt beds. The Chinese worker first used a water pump to draw the seawater from the larger ditch below to the salt-evaporation beds above. The man moved the two handles back and forth to work the pump. The evaporation beds were lined with clay, wet with sea water, and tramped and pounded down. Each pan was about 20 ft sq, covered with about two inches of water, and bound by an earth dyke, so that the area looked like a large grid, as shown in a modern photograph of the salt beds at Hanapēpē, Kauai (Figure 17) and a photograph of the Kewalo salt brine beds (Figure 18). After allowing the sun to evaporate some of the water, the worker stepped into the evaporation pan and scraped the salt into a pile in the center with a simple wooden scraper. He then threw a large basket shaped like a scoop into the brine and used a tin dipper to move the salt to the basket. Two baskets, one on each side of a pole, were then carried on the back of a worker across the thin earth dykes between the salt pans. The baskets were dumped into large drying piles, where the remaining water seeped out into the ground. The salt was then sewn into gunny sacks and sent to the market for sale.

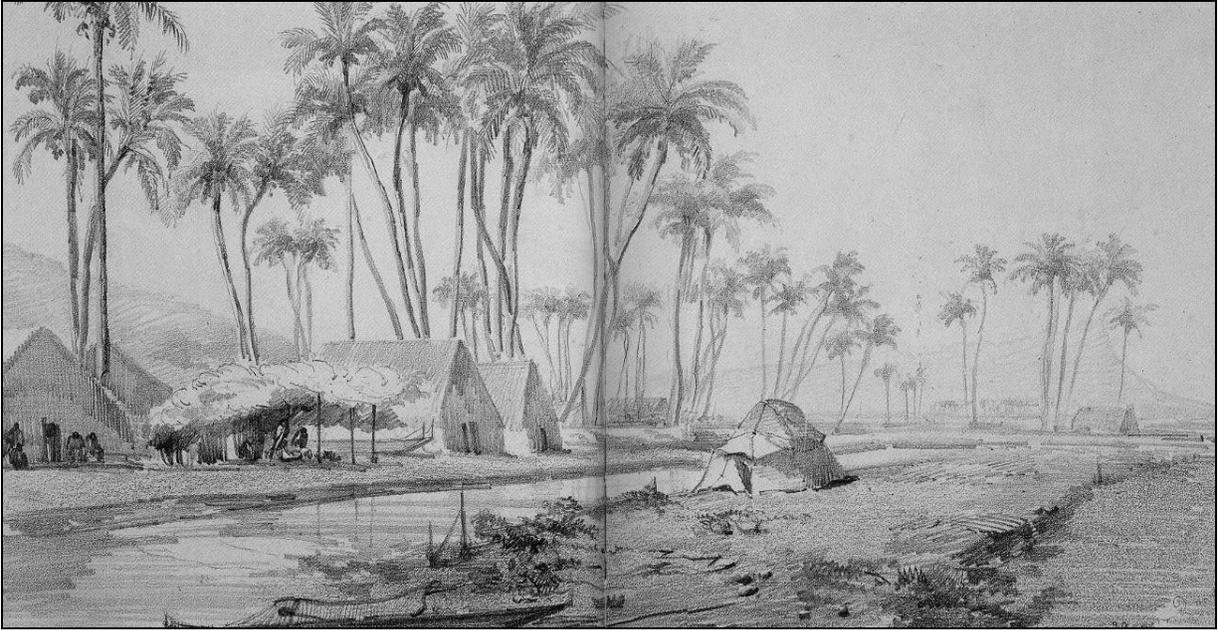


Figure 15. 1838 sketch of “Honolulu Salt Pan, near Kaka‘ako” drawn by a French visitor, Auguste Borget (original sketch at Peabody Essex Museum, Salem, Massachusetts; reprinted in Grant 2000:64-65)

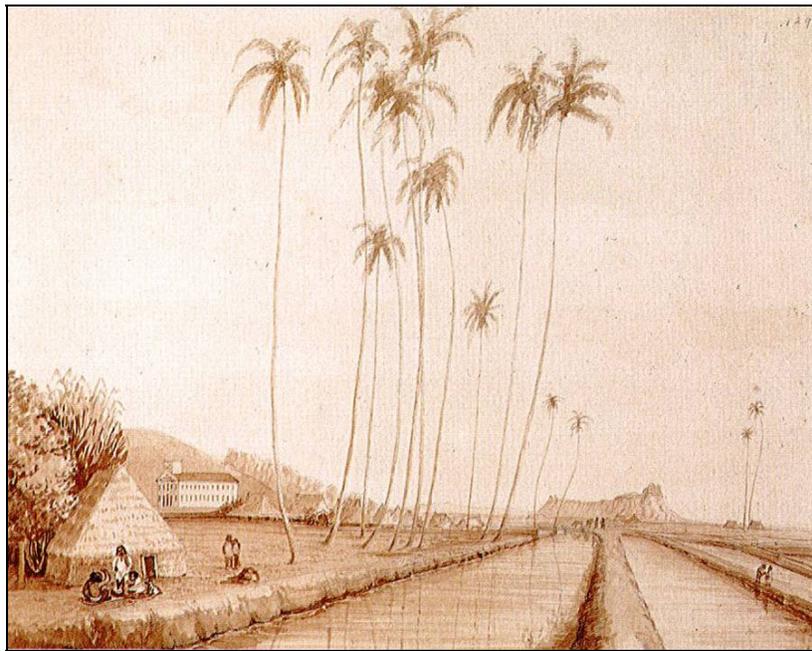


Figure 16. 1845 sketch of “Native Church [Kawaiiaha‘o Church], Oahu, from the Old Salt Pans,” drawn by John B. Dale, from the U.S. Exploring Expedition led by Lt. Charles Wilkes (J. Welles Henderson Collection, reprinted in Forbes 1992:126); the sketch is probably from the salt pans in the Ka‘ākaukukui area



Figure 17. Traditional-type salt evaporation pans in Hanapēpē, Kaua'i (photograph from Hawai'i State Historic Preservation Division)



Figure 18. 1902 photograph of Kewalo brine basins, showing rectangular, grid-like pans (original photograph at Bishop Museum; reprinted in Scott 1968:579)

By 1901, most of the fishponds and salt pans *makai* of the Ward “Old Plantation” area were reported as abandoned. In that year, the Hawaii Legislature (1901:185) proposed to build a ditch to drain away the “foul and filthy water that overflows that district at the present time.”

The district *makai* of King St. and the Catholic Cemetery, Ewa of Mrs. Ward's (the Old Plantation), mauka of Clayton St., and Waikiki of the land from King St., leading to the Hoomananaauao Church, consists of six large abandoned fish ponds and a large number of smaller ones, all in filthy condition, fed by springs and flowing into Peck's ditches. Just *makai* of these ponds, at the end of Clayton street, next to Mr. Ward's, is Peck's place. An artesian well flushing the wash houses flows into two foul ditches, thence to the big pond which is Waikiki of what used to be Cyclomere and next to Mrs. Ward's line [ditch] extending down to Waimanu St.

The rear portion of Mrs. Ward's property down to Waimanu St. used to be fish ponds all connecting to the sea by a ditch which is fed by an artesian well. These ponds, with the exception of three, are abandoned. [Hawaii Legislature 1901:185]

2.1.3.3 Kaka'ako's Role as a Human Quarantine Center and Cemetery Area

During the 1853 smallpox epidemic, patients were isolated at a temporary quarantine camp, a hospital was set up at Kaka'ako (Thrum 1897), and victims of the disease were buried at the Honuakaha Cemetery near the modern junction of Quinn Lane and South Street (Griffin et al. 1987:13; Hammatt and Pfeffer 1993; Pfeffer et al. 1993).

Hansen's Disease (leprosy) was first reported in 1840, and first definitely identified in 1853. During the next 25 years (1853-1878), there were 160 cases per year (about 4,000) and 80 cases (about 4,000) per year in the following 50 years (1878-1928), steadily decreasing to 60 cases a year in 1931 and 20 cases a year by 1951 (Arnold 1956:317). In 1865, a receiving hospital in Kalihi, west of Honolulu town, was set up to examine suspected lepers. If the diagnosis was confirmed, the patients were forcibly exiled to the Kalaupapa colony on Moloka'i. In cases where it was uncertain if the patient had leprosy or some other type of skin disease, the stay at the hospital could extend into weeks while the doctors waited for definite symptoms of leprosy to develop.

In 1881, a branch hospital and receiving station for cases of Hansen's Disease was opened in Kaka'ako, in a block now bounded by Ala Moana, Auahi, Coral and Keawe streets, located to the southeast of the current project area (Griffin et al. 1987:55 [see Figure 13]), with 48 patients tended by Dr. George L. Fitch (Hanley and Bushnell 1980:112). This land, at “Fisherman's Point,” was donated by Princess Ruth Ke'elikōlani. On an 1881 map of O'ahu (Figure 19) the project area is indicated to be just *makai* of the Kaka'ako Salt Works.

One of the main purposes of the Kaka'ako Detention Center was to keep suspected lepers isolated from the general public. Sister Leopoldina, a Franciscan sister, likened the Kaka'ako Hospital in 1885 to a prison, enclosed by

. . . . a high close board fence and large strong locked gates. . . . A large building [sat] over those gates where the lepers were allowed to talk with their relatives



Figure 19. 1881 Hawaiian Government Survey map of O'ahu, Hawaiian Islands, by R. Covington, showing project parcel in Ka'ākaukui 'Ili in salt pan (grid) area

through prison bars. No one was allowed to enter without a permit from the Board of Health. [Hanley and Bushnell 1980:114]

As the complex was on a former salt marsh near the sea, it was subject to flooding at high tide. The salt water killed all vegetation and made it impossible to landscape the complex with grass or plants; the water swept away stone-bordered paths, corroded metal, and destroyed the whitewash on the buildings. Even so, the Board of Health expected the patients to help feed themselves by growing their own vegetables in gardens on the center's grounds. Overcrowding was also a problem. The hospital, built to house 100 patients, had over 200 residents by 1883. Dr. Fitch was in favor of making the Kaka'ako station a permanent leprosarium, and often delayed sending confirmed lepers to Moloka'i (Hanley and Bushnell 1980).

In 1883, Walter Murray Gibson, minister in King Kalākaua's government and head of the Board of Health, sent out a plea for a religious order to care for the sick of Hawai'i, especially the lepers. The call was answered by the Franciscan Sisters of Syracuse, New York, led by Mother Marianne Cope. Seven sisters arrived in Honolulu and made their first visit to the Kaka'ako Leper Detention Center in November of 1883. They were appalled by what they saw—tumble-down cottages, filth and flies in the dining area, and the stench of the leper's unwashed sores. The hospital steward, J.J. Van Geisen, took them on a tour.

'Now let me show you the most interesting place,' he announced, leading the group to a narrow building that teetered on pilings over the surf. The structure had been divided into three dingy cubicles, with warped floors and windows ghosted by salt spray. The first of the rooms was the 'morgue.' Van Geisen explaining that when a patient's condition reached a certain point, he was forced into the morgue and remained there until dead. The body was then dragged to the second cubicle, where Fitch performed an autopsy. Finally the remains were moved to the third room, to await a burial team. [Tayman 2006:143]

The sisters built a convent at the hospital in November to live near their patients. The convent was a two-story house with a hall, parlor, and refectory on the ground floor, and five bedrooms upstairs. A small chapel attached to the rear of the structure was dedicated to St. Philomena. The sisters soon took the running of the hospital in hand, cleaning and whitewashing the cottages, separating the males and females into two wards, and setting up new landscaped areas and gardens (Figure 20) (Hanley and Bushnell 1980).

In 1884, Mother Marianne built a home at Kaka'ako for the non-leprous daughters of the patients at the Kaka'ako detention center and the exiled lepers at Moloka'i (Figure 21). This girls' home was named after Queen Kapi'olani, who supported Mother Marianne's plan by raising funds. A two-story dormitory for the girls was built near the sisters' chapel (Hanley and Bushnell 1980:222).

In 1888, the Board of Health decided to close the Kaka'ako Branch, moving the receiving station to Kalihi; they determined that "The buildings at Kakaako should be entirely removed" (Hanley and Bushnell 1980:275). The hospital and several other of the larger buildings were dismantled and transported for use at Moloka'i (Daws 1984:xxiii), but a few buildings remained, and Kaka'ako continued to be used as a temporary leprosy receiving station. In 1889, the Kapi'olani School for Girls also was moved to Kalihi (Hanley and Bushnell 1980:326). The

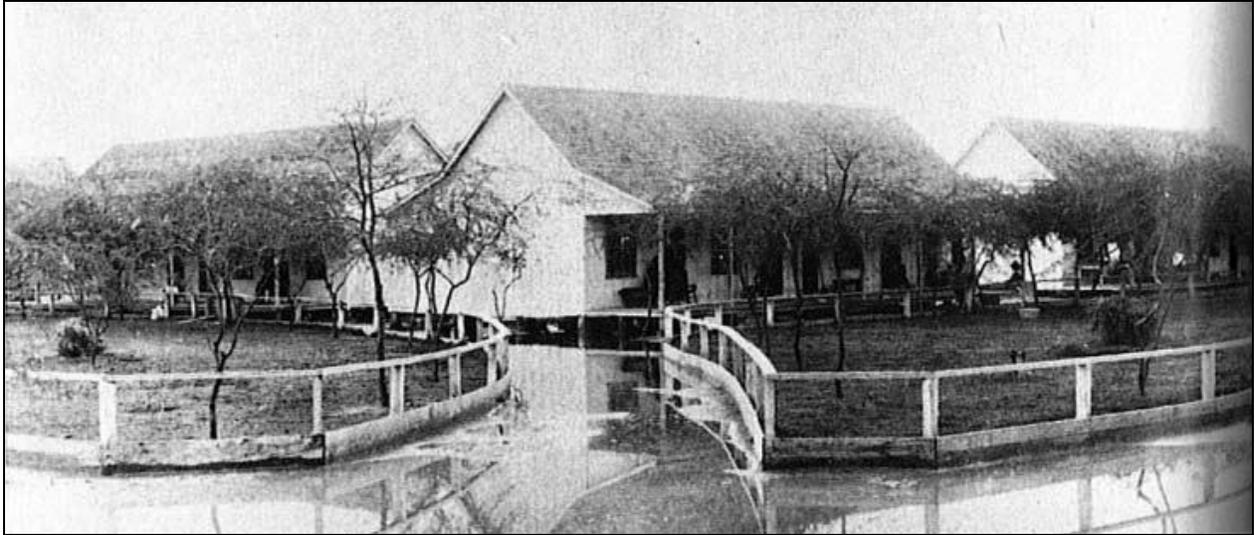


Figure 20. 1886 photograph of patients' Oceanside cottages at the Kaka'ako Leper Detention Center (reprinted in Hanley and Bushnell 1980: photograph section)



Figure 21. 1886 photograph of the Kapi'olani Home for Girls within the Kaka'ako Leper Detention Center; Mother Marianne Copeland is the second woman from the right (reprinted in Hanley and Bushnell 1980: photograph section)

buildings were torn down and the new immigration station was built on the former grounds of the home. Thrum (1897:101) reports that victims of the cholera epidemic of 1895 were treated at the Kaka'ako Hospital, suggesting the remaining buildings were modified or a new hospital was built during this time.

In 1899, the first case of bubonic plague was identified in Hawai'i and spread rapidly through the crowded tenements of Chinatown. The government decided the best way to eradicate the disease was through "controlled burning" of the wooden buildings. Infected patients were moved to a quarantine camp at Kaka'ako. Some people, not necessarily patients, whose houses were burned were housed at the barracks of the Kaka'ako Rifle Range, and their belongings were stored in the cellars of Kaumakapili Church. On 20 January, a fire set in Block 15 between Kaumakapili Church and Nu'uuanu Avenue quickly got out of control. No one was killed in the fire, but Chinatown was destroyed. Many people were homeless, and also bereft of all belongings, lost when Kaumakapili Church burned to the ground (Iwamoto 1969:122-124, 130-131).

In 1905, the Kaka'ako area was used for the incineration of the waste from urban Honolulu. Thomas Thrum reported,

Early in the year was completed the long projected garbage crematory for the disposal, daily, of the city's refuse by a patent and sanitary process. It is located on the shore of Kakaako, adjoining the sewer pumping station; is two stories in height and built of brick. [Thrum 1906:177]

The dredging of Honolulu harbor and its channel is completed as far as planned for the present, and excavations for the Alakea and Kinau slips finished, the material therefrom being used to fill in a large area of Kakaako and the flats in the vicinity of the sewer pumping station and garbage crematory. The amount of material removed by the Federal dredging was a million and a half cubic yards. [Thrum 1907:148-149]

2.1.3.4 Military Works at Kaka'ako, Ka'ākaukukui, and Kukuluāe'o

During the monarchy, the point at Kaka'ako was the location for a battery. Its three cannons were used to salute visiting naval vessels, which responded with their own cannon salutes. Other saluting batteries were at the top of Punchbowl Crater and at the Honolulu Fort (Dukas 2004:163). The *Hawaiian Annual and Almanac for 1887* (Thrum 1887:37) reported \$4,500 had been spent to build the battery, which was used for gun salutes up to at least the end of the monarchy in 1893 (Judd 1975:57), as shown on an 1887 photograph (Figure 22) and a 1887 map (see Figure 14).

After the annexation of the Islands by the United States in 1899, the U.S. Congress began to plan for the coastal defenses of their new lands. The major batteries were placed at Pearl Harbor and in Waikīkī, but a small reservation named Fort Armstrong was also set up on the Ka'ākaukukui Reef as a station for the storage of underwater mines.

The fort does not seem to have been very impressive. William Castle in 1917 noted,

Fort Armstrong is the saluting station for the port of Honolulu. It is built on the Kaakaukukui Reef, one mile from the centre of the city and at the entrance of the

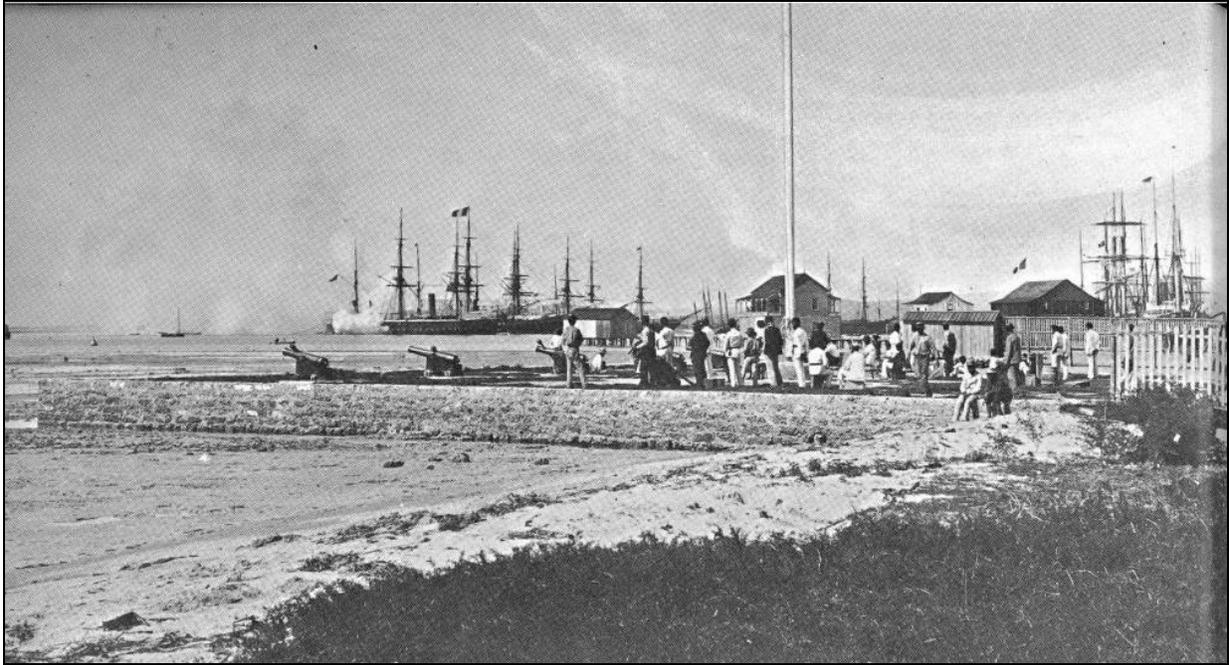


Figure 22. 1887 photograph of the Kaka'ako Saluting Battery and flagstaff (original photograph taken by Karl Kortum and archived at the San Francisco Maritime Museum; reprinted in Scott 1968:176)

harbour. Its area is 64 acres, and it has as garrison the 104th Company (mine) of the Coast Artillery Corps. Both officers and men are wretchedly housed in temporary board and batten shacks, although the fort has been in use for three years. [Castle 1917:90]

In 1899, the first case of bubonic plague was identified in Hawai'i and spread rapidly through the crowded tenements of Chinatown. The government decided the best way to eradicate the disease was through "controlled burning" of the wooden buildings. Infected patients were moved to a quarantine camp at Kaka'ako. Some people, not necessarily patients, whose houses were burned were housed at the barracks of the Kaka'ako Rifle Range, and their belongings were stored in the cellars of Kaumakapili Church. On 20 January, a fire set in Block 15 between Kaumakapili Church and Nu'uuanu Avenue quickly got out of control. No one was killed in the fire, but Chinatown was destroyed. Many people were homeless, and also bereft of all belongings, lost when Kaumakapili Church burned to the ground (Iwamoto 1969:122-124, 130-131).

The fort saw some small action during World War I when, in October 1917, the military authorities closed Honolulu Harbor between sunset and sunrise. The steamer *Claudine*, sailing from Maui when the edict went into effect, sailed into Honolulu Harbor unknowingly after twilight. The coast artillery at Fort Armstrong shot a few shells across her bow, and the steamer quickly reversed her engines and went back out to sea until the following morning, when she could safely and legally come to shore (Thomas 1983:147).

In the attack on the Islands on 7 December 1941, the fort escaped relatively unscathed; only one motor pool structure was hit. Antiaircraft shells were fired from the fort, but were ineffective; at least one hit the town rather than any aircraft (Richardson 2005:34). In the 1950s, the federal government returned most of Fort Armstrong to the Territory of Hawai'i, which used the area to expand the shipping piers of the harbor.

2.1.3.5 Honolulu Iron Works

In the 1850s, Hawaiian sugar planters became interested in a type of centrifugal machine that could separate sugar from molasses. In 1851, an engineer named David Weston installed his version of this machine in a Maui sugar mill. With backing from Hawaiian businessmen, Weston returned to the Islands in 1853 and founded the Honolulu Iron Works (Figure 23), which he set up in a building already occupied by a flour mill (Kuykendall 1938:326-327). The flour mill was at first the most successful part of the business, where wheat from Maui and as far away as Chile was ground into flour and then exported to California. However, as the sugar industry became more prominent in the Hawaiian Island economy, the Iron Works began to build the machinery needed to operate the new sugar mills, not only in Hawai'i but all over the world. At one point, the iron works employed 1,500 workers, many of whom lived in the Kaka'ako area (Nicol 1998:510).

Business began to decline in the 1950s, and in 1973 the works were closed (Nicol 1998:510). At first the old buildings were converted to retail space, but eventually all were torn down; the last warehouse was demolished in 1982 (Kawasaki 2005:2). The main lot for this complex is now covered by One Waterfront Plaza, northwest of the current project area.



Figure 23. 1901 (ca.) photograph of the Honolulu Iron Works complex; note the empty lots east of the complex; the study parcels would be to the east or right of this complex (original photograph at Bernice Pauahi Bishop Museum; reprinted in Myatt 1991:40-41)

2.1.3.6 Kaka'ako Land Reclamation

The first efforts to deepen Honolulu Harbor were made in the 1840s. The idea to use this dredged material, composed of sand and crushed coral, to fill in low-lying lands, was quickly adopted. From 1857 to 1870, the “Esplanade” between Fort and Alakea streets was created on 22 acres of filled-in former reef and tideland. By 1874, Sand (Quarantine) Island, site of the first immigration station, had been created over “reclaimed” land on reefs (Hawaii Board of Health 1902).

By the 1880s, filling in of the mud flats, marshes, and salt ponds in the Kaka'ako area had begun. This filling was pushed by three separate but overlapping improvement justifications. The first directive or justification was for the construction of new roads and improving older roads by raising the grade so improvements would not be washed away by flooding during heavy rain. A report by the Hawaii Board of Health (1908) noted the following:

I beg to call attention to the built-up section of Kewalo, ‘Kaka'ako,’ where extensive street improvements, filling and grading have been done. This, no doubt, is greatly appreciated and desirable to the property owners of that locality, but from a sanitary point of view is dangerous, inasmuch as no provision has been made to drain the improved section, on which have been erected neat cottages occupied for the greater part by Hawaiian and Portuguese families, now being from one to three feet below the street surface, and which will be entirely flooded during the rainy season. Unless this is remedied this locality will be susceptible to an outbreak [of cholera] such as we experienced in the past. [Hawaii Board of Health 1908:80]

The second, and most frequently used, justification for filling was driven by public health and sanitation, the desire to clean up rivers and ponds that were reservoirs for diseases such as cholera and that acted as breeding places for rats and mosquitoes. Thus, as early as 1902 it is reported that:

The Board has paid a great deal of attention to low-lying stagnant ponds in different parts of the city, and has condemned a number of them. The Superintendent of Public Works has given great assistance to seeing that the ponds condemned by the Board are filled. In September a pond on South Street was condemned as deleterious to the public health. [Hawaii Board of Health 1902:80]

The first areas to be filled were those closest to Honolulu town, then areas moving outwards to Kaka'ako (Griffin et al. 1987:13). The first fill material may have been set down in 1881 for the Kaka'ako Leper Branch Hospital (between Coral and Keawe streets), which had been built on a salt marsh. Laborers were hired to “haul in wagon loads of rubble and earth to fill up that end of the marsh” (Hanley and Bushnell 1980:113). In 1903, five more lots in Kewalo, on Laniwai, Queen, and Cooke streets, were condemned and ordered filled (Hawaii Board of Health 1903:6).

Although public health and safety were prominently cited, according to Nakamura (1979), the third justification or main desire for filling in Honolulu, Kewalo, and then Waikīkī lands was to provide more room for residential subdivisions, industrial areas, and finally tourist resorts. In the

early part of the twentieth century, Kaka'ako was becoming a prime spot for large industrial complexes such as iron works, lumber yards, and draying companies, which needed large spaces for their stables, feed lots, and wagon sheds. In 1900, the Honolulu Iron Works, which produced most of the large equipment for the Hawaiian plantation sugar mills, moved from their old location at Queen and Merchant Street near downtown Honolulu to the shore at Kaka'ako, on land that had been filled from dredged material during the deepening of Honolulu Harbor (Thrum 1901:172). Other businesses soon followed. Thrum (1902) noted,

The Union Feed Co. is another concern whose business has outgrown the limits of its old location, corner of Queen and Edinburgh streets. Like the Iron Works Co. they have secured spacious premises at Kakaako, erecting buildings specially adapted to the needs of their extensive business at the corner of Ala Moana (Ocean Road) and South Street. [Thrum 1902:168]

Private enterprises were not the only new occupants of Kaka'ako. A sewer pumping station, an immigrant station, and a garbage incinerator were also built on "reclaimed land" located in the vicinity of the current project area, across Ala Moana Boulevard. Thrum (1907) noted,

The dredging of Honolulu harbor and its channel is completed as far as planned for the present . . . the material there from being used to fill in a large area of Kakaako and the flats in the vicinity of the sewer pumping station and garbage crematory. [Thrum 1907:148-149]

For the incinerator, Thrum (1907) noted,

The new station is built on piles on reclaimed land that is being filled in from the coral dredgings that is going on, and is gradually taking on a tropical appearance. . . . Adjoining its premises on the mauka side is the new building designed for the Planters' Association for their labor bureau. [Thrum 1907:148-149]

The new immigration station had seven large rooms for dormitories surrounded by a breezy, open *lanai* where immigrant workers would stay while waiting for their clearance to go to their new work places on the sugar plantations. Adjacent to the dormitory was a hospital, which was used to check the new immigrants for any "loathsome or dangerous contagious disease" (Hawaii Governor 1905:77). The hospital was also used during epidemics to isolate contagious patients suffering from such diseases as smallpox, cholera, or plague.

In 1900, a Kewalo area pond surrounded by a bicycle racing track, called the Cyclomere (built in 1897), was filled. The pond was located on the *makai* side of Kapi'olani Avenue between Cooke Street and Ward Avenue. In 1904, the area around South Street from King to Queen streets was filled in. The Hawaii Department of Public Works (1904) identified the need for considerable in-filling for the extension of Queen Street was required, from South Street to Ward Avenue.

2.1.3.7 Kewalo Reclamation Project

Although the Board of Health could condemn a property and the Department of Public Works could then fill in the land, the process was rather arbitrary and piecemeal. In 1910, after an epidemic of bubonic plague, the Board of Health condemned a large section of Kewalo,

consisting of 140 land parcels (including areas in Ka'ākaukui), which had numerous ponds (Hawaii Department of Public Works 1914:196).

In 1914, the entire

. . . locality bounded by King street, Ward avenue, Ala Moana and South street, comprising a total area of about two hundred acres, had been found by the board of health of the Territory to be deleterious to the public health in consequence of being low and below 'the established grades of the street nearest thereto' and at times covered or partly covered by water and improperly drained and incapable by reasonable expenditure of effectual drainage, and that said lands were in an insanitary and dangerous condition. [Hawaii Supreme Court 1915:329].

The superintendent then sent a letter to all of the property owners, informing them that they must fill in the lands to the grade of the street level within sixty days. Only a few of the land owners complied, and filled their land with a variety of materials. Most of the land owners did not comply with this notice, and in 1912 the bid to fill in the land was given to Lord-Young Engineering Company to fill in the land with "sand, coral and material dredged from the harbor or reef and the depositing of the same upon the land by the hydraulic method" (Hawaii Supreme Court 1915:331). The recalcitrant land owners sued to stop the work, and in the suit, the method of hydraulic filling is described as follows:

By this [hydraulic] method the material dredged is carried in suspension or by the influence of water which is forced through large pipes and laid upon the lands and intervening streets, and afterwards is distributed and leveled, the water having drained off through ditches provided for the purpose. The work is done in large sections around which bulkheads have been constructed. A section can be filled in about thirty days, the dredger working about fifteen hours per day. And in about two months after a section has been filled the ground will have dried out so as to be fit for use as before. . . . The character of the material varies from very fine sand to coarse bits of coral . . .

