



Figure 172. T-091 south wall profile

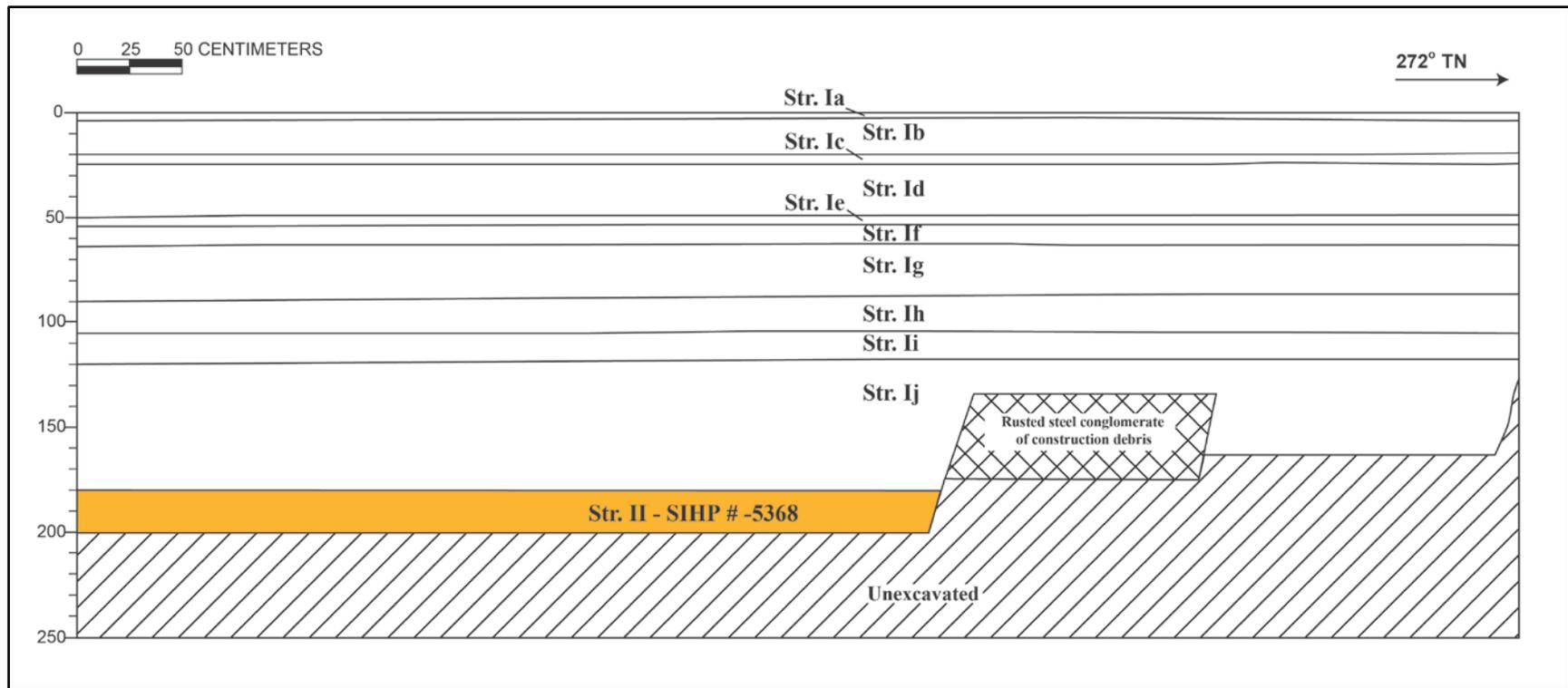


Figure 173. T-091 south wall profile

Table 21. T-091 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-4	Asphalt
Ib	4-21	Fill; 10 YR 3/6 (dark yellowish brown); very gravelly sandy loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	21-25	Fill; buried concrete
Id	25-50	Fill; 10 YR 4/2 (dark grayish brown); sandy clay loam; blocky structure; moist, friable consistency; slightly plastic; mixed origin; abrupt lower boundary; modern fill event with ferrous construction material
Ie	50-55	Fill; asphalt; abrupt lower boundary; old buried asphalt
If	55-65	Fill; 10 YR 8/1 (white); gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt lower boundary; crushed coral fill
Ig	65-90	Fill; 10 YR 2/1 (black); silty sandy loam; weak, fine, crumb structure; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; gravelly fill layer
Ih	90-106	Fill; 10 YR 8/2 (very pale brown); crushed coral; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary
Ii	106-120	Fill; 10 YR 3/2 (very dark grayish brown); very gravelly sandy loam; weak, fine to medium, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral cobbles in sandy loam fill
Ij	120-190	Fill; 10 YR 2/1 (black); sandy gravelly cinder; weak, fine to medium, crumb structure; moist, loose consistency; non-plastic; mixed origin; imported fill with ferrous material and wood observed (not collected)
II	190-200 (BOE)	Natural; Gley1 4/N (dark gray); clay loam; structureless, massive; wet, sticky consistency; plastic; mixed origin; pond sediment, fresh water snail shells; Kūwili Fishpond sediments; component of SIHP #-5368



Figure 174. T-092 west wall profile, view to south. Stratum II pond sediments appear as dark sediments along the base of the trench wall and in the trench floor to the left of the photo scale (compare to Figure 175)

