

Section 2 Zone 9 East Kaka'ako (Test Excavations 179 to 197)

2.1 Overall Location

For reporting purposes for this AIS, the City Center Section 4 of the Honolulu High-Capacity Transit Corridor Project (HHCTCP) has been divided into 11 zones based on geographical and cultural boundaries. The East Kaka'ako Geographic Zone extends from Kamake'e and Queen Streets at the west end, through Waimanu and Pensacola Streets, and follows Kona Street to Pi'ikoi Street, which marks the east end (Figure 2). The central portion of this zone lies within the historic Kolowalu Fishpond (see Volume II). The East Kaka'ako Zone corridor is located entirely within Honolulu Ahupua'a. Pi'ikoi Street marks the *ahupua'a* boundary between Honolulu and Waikiki Ahupua'a.

The East Kaka'ako Zone includes 19 AIS Test Excavations numbered T-179 through T-197 (T-197 was abandoned because it was located in an existing building; however, T-196 was placed in the immediate vicinity of T-197, between the straddle-bent columns and within the utility relocation corridor, and pertinent information was collected from this area). Test excavations were generally numbered from west to east. The Test Excavations within the East Kaka'ako Zone were located within TMKs [1] 2-3-004 (Waimanu Street, owned by the City and County of Honolulu), [1] 2-3-004:080 and [1] 2-3-004:054 (Queen Street, owned by the Hawaii Community Development Authority), [1] 2-3-004:069 (Queen Street, owned by Cody Properties LLC), [1] 2-3-007 (Pensacola Street and Kona Street, owned by the City and County of Honolulu), [1] 2-3-007:033 (Kona Street and Pensacola Street, owned by Kakaako Associates LLC) and [1] 2-3-007:054 (Kona Street, owned by Virginia L. Trust).

2.2 Transit Infrastructure

Transit infrastructure for the current project within the East Kaka'ako Zone includes a support facility structure located *mauka* of the station, 12 single columns and three straddle-bent columns to support the fixed guideway system spaced along the corridor within the East Kaka'ako Zone, and utility relocation corridors throughout. Test excavations focused on utility relocation corridors (T-184 through T-186, T-190 through T-193, T-195) and the Guideway Columns (T-179 through T-183, T-187 through T-189, T-194, T-196, and T-197) (see Volume I).

In consultation with the land owner, a portion of the project corridor near the proposed Kaka'ako Station was moved slightly to the north. As a result, two test excavations (T-179 and T-180) within the East Kaka'ako Zone were shifted slightly *mauka* to reflect the revised location of the two columns.

2.3 Geography, Geology, and Land Forms

The East Kaka'ako Zone is situated within a topographic section of O'ahu called the Honolulu Plain, approximately 0.5 km from the shoreline, in an area generally less than 4.5 m above sea level (Davis 1989:5). Test excavations ranged from 1.3 to 1.8 m amsl. The Honolulu Plain is stratified with late-Pleistocene coral reef substrate overlaid with calcareous marine sand or terrigenous sediments, and stream-fed alluvial deposits (Armstrong 1983:36). As the East Kaka'ako Zone traverses a predominantly urban landscape, vegetation in the immediate vicinity

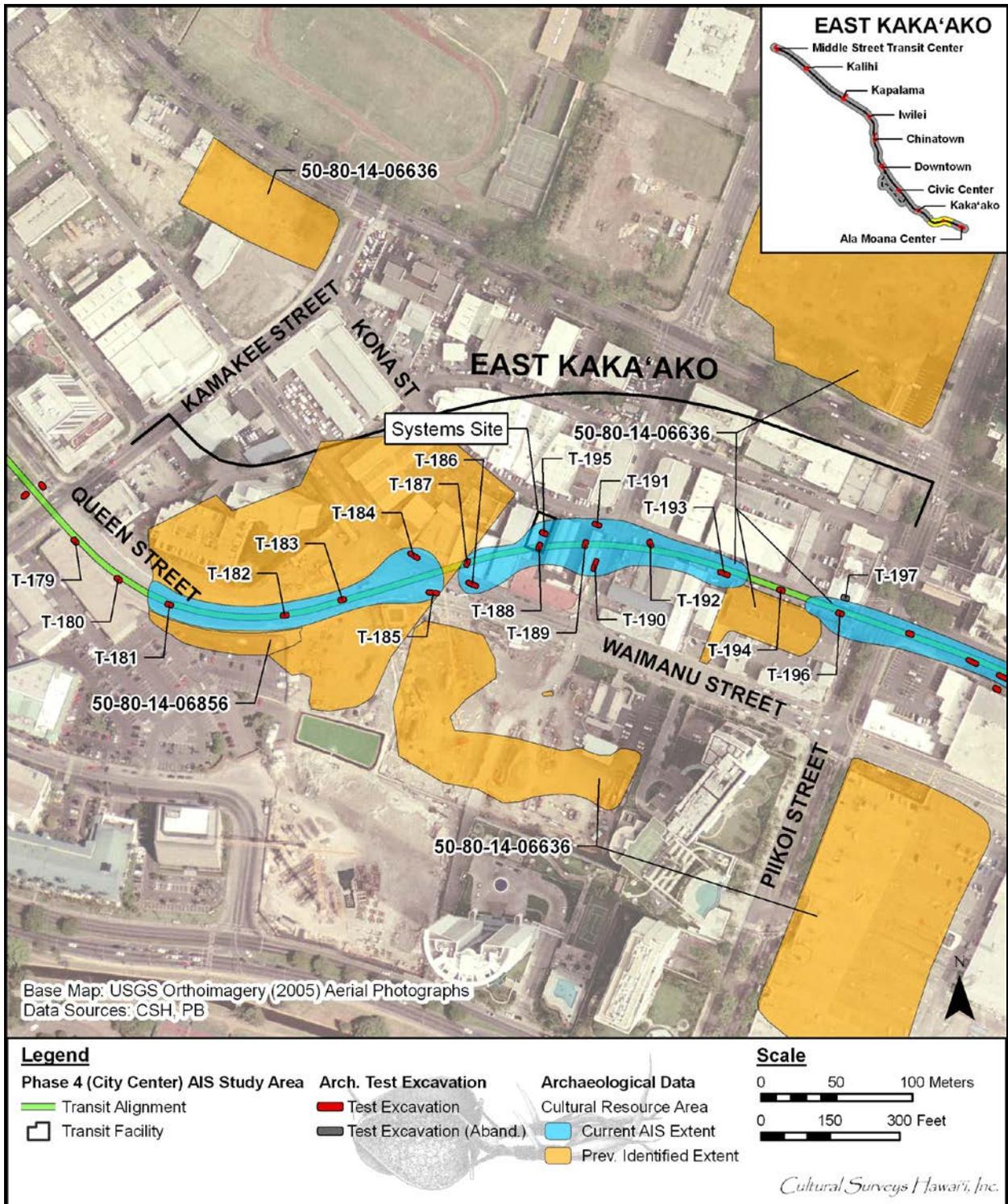


Figure 2. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) showing the location of the East Kaka'ako Zone AIS Test Excavations (T-179 through T-197) along the HHCTCP corridor

is largely the result of landscaping and consists primarily of introduced (non-indigenous) landscaping trees, shrubs, and ground cover. The average annual rainfall in the East Kaka'ako Zone is approximately 600 mm (23 inches) (Giambelluca et al. 2011).

According to the U.S. Department of Agriculture Soil Survey Geographic (SSURGO) Database (2001) and soil survey data gathered by Foote et al. (1972), soils within the Kewalo Zone, which lies in Kaka'ako, consist exclusively of Fill land (FL) (Figure 3). Fill land soils are described as:

...areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources... This land type is used for urban development including airports, housing areas, and industrial facilities [Foote et al. 1972:31].

2.4 Traditional and Historic Land Use

As noted, the East Kaka'ako Zone corridor is located within Honolulu Ahupua'a. A brief summary of the Honolulu Ahupua'a in the vicinity of the East Kaka'ako Zone follows.

2.4.1 Traditional Accounts of East Kaka'ako Zone

The East Kaka'ako Zone is located at the eastern end of the Honolulu *ahupua'a*, within the current urban district known as Kaka'ako. Late nineteenth century maps indicated that this area was traditionally divided into several traditional land units ('*ili*) known as Ka'ākaukukui, Kukuluāe'ō, and Kewalo (Figure 4). The East Kaka'ako Zone appears to be between the Kukuluāe'ō and Kewalo units.

Until fairly recently, Kaka'ako and the surrounding area were sometimes referred to as something of a wasteland, or empty space, between the better-known locations of Kou (modern-day Honolulu) and Waikīkī. This area was known traditionally for its low-lying marshes, fishponds, and salt making.

Pukui et al. (1974) do not define 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, this could arise from the fact that salt marshes, such as areas like Kaka'ako, were excellent places to gather tall pili grass, which the Hawaiians traditionally used to thatch their houses.

Kukuluāe'ō, translated literally, is the "Hawaiian stilt (bird)," *Himantopus himantopus*, and from the word *kukuluāe'ō*, 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 Kukuluāe'ō 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 Award and other historic-era documents identify Kewalo as the area between Cooke and Sheridan Streets, *mauka* of Queen Street and the coastal sections of Ka'ākaukukui, Kukuluāe'ō, and Kālia. According to Pukui et al. (1974:109), "outcasts (*kauwā*) intended for sacrifice were drowned here" (see

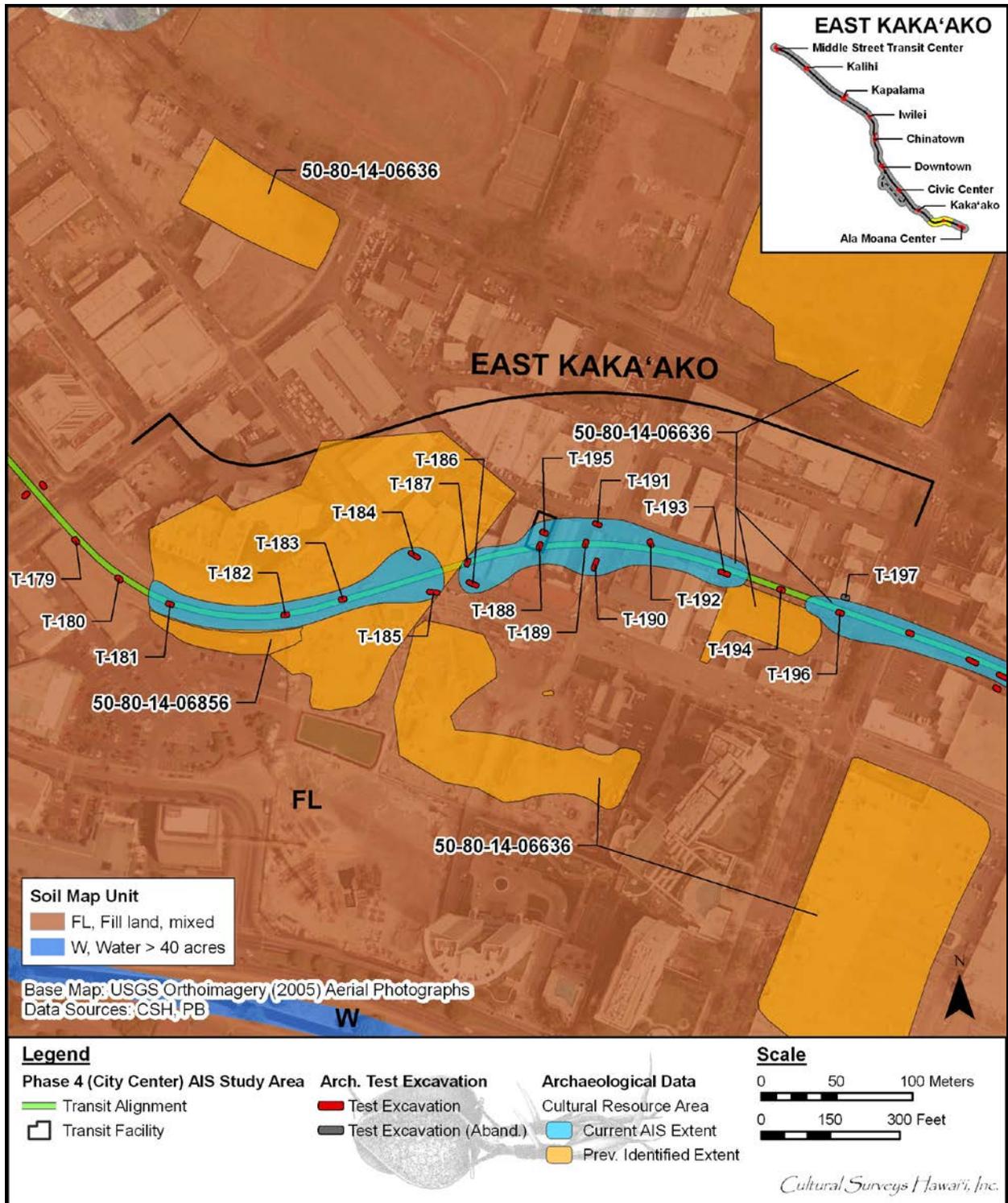


Figure 3. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) with overlay of the Soil Survey of Hawai'i (Foote et al. 1972) showing sediment types within and in the vicinity of the East Kaka'ako Zone

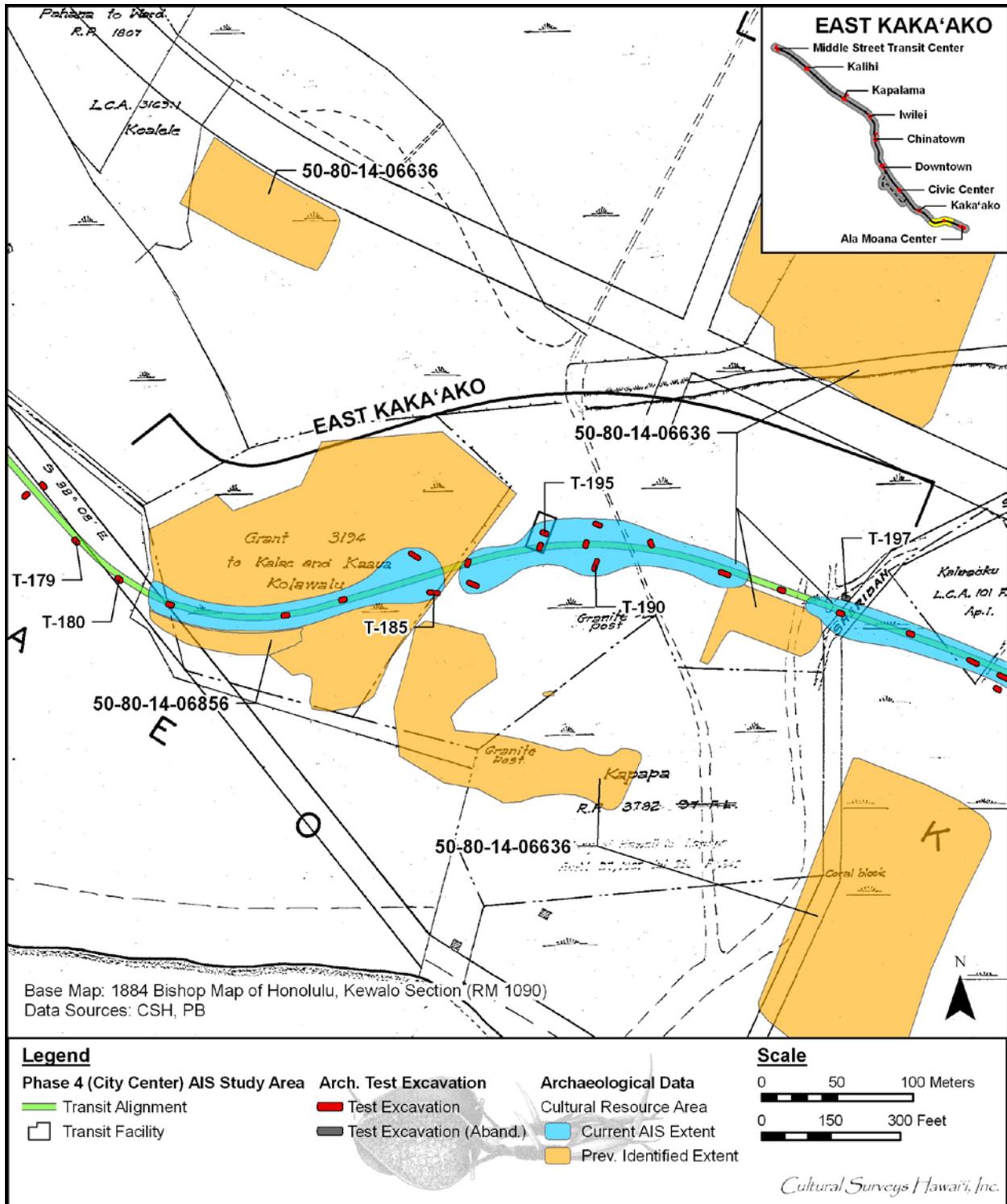


Figure 4. A close-up of the 1884 Map of Honolulu, Kewalo Section, by S. E. Bishop (Reg. Map 1090), showing traditional place names in the study area, along with the HHCTCP corridor and the AIS excavations (T-179 through T-197) in the East Kaka'ako Zone

mo'olelo below).

Background research indicates that Kolowalu Fishpond was part of Land Commission Grant 3194, known as “Kolowalu,” awarded to Kalae and Ka'aua. The general location of this pond in relation to the East Kaka'ako Zone is visible in an 1884 map by S. E. Bishop (see Figure 4) and an 1897 map by M. D. Monsarrat (see Volume II). The fishpond may have been constructed prehistorically, with continued use into the historic period. Fishponds typically function for aquaculture. Because it lies inland, the Kolowalu pond was likely freshwater, or partially brackish. Based on historic documents and maps, Kolowalu Fishpond was not filled in until the late 1920s or early 1930s, probably during the Waikīkī Reclamation Project (as evidenced by a layer of hydraulic fill).

2.4.2 LCA Documentation

During the mid-nineteenth century Māhele, the majority of lands within and directly adjacent to the East Kaka'ako Zone consisted of portions of large awards that were given to *ali'i*. Two large parcels are located within the East Kaka'ako Zone: LCA 387 and LCA 10605 Lot 7 (Figure 5 and Table 1). The *'ili* of Kukuluāe'o (LCA 387) was originally awarded to King Kamehameha III, but he returned it to the government. The *'ili* was then awarded to the American Board of Commissioners for Foreign Missions (ABCFM) as LCA 387. The *'ili* of Kewalo (LCA 10605) was awarded to Kamake'e Pi'ikoi, wife of Jonah Pi'ikoi, as part of LCA 10605, *'āpana* (lot) 7. Jonah Pi'ikoi was an *ali'i*, a retainer of Kamehameha III, who held several government posts. The award was divided between himself and his wife (Kame'eleihiwa 1992:269).

Land Grant 3194, the Kolowalu parcel, is located within the eastern portion of the East Kaka'ako Zone, between Kamake'e and Waimanu Streets. During the Māhele in 1848, a Hawaiian man named Kahue stated that the two fishponds in Kolowalu were given to him by Kalei in the year 1846. The LCA testimony indicates that several of his neighbors were consulted and Kahue's claim to the land was eventually not awarded. The Kolowalu parcel was granted to Ka'aua, *kāne* (man), and Kalae, *wahine* (woman), as Land Grant 3194 in the year 1878.

There is some evidence that the Kolowalu parcel was not part of a Land Commission Award to an *ali'i* or to a commoner in the mid-nineteenth century Māhele, as Land Grants recorded the sale of land set aside (or returned by the *ali'i*) for the Hawaiian government, not for land awarded as LCA parcels. These government lands were sold in fee simple to generate income for the kingdom. Although the land grant was not awarded until 1878, there is evidence that the awardee, Ka'aua, had a close association with this land even before the mid-nineteenth century Māhele. Ka'aua was a priest for the chief 'Aikanaka, who was born around 1790. 'Aikanaka was the father of the Hawaiian chiefess, Analea Keohokālole (born in 1816), the mother of two future Hawaiian monarchs, Kalākaua and Lili'uokalani. Thus, if Ka'aua was 'Aikanaka's contemporary, he was associated with the land in the early to mid-nineteenth century, before the 1848 Māhele.