It appears in evidence that though the method employed the finest of the material which is carried upon the land settles when the water which transports it becomes quiet and as the water runs off a sludge or mud remains which forms a strata more or less impervious to water. This strata, however, is covered by the coarser and more porous material. . . . it appears that by mixing in to a depth of a few inches ordinary soil small plants will grow without difficulty. . . . The character of the locality must be considered. It is not adapted to agriculture, but is suited more particularly to such business purposes as it now partly used for, such as stables, laundries, warehouses, mills, etc., and for cottages with small yards for the accommodation of laborers engaged in connection therewith. Upon the whole, we are of the opinion that the material proposed to be used in the fill-in of the lands of the complainants is not of a character as should be held to be improper for any of the reasons urged. [Hawaii Supreme Court 1914:351]

The first land to be filled in was the portion of the Ward Estate Kukuluāe'o property west of Ward Avenue, completely filled in by June 1913. In July "25,000 cubic yards of sand and

ground-up coral were deposited on the Bishop Estate in the vicinity of Ala Moana and Keawe street, the reason for shifting operations to this part of the district being that the Hawaiian Sugar Planter's Association had erected a reinforced concrete building there and wished to have the lot brought to grade" (Hawaii Department of Public Works 1914:198). By August, the rest of the Ward Kukuluae'o lands west of Ward Avenue had been completely filled in, and by February 1914, all of the land from South Street to Ward Street, and from Ala Moana to Queen Street had been filled. This would include the current project area.

The expense of the suit did manage to shut down operations planned for the area from Ward Street to Waikiki (Thrum 1916:159-160). This land was mainly owned by the Bishop Estate, which leased the land to small farmers growing taro and rice and raising ducks in the ponds. In 1916, the Bishop Estate announced that as soon as their present tenant leases expired, they planned to fill the lands and divide them into residence and business lots (Larrison 1917:148-149). In 1919, a portion of the coastal section of the Bishop Estate lands was secured by the government in order to expand the Kewalo Basin (Thrum 1920:148).

2.1.4 Early Twentieth Century to the Present

2.1.4.1 Urban Expansion in the Kaka'ako Area

The 1884 Bishop map (see Figure 13) shows the nascent traces of the future development in the grid of roads stretching *mauka* of the project area. Kaka'ako was considered outside the Honolulu town boundary and was used in the mid- to late nineteenth century as a place for cemeteries, burial grounds, and for the quarantine of contagious patients. Then in the beginning of the twentieth century, the area was used as a place for sewage treatment and garbage burning, finally becoming an area for cheap housing and commercial industries (Griffin et al. 1987:13). Late nineteenth century maps show a corridor of streets extending diagonally from Honolulu Town including Queen Street, planned to connect to the beach road to Waikiki. The Queen Street alignment appears to follow the route of the traditional trail from Kou (Honolulu) to Waikiki described by John Papa 'I'i. As noted previously, this trail likely ran on a sand berm raised above the surrounding marshlands and coral flats. The three ponds northwest of the project area are still present.

A series of USGS (or wartime U.S. Army) quadrangles show the gradual expansion of the Honolulu urban district to the edge of Kaka'ako and beyond in the early twentieth century. During the first half of the twentieth century, both rice fields and marshlands were eliminated as Kaka'ako lands were filled to accommodate the expanding urbanization of Honolulu.

On a 1919 map (Figure 24), early twentieth century residences were clustered between Pohukaina and Queen streets, one to two blocks northeast of the project area. Proposed streets extending to Waikiki are dotted in, indicating the roads have not been built or improved (paved) by this time. As noted in the previous section, the project area would have been completely filled in by 1914 during road improvement projects and the Kaka'ako and Kewalo reclamation projects. All of the ponds and low-lying areas around the project area have been filled, and new land for Fort Armstrong has been created from dredged material.

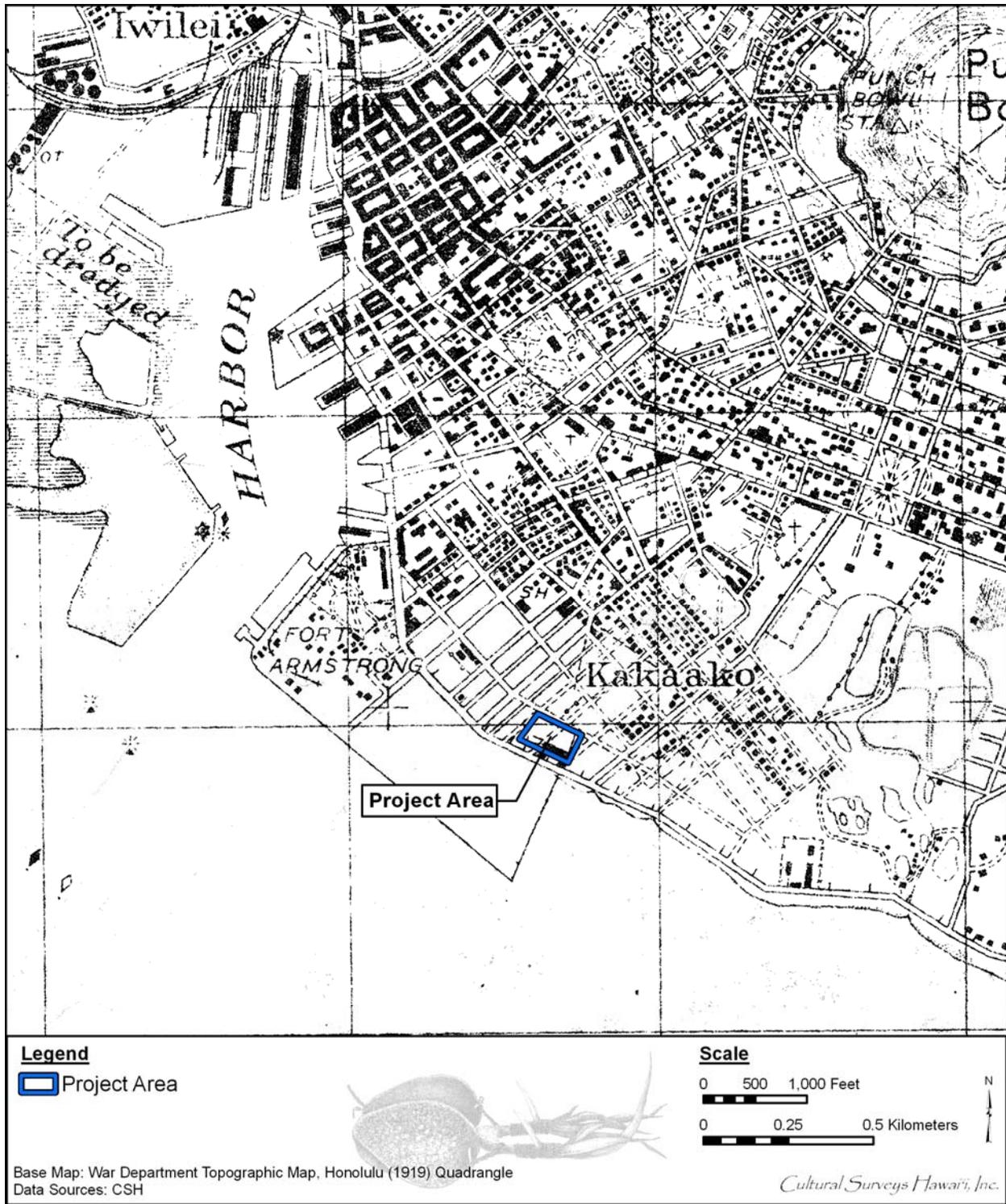


Figure 24. 1919 War Department map (Honolulu Quadrangle) showing location of the project area

On a 1927 topographic map (Figure 25) and aerial photograph (Figure 26), the open areas of Kaka'ako have been filled with material dredged from the Ala Wai Canal, Ala Moana Beach Park, the on-going excavation of Kewalo Basin, and with material from the city incinerator at the Kewalo coastline. The 1927 aerial photograph shows a large cluster of homes within the south corner of the project area with a vegetated area directly to the north. The remainder of the project area consists of large open areas with a few larger structures.

On a 1952 aerial photograph (Figure 27), the large cluster of homes within the south corner of the project area is still present, but the vegetated area to the north has been cleared. Additionally the western half of the project area is no longer clear, and is now covered with a smaller cluster of homes and a few larger structures.

2.1.4.2 Fire Insurance Maps

A series of fire insurance maps illustrates the history of the project area in greater detail. At the University of Hawai'i at Mānoa, the Dakin Fire Insurance maps for 1891, 1899, and 1906 and the Sanborn Fire Insurance maps for 1914, 1927, 1950, and 1956 are available. The current project area is not shown on any of the Dakin Fire Insurance maps for 1891, 1899, or 1906, suggesting there were no permanent structures in the area in those years. Sanborn Fire Insurance maps for 1914, 1927, 1950, and 1956 for the project area are illustrated in Figure 28 through Figure 31.

1914 Sanborn Fire Insurance Map

The 1914 map indicates the project area was being utilized by the Union Feed Company as a stable (see Figure 28). Union Feed Company operations seemed to be focused within the *makai* portion of the parcel, and may reflect areas that contained dry land. Large wagon sheds appear to form the perimeter of the stable. Of note are two dwellings just west of the stable, located along the *makai* edge of the project area.

1927 Sanborn Fire Insurance Map

By 1927, the project area has undergone drastic changes. The Union Feed Company stable has been replaced by a large cluster of dwellings situated within the Diamond Head-*makai* corner of the project area (see Figure 28). Corrals and associated infrastructure (i.e., hay storage sheds and dwellings) are now present within the central portion of the project area. A boat building with associated dwellings and a kitchen are present within the 'Ewa-*makai* corner of the project area. And a contractors' base yard with associated storage facilities is present within the 'Ewa-*mauka* corner of the project area.

1950 and 1956 Sanborn Fire Insurance Maps

By 1950, the dwellings within the Diamond Head-*makai* corner are still present, as are the corrals and boat building along the *makai* edge of the project area (Figure 30). Of note are the numerous dwellings now present within the 'Ewa portion of the project area. A concentration of warehouses and storage facilities is also present within the 'Ewa-*mauka* corner of the project area.

By 1956, the large concentration of dwellings within the Diamond Head-*makai* portion of the project area are now gone. The 'Ewa portion of the project area remains relatively unchanged, with some of the dwellings shown in the 1950 map now gone.

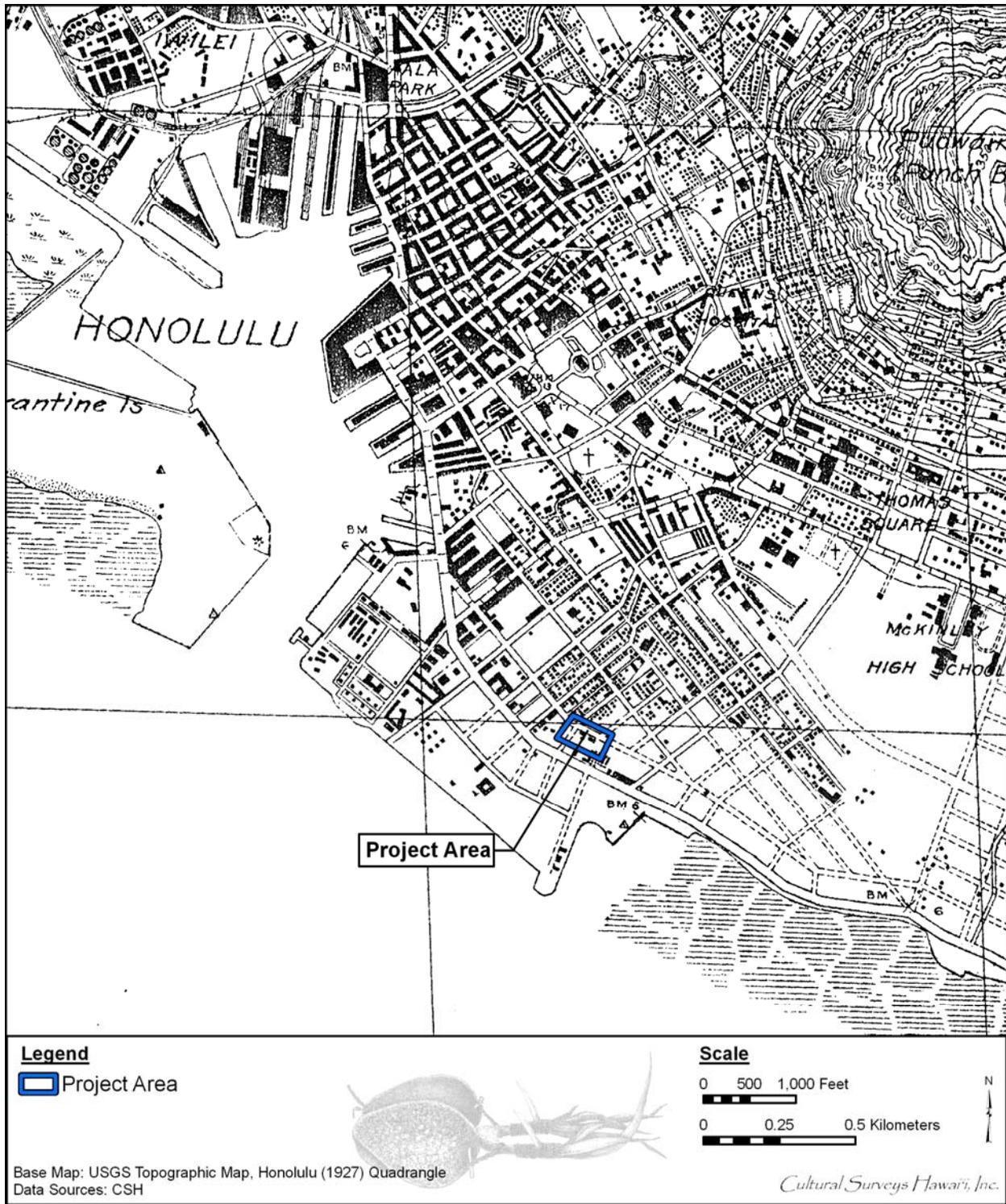


Figure 25. 1927 Honolulu USGS quadrangle showing the project area location



Figure 26. 1927 aerial photograph of the Waikiki coast (University of Hawai'i School of Ocean and Earth Science and Technology [SOEST]) showing the project area location



Figure 27. 1952 aerial photograph of the Kaka'ako coast (University of Hawai'i School of Ocean and Earth Science and Technology [SOEST]) showing the project area location

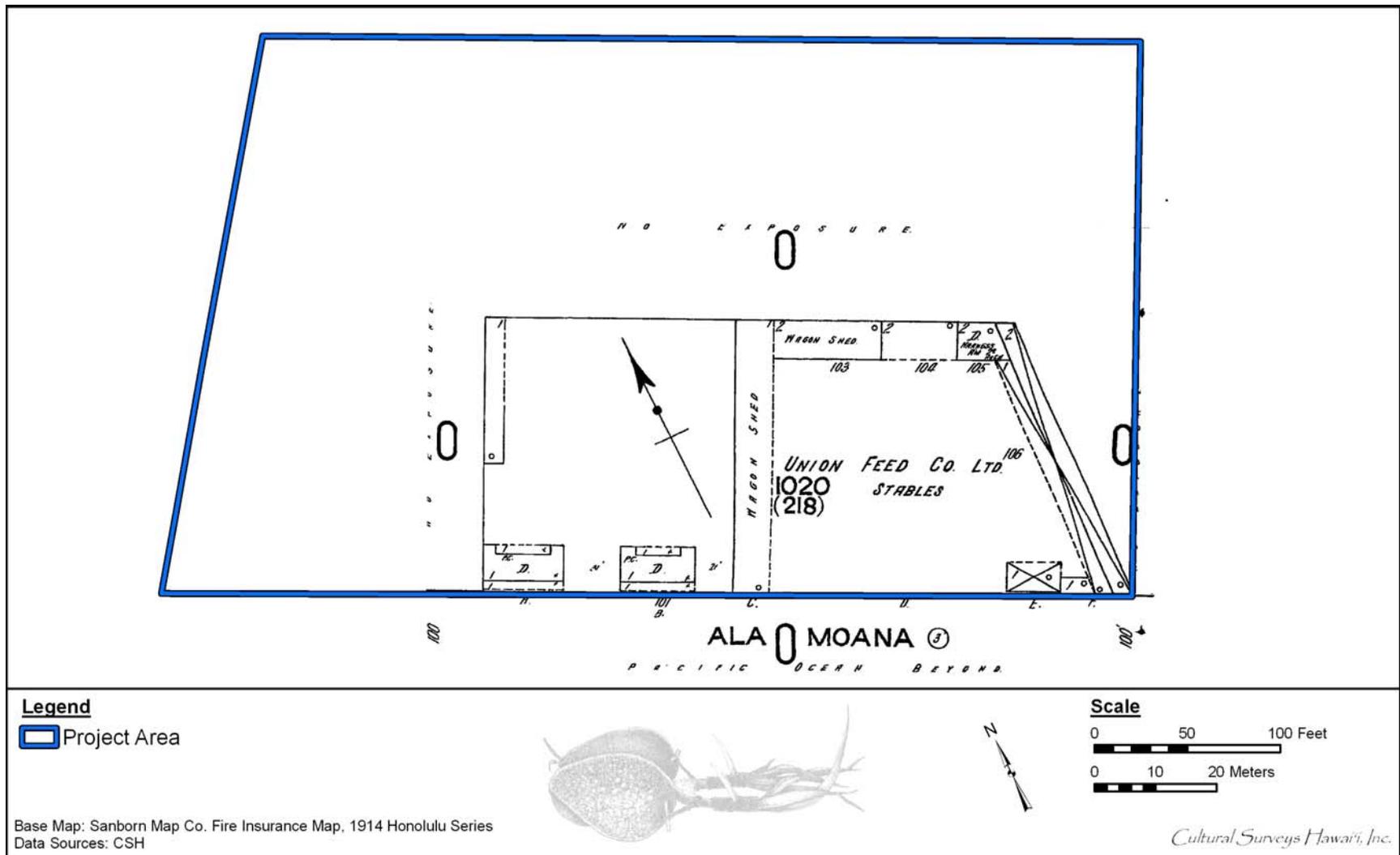


Figure 28. 1914 Sanborn Fire Insurance Map showing the project area location

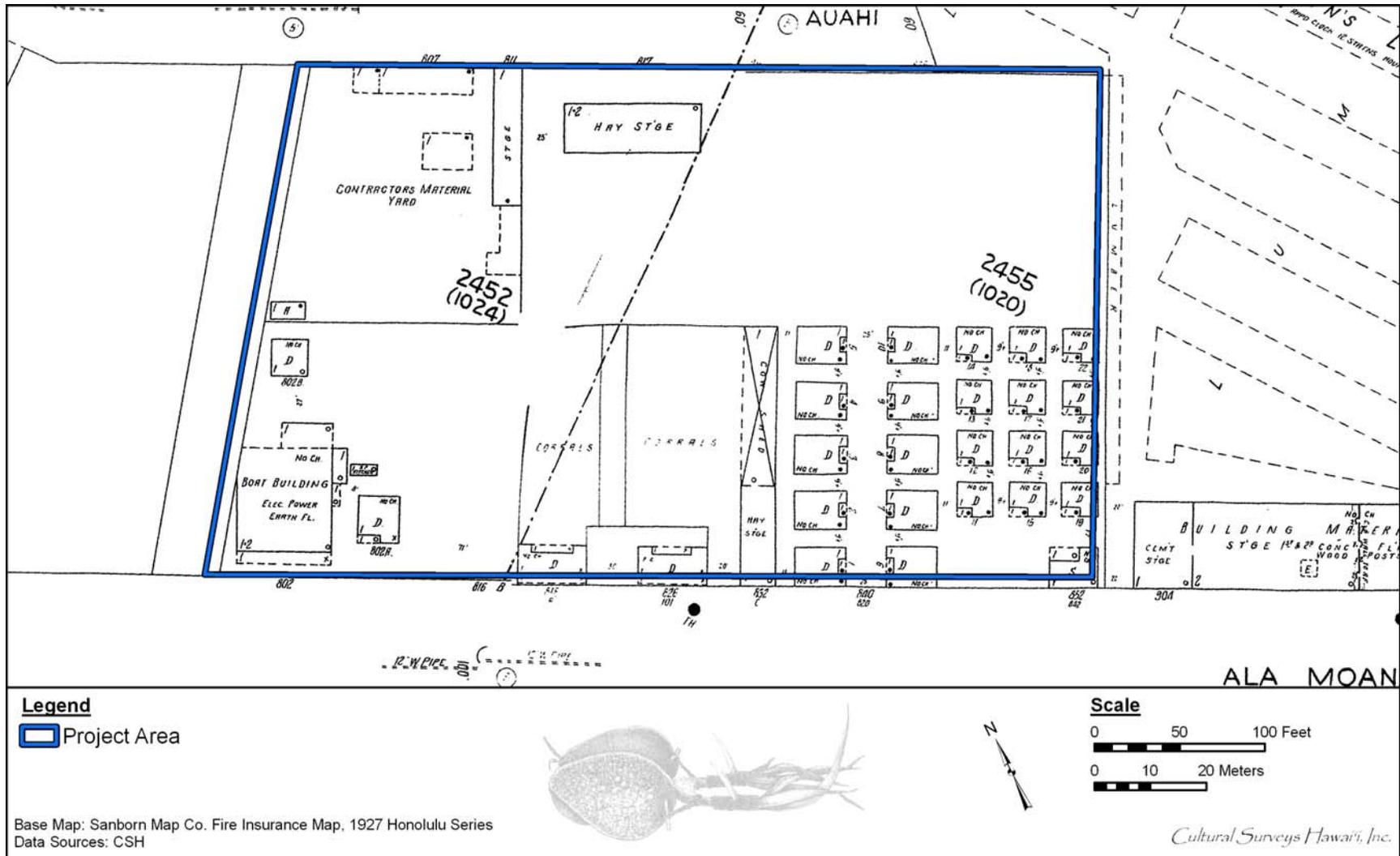


Figure 29. 1927 Sanborn Fire Insurance Map showing the project area location

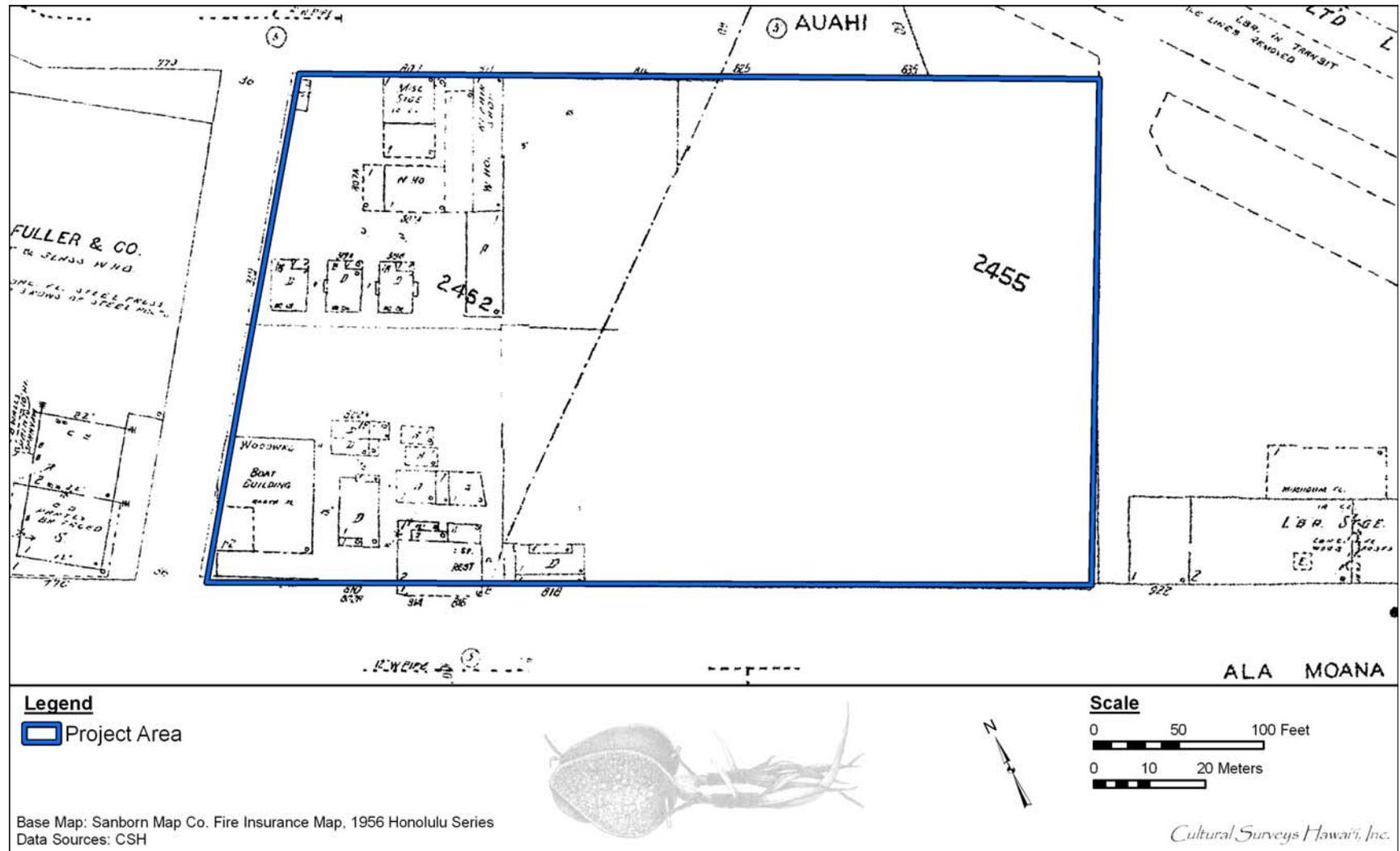


Figure 31. 1956 Sanborn Fire Insurance Map showing the project area location

2.2 Previous Archaeological Research

Most traditional Hawaiian surface structures in the project vicinity had been demolished by the time of the first scientific archaeological surveys in the early twentieth century. In his report on the survey of O'ahu sites conducted in the early 1930s, McAllister (1933:80) says of Honolulu "Information regarding former sites within the present limits of Honolulu must come entirely from literary sources."

Archaeological investigations have been conducted in parcels and road alignments near or adjacent to the project area. Figure 32 and Figure 33 show the location of these archaeological studies and identified sites (with known locations), including burials. Previous archaeological projects are listed in Table 1 and findings of these investigations are summarized below.

2.2.1.1 Honuakaha Smallpox Cemetery

Pfeffer et al. (1993) reported on archaeological monitoring of construction activities in the Kaka'ako ID-1 project area, including along South Street and Quinn Lane. Historic research had shown that Honuakaha Cemetery, created solely for the 1853-1854 smallpox epidemic, was located *makai* of Queen Street on the west side of South Street. This cemetery is now covered by urban development, including the Old Kaka'ako Fire Station, several other buildings and a portion of the American Brewery lot. The cemetery may contain more than 1,000 burials. It appears that the cemetery was not utilized following the epidemic.

Thirty-one burials in the Honuakaha Cemetery (SIHP # 50-80-14-3712) were encountered and recorded during the 1986-1988 monitoring (Pfeffer et al. 1993). One of the "burials" consisted of a wooden coffin with no human skeletal remains. Of the remaining 30, 28 were disinterred. Two burials, which were determined to be outside the project area, were left in place. For the 28 disinterments, 18 were determined to be historic, as they were interred in an extended position and contained historic artifacts, including in 12 cases, the wooden remains of a coffin. Two burials were interpreted as possible pre-Contact burials as they were interred in a sand layer and did not have any evidence of a wooden coffin or any historic artifacts. The remaining eight burials were too disturbed to determine date of interment. In March and April of 1993, during sewer line excavation by Mouse Construction, three burials were inadvertently discovered at 614 South Street in the central portion of the lot (TMK: [1] 2-1-031:020) on the southwest corner of South Street and Quinn Lane. These burials were situated in the Honuakaha Cemetery (SIHP # 50-80-14-3712). Subsequent monitoring of the site identified six additional burials in the same location, totaling nine smallpox cemetery burials in this area (Avery and Kennedy 1993).

2.2.1.2 State Office Building

In 1982, six partial sets of human skeletal remains were recovered during excavation for construction of the State Office Building No. 2 at the southeast corner of Punchbowl and Halekauwila streets (TMK: [1] 2-1-031:023). The remains were in poor to very poor condition and the osteological analyses yielded little information. Two of the burials showed evidence of incisor evulsion (intentional removal) which was practiced by Hawaiians into the early post-Contact period (Ota and Kam 1982). All other burials were located in both pre-Contact deposits and natural sand deposits, although some historic disturbance may have taken place. This burial area was later designated SIHP # 50-80-14-2963 (Clark 1987).