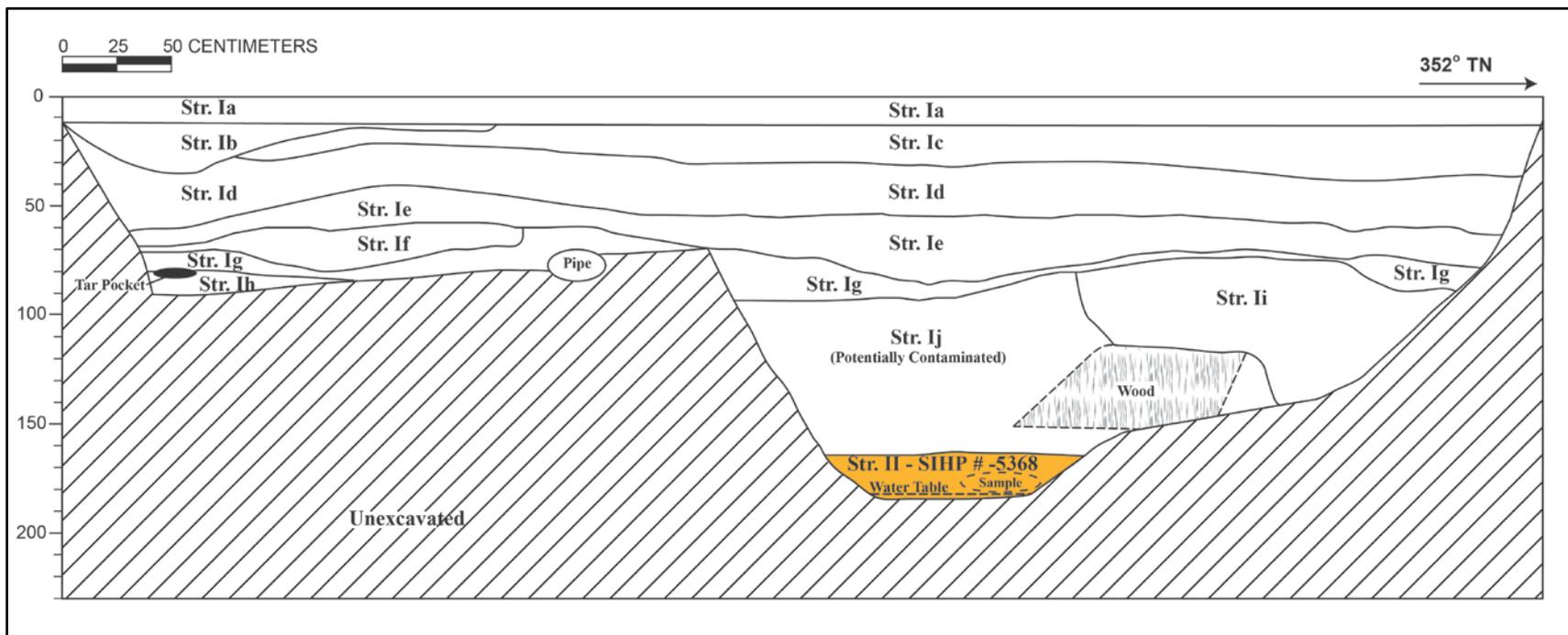


Figure 175. T-092 west wall profile

Table 22. T-092 Stratigraphic Descriptions

Stratum	Depth (cmbs)	Description
Ia	0-13	Asphalt
Ib	13-35	Fill; 10 YR 8/2 (very pale brown); sandy clay loam; structureless, massive; moist, firm consistency; slightly plastic; marine origin; very abrupt, broken/discontinuous lower boundary; likely dredged marine layer—seen only in Diamond Head end of T-092
Ic	13-35	Fill; 7.5 YR 4/4 (brown); gravelly sandy clay; structureless, massive; moist, firm consistency; plastic; terrigenous origin; abrupt, wavy lower boundary; contained coarse coral sand and coral gravel, some dense metal debris was revealed, possibly from fill
Id	35-60	Fill; 10 YR 2/1 (black); asphalt; structureless, massive; moist, extremely firm consistency; non-plastic; terrigenous origin; likely surface for former gas station/train platform or other industrial use
Ie	40-85	Fill; 10 YR 4/2 (dark grayish brown); very gravelly sand; structureless, single-grain; dry, loose consistency; non-plastic; abrupt, wavy lower boundary; contained non-diagnostic piece of coiled metal wire (not collected); fill
If	57-80	Fill; 10 YR 8/1 (white); gravel and cobbles (coral); structureless, single-grain; moist, loose consistency; non-plastic; marine origin; very abrupt, broken/discontinuous lower boundary; crushed coral seen only in Diamond Head end of T-092—likely associated with Stratum Id asphalt
Ig	60-93	Fill; 2.5 YR 5/3 (light olive brown); extremely gravelly clay; structureless; moist, friable consistency; slightly plastic; abrupt, broken/discontinuous lower boundary; diffusion with If as If ran into Ig on horizontal plane; crushed coral in clay matrix; metal pipe found running approximately west to east, possible fuel line
Ih	80-90	Fill; 10 YR 4/2 (dark grayish brown); sandy loam; structureless, single-grain; moist, friable consistency; non-plastic to slightly plastic; terrigenous origin; abrupt, broken/discontinuous lower boundary; seen only in Diamond Head end of T-092.
Ii	70-140	Fill; 10 YR 3/3 (dark brown); sandy loam; structureless, single-grain; moist, friable consistency; non-plastic to slightly plastic; terrigenous origin; lower boundary not visible; contained oxidized metal fragments (not collected); contaminated petroleum created diffuse boundary
Ij	79-165	Fill; 10 YR 2/1 (black); clay; structureless, massive; moist, firm consistency; plastic; mixed origin; diffuse, broken/discontinuous lower boundary; contained debris wood planks and metal fragments; potentially contaminated with petroleum product; contained some small basalt gravel
II	165-183 (BOE)	Natural; Gley1 3/10Y (very dark greenish gray); clay; structureless, massive; wet, sticky consistency; plastic; marine origin; lower boundary not visible; marine sediment contained many marine shells; Kūwili Fishpond sediment; component of SIHP #-5368



Figure 176. T-093 northeast wall profile, view to southwest

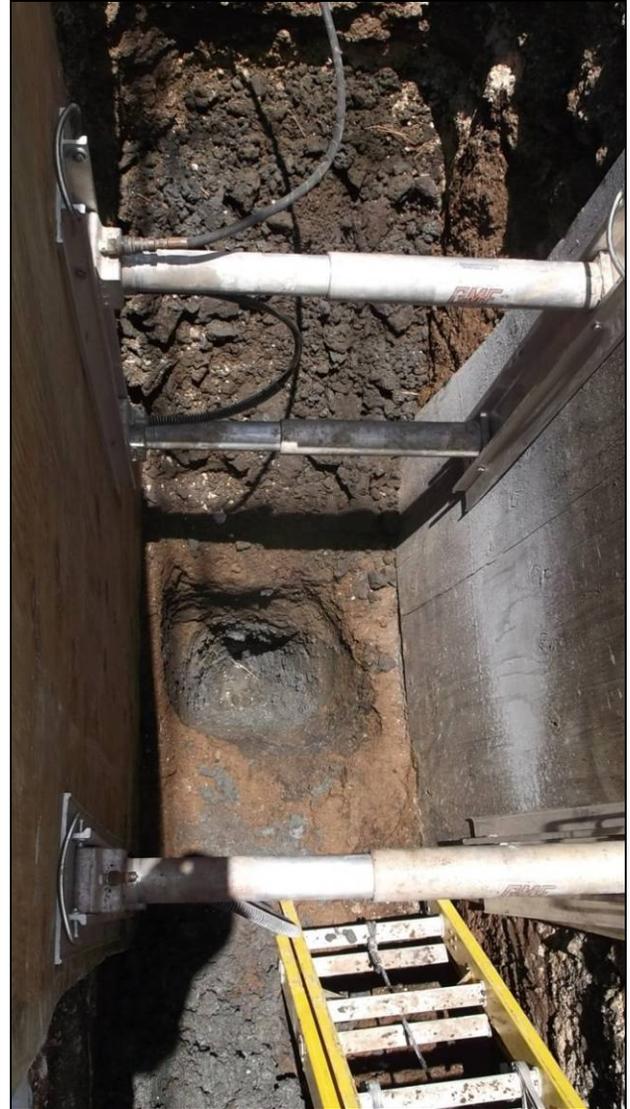


Figure 177. T-093 overhead view of shoring system and excavation into Stratum IIb