The LCA records indicate that the traditional Hawaiian use of the region and its environs may have been confined to salt making, farming of fishponds, and wetland agriculture. The LCA records also reveal that midway through the nineteenth century, taro cultivation, traditional salt

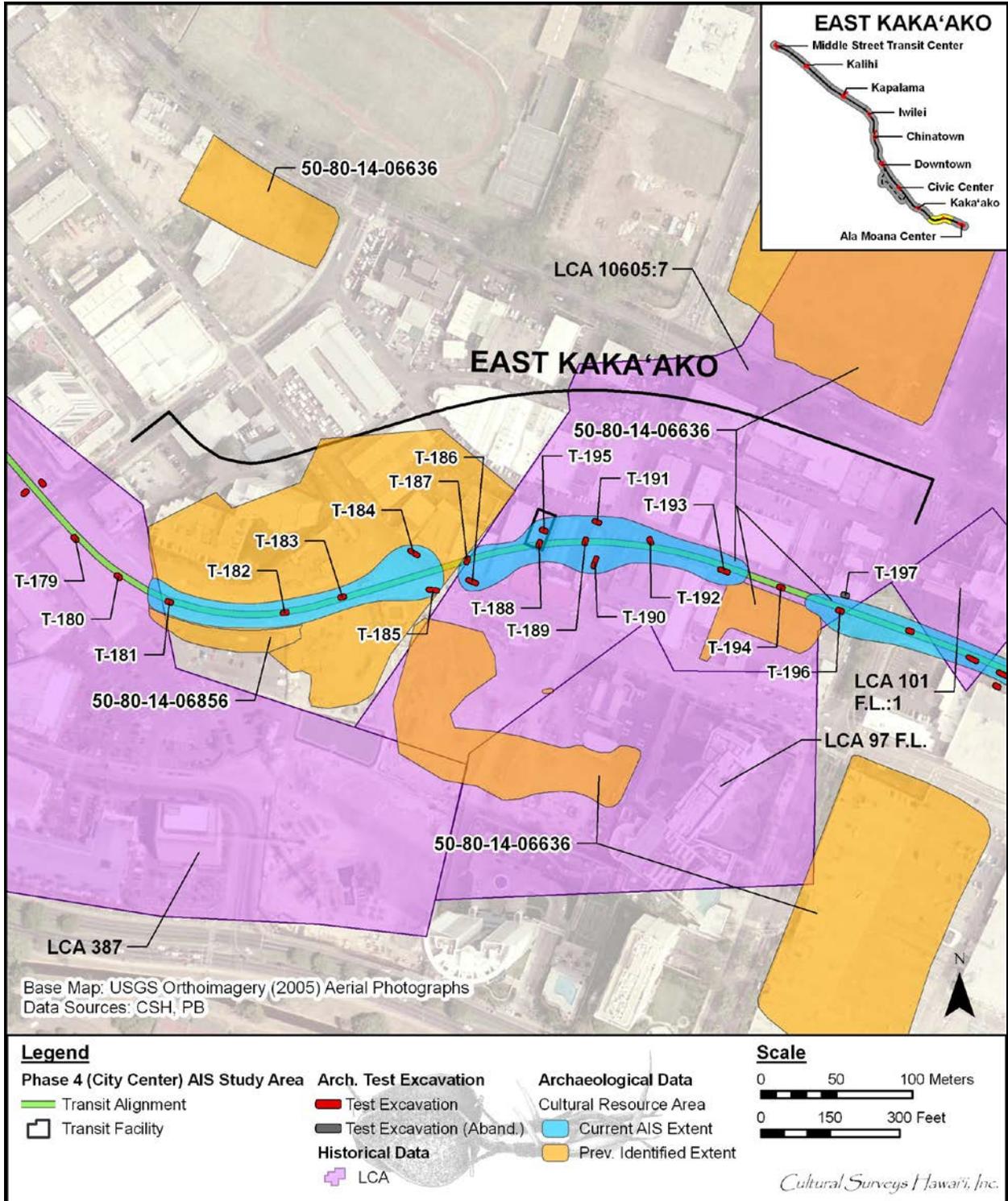


Figure 5. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) showing the LCAs in the vicinity of the East Kaka'ako Zone

making, and fishpond farming activities continued in the Kewalo/Kaka'ako area. These activities and the land features that supported them would be eliminated, or buried, during the remainder of the nineteenth century by the urbanization of Honolulu.

Table 1. LCAs in the vicinity of the East Kaka'ako Zone (in numerical order)

LCA Number	Contents of Award
387	Salt beds attached to Punahou awarded to ABCFM
10605:7	52.8 acres to Iona Pi'ikoi and Kamake'e

2.4.3 Historic Land Use

In the early post-Contact period, Kaka'ako was a portion of the area called the "salt plains of Honolulu" (Bingham 1981:92–93). Kawaiaha'o Church, built in 1820 at the edge of this dry plain, drew Christian converts to the area near the mission, a major factor pulling the development of Honolulu toward East Kaka'ako into an area that had been relatively less inhabited in pre-Contact times. The barrenness of the Kaka'ako area is illustrated in two sketches made of Kawaiaha'o Church, one in 1834 (see Volume II), and one in 1850 (see Volume II). The western boundary of the East Kaka'ako Zone is located approximately 1.33 km east of Kawaiaha'o Church. An 1887 photograph of the area also shows its marshy nature, with only scattered houses near the ponds or near the shore *makai* of Kawaiaha'o Church (see Volume II).

By 1901, most of the fishponds and salt pans *makai* of King Street were reported as abandoned. In that year, the Hawai'i 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 export of salt declined in the late nineteenth century and by 1916, only one salt works, the Honolulu Salt Co., was still operating. These activities and the land features that supported them would later be eliminated, or buried, during the remainder of the nineteenth century by the urbanization of Honolulu.

In 1910, after an epidemic of bubonic plague, the Board of Health condemned a large section of Kewalo, including areas in the East Kaka'ako Zone, which had numerous ponds (Hawaii Department of Public Works 1914:196). All of the property owners were informed 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 a bid was given to Lord-Young Engineering Co. 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 Reports 1915:331). The recalcitrant land owners sued to stop the work.

The lawsuit led to halting of operations planned from Ward Street to Waikīkī, including the East Kaka'ako Zone (Thrum 1915:159–160). This land was mainly owned by the Bishop Estate, who leased the land to small farmers growing taro and rice and raising ducks in the ponds. In 1916, the Bishop Estate announced that once their present tenant leases expired, they planned to fill the lands and divide them into residence and business lots (Larrison 1917:148–149).

A 1919 U.S. Army War Department map indicates several ponds and few structures existed within and surrounding the East Kaka'ako Zone, including the Kolowalu Fishpond (SIHP #50-80-14-6856) (Figure 6). A path or unimproved road arched around the area *makai* of the East Kaka'ako Corridor, probably to avoid the marshy ground. Most of the roads to the west are depicted by dashed lines, a symbol used for proposed (but not constructed) new roads, or unimproved (dirt, not asphalt) roads. Although ponds in the Kaka'ako, Kukuluāe'o, and Kewalo area were being filled with trucked-in "dry" fill as early as the 1880s, and with dredged coral fill in the 1910s (Griffin et al. 1987:56-57), based on historic documents and maps, it appears that the current project area was not filled in until the late 1920s or early 1930s. The 1914 and 1927 Sanborn Fire Insurance maps show almost no development within the East Kaka'ako Zone (Figure 7 and Figure 8). The 1933 U.S. Army War Department Fire Control map shows that all the ponds had been filled in and roads had been realigned, including Sheridan Street, forming modern day Pi'ikoi Street, visible as a dashed line marking the eastern boundary of the East Kaka'ako Zone (Figure 9). By 1950, the East Kaka'ako Zone had become much more developed (Figure 10).

2.4.4 Settlement Pattern Summary

The land around the East Kaka'ako Zone in Honolulu Ahupua'a offered desirable environmental conditions for traditional Hawaiian subsistence practices. The traditional settlement pattern would have included small fishponds and salt pans. A large fishpond, the Kolowalu Fishpond (SIHP #50-80-14-6856), was documented within this stretch of coastline. The Honolulu Ahupua'a did not contain perennial streams providing water to the coastal plains. Consequently, the central coastal plains were relatively dry and not heavily cultivated with wetland taro. The coastal area, below present-day King Street, consisted of extensive swamp lands used for fishponds and salt pans along with occasional taro *lo'i* and habitation. Māhele awards in this area described significant tracts of salt lands, particularly within the larger LCAs (e.g., LCAs 387 and 10605). The extent of salt cultivation may have significantly increased during the post-Contact period; however, the importance of salt cultivation in the pre-Contact period was consistently described and mapped by early Western arrivals. Habitation was likely scattered along the shore and along trails that connected Honolulu to Waikīkī.

2.5 Previous Archaeology

The Kaka'ako area contains historic properties of both pre- and post-Contact origin. The area has been subject to intensive reconstruction since the mid-1990s as part of the growth of Honolulu and Waikīkī. Several investigations have uncovered subsurface elevated sand ridges, often containing burials and other historic properties, such as post-Contact trash pits.

A total of 14 previous archaeological studies have been conducted within or directly adjacent to the East Kaka'ako Zone (Figure 11 through Figure 13). Table 2 lists and summarizes these studies, which are detailed below. The discussion of previous archaeological investigations proceeds from west to east.

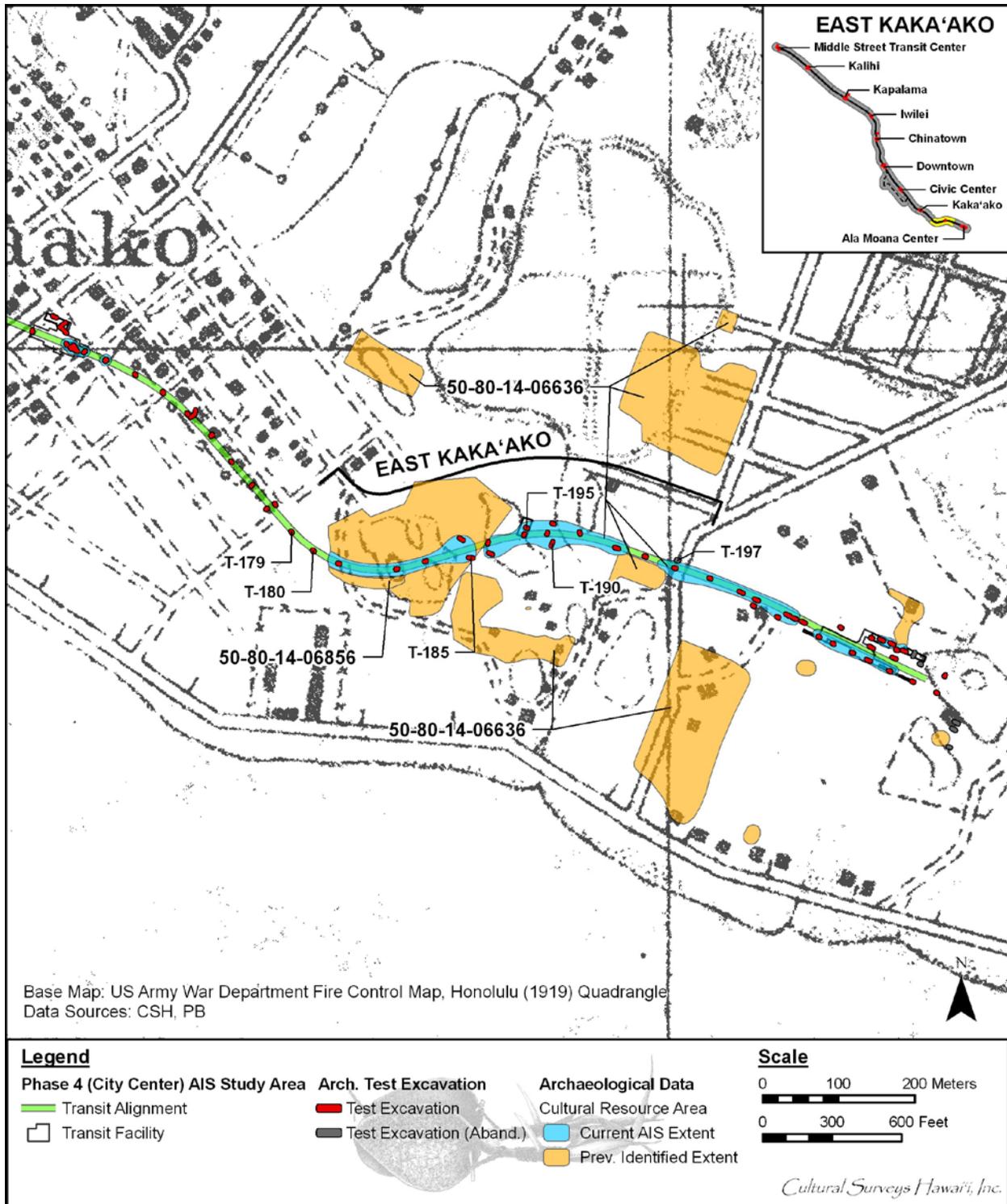


Figure 6. 1919 U.S. Army War Department Fire Control map showing several ponds and few structures in the vicinity of the East Kaka'ako Zone

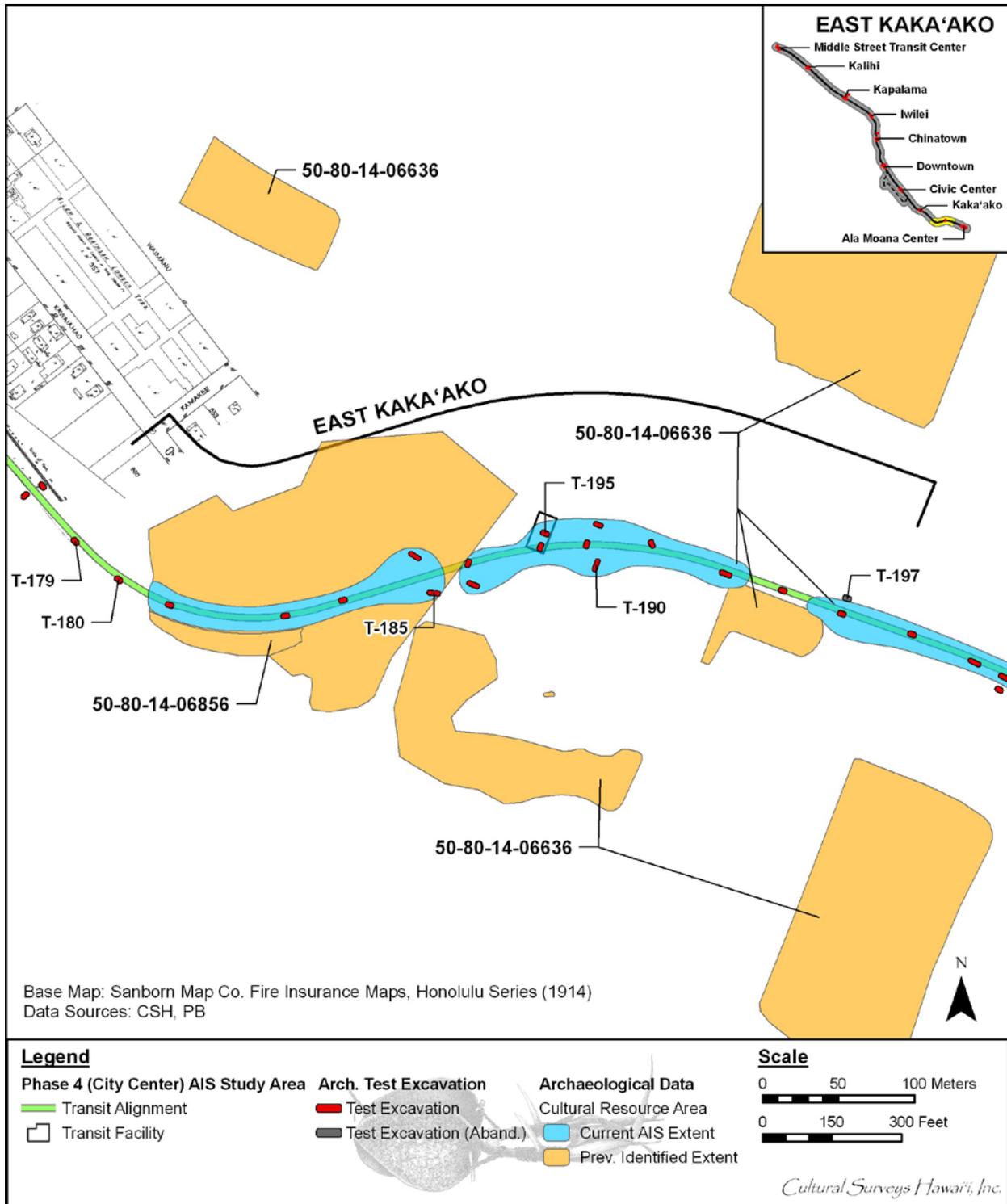


Figure 7. 1914 Sanborn Fire Insurance maps showing almost no development within the East Kaka'ako Zone

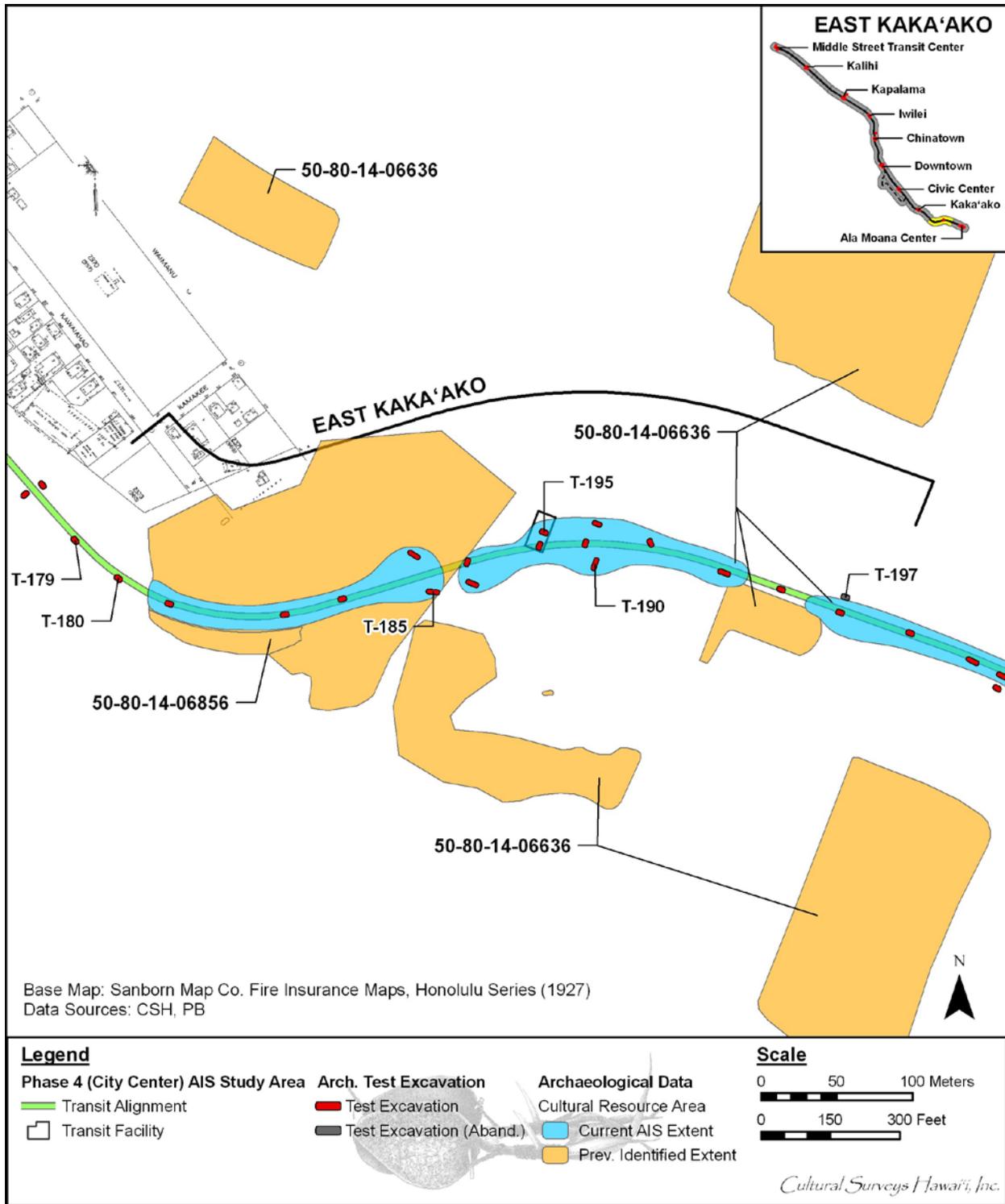


Figure 8. 1927 Sanborn Fire Insurance maps showing almost no development within the East Kaka'ako Zone