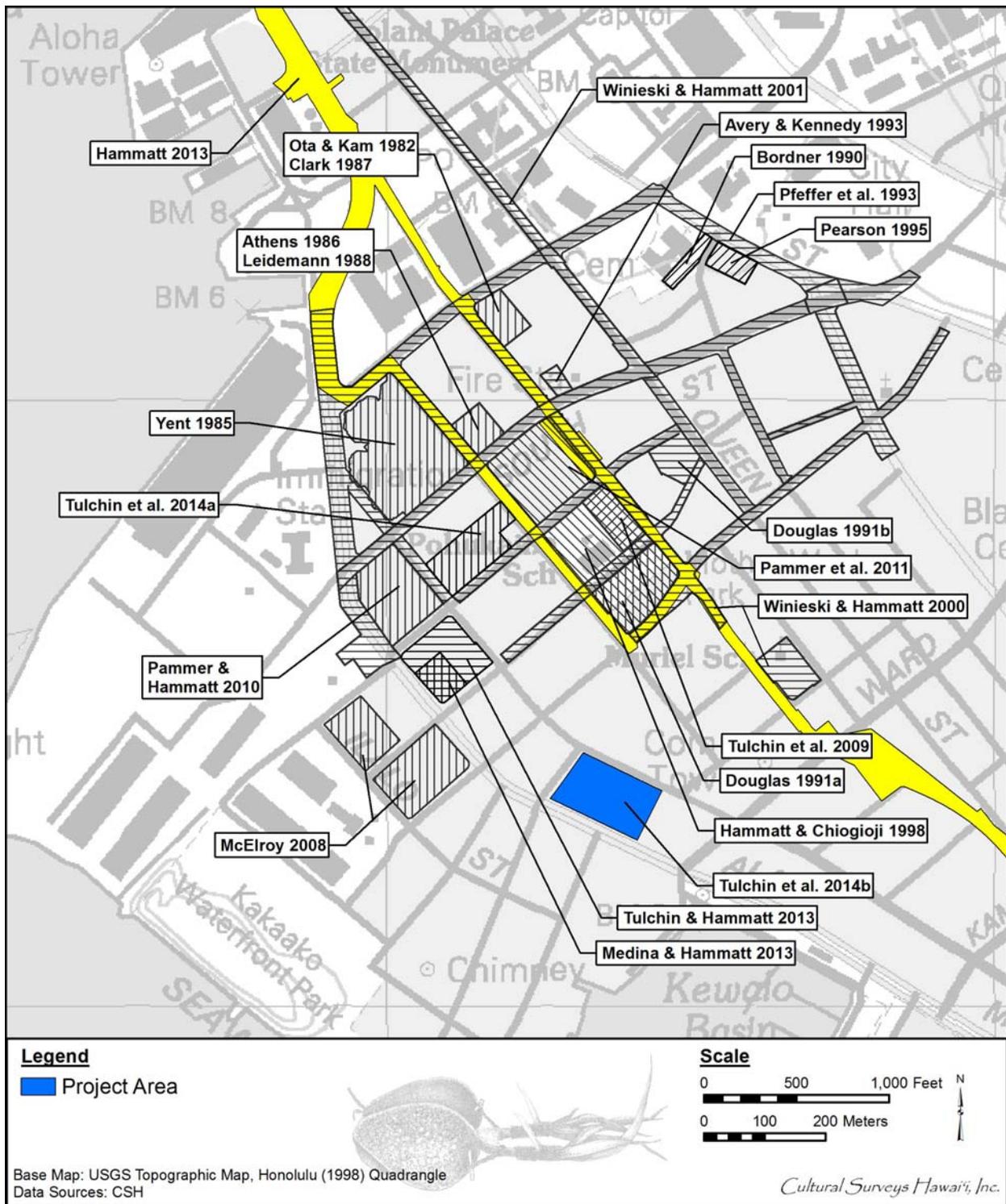


Figure 32. Previous archaeological studies in the vicinity of the project area

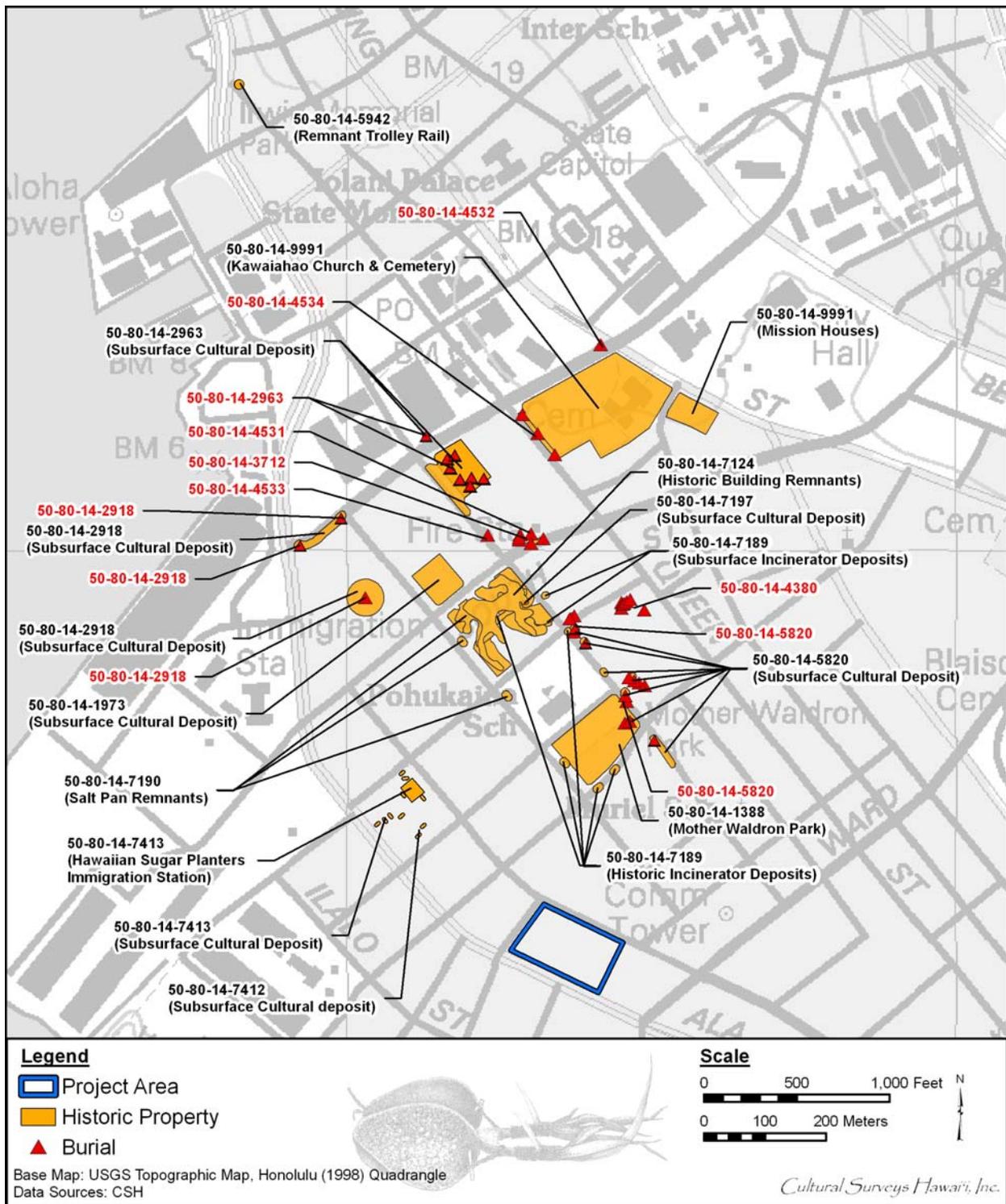


Figure 33. Historic properties identified in the vicinity of the project area

Table 1. Previous Archaeological Work in Kaka'ako Near the Project Area (All Sites Begin with 50-80-14-)

Author	Site(s): SIHP # 50-80-14-	Report Description and Findings
Ota and Kam 1982	2963	Makai Parking Garage; six partial burial sets (2963) found; probable pre-Contact to 1850 date
Yent 1985	2918	Ka'ākaukukui Cemetery (2918) at the Honolulu Iron Works project area; six burials (2918) recorded
Athens 1986	1973	Monitoring of Judiciary parking lot; historic deposits (1973) with artifacts dating late nineteenth-early twentieth century
Clark 1987	2963	Monitoring at Makai Parking Garage; seven burials (2963) found; probably dating to pre-1850
Leidemann 1988	1973	Monitoring at Federal parking lot; historic deposits (1973) found
Bordner 1990	9991	Test trenches excavated in the Kawaiaha'o Church grounds (9991); some historic artifacts recovered
Douglas 1991a	4380	Coral and Queen Street area; eight burials (4380) recorded and five disinterred
Douglas 1991b	4380	Coral and Queen Street area; one burial recorded (4380)
Avery and Kennedy 1993	3712	Monitoring of South Street Building Complex; six burials associated with 1853-1854 Honuakaha Smallpox Cemetery (3712) found
Pfeffer et al. 1993	3712/4531 4532 4533 4534	Monitoring for Kaka'ako ID-1; 31 historic burials at the South Street/Quinn Lane junction; 116 historic burials from Kawaiaha'o Cemetery (4534) (used from 1825-1920) at Queen Street found; isolated burials found at Site 4532 (one individual) and Site 4533 (one individual)
Pearson 1995	9991	Test pits excavated near the Mission Houses (9991); nineteenth and twentieth century artifacts recovered
Hammatt and Chiogioji 1998	1388	Archaeological assessment of area that includes Mother Waldron playground (1388) and Pohukaina Elementary School; no field work

Author	Site(s): SIHP # 50-80-14-	Report Description and Findings
Winieski and Hammatt 2000	4380 5820	Monitoring at Kaka'ako ID-3 and other parcels; nine burials found at the Pohulani Housing area (4380) and 11 human burials (5820) found at Mother Waldron Park; at least two interred in post-Contact period
Winieski and Hammatt 2001	5942	Monitoring for the Nimitz Highway Reconstructed Sewer Project; historic artifacts and features observed (including 5942)
McElroy 2008	None	Test excavations showed study area consisted of former reef flats that had been filled in during the early 1900s
Tulchin et al. 2009	None	Archaeological inventory survey of Halekauwila Place; 18 test trenches excavated; no pre-Contact material recorded; numerous historic artifacts found dating to the late nineteenth-early twentieth century
Pammer and Hammatt 2010	None	Archaeological inventory survey (former Comp USA parcel for Kamehameha Schools); 19 test trenches indicated study area consisted of former reef flats that had been filled in during the early 1900s
Pammer et al. 2011	7124 7189 7190 7197	Archaeological inventory survey of Kamehameha Schools Block 2 parking lot, including work from CSH's archaeological inventory survey plan (O'Hare et al. 2009) during which five trenches were excavated; 83 trenches in all excavated; identification of four subsurface historic deposits: two historic-era layers (7124 and 7189), salt-pan deposits (7190) and a late pre-Contact/early historic cultural layer (7197)
Medina and Hammatt 2013	7413 Feature B	Archaeological monitoring of 680 Ala Moana building located within Kamehameha Schools Kaka'ako Block F; stratigraphy consisted predominantly of imported fill associated with historic land reclamation; Jaucas sands observed in portions of study area; presence of buried concrete slabs that correspond with historic building footprints based on historic fire insurance maps spanning from the 1920s to the 1950s (7413 Feature B)

Author	Site(s): SIHP # 50-80-14-	Report Description and Findings
Tulchin and Hammatt 2013	7412 7413	Archaeological inventory survey (Kamehameha Schools Kaka‘ako Block F); 20 test trenches excavated resulting in the identification of 7412, a discontinuous subsurface cultural layer containing post-Contact Western-introduced cultural material, including crushed red brick, cut faunal bone, glass fragments, slag, and metal fragments; and (2) 7413, surface and subsurface features predominantly associated with the property’s development and utilization as a Hawaiian Sugar Planters Immigration Station (i.e., a reinforced concrete building, buried concrete structural remnants, and subsurface trash layers)
Hammatt 2013	2918 2963 5820 7124 7189 7190	Archaeological inventory survey for the City Center portion of the Honolulu High-Capacity Transit Corridor Project; identified six previously identified historic properties in the Kaka‘ako area from Punchbowl Street to Ward Avenue: (1) 2819, subsurface cultural deposit, human burials, and a pit feature containing structural remains from a former trolley or rail line; (2) 2963, subsurface cultural deposit, subsurface pond sediments, human burials, and animal burials; (3) 5820, subsurface cultural deposit and human burials; (4) 7124, subsurface infrastructure remnants; (5) 7189, subsurface burnt trash deposit; and (6) 7190, subsurface salt pan remnants
Tulchin et al. 2014a	7512 7513	Archaeological inventory survey (Kamehameha Schools Kaka‘ako Block B); 39 test trenches excavated resulting in the identification of two subsurface historic properties: 1.) SIHP # 50-80-14-7512, post-Contact structural remnants associated with early- to mid-twentieth century development; and 2.) SIHP # 50-80-14-7513, post-Contact trash layer associated with early twentieth century land reclamation.
Tulchin et al. 2014b	7578 7579 7580 7581 7582 7583	Archaeological inventory survey (Kamehameha Schools Kaka‘ako Block I); Six historic properties were identified during subsurface testing, including an early to mid-twentieth century cultural layer (SIHP # -7578); a nineteenth century cultural layer (SIHP #-7579); a pre- to post-Contact cultural layer with a historic burial cluster (SIHP # -7580); a pre-Contact traditional Hawaiian bundle burial (SIHP # -7581); and two sets of disarticulated human skeletal remains within non-burial contexts (SIHP #s -7582 and -7583)

2.2.1.3 Makai Parking Garage

In 1987, the Bishop Museum (Clark 1987) monitored construction of a parking garage on the southeast corner of Punchbowl and Halekauwila streets in the same TMK parcel as the earlier Ota and Kam (1982) study area. Archaeological features revealed both pre-Contact and post-Contact utilization of the site. Seven human burials were unearthed, of which four were complete burials with well-defined burial pits. Two burials were in a flexed position, one was a bundle burial, and one was too disturbed to determine burial position. Charcoal from one of the burials (Feature 28) was dated to AD 1270-1410. Feature 28 also showed post-mortem breakage of the limb bones. Only the femoral heads were still present in the burial pit; the shafts had been broken off and removed (Clark 1987:75-76). Osteological analyses of the burials and analysis of five grave goods indicated that the individuals were of Hawaiian ancestry, probably from the commoner class rather than the chiefly (*ali'i*) class. The burial area was designated as part of SIHP # 50-80-14-2963, which was first identified by Ota and Kam (1982). Artifacts recovered at the site included basalt tools—including an adze, a hammerstone, and a *poi* pounder top—and a coral abrader as well as glass bottles, ceramic fragments and metal objects. Clark concluded that the “nineteenth century use of the site area included primarily burying of trash and burial of animals” (Clark 1987:114).

2.2.1.4 Judiciary Parking Garage

In 1985, monitoring was conducted for the proposed Judiciary Parking Garage at the northwest corner of Pohukaina and South streets (Athens 1986). In the nineteenth century, this project area would have been in the *'ili* of 'Auwaiolimu, south of three fishponds. No undisturbed sand layers were noted in the excavations and much of the area appeared to have been previously disturbed. It is likely that the area was underwater or was intertidal in pre-Contact times. No pre-Contact cultural deposits or traditional artifacts were recorded, but historic artifacts were common in the several fill layers exposed in the construction trenches. Bottles dating from between 1880 and 1915 were identified. The historic deposit was not given a site number at the time of Athens' reporting, although it appears its designation as SIHP # 50-80-14-3984 was assigned by SHPD at a later time. However, CSH believes the appropriate site number for this historic deposit is SIHP # 50-80-14-1973.

This confusion in site number designations between SIHP # 50-80-14 3984 and -1973 is likely the result of several subsequent studies that deferred in their designation of the location of Athen's 1986 project area. In 1985–1986, monitoring for the Federal Judiciary Building parking complex was conducted by the Bishop Museum (Clark 1987). The project area was described as being on the northwest corner of Pohukaina and South streets by Leidemann (1988:1), who conducted the laboratory analysis of the recovered artifacts, which would make this project area the same as Athen's (1986) study area. However, on Leidemann's Figure 1 (Leidemann 1988:2), the project area is drawn on the northwest corner of Reed Lane and South Street, which would make this project area immediately north of the Athen's study area. Leidemann makes no mention of the Athen's study in her report. Clark (1987:22) states that the project areas are the same. As in the Athen's study, no undisturbed sand deposits were recorded and no traditional artifacts were found. The results of the analysis of the artifacts determined that the most likely time frame for the manufacture and disposal of the historic artifacts was between 1880 and 1930. Thus, this historic deposit was designated SIHP # 50-80-14-1973.

2.2.1.5 Honolulu Iron Works

In 1985, six sets of human skeletal remains were documented at the Honolulu Iron Works construction site at the corner of Pohukaina and Punchbowl streets (Yent 1985). The burials pits were observed within a sand deposit approximately 80 cm beneath the existing surface. The burials were designated SIHP # 50-80-14-2918 and were determined to be associated with Ka'ākaukui Cemetery, which was utilized from the 1700s to the early 1800s (McElroy et al. 2008).

2.2.1.6 Nimitz Highway Reconstructed Sewer Project

In 2001, CSH conducted archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project (Winieski and Hammatt 2001). The route of the sewer construction began on River Street, at the intersection of River and Hotel streets, ran to Nimitz Highway, then to Bethel Street, and then along Bethel Street to the intersection of Nimitz Highway and 'Ewa end of Queen Street. The route then extended along Queen Street to South Street, along South Street to Ala Moana Boulevard, and terminated at the Ala Moana Wastewater Pump Station. Only one historic property was encountered, a remnant of a light-gauge rail associated with the historic Honolulu Rapid Transit trolley system (SIHP # 50-80-14-5942) at the intersection of Queen Street and Nimitz Highway.

2.2.2 South Street to Cooke Street

2.2.2.1 Kaka'ako Improvement District 3 and Pohulani Elderly Housing

In 1990, during construction of an elderly housing project southwest of the intersection of Coral and Queen Streets, human skeletal remains were uncovered and reported to the SHPD (Douglas 1991a). Eight burials were identified on the east side of the property, of which five were removed (Winieski and Hammatt 2000). A glass bead was found with one burial, indicating a post-Contact date. One burial also exhibited an antemortem loss of the lower incisors, which suggests deliberate tooth evulsion, a procedure known to have been practiced by Hawaiians into the early post-Contact period (Ota and Kam 1982). This burial area was later designated SIHP # 50-80-14-4380. The project area is within the boundary of LCA 2045 to Kauwahi, who received the parcel during the time of Kamehameha I, indicating this was a Hawaiian habitation area as early as the beginning of the nineteenth century.

In 1991, during excavation of a waterline trench between Coral and Queen Streets across Mother Waldron Park (SIHP # 50-80-14-1388), human skeletal remains were discovered and disinterred (Douglas 1991b). The burial was located in the northwest corner of the park, just east (Diamond Head) of the intersection of Coral Street and the westward extent of Halekauwila Street. Note that during the project, the eastern extent of Halekauwila Street was realigned, and the section of Coral Street between Halekauwila and Pohukaina Streets was eliminated. The result of this is that the location of the burial would now be on the northeast *mauka* side of Halekauwila Street, and no longer within the park (Hammatt and Winieski 2000). The remains were determined to be of Hawaiian ancestry, with a possibly associated pig burial. These burials were designated as part of SIHP # 50-80-14-4380.

Between November 1990 and September 1992, CSH (Winieski and Hammatt 2000) monitored construction within the Kaka'ako ID-3, the Pohulani Elderly Rental Housing project area, and the Kauhale Kaka'ako project area (TMKs: [1] 2-1-030, 031, 032, 044, 046, 047, 048,

050, 051, 052, 054). Kaka'ako Improvement District 3 is bounded by Kapi'olani Boulevard and King Street (north), the northern end of Cooke Street (east), Halekauwila Street (south) and South Street (west). It also includes extensions of Keawe and Cooke Streets to the south.

The monitoring of subsurface excavations revealed that although the area had been previously disturbed a cultural layer and naturally-deposited Jaucus sand and volcanic cinder deposits are still intact below the fill layers. The cultural layer contained historic artifacts mixed with sparse traditional Hawaiian cultural materials. Twenty human burials were discovered during these projects (Ota and Kam 1982, Douglas 1991a, Douglas 1991b and Winieski and Hammatt 2000): nine at the Pohulani Elderly Rental Housing project (SIHP # 50-80-14-4380) and 11 within or near Mother Waldron Park (SIHP # 50-80-14-5820). Five burials were in an extended position, seven were flexed, and eight could not be determined. One burial was in a coffin and one contained a glass trade bead, indicating they were of post-Contact age. Seventeen of these burials were disinterred and subsequently reinterred in the northeast corner of Mother Waldron Park. Three were left in place beneath the Pohulani Elderly Rental Housing building. These burials all clustered around the location of LCA 982 to Kukao and the Pu'unui parcel to Queen Emma, an area characterized by a cluster of Hawaiian houses shown on several late nineteenth century maps (Winieski and Hammatt 2000).

In 1998, an archaeological assessment for a 6.8-acre land parcel was conducted by CSH (Hammatt and Chiogioji 1998). The parcel is bounded by Halekauwila Street (north), Pohukaina Street (south), Keawe Street (west), and Cooke Street (east). The parcel is the site of a municipal parking lot, a state government building, Mother Waldron Playground, and a lawn area. It is also the former site of the Pohukaina Elementary School. The Mother Waldron Park area was designated SIHP # 50-80-14-1388 as part of a thematic group of Honolulu City and County Art Deco Parks. A reinterment site for the Hawaiian burials discovered during construction within Kaka'ako ID-3 (Winieski and Hammatt 2000) was established at the corner of Cooke and Halekauwila Streets. SHPD also designated an interment site at the corner of Cooke and Pohukaina Streets, which "will be reserved for future interments" (SHPD memo of July 2, 1992, cited in Hammatt and Chiogioji 1998:29).

2.2.2.2 Halekauwila Street Properties – Pohukaina School

In 2009, preliminary subsurface backhoe testing was conducted at two parcels owned by Kamehameha Schools between Halekauwila and Auahi Streets in the western *mauka* section of the Kaka'ako Development District (KS Kaka'ako Blocks 2 and B) (O'Hare et al. 2009). Thirteen trenches were excavated in open/parking areas of the parcels, 5 in KS Block 2 and 8 in KS Block B. A sandy clay/clay loam layer (Stratum II), the former ground surface during the pre-Contact/early post-Contact periods, was recorded in six of the test trenches, but not assigned a site number.

In 2009, CSH excavated 16 trenches within the Halekauwila Place property, once the grounds of Pohukaina School (Tulchin et al. 2009). Subsurface testing revealed several historic and modern fill layers overlying natural sediments. The natural sandy clay sediments were typical of a wet, marsh-type environment. Fill layers overlying the natural sediments included a layer of ash and burnt garbage, interpreted as fill material generated by the city's municipal garbage incinerator [this deposit is identified elsewhere in Kaka'ako as SIHP# 50-80-14-7189; see Pammer et al. 2011] and layers of sandy clay, interpreted as fill material generated by the

dredging of Honolulu Harbor and other coastal areas in the vicinity. The presence of the dredge fill material and incinerator fill material is consistent with background research of Kaka'ako land reclamation projects dating to the late 1800s and early 1900s. The upper terrigenous fill layers included construction debris and abandoned utilities, evidence of the former Pohukaina School. Numerous historic artifacts, mainly glass bottles and ceramics, were recovered from the fill layers; most were dated to the late nineteenth to early twentieth century. No pre-Contact cultural layers, artifacts or burials were found.

2.2.2.3 Block 2 Parking Lot

In 2010, CSH conducted an archaeological inventory survey of Kamehameha Schools Block 2 Parking Lot (Pammer et al. 2011). This AIS work included excavation of 72 trenches. CSH identified four subsurface historic properties: two historic-era layers (SIHP # 50-80-14-7124 and -7189), salt-pan deposits (SIHP# -7190), and a late pre-Contact/early historic cultural layer (SIHP# -7197). No human skeletal remains or burials were identified (Pammer et al. 2011).

2.2.2.4 Former Comp USA Parcel

In 2010, CSH conducted an archaeological inventory survey (19 trenches) in the former Comp USA parcel property, located immediately southwest of the current project area (Pammer and Hammatt 2010). No historic properties were identified. Observed stratigraphy consisted of varying fill layers deposited atop a thin layer of marine clay atop the coral shelf. Test excavations indicated the subject parcel formerly consisted of tidal flats periodically inundated with seawater prior to being filled in during activities that occurred in the area in the late 1800s and early 1900s.

2.2.2.5 Kamehameha Schools Block F

In 2012, archaeological monitoring associated with the 680 Ala Moana Renovation Project was conducted just south of the current project area (Medina and Hammatt 2013). Ground disturbance associated with this project involved open trenching for utility installations and a grease interceptor. Observed stratigraphy consisted predominantly of imported fill associated with historic land reclamation activities. Jaucas sands were observed beneath approximately 1.5 m of fill in several portions of the study area. Two features (Features B and C) associated with a previously identified historic property (SIHP # 50-80-14-7413) were identified. Feature B consists of buried concrete slabs that corresponded to historic building footprints based on historic fire insurance maps spanning from the 1920s to the 1950s. Feature C consists of subsurface trash layers associated with land reclamation.

In 2013, CSH completed an archaeological inventory survey of Kamehameha Schools Kaka'ako Block F, located immediately south of the current project area (Tulchin and Hammatt 2013). This AIS work included the excavation of 20 trenches. Two subsurface historic properties were identified: (1) SIHP # -7412, a discontinuous subsurface cultural layer containing post-Contact Western-introduced cultural material, including crushed red brick, cut faunal bone, glass fragments, slag, and metal fragments; and (2) SIHP # -7413, surface and subsurface features predominantly associated with the property's development and utilization as a Hawaiian Sugar Planters Immigration Station (i.e., a reinforced concrete building, buried concrete structural remnants, and subsurface trash layers.).

2.2.2.6 Kamehameha Schools Block B

In 2014, CSH completed an archaeological inventory survey for Kamehameha Schools Kaka'ako Block B (Tulchin et al. 2014a). This AIS work included the excavation of 39 trenches. Two subsurface historic properties were identified: (1) SIHP # 50-80-14-7512, post-Contact structural remnants (i.e., buried concrete foundations) associated with early- to mid-twentieth century development; and (2) SIHP # 50-80-14-7513, post-Contact trash layer associated with early twentieth century land reclamation.

The trash layer (SIHP # 50-80-14-7513) was observed deposited either atop naturally deposited sediments or atop the coral shelf (i.e., limestone bedrock), and is commonly capped by crushed coral fill utilized historically (circa late nineteenth to early twentieth century) for land reclamation in the Kaka'ako area. It contained late nineteenth to early twentieth century artifacts including glass and ceramic bottles, ceramics, and melted metal fragments. SIHP # -7513 (post-Contact trash layer) was determined to be associated with trash disposal activities conducted both within and outside of the project area during the early twentieth century. The presence of melted metal refuse within the trash layer suggests that one source of the trash may have been nearby iron works operations (Honolulu Iron Works and the Catton, Neill and Company Iron Works) while the remainder was likely from the municipal collection of domestic refuse from residences and various businesses throughout Honolulu.

2.2.2.7 Kamehameha Schools Block I

In 2014, CSH completed an archaeological inventory survey of the current project area (Tulchin et al. 2014b). Six historic properties were identified during subsurface testing, including an early to mid-twentieth century cultural layer (SIHP # -7578); a nineteenth century cultural layer (SIHP #-7579); a pre- to post-Contact cultural layer with a historic burial cluster (SIHP # -7580); a pre-Contact traditional Hawaiian bundle burial (SIHP # -7581); and two sets of disarticulated human skeletal remains within non-burial contexts (SIHP #s -7582 and -7583)

2.2.2.8 Ilalo Street

In 2008, Garcia and Associates completed an archaeological assessment of a four acre parcel bounded by Ala Moana Boulevard, Cooke Street, Ilalo Street, and Keawe Street (McElroy et al. 2008). Stratigraphic information from test excavations indicated the study area consisted of former reef flats that had been filled in during the early 1900s. Observed sediments consisted of modern fill deposits over submerged, gleyed, clayey silt. No significant cultural resources were identified.

2.2.3 Honolulu High-Capacity Transit Corridor Project (Punchbowl Street to Ward Avenue)

In 2013, CSH completed an archaeological inventory survey for the City Center portion of the Honolulu High Capacity Transit Corridor Project (HHCTCP) (Hammatt 2013), a study area extending from Middle Street to Ala Moana Center. Subsurface investigations identified six previously identified historic properties in the Kaka'ako area from Punchbowl Street to Ward Avenue: SIHP #s 2819, 2963, 5820, 7124, 7189, and 7190.

SIHP # -2819 is a previously identified subsurface cultural deposit consisting of a culturally-enriched sandy loam A-horizon, exhibiting both pre- and post-Contact land usage. This historic property was first identified in 1985 by Martha Yent of State Parks as consisting of six burials

located at the Honolulu Ironworks construction site (Yent 1985). Hammatt (2013) expanded the boundaries of the site and identified 30 additional features. Twenty-six features were associated with the culturally enriched A-horizon and consisted of one human burial pit, one dog burial pit, three postmolds, and 21 indeterminate pits. The other four features associated with the cultured layer, consisted of two indeterminate pits, an infilled pit containing historic trolley and other structural remains, and a postmold containing portion of a preserved post.

SIHP # -2963 is a subsurface cultural deposit consisting of a buried, culturally-enriched A-horizon with 39 associated features, pond sediments, and eight other archaeological features associated with either fill layers or natural strata. Collectively, the 39 features consist of 16 pits, six trash pits, five animal burials, four human burials, one postmold, four possible postmolds, two isolated animal bone areas and one burned soil area. Twenty-seven of the features were previously identified by Clark (1987) and 12 were newly-identified by Hammatt (2013). Pond sediments were identified by both Clark (1987) and Hammatt (2013). The eight features identified by Clark (1987) in deposits above or below the A-horizon and consist of a large pit, a cement building foundation, a red brick layer or possible building foundation within parking lot fill; a buried land surface within marine sand; and three human burials with no associated burial pits for which the strata was not determined. A total of 13 human burials designated as part of SIHP # -2963, of which six were identified by Ota and Kam (1982) and seven were identified by Clark (1987).

SIHP # -5820 consists of two buried, culturally-enriched layers. The lower cultural layer is an *in situ* culturally-enriched A-horizon. The upper cultural layer consisted of re-deposited culturally-enriched fill, which may be a re-worked former A-horizon. It was separated from the lower cultural layer by an approximately 20 to 50 cm thick fill deposit. Hammatt (2013) identified 31 archaeological features including a traditional Hawaiian burial within the Jaucus sand that predated the lower buried A-horizon. Winieski and Hammatt (2000) identified 11 burials and of the 31 identified features, 19 were associated with the lower, culturally-enriched A-horizon and include one *imu* pit and 18 indeterminate pits. Eight features were identified within the upper cultural layer and consisted of one pit containing two dog burials, one possible postmold, and six indeterminate pits. Three additional features that were truncated by fill material post-dating the buried A-horizon were considered to be part of SIHP # -5820 based on proximity. They include one pit feature containing a horse burial, as well as disarticulated and scattered human remains; and two indeterminate pits.

SIHP # -7124 consists of buried in situ and displaced historic infrastructure remnants, demolition debris, and refuse-enriched fill deposits that were initially identified by Pammer et al. (2011). The limits of SIHP #-7124 was expanded by Hammatt (2013).

SIHP # -7189 is a subsurface burnt trash deposit that contains glass bottles, ceramics, metal, and cut faunal bone. The site was originally identified by Pammer et al. (2011) and its boundaries were expanded by Hammatt (2013). Historic artifacts collected from SIHP #-7189 date from the late 1800s to early 1900s are interpreted as being associated with open-air trash burning. The subsurface burnt trash layer was determined to have been deposited in the early twentieth century (ca. 1920s to 1930s) when low-lying areas in Kaka'ako were infilled to advance urban development (Hammatt 2013).

SIHP # -7190 consists of subsurface salt pan remnants originally identified by Pammer et al. (2011), the limits of which were expanded by Hammatt (2013). The salt pan remnants include alternating layers of clay and organic peat and one sandy clay berm. SIHP # -7190 was identified at depths ranging from 1.3 m to 1.65 m below the surface during the Pammer et al. (2011) study and between 0.78 m and 1.37 m during the Hammatt (2013) study. Multiple fill strata were observed overlying the salt pan remnants including burnt trash fill (SIHP # -7189) and as well as hydraulic fill strata associated with historic land reclamation and urban development.