Figure 178. Closeup of terrestrial snail shells within T-093 Stratum IIb



Figure 179. Closeup of organics within T-093 Stratum IIa

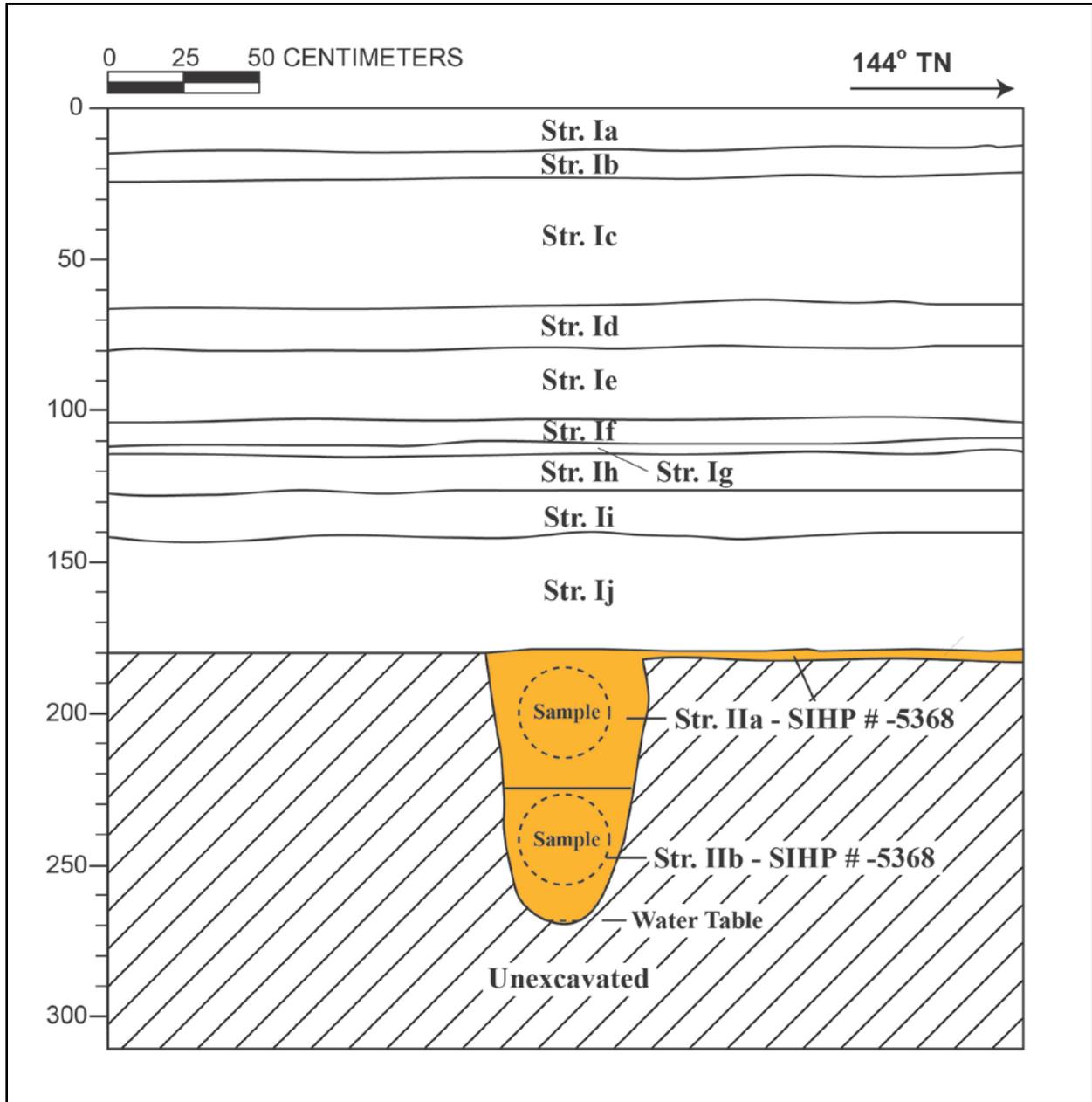


Figure 180. T-093 northeast wall profile

Table 23. T-093, Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-14	Asphalt
Ib	14-23	Fill; 10 YR 6/4 (light yellowish brown); extremely gravelly loamy sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contained small to large coral gravels, (1) piece rebar at bottom of layer
Ic	23-66	Fill; 10 YR 3/3 (dark brown); stony sandy loam; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contained (1) large marble, abundant coral cobbles and boulders
Id	65-80	Fill; 10 YR 8/3 (very pale brown); crushed coral; structureless, single-grain; moist, loose consistency; non-plastic; abrupt, smooth lower boundary
Ie	80-106	Fill; 10 YR 3/1 (very dark gray); sandy loam; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; has strong petroleum odor
If	106-114	Fill; 2.5 Y 7/4 (pale yellow); crushed coral; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary
Ig	114-117	Fill; 10 YR 3/4 (dark yellowish brown); silty loam; weak, fine, crumb structure; moist consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary
Ih	117-130	Fill; 10 YR 3/2 (very dark grayish brown); sandy loam; single-grain, very fine structure; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contained common charcoal flecks and chunks, few shell fragments, and glass fragments (not collected)
Ii	130-145	Fill; 2.5 Y 3/1 (very dark gray); silty clay; massive structure; moist consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; dredge fill
Ij	145-182	Fill; 10 YR 3/3 (dark brown); silty sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contains abundant charcoal flecks, water-rounded gravel and shells and shell fragments; likely coastal material used as fill
IIa	182-229	Natural; Gley1 3/10Y (very dark greenish gray); silty clay; structureless, massive; moist consistency; plastic; marine origin; lower boundary not visible; extremely homogenous sediment with a few brown organics (see photos); wetland sediment; part of SIHP #-5368 (buried remnants of Kūwili Fishpond)
IIb	229-274 (BOE)	Natural; Gley1 3/N (very dark gray); silty clay; structureless, massive; moist consistency; plastic; marine origin; lower boundary not visible; pond sediment, extremely abundant shells; part of SIHP #-5368 (buried remnants of Kūwili Fishpond)