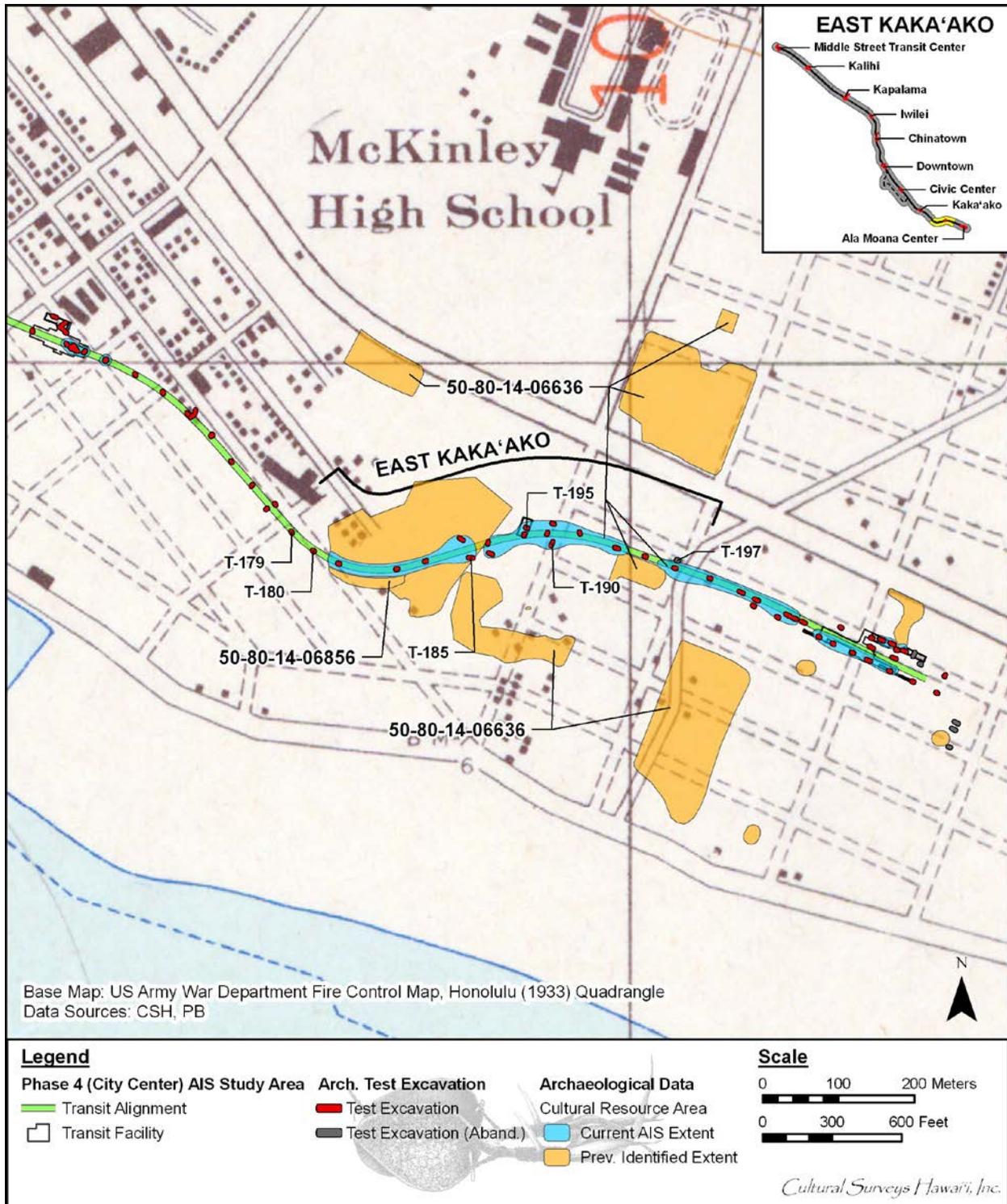


Figure 9. 1933 U.S. Army War Department Fire Control map, Honolulu Quadrangle, showing the proposed street grid system in the vicinity of the East Kaka'ako Zone

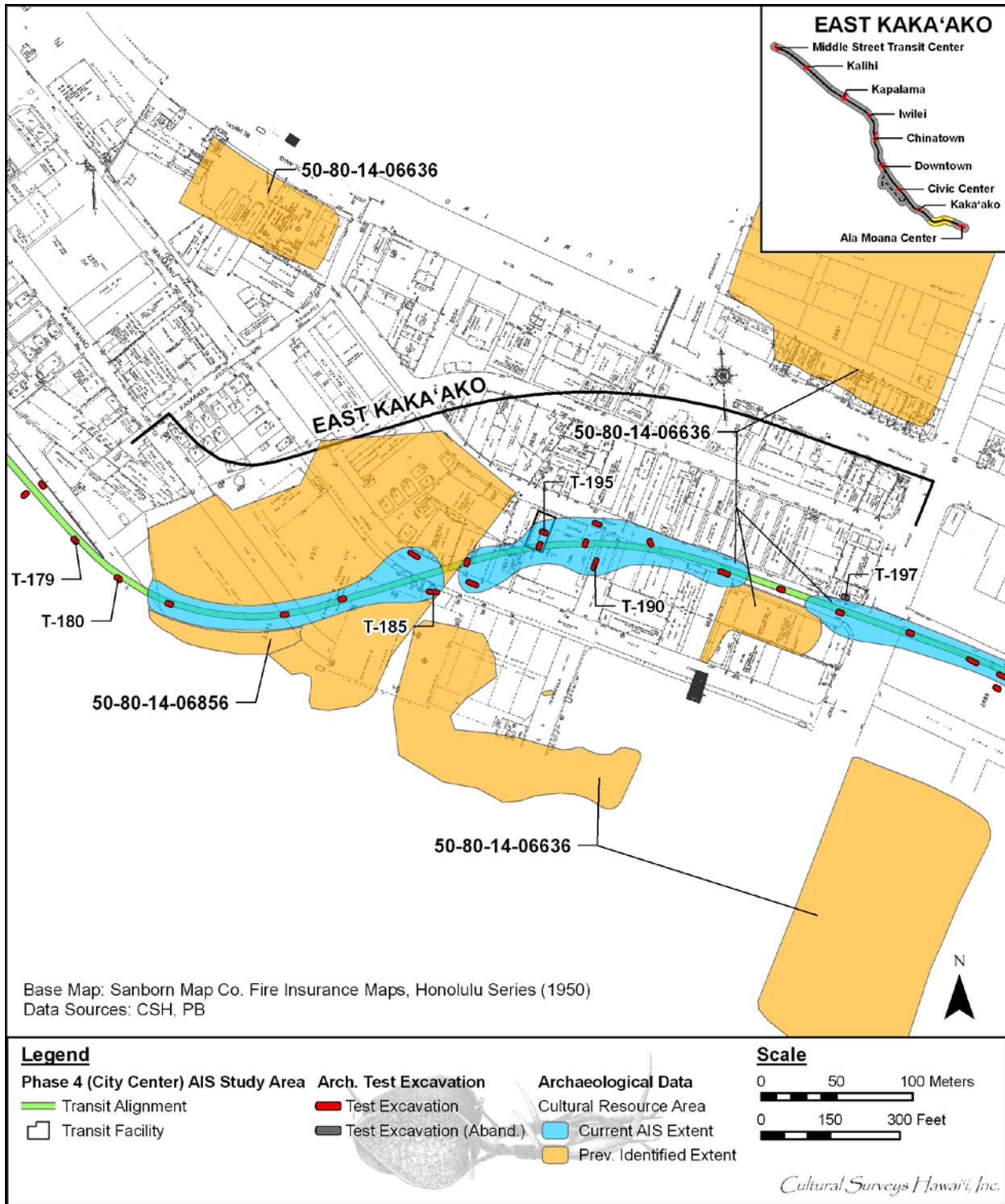


Figure 10. 1950 Sanborn Fire Insurance maps showing increased development within the East Kaka'ako Zone

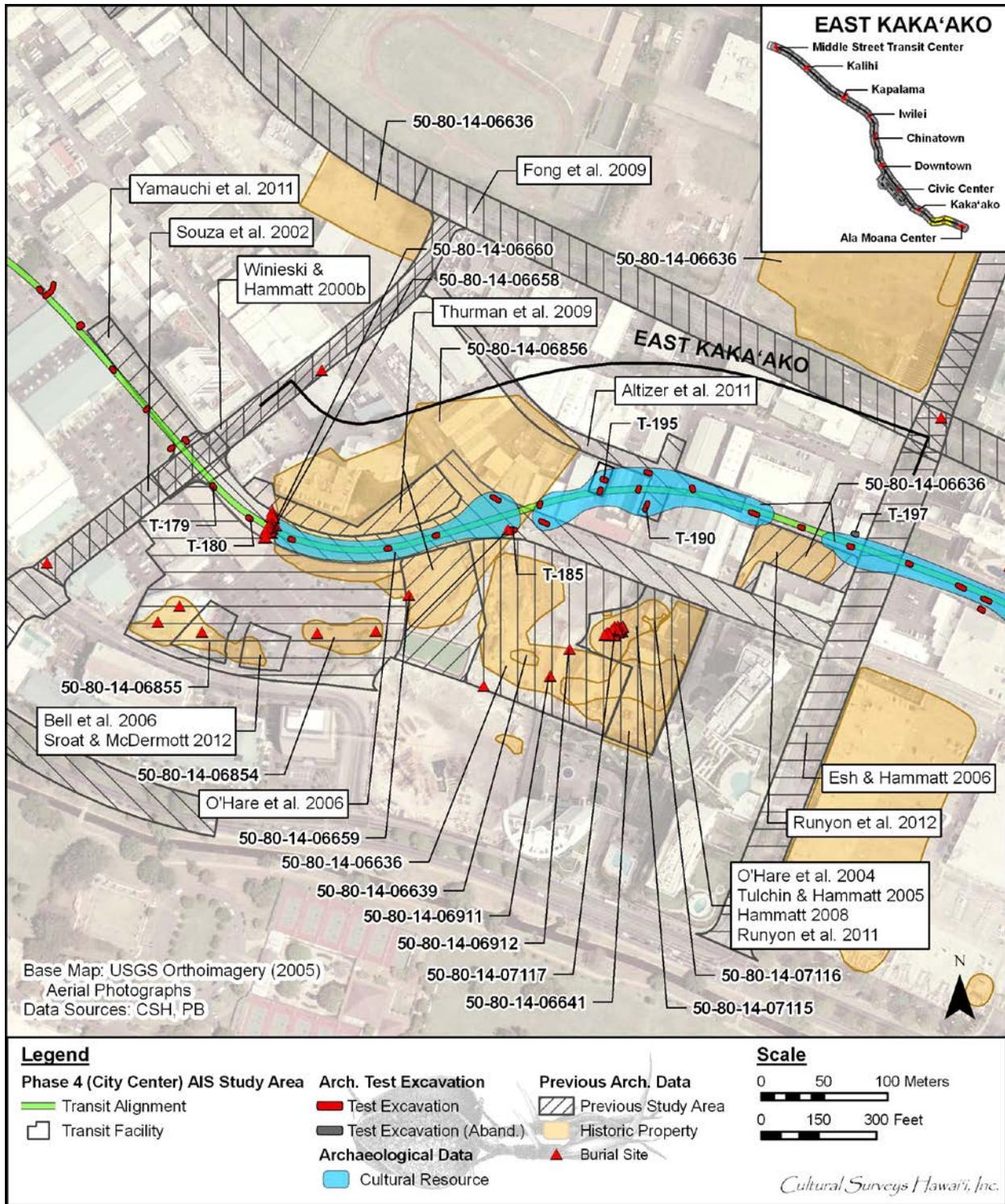


Figure 11. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) showing the location of previous archaeological studies near the East Kaka'ako Zone AIS test excavations (T-179 through T-197) along the HHCTCP corridor

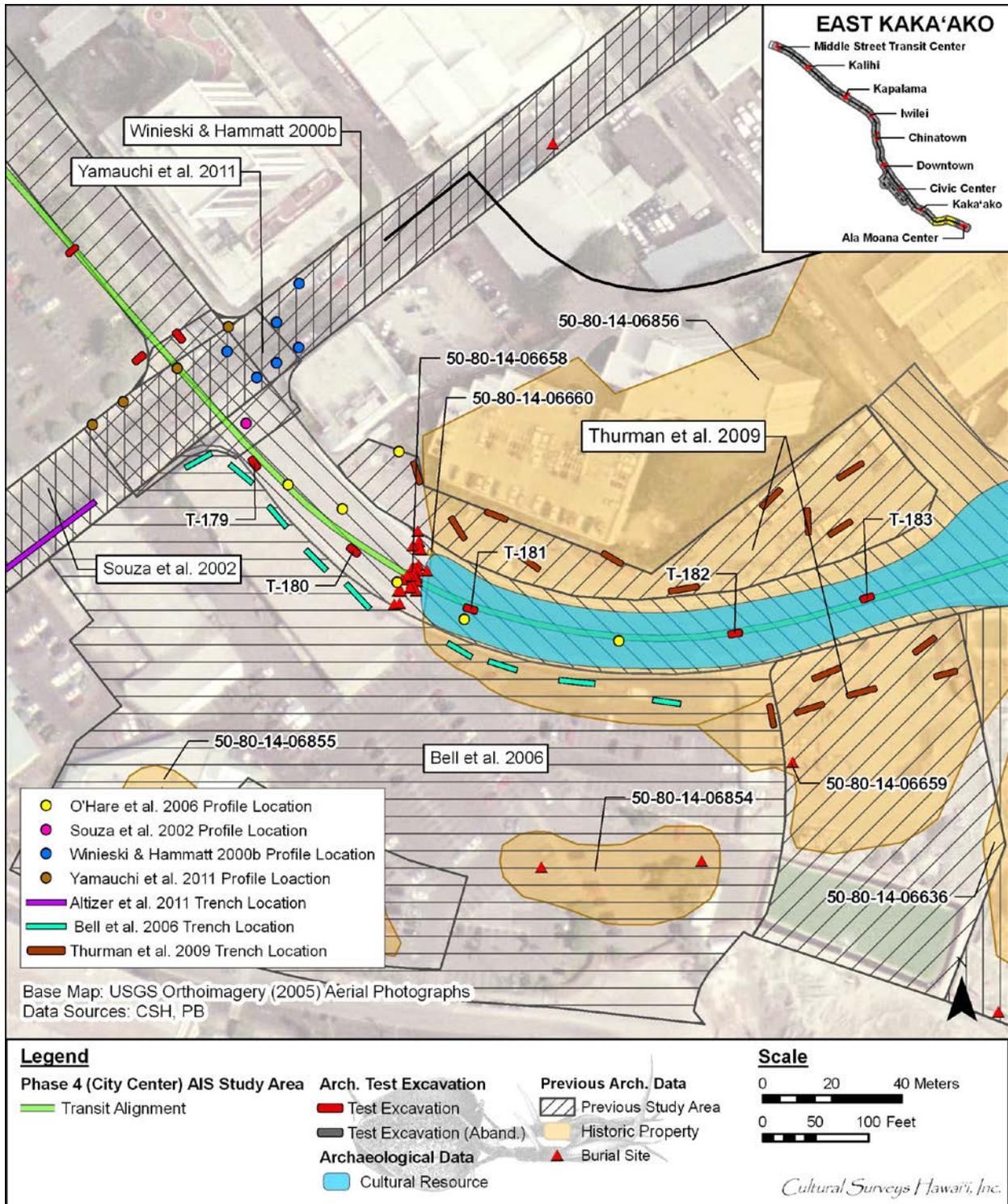


Figure 12. Previous archaeological studies in the vicinity of the western portion of the East Kaka'ako Zone (base map: U.S. Geological Survey Orthoimagery 2005) showing test excavations of prior studies that are immediately adjacent to the East Kaka'ako Zone corridor

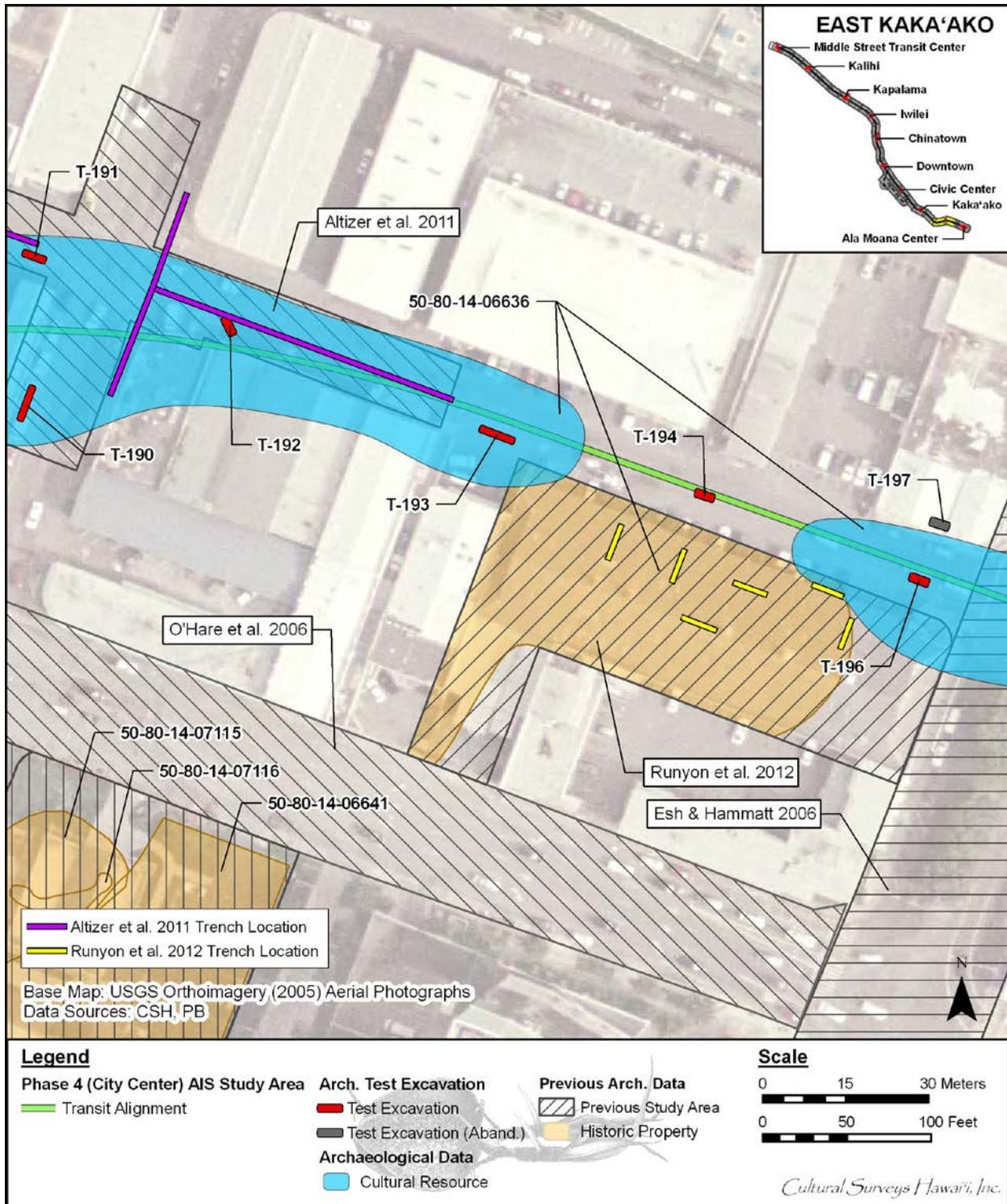


Figure 13. Previous archaeological studies in the vicinity of the eastern portion of the East Kaka'ako Zone (base map: U.S. Geological Survey Orthoimagery 2005) showing Test Excavations of prior studies that are immediately adjacent to the East Kaka'ako Zone corridor