Section 3 Archaeological Inventory Survey Results

3.1 Inventory Survey Summary

The pedestrian inspection of the project area's surface confirmed there were no surface archaeological historic properties present. However, an architectural inventory survey of the project area has established that most of the standing architecture within the project area is over 50 years old (Mason Architects, Inc. 2009). The architectural inventory survey stated that the historic buildings within the current project area “[l]acks significance associated with architectural distinction. No known association with a significant person or event. Lacks integrity due to significant alteration. Evaluated ineligible both individually or as part of a district for nomination to the National Register of Historic Places” (Mason Architects, Inc. 2009).

The subsurface testing program initially consisted of 46 machine-assisted test excavations, each measuring 6 m long by 0.8 m wide, for a total surface excavation of approximately 221 sq m (Figure 34). However, upon identifying burial finds in Test Excavations 25 and 40, an additional 195 sq m was excavated in order to better delineate the horizontal extent of subsurface cultural deposits. This expansion of subsurface testing consisted of the excavation of 15 additional test excavations of varying size, increasing the total surface area of excavation to 416 sq m or approximately 3.0% of the total project area.

Six historic properties were identified during subsurface testing, including an early to mid-twentieth century cultural layer (SIHP # -7578); a nineteenth century cultural layer (SIHP # -7579); a pre- to post-Contact cultural layer with a historic burial cluster (SIHP # -7580); a pre-Contact traditional Hawaiian bundle burial (SIHP # -7581); and two sets of disarticulated human skeletal remains within non-burial contexts (SIHP #s -7582 and -7583) (see Figure 34 and Table 2).

Observed stratigraphy from open trenching indicates the project area had been subjected to intensive land reclamation via in-filling of low-lying areas. Fill material associated with land reclamation consisted primarily of crushed coral with smaller amounts of dredged marine clay. This fill material is consistent with material known to have been utilized during large-scale land reclamation projects within the Kaka'ako area (ca. late nineteenth century to early twentieth century), with the sand and ground-up coral (i.e., crushed coral) originating from dredging activities associated with the expansion of Honolulu Harbor and other various marine development (Hawaii Department of Public Works 1914; Hawaii Supreme Court 1915). Historic accounts indicate the entire project area would have been completely filled by 1914.

Observation of naturally deposited sediments capped beneath historic land reclamation fill prompted the designation of three stratigraphic zones within the project area (Figure 35). Each of the three stratigraphic zones coincides with discrete land forms and/or environmental zones that would have been present prior to historic in-filling and other various land alterations associated with urbanization (i.e., stream channeling, etc.).

Stratigraphic Zone 1 consists of the Diamond Head-*makai* portion of the project area (see Figure 35). The stratigraphic sequence within this zone consists of imported fill sediments (both modern and historic) atop a buried A horizon formed atop naturally deposited Jaucas sand. Underlying the Jaucas sand are naturally deposited marine clays developed atop the coral shelf

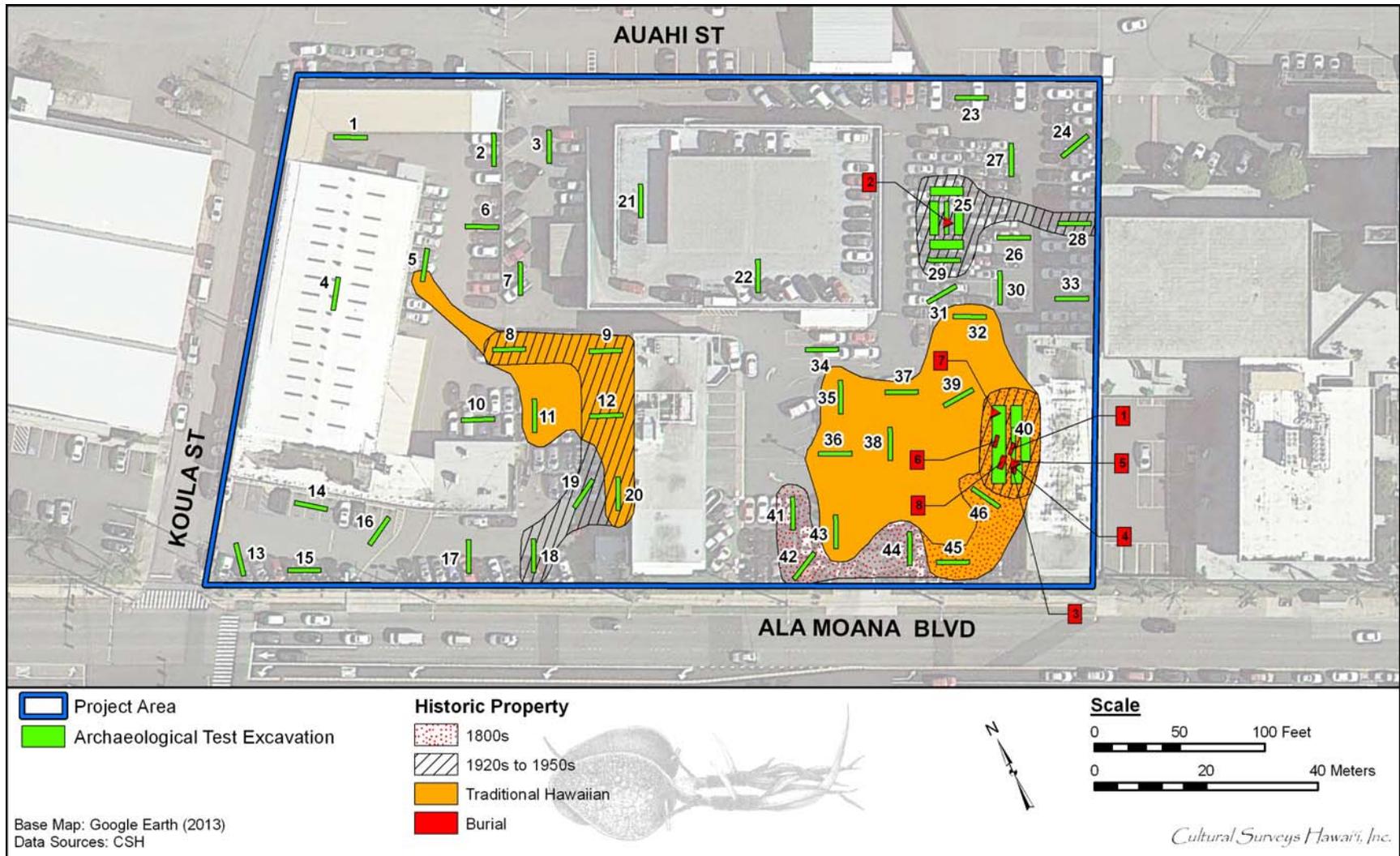


Figure 34. Historic properties identified within the project area

Table 2. Historic Properties Identified within the Project Area

SIHP #	Site Type	Function	Age	Significance Criteria	Recommended Mitigation
50-80-14-7578	Subsurface cultural layer	Habitation	Post-Contact (early to mid-twentieth century)	“d”	Archaeological monitoring
50-80-14-7579	Subsurface cultural layer	Habitation	Post-Contact (early twentieth century)	“d”	Archaeological monitoring
50-80-14-7580	Subsurface cultural layer	Habitation/burial	Pre-Contact to post-Contact	“d” and “e”	Archaeological data recovery, burial treatment, preservation, and archaeological monitoring
50-80-14-7581	Traditional Hawaiian bundle burial	Burial	Pre-Contact	“d” and “e”	Burial treatment
50-80-14-7582	Disarticulated human skeletal remains	Isolated find location	Indeterminate	“d” and “e”	Burial treatment
50-80-14-7583	Disarticulated human skeletal remains	Isolated find location	Indeterminate	“d” and “e”	Burial treatment

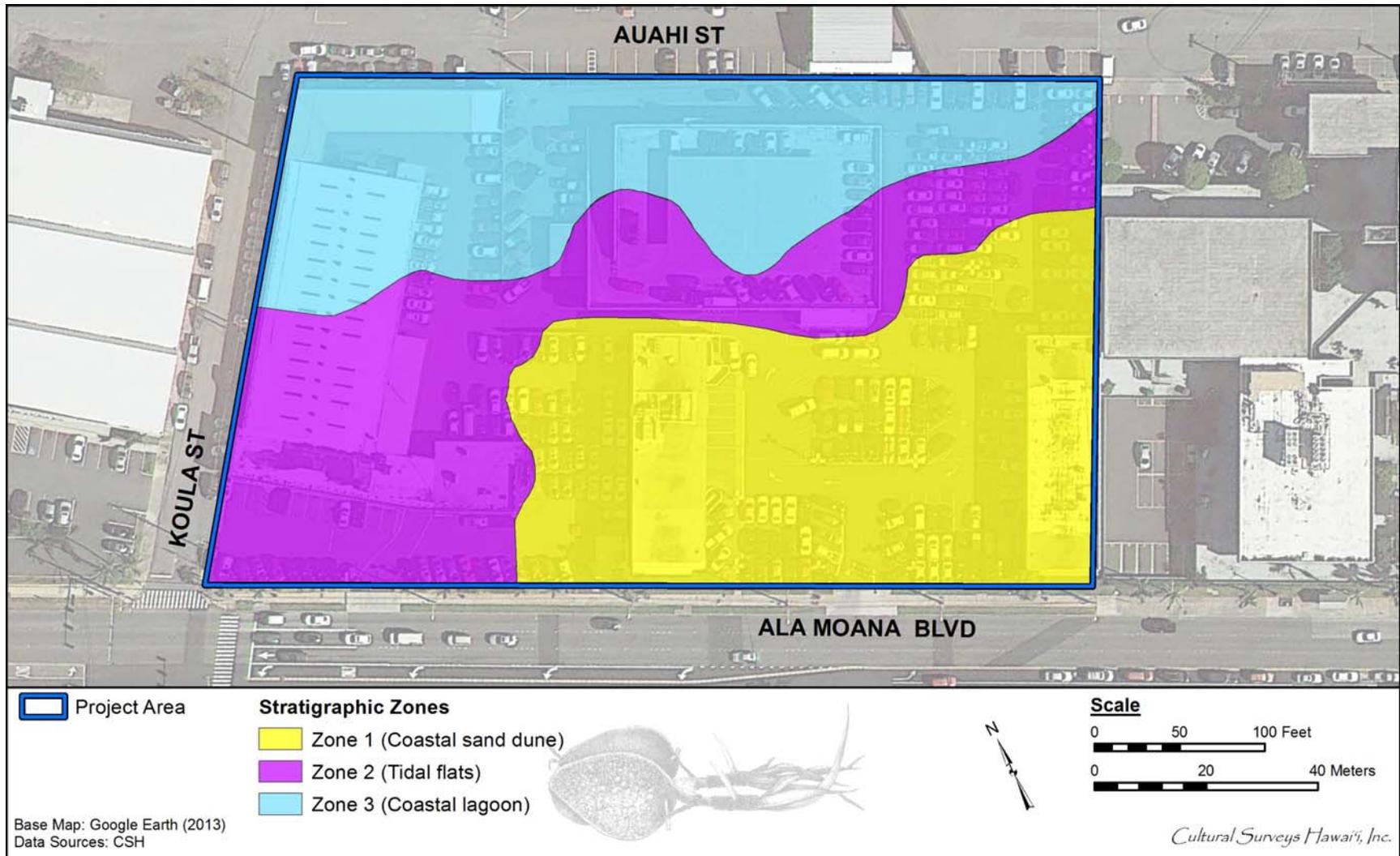


Figure 35. Stratigraphic zones present within the project area

(i.e., limestone bedrock). Stratigraphic Zone 1 represents a coastal sand dune that would have been an elevated land surface rising above the shoreline and surrounding semi-marine environment (tidal flats, coastal lagoons, etc.) prior to historic land reclamation. The likelihood of encountering archaeologically sensitive cultural deposits (i.e., traditional Hawaiian cultural layers and burials, both traditional and historic) within this stratigraphic zone is high.

Stratigraphic Zone 2 runs along the *mauka* edge of Stratigraphic Zone 1 and fans out at the 'Ewa-*makai* corner of the project area (see Figure 35). The stratigraphic sequence within this zone consists of imported fill sediments (both modern and historic) atop naturally deposited sandy clay that has formed atop the coral shelf (i.e., limestone bedrock). Stratigraphic Zone 2 represents tidal flats that formed behind the sand dune (Stratigraphic Zone 1) and extended west ('Ewa) along the coast. This stratigraphic zone represents a semi-marine environment (i.e., tidal flats) that existed prior to historic land reclamation. The likelihood of encountering archaeologically sensitive cultural deposits (i.e., traditional Hawaiian cultural layers and burials, both traditional and historic) within this stratigraphic zone is low; however there is still potential for encountering post-Contact cultural layers and structural remnants (i.e., building foundations, wastewater infrastructure, etc.).

Stratigraphic Zone 3 consists of the *mauka* third of the project area (see Figure 35). The stratigraphic sequence within this zone consists of imported fill sediments (both modern and historic) atop naturally deposited marine clay that has formed atop the coral shelf (i.e., limestone bedrock). The naturally deposited sediments observed in this zone consist of anaerobic soils developed while completely waterlogged and suggest that Stratigraphic Zone 3 represents a coastal lagoon environment formed behind the sand dune (Stratigraphic Zone 1). Prior to historic land reclamation, this zone would have been completely inundated with shallow slow moving water. The likelihood of encountering archaeologically sensitive cultural deposits (i.e., traditional Hawaiian cultural layers and burials, both traditional and historic) within this stratigraphic zone is low; however there is still potential for encountering post-Contact cultural layers and structural remnants (i.e., building foundations, wastewater infrastructure, etc.).

Of particular interest is SIHP # -7580, a pre-Contact to post-Contact subsurface cultural layer. This cultural layer consists of a buried A horizon (i.e., former land surface) developed atop naturally deposited marine sand that consisted of an elevated sand dune amidst a semi-marine environment prior to historic land reclamation of the greater Kaka'ako area. The buried A horizon contains numerous subsurface pit features (fire pits, post molds, cooking features, etc.), contains a historic burial cluster, and is enriched with midden (indicative of a traditional Hawaiian diet) and artifacts (both traditional and historic).

Analysis of the artifact assemblage and charcoal (i.e., radiocarbon analysis) collected from SIHP # -7580 indicates the cultural layer was potentially utilized continuously from the pre-Contact period into the post-Contact period. Collected artifacts include traditional Hawaiian items such as an adze and basalt sinker, as well as western introduced material including chert flakes, potentially used as gun flint or for strike-a-lights, and an engraved mother-of-pearl English game counter originally manufactured in China pre-1840. Additionally, radiocarbon analysis of charcoal indicates occupation associated with the cultural layer spanned from the late fifteenth century into the nineteenth century. (Note that while radiocarbon dates indicate date

ranges into the 1900s, archaeological evidence and historic research has indicated the cultural layer was likely capped by fill events beginning in the mid to late-1800s.)

The archaeological record at this particular location provides evidence of multiple periods of occupation by different groups of individuals influenced by vastly different cultural sensibilities. The initial occupation consisted of pre-Contact indigenous Hawaiians who were utilizing the coastal sand dune within the project area as a living surface and as an area for exploiting ocean resources. This occupation extended into the early post-Contact period, when indigenous Hawaiians were exposed to western influences. During this transitional occupation phase indigenous Hawaiians began to adopt western technologies (e.g., utilization of guns and/or strike-a-lights) and cultural practices (e.g., extended burials within coffins). A dramatic shift then occurs following historic land reclamation (ca. late nineteenth to early twentieth century). At this time, the potential living surface within the project area is vastly expanded, via in-filling of lowland areas, and the indigenous Hawaiian population appears to have been supplanted by a mixture of European and Asian immigrants (based on the observed artifact assemblage collected from the project area). Traditional Hawaiian land use within the project area is no longer existent, a result of the western influenced urban expansion of Honolulu into Kaka'ako—where the project area is located—which became dominated by dense clusters of residential dwellings and buildings associated with light industrial activity.

In summary, archaeological investigations within the project area have revealed the presence of rich archaeological deposits spanning from the pre-Contact period into the post-Contact period. These deposits include subsurface cultural layers, human burials (both pre-Contact and post-Contact), and buried structural remnants (i.e., building foundations). These archaeological deposits are associated with traditional Hawaiian habitation, as well as historic land use (i.e., nineteenth/early twentieth century stables and twentieth century residences).

3.2 Historic Property Descriptions

The following site description has been taken directly from the project's archaeological inventory survey report (Tulchin and Hammatt 2014b) which is currently under review by SHPD.

3.2.1 SIHP # 50-80-14-7578

TEMPORARY #	CSH 1
FORMAL TYPE:	Subsurface cultural layer and buried structural remnants
FUNCTION:	Habitation
# OF FEATURES:	30
AGE:	Post-Contact (Early to mid-twentieth century)
DIMENSIONS:	Indeterminate

DESCRIPTION: SIHP # -7578 is a subsurface cultural layer observed discontinuously throughout the project area within test excavations 8, 9, 12, 18-20, 25, 25A-25D, 28, and 40A-40H, 48, and 49 (Figure 36). It is defined as an area that shows subsurface remnants of post-Contact activity. Generally, this is evidenced by an A horizon developed atop large scale historic land reclamation fill (i.e., crushed coral) but was also present atop the more localized fill event associated with SIHP # -7579 (mid-nineteenth to early twentieth century artificial land surface). The cultural layer was documented from 30 to 80 cm below the existing ground surface and consisted of a dark grayish brown sandy loam that contained charcoal flecking, as well as glass, metal, and ceramic fragments. In some locations a crushed coral pavement was present instead of a buried A horizon. It is believed the pavement was utilized in areas that required a more stable land surface, such as roadways or developed areas (i.e., residential or industrial zones).

Historic fire insurance maps spanning from 1927 to 1956 indicate dense clusters of dwellings throughout the project area; a horse corral is also indicated, as well as areas utilized for various light industrial activity (Figure 37 through Figure 39). It is believed SIHP # -7578 is associated with this period of land use within the project area.

Thirty features associated with SIHP # -7578 were identified (Table 3). These included buried structural remnants (i.e., building foundations and septic tank) and various subsurface pit features (trash pits, post molds, a horse burial, and a fire pit used for cooking).

Fifteen of the thirty identified features (50%) consisted of concrete building foundations (SIHP # -7578 Features K–W, Y, and Z) believed to be associated with a dense cluster of dwellings shown on the aforementioned historic maps (see Figure 37 through Figure 39). In general, these foundations consist of a square concrete base (70 cm long by 70 cm wide by 20 cm high) set on the coral shelf, with a rectangular concrete column (90 cm long by 30 cm wide by 30 cm high) set freestanding and upright atop the square base (Figure 40). These foundations were installed by pit excavations that originated from the former ground surface and extended down to the coral shelf. The concrete foundations were then installed within the

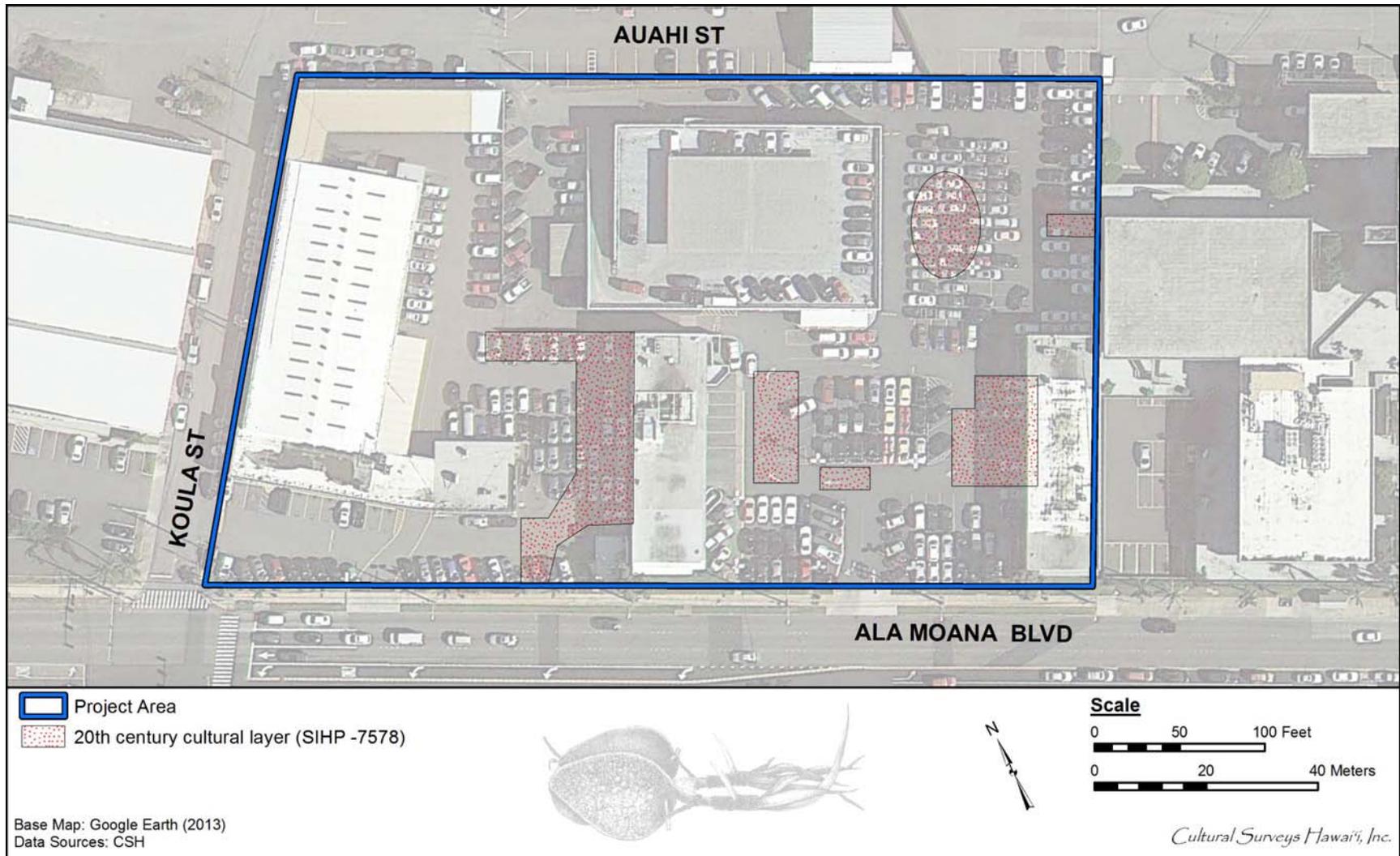


Figure 36. Aerial photograph showing the location of SIHP # -7578 within the project area

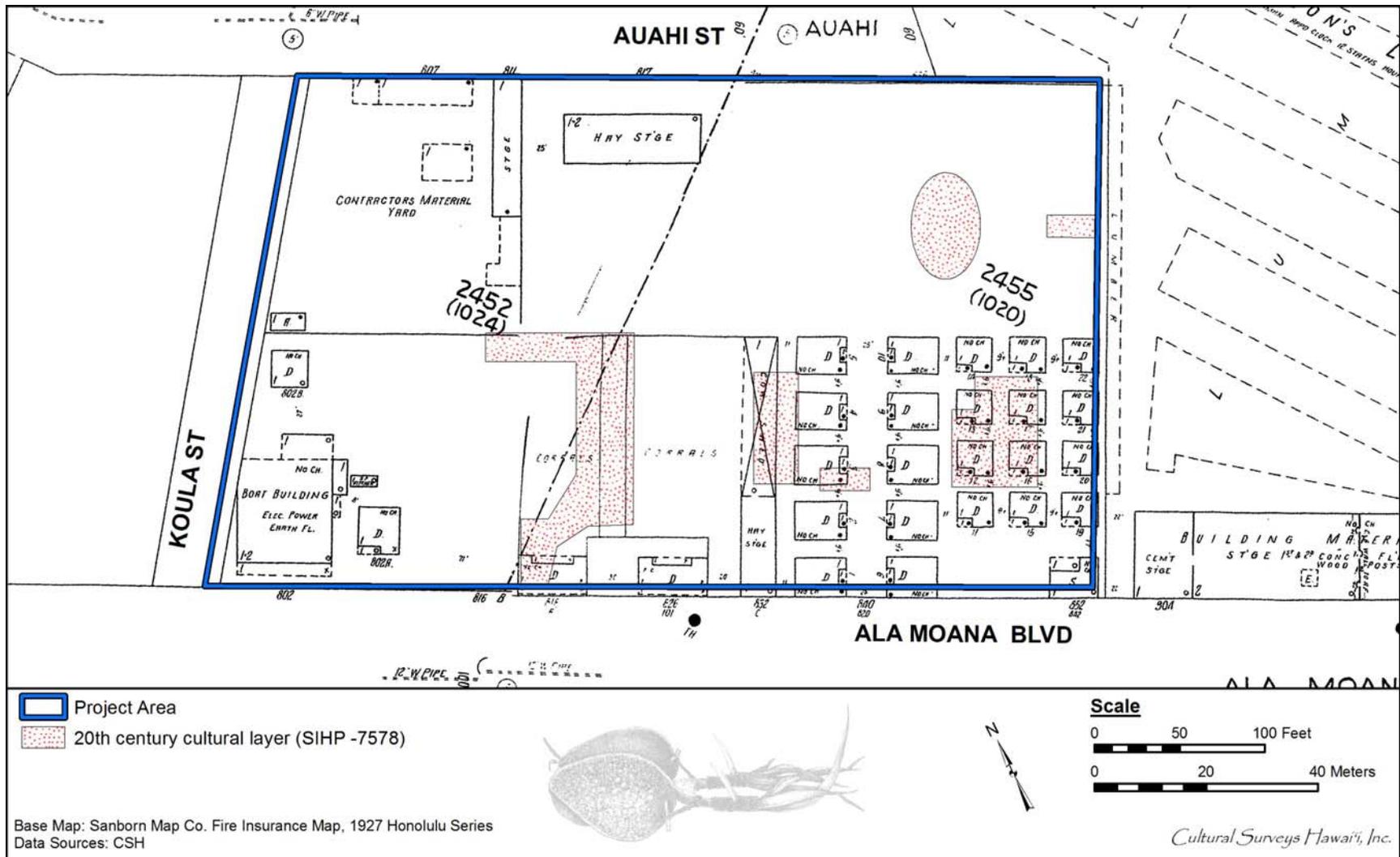


Figure 37. 1927 Sanborn Fire Insurance Map showing SIHP # -7578 within the project area

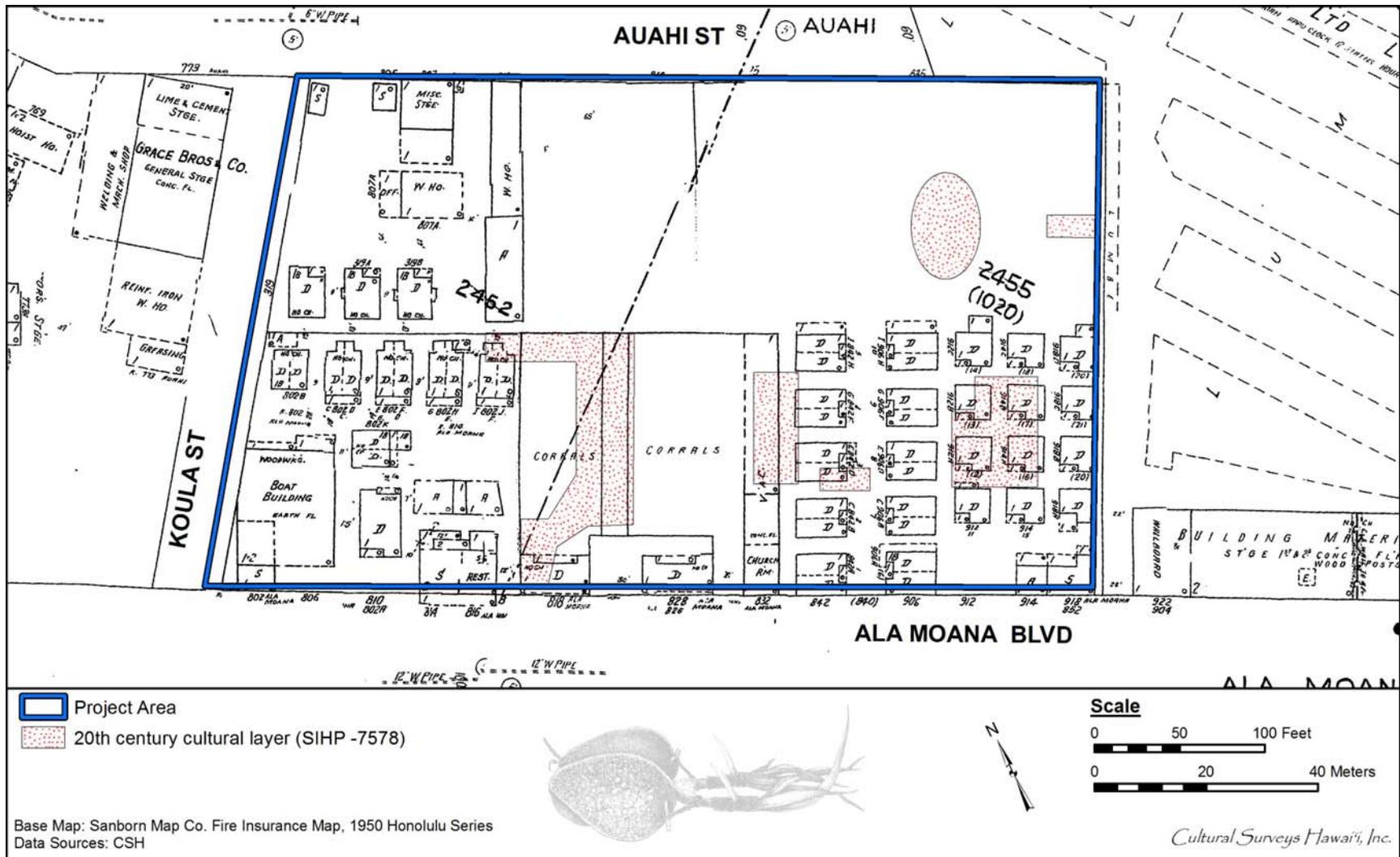


Figure 38. 1950 Sanborn Fire Insurance Map showing SIHP # -7578 within the project area