Figure 181. T-094 southwest wall profile, view to south

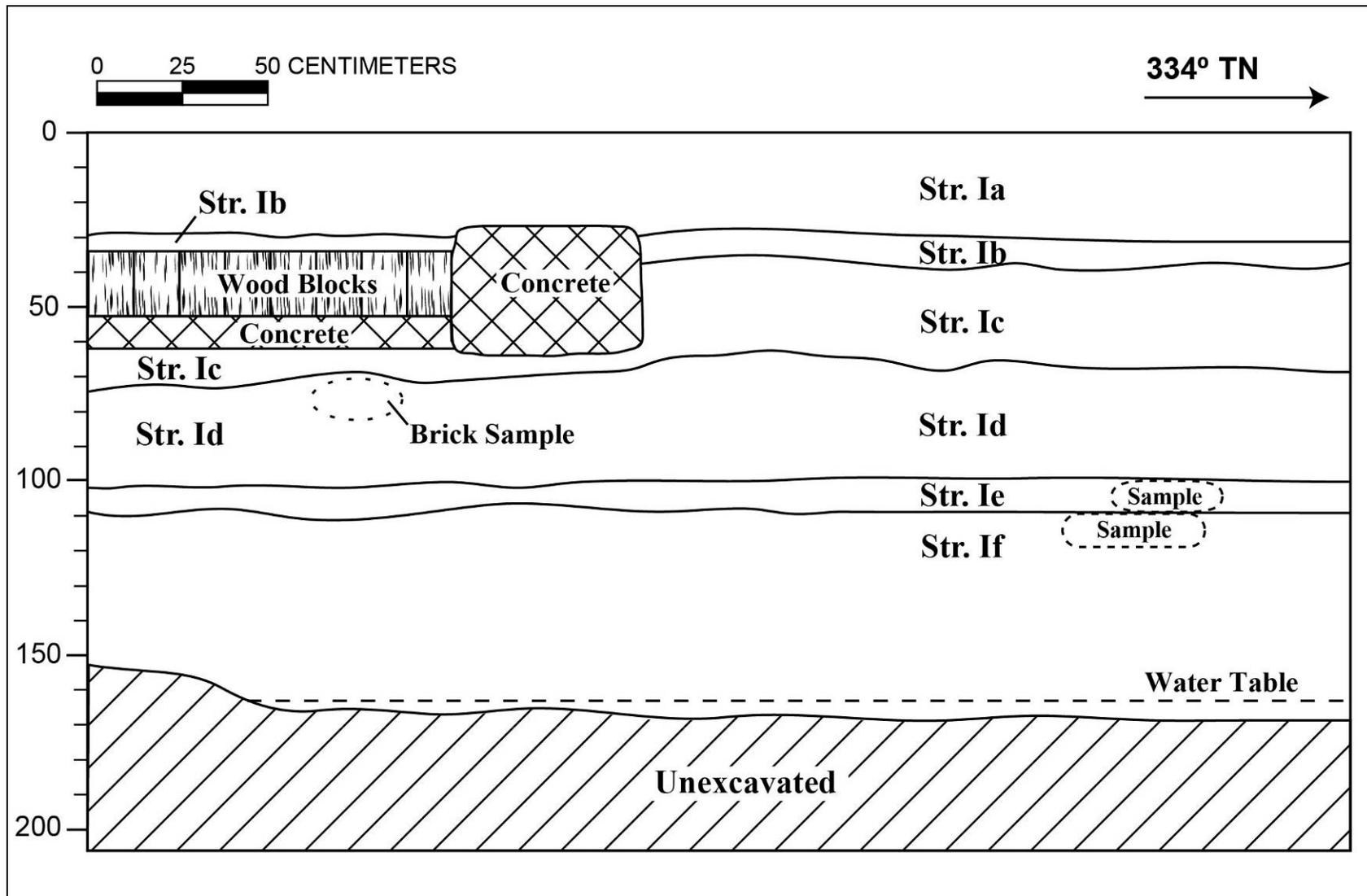


Figure 182. T-094 southwest wall profile

Table 24. T-094 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-30	Fill; 10 YR 6/4 (light yellowish brown); extremely gravelly sand, structureless, single-grain; moist, friable consistency; non-plastic; abrupt, smooth lower boundary; crushed coral gravel road surface
Ib	30-37	Fill; asphalt
Ic	37-75	Fill; 10 YR 4/2 (dark grayish brown); very gravelly cobbly sandy loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; very angular basalt cobbles present; concrete and wood blocks observed and not collected
Id	65-100	Fill; 10 YR 7/3 (very pale brown); very gravelly clay loam; fine to medium, blocky structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; brick found at NW wall (collected)
Ie	100-110	Fill; 10 YR 3/2 (very dark grayish brown); silty clay loam; weak, fine, crumb structure; moist, friable consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; contained charcoal deposit and glass fragments (not collected)
If	110-170 (BOE)	Fill; 10 YR 3/3 (dark brown); gravelly sandy loam; fine to medium, blocky structure; moist, friable consistency; slightly plastic; mixed origin; lower boundary not observed; possible water-rounded basalt cobbles, chunks of coral blocks

SIHP #-5368 (Kūwili Fishpond) is a historically-documented fishpond that background research and previous archaeological studies suggest was constructed during pre-Contact times, possibly as early as ca. AD 1100 and most likely by ca. AD 1600, with continued use into the latter part of the nineteenth century. Historic maps and photographs document the presence of the fishpond through the 1890s. Due to health concerns following a cholera outbreak, as well development pressure related to the need for an OR&L terminal in close proximity to Honolulu, Kūwili Fishpond was filled in beginning in the 1880s. McGerty et al. (1997) and Athens and Ward (1997) both identified Kūwili Fishpond sediments during their AIS studies for the proposed Liliha Civic Center Project. Hammatt et al. (2008) also identified fishpond sediments within two of three excavations during data recovery for the Iwilei Senior Housing Project. Radiocarbon and pollen analyses of fishpond samples collected during the studies suggests a pre-Contact construction date for Kūwili Fishpond.

The current AIS investigation identified fishpond sediments within three test excavations (T-091, T-092, T-093) while two additional excavations (T-088, T-094) within the known footprint of the pond exposed only fill deposits. Up to ten distinct fill strata were recorded in T-091, T-092, and T-093, and six in T-088 and T-094. Fill strata in each of the five test excavations contained historic debris. The older fill strata date between the late 1880s and 1900 and were part of the infilling of the fishpond that followed the cholera outbreak and preceded the construction of the OR&L terminal. The more recent fill deposits, some containing discarded railroad debris, are associated with circa 1950s deposition related to the demolition of the OR&L infrastructure, circa 1950, present within the infilled fishpond footprint. Beneath the thick fill strata, Kūwili Fishpond deposits consisted of clay-rich, darkly colored sediments that containing abundant non-cultural shell, terrestrial snail shells, charcoal, and organics.

Based on the guidance of National Register Bulletin No. 15, SIHP # 50-80-14-5368 (Kūwili Fishpond) retains its integrity of location, materials, and workmanship. SIHP #-5368 was previously determined eligible to the Hawai'i and National Registers under significance Criterion D (has yielded, or is likely to yield information important for research on prehistory or history) (McGerty et al. 1997). Based on the results of the current AIS investigation, CSH recommends that this cultural resource maintains integrity to support its historic significance under Criterion D of both the Hawai'i and National Registers, exclusively for its information potential.