Table 2. Previous archaeological studies conducted adjacent to the East Kaka'ako Zone (arranged chronologically)

Author	SIHP #50-80-14	Report Description and Findings
Winieski and Hammatt 2000b	-5598	Monitoring for Kaka'ako Improvement District 4 construction. Two isolated historic coffin burials (SIHP #50-80-14-5598) documented on Kamake'e Street, between the intersections of Kawaiaha'o and Waimanu Streets.
Souza et al. 2002	-6376; -6377; and -6378	Kaka'ako Improvement District 7 Monitoring. Three burials encountered: SIHP #50-80-14-6376, SIHP #50-80-14-6377, and SIHP #50-80-14-6378.
O'Hare et al. 2004	-6639; -6641; -6636	Inventory survey Ko'olani Condominium. Three historic properties documented: SIHP #50-80-14-6639 and SIHP #50-80-14-6641, historic trash pits dating from the early twentieth century; and SIHP #50-80-14-6636, the original wetland surface of Kewalo.
Tulchin and Hammatt 2005	-6636; -6641	Inventory survey Phase II portion of the Ko'olani Condominium parcel. Two historic properties identified: SIHP #50-80-14-6636, original wetland surface of Kewalo area; and SIHP #50-80-14-6641, historic garbage layer. Both previously identified by O'Hare et al. (2004).
Bell et al. 2006	-6854; 6855; -6856	Archaeological inventory survey for Victoria Ward Village Shops. Three historic properties identified: SIHP #50-80-14-6854, subsurface cultural layer containing both historic and prehistoric cultural material and five human burials; SIHP #50-80-14-6855, pre-Contact traditional Hawaiian cultural layer with six human burials; and SIHP #50-80-14-6856, historic fishpond remnant.
O'Hare et al. 2006	-6658; -6659; -6660.	Monitoring for the Queen Street Extension Project. Three historic properties documented: SIHP #50-80-14-6658, a cluster of 28 burials; SIHP #50-80-14-6659, two isolated burials; and SIHP #50-80-14-6660, post-Contact trash deposit.
Esh and Hammatt 2006	N/A	Monitoring for the Rehabilitation of Street Unit 5B on Pi'ikoi Street between Ala Moana Boulevard and Matlock Street. No historic properties observed.
Hammatt 2008	-6910; -6911; -6912	Monitoring associated with the development of the Ko'olani Towers Phase I. Three historic properties were identified: SIHP #50-80-14-6910, a single pre-Contact burial; SIHP #50-80-14-6911, a cluster of 16 historic coffin burials; and SIHP #50-80-14-6912, a single burial.
Fong et al. 2009	N/A	Monitoring of Kapi'olani Boulevard Drainage, Water, and Sewer Systems Improvements. No historic properties observed.
Thurman, et al. 2009	-6856	Archaeological inventory survey for Queen Street parks project. Documented one previously identified historic property, SIHP #50-80-14-6856, a historic fishpond remnant, originally identified by Bell

Author	SIHP #50-80-14	Report Description and Findings
		et al. (2006).
Altizer et al. 2011	-6636	Archaeological Monitoring for the Kapi'olani Area Revised Sewer Systems. No new historic properties identified. Further documentation of SIHP #50-80-14-6636 was conducted in one sewer line segment (Sewer line G).
Runyon et al. 2011	-6636 -6641, -7115, -7116, -7117	Five historic properties were identified. SIHP #50-80-14-6641, a burned historic trash layer, was previously evaluated and determined significant under criteria A and D; SIHP #50-80-14-6636, Kewalo wetland sediment, was previously evaluated and determined significant under criteria A and D; SIHP #50-80-14-7115, a subsurface cultural layer containing intact pit features and artifacts, is significant based on criteria A, D, and E; SIHP #50-80-14-7116, a buried low-energy alluvial layer, is significant based on criteria A and D; SIHP #50-80-14-7117, based on available archaeological information, is a concentration of post-Contact human burials, the majority of which are in an extended burial posture and located in coffins. All 27 burials were documented in pits extending down from the overlying buried, culturally-enriched A-horizon (SIHP #50-80-14-7115).
Sroat and McDermott 2012	-6855	This Supplemental Archaeological Inventory Survey Report for the Ward Village Shops Phase 2 Project identified no new historic properties. Further documentation of SIHP #50-80-14-6855 was completed.
Runyon et al. 2012	-6636	Archaeological Inventory Survey Report for the Senior Residence at Pi'ikoi. Documented portions of the previously identified former wetland surface of the Kewalo area (SIHP #50-80-14-6636).

Kaka'ako Improvement District 4 (Winieski and Hammatt 2000b)

In 2000, archaeological monitoring by Cultural Surveys Hawai'i, Inc. for the Kaka'ako Improvement District 4 construction (Figure 13) documented two isolated historic coffin burials (SIHP #50-80-14-5598) on Kamake'e Street, between the intersections of Kawaiaha'o and Waimanu Streets (Winieski and Hammatt 2000b). The two adjacent burials were found in undisturbed beach sand with an associated A-horizon that was capped by modern fill. Well-defined burial pits were present, as well as staining from the deteriorated coffin wood. No associated artifacts, other than the coffins, were discovered during disinterment.

Kaka'ako Improvement District 7 (Souza et al. 2002)

In 2000, excavation associated with the Kaka'ako Improvement District 7 construction was undertaken by CSH (see Figure 13). Excavations consisted of trenching for utility rehabilitation on Kamake'e Street between Queen Street and Ala Moana Boulevard. Three human burials were encountered, which were severely disturbed by excavation activity (Souza et al. 2002). The burials' age and ethnicity are unknown, though the lack of grave goods may indicate they are pre-Contact or early post-Contact. Burial 1 (SIHP #50-80-14-6376) was inadvertently discovered by Delta Construction Company personnel on October 13, 2000, in the base yard back dirt pile. Burial 2 (SIHP #50-80-14-6377) was encountered by a CSH archaeologist during backhoe excavations for a box drain. The burial was located within an undisturbed beach sand deposit on Kamake'e Street, approximately 140 meters SW (*makai*) of the western end of the East Kaka'ako Zone. Burial 3 (SIHP #50-80-14-6378) was recovered in the Delta Co. base yard on Pensacola Avenue and Kapi'olani Boulevard.

Ko'olani Condominium (O'Hare et al. 2004; and Hammatt 2008)

In 2003, Cultural Surveys Hawai'i, Inc., conducted an archaeological inventory survey for the Ko'olani Condominium parcel in the Kewalo area, Honolulu (see Figure 11). Two previously unrecorded historic properties were found. SIHP #50-80-14-6639 and SIHP #50-80-14-6641 are historic trash pits dating from the early twentieth century. In addition, one previously identified historic property, the original wetland surface of Kewalo (SIHP #50-80-14-6636), was documented (O'Hare et al. 2004). Test Excavation 8 was located in the northwest corner of the project area, which borders the East Kaka'ako Zone corridor. This test excavation contained a substantial amount of fill, over natural sand and Kewalo Wetland Sediments (SIHP #50-80-14-6636). Test Excavation 8 was one of the 10 out of 13 test excavations in which this historic property was encountered.

In 2008, Cultural Surveys Hawai'i, Inc. completed archaeological monitoring associated with the development of the Ko'olani Towers Phase I, located in Kaka'ako, west of Waimanu Street and mid-block between Kamake'e Street and Pi'ikoi Street (see Figure 82). Three historic properties were identified: SIHP #50-80-14-6910, a single pre-Contact burial; SIHP #50-80-14-6911, a cluster of 16 historic coffin burials believed to comprise a discrete cemetery; and SIHP #50-80-14-6912, a single burial. (The total number of burials encountered was 18.) In addition, various historic trash deposits were observed throughout the study area but were not considered eligible for the Hawai'i Register of Historic Places (Hammatt 2008). Burials were reported at depths of 60 cmbs, 78 cmbs, and 100 cm below surface, but no depths are reported for most burials (due to removal of the former ground surface in the vicinity prior to burial discovery).

Eight of the burials were left in their original place of interment, with most of the rest relocated closer to the burials left in place. SIHP #50-80-14-6911 and -6910 are located approximately 120 meters from the East Kaka'ako Zone corridor.

Phase II Portion of the Ko'olani Condominium (Tulchin and Hammatt 2005)

In 2005, an inventory survey was conducted for the Phase II portion of the Ko'olani Condominium parcel (see O'Hare et al. 2004 for Phase I) in the Kewalo area of Honolulu (see Figure 11). Two historic properties were identified: SIHP #50-80-14-6636, original wetland surface of Kewalo area, and SIHP #50-80-14-6641, historic garbage layer. Both were previously identified by O'Hare et al. (2004). The wetland sediments (SIHP #50-80-14-6636) documented by Tulchin and Hammatt (2005) correspond with the stratigraphy observed during the current AIS in East Kaka'ako (T-186-T-193, T-195, and T-196).

Victoria Ward Village Shops (Bell et al. 2006; McDermott 2011; and Sroat and McDermott 2012)

In 2006, CSH completed an archaeological inventory survey for the Victoria Ward Village Shops (Bell et al. 2006) (see Figure 11 and Figure 13). As there were no surface historic properties within the project area, the investigation focused on an intensive subsurface testing program. Based on inventory survey investigation results, three significant historic properties were identified:

- SIHP #50-80-14-6854, subsurface cultural layer/activity area remnant, consists of an immature pig skeleton, remnants of a historic privy, remnants of a culturally enriched A-horizon (containing both historic and prehistoric cultural material), five previously identified human burials (found during AIS), and 23 inadvertent burial finds (found subsequently during burial disinterment and construction activity) (McDermott 2011).
- SIHP #50-80-14-6855, activity area remnant, is comprised of a pronounced subsurface traditional Hawaiian cultural layer that includes numerous pit features, six previously identified human burials (found during AIS), and 30 inadvertent burial finds (found subsequently during burial disinterment and construction activity) (McDermott 2011). There are two distinct portions to this cultural layer separated by areas of disturbance and/or a slightly culturally enriched buried A-horizon that contains both traditional Hawaiian and historic cultural material.
- SIHP #50-80-14-6856, a historic fishpond remnant, part of Land Commission Grant 3194, "Kolowalu," awarded to Kalae and Ka'aua.

The stratigraphy in several of the East Kaka'ako test excavations corresponds with Bell et al.'s (2006) documentation of SIHP #50-80-14-6856.

A Supplemental Archaeological Inventory Survey Report for the Ward Village Shops Phase 2 Project (Sroat and McDermott 2012) identified no new historic properties; however, further documentation of SIHP #50-80-14-6855 was conducted.

Queen Street Extension Project (O'Hare, Bush, and Hammatt 2006)

In 2004, CSH completed archaeological monitoring for the Queen Street Extension Project, which extended between Kamake'e Street and Pi'ikoi Street (see Figure 11). The western half of the East Kaka'ako Zone corridor lies within the western portion of the Queen Street Extension

project. Three historic properties were documented during the SIHP #50-80-14-6658, SIHP #50-80-14-6659, and SIHP #50-80-14-6660.

- SIHP #50-80-14-6658 is a cluster of 28 burials within the Queen Street extension, approximately 75 meters Diamond Head of Kamake'e Street. Seventeen of the 28 burials were determined to be of Hawaiian ethnicity, based on the types of grave goods, the presence of tooth ablation, and a traditional burial position (flexed vs. extended). The ethnicity of the remaining 11 could not be definitively determined, but it is assumed that most of these were also Hawaiian since this area of Kaka'ako was not inhabited by other ethnic groups until the twentieth century. All grave goods were historic; most were dated to the mid to late nineteenth century. It is possible that many of these individuals were victims of the 1853 smallpox epidemic or one of the other epidemics that decimated the Hawaiian population in the last half of the nineteenth century.
- SIHP #50-80-14-6659 consists of two isolated burials in a previously disturbed stratigraphic context, located in the intersection of Waimanu Street and Queen Street. The age and ethnicity of these burials could not be determined.
- SIHP #50-80-14-6660 is a discrete historic dump area near Kamake'e Street containing bottles dated to the early twentieth century. The burials were reinterred in a reburial vault in the immediate vicinity on the *mauka* side of Queen Street.

O'Hare et al. (2006:64) also documented four distinct stratigraphic zones within their project area. Two of these zones contained undisturbed sand, perhaps sandbar remnants, along the southeastern and southwestern edges of Kolowalu Fishpond (SIHP #50-80-14-06856). One zone consisted of various sand pockets and coral fill that appeared to be related to the reclamation of the low-lying wetland area (O'Hare et al. 2006:64). The fourth stratigraphic zone was consistent with the findings of the current HHCTCP AIS. This zone consisted of various layers of fill material overlying a natural gleyed clay stratum, associated with the bottom of the Kolowalu Fishpond. The stratigraphy in the adjacent East Kaka'ako test excavations corresponds with the findings of O'Hare et al. (2006), and included several fill layers overlying either remnant Kolowalu Fishpond sediments (T-181–T-185), or remnant Kewalo wetland deposits (SIHP #50-80-14-06636) (T-186-T-193, T-195, and T-196).

Rehabilitation of Streets Unit 5B on Pi'ikoi Street (Esh and Hammatt 2006)

In August 2004, Cultural Surveys Hawai'i, Inc. conducted archaeological monitoring for the Rehabilitation of Streets Unit 5B on Pi'ikoi Street, which marks the eastern end of the East Kaka'ako Zone between Ala Moana Boulevard and Matlock Street (Esh and Hammatt 2006) (see Figure 11). No historic properties were observed.

Kapi'olani Boulevard Drainage, Water, and Sewer Systems (Fong et al. 2009)

In 2009, Cultural Surveys Hawai'i, Inc. completed archaeological monitoring of construction associated with the upgrading of existing drainage, water, and sewer systems within Kapi'olani Boulevard from Kalākaua Avenue to Ward Avenue, within Kamake'e Street from Kapi'olani Boulevard to Auahi Street, and within Atkinson Drive from Kapi'olani Boulevard to Ala Moana Boulevard (see Figure 11). No historic properties were observed.

Observed stratigraphy consisted primarily of imported fill material associated utility and road construction. In some instances pockets of naturally deposited sediment (Jaucas sand and wetland clays) were observed beneath fill deposits.

Queen Street Parks Project (Thurman et al. 2009)

In 2009, Cultural Surveys Hawai'i, Inc. completed an archaeological inventory survey for the Queen Street Parks project (see Figure 11). Fieldwork involved the excavation of 29 backhoe excavations. One previously identified historic property was recorded: SIHP #50-80-14-6856, the Kolowalu fish pond remnant originally identified by Bell et al. (2006). Documented stratigraphy consisted of varying fill layers overlying various naturally deposited sediments atop the coral shelf. The fill consisted of imported terrigenous sediment, incinerator material containing burned and non-burned historic refuse, crushed coral, and hydraulic fill. Natural sediments consisted primarily of backshore marsh or pond sediments associated with SIHP #50-80-14-6856 (Kolowalu Fishpond). These fishpond sediments correspond with the stratigraphy observed during the current AIS in East Kaka'ako (T-181 to T-185). Naturally-deposited Jaucas sand deposits were also observed.

Kapi'olani Area Revised Sewer System (Altizer et al. 2011)

In 2008 and 2009, Cultural Surveys Hawai'i, Inc. conducted archaeological monitoring for the rehabilitation or replacement of 13 sewer line segments within the Kapi'olani area (see Figure 11). During the subsurface program, CSH encountered former wetland or marsh sediment containing an abundance of land snail shell. This wetland sediment was documented as part of the previously recorded Kewalo Wetland sediments (SIHP #50-80-14-6636), also observed during the current AIS in East Kaka'ako (T-186 to T-193, T-195, and T-196).

Waihonua (Runyon et al. 2011)

In 2011, Cultural Surveys Hawai'i, Inc. completed an Archaeological Inventory Survey Report for the Ko'olani Phase II (re-named Waihonua) Project (located just *mauka* of the Tulchin and Hammatt 2005 project area; see Figure 11). Five historic properties were documented within the project area (two previously documented and three newly identified). During a previous archeological inventory survey (Tulchin and Hammatt 2005), eight trenches were excavated within the southern portion of the current project area. The investigation documented a layer of burned trash in the southern portion of the project area, which dated from the 1880s to 1920s and was designated SIHP #50-80-14-6641. Additionally, buried Kewalo wetland sediment was documented in the southern portion of the project area and was designated SIHP #50-80-14-6636. These wetland sediments were also observed during the current AIS in East Kaka'ako (T-186 to T-193, T-195, and T-196).

As a result of the investigation, the boundary of SIHP # -6641 was expanded and three newly documented historic properties were identified. These included the following:

- SIHP #50-80-14-7115, a buried culturally-enriched sand A-horizon (cultural layer) containing multiple pit features and pre- and post-Contact artifacts, located throughout the west half of the project area.

- SIHP #50-80-14-7116, a buried low-energy alluvial layer (gleyed sediment) corresponding geographically to a documented historic pond, located in the northern portion of the project area.
- SIHP #50-80-14-7117, a concentration of 27 post-Contact human burials, located in the western portion of the project area, approximately 100 meters from the East Kaka'ako Zone corridor.

Senior Residence at Pi'ikoi (Runyon, Borthwick, and Hammatt 2012)

In 2012, Cultural Surveys Hawai'i, Inc. completed an Archaeological Inventory Survey Report for the Senior Residence at Pi'ikoi (see Figure 11). The project area is located at the corner of Pi'ikoi Street and Kona Street, directly *makai* of the east end of the East Kaka'ako Zone corridor. Subsurface Kewalo wetland sediments (SIHP #50-80-14-6636) were observed in all 13 of the test excavations during the project. In general, the wetland deposits consist of very dark brown silty clay loam containing abundant decomposing organic materials (peat), snail shells, rootlets and charcoal flecking. These sediments were usually overlying gleyed sandy clay sediments over the coral shelf. Similar deposits of this wetland surface were observed during the current AIS in East Kaka'ako (T-186-T-193, T-195, and T-196). Historic documentation suggests the site was capped with imported fill during early twentieth century Land Reclamation fill events. The site has been previously documented in nearby areas in Kaka'ako (O'Hare et al. 2003, O'Hare et al. 2004, Tulchin and Hammatt 2005, and Runyon et al. 2011).

A sediment sample collected from SIHP #50-80-14-6636 was analyzed by Dr. Carl Christensen, professional malacologist. In general, the analysis found that the wetland site, SIHP #50-80-14-6636, contains fauna typical of other similar wetland environmental sites in Hawai'i. The analysis also noted that the snail species represented in the samples were "little changed from those present there and in similar environments in pre-Contact times" (Christensen 2011:9). Of three snail species commonly found in these wetland environments (*T. porrecta*, *M. tuberculata*, and *T. granifera*), one species (*T. porrecta*) found within SIHP #50-80-14-6636 is now virtually extinct.

2.6 Modern Land Use and Built Environment

The East Kaka'ako Zone traverses an urban environment through the neighborhood of Kaka'ako/Kewalo. The centerline of the project alignment within the East Kaka'ako Zone lies within Queen Street and Kona Street, cutting through a current industrial lot bordered by Waimanu, Pensacola and Kona Streets. Parcels bordering the East Kaka'ako Zone corridor contain primarily commercial structures, industrial warehouses, residential high rises and parking lots. Additionally, two construction projects are on-going, one at the east end of the corridor and a second slightly *makai* of the East Kaka'ako Zone Corridor on Waimanu Street, both for residential high rise buildings. A massive utility corridor is also present throughout the East Kaka'ako Zone containing electrical, gas, water, sewer, and storm lines. The number and distribution of these existing utilities indicate that this East Kaka'ako Zone has been heavily disturbed in the past.