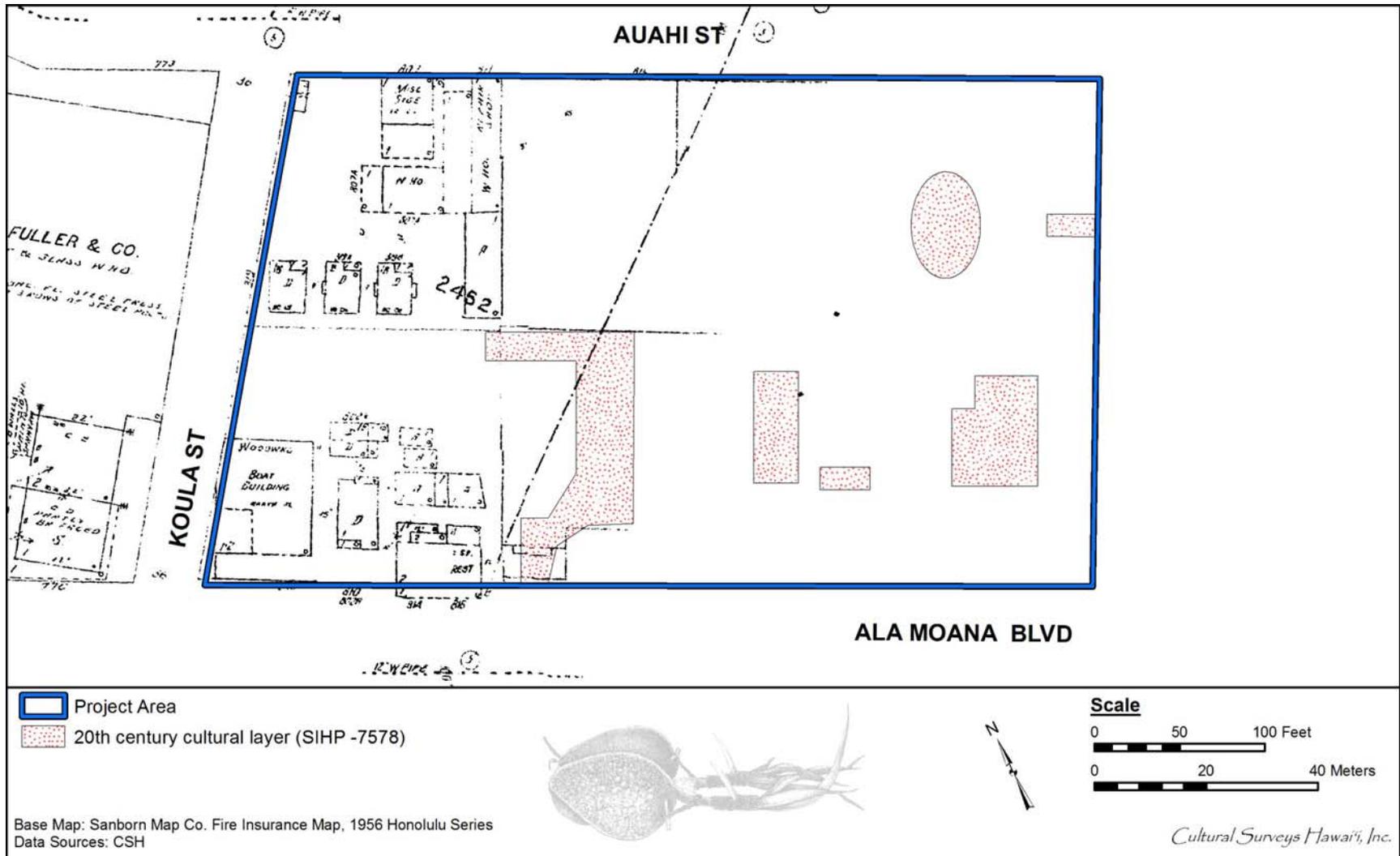


Figure 39. 1956 Sanborn Fire Insurance Map showing SIHP # -7578 within the project area

Table 3. SIHP # -7578 Feature Table

Feature	Horizontal Extent	Vertical Extent (cmts)	Pit Fill	Description	Cultural Material	Function
A	130 cm long x 40 cm wide	50-160	Conglomeration of Strata II, III, IV, and V sediments	Rectangular-shaped pit feature observed within northeast sidewall of TE 8. Feature originates from Stratum II and intrudes into Stratum Vb.	A single wooden plank at base of feature; small red brick, glass, and ceramic fragments observed within pit fill (not collected); historic materials widely dispersed, not concentrated	Indeterminate
B	100 cm long	50-80	Mixture of Strata II and III	Rectangular-shaped pit feature observed within the southwest sidewall of TE 12. The upper boundary of Feature B has been truncated by Str. Ib. The feature intrudes into Str. III.	Clear screw-top bottle, an amber Clorox bottle base, metal wire-cut nails, a saw-cut cow bone, a metal spoon fragment, and miscellaneous bottle glass fragments	Trash disposal
C	140 cm long	60-110	Conglomeration of Strata II, III, and IV	Trapezoid-shaped pit feature observed in north wall of TE 19. Feature originates from Stratum II and intrudes into Stratum IV.	Broken glass bottles, metal and ceramic fragments	Trash disposal
D	70cm long	60-130	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in east sidewall of TE 20. Pit feature originates from Stratum II. The upper boundary is truncated by Stratum Ib. The feature intrudes into Stratum Va.	None observed	Indeterminate
E	30 cm diameter	60-120	Mixture of Strata II, III, IV, and V	Rectangular-shaped pit feature observed in east sidewall of TE 20. Pit feature originates from Stratum II. The upper boundary is truncated by Stratum Ib. The feature intrudes into Stratum Va.	Rectangular 2 x 4 wooden post remnant set vertically observed within feature	Post mold

Feature	Horizontal Extent	Vertical Extent (cmb)	Pit Fill	Description	Cultural Material	Function
F	110 cm long	60-150	Mixture of Strata II, III, IV, and V	Funnel-shaped pit feature observed in east sidewall of TE 20. Pit feature originates from Stratum II. The upper boundary is truncated by Stratum Ib. The feature intrudes into Stratum Vb.	Two plastic toy cars, two glass bottles, and one plastic 1948 Chevron gas station calendar	Trash disposal
G	190 cm long by 80+ cm wide	40-140	Excavated and backfilled Stratum III sediment	Bowl-shaped pit feature observed within the northwest sidewall of TE 25. Pit feature cuts through Stratum II and intrudes into Stratum III.	Complete, fully articulated horse burial, an isolated human tooth, and a possible human cranial fragment	Horse burial
H	400 cm long by 80+ cm wide	30-80	Mixture of Strata II and IIIa	Large bowl-shaped pit feature observed in the southwest sidewall of TE 28. Feature originates in Stratum II and intrudes into Stratum IIIa.	Pig bones, charcoal, burnt water worn basalt cobbles, and a glass bottle	Food preparation
I	120 cm long	30-70	Mixture of Strata II and III	Bowl-shaped pit feature within southwest sidewall of TE 25A. The upper boundary of the feature has been truncated by Stratum I. The feature intrudes through Stratum II and into Stratum III.	Charcoal, glass, metal, red brick, saw-cut faunal bone	Trash disposal
J	100 cm long	30-60	Mixture of Strata II and III	Circular-shaped pit feature observed in the northeast sidewall of TE 25C and in plan view. The upper boundary of the feature has been truncated by Stratum I. The feature originates in Stratum II and intrudes into Stratum III.	Glass bottle, glass fragments, fork, metal fragments, slag, saw-cut faunal bone and charcoal	Trash disposal
K	100 cm long by 100 cm wide	40-150	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40A plan view. Historic utility bisects the feature and toppled the rectangular column off its base. The feature originates at the top of Stratum II and terminates at the coral shelf. Square concrete block at base of pit.	Concrete column and base	Habitation / historic building foundation

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
L	60 cm long by 55 cm wide	40-140	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40A plan view and in west sidewall. The feature originates at the top of Stratum II and terminates at the coral shelf. Square concrete block at base of pit.	Concrete column and base	Habitation / historic building foundation
M	60 cm wide in profile	60-150	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40A east sidewall. The feature originates at the top of Stratum II and terminates at the coral shelf. Square concrete block at base of pit.	Concrete column and base	Habitation / historic building foundation
N	100 cm long by 100 cm wide	50-150	Mixture of Strata II, III, IV, and V	Rectangular pit feature observed in center portion of plan view and in center of NW profile wall of TE 40B. Pit originates in Stratum II and terminates at coral shelf (i.e., limestone bedrock).	Concrete column and base	Habitation / historic building foundation
O	100 cm long by 100 cm wide	60-150	Mixture of Strata II, III, IV, and V	Square pit feature in plan view and rectangular shaped in NW profile wall of TE 40B. Pit originates in Stratum II and terminates at coral shelf (i.e., limestone bedrock).	Concrete column and base	Habitation / historic building foundation
P	90 cm long	60-150	Mixture of Strata II, III, IV, and V	Rectangular pit feature observed in SE profile of TE 40B. Pit originates in Stratum II and terminates at coral shelf (i.e., limestone bedrock).	Concrete column and base	Habitation / historic building foundation
Q	60 cm long	50-145	Mixture of Strata II, III, IV, and V	Rectangular pit feature observed in SE profile of TE 40B. Pit originates in Stratum II and terminates at coral shelf (i.e., limestone bedrock).	Concrete column and base	Habitation / historic building foundation

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
R	100 cm long by 60+ cm wide	60-130	Mixture of Strata II, III, IV, and V	Rectangular pit feature observed in east profile wall of TE 40C and in plan view and in TE 40H plan view. Also observed in plan view of TE 40H. Pit originates in Stratum II and terminates at Stratum Vb.	Concrete column and base	Habitation / historic building foundation
S	100 cm long by 80 cm wide	50-160	Mixture of Strata II, III, IV, and V	Rectangular pit feature observed in plan view of TE 40D. Feature originates from Stratum II and intrudes into Stratum V.	Concrete column and base	Habitation / historic building foundation
T	30 cm in profile	55-145	Mixture of Strata II, III, IV, and V	Rectangular pit feature observed in East sidewall of TE 40D. Feature originates from Stratum II and intrudes into Stratum V.	None observed	Habitation
U	60 cm by 50 cm	60-160	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40E plan view and in south sidewall. The feature originates at the top of Stratum II and terminates at the coral shelf. Square concrete block at base of pit.	Concrete column and base	Habitation / historic building foundation
V	110 cm by 50 cm	50-160	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40E plan view and in west sidewall. The feature originates at the top of Stratum II and terminates at Stratum Va. Concrete base observed.	Concrete column and base	Habitation / historic building foundation
W	40 cm by 30 cm	50-160	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40E plan view and in east sidewall. The feature originates at the top of Stratum II and terminates at the coral shelf. Rectangular concrete column present within feature.	Concrete column and base	Habitation / historic building foundation

Feature	Horizontal Extent	Vertical Extent (cmts)	Pit Fill	Description	Cultural Material	Function
X	90 cm long by 50 cm wide	55-105	Mixture of Strata II, III, IV, and V	Oblong pit feature observed in plan view of TE 40E. The feature originates in Stratum II and intrudes into Stratum V.	Glass milk bottles, bone button, slate pencil, glass vial, and a copper handle	Trash disposal
Y	140 cm diameter	70-160	Mixture of Strata II, III, IV, and V	Circular pit feature observed in TE 40E plan view and in north sidewall. The feature originates at the top of Stratum II and terminates at the coral shelf. Square concrete block at base of pit.	Concrete column and base	Habitation / historic building foundation
Z	50 cm long by 30 cm wide	40-130	Mixture of Strata II, III, IV, and V	Square-shaped pit feature observed in TE 40H plan view and in east sidewall. The feature originates at the top of Stratum II and terminates at the marine clay (Stratum Vb). Square concrete block at base of pit.	Concrete column and base	Habitation / historic building foundation
AA	280 cm long by 80 cm wide	40-120	Mixture of Strata IIa and IIb	Large bowl-shaped pit feature observed in plan view and east sidewall of TE 48. Truncated Stratum I intrudes into Stratum IIb.	Glass bottles, slate, red brick, marble, and metal fragments	Trash pit
AB	70 cm long by 70 cm wide	40-110	Pit fill removed by subsequent utility installation	Square concrete box enclosed at base, but open at top. East and west side of box contain angled outlet holes assumed to transport liquid (i.e., water or sewage).	Concrete box filled with small ceramic, glass, and faunal bone (bird) fragments all within a matrix of charred sand	Water control / refuse disposal
AC	80 cm diameter	35-95	Mixture of Strata II, III, and IV	Circular pit feature observed in plan view and west sidewall of TE 49. Feature originated in Stratum IIa and intrudes in to Stratum IVa.	Glass bottles and metal fragments	Trash pit
AD	30 cm long by 30 cm wide in profile	35-65	Mixture of STR. II, III and IV	Oblong pit feature observed in and west sidewall of TE 49. Feature originated in Stratum IIa and intrudes into Stratum IVa.	Metal and plastic fragments	Trash pit

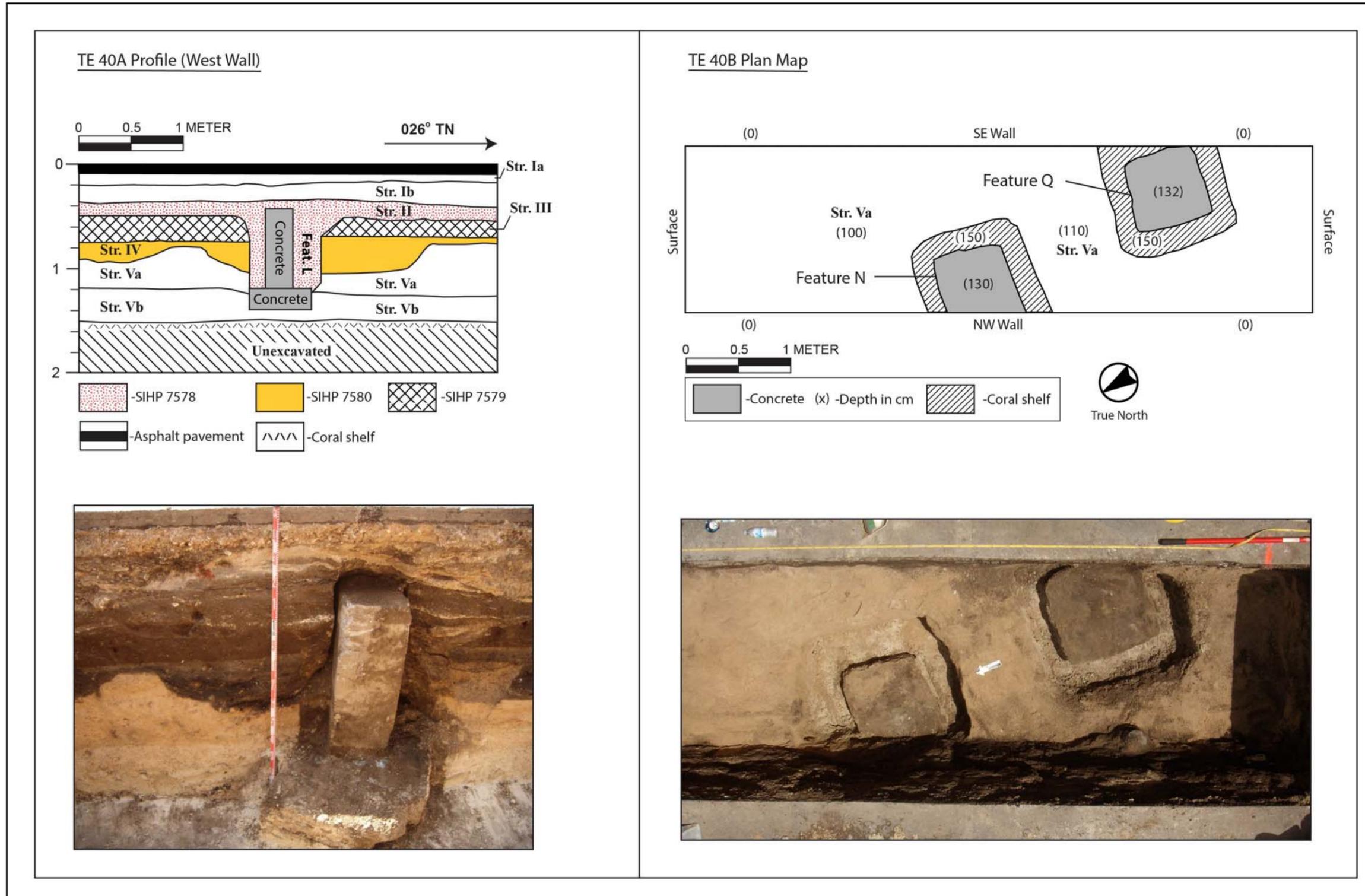


Figure 40. Representative profile and plan view of buried structural remnants (i.e., concrete building foundation) associated with SIHP # -7578

SIHP # -7578 Feature AB consists of a buried square concrete box believed to be utilized for wastewater management (see Table 3 and Figure 41). The concrete box is enclosed at the base, but open at the top. The east and west side of the box contains angled outlet holes assumed to transport liquid (i.e., water or sewage). The box was filled with small ceramic, glass, and faunal bone (bird) fragments all within a matrix of charred sand (cultural material noted, but not collected). Based on its construction and stratigraphic provenience SIHP # -7578 Feature AB is interpreted to be a historic septic tank repurposed for a short time to burn refuse.

Nine of the thirty identified features (30%) consisted of trash pits (SIHP # -7578, Features B, C, F, I, J, X, AA, AC, and AD) (see Table 3 and Figure 42). These trash pits varied in size and shape, but all originated from the top of SIHP # -7578, cultural layer/buried A horizon, and were excavated into the underlying sediment. All of the trash pits contained similar types of refuse. The cultural material observed from these features included glass bottles (Clorox, milk, and soda), saw-cut faunal bone, metal nails, metal utensils, plastic toy cars, a slate pencil, a glass vial, and a plastic calendar (dated 1948). This assemblage of cultural material is indicative of the early to mid-twentieth century habitation within the project area. Additionally, bottles collected for analysis from these trash pits have been dated between the 1910s to the 1940s (see Section 5 Laboratory Analysis below).

SIHP # -7578, Feature G consists of a fully articulated horse burial (see Table 3). The burial pit was observed cutting through SIHP # -7578 (cultural layer) and intruding into the underlying fill deposits (i.e., imported historic land reclamation fill) (Figure 43). The burial pit had a horizontal extent of 190 cm long by 80+ cm wide, and was present from 40 to 140 cm below the existing surface. During documentation of the horse burial a single isolated human molar was identified. This prompted the complete excavation of the horse burial to determine if additional human remains were present. Further exploration identified a possible cranial fragment in addition to the molar. The human remains (SIHP # -7582) were isolated to the pit fill of SIHP # -7578, Feature G. It was determined the human remains were associated with the imported historic land reclamation fill, and the human remains were within a tertiary burial context, being disturbed during removal and transport of fill sediment and being disturbed again during the interment of the horse. Following documentation of this feature, the human skeletal remains were wrapped in muslin and placed in a small *lauhala* basket. The basket was then filled with clean sand and returned to the approximate location where the human molar was first identified. The excavation was then backfilled, with a small plywood board placed atop the *lauhala* basket for added protection and to act as a marker if the need arises to relocate the remains.

SIHP # -7578, Feature H consists of a fire pit utilized for food preparation (see Table 3). The feature was observed cutting through SIHP # -7578 (cultural layer) and intruding into the underlying fill deposits (i.e., imported historic land reclamation fill) (Figure 44). It had a horizontal extent of approximately 400 cm long and 80+ cm wide, and was present from 30 to 80 cm below the existing surface. Cultural materials observed included pig bones, charcoal, a glass milk bottle, and charred water-rounded basalt cobbles.

The three remaining features associated with SIHP # -7578 consist of a post mold and two indeterminate features (SIHP # -7578, Features E, D and A; see Table 3). The post mold (SIHP # -7578, Feature E) was observed at TE 20 and consisted of a rectangular pit feature

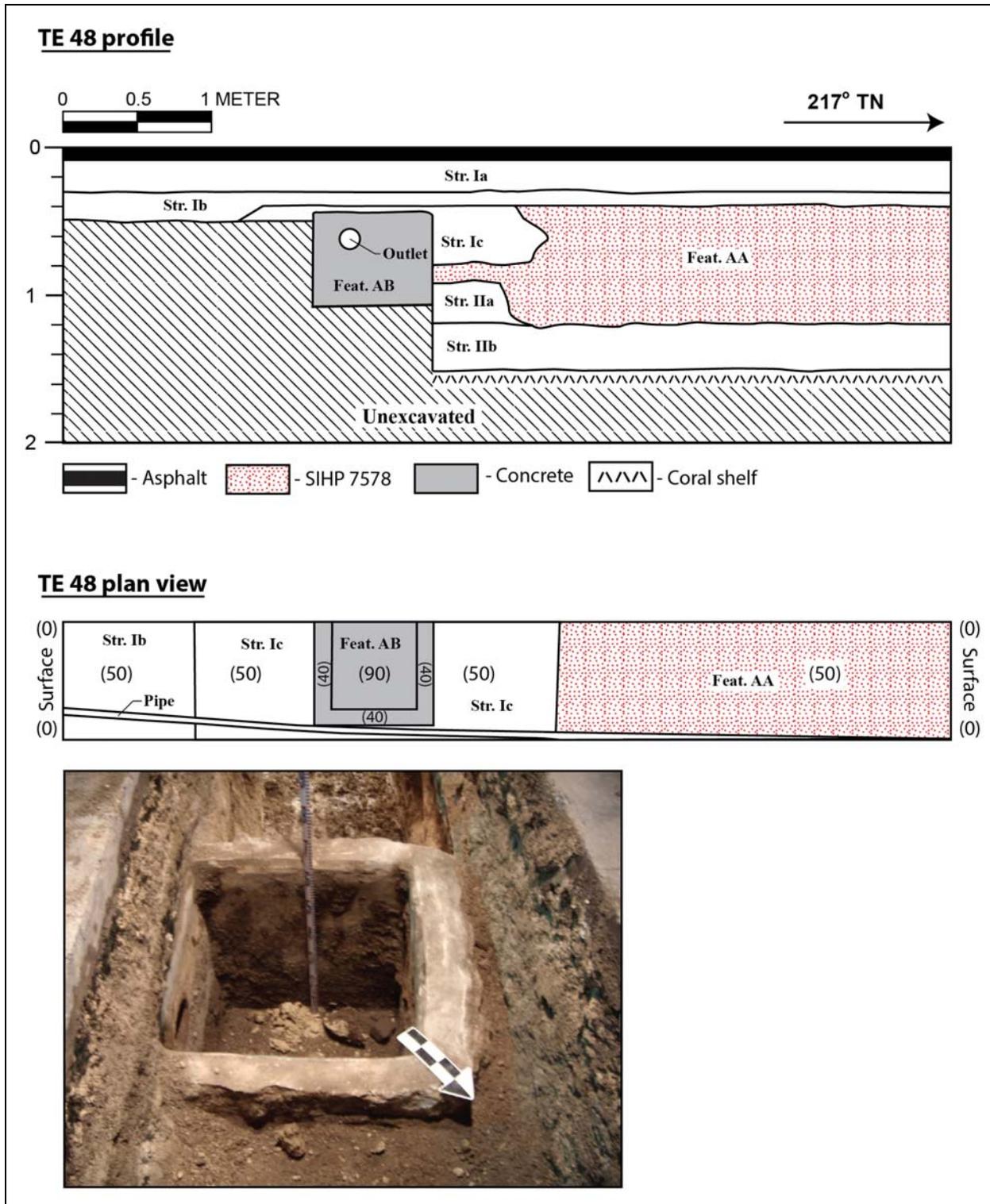


Figure 41. SIHP -7578 Feature AB, plan view, profile and photograph

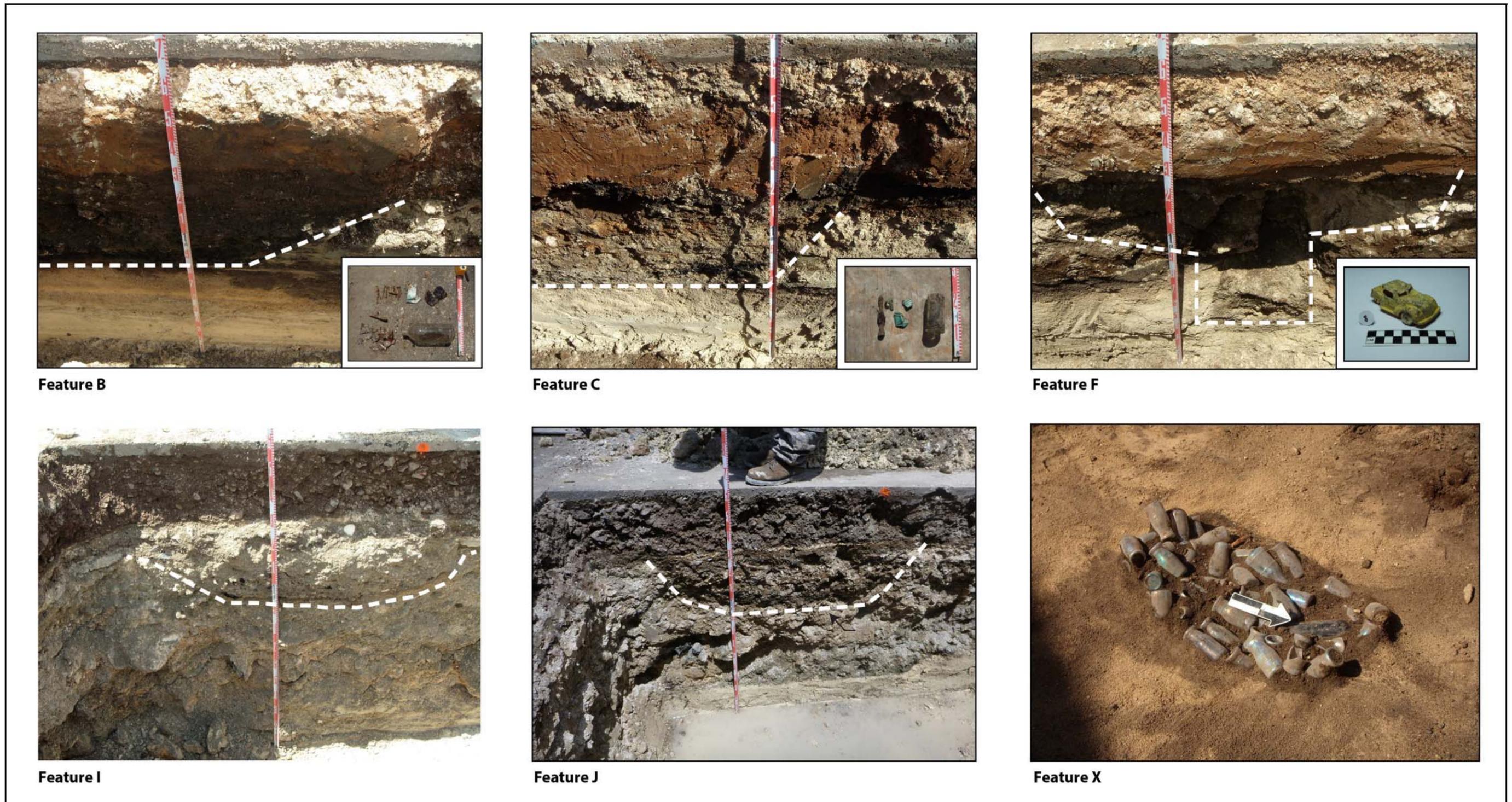


Figure 42. Trash pits associated with SIHP # -7578 (Features B, C, F, I, J, and X)