SIHP # 50-80-14-5368 has provided information, and has potential to provide additional information, on the construction, depositional sequence, characteristics, and geographic extent of Kūwili Fishpond. McGerty et al. (1997) and Athens and Ward (1997) documented in situ fishpond sediments between 1.50 mbs to 2.40 mbs. Because of the amount of significant information provided by Athens and Ward (1997) and McGerty et al. (1997), data recovery excavations as a form of mitigation do not appear warranted for the current project. However, the possibility of encountering Kūwili Fishpond sediments during future project-related ground disturbance warrants the implementation of an archaeological monitoring program. Archaeological monitoring will obtain additional data on the depositional sequence and extent of SIHP #-5368 as well as document any potential structural remnants of Kūwili Fishpond. Archaeological monitoring also will involve recordation of stratigraphic profiles and sampling of exposed Kūwili Fishpond sediments for radiocarbon and palynological analyses. This effort will

potentially augment the information from previous archaeological research conducted at Kūwili Fishpond and other Hawaiian fishponds, including adjacent Kawa Fishpond (SIHP # 50-80-14-5966).

5.3.4 SIHP #50-80-14-5820

FORMAL TYPE:	Subsurface cultural deposit, human burials
FUNCTION:	Habitation and burial interment
PREVIOUS DOCUMENTATION:	Winieski and Hammatt (2000)
AGE:	Pre- and post-Contact
NUMBER OF FEATURES:	42 total; 31 newly identified and 11 previously documented
TYPES OF FEATURES:	12 human burials, 1 <i>imu</i> pit, 1 pit containing two dog burials, 1 pit containing a horse burial and disturbed human remains, and 27 indeterminate pits
DISTRIBUTION:	Approximately 0.04 acres within the current project area, 0.08 acres total area
LOCATION:	Halekauwila Street from Keawe Street to east of Ohe Street (West Kaka'ako Geographic Zone)
TAX MAP KEY:	TMK [1] 2-1-050:067; [1] 2-1-050 (Halekauwila Street ROW por.); [1] 2-1-051 (Halekauwila Street ROW por.); [1] 2-1-031 (Keawe Street ROW por.); [1] 2-1-051:003 and 038
LAND JURISDICTION:	Hawai'i Community Development Authority and the City and County of Honolulu (within current project area)
TEST EXCAVATIONS:	T-141, T-142, T-145, T-146A, T-150, T-151, and T-151A; T-140, T-143, T-144, T-146, T-147, T-148, T-148A, T-149, and T-152 are included in the SIHP #-5820 interpolated boundary

SIHP #50-80-14-5820 is a previously-identified subsurface cultural deposit including 42 features in the vicinity of Mother Waldron Park and Halekauwila Street from Keawe Street to east of Ohe Street. This archaeological cultural resource was first reported by Winieski and Hammatt (2000) as consisting of 11 human burials encountered within and/or near Mother Waldron Park and Halekauwila Street (Figure 183).

Winieski and Hammatt (2000) conducted archaeological monitoring between 1990 and 1992 by CSH for the Kaka'ako Improvement District 3 (ID-3) project which included infrastructure improvements to utility and drainage systems along Mother Waldron Park and Halekauwila Street. Of the 11 burials designated by Winieski and Hammatt (2000) as part of SIHP #-5820, five were located along Halekauwila Street, two were within Keawe Street, and four burials were within Mother Waldron Park. All 11 burials were recovered and reinterred within Mother Waldron Park. The project also included construction of the Pohulani Elderly Rental Housing facility along Queen Street; however, the archaeological findings from that location are not a component of SIHP #-5820.

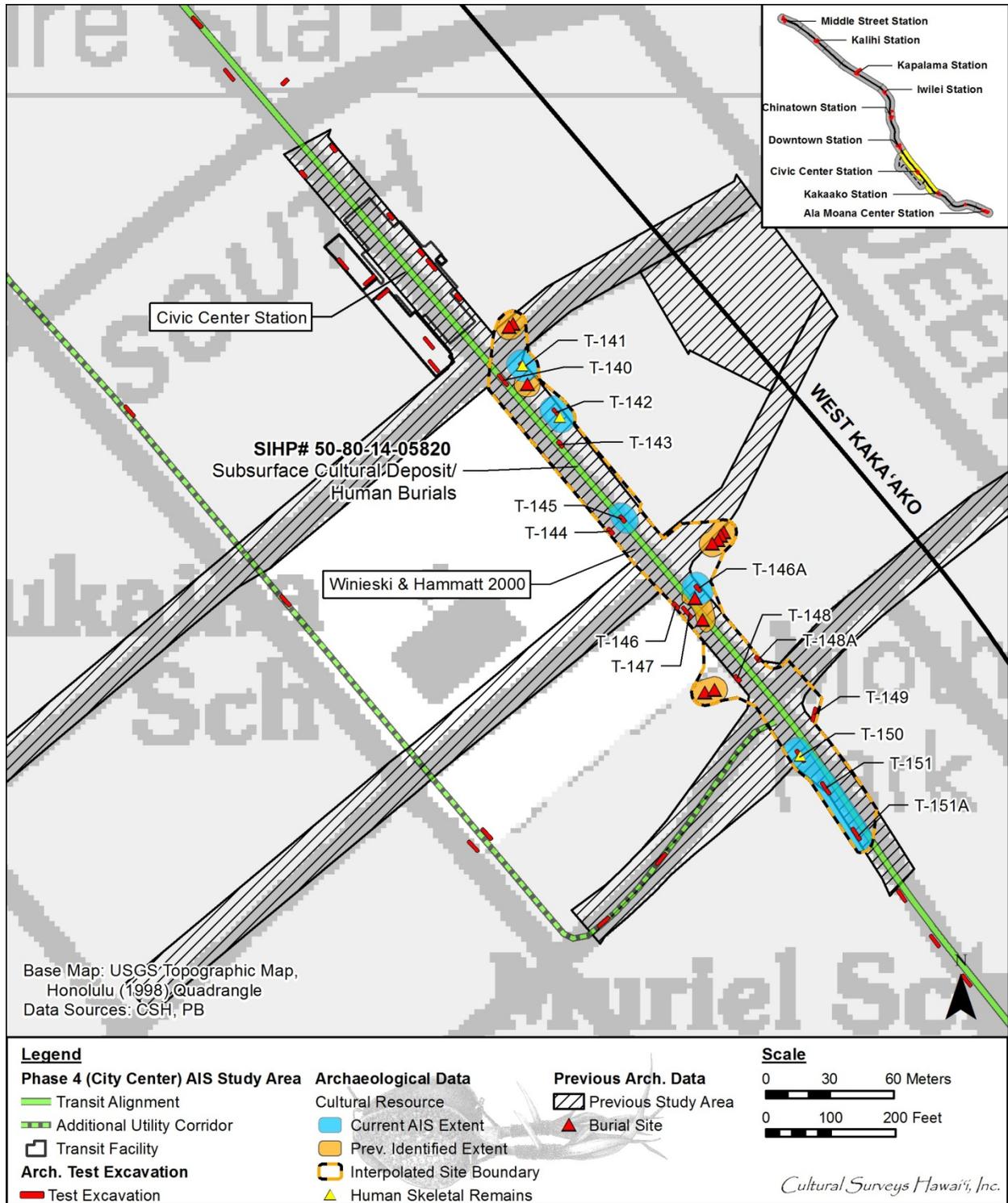


Figure 183. Location of SIHP # 50-80-14-5820 in the Kaka'ako West Geographic Zone (Base Map: 1998 USGS Topographic Map of Honolulu Quadrangle)

According to Winieski and Hammatt (2000), the general stratigraphic sequence recorded at the burial sites consisted of beach sand deposits overlain by a discontinuous buried A-horizon and/or fill layers. Archaeological monitoring of the project mostly involved on-call monitoring or response to an inadvertent discovery. Therefore, the extent and distribution of the cultural A-horizon across the project area was not recorded, and the A-horizon initially was not included as a component of SIHP #-5820.