2.7 Test Excavation 179 (T-179)

Ahupua'a:	Honolulu
LCA:	387
TMK #:	2-3-004: 080
Elevation Above Sea Level:	1.32 m
UTM:	619110 mE, 2355157 mN
Max Length/Width/Depth:	3.66 m / 0.93 m / 1.26 mbs
Orientation:	331 / 151° TN
Targeted Project Component:	Guideway Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 179 (T-179) was located on private property within the east bound road cut of the modern Queen Street extension. T-179 was relocated 6.5 m north of its original layout due to the re-alignment of the HHCTCP project area. A water line was located approximately 3 m northeast of T-179 and a telephone box was located 2.7 m southwest. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-179 was situated in LCA 387 awarded to the American Board of Commissioners for Foreign Missions (ABCFM). A Land Commission Grant 3194 awarded to Kalae and Ka'aua was located 50.0 m east of T-179. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-179 consisted of a marsh/wetland environment. T-179 was located within 50.0 m of the Kolowalu (also referred to as Kolowalu) fishpond (SIHP #50-80-14-6856) and approximately 230 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little land development within the vicinity at that time. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-179. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-179, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 5.0 m south of T-179 (Bell et al. 2006). Three cultural resources were identified including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856.) According to O'Hare et al. (2004), three historic properties were recorded as part of an archaeological inventory survey for the Ko'olani Condominium project, approximately 195.0 m east of T-179. Approximately 45.0 m northwest of T-179, three human burials (SIHP #50-80-14-6376, -6377, -6378) were encountered during the archaeological monitoring of the Kaka'ako

Improvement District 7 project (Souza et al. 2002.) According to Winieski and Hammatt (2000b), two historic coffin burials and historic cultural materials (SIHP #50-80-14-5598) were recorded during the archaeological monitoring for the Kaka'ako Improvement District 4, approximately 130 m west of T-179.

Documentation Limitations: T-179 was excavated to the water table at a depth of 1.26 mbs. There were no specific factors that limited documentation of T-179.

Stratigraphic Summary: The stratigraphy at T-179 consisted of fill overlying natural sediment. Observed strata included asphalt (Ia), gravel base course (Ib), coarse cobble layer (Ic), and natural marine sand (II). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: A bulk sediment sample was collected from Stratum II between 1.05–1.15 mbs (4.5 L). The bulk sample was wet-screened and contained naturally-occurring, water-rounded limpets/gastropods (3.6 g), crustacean fragments (1.6 g), Mytilidae *Brachiodontes crebristriatus* (1.1 g), Neritidae (0.1 g), and Echinodermata *diadema/mathaei* sp. (0.1 g). The results of sample analysis support the identification of Stratum II as a natural marine deposit.

GPR Discussion: A review of amplitude slice maps indicated a linear feature but none were encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth except for the linear feature. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.75 mbs.

GPR depth profiles for T-179 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.4 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.0 mbs.

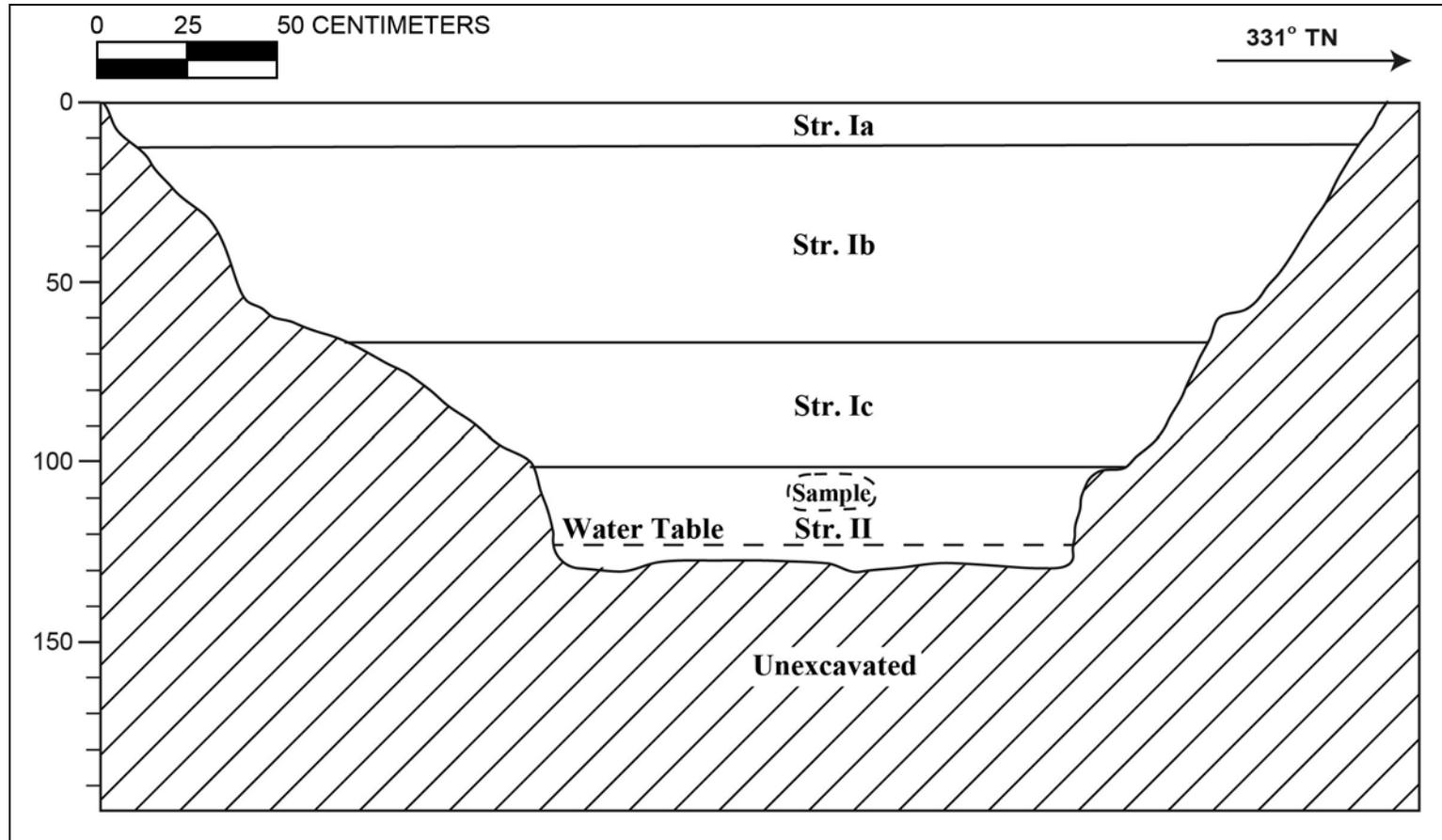
Summary: T-179 was excavated to the water table at a depth of 1.26 mbs. The stratigraphy of T-179 consisted of fill (Ia–Ic) overlying natural sediment (II). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). A bulk sediment sample was collected from Stratum II between 1.05–1.15 mbs (4.5 L). The bulk sample was wet-screened and contained natural marine shell and shell fragments. The results of sample analysis support the identification of Stratum II as a natural marine deposit. No archaeological cultural resources were identified within T-179.



T-179 general location, view to east



T-179 southwest profile wall, view to south



T-179 southwest wall profile

T-179 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-13	Asphalt; road surface
Ib	13-68	Fill; 10 YR 5/1 (gray); extremely gravelly sandy loam; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; base course
Ic	68-104	Fill; 10 YR 5/1 (gray); cobbles; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt lower boundary; base course cobbles
II	104-126	Natural; 10 YR 8/4 (very pale brown); sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; lower boundary not visible; possibly previously disturbed during deposition of overlying fill deposits

2.8 Test Excavation 180 (T-180)

Ahupua'a:	Honolulu
LCA:	387
TMK #:	2-3-004: 080
Elevation Above Sea Level:	1.3 m
UTM:	619139 mE, 2355132 mN
Max Length/Width/Depth:	3.07 m / 0.92 m / 1.04 m
Orientation:	134 / 314° TN
Targeted Project Component:	Guideway Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 180 (T-180) was located within the road cut of the modern Queen Street extension. T-180 was located on private property. A water line was located approximately 1.0 m south of T-180. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-180 was situated in LCA 387 awarded to the ABCFM. A Land Commission Grant 3194 awarded to Kalae and Ka'aua was located 26.0 m northeast of T-180. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-180 consisted of a marsh/wetland environment. T-180 was adjacent to the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 230 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little land development within the vicinity at that time. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-180. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-180, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 12.0 m south of T-180 (Bell et al. 2006). Three cultural resources were identified including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856.) According to O'Hare et al. (2004), three historic properties were recorded as part of an archaeological inventory survey for the Ko'olani Condominium project, approximately 195.0 m east of T-180. Approximately 45.0 m northwest of T-180, three human burials (SIHP #50-80-14-6376, -6377, -6378) were encountered from the archaeological monitoring of the Kaka'ako Improvement District 7 project (Souza et al 2002.) According to Winieski and Hammatt (2000b), two historic coffin burials and historic cultural materials (SIHP #50-80-14-5598) were recorded during the archaeological monitoring for the Kaka'ako Improvement District 4, approximately 130.0 m west of T-180.

Documentation Limitations: T-180 was excavated to beneath the water table at a depth of 1.04 mbs. There were no specific factors that limited documentation of T-180.

Stratigraphic Summary: The stratigraphy at T-180 consisted of fill to the water table. Observed strata included asphalt (Ia), crushed gravel base course (Ib), very gravelly sandy loam (Ic and Id), loamy clay (Ie), and sandy clay loam (If). The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

Artifact Discussion: No artifacts were observed.

Feature Discussion: No features were observed.

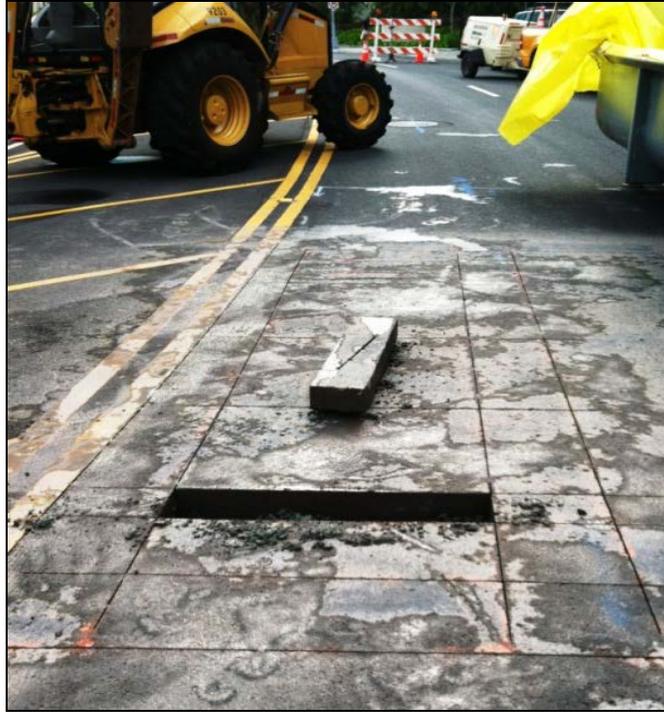
Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: No sample analysis was conducted.

GPR Discussion: A review of amplitude slice maps indicated no linear features that might correspond to the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.75 mbs.

GPR depth profiles for T-180 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.6 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 0.9 mbs.

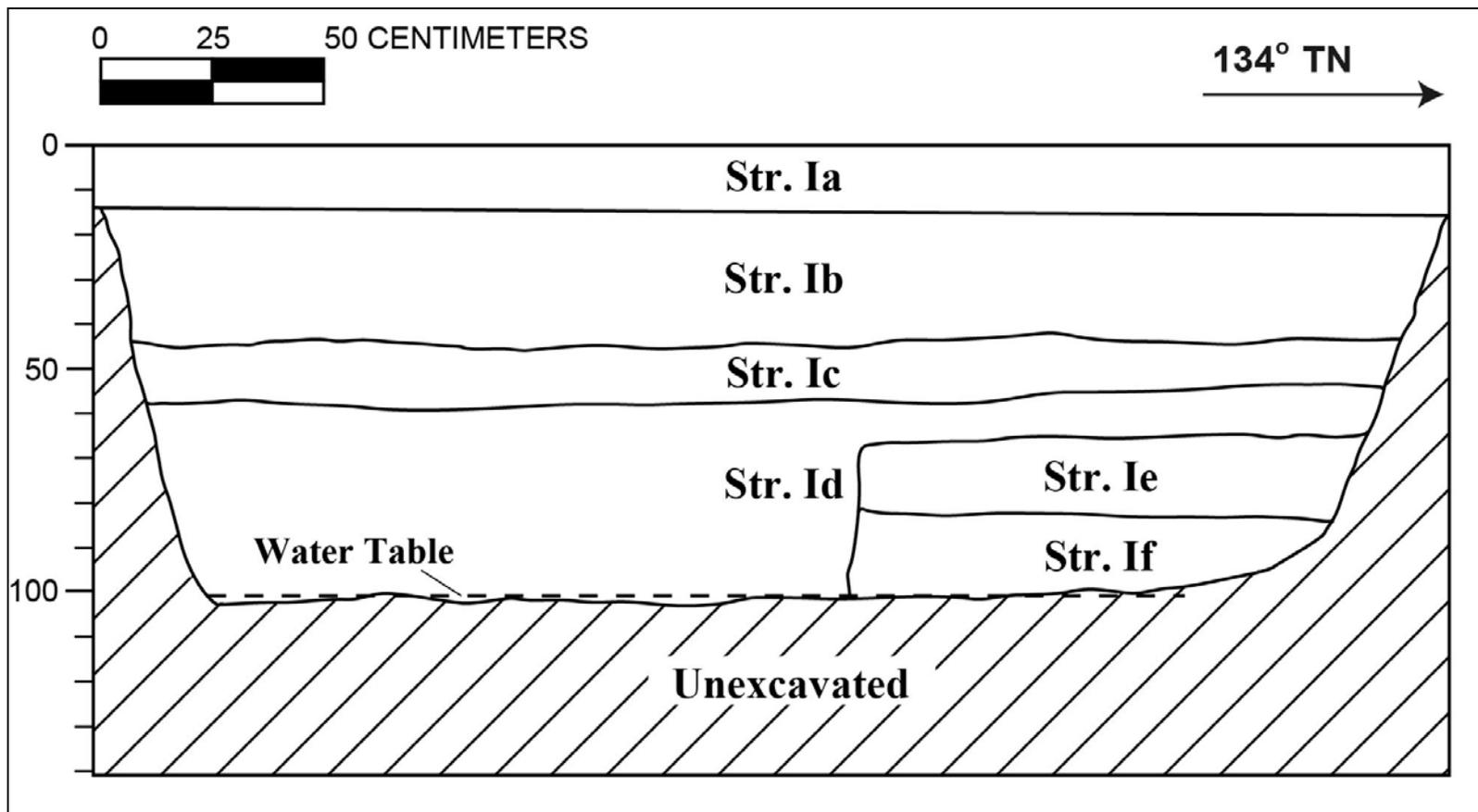
Summary: T-180 was excavated to beneath the water table at a depth of 1.04 mbs. The stratigraphy at T-180 consisted of fill (Ia-If) to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). No natural sediment was observed. No cultural materials were identified within T-180.



T-180 general location, view to southeast



T-180 northeast profile wall, view to east



T-180 northeast wall profile

T-180 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–15	Asphalt
Ib	15–46	Fill; 10 YR 5/1 (gray); extremely gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	42–60	Fill; very gravelly sandy loam; weak, medium, crumb structure; moist, very friable consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; crushed gravel and crushed coral in a sandy loam matrix grading fill
Id	52–103	Fill; 10 YR 4/2 (dark grayish brown) with clay mottles; very gravelly sandy loam; moderate, medium, crumb structure; moist, very friable consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; fill deposit
Ie	63–83	Fill; 2.5 YR 3/6 (dark red); loamy clay; moderate, coarse, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; very abrupt, smooth lower boundary; grading fill
If	81–104	Fill; 5 Y 8/1 (white); sandy clay loam; moderate, medium, crumb structure; moist, friable consistency; slightly plastic; mixed origin; lower boundary not visible; hydraulic fill deposit

2.9 Test Excavation 181 (T-181)

Ahupua'a:	Honolulu
LCA:	N/A (Grant 3194)
TMK #:	2-3-004: 080
Elevation Above Sea Level:	1.44 m
UTM:	619173 mE, 2355115 mN
Max Length/Width/Depth:	3.69 m / 1.23 m / 1.40 m
Orientation:	290 / 110° TN
Targeted Project Component:	Guideway Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 181 (T-181) was located within the road cut of the modern Queen Street extension near Kamake'e and Waimanu Street, on private property. A water line was located approximately 3.0 m south of T-181 and a sewer line located to the north. The topography of the excavation area was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-181 was situated in Land Commission Grant 3194 awarded to Kalae and Ka'aua and 2.6 m west of LCA 387 awarded to the ABCFM. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-181 consisted of a marsh/wetland environment. T-181 was within the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 232.0 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little land development within the vicinity at that time. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-181. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-181, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 23.0 m south of T-181 (Bell et al. 2006). Three cultural resources were identified including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009, an archaeological inventory survey was conducted for the Queen Street parks project in which a previously identified cultural resource, indicative of Kolowalu Fishpond (SIHP #50-80-14-6856), was encountered (Thurman et al. 2009).

Documentation Limitations: T-181 was excavated to a depth of 1.40 mbs and beneath the water table at 1.3 mbs. A PVC irrigation pipe was encountered within the southwest portion of T-181, which limited excavation.

Stratigraphic Summary: The stratigraphy at T-181 consisted of fill overlying natural sediment to the beneath the water table. Observed strata included asphalt (Ia), gravel base course (Ib), crushed coral fill (Ic), and locally-procured sandy clay fill (Id) overlying natural sandy clay (II). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). Stratum II contained lenses of peat material and common, fine roots. The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: A total of two bulk sediment samples were collected from T-181, including a sample of Stratum Id between 0.8–1.0 mbs (1 L) and one from Stratum II between 1.20–1.30 mbs (0.5 L). The bulk samples were wet-screened. Samples from Stratum Id and Stratum II contained only naturally-occurring, water-rounded marine shell. The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events. The marine shell, which exhibited smooth, water-rounded edges, does not appear to be culturally-modified or deposited as the result of human activity.

GPR Discussion: Although a review of amplitude slice maps indicated a linear feature, none were encountered during excavation. An irrigation line, however, was encountered below the clean signal return. Reflectivity was relatively uniform throughout the grid and decreased with depth except for the linear feature detected by the GPR. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs and increased again around 0.75 mbs.

GPR depth profiles for T-181 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.3 mbs. An anomaly was observed in the profile but was not encountered during excavation, although an irrigation line was encountered. The maximum depth of clean signal return was approximately 1.1 mbs.

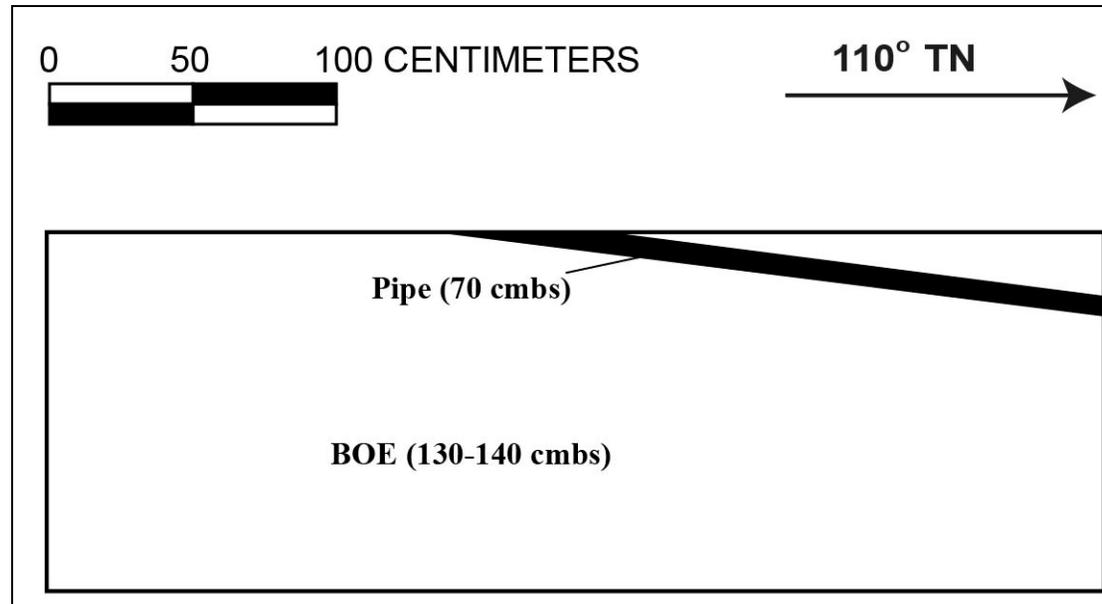
Summary: T-181 was excavated to a depth of 1.40 mbs and beneath the water table at 1.3 mbs. The stratigraphy at T-181 consisted of fill (Ia to Id) overlying natural sediment (II) to the beneath the water table. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). A total of two bulk sediment samples were collected from T-181, including a sample of Stratum Id between 0.8–1.0 mbs (1 L) and one from Stratum II between 1.20–1.30 mbs (0.5 L). The bulk samples were wet-screened yielding only naturally-occurring, water-rounded marine shell. The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events (St. II). T-181 was located within the previously established boundary of Kolowalu Fishpond (SIHP #50-80-14-6856).