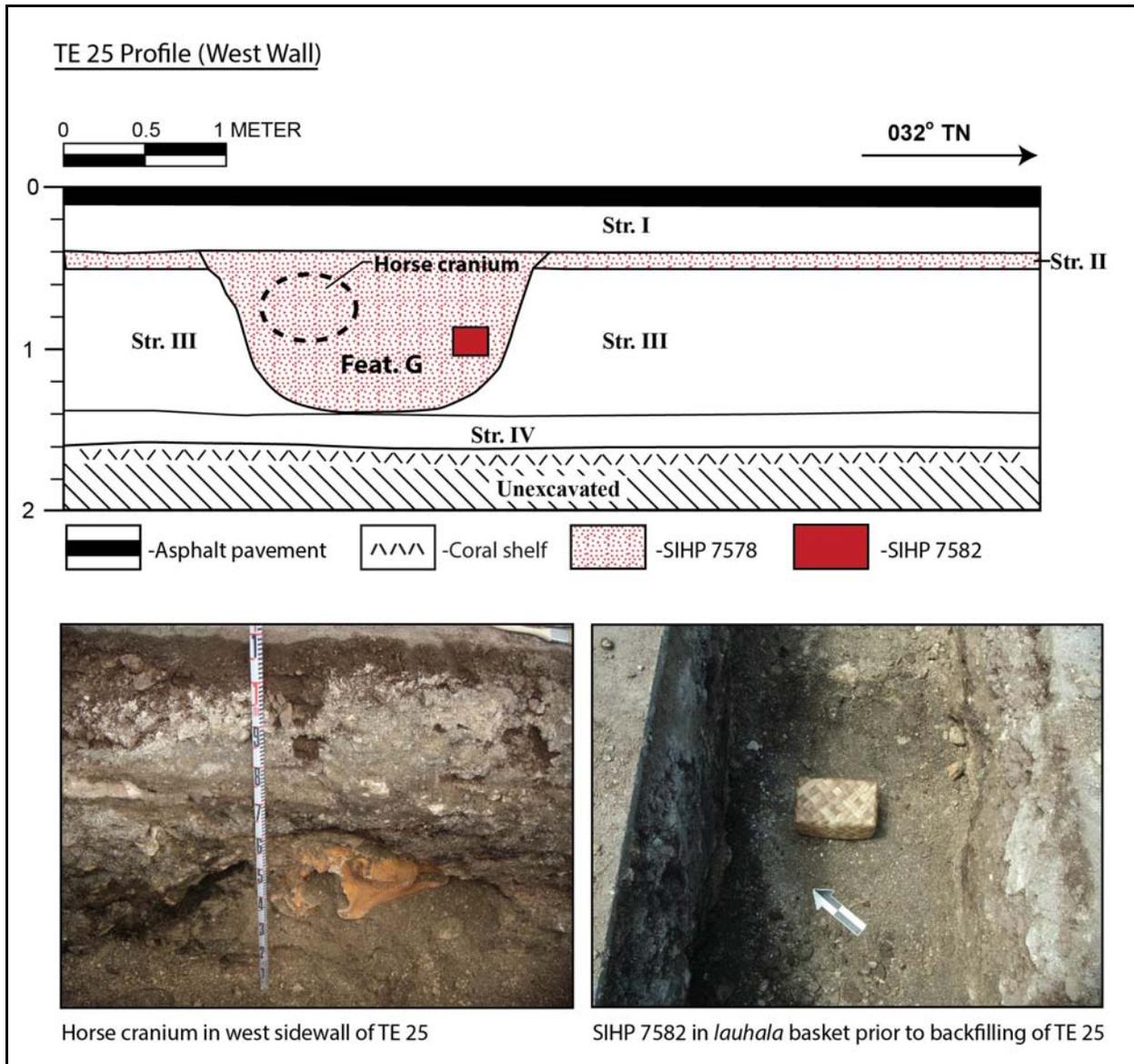


Figure 43. SIHP # -7578, Feature G (Horse burial) and Burial Find SIHP # -7582

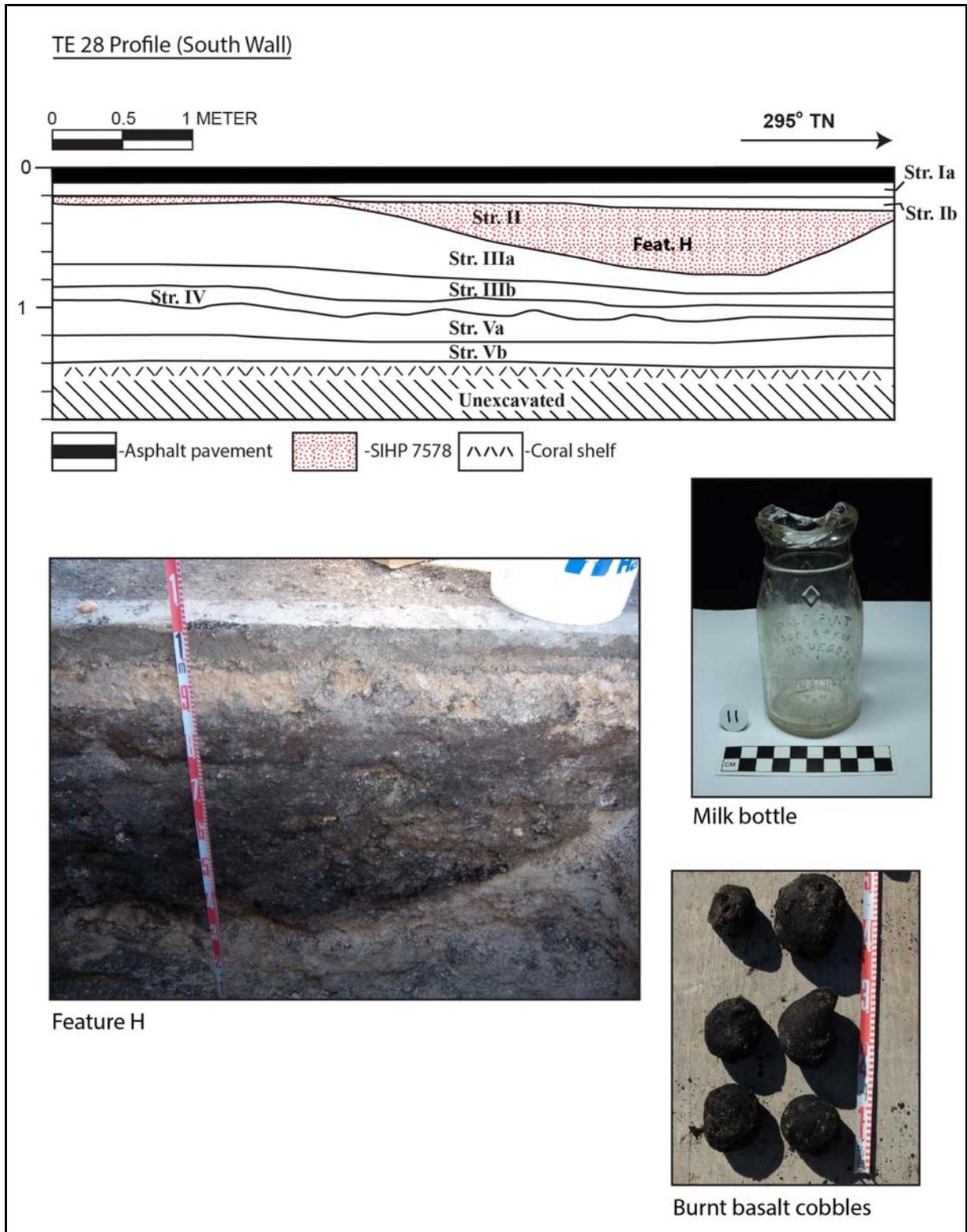


Figure 44. SIHP # -7578 Feature H (cooking feature)

originating at the SIHP # -7578 cultural layer and intruding into the underlying land reclamation fill. A rectangular "2 x 4" wooden post remnant, set vertically, was observed within the feature. In the immediate vicinity of this post mold was SIHP # -7578, Feature D, a square pit feature originating in the SIHP # -7578 cultural layer and ranging from 60 to 130 cm in depth below the existing surface. No cultural material was observed within the feature. The exact function of this feature could not be determined.

The other indeterminate feature (SIHP # -7578, Feature A) consists of a rectangular-shaped pit feature observed within the northeast sidewall of TE 8 (Table 3). It measured 130 cm long and 40 cm wide, and was present from 50 to 160 cm below the existing surface. Observed cultural material consisted of a single glass bottle base and three ceramic fragments. A thin (1 cm thick), heavily decomposed wood plank was observed at the base of the feature. The exact function of SIHP # -7578, Feature A could not be determined.

3.2.2 SIHP # 50-80-14-7579

TEMPORARY #	CSH 2
FORMAL TYPE:	Subsurface cultural layer
FUNCTION:	Habitation
# OF FEATURES:	N/A
AGE:	Post-Contact (mid-nineteenth to early twentieth century)
DIMENSIONS:	Indeterminate

DESCRIPTION: SIHP # -7579 consists of a mid-nineteenth to early twentieth century land surface artificially created through the deposition of imported fill sediments atop a naturally occurring sand dune. This cultural layer is associated with a localized fill event that pre-dates the large-scale land reclamation of Kaka'ako that occurred between the late nineteenth and early twentieth centuries. SIHP # -7579 was observed within the southern corner of the project area, within test excavations 40, 40A-40F, 41, 42, and 44-47 (Figure 45).

SIHP # -7579 is comprised of a dark brown clay loam fill that contains artifacts dating to the nineteenth century. Artifacts collected from this stratum included ceramic tableware fragments, kaolin clay pipe fragments, and a celluloid hair barrette (see Section 5 Laboratory Analysis below).

A review of a 1914 fire insurance map indicates the distribution of SIHP # -7579 corresponds to the limits of the Union Feed Company stables (Figure 46). Wagon sheds, stables, and dwellings were present within the project area during the early twentieth century, likely prior to the large-scale land reclamation (via filling) that occurred within the project area.

Based on stratigraphic provenance, historic map review, and artifact analysis it is believed SIHP # -7579 is an artificial land surface created sometime between the mid- to late nineteenth century to provide a hard level surface for wagon transport and various other activities associated with the Union Feed Company stable.

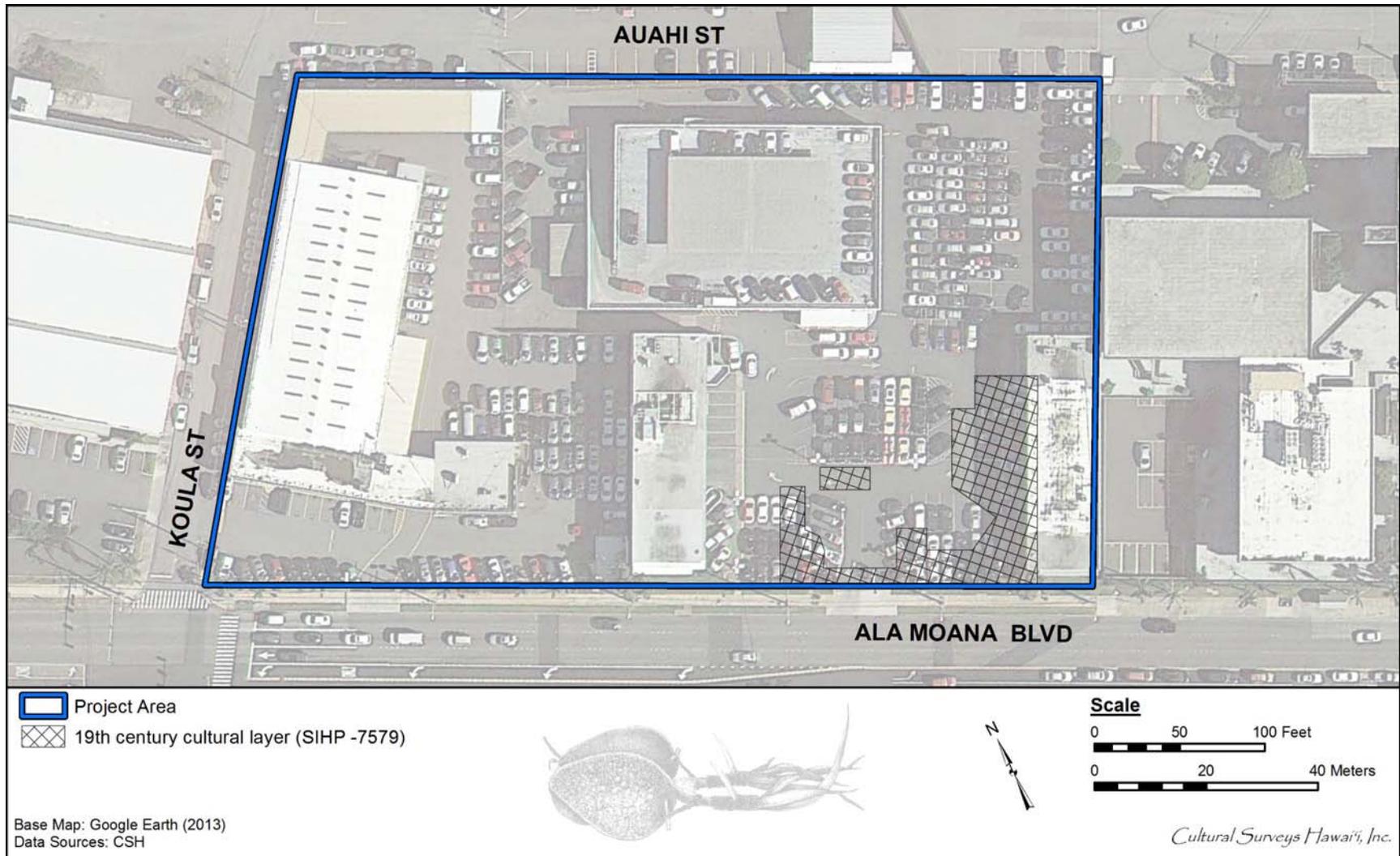


Figure 45. Aerial photograph showing the location of SIHP # -7579 within the project area

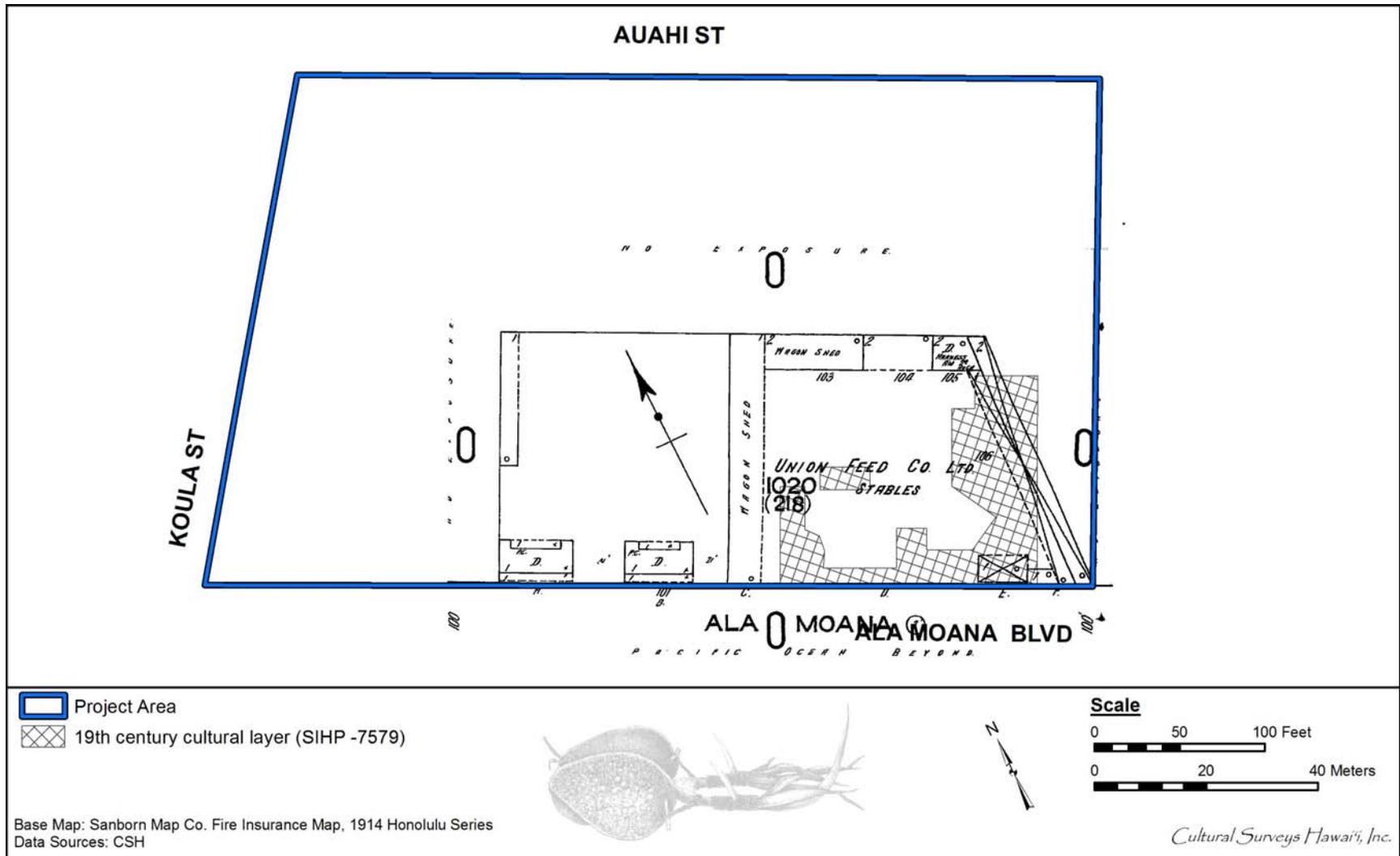


Figure 46. 1914 Sanborn Fire Insurance Map showing SIHP # -7579 within the project area

3.2.3 SIHP # 50-80-14-7580

TEMPORARY #	CSH 3
FORMAL TYPE:	Subsurface cultural layer and human burials
FUNCTION:	Habitation
# OF FEATURES:	27 pit features, 17 subfeatures, and 8 burial finds
AGE:	Pre-Contact to post-Contact
DIMENSIONS:	Indeterminate

DESCRIPTION: SIHP # -7580 is a subsurface cultural layer observed in the project area within test excavations 5, 8, 9, 11, 12, 20, 32, 35–40, 40A–40H, and 43–47 (Figure 47). It is defined as an area that shows subsurface remnants of pre-Contact and early post-Contact activity. Generally, this is evidenced by an A horizon developed on naturally deposited Jaucas sand, enriched primarily with traditional Hawaiian cultural material. This A horizon was subsequently buried by historic fill events that brought the surface to its current elevation. During these fill events, the upper boundary of the A horizon was truncated during grading that preceded filling.

The cultural layer was documented from 60 to 125 cm below the existing ground surface and consisted of a very dark brown silty sand containing marine shell midden, charcoal, and fire-cracked rock (basalt) evenly dispersed throughout the stratum. The fire-cracked rock consisted of semi-porous, angular, thermally altered basalt. Traditional Hawaiian artifacts were also present within the cultural layer. These included a basalt core (Acc. # 41), an adze fragment (Acc. # 2), a bone awl (Acc. # 39), an *aku* lure preform (Acc. # 79), and a marine shell gourd stopper (Acc. # 40). Of note was the presence of a basalt sinker (Acc. # 29) which was collected from naturally deposited marine sand underlying the cultural layer.

While observed cultural material was predominantly of pre-Contact to early post-Contact traditional Hawaiian origin, some nontraditional western introduced materials were also collected from the cultural layer. These cultural materials were typically encountered within the top 10 cm of the cultural layer or were encountered within subsurface pit features. These included chert flakes (Acc. # 27), a square head nail (Acc. # 38), an English game chip (Acc. # 80), as well as glass and ceramic fragments.

3.2.3.1 Subsurface pit features

Twenty-seven features and 17 subfeatures associated with SIHP # -7580 were recorded. All of these features and subfeatures consisted of subsurface pit features. Alphabetic feature designations were given to fire pits and other features of particular interest (Table 4). Numeric subfeature designations were assigned to post molds and to ephemeral pit features of

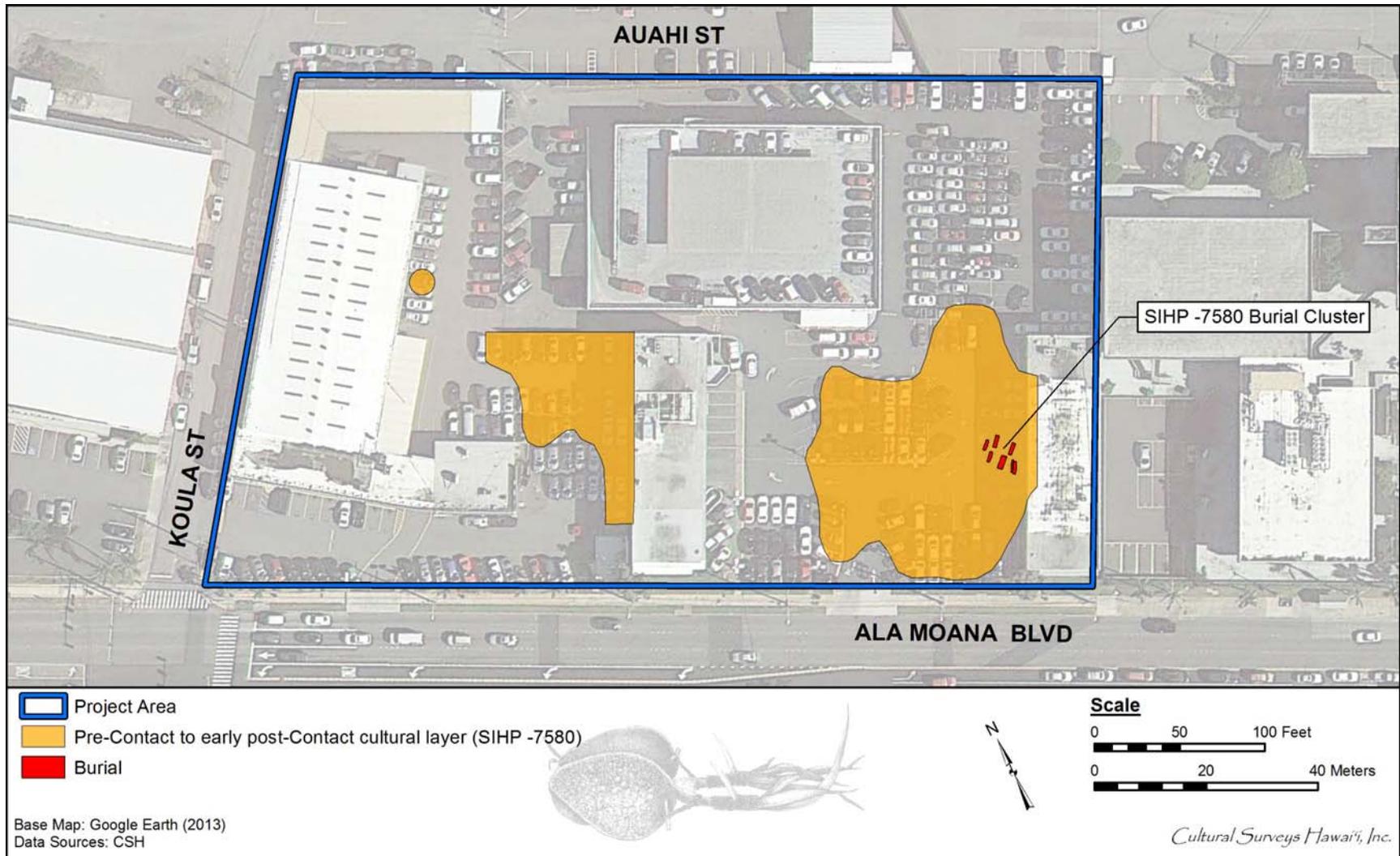


Figure 47. Distribution of SIHP # -7580 throughout the project area

Table 4. SIHP # 50-80-14-7580 Feature Table

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
A	45 cm diameter	130-160	Pit fill consists of Stratum Vb sediment.	Feature consists of a circular concentration of fishbone and charcoal observed within northeast sidewall of TE 8. No pit outline observed. Feature was observed to be isolated within Stratum Vb. The entire feature was sampled and screened (approx. 3 gallons).	Fishbone and charcoal (collected)	Refuse pit
B	120 cm long x 55+ cm wide	110-140	Mixture of Strata IV and V	Amorphous pit feature observed within the north sidewall and in plan view. Feature originates from Stratum IV and intrudes into Stratum Vb. Base of feature was lined with charred basalt cobbles.	Fire-cracked rock (basalt), marine shell midden, charcoal, and faunal bone (pig)	Fire pit
C	60 cm long by 35 cm wide	100-130	Mixture of Strata III and IVa	Oblong-shaped pit feature observed in TE 32 plan view. Feature originates from Stratum III and intrudes into Stratum IVs.	Basalt fire-cracked rock, a pig tooth, and charcoal	Food preparation
D	60 cm diameter	100-130	Mixture of Strata III and IVa	Circular pit feature observed in TE 32 plan view. Feature originates from Stratum III and intrudes into Stratum IVs.	Glass fragments (not collected)	Indeterminate (post-Contact origin)
E	80 cm long by 70 cm wide	80-110	Stratum II	Amorphous-shaped pit feature observed in the northeast sidewall of TE 38 and in plan view. Feature originated in Stratum II and intrudes into Stratum III.	Basalt fire-cracked rock, assorted marine shell midden, and charcoal	Fire pit
F	45 cm diameter	85-115	Mixture of Strata III and IVa	Circular pit feature observed in TE 39 plan view. The feature originates from Stratum III and intrudes into Stratum IVa.	Marine shell midden, charcoal, and metal fragments	Post-Contact trash pit
G	210 cm long by 50 cm wide	70-105	Mixture of Strata IV and Va	Bowl-shaped pit feature observed in TE 40A plan view and in west sidewall. The feature originates from Stratum IV and intrudes into the underlying Jaucas sand (Str. Va). The central portion of this feature has been bisected by SIHP # -7578, Feature L.	Fire-cracked rock (basalt), charcoal and marine shell midden, fish bone	Food preparation

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
H	50 cm across in profile	80-100	Stratum IV sediment	Bowl-shaped pit feature observed in west sidewall profile of TE 40C. Feature originates from Stratum IV and intrudes into Stratum Va. A 3-gallon sample was screened.	Sparse marine shell midden, <i>kukui</i> nut shell, dog tooth, fire-cracked rock (basalt), and charcoal (charcoal collected)	Food preparation
I	180 cm long by 90 cm wide	90-115	Stratum IV sediment	Amorphous-shaped pit feature observed in plan view of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va. A 10-gallon sample was collected and screened.	Marine shell midden, fire-cracked rock (basalt), burnt coral cobbles, and sparse charcoal; charcoal and marine shell midden collected	Food preparation
J	35 cm diameter	80-100	Stratum IV sediment	Circular pit feature observed in plan view. Feature originates from Stratum IV and intrudes into Stratum Va. A 4-gallon sample was collected and screened.	Sparse marine shell midden, fire-cracked rock (basalt), and charcoal (not collected)	Fire pit
K	400 cm long by 380 cm wide	80-120	Stratum IV sediment	Amorphous-shaped pit feature observed in plan view and west sidewall of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va. Sixteen gallons of sediment were collected and screened. Base of feature was lined with charred coral cobbles and pebbles.	Large concentrations of charcoal and marine shell midden; a gourd stopper (shell) and calcium carbonate crystalline cobble manuport also observed; all cultural material collected from sample area	Food preparation
L	155 cm long by 140 cm wide	80-100	Stratum IV sediment	Amorphous-shaped pit feature observed in plan view of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va. An 8-gallon sediment sample was collected and screened.	Sparse marine shell midden, charcoal, and fire-cracked rock (basalt) (not collected)	Fire pit

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
M	80 cm long by x 30 cm wide	75-110	Stratum IV sediment	Semi-circular-shaped pit feature in plan view and bowl shaped in east sidewall of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va.	Sparse charcoal and fire-cracked rock (basalt) (not collected)	Fire pit
N	170 cm long by 50 cm wide	90-110	Stratum IV sediment	Amorphous-shaped pit feature in plan view of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va.	Sparse marine shell midden and fire-cracked rock (basalt) (not collected)	Fire pit
O	320cm by 260 cm	80-95	Pit fill consists primarily of Strata IV and Va sediments.	Observed in plan view of TE 40E. Two linear features connected by three post molds, forming a 90-degree angle. An outline of a semi-circle extends from the northern edge of the feature. The pit feature originates in Stratum IV and intrudes into Stratum Va.	Charcoal observed in post molds	Indeterminate (possible outline of a surface structure)
P	40 cm diameter	75-90	Pit fill consists of Str. IV sediment	The feature is bowl shaped in north sidewall and circular in plan view of TE 40E. The pit feature originates in Stratum IV and intrudes into Stratum Va.	Marine shell midden, charcoal, and basalt fire-cracked rock	Food preparation
Q	110 cm by 100 cm	70-90	Stratum IV sediment	Amorphous pit feature observed in plan view and west sidewall of TE 40F. Feature originates within Stratum IV and intrudes into Stratum Va. A 5-gallon sample was collected and screened from the feature.	Marine shell midden, <i>kukui</i> nut shell, charcoal, and fire-cracked rock (basalt)	Food preparation
R	120 cm diameter	70-100	Stratum IV sediment	Circular pit feature observed in plan view and profile of TE 40F. Feature originates within Stratum IV and intrudes into Stratum Va. Ten gallons screened.	Charcoal, marine shell midden, and fire-cracked rock (basalt)	Fire pit

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
S	55 cm diameter	75-105	Mixture of Strata IV and Va	Circular pit feature observed in plan view of TE 40F. Feature originates within Stratum IV and intrudes into Stratum Va. Linear f5 gallons screened.	A basalt flake, dog tooth, marine shell midden, and charcoal	Food preparation
T	160(L) x 10(W)	75-85	Mixture of Strata IV and Va	Linear pit feature observed in plan view of TE 40F. Feature originates within Stratum IV and intrudes into Stratum Va.	No cultural material was observed.	Indeterminate (possible outline of a surface structure)
U	120 cm by 110 cm	75-90	Stratum IV sediment	Amorphous pit feature observed in plan view of TE 40F. Ten gallons were screened.	Glass fragments, sparse charcoal, fire-cracked rock (basalt), slag, and marine shell midden (not collected)	Historic fire pit
V	60 cm diameter	80-100	Stratum IV sediment	Circular pit feature observed in plan view of TE 40G. Feature originates from Stratum IV and intrudes into Stratum Va. A 5-gallon sample was collected and screened.	Marine shell midden, fish bone, and charcoal; all cultural material collected	Food preparation
W	50 cm long by 40 cm wide	80-105	Stratum IV sediment	Oblong pit feature observed in plan view of TE 40G. Feature originates from Stratum IV and intrudes into Stratum Va. A 5-gallon sample was collected and screened.	Marine shell midden, fish bone, and charcoal; all cultural material collected	Food preparation
X	120 cm long by 70 cm wide	80-100	Stratum IV sediment	Oblong pit feature observed in plan view and east profile of TE 40G. Feature originates from Stratum IV and intrudes into Stratum Va. A 10-gallon sample was collected and screened.	Sparse charcoal, shell midden, and fire-cracked rock (basalt) observed but not collected	Fire pit
Y	270 cm long by 120 cm wide	80-115	Stratum IV sediment	Circular pit feature observed in plan view and west profile of TE 40G. Feature originates from Stratum IV and intrudes into Stratum Va. A 20-gallon sample was collected and screened.	Charcoal, metal, glass fragments, fire-cracked rock (basalt), and sparse marine shell observed but not collected	Fire pit

Feature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
Z	90 cm diameter	80-125	Stratum IV sediment	Circular pit feature observed in plan view and east sidewall of TE 40G. Feature originates from Stratum IV and intrudes into Stratum Va. Five gallons of sediment were collected and screened.	Sparse charcoal, shell midden, and fire-cracked rock (basalt) observed but not collected	Fire pit
AA	85 cm diameter	85-115	Stratum IV sediment	Circular pit feature observed in plan view and north sidewall of TE 47. Feature originates from Stratum IV and intrudes into Stratum Va. Ten gallons of sediment were collected and screened.	Moderate charcoal, fire-cracked rock (basalt), and sparse marine shell observed, but not collected	Fire pit

Table 5. SIHP # 50-80-14-7580 Subfeature Table

Subfeature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
1	20 cm diameter	120-160	Mixture of Strata IV and V	Circular pit feature observed in excavation plan view. Feature originates in Stratum IV and intrudes into Stratum V.	None observed	Post mold
2	20 cm diameter	120-140	Mixture of Strata IV and V	Circular pit feature observed in excavation plan view. Feature originates in Stratum IV and intrudes into Stratum V.	None observed	Post mold
3	20 cm diameter	120-130	Mixture of Strata IV and V	Circular pit feature observed in excavation plan view. Feature originates in Stratum IV and intrudes into Stratum V.	None observed	Post mold
4	25 cm diameter	115-150	Mixture of Strata IV and V	Circular pit feature observed in excavation plan view. Feature originates in Stratum IV and intrudes into Stratum V.	None observed	Post mold
5	55 cm diameter	80-110	Stratum II	Circular shaped pit feature observed in TE 38 plan view. Feature originated in Stratum II and intrudes into Stratum III.	Sparse marine shell midden and charcoal	Indeterminate
6	50 cm long	80-100	Stratum II	Rectangular pit feature observed in the northeast sidewall of TE 38 and in plan view. Feature originated in Stratum II and intrudes into Stratum III.	Sparse marine shell midden and charcoal	Indeterminate
7	20 cm diameter	85-110	Mixture of Strata III and IVa	Circular pit feature observed in TE 39 plan view. The feature originates from Stratum III and intrudes into Stratum IVa.	Sparse marine shell midden	Indeterminate (possible natural undulation of the cultural layer)
8	160 cm long by 15 cm wide	90-115	Stratum IV sediment	Linear pit feature observed in plan view and SE profile of TE 40B. Feature originates from Stratum IV and intrudes into Stratum Va. The entire feature was sampled and screened (approx. 3 gallons).	Sparse marine shell midden and charcoal (not collected)	Indeterminate (possible natural undulation of the cultural layer)

Subfeature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
9	15 cm diameter	85-100	Stratum IV sediment	Circular pit feature observed within the plan view of TE 40B. Feature originates from base of Str. IV and intrudes into Str. Va. The entire feature was sampled.	None observed	Indeterminate (possible natural undulation of the cultural layer)
10	240 cm long by 160 cm wide	80-115	Stratum IV sediment	Amorphous-shaped feature in plan view, and bowl-shaped in SE and NW profile walls of TE 40B. Feature originates from Stratum IV and intrudes into Stratum Va. A 19-gallon sample was screened.	Sparse charcoal, marine shell midden, and fire-cracked rock (basalt) (not collected)	Indeterminate (possible natural undulation of the cultural layer)
11	35 cm long	90-115	Stratum IV sediment	Square-shaped feature in NW profile of TE 40B. Feature originates from Stratum IV and intrudes into Stratum Va. A 4-gallon sample was screened.	Charcoal and marine shell midden (collected), fire-cracked rock (basalt) (not collected)	Indeterminate
12	80 cm diameter	105-120	Stratum IV sediment	Circular-shaped pit feature observed in east profile of TE 40C and in plan view. Feature originates at base of Str. IV and intrudes into Str. Va. A 5-gallon sample was screened.	Sparse marine shell midden, and charcoal flecking (not collected)	Indeterminate (possible natural undulation of the cultural layer)
13	45 cm diameter	85-95	Stratum IV sediment	Circular-shaped pit feature observed in plan view of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va. A 3-gallon sediment sample was collected and screened.	None observed	Post mold
14	20 cm diameter	90-100	Stratum IV sediment	Circular pit feature observed in plan view of TE 40D. Feature originates from Stratum IV and intrudes into Stratum Va. A 1-gallon sediment sample was collected and screened.	None observed	Post mold

Subfeature	Horizontal Extent	Vertical Extent (cmbs)	Pit Fill	Description	Cultural Material	Function
15	20 cm diameter	80-90	Stratum IV sediment	Circular pit feature observed in plan view of TE 40D. Feature originates from base of Str. IV and intrudes into Stratum. Va. Entire feature was screened (approx. 1 gallon).	None observed	Post mold
16	10 cm by 10 cm	80-90	Stratum IV sediment	Square-shaped pit feature observed in plan view. Feature originates at base of Str. IV and intrudes into Str. Va. Entire feature was screened (approx. 1.5 gallons).	None observed	Post mold
17	20 cm wide by 60 cm deep in profile	85-145	Strata IV and V sediment	Narrow linear pit feature observed in east profile of TE 40G. Feature originates from Stratum IV and intrudes into Stratum Vb.	None observed	Post mold

indeterminate function that may represent natural undulations of the cultural layer (Table 5 and Figure 48).