The buried A-horizon documented by Winieski and Hammatt (2000) ranged from a very dark grayish brown to dark brown silty sand to sandy clay. It was identified at depths from 0.4 mbs to 1.25 mbs. At least eight of the 11 human burials encountered during the project were located within the A-horizon (Table 25). In most cases, the burial pits intruded into the underlying sterile beach sand.

Of the 11 burials identified by Winieski and Hammatt (2000), eight had identifiable burial pits, seven were either intact or partially intact, and six were in a fully flexed position characteristic of traditional Hawaiian burial practices (see Table 25). Mother Waldron Park Burial 4 was the deepest of the confirmed flexed finds. It was uncovered between 1.45 mbs and 1.50 mbs in gleyed sandy clay directly at the water table. The damp environment surrounding this burial preserved a sennit cord wrapped around the remains. It was probably a remnant of the cordage used to bind the body into a flexed position (Winieski and Hammatt 2000).

The remaining flexed burials originated in the A-horizon and extended into the underlying sterile layer of beach sand. Winieski and Hammatt (2000) documented the depths of the burials as ranging from 1.15 mbs to 1.40 mbs, except for one burial encountered at 0.60 mbs.

Winieski and Hammatt (2000) recorded osteological information from Mother Waldron Park Burial 1, recovered from a depth of 1.25 mbs to 1.35 mbs. The remains were flexed in a burial pit with the arms tight against the upper torso, the hands near the shoulders, and the skull oriented to the north. Osteological analyses suggested that the burial was an adult female of Polynesian ancestry between approximately 40 to 45 years of age. The cranium exhibited artificial deformation known to have been practiced in Hawai'i.

A whole pig (*Sus scrofa*) was found buried at the base of the trench directly adjacent to the skull of Mother Waldron Park Burial 1. The pig burial was within a well-defined pit extending from the cultural layer and intruding into the white beach sand layer. Additionally, a small pit approximately 0.50 m east of the human and pig burials contained the charred partial remains of another pig (Figure 184). This latter pit intruded into the beach sand layer from the base of the overlying cultural layer. The pig bones were bundled in the base of the pit at a depth of 1.70 mbs.

Keawe Street Burial 2 was also of particular note. It was discovered at depth of 0.60 mbs to 0.70 mbs, making it the shallowest of the confirmed fully-flexed burials. The 0.85-m oval pit extended from the A-horizon into sterile beach sand and contained the in situ remains of a juvenile female. The remains were lying on their left side with the skull toward the north, and the arms were flexed with the hands in front of the face. Cowrie and tellina species shells were found in association with the burial, near the elbows.

The only confirmed extended burial was Halekauwila Street and Coral Street Burial 3. The remains were located in a disturbed pit at the base of the A-horizon, at a depth of 1.2 mbs to 1.3 mbs. The articulated portion of the burial was in an extended position, with the fragmented

Table 25. Detail of 11 Burials Documented as SIHP # 50-80-14-5820 by Winieski and Hammatt (2000)

Burial #	Condition	Position	Head Direction	Depth (cmbs)	Stratum	Notes
Mother Waldron Park Burial 1	Intact pit burial	Flexed, supine	North	125-135	Sand A-horizon	Female, Polynesian descent, aged 40 to 45 years; artificial cranial deformation. Associated with a whole pig burial in an adjacent pit, and charred partial remains of a second pig
Mother Waldron Park Burial 2	Disturbed/fragmented	-	-	-	-	Right ulna and radius, and hand fragments. No in situ location identified.
Mother Waldron Park Burial 3	Intact pit burial	Flexed, right	Southeast	110-115	Sand A-horizon	No osteological analysis provided
Mother Waldron Park Burial 4	Intact pit burial	Flexed, right	East	145-150	Gleyed sandy clay	Recovered a sennit cord used to bind the remains in a flexed position; preservation due to location at the water table
Keawe St. Burial 1	Disturbed/fragmented	-	-	-	-	Skull and long bones recovered from backdirt. No in situ location identified.
Keawe St. Burial 2	Intact pit burial	Flexed, left	North	60-70	Beach sand	Juvenile female with hands positioned in front of face, charcoal near the hands, associated cowrie and tellina shells
Halekauwila St. & Coral St. Burial 1	Disturbed/fragmented	-	-	140	Silty sand A-horizon	Heavy disturbance from project-related excavation
Halekauwila St. & Coral St. Burial 2	Disturbed pit burial	-	North	140-160	Silty sand A-horizon	In situ portions included an ulna and radius, and a torso and scapulae. Disturbance from project-related excavation.
Halekauwila St. & Coral St. Burial 3	Disturbed pit burial	Extended, supine	Southeast	120-130	Silty sand A-horizon	In situ portions included right ulna and radius, pelvis, vertebrae, and ribs. Disturbance from project-related excavation.
Halekauwila St. & Coral St. Burial 4	Intact pit burial	Flexed, right	East	130-140	Silty sand A-horizon	Complete in situ except for the skull
Halekauwila St. & Keawe St. Burial 1	Disturbed pit burial	Flexed	South	80-115	Silty sand A-horizon	In situ portion included femur, patella, tibia, fibula and mandible fragment. Disturbance from project-related excavation.