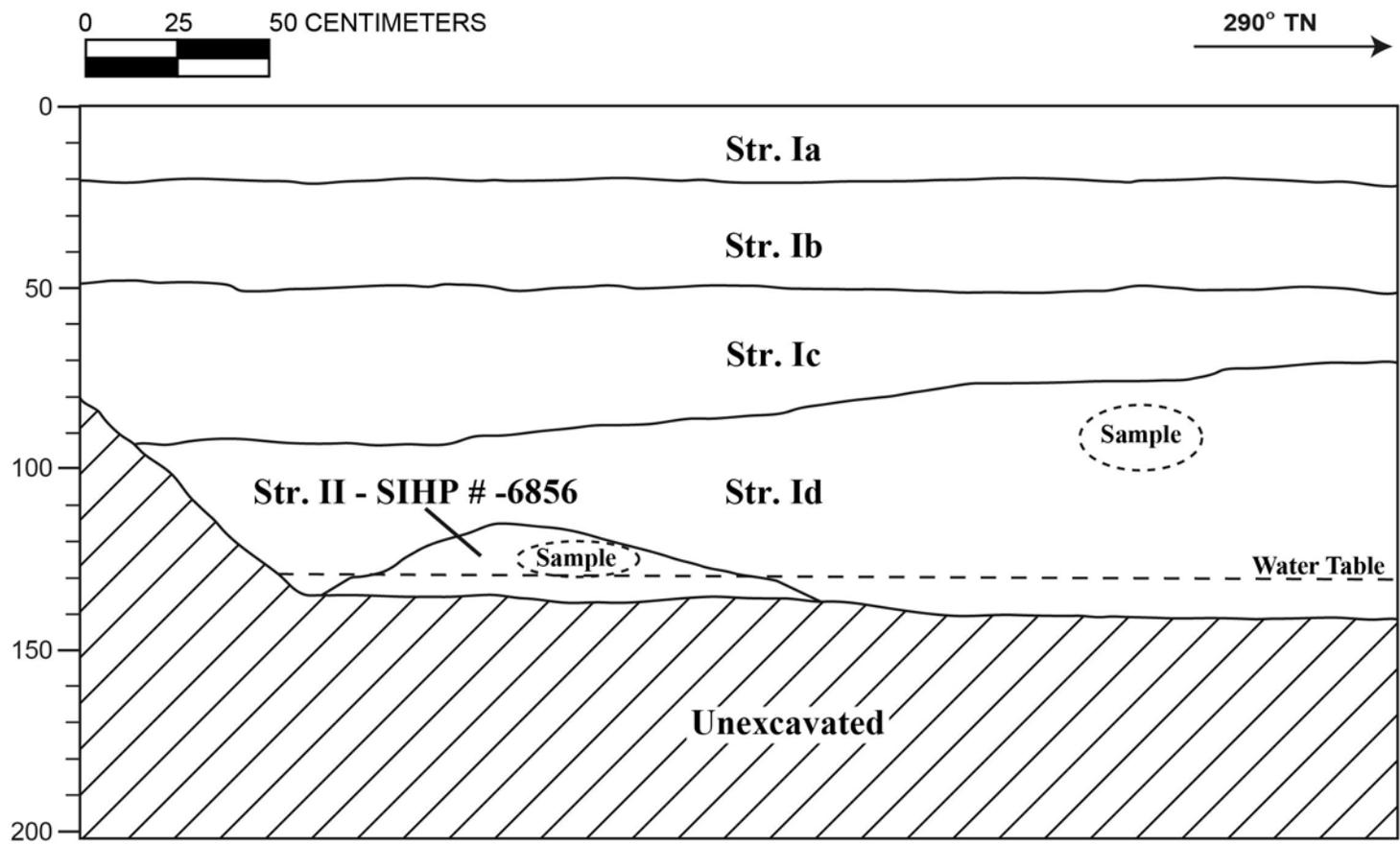
T-181 general location, view to east



T-181 south profile wall, view to southwest



T-181 post-excavation plan view showing the base of excavation (BOE) and the location of a PVC irrigation pipe



T-181 south wall profile

T-181 Stratigraphic Description

Stratum	Depth (cmts)	Description
Ia	0–21	Asphalt
Ib	21–50	Fill; 10 YR 4/4 (dark yellowish brown); extremely gravelly clay loam; structureless, single-grain; dry, loose consistency; non-plastic; terrigenous; very abrupt lower boundary; base course used a cushion material for overlying street surface, basalt gravel and coral gravel and cobble
Ic	50–95	Fill; 10 YR 8/3 (very pale brown); very coarse sand to cobbles; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, wavy lower boundary; crushed coral used as fill to elevate former land surface
Id	70–130	Fill; 2.5 Y 7/2 (light gray) with many, coarse, sandy clay mottles of 10YR 7/3 (very pale brown); structureless, massive; moist, firm to very firm consistency; plastic; mixed origin; clear, wavy lower boundary; locally-procured sediment from underlying wetland environment
II	115–140	Natural; GLEY 1 6/10 Y (greenish gray) with common, fine to coarse mottles of GLEY 1 7/1 (light greenish gray); sandy clay; structureless, massive; moist, very friable consistency; plastic; terrestrial origin; discontinuous lower boundary; common, very fine roots; contained lenses of peat material; component of SIHP # -6856

2.10 Test Excavation 182 (T-182)

Ahupua'a:	Honolulu
LCA:	N/A (Grant 3194)
TMK #:	2-3-004: 080
Elevation Above Sea Level:	1.52 m
UTM:	619249 mE, 2355109 mN
Max Length/Width/Depth:	3.02 m / 0.90 m / 1.38 mbs
Orientation:	264 / 84° TN
Targeted Project Component:	Guideway Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 182 (T-182) was located within the road cut of the modern Queen Street extension between Kamake'e and Waimanu Street on private property. Utilities in the immediate area of T-182 included a water line utility located 3.5 m north, a drain line located 4.5 m west, and a sewer line located 6.4 m south. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-182 was situated in Land Commission Grant 3194 awarded to Kalae and Ka'aua and 51 m north of LCA 387 awarded to the ABCFM. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-182 consisted of a marsh/wetland environment. T-182 was within the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 230 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little development within the vicinity. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-182. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-182, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 10.0 m south of T-182 (Bell et al. 2006). Three cultural resources were identified including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009, an archaeological inventory survey was conducted for the Queen Street parks project located 20.0 m southeast of T-182 in which a previously identified cultural resource, indicative of Kolowalu Fishpond (SIHP #50-80-14-6856), was encountered (Thurman et al. 2009).

Documentation Limitations: T-182 was excavated to a depth of 1.38 mbs and below the water table at 1.31 mbs. A concrete jacket was located within the east end of T-182, which limited documentation.

Stratigraphic Summary: The stratigraphy of T-182 consisted of fill overlying natural sediment. Observed strata included asphalt (Ia), very gravelly sandy loam fill (Ib), stony crushed coral sand fill (Ic), and fine sand fill (Id), overlying natural sandy clay (II) to the water table. The stratigraphy generally conformed to the USDA soil designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: One bulk sediment sample was collected from Stratum II between 1.29–1.38 mbs (2 L). The bulk sample was wet-screened. The sample contained only naturally-occurring, water-rounded marine shell. The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events. The marine shell, which exhibited smooth, water-rounded edges, does not appear to be culturally-modified or deposited as the result of human activity.

GPR Discussion: A review of amplitude slice maps indicated no linear features, although a concrete utility jacket was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

GPR depth profiles for T-182 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.3 mbs. An anomaly was observed in the profile which corresponded to the utility jacket encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

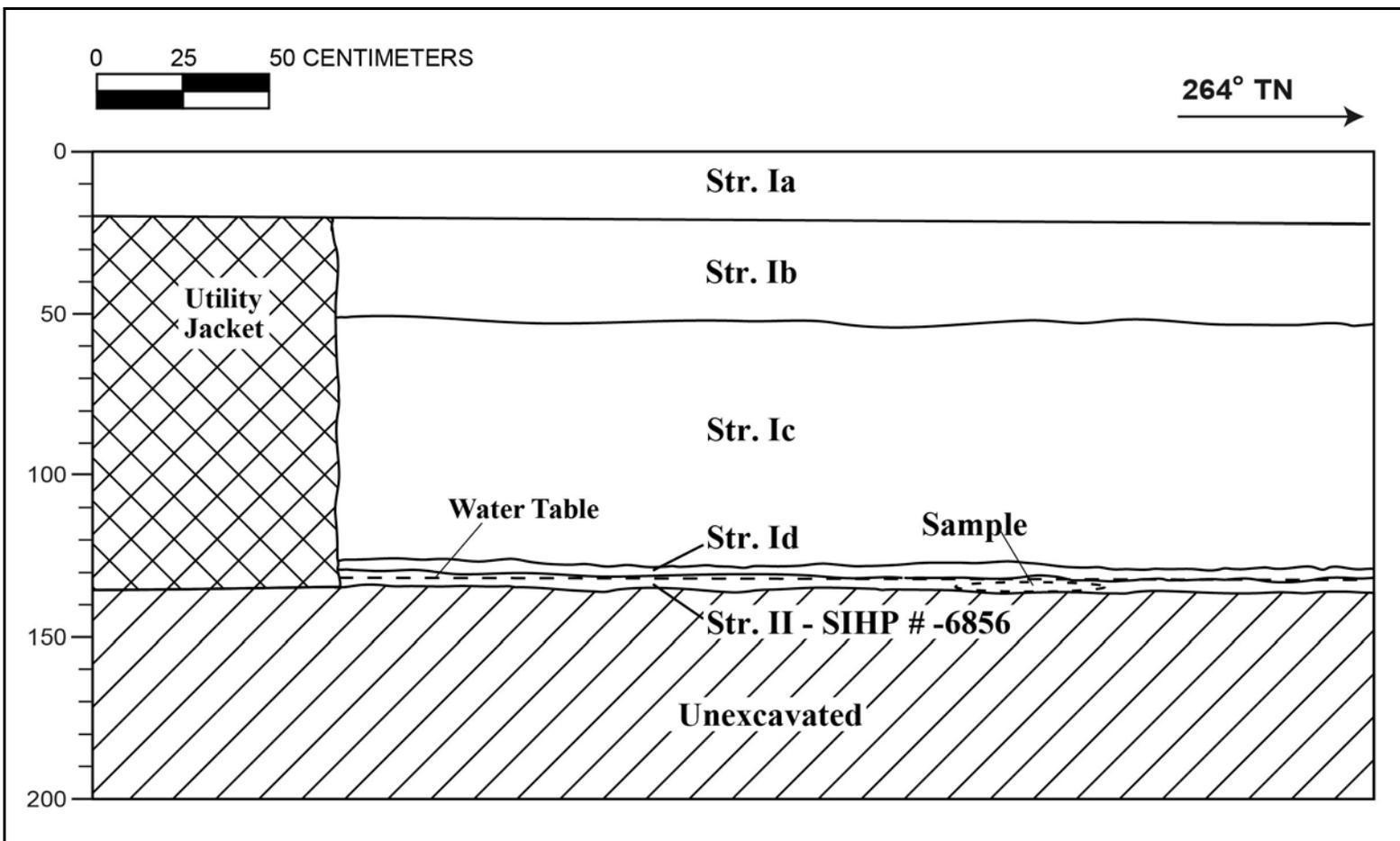
Summary: T-182 was excavated to a depth of 1.38 mbs and below the water table at 1.31 mbs. The stratigraphy of T-182 consisted of fill (Ia to Id) overlying natural sediment (II). The stratigraphy generally conformed to the USDA soil designation of Fill land (FL). One bulk sediment sample was collected from Stratum II between 1.29–1.38 mbs (2 L). The bulk sample was wet-screened yielding only naturally-occurring, water-rounded marine shell. The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events (St. II). T-182 was located within the previously established boundary of Kolowalu Fishpond (SIHP #50-80-14-6856).



T-182 general location, view to west



T-182 south profile wall, view to southwest



T-182 north wall profile

T-182 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–20	Asphalt
Ib	20–50	Fill; 10 YR 3/4 (very yellowish brown); very gravelly sandy loam; weak, very fine, crumb structure; dry, weakly coherent consistency; terrigenous origin; clear, smooth lower boundary; concrete jacket at E end; basalt base course
Ic	50–126	Fill; 10 YR 8/3 (very pale brown); stony sand; structureless, single-grain; moist-loose consistency; non-plastic; marine origin; diffuse, smooth lower boundary; crushed coral fill
Id	126–130	Fill; 10 YR 8/2 (very pale brown); fine sand; structureless, single-grain; non-sticky consistency; non-plastic; marine origin; clear lower boundary; appears to be fine-grain material that has settled from the overlying stony crushed coral sand (Ic)
II	129–138	Natural; GLEY 2 6/1 (bluish gray); clay; structureless, massive; wet, slightly sticky consistency; slightly plastic; terrestrial origin; lower boundary not visible; natural sediment; component of SIHP # -6856

2.11 Test Excavation 183 (T-183)

Ahupua'a:	Honolulu
LCA:	N/A (Grant 3194)
TMK #:	2-3-004:080
Elevation Above Sea Level:	1.44 m
UTM:	619287 mE, 1244119 mN
Max Length/Width/Depth:	3.75 m / 0.90 m / 1.80 mbs
Orientation:	250 / 70° TN
Targeted Project Component:	Guideway Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 183 (T-183) was located within the road cut of the modern Queen Street extension between Kamake'e and Waimanu Street. T-183 was located on private property. Utilities in the immediate vicinity of T-183 include a water line utility located 1.8 m south, a drain line located 6.7 m south, and an electrical line located 1.8 m south. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-183 was situated in Land Commission Grant 3194 awarded to Kalae and Ka'aua and 55.0 m west of LCA 10605:7 awarded to Pi'ikoi. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-183 consisted of a marsh/wetland environment. T-183 was within the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 251.0 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little development within the vicinity. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-183. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-183, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 30.0 m south of T-183 (Bell et al. 2006). Three cultural resources were identified, including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials, six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009, an archaeological inventory survey was conducted for the Queen Street parks project located 14 m south of T-183 in which a previously identified cultural resource, indicative of Kolowalu Fishpond (SIHP #50-80-14-6856), was encountered.

Documentation Limitations: T-183 was excavated to a depth of 1.80 mbs and beneath the water table at 1.70 mbs. Sediment samples were not collected due to possible sewage contamination from a leaking PVC pipe.

Stratigraphic Summary: The stratigraphy of T-183 consisted of fill overlying natural sediment to beneath the water table. Observed strata included asphalt (Ia), extremely gravelly sandy silt base course (Ib), gravelly sandy loam fill (Ic), and hydraulic fill (Id), overlying natural clay (IIa) and natural sand (IIb). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: No sample analysis was conducted.

GPR Discussion: A review of amplitude slice maps indicated no linear features although utilities were encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

GPR depth profiles for T-183 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs and again around 0.55 mbs. Several anomalies were observed in the profile but not within the excavation boundaries and do not correspond to the utilities encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

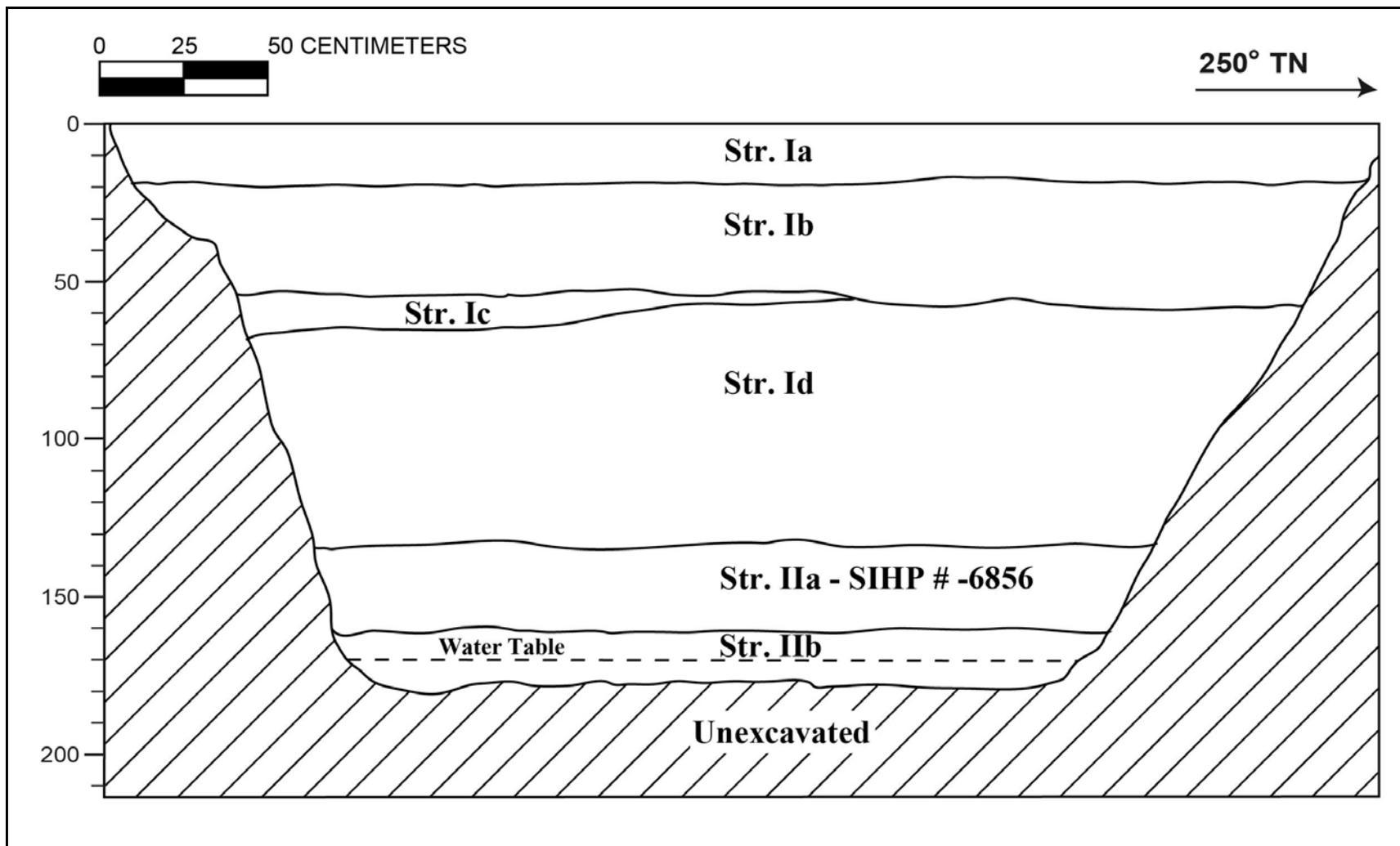
Summary: T-183 was excavated to a depth of 1.80 mbs and beneath the water table at 1.70 mbs. The stratigraphy of T-183 consisted of fill (Ia to Id) overlying natural sediment (IIa and IIb) to beneath the water table. The stratigraphy generally conformed to the USDA soil survey designation of Fill land. T-183 was located within the previously established boundary of Kolowalu Fishpond (SIHP #50-80-14-6856). The natural sediment (IIa) within T-183 was considered to be a possible remnant of Kolowalu Fishpond (SIHP #50-80-14-6856).