Approximately 78% (21) of the identified pit features within the “feature” category consisted of traditional Hawaiian fire pits, with 48% (10) of these determined to have been utilized for food production. The size and shape of these fire pits vary considerably with the largest (Feature K) measuring 400 cm long by 380 cm wide and 40 cm deep, and the smallest (Feature J) having a 35 cm diameter and 20 cm depth.

The remaining pit features within the “feature” category consist of a traditional Hawaiian refuse pit (Feature A), a historic fire pit (Feature U), and four pit features of indeterminate function. Two of these indeterminate features (Features D and F) contained either glass or metal fragments, and are thus of post-Contact origin. The remaining two indeterminate features (Features O and T) consist of linear outlines imprinted into the sterile marine sand, and may correspond to the outlines of surface structures once erected atop the now buried A horizon cultural layer (SIHP # -7580).

Approximately 53% (9) of the identified subfeatures consisted of post molds. All of the post molds originated at the SIHP # -7580 cultural layer and were excavated into the underlying naturally deposited sediments. The average diameter of the post molds was 20 cm. None of the post molds assigned as subfeatures contained cultural material.

Approximately 47% (8) of the identified subfeatures were of indeterminate function. These pit features did not have any definitive shape, and contained sparse cultural material that was consistent with the general distribution of cultural material throughout the cultural layer (SIHP # -7580). Thus an exact function could not be assigned to these subfeatures. It is possible these subfeatures represent natural undulations within the cultural layer.

Pit features associated with SIHP # -7580 of particular interest include Features A, K, and O.

SIHP # -7580, Feature A consists of a fishbone and charcoal concentration observed within naturally deposited marine clay. This feature is of interest because it was present below the cultural layer and thus appears to have been created prior to the formation of the cultural layer

The feature was observed within the northwest sidewall of TE 8. The feature was circular in shape, with a 45 cm diameter in profile and present from 130 to 160 cm below the existing surface. No pit outline was observed, further suggesting the feature may be of some antiquity. The fishbone and charcoal was collected from the feature for analysis (see Section 5 Results of Laboratory Analysis below). While not stratigraphically associated with the SIHP # -7580 cultural layer, the cultural material present within the feature warranted its inclusion as a feature component of SIHP # -7580.

SIHP # -7580, Feature K consists of a large fire pit utilized for food production. It was observed within TE 40D and TE 40F (Figure 49). The pit feature originated at the cultural layer and was excavated into the underlying marine sand. The feature had a horizontal extent of 400 cm long by 380 cm wide, and was 80 to 120 cm below the existing surface. The base of the feature was lined with charred coral cobbles and pebbles, with concentrations of large chunks of charcoal atop them. A large quantity of marine shell midden and charcoal was observed during sampling of the feature. Also present was fire-cracked rock (basalt), burnt coral cobbles, a gourd stopper (shell) (Acc. # 40), and a calcium carbonate crystalline cobble manuport (Acc. # 63) (see



Figure 48. Representative photographs of SIHP # -7580, Features (top) and Subfeatures (bottom)

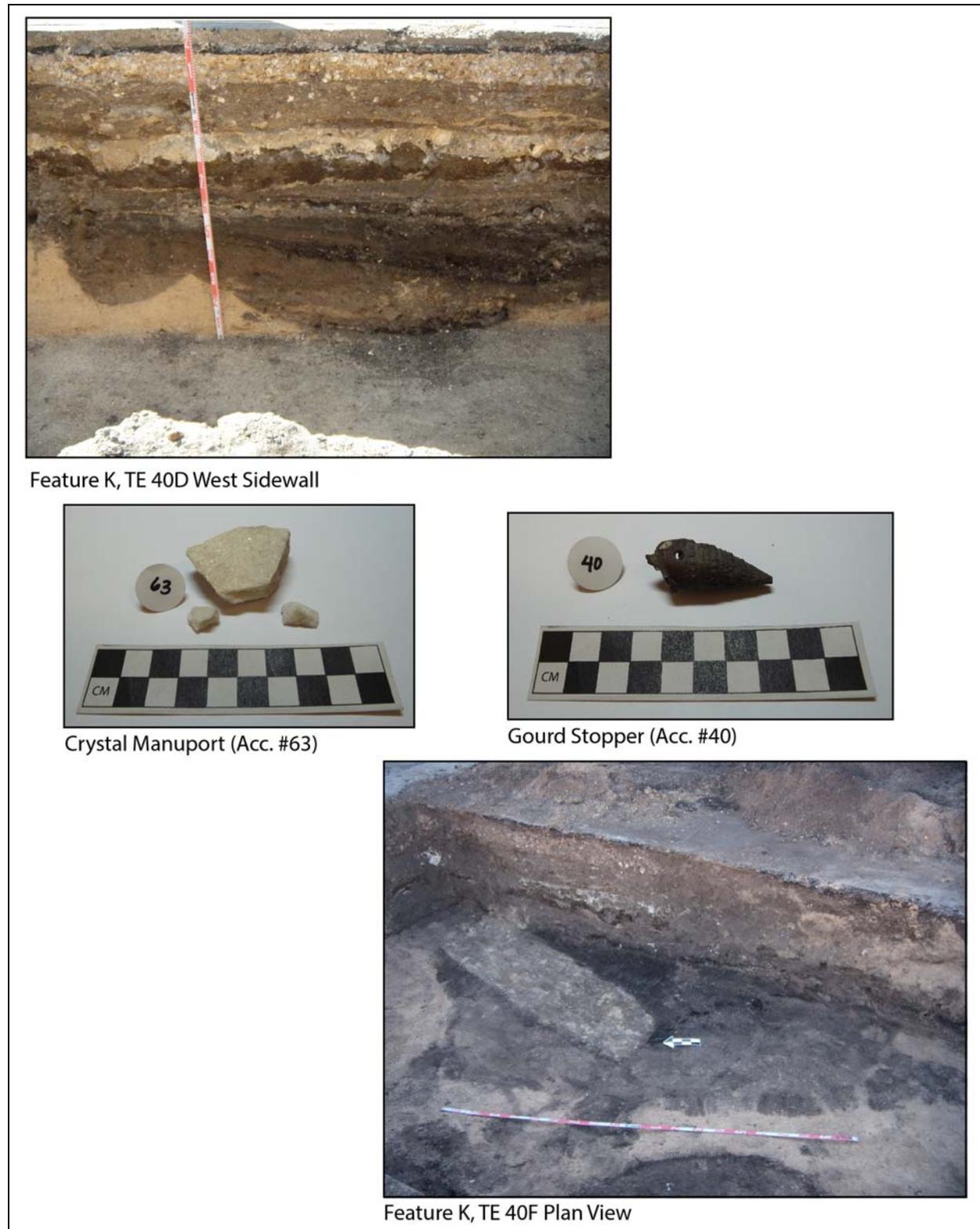


Figure 49. SIHP # -7580, Feature K photo collage

Section 5 Results of Laboratory Analysis below). This feature is of interest due to its large size, high volume of midden, presence of artifacts, and construction style (base of the feature is lined with coral cobbles and pebbles). All of these factors are suggestive of a feature that may have been utilized as a reusable *imu* and/or was a component of a cooking house. Both of which indicate a potential of more formal permanent habitation at this site as opposed to more transient habitation associated with a small fishing camp.

SIHP #-7580, Feature O was observed in TE 40E. It consisted of two linear features connected by four post molds, forming a 90-degree angle (Figure 50). An outline of a semi-circle extends from the northern edge of the feature. The entire feature, the 90-degree angle and semi-circle, measure approximately 320 cm by 260 cm, and were observed from 80 to 95 cm below the existing surface. The four post molds associated with this feature have an average diameter of 20 cm, and were observed from 80 to 110 cm below the existing surface. No cultural material was present within SIHP # -7580 Feature O with the exception of charcoal collected at the base of the northernmost post mold. The size and shape of this feature, along with the presence of multiple associated post molds suggests SIHP # -7580, Feature O may be the outline of a surface structure. The function of this structure remains unknown.

3.2.3.2 Burials

SIHP # -7580 includes eight human burials (Burial Find #s 1–8). These burials consist of a cluster of early post-Contact coffin burials located within the southern corner of the project area (Figure 52 and Figure 52). The burial pits of these burials originate within the SIHP # -7580 cultural layer and extend into the underlying marine sand and clay.

Table 6 provides a summary of each of the burial finds. Detailed discussions and maps for each burial find are provided within Section 4.2.2 Test Excavation Documentation above.



Feature O, view to east



Feature O, view to south

Figure 50. SIHP # -7580, Feature O, plan view photos from TE 40E

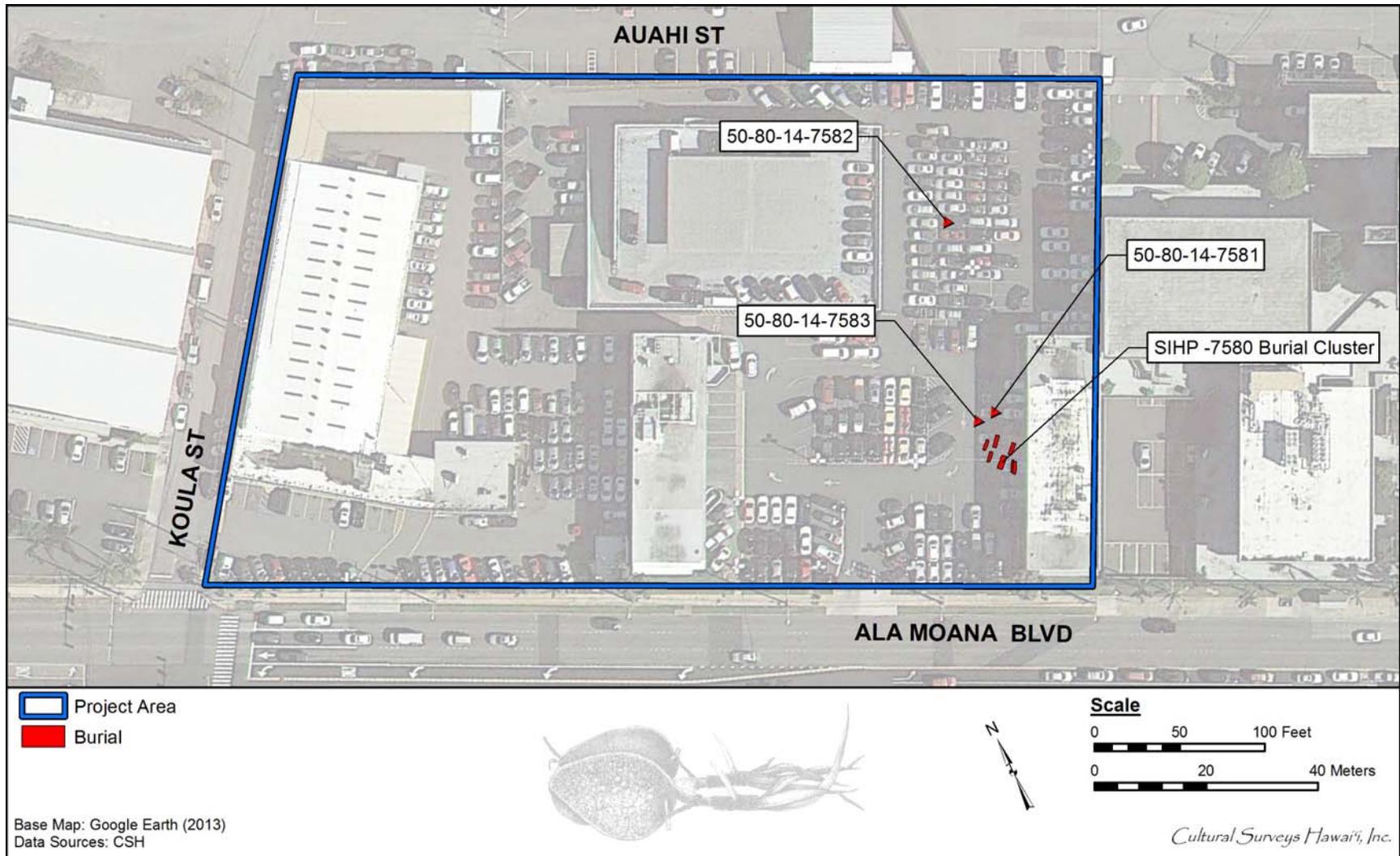


Figure 51. Locations of burial finds within the project area

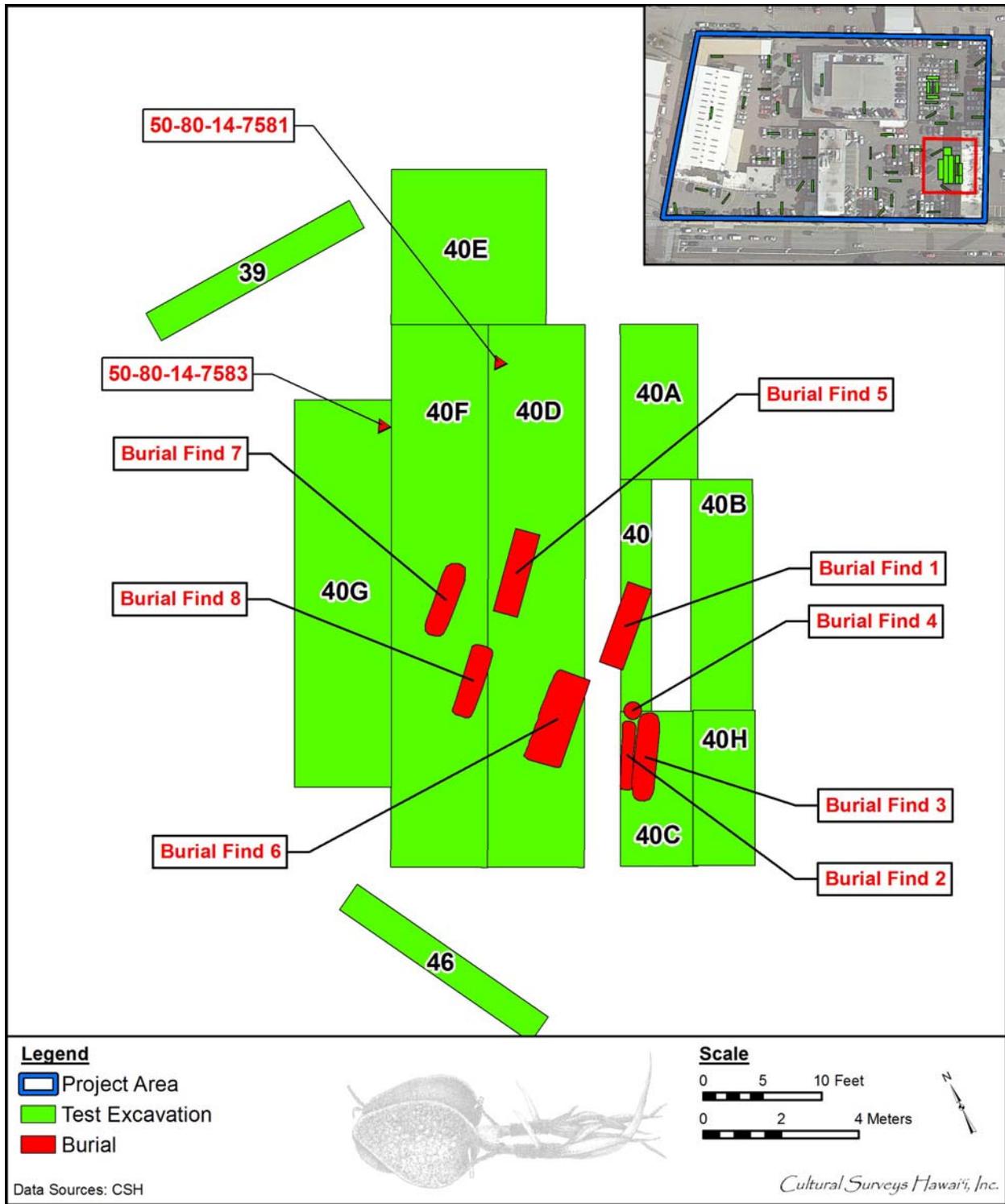


Figure 52. Location of SIHP # -7580 Burial Find #s 1-8

Table 6. SIHP # 50-80-14-7580 Burial Finds

Burial Find #	Test Excavation	Depth	Stratigraphic Provenience	Burial Style	Interpreted Age
1	40	Burial pit from 70-160 cmbs Burial at 135 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand.	Intact coffin burial, adult; rectangular burial pit with tight corners; extended supine position; feet oriented <i>makai</i> (SW); skeletal remains observed atop coral shelf	Post-Contact
2	40C	Burial pit at 80 cmbs Burial at 120 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand.	Intact coffin burial, juvenile; rectangular burial pit; extended supine position; feet oriented <i>makai</i> (SW); skeletal remains observed within Jaucas sand	Post-Contact
3	40C	Burial pit at 80 cmbs Burial at 120 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand.	Intact coffin burial, adult; rectangular burial pit; extended supine position; head oriented <i>makai</i> (SW); coffin outline and decomposing metal hardware observed; skeletal remains observed within Jaucas sand	Post-Contact
4	40C	Burial at 110 cmbs	Burial is directly below an early twentieth century sewer line and extends into an unexcavated sidewall. Burial pit is difficult to discern.	Partial skull, fragmented by utility disturbance; based on stratigraphic provenience with Burial Finds 3 and 4, it is believed Burial Find 5 is also a coffin burial that remains relatively intact beneath an abandoned utility line	Post-Contact
5	40D	Burial pit from 65-150 cmbs Burial at 140 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand and clay.	Intact coffin burial, adult; rectangular burial pit with tight corners; extended supine position; head oriented <i>mauka</i> (NE); deteriorating coffin wood observed; bone button observed in pit fill; skeletal remains observed within marine clay	Post-Contact

Burial Find #	Test Excavation	Depth	Stratigraphic Provenience	Burial Style	Interpreted Age
6	40D	Burial pit from 75-140 cmbs Burial at 120 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand and clay.	Intact coffin burial, adult; top of burial pit delineated with a rectangular mound constructed of coral boulders and cobbles; large square-cut coral block inset into the ground and marks/delineates the top SW edge of burial; rectangular burial pit with tight corners; extended supine position; head oriented <i>makai</i> (SW); coffin outline observed; skeletal remains observed within marine clay	Post-Contact
7	40F	Burial pit from 70-150 cmbs Burial at 150 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand and clay.	Intact coffin burial, adult; rectangular burial pit, 210 cm (L) x 60 cm (W); extended supine position; feet oriented <i>mauka</i> (NE); coffin outline and metal nails observed; skeletal remains observed within marine clay	Post-Contact
8	40F	Burial pit from 80-140 cmbs Burial at 140 cmbs	Burial pit originates within SIHP # -7580 cultural layer and extends into underlying marine sand and clay.	Intact coffin burial, adult; rectangular burial pit, 200 cm (L) x 55 cm (W); extended supine position; feet oriented <i>mauka</i> (NE); coffin outline observed; skeletal remains observed within marine clay	Post-Contact

3.2.4 SIHP # 50-80-14-7581

TEMPORARY #	CSH 4
FORMAL TYPE:	Traditional Hawaiian bundle burial
FUNCTION:	Burial
# OF FEATURES:	N/A
AGE:	Pre-Contact
DIMENSIONS:	N/A

DESCRIPTION: SIHP # -7581 consists of a traditional Hawaiian bundle burial located within the southern corner of the project area, and just northeast of the SIHP # -7580 historic coffin burial cluster (see Figure 52). The burial was discovered during the excavation of TE 40D.

SHIP # -7581 consists of an intact bundle burial. The burial pit was very subtle and not visible in profile, only in plan view. The burial pit originates from culturally sterile Jaucas sand and extends into marine clay (Figure 53). The burial pit is circular in shape, measures approximately 50 cm in diameter, and was observed from 135 to 160 cm below the existing surface. Pit fill consisted of a mixture of the sterile marine sand and clay.

Observed skeletal elements comprising SIHP # -7581 included long bones (femur, tibia, humerus, etc.) and ribs (see Figure 53). It is believed that all other skeletal elements (cranium, vertebrae, phalanges, etc.) are present beneath the meticulously stacked and sorted long bones. Human skeletal remains were encountered at 140 cm below the existing surface.

SIHP # -7581 comprises the complete skeletal remains of an adult individual. The burial is believed to be of pre-Contact origin based on its burial style (bundle burial) and its stratigraphic provenience. SHIP # -7581 is believed to be of some antiquity as its origin appears to pre-date the formation of SIHP # -7580, a pre- to post-Contact cultural layer (i.e., the SIHP # -7581 burial pit originates below the cultural layer within culturally sterile marine sand). Ethnicity is presumed to be probable Hawaiian based on its geographic and archaeological context.

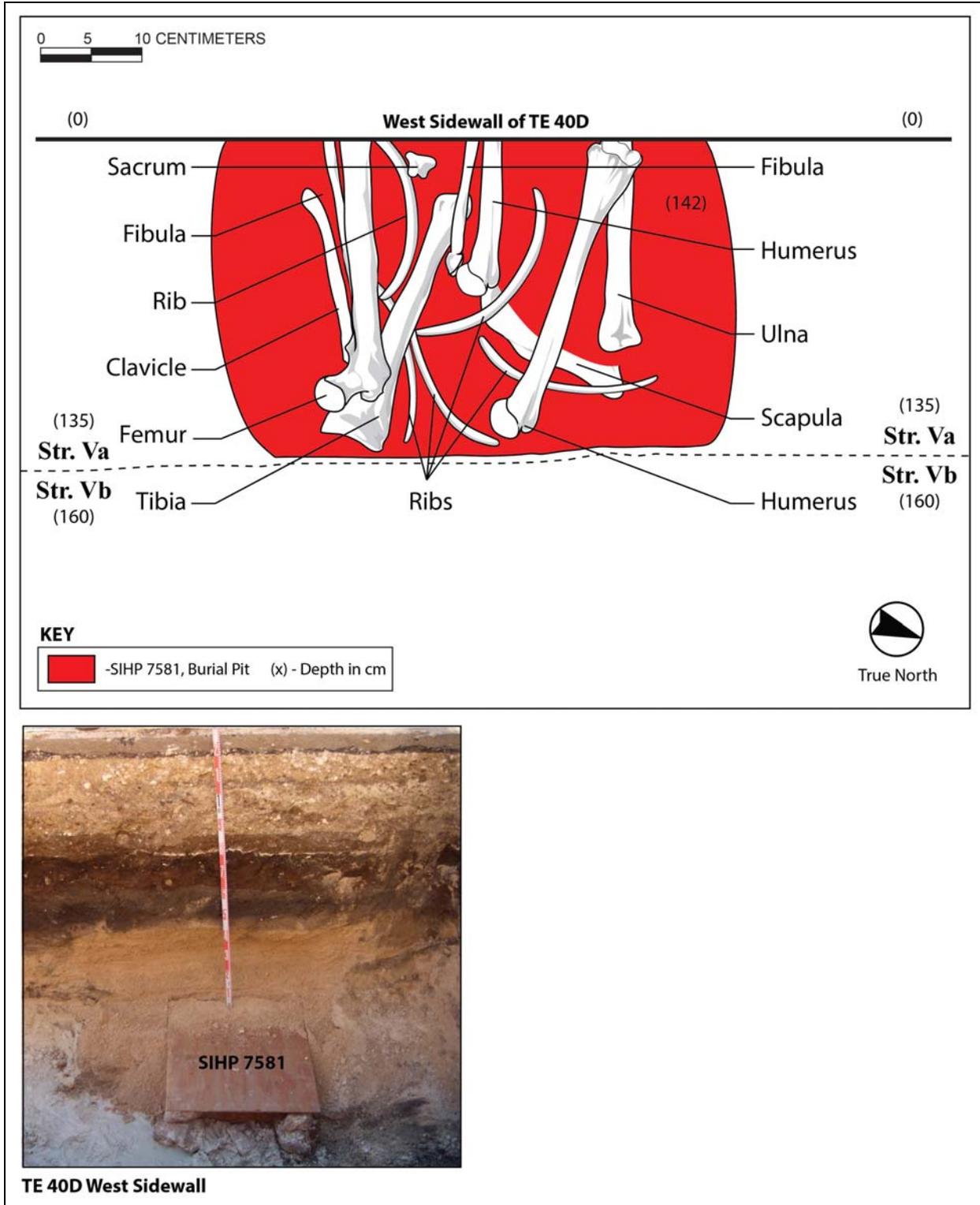


Figure 53. Plan view of SIHP # -7581 (top) and photo of burial location (bottom)

3.2.5 SIHP # 50-80-14-7582

TEMPORARY #	CSH 5A
FORMAL TYPE:	Human skeletal remains
FUNCTION:	Isolated find location
# OF FEATURES:	N/A
AGE:	Indeterminate
DIMENSIONS:	N/A

DESCRIPTION: SIHP # -7582 consists of disarticulated human skeletal remains identified within a non-burial context. The remains consist of a single adult molar and a possible cranial fragment located within the northeastern corner of the project area during the excavation of TE 25 (see Figure 51).

SIHP # -7582 was identified during documentation of a horse burial (SIHP # -7578, Feature G) associated with SIHP # -7578, an early to mid-twentieth century cultural layer developed within and atop imported fill sediment. Investigation of the horse burial (SIHP # -7578, Feature G) revealed that the human remains (SIHP # -7582) were limited to the pit fill of the horse burial. It was determined the human remains were associated with imported historic land reclamation fill; and the human remains were within a tertiary burial context, being disturbed during removal and transport of fill sediment and being disturbed again during the interment of the horse. Age and ethnicity could not be determined due to the absence of primary burial context and the fragmented nature of the remains.

3.2.6 SIHP # 50-80-14-7583

TEMPORARY #	CSH 5B
FORMAL TYPE:	Human skeletal remains
FUNCTION:	Isolated find location
# OF FEATURES:	N/A
AGE:	Indeterminate
DIMENSIONS:	N/A

DESCRIPTION: SIHP # -7583 consists of disarticulated human skeletal remains identified within a non-burial context. The remains consist of a partial adult human mandible located within the southern corner of the project area, just north of the SIHP # -7580 burial cluster (see Figure 51 and Figure 52). SIHP # -7583 was identified during the excavation of TE 40G.

SIHP # -7583 was discovered within an imported fill deposit associated with nineteenth century land use within the project area (SIHP # -7579). The human remains (SIHP # -7583) were determined to be isolated and are believed to have been imported from some other off-site location. Age and ethnicity could not be determined due to the absence of primary burial context and the fragmented nature of the remains.

Section 4 Archaeological Monitoring Provisions

In consultation with SHPD, it was determined that an archeological monitoring program was warranted as a historic preservation mitigation measure for the proposed project. This is based on the results of the AIS of the project area (Tulchin et al. 2014b) which identified the presence of six subsurface historic properties: 1) SIHP # 50-80-14-7578, an early to mid-twentieth century cultural layer; 2) SIHP # 50-80-14-7579, an early twentieth century cultural layer; 3) SIHP # 50-80-14-7580, pre-Contact to post-Contact cultural layer with a historic burial cluster; 4) SIHP # 50-80-14-7581, a pre-Contact traditional Hawaiian bundle burial; 5) SIHP # 50-80-14-7582, disarticulated human skeletal remains within a non-burial context; and 6) SIHP # 50-80-14-7583, disarticulated human skeletal remains within a non-burial context.

A monitoring program involving on-site monitoring will be undertaken to document buried historic properties (non-burial and burial) and the local stratigraphy. Based on the results of the AIS, an on-site monitor be present during all excavations extending more than 30 cm below the surface. Any change in the monitoring program only will occur with written concurrence from SHPD.

Under Hawai'i State historic preservation legislation, "Archaeological monitoring may be an identification, mitigation, or post-mitigation contingency measure. Monitoring shall entail the archaeological observation of, and possible intervention with, on-going activities which may adversely affect historic properties" (HAR Chapter 13-279-3). For this project, the proposed monitoring program will serve as a mitigation measure that ensures proper documentation of all historic properties encountered during construction work.