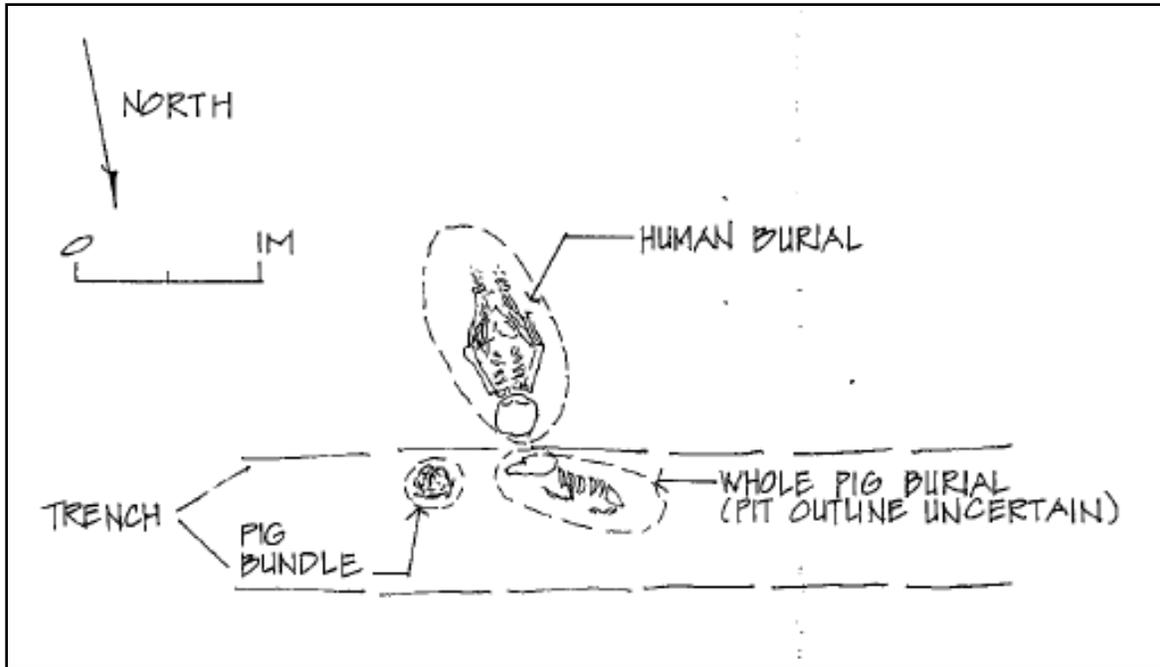


Figure 184. Winieski and Hammatt (2000:26) plan view of Mother Waldron Park Burial 1

skull oriented toward the southeast. The in situ portion of the burial consisted of the articulated right ulna and radius, pelvis, vertebrae, and ribs. Disturbance was due to project-related excavations.

In 2012, Scientific Consulting Services, Inc. (SCS) recovered a human burial at the intersection of Halekauwila Street and Cooke Street, across from Mother Waldron Park (Dagher and Spear 2013). The burial location is approximately 5 m east of the City Center Section 4 AIS T-149, and 15 m northeast of T-150. The cultural resource was designated as SIHP # 50-80-14-7260. The in situ remains had been displaced by construction activity, and no burial pit was identified. Based on the sand context of the burial and the lack of historic materials, it was identified as a pre-Contact burial. Traditional Hawaiian artifacts associated with the burial consisted of five fragments of volcanic glass (1 core, 1 flake, and 3 fragments of debitage) and possible midden material (e.g., pig, fish, marine invertebrates) (Dagher and Spear 2012:15). However, historic artifacts were collected from the backfill material and included 1 clay pipe stem fragment, 1 ferrous square nail, 5 ceramic fragments, and 1 brass military button. Preliminary analysis of the skeletal elements indicated a single individual of Polynesian ancestry between 16 to 19 years of age (Dagher and Spear 2013:17).

During the City Center archaeological inventory survey, two cultural layers were identified as components of SIHP #-5820. The lower cultural layer is an in situ culturally-enriched A-horizon identified as Stratum II in T-141, T-142, T-145, T-146A, T-150, and T-151. It was capped by multiple fill layers consisting of either locally-procured material or imported sediments, subsequently capped by the modern Halekauwila Street asphalt surface and underlying base course. The upper cultural layer (Stratum Id) was identified in T-151 and T-151A. Stratum Id consisted of re-deposited culturally-enriched fill, and was likely a re-worked former A-horizon. It was separated from the lower cultural layer (Stratum II) by an approximately 20 to 50 cm thick fill deposit (Stratum Ie). The upper cultural layer was also capped by multiple fill layers consisting of either locally-procured material or imported sediments.

A general sequence for the stratigraphy within the interpolated boundaries of SIHP #-5820 indicates the lower A-horizon (Stratum II) is overlain by a series of historic and modern fills and is underlain by Jaucas sand. This sequence was documented in T-141, T-142, T-145, T-146A, T-150, and T-151. A generalized profile of this sequence is shown in Figure 185 based on data from T-146A. The coral reef was exposed below the Jaucas sand in T-141 and, although not reached, is presumed to be present within the other test excavations dug within the interpolated boundaries of SIHP #-5820. In T-141, T-142, and T-151, marine deposits were identified below the Jaucas sand to the base excavation. These marine deposits are described as silty sand (T-141), sand (T-142), and sand with clay mottles (T-151).

Due to historic/modern disturbances and/or excavation limitations (e.g., concrete jackets, water table), these culturally-enriched strata (Stratum II and Id) were not exposed in another nine test excavations (T-140, T-143, T-144, T-146, T-147, T-148, T-148A, T-149, and T-152) dug within the interpolated boundaries of SIHP #-5820. However, available stratigraphic data suggest the A-horizon likely was previously present in each of these nine test excavations.

Pit features are associated with both the lower cultural layer (II) and the upper cultural layer (Id in T-151 and T-151A only). The features associated with the lower cultural layer are as follows: Features 2 and 4 in T-141, Features 5-8 in T-142, Features 9 and 10 in T-145, Features