T-183 general location, view to west



T-183 south profile wall, view to southwest



T-183 south wall profile

T-183 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–20	Asphalt
Ib	20–58	Fill; 10 YR 6/1 (gray); extremely gravelly sandy silt single-grain structure; moist, loose consistency; non-plastic; terrigenous origin; very abrupt, smoother lower boundary, basalt gravel base course
Ic	52–70	Fill; 10 YR 4/4 (dark yellow brown) with many coarse mottles of 10 YR 8/1 (white); very gravelly silt loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; very abrupt, broken/discontinuous lower boundary; with crushed coral in matrix
Id	58–135	Fill; 2.5 Y 7/3 (pale yellow); sandy clay; structureless, massive; moist, very firm consistency; plastic; mixed origin; abrupt, smooth lower boundary; sandy clay hydraulic fill material
IIa	130–165	Natural; GLEY 2 6/1 (greenish gray); clay; structureless, massive; moist, very firm consistency; plastic; terrestrial origin; diffuse, smooth lower boundary; component of SIHP # -6856
IIb	165–180	Natural; GLEY 2 5/1 (greenish gray); sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; marine origin; lower boundary not visible

2.12 Test Excavation 184 (T-184)

Ahupua'a:	Honolulu
LCA:	N/A (Grant 3194)
TMK #:	N/A
Elevation Above Sea Level:	1.36 m
UTM:	619334 mE, 2355149 mN
Max Length/Width/Depth:	5.5 m / 0.99 m / 1.47 m
Orientation:	130 / 310° TN
Targeted Project Component:	Utility Relocation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 184 (T-184) was located within a landscaped area, slightly elevated from the surrounding area. T-184 was located adjacent to the Queen Street and Waimanu Street intersection, and extended parallel with Waimanu Street. T-184 was located on City and County of Honolulu property. A sewer line was located 7.4 m southwest of T-184.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-184 was situated in Land Commission Grant 3194 awarded to Kalae and Ka'aua and 30.0 m west of LCA 10605:7 awarded to Pi'ikoi. In relation to the 1897 map of Honolulu by M. D. Monsarrat the natural landscape surrounding T-184 consisted of a marsh/wetland environment. T-184 was within the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 284.0 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little development within the vicinity. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-184. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-184, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 100.0 m southwest of T-184 (Bell et al. 2006). Three cultural resources were identified, including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009 an archaeological inventory survey was conducted for the Queen Street parks project located 49.0 m southwest of T-184 in which a previously identified cultural resource indicative, of Kolowalu Fishpond (SIHP #50-80-14-6856), was encountered (Thurman et al. 2009).

Documentation Limitations: T-184 was excavated to a depth of 1.47 mbs and beneath the water table at 1.40 mbs. A storm drain, large roots, and unstable sidewalls limited the excavation of T-184.

Stratigraphic Summary: Stratigraphy of T-184 consisted of fill overlying natural sediment to beneath the water table. Observed strata included asphalt (Ia), very gravelly sandy loam base course (Ib), crushed coral fill (Ic), and sandy clay (Id) overlying natural clay (II). The stratigraphy generally conformed to the USDA soil survey designation of Fill land.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: A total of two bulk samples were collected from T-184, including one from Stratum Id at 0.86-1.06 mbs (3.8 L) and one from Stratum II at 1.39–1.46 mbs (3.8 L). The bulk samples were wet-screened. Contents from Stratum Id included marine shell content that was considered to be a naturally-occurring within the sediment matrix. Natural marine shell included *Theodoxus neglectus* (2.8 g), crustacean (0.5 g), gastropods (5.1 g), snails (2.9 g), and Echinodermata *mathaei sp/diadema sp* (0.1 g). A bird (*Aves*) long-bone fragment (0.3 g) was also identified. Contents from Stratum II included small charcoal or carbonized plant matter (0.5 g), bivalves (3.1 g), *Nerita picea* (0.4 g), crustacean (< 0.1 g), and *Ruppia maritima* seeds.

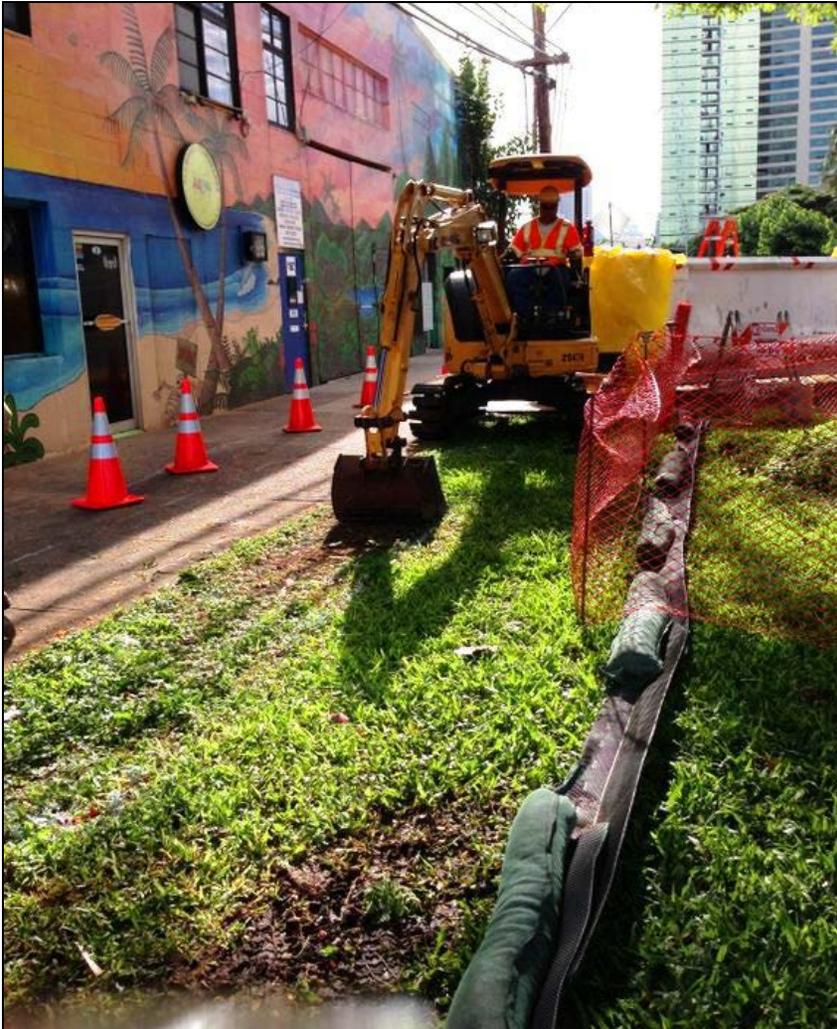
Sample analysis of the sample collected from Stratum Id documented the presence of naturally-occurring marine shell and a bird long-bone fragment that was also considered to be naturally-occurring. Sample analysis of the material collected from Stratum II appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events. The marine shell, which exhibited smooth, water-rounded edges, does not appear to be culturally-modified or deposited as the result of human activity. The *Ruppia maritima* seeds and charcoal or carbonized plant matter within Stratum II was considered to be naturally-deposited organic content consistent with wetland sediment.

GPR Discussion: A review of amplitude slice maps indicated a linear feature, but none were encountered during excavation. A water line was observed below the clean signal return. Reflectivity was relatively uniform throughout the grid and decreased with depth except for the linear feature. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 mbs and increased again around 0.75 mbs.

GPR depth profiles for T-184 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.2 mbs. An anomaly was observed in the profile but was not encountered, and the water line observed was below the clean signal return. The maximum depth of clean signal return was approximately 0.8 mbs.

Summary: T-184 was excavated to a depth of 1.47 mbs and beneath the water table at 1.40 mbs. T-184 was located within the previously established boundary of Kolowalu Fishpond (SIHP #50-80-14-6856). Stratigraphy of T-184 consisted of fill (Ia to Id) overlying natural sediment (II) to beneath the water table. The stratigraphy generally conformed to the USDA soil survey designation of Fill land. A total of two bulk samples were collected from T-184, including one from Stratum Id at 0.86–1.06 mbs (3.8 L) and one from Stratum II at 1.39–1.46 mbs (3.8 L). The bulk samples were wet-screened. Contents from Stratum Id included marine shell content that

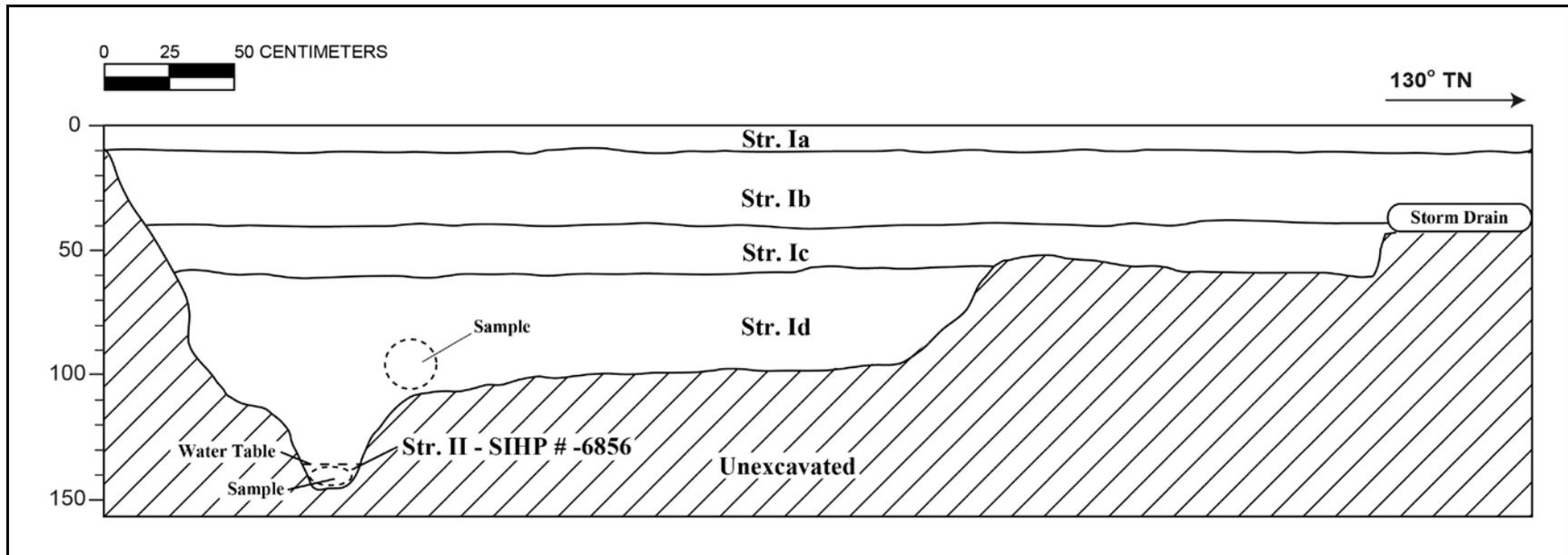
was considered to be a naturally-occurring within the sediment matrix. Sample analysis of the material collected from Stratum II appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events. The organic content that was observed within Stratum II (*Ruppia maritima* seeds and charcoal or carbonized plant matter) was considered to be naturally-deposited organic content consistent with wetland sediment. The natural sediment (II) within T-184 was considered to be a possible remnant of Kolowalu Fishpond (SIHP #50-80-14-6856).



T-184 general location, view to east



T-184 northeast profile wall, view to north



T-184 northeast wall profile

T-184 Stratigraphic Description

Stratum	Depth (cmts)	Description
Ia	0–10	Asphalt
Ib	10–40	Fill; 10 YR 6/4 (yellowish brown); very gravelly sandy loam; weak, medium structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth, lower boundary; common, fine roots; gravel base course
Ic	40–60	Fill; 10 YR 8/3 (very pale brown); very gravelly cobbly sand; structureless, single-grain; moist, loose, non-sticky, weak consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, coarse roots; crushed coral
Id	60–139	Fill; 2.5 Y 6/2 (light brownish gray); sandy clay; blocky structure; moist, friable consistency; plastic; few, coarse roots; abrupt, smooth lower boundary;
II	139–147	Natural; GLEY 2 6/1 (bluish gray); clay; medium structure; wet, sticky consistency; plastic; terrestrial origin; abrupt, smooth lower boundary; natural sediment; component of SIHP # -6856

2.13 Test Excavation 185 (T-185)

Ahupua'a:	Honolulu
LCA:	N/A (Grant 3194)
TMK #:	2-3-004: 080
Elevation Above Sea Level:	1.32 m
UTM:	619347 mE, 2355124 mN
Max Length/Width/Depth:	6.7 m / 0.66 m / 1.35 mbs
Orientation:	93 / 273° TN
Targeted Project Component:	Utility Corridor
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 185 (T-185) was located within the left east-bound lane of Waimanu Street near the Waimanu and Queen Street intersection. T-185 was located on private property. A sewer line was located 7.8 m southwest of T-185, a water line 4.5 m north, and a storm drain 6 m east. The excavation area was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-185 was situated in Land Commission Grant 3194 awarded to Kalae and Ka'aua and 5.6 m west of LCA 10605:7 awarded to Pi'ikoi. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-185 consisted of a marsh/wetland environment. T-185 was within the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 263.0 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little development within the vicinity. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-185. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-185, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). An archaeological inventory survey for the Ko'olani Condominium documented three historic properties, SIHP #50-80-14-6639 and SIHP #50-80-14-6641, historic trash pits dating from the early twentieth century; and SIHP #50-80-14-6636, the original wetland surface of Kewalo, just south of T-185 (O'Hare et al. 2004). During monitoring for this project, a total of 18 burials (both pre-Contact and historic coffin burials) including an isolated single burial (SIHP #50-80-14-6910), a cluster of 16 historic-era coffin burials (SIHP #50-80-14-6911), and an isolated single burial (SIHP #50-80-14-6912) were encountered and reinterred within the designated preserve area (Hammatt 2008). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 100.0 m southwest of T-185 (Bell et al. 2006). Three cultural resources were identified, including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the

remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009, an archaeological inventory survey was conducted for the Queen Street parks project located 44.0 m southwest of T-185 in which a previously identified cultural resource indicative of Kolowalu Fishpond (SIHP #50-80-14-6856) was encountered (Thurman et al. 2009).

Documentation Limitations: T-185 was excavated to a depth of 1.35 mbs and beneath the water table at 1.20 mbs. Unstable excavation sidewalls prohibited the collection of bulk sediment samples from natural strata within T-185, which limited documentation.

Stratigraphic Summary: The stratigraphy at T-185 consisted of fill overlying natural sediment to the base of excavation. Observed strata included asphalt (Ia), very gravelly loam base course (Ib), very gravelly loam fill (Ic and Id), silty loam fill (Ie), and sandy clay loam fill (If) overlying natural gravelly sandy clay (II). Snail shells (most likely terrestrial) were observed within Stratum II, but not collected due to unstable excavation sidewalls which prohibited entry and collection of in-situ samples. The stratigraphy generally conformed to the USDA soil survey designation of Fill land. The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events. The natural sediment (II) within T-185 was considered to be a possible remnant of Kolowalu Fishpond (SIHP #50-80-14-6856), and the sandy clay loam fill (If) may represent an associated berm.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: No sample analysis was conducted.

GPR Discussion: A review of amplitude slice maps indicated no linear features that might represent the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

GPR depth profiles for T-185 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.3 mbs. An anomaly was observed in the profile and seems to correspond with a truncated pocket of Stratum Ie. The maximum depth of clean signal return was approximately 1.0 mbs.

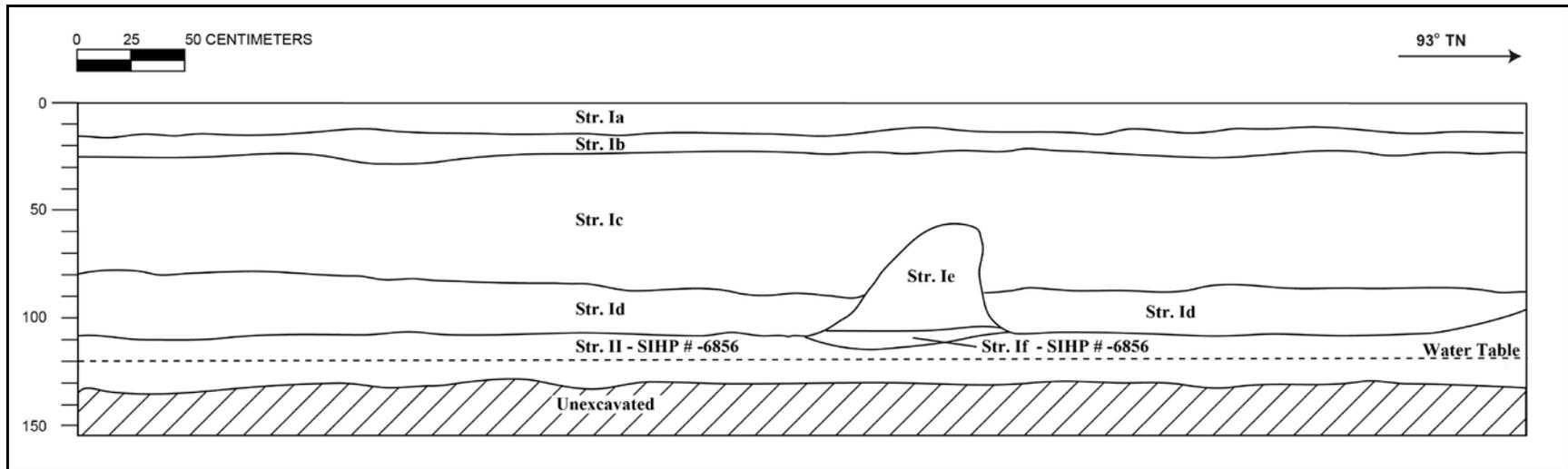
Summary: T-185 was excavated to a depth of 1.35 mbs and beneath the water table at 1.20 mbs. The stratigraphy at T-185 consisted of fill (Ia to If) overlying natural sediment (II) to the base of excavation. The stratigraphy generally conformed to the USDA soil survey designation of Fill land. T-185 was located within the previously established boundary of Kolowalu Fishpond (SIHP #50-80-14-6856). Stratum If may represent a berm associated with Kolowalu Fishpond. The natural sediment (II) within T-185 was considered to be a possible remnant of Kolowalu Fishpond (SIHP #50-80-14-6856).



T-185 general location, view to east



T-185 north profile wall, view to west



T-185 north wall profile

T-185 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	6–15	Asphalt
Ib	15–25	Fill; 10 YR 5/1 (gray); very gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	25–90	Fill; 10 YR 5/2; (grayish brown); very gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary
Id	80–110	Fill; 10 YR 5/1; (gray); very gravelly loam; structureless, single-grain; moist, very friable consistency; non-plastic, terrigenous origin; abrupt, smooth lower boundary; fill inside of filter fabric
Ie	55–110	Fill; 10 YR 6/2 (light brownish gray); silty loam; weak, fine, crumb structure; moist, firm consistency; slightly plastic, mixed origin; abrupt, broken/discontinuous lower boundary
If	100–117	Fill; 10 YR 6/4 (light yellowish brown); sandy clay loam; weak, fine blocky structure; moist, friable, non-sticky consistency; non-plastic; mixed origin; clear, broken discontinuous lower boundary; possible berm; component of SIHP # -6856
II	110–135	Natural; 10 YR 4/1 (dark gray); gravelly sandy clay; weak, fine, blocky structure; moist, firm consistency; slightly plastic; mixed origin; lower boundary not visible; fresh water snail shell observed within sediment but not collected; component of SIHP # -6856

2.14 Test Excavation 186 (T-186)

Ahupua'a:	Honolulu
LCA:	1065:7
TMK #:	2-3-004
Elevation Above Sea Level:	1.45 m
UTM:	619372 mE, 2355130 mN
Max Length/Width/Depth:	6.7 m / 0.75 m / 1.55 mbs
Orientation:	118 / 298° TN
Targeted Project Component:	Utility Relocation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 186 (T-186) was located within the right west-bound lane of Waimanu Street near the Waimanu and Queen Street intersection. T-186 was located on property owned by the City and County of Honolulu. A sewer line was located 5.5 m south of T-186, a water line 4.5 m north, and a storm drain 6 m east. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-186 was situated in LCA 10605:7 awarded to Pi'ikoi. T-186 was 11 m east of Land Commission Grant 3194 awarded to Kalae and Ka'aua. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-186 consisted of a marsh/wetland environment (SIHP #50-80-14-6636). T-186 was 10 m east of the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 195 m north of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little development within the vicinity. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-186. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-186, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). An archaeological inventory survey for the Ko'olani Condominium documented three historic properties, SIHP #50-80-14-6639 and SIHP #50-80-14-6641, historic trash pits dating from the early twentieth century; and SIHP #50-80-14-6636, the original wetland surface of Kewalo, approximately 20 m south of T-186 (O'Hare et al. 2004). During monitoring for this project, a total of 18 burials (both pre-Contact and historic coffin burials) including an isolated single burial (SIHP #50-80-14-6910), a cluster of 16 historic-era coffin burials (SIHP #50-80-14-6911), and an isolated single burial (SIHP #50-80-14-6912) were encountered and reinterred within the designated preserve area (Hammatt 2008). CSH subsequently conducted an archaeological inventory survey in the adjacent parcel for the Ko'olani Phase II (re-named Waihonua) Project. Three new historic properties were documented; a culturally enriched A-horizon containing pit features (SIHP #50-80-14-7115), historic pond sediment (SIHP #50-80-14-7116), and a concentration of 27 post-Contact coffin

burials (Runyon et al. 2011). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 129.0 m southwest of T-186 (Bell et al. 2006). Three cultural resources were identified, including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009 an archaeological inventory survey was conducted for the Queen Street parks project located 70.0 m southwest of T-186 in which a previously identified cultural resource indicative of Kolowalu Fishpond (SIHP # -6856) was encountered (Thurman et al. 2009). Approximately 165.0 m east of T-186, wetland/marsh sediments were recorded (SIHP #50-80-14-6636) during the archaeological inventory survey for the Pi'ikoi Senior Residence project (Runyon et al. 2012).