Hawai'i State historic preservation legislation governing archeological monitoring programs requires that each monitoring plan discuss eight specific items (HAR Chapter 13-279-4). The monitoring provisions below address those eight requirements in terms of the archaeological monitoring for the construction within the project area.

1. Anticipated Historic Properties:

The project area has a potential for pre-Contact and post-Contact cultural deposits as well as human burials.

2. Locations of Historic Properties:

Historic properties may be encountered anywhere within the project area.

3. Fieldwork:

On-site archaeological monitoring is will occur for all ground disturbing activities 30 cm below the existing ground surface. Any departure from this will only follow consultation with, and written concurrence from, SHPD.

The monitoring fieldwork will involve documentation of all subsurface archaeological deposits (e.g, trash pits and structural remnants) encountered during construction and will employ current standard archaeological recording techniques. This will include drawing and recording the stratigraphy of excavation profiles where cultural features

or artifacts are exposed as well as representative profiles. These exposures will be photographed, located on project area maps, and sampled. Photographs and representative profiles of excavations will be taken even if no historically-significant sites are documented. Sampling will include the collection of representative artifacts, and bulk sediment samples, and/or the on-site screening of cultural layers measured volumes of feature fill to determine feature contents.

In the event of inadvertent discovery of non-burial sites, SHPD shall be consulted concerning appropriate mitigation measures, pursuant to HAR §13-280-3. If any human remains are encountered, no further work will take place, including no screening of back dirt, no cleaning and/or excavation of the burial area, and no exploratory work of any kind unless specifically requested by SHPD. All inadvertent discoveries of human skeletal remains will be handled in accordance with HAR §13-300-40 and with SHPD directives.

4. Archaeologist's Role:

The on-site archaeologist will have the authority to stop work immediately in the area of any findings so that documentation can proceed and appropriate treatment can be determined. In addition, the archaeologist will have the authority to slow and/or suspend construction activities in order to ensure that the necessary archaeological sampling and recording can take place.

5. Coordination Meeting:

Before work commences on the project, the on-site archaeologist shall hold a coordination meeting to orient the construction crew to the requirements of the archaeological monitoring program. At this meeting the monitor will emphasize his or her authority to temporarily halt construction and that all historic finds, including objects such as bottles, are the property of the landowner and may not be removed from the construction site. At this time it will be made clear that the archaeologist must be on site during subsurface excavations, if warranted.

6. Laboratory work:

Laboratory analysis of non-burial related finds will include standard artifact and midden recording. Artifact documentation will provide provenience, weight, length, width, type of material, and presumed function. Bone and shell midden materials will be sorted to the species level, when possible, and will be presented in a table by provenience.

7. Report Preparation:

The primary objective of the report will be to document subsurface historic properties (non-burial and burial) and local stratigraphy of the project area. The report will contain sections on monitoring methods, stratigraphy, archaeological findings and results of laboratory analyses. The report will address the requirements of a monitoring report (HAR§ 13-279-5). Photographs of excavations will be included in the monitoring report even if no historically-significant sites are documented. Should burial treatment be completed as part of the monitoring effort, a summary of this

treatment will be included in the monitoring report. Should burials and/or human remains be identified, then other letters, memos, and/or reports may be requested by SHPD.

8. Archiving Materials:

All burial materials will be addressed as per SHPD directives. Materials not associated with burials will be temporarily stored at the contracted archaeologist's facilities until an appropriate curation facility is selected in compliance with HRS Chapter 6E-3, HAR Chapter 13-279, and in consultation with the landowner and SHPD.

4.1 Research Objectives

The research focus of this monitoring program would be to better define the horizontal extent, nature, function, and temporal association of the six historic properties identified during the archaeological inventory survey (Tulchin et al. 2014b).

Section 5 References Cited

Andrews, Lorrin

2003 *A Dictionary of the Hawaiian Language*. Island Heritage Publishing, Waipahu, Hawai'i.

Arnold, Harry L.

1956 Hawaii Medical Association, 1856-1956. *Hawaii Medical Journal* 15(4):313-324.

Armstrong, Warwick, editor

1983 *Atlas of Hawai'i*. University of Hawai'i Press, Honolulu.

Athens, Stephen J.

1986 *Archaeological Monitoring at the Judiciary Parking Garage, Honolulu, Hawai'i (TMK 2-1-30:003, 004, 038, 039, 041, 043; State Site 80-14-3984)*. International Archaeological Research Institute, Inc., Honolulu.

Athens, Stephen J. and Jerome V. Ward

1991 *Paleoenvironmental and Archaeological Investigations, Kawainui Marsh Flood Control Project, O'ahu Island, Hawai'i*. Micronesian Archaeological Research Services, Guam.

Avery, Serge and Joseph Kennedy

1993 *Archaeological Report Concerning the Inadvertent Discovery of Human Remains at the South Street Building Complex TMK: 2-1-31:20, Honolulu Ahupua'a, Kona District, Island of Oahu*. Archaeological Consultants of Hawai'i, Inc., Hale'iwa, Hawai'i.

Beckwith, Martha

1940 *Hawaiian Mythology*. Yale University Press, New Haven, Connecticut.

Bingham, Hiram

1847 *A Residence of Twenty-one Years in the Sandwich Islands*. Huntington Publishing, Hartford, Connecticut.

Bishop, S.E.

1884 Map of Honolulu, Kewalo Section. Registered Map 1090. Archived at Hawai'i Land Survey Division, Department of Accounting and General Services, 1151 Punchbowl Street, Room 210, Honolulu.

Boelen, Jacobus

1988 *A Merchant's Perspective: Captain Jacobus Boelen's Narrative of his Visit to Hawai'i in 1828*. Hawaiian Historical Society, Honolulu.

Bordner, Richard

1990 *The Change in Church and Community in Honolulu: Kawaiahao Church Field Research*. Chaminade University Archaeology Club. Available at State Historic Preservation Division Library, Kapolei, Hawai'i.

Borget, August

1838 "Honolulu Salt Pan, near Kaka'ako" [sketch]. Original at Peabody Essex Museum, Salem, Massachusetts. In *Hawai'i Looking Back: An Illustrated history of the Islands* by Glen Grant, 2000, Mutual Publishing, Honolulu.

Castle, William R., Jr.

1917 *Hawaii Past and Present*. Dodd, Mead, and Company, New York.

Clark, Stephen D.

1987 *Archaeological Monitoring of the Makai Parking Garage, Corner of Punchbowl and Halekauwila Streets (TMK 2-1-31:23), Honolulu, O'ahu, State of Hawai'i*. Bernice Pauahi Bishop Museum, Honolulu.

Cook, James P.

1784 *A Voyage to the Pacific Ocean . . . the Northern Hemisphere . . . Performed Under the Direction of Captains Cook, Clerke, and Gore, in . . . the Resolution and Discovery . . . in the years 1776, 1777, 1779, and 1780*. Vols. 2 and 3. G. Nichol & T. Cadell, London.

Covington, R.

1881 Hawaiian Government Survey map. Registered Map 1381. Available at the Department of Accounting and General Services, Land Survey Division, 1151 Punchbowl Street, Room 210, Honolulu.

Dale, John B.

1845 "Native Church, Oahu, from the Old Salt Pans" [sketch]. J. Welles Henderson Collection. In *Encounters with Paradise: Views of Hawaii and its People 1778-1941* by David Forbes, 1992, Honolulu Academy of Arts, Honolulu.

Davis, Bertell D.

1989 *Subsurface Archeological Reconnaissance Survey and Historical Research at Fort DeRussy, Waikiki, Island of O'ahu, Hawai'i*. International Archaeological Research Institute, Inc., Honolulu.

Daws, Gavan

1984 *Holy Man: Father Damien of Molokai*. University of Hawai'i Press, Honolulu.

Dean, Love

1991 *The Lighthouses of Hawai'i*. University of Hawai'i Press, Honolulu.

Douglas, Michele Toomay

1991a *Report on a Single Human Skeleton Recovered from Mother Waldron Park, Kaka'ako, O'ahu, Hawai'i, Honolulu, Hawai'i*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

1991b *Report on Six Human Skeletons from Coral Street and Queen Street, Kaka'ako, O'ahu, Honolulu, Hawai'i*. Available at State Historic Preservation Division, Kapolei, Hawai'i.

Dukas, Neil Bernard

2004 *A Military History of Sovereign Hawai'i*. Mutual Publishing, Honolulu.

Dye, Tom and J. Stephen Athens

2000 Part A: Introduction. In *Ancient Hawaiian Fishponds of Pearl Harbor: Archaeological Studies on U.S. Navy Lands, Hawai'i*. J. Stephen Athens, editor. International Archaeological Research Institute, Inc., Honolulu.

Ellis, William

1827 *Narrative of a Tour through Hawaii, or Owhyhee; With Observations on the Natural History of the Sandwich Islands, and Remarks on the Manners, Customs, Traditions, History, and Language of their Inhabitants*. Printed for B.J. Holdsworth, London.

Emmert, Paul

1850 Sketch of Honolulu. Original at Hawaiian Historical Society, Honolulu.

Emory, Kenneth P., William J. Bonk, and Yoshihiko H. Sinoto

1968 *Fishhooks*. Bishop Museum Special Publication 47. Bishop Museum Press, Honolulu.

Fitzpatrick, Gary

1986 *The Early Mapping of Hawai'i*. Editions Limited, Honolulu.

Fletcher, Charles H. III and Anthony T. Jones

1996 Sea-level highstand recorded in Holocene shoreline deposits on O'ahu, Hawaii. *Journal of Sedimentary Research* 66(3):632-641.

Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens

1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. U.S. Department of Agriculture, Soil Conservation Service, Government Printing Office, Washington, D.C.

Forbes, David

1992 *Encounters with Paradise: Views of Hawaii and its People 1778-1941*. Honolulu Academy of Arts, Honolulu.

Gessler, Clifford

1938 *Hawaii: Isles of Enchantment*. Appleton-Century, New York.

Gilman, Gorman D.

1904 Streets of Honolulu in the Early Forties. *Hawaiian Almanac and Annual for 1904*. Thomas G. Thrum, editor. Thos. G. Thrum, Honolulu.

Google Earth

2013 Aerial photographs of Hawai'i. Google Inc., 1600 Amphitheatre Parkway, Mountain View, California. Available online at www.google.com/earth.html.

Grant, Glen

2000 *Hawai'i Looking Back. An Illustrated History of the Islands*. Mutual Publishing, Honolulu.

Griffin, P. Bion, D.T.P. Keene, and Joseph Kennedy

1987 *Kaka'ako: Prediction of Sub-Surface Archaeological Resources, Kaka'ako Community Development District, Archaeological Reconnaissance Survey*. University of Hawai'i at Mānoa, Honolulu.

Grossman, E.E. and C.H. Fletcher

1998 Sea level higher than present 3500 years ago on the northern main Hawaiian Islands. *Geology* 26(4):363-366.

Grossman, E.E., C.H. Fletcher, and B.M. Richmond

1998 The Holocene sea-level highstand in the equatorial Pacific: analysis of the insular paleosea-level database. *Coral Reefs* 17: 309-327.

Hammatt, Hallett H.

2013 *Final. Archaeological Inventory Survey Report for the City Center (Section 4) of the Honolulu High-Capacity Transit Corridor Project, Kalihi, Kapālama, Honolulu, and Waikīkī Ahupua'a, Honolulu (Kona) District, Island of O'ahu, TMK [1] 1-2, 1-5, 1-7, 2-1, 2-3 (Various Plats and Parcels). Volume V: Lab Results.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H. and Rodney Chiogioji

1998 *An Archaeological Assessment of the Mother Waldron Playground/Former Pohukaina School Parcel (6.8 Acres), in the Kaka'ako District of Honolulu, Island of O'ahu.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H. and Michael Pfeffer

1993 *Archaeological Inventory Survey at the Brewery Site: Honolulu, O'ahu (TMK 2-1-31:21).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Handy, E.S. Craighill and Elizabeth G. Handy

1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment.* Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.

Hanley, Sister Mary Laurence and O.A. Bushnell

1980 *A Song of Pilgrimage and Exile: the Life and Spirit of Mother Marianne of Molokai.* Franciscan Herald Press, Chicago.

Harney, J.N., E.E. Grossman, B.M. Richmond, and C.H. Fletcher III

2000 Age and composition of carbonate shoreface sediments, Kailua Bay, Hawaii. *Coral Reefs* 19:141-154.

Hawaii Board of Health

1902 *Report of the President of the Board of Health of the Territory of Hawaii.* Bulletin Publishing Company, Honolulu.

1903 *Annual Report of the Board of Health of the Territory of Hawaii.* Bulletin Publishing Company, Honolulu.

1908 *Annual Report of the Board of Health of the Territory of Hawaii.* Bulletin Publishing Company, Honolulu.

Hawaii Department of Public Works

1904 *Annual report of the Superintendent of Public Works to the Governor of the Territory of Hawaii.* Bulletin Publishing Company, Honolulu.

1914 *Annual report of the Superintendent of Public Works to the Governor of the Territory of Hawaii.* Bulletin Publishing Company, Honolulu.

Hawaii Governor

1905 *Report of the Governor of the Territory of Hawaii to the Secretary of the Interior.* Government Printing Office, Washington, D.C.

Hawaii Legislature

1901 *First Legislative Assembly of the Territory of Hawaii. 1901. Extra Session.* Grieve Publishing Company, Honolulu.

Hawai'i State Historic Preservation Division

2009 Photograph of salt pans at Hanapēpē, Kaua'i. Available online at <http://hawaii.gov/dlnr/hpd/hppreserves.htm> (accessed 12 December 2009).

Hawaii Supreme Court

1914 *Hawaii Reports. Cases Decided in the Supreme Court of the Territory of Hawaii.* Honolulu Star-Bulletin, Honolulu.

1915 *Hawaii Reports. Cases Decided in the Supreme Court of the Territory of Hawaii.* Honolulu Star-Bulletin, Honolulu.

Hawai'i TMK Service

2013 Tax Map Key [1] 2-1-056. Available at Hawai'i TMK Service, 222 Vineyard Street, Suite 401, Honolulu.

Hawaiian Gazette

1897 Article from 29 January.

Ho'oulumāhie

2006a *Ka Mo'olelo O Hi'iakaikapoliopele.* Awaiaulu Press, Honolulu.

2006b *The Epic Tale Of Hi'iakaikapoliopele.* Puakea Nogelmeier, translator. Awaiaulu Press, Honolulu.

Hustace, Frank Ward, III

2000 *Victoria Ward and Her Family: Memories of Old Plantation.* Victoria Ward, Ltd., Honolulu.

‘Ī, John Papa

1959 *Fragments of Hawaiian History as Recorded by John Papa Ii.* Bishop Museum Press, Honolulu.

Iwamoto, Lana

1969 The Plague and Fire of 1899-1900 in Honolulu. In *Hawaii Historical Review Selected Readings*, pp. 122-141. Hawaii Historical Society, Honolulu.

Judd, Walter F.

1975 *Palaces and Forts of the Hawaiian Kingdom. From Thatch to American Florentine.* Pacific Books, Palo Alto, California.

Kamakau, Samuel M.

1961 *Ruling Chiefs of Hawaii.* Kamehameha Schools Press, Honolulu.

Kawasaki, Annette

2005 HCDA Perspectives Column. *Kaka'ako Connection* 27 (1):2.

Kay, E. Alison

1979 *Hawaiian Marine Shells.* Bishop Museum Press, Honolulu.

Ke Alakai o Hawaii

1932 Rawley Ice Cream advertisement (text in Hawaiian). *Ke Alakai o Hawaii* 3(37):3.

Kekahuna, Henry E.P.

1958 *Hawaiian Place Names of O'ahu*. Box M-445, Item #81, Hawai'i State Archives, Honolulu.

Kirch, Patrick

1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawai'i Press, Honolulu.

Kortum, Karl

1887 Photograph of Kakaako Saluting Battery and flagstaff. Original archived at the San Francisco Maritime Museum, San Francisco. In *The Saga of the Sandwich Islands, Volume 1* by Edward B. Scott, 1968, Sierra-Tahoe Publishing Company, Crystal Bay, Lake Tahoe, Nevada.

Kotzebue, Otto von

1817 South O'ahu. Map by Otto von Kotzebue. In *The Early Mapping of Hawai'i*, by Gary L. Fitzpatrick 1986, pp. 48-49. Editions Limited, Honolulu.

Kuykendall, Ralph S.

1938 *The Hawaiian Kingdom: 1778-1854, Volume 1*. University of Hawai'i Press, Honolulu.

LaPasse, Lt. Joseph de

1855 Plan du Mouillage [Anchorage] d'Honolulu. Map by Lt. Joseph de LaPasse. In *The Early Mapping of Hawai'i* by Gary L. Fitzpatrick, 1986, pp. 82-83. Editions Limited, Honolulu.

Larrison, G.

1917 Honolulu's Future Water Supply. In *Hawaiian Almanac and Annual for 1917*. Thomas G. Thrum, Honolulu.

Lebo, Susan A.

1997 *Native Hawaiian and Euro-American Culture Change in Early Honolulu, Archaeological Data Recovery, Harbor Court Property, Site No. 50-80-14-2456, Honolulu, Hawai'i*. Susan A. Lebo, editor. Anthropology Department, Bishop Museum, Honolulu.

Leidemann, H.H.

1988 *Analysis of Artifactual Material from the Judiciary Garage Site 50-0A-A5-11, (50-80-14-1973) TMK 2-1, Honolulu, O'ahu, State of Hawai'i*. Bernice Pauahi Bishop Museum, Honolulu.

Lister, Florence C. and Robert H. Lister

1989 *The Chinese of Early Tucson, Historic Archaeology from the Tucson Urban Renewal Project*. University of Arizona Press, Tucson, Arizona.

Lyons, Curtis J.

1876 Kaakaukukui and Puunui. Map by C.J. Lyons, Registered Map 611. Available at Hawai'i Land Survey Division, Department of Accounting and General Services, 1151 Punchbowl Street, Room 210, Honolulu.

- 1894 No. 37. Statement of Curtis J. Lyons. Originally published 1875. In *Report on the Committee of Foreign Relations, United States Senate, with Accompanying Testimony and Executive Documents Transmitted to Congress from January 1, 1893 to March 10, 1894*, pp. 1694-1703. Government Printing Office, Washington, D.C.

Macdonald, Gordon A., Agatin T. Abbott, and Frank L. Peterson

- 1983 *Volcanoes in the Sea: The Geology of Hawaii*. University of Hawai'i Press, Honolulu.

Malo, David

- 1951 *Hawaiian Antiquities (Moolelo Hawaii)*. Second Edition. Nathaniel B. Emerson, translator (1898). Bishop Museum Special Publication. Bishop Pauahi Bishop Museum, Honolulu.
- 2006 *Ka Mo'olelo Hawai'i. Hawaiian Traditions*. Malcolm Nāea Chun, translator. First People's Productions, Honolulu.

Mason Architects, Inc.

- 2009 *Architectural Inventory Survey: Kaka'ako Mauka*. Mason Architects, Inc., Honolulu.
- 2012 *DRAFT Hawaiian Sugar Planters' Association Immigration Station, Photographs, Written Historical and Descriptive Data*. Mason Architects, Inc., Honolulu.

McAllister, J.G.

- 1933 *Archaeology of O'ahu*. Bishop Museum Bulletin 104. Bernice Pauahi Bishop Museum, Honolulu.

McElroy, Windy K., Amanda Sims, and Michael Desilets

- 2008 *Ethno-Historical Inventory Study of Kaka'ako, Honolulu Ahupua'a, Kona District, O'ahu*. Garcia and Associates, Kailua, Hawai'i.

Medina, Leandra W. and Hallett H. Hammatt

- 2013 *Archaeological Monitoring Report for 680 Ala Moana Boulevard Re-development Project, Kaka'ako Ahupua'a, Honolulu (Kona) District, O'ahu Island TMK: [1] 2-1-055:021*. Cultural Surveys Hawai'i, Inc. Kailua, Hawai'i.

Murakami, Gail M.

- 2013 *Radiocarbon Sample Screening for KAKAAKO 101 Project, Kaka'ako, O'ahu Island*. International Archaeological Research Institute, Inc., Honolulu.

Myatt, Carl

- 1991 *Hawaii, The Electric Century*. Signature Publishing, Honolulu.

Nakamura, Barry

- 1979 *The Story of Waikiki and the Reclamation Project*. M.A. thesis, University of Hawai'i at Mānoa, Honolulu.

Nicol, Brian

- 1998 Kaka'ako, In *Hawai'i Chronicles II: Contemporary Island History from the Pages of Honolulu Magazine*, compiled by Bob Dye, pp. 37-54. University of Hawai'i Press, Honolulu.

O'Hare, Constance R., Todd Tulchin, Douglas Borthwick, and Hallett H. Hammatt

2009 *Inventory Survey Plan for Three Kamehameha Schools Kaka'ako Mauka Parcels, Kaka'ako, Honolulu District, O'ahu Island, TMK: [1] 2-1-030:001; 2-1-054:025, 027, 028, 032.* Cultural Surveys Hawai'i, Inc. Kailua, Hawai'i.

Ota, J. and W. Kam

1982 *An Osteological Study of Human Remains from the State Office Building #2 (Corner of Punchbowl and Halekauwila).* Division of State Parks, Department of Land and Natural Resources, Honolulu.

Pammer, Michelle, Jeff Fong, and Hallett H. Hammatt

2011 *Archaeological Inventory Survey Report for the Block 2 Parking Lot, Kaka'ako Ahupua'a, Honolulu District, O'ahu Island TMK: [1] 2-1-030:001, 043.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Pammer, Michelle, and Hallett H. Hammatt

2010 *Archaeological Assessment for the Former Comp USA Parcel, Kaka'ako, Honolulu District, O'ahu Island.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Pearson, Richard

1995 A Brief Report on Test Excavations at the Hawaiian Mission, Honolulu. *Hawaiian Archaeology* 4:27-33. Society for Hawaiian Archaeology, Honolulu.

Pfeffer, Michael, Borthwick, Douglas F., and Hallett H. Hammatt

1993 *An Archaeological Summary of the Kaka'ako Improvement District 1 Monitoring, Kaka'ako, O'ahu, Hawai'i (TMKs 2-1-29 to 2-1-32, 2-1-46 to 1-2-48, 2-1-51, 2-1-54, and 2-1-55), for Hawaii Community Development Authority,* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Pukui, Mary Kawena and Samuel H. Elbert

1986 *Hawaiian Dictionary.* Second edition. University of Hawai'i Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert, and Esther T. Mookini

1974 *Place Names of Hawaii.* University of Hawai'i Press, Honolulu.

Richardson, Kent D.

2005 *Reflections of Pearl Harbor: An Oral History of December 7, 1941.* Greenwood Publishing Group, Westport, Connecticut.

Rogove, Susan Tobier and Marcia Baun Steinhauer

1993 *Pyrex by Corning. A Collector's Guide.* Antique Publications, Marietta, Ohio.

Sanborn Fire Insurance Company

1914 Sanborn Fire Insurance Map for 1914. On file at Sanborn Map Company, 11 Broadway, New York. Available at Hamilton Library, University of Hawai'i at Mānoa, Honolulu.

1927 Sanborn Fire Insurance Map for 1927. On file at Sanborn Map Company, 11 Broadway, New York. Available at Hamilton Library, University of Hawai'i at Mānoa, Honolulu.

1950 Sanborn Fire Insurance Map for 1950. On file at Sanborn Map Company, 11 Broadway, New York. Available at Hamilton Library, University of Hawai'i at Mānoa, Honolulu.

- 1956 Sanborn Fire Insurance Map for 1956. On file at Sanborn Map Company, 11 Broadway, New York. Available at Hamilton Library, University of Hawai'i at Mānoa, Honolulu.

Schmitt, Robert C.

- 1980 Some Firsts in Island Businesses and Government. *Hawaiian Journal of History* 14:80-108

Scott, Edward B.

- 1968 *The Saga of the Sandwich Islands, Volume 1*. Sierra-Tahoe Publishing Company, Crystal Bay, Lake Tahoe, Nevada.

Severson, Don R., Michael D. Horikawa, and Jennifer Saville

- 2002 *Finding Paradise. Island Art in Private Collections*. Honolulu Academy of Arts, Honolulu.

Sigall, Bob

- 2004 *The Companies We Keep. Amazing Stories about 450 of Hawaii's Best Known Companies*. Small Business Hawaii, Honolulu.

Stearns, H.T.

- 1978 *Quaternary Shorelines in the Hawaiian Islands*. Bishop Museum Bulletin 237. Bishop Museum Press, Honolulu.

Stewart, C.S.

- 1970 *Journal of a Residence in the Sandwich Islands, During the Years 1823, 1824, and 1825*. University of Hawai'i Press for the Friends of the Library of Hawai'i, Honolulu.

Stone, Scott C.S.

- 1983 *Honolulu, Heart of Hawai'i*. Continental Heritage Press, Inc., Tulsa, Oklahoma.

Tayman, John

- 2006 *The Colony. The Harrowing True Story of the Exiles of Molokai*. Scribner, New York.

Thomas, Mifflin

- 1983 *Schooner from Windward. Two Centuries of Hawaiian Interisland Shipping*. University of Hawai'i Press, Honolulu.

Thrum, Thomas G.

- 1884 Retrospect of the Year 1883. *Hawaiian Almanac and Annual for 1884*. Thomas G. Thrum, Honolulu.
- 1887 Appropriation Bill for the Biennial Period Ending March 13, 1888. *Hawaiian Almanac and Annual for 1887*. Thomas G. Thrum, Honolulu.
- 1897 Hawaiian Epidemics. *Hawaiian Almanac and Annual for 1897*. Thomas G. Thrum, Honolulu.
- 1901 Retrospect for 1900. *Hawaiian Almanac and Annual for 1901*. Thomas G. Thrum, Honolulu.
- 1902 Retrospect for 1901. *Hawaiian Almanac and Annual for 1902*. Thos. G. Thrum, Honolulu.

- 1904 Retrospect for 1903. *Hawaiian Almanac and Annual for 1904*. Thos. G. Thrum, Honolulu.
- 1906 Retrospect for 1905. *Hawaiian Almanac and Annual for 1906*. Thomas G. Thrum, Honolulu.
- 1907 Retrospect for 1906. *Hawaiian Almanac and Annual for 1907*. Thomas G. Thrum, Honolulu.
- 1908 Retrospect for 1907. *Hawaiian Almanac and Annual for 1908*. Thos. G. Thrum, Honolulu.
- 1916 *Hawaiian Almanac and Annual for 1917*. Thomas G. Thrum, Honolulu.
- 1920 *Hawaiian Almanac and Annual for 1921*. Thomas G. Thrum, Honolulu.
- 1921 Retrospect for 1920. *Hawaiian Almanac and Annual for 1921*. Thomas G. Thrum, Honolulu.
- 1923 *More Hawaiian Folk Tales*. Unknown publisher.
- 1924 Hawaiian Salt Making. *Hawaiian Almanac and Annual for 1924*. Thomas G. Thrum, Honolulu.

Titcomb, Margaret

- 1972 *Native Use of Fish in Hawaii*. University of Hawai'i Press, Honolulu.
- 1979 *Native Use of Marine Invertebrates in Old Hawaii*. University of Hawai'i Press, Honolulu.

Tulchin, Jon and Hallett H. Hammatt

- 2013 *Archaeological Inventory Survey for the Kamehameha Schools Kaka'ako Block F, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu Island, TMK: [1] 2-1-055:003, 006, 021, 026, 038*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Tulchin, Jon, Constance O'Hare and Hallett H. Hammatt

- 2014a *Archaeological Inventory Survey for Kamehameha Schools Kaka'ako Block B, Honolulu Ahupua'a, Honolulu (Kona) District, Island of O'ahu, TMKs: (1) 2-1-054: 025, 027, 028 por. and 032*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- 2014b *Archaeological Inventory Survey for Kamehameha Schools Kaka'ako Block I, Honolulu Ahupua'a, Honolulu (Kona) District, O'ahu, TMKs: [1] 2-1-056:002, 007 and 008*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Tulchin, Todd, Kendy Altizer, Douglas Borthwick, and Hallett H. Hammatt

- 2009 *Final Archaeological Assessment of the Proposed Halekauwila Place Project, Kaka'ako, Honolulu District, O'ahu Island, TMK: [1] 2-1-051:009 por.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

University of Hawai'i School of Ocean and Earth Science Technology (SOEST)

- 1927 Aerial photography of Waikiki coast. University of Hawai'i of Ocean and Earth Science Technology (SOEST), Honolulu.
- 1952 Aerial photography of Kaka'ako coast. University of Hawai'i of Ocean and Earth Science Technology (SOEST), Honolulu.

U.S. Department of Agriculture

- 2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/>.

U.S. Geological Survey

- 1927 Honolulu USGS 7.5-minute topographic quadrangle. Available at USGS Information Services, Box 25286, Denver, Colorado.
- 1998 Honolulu USGS 7.5-minute topographic quadrangle. Available at USGS Information Services, Box 25286, Denver, Colorado.

U.S. War Department

- 1919 U.S. War Department 7.5-minute topographic map, Honolulu Quadrangle. Available at USGS Information Services, Box 25286, Denver, Colorado.

Waihona 'Aina

- 2000 *The Māhele Database*. Electronic document, <http://waihona.com>.

Wall, W.A.

- 1887 Map of Honolulu and Vicinity, Oahu Island, Kona District. Copy at Library of Congress, Geography and Map Division. Archived at Hawai'i Land Survey Division, Department of Accounting and General Services, 1151 Punchbowl Street, Room 210, Honolulu.

Westervelt, W.D.

- 1906 Honolulu Salt Beds. *Paradise of the Pacific* 19:43-46.

Wilson Okamoto & Associates, Inc.

- 1998 *Final Environmental Impact Statement for the Block J Redevelopment Project Honolulu, O'ahu, Hawai'i*. Prepared for City and County of Honolulu Department of Community Services, Honolulu.

Winieski, John P. and Hallett H. Hammatt

- 2000 *An Archaeological Monitoring Report for Kākā'āko Improvement District 3 Pohulani Elderly Rental Housing and Kauhale Kākā'āko, Honolulu, O'ahu, Hawai'i (TMK 2-1-30, 31, 32, 44, 46, 47, 48, 50, 51, 52, 54)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- 2001 *Archaeological Monitoring Report for the Nimitz Highway Reconstructed Sewer, Honolulu, O'ahu, Hawai'i (TMK 1-7-02, 03 and 2-1-02, 13-16, 25, 27, 29-32)*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Yent, M.

- 1985 *Burial Excavations at the Honolulu Ironworks Construction Site, Honolulu, O'ahu*. Department of Land and Natural Resources, Division of State Parks, Honolulu.