Documentation Limitations: T-186 was excavated to a depth of 1.55 mbs and beneath the water table at 1.29 mbs. There were no specific factors that limited documentation of T-186.

Stratigraphic Summary: The stratigraphy of T-186 consisted of fill overlaying natural sediment. Observed strata included asphalt (Ia), very gravelly loam base course (Ib), crushed coral grading fill (Ic), and hydraulic fill (Id) overlying a gravelly clay loam buried O-horizon (IIa), gravelly loam wetland sediment (IIb), and loamy sand (III). Stratum IIa, a buried O-horizon, was considered to be the decomposed remnant of overlying vegetation (grasses and sedges) that was likely present, at least intermittently, across the entire wetland. Stratum IIb was considered to be backshore wetland sediment. The observed stratigraphy generally conformed to the USDA soil survey designation of Fill land.

Artifacts Discussion: No artifacts were observed.

Feature Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: A total of two bulk sediment samples were collected from T-186 including one sample from the Stratum IIa/IIb interface at 1.24–1.37 mbs (2.5 L) and one from Stratum III at 1.35–1.45 mbs (3 L). The sediment samples were wet-screened. The sample from the Stratum IIa/IIb interface contained naturally-deposited, water-rounded marine shell (2.3 g) including an operculum, Echinodermata *mathaei* sp, crustacean, limpets, bivalves, and gastropod fragments. Contents from Stratum III contained naturally-deposited, water-rounded marine shell (45.3 g) including crustaceans, snails, Echinodermata *mathaei* sp, limpets, gastropods, bivalve fragments, and a shark tooth. Water rounded coral and basalt gravels were present in both samples.

The gastropods from both bulk sediment samples were submitted for additional identification and analysis. The analysis indicated that the gastropods included estuarine, strandline, and shoreline-dwelling species, *A. parvula* and *Melampus* sp., which is consistent with the coastal location of T-186. A fresh- or brackish-water environment was present with the presence of *M. tuberculata* indicating permanent water. There were no significant differences between the two samples. There was no evidence indicative of change over time.

The results of sample analysis have indicated that the natural sediment within T-186 represented coastal deposits associated with a fresh- or brackish-water environment. The naturally-occurring

marine shell within both samples was likely deposited within the environment during storm or tidal events.

GPR Discussion: A review of amplitude slice maps indicated a linear feature but none were encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth except for the linear feature detected by the GPR. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

GPR depth profiles for T-186 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs and again around 1.1 mbs. An anomaly was observed in the profile but was not within excavation boundaries. The maximum depth of clean signal return was approximately 1.1 mbs.

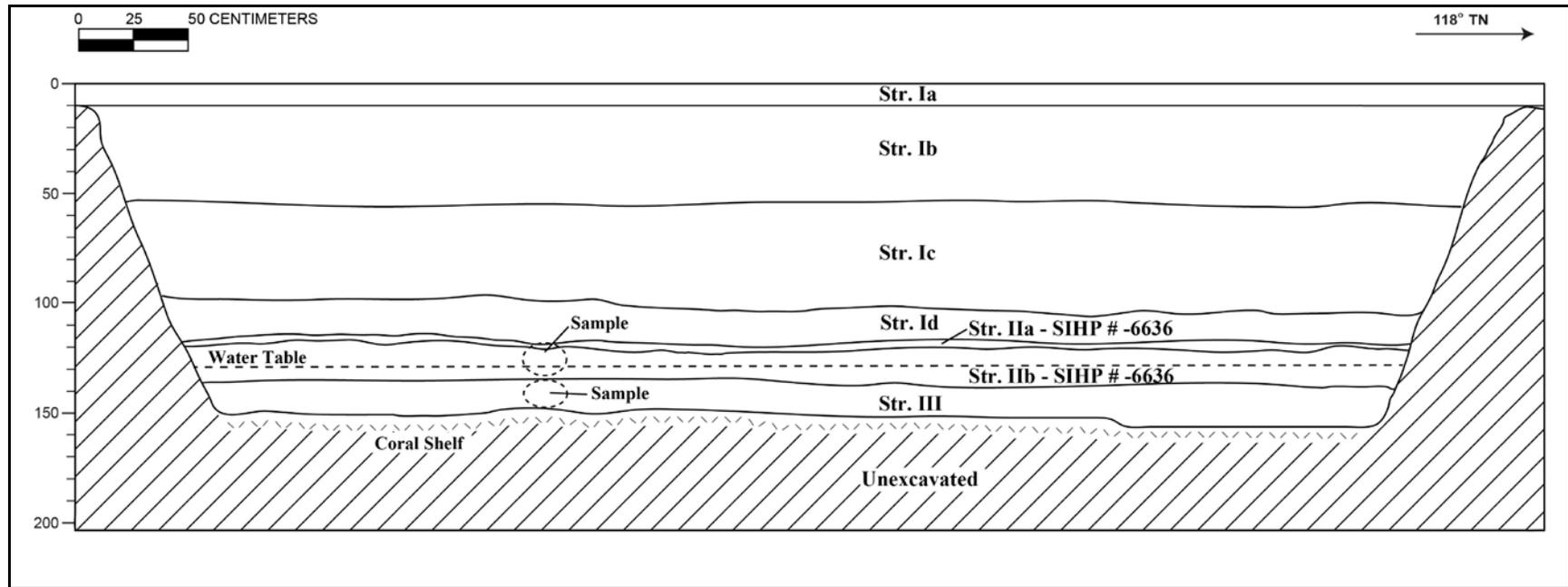
Summary: T-186 was excavated to a depth of 1.55 mbs and beneath the water table at 1.29 mbs. The stratigraphy of T-186 consisted of fill (IA to Id) overlaying natural sediment (IIa, IIb, and III). The observed stratigraphy generally conformed to the USDA soil survey designation of Fill land. A total of two bulk sediment samples were collected from T-186 including one sample from the Stratum IIa/IIb interface at 1.24–1.37 mbs (2.5 L) and one from Stratum III at 1.35–1.45 mbs (3 L). The results of sample analysis have indicated that the natural sediment within T-186 represented coastal deposits associated with a fresh- or brackish-water environment. The naturally-occurring marine shell within both samples was likely deposited within the environment during storm or tidal events. The natural sediment (IIa and IIb) within T-186 was considered to be a possible remnant of Kewalo wetland (SIHP #50-80-14-6636).



T-186 general location, view to southeast



T-186 northeast profile wall, view to northwest



T-186 northeast wall profile

T-186 Stratigraphic Description

Stratum	Depth (cmts)	Description
Ia	0–10	Asphalt
Ib	10–56	Fill; 5 Y 4/1 (dark gray); very gravelly loam; structureless; moist, friable consistency; non-plastic; terrigenous origin; very abrupt, smoother lower boundary; gravel base course
Ic	45–101	Fill; 5 Y 8/1 (white); extremely gravelly sand; structureless, single-grain; moist, friable consistency; non-plastic; abrupt, smooth lower boundary; crushed coral base course
Id	95–118	Fill; GLEY 1 7/1 5 GY (light greenish gray); silty clay; moderate, fine, platy structure; moist, firm consistency; very plastic; mixed origin; very abrupt, smooth lower boundary; hydraulic fill
IIa	112–121	Natural, 5 Y 2.5/2 (black); gravelly clay loam; weak, fine, platy structure; moist, friable consistency; non-plastic; mixed origin; clear, wavy lower boundary; former O-horizon; abundant decaying organic matter overlying wetland sediment; component of SIHP # -6856
IIb	115–136	Natural; 5 Y 5/1 (gray); gravelly loam; moderate, very fine, crumb structure; slightly plastic; mixed origin; clear, smoother lower boundary; component of SIHP # -6636
III	131–155	Natural; GLEY 1 7/10 Y (light greenish gray); loamy sand; moderate, medium, granular structure; wet, slightly sticky consistency; non-plastic; mixed origin; lower boundary not visible; natural marine lagoonal sediment

2.15 Test Excavation 187 (T-187)

Ahupua'a:	Honolulu
LCA:	10605:7
TMK #:	2-3-004: 069
Elevation Above Sea Level:	1.61 m
UTM:	619369 mE, 2355144 mN
Max Length/Width/Depth:	3.1 m / 0.93 m / 1.5 mbs
Orientation:	30 / 210° TN
Targeted Project Component:	Guideway Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 187 (T-187) was located on private property within a warehouse building fronting Waimanu Street. No subsurface utilities were present in the immediate vicinity. The excavation area was level with the surrounding land surface.

Summary of Background Research and Land Use: According to S. E. Bishop's map of the Kewalo area of Honolulu (1884), T-187 was situated in LCA 10605:7 awarded to Pi'ikoi. T-187 was 2.3 m east of Land Commission Grant 3194 awarded to Kalae and Ka'aua. In relation to the 1897 map of Honolulu by M. D. Monsarrat, the natural landscape surrounding T-187 consisted of a marsh/wetland environment (SIHP #50-80-14-6636). T-187 was 2.3 m east of the Kolowalu Fishpond (SIHP #50-80-14-6856) and approximately 185 m northeast of the shoreline. The 1933 U.S. Army War Department map indicated that Kolowalu pond was filled with sediment and that there was little development within the vicinity. The 1943 U.S. Army War Department map and the 1953 U.S. Army Mapping Service map indicated extensive urban development.

There were several previous archaeological investigations surrounding the location of T-187. Archaeological monitoring within the Kaka'ako Community Improvement District 10, which included the location of T-187, identified a total of 30 post-Contact burials (SIHP #50-80-14-6658, -6659, and -6660) (O'Hare et al. 2006). An archaeological inventory survey for the Ko'olani Condominium documented three historic properties, SIHP #50-80-14-6639 and SIHP #50-80-14-6641, historic trash pits dating from the early twentieth century; and SIHP #50-80-14-6636, the original wetland surface of Kewalo, approximately 35 m south of T-187 (O'Hare et al. 2004). During monitoring for this project, a total of 18 burials (both pre-Contact and historic coffin burials) including an isolated single burial (SIHP #50-80-14-6910), a cluster of 16 historic-era coffin burials (SIHP #50-80-14-6911), and an isolated single burial (SIHP #50-80-14-6912) were encountered and reinterred within the designated preserve area (Hammatt 2008). CSH subsequently conducted an archaeological inventory survey in the adjacent parcel for the Ko'olani Phase II (re-named Waihonua) Project. Three new historic properties were documented; a culturally enriched A-horizon containing pit features (SIHP #50-80-14-7115), historic pond sediment (SIHP #50-80-14-7116), and a concentration of 27 post-Contact coffin burials (Runyon et al. 2011). CSH conducted an archaeological inventory survey for the Victoria Ward Village shops, which are located approximately 127.0 m southwest of T-187 (Bell et al.

2006). Three cultural resources were identified, including a subsurface cultural layer containing both historic and prehistoric contents with five human burials (SIHP #50-80-14-6854), a subsurface cultural layer consisting of pre- and post-Contact cultural materials and six human burials (SIHP #50-80-14-6855), and the remnants of Kolowalu Fishpond (SIHP #50-80-14-6856) (Bell et al. 2006). In 2009, an AIS was conducted for the Queen Street parks project located 70.0 m west of T-187 in which a previously identified cultural resource indicative of Kolowalu Fishpond (SIHP #50-80-14-6856) was encountered (Thurman et al. 2009). Approximately 170.0 m east of T-187, wetland/marsh sediments were recorded (SIHP #50-80-14-6636) during the AIS for the Pi'ikoi Senior Residence project (Runyon et al. 2012).

Documentation Limitations: T-187 was excavated to the water table at a depth of 1.50 mbs. There were no specific factors that limited documentation of T-187.

Stratigraphic Summary: The stratigraphy of T-187 consisted of fill overlying natural sediment. Observed strata included concrete (Ia), coarse sand (cinder) fill (Ib), crushed coral fill (Ic), and silty clay hydraulic fill (Id), overlying previously-disturbed natural sandy clay (IIa), natural sandy loam (IIb), and marine loamy sand (III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). The results of sample analysis appeared to document the natural deposition of marine shell within a backshore wetland environment during storm or tidal events. The natural sediment (IIa and IIb) within T-187 was considered to be a possible remnant of Kewalo wetland (SIHP #50-80-14-6636).

Artifacts Discussion: No artifacts were observed.

Feature Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: One bulk sample was collected from Stratum IIb between 1.18–1.36 mbs. The sediment sample was wet-screened. Contents consisted of charcoal (0.5 g), naturally-occurring marine shell (3.0 g), terrestrial snails (25.7 g), *kukui* nutshell (1.2 g), and an indeterminate faunal bone fragment (<0.1 g). The results of sample analysis document the mixed depositional origin of Stratum IIb. The marine shell appeared to have been naturally-deposited within a backshore wetland environment during storm or tidal events. The marine shell exhibited smooth, water-rounded edges, and did not appear to be culturally-modified or deposited as the result of human activity. The presence of terrestrial snails was indicative of a wetland deposit. The presence of a *kukui* nutshell and an indeterminate faunal bone may represent natural deposition or human-introduced (cultural) disposal of material within the wetland.

GPR Discussion: A review of amplitude slice maps indicated no linear features that might represent the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs but the signal regained strength at 0.75 mbs.

GPR depth profiles for T-187 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. An anomaly was observed in the profile but was not

encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

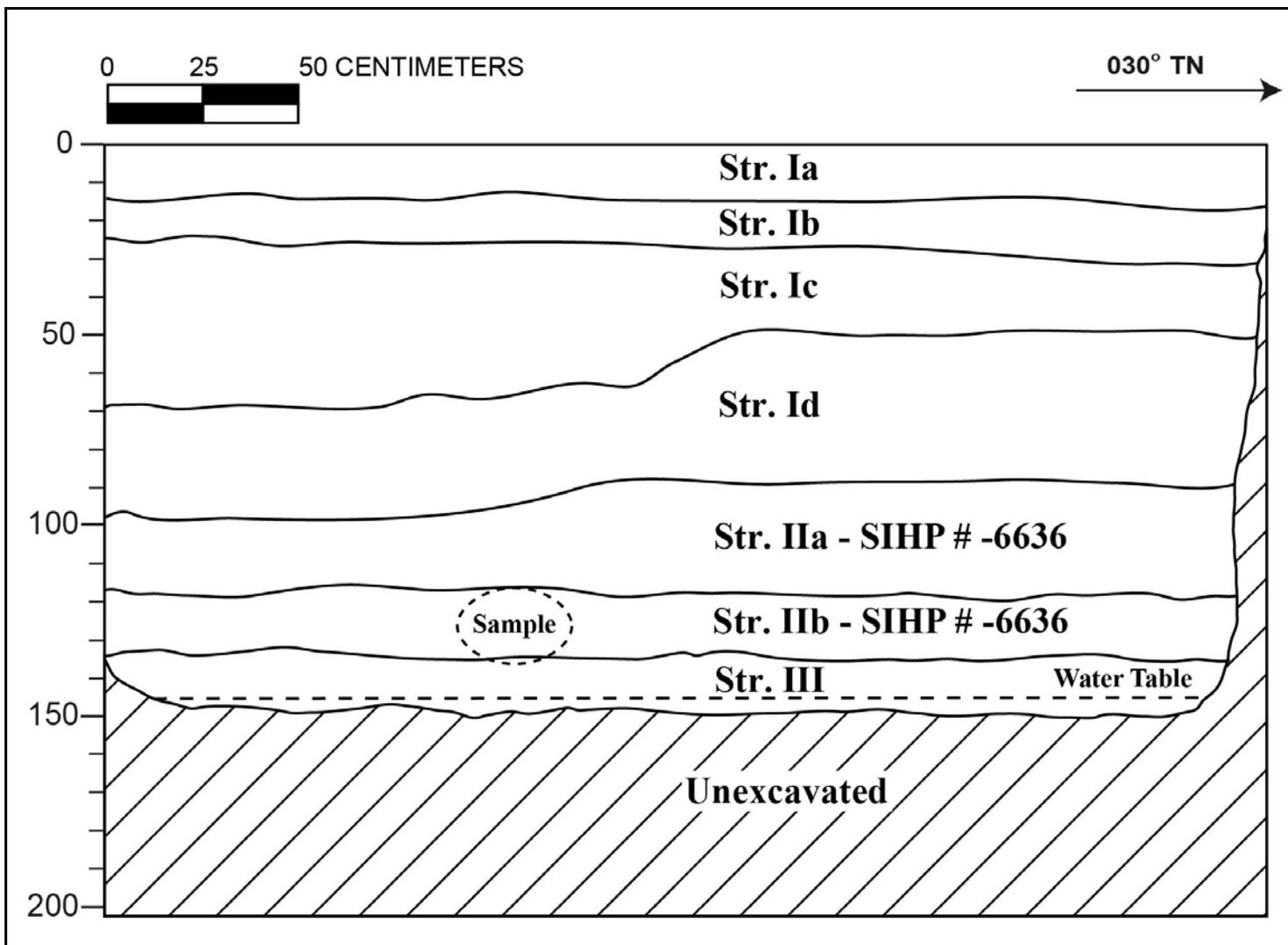
Summary: T-187 was excavated to the water table at a depth of 1.50 mbs. The stratigraphy of T-187 consisted of fill (Ia to Id) overlying natural sediment (IIa, IIb, and III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). Stratum IIa was considered to be previously disturbed during fill deposition related to land reclamation or urbanization. One bulk sample was collected from Stratum IIb between 1.18–1.36 mbs. The results of sample analysis documented the mixed depositional origin of Stratum IIb, which included natural marine-, natural terrestrial-, and potential culturally-deposited material. The natural sediment (IIa and IIb) within T-187 was considered to be a possible remnant of Kewalo wetland (SIHP #50-80-14-6636).



T-187 general location, view to north



T-187 northwest profile wall, view to west



T-187 northwest wall profile

T-187 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0–15	Concrete
Ib	15–25	Fill; 10 YR 2/1 (black); coarse sand; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; cinder fill
Ic	25–70	Fill; 10 YR 8/2 (very pale brown); cobbly gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; wavy, clear lower boundary; crushed coral fill
Id	50–100	Fill; 10 YR 8/2 (very pale brown); silty clay; structureless, massive; wet, sticky consistency; plastic; marine origin; abrupt, smooth lower boundary; hydraulic fill
IIa	90–120	Natural; 10 YR 5/2 (grayish brown); sandy clay; weak, medium, crumb structure; moist, firm consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; few, fine roots; wetland sediment; previously disturbed during fill deposition related to land reclamation/urbanization; component of SIHP # -6636
IIb	118–135	Natural; 10 YR 4/2 (dark grayish brown); sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; many, fine roots; wetland sediment; component of SIHP # -6636
III	135–150	Natural; 10 YR 5/2 (grayish brown); loamy sand; weak, fine, crumb structure; wet, non-sticky, weak consistency; non-plastic; mixed origin; lower boundary not visible; marine lagoonal sediment