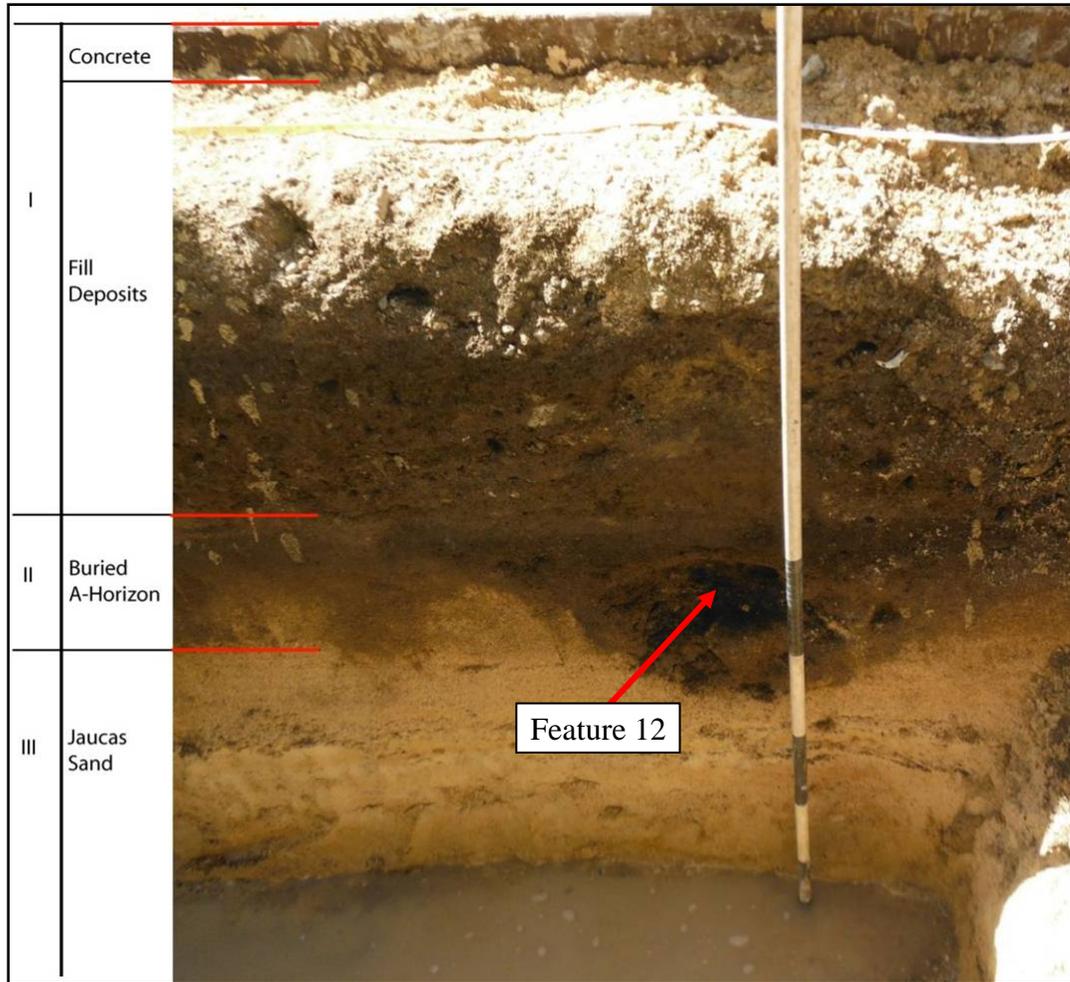


Figure 185. T-146A southwest wall profile representing the general depositional sequence observed in the vicinity, also shown is SIHP #-5820 Feature 12, view to southwest

11-17 in T-146A, Features 18-20 in T-150, and Feature 25 in T-151. The features associated with the localized upper cultural layer (Stratum Id) consist of SIHP #-5820 Features 21-24 in T-151 and Features 26-29 in T-151A.

Four additional pit features (Features 1, 3, 30, and 31) not associated with either the lower or upper cultural layers were identified within SIHP #-5820. Feature 1 is a pit in T-141 that was truncated by sandy loam fill (Stratum Ie) and that is intrusive into the buried A-horizon (Stratum II) and the underlying natural Jaucas sand (Stratum III). Feature 3 is a second pit in T-141 that was truncated by sandy loam fill (Stratum Ie) and that is intrusive into the buried A-horizon (Stratum II), the underlying natural Jaucas sand (Stratum III), and the lagoonal sediment (Stratum IV). Feature 30 is an in situ human burial exposed in the Jaucas sand (Stratum III) below the lower cultural layer in T-142. Feature 31 is a large pit intrusive through two fill strata (Id-Ie), the lower cultural layer (Stratum II), the underlying Jaucas sand (Stratum III) and natural marine/lagoonal sediments (Stratum IV), terminating just above the coral shelf.

The 31 pit features identified as components of the SIHP #-5820 consist of 1 horse burial pit with disarticulated and scattered human remains (Feature 1), 26 indeterminate pits (Features 2-8, 10-22, 25-29, and 31), 1 *imu* (Feature 9), 1 possible postmold (Feature 23), two infant dog burials (Feature 24), and 1 traditional Hawaiian human burial (Feature 30). These features are summarized in Table 26 and briefly described below.

SIHP #-5820 Feature 1 was identified within T-141 as a pit extending from the lower boundary of Stratum Ie at 0.55 mbs and terminating within Stratum III at 1.15 mbs (Figure 186 and Table 27). The pit was truncated by overlying fill layers and was intrusive into both the buried A-horizon (Stratum II) and underlying natural Jaucas sand (Stratum III). The upper portion (0.55-0.77 mbs) contained isolated and disarticulated human skeletal elements (Figure 187). Human skeletal elements were also found within SIHP #-5820 Feature 31 (an adjacent pit feature of mixed fill), and along the upper boundary of Stratum III. The presence of historic artifacts within both SIHP #-5820 Feature 1 and Feature 31 indicates the features post-date the A-horizon and Stratum III.

Terrestrial faunal remains individually collected from SIHP #-5820 Feature 1 consisted of a pig (*Sus scrofa*) molar, dog (*Canis lupus familiaris*) bones, and bird (Aves) bones. A basalt stone sinker (Acc. # 141-H-1) was found at 0.70 mbs immediately adjacent to the pit outline visible at the upper limit of Stratum III (Jaucas sand) (Figure 188). Beneath the human skeletal remains within the pit, a complete, in situ horse (*Equus ferus caballus*) burial was encountered between 0.77 mbs and 1.15 mbs (Figure 189). All of the sediment within pit was screened in order to complete the recovery of human skeletal remains. A 11-liter bulk sample of sediment within the pit was collected from 0.83-1.15 mbs. The screened bulk sediment sample yielded charcoal (0.1 g), possible marine shell midden (20.6 g), naturally-occurring marine shell (9.4 g), and one medium mammal bone fragment (0.8 g). The possible marine shell midden included *Tellina palatam* (12.1 g), *Brachidontes crebristriatus* (3.2 g), Isognomidae (1.8 g), *Nerita picea* (1.8 g), crustacean (1.5 g), and Echinoidea (0.2 g).

The human skeletal remains identified within SIHP #-5820 Feature 1 represented a minimum number of three individuals. Skeletal elements noted as either juvenile or adult included a second cervical vertebra, a thoracic vertebra, several unspecified vertebrae, several rib fragments, a manubrium, a right third metacarpal, two left second metacarpals, a proximal hand phalanx, an

Table 26. Archaeological Features of SIHP #-5820 Identified during the City Center Section 4 AIS

Feature	Test Excavation	Depth (cmbs)	Radiocarbon Age (C14)	Type/Function	Contents
1	T-141	55-115	-	Pit/Horse burial/ Disarticulated human skeletal remains	<i>In situ</i> horse burial, previously disturbed and scattered human skeletal remains (incomplete remains of at least 1 infant, 1 adult, and a possible juvenile or adult), faunal remains (pig, dog, bird, and medium-sized mammal), charcoal, shell midden, and no naturally-occurring marine shell
2	T-141	71-89	-	Pit/Indeterminate	Marine shell and a pig bone fragment
3	T-141	63-150	-	Pit/Indeterminate	Ceramic fragments and rusted metal, possible midden
4	T-141	75-95	-	Pit/Indeterminate	Charcoal (<i>kukui</i> and <i>unidentified monocot</i>)
5	T-142	44-75	-	Pit/Indeterminate	Basalt game stone; a fire-cracked, water-worn basalt cobble, several flakes from fire-cracked rock, two ceramic fragments and rusted metal pieces, charcoal, naturally-occurring shell, midden, and faunal remains (cow, medium mammal, and fish).
6	T-142	56-75	-	Pit/Indeterminate	A traditional Hawaiian shell fishhook and historic artifacts including a possible ceramic fragment, a clear glass fragment, and a piece of rusted metal. Charcoal, shell midden, naturally-occurring marine shell, water-worn rocks, faunal remains (cow, medium mammal, fish, and rat), and human skeletal remains (two teeth and cancellous bone) also present.
7	T-142	50-90	-	Pit/Indeterminate	Charcoal, shell midden, naturally-occurring marine shell, a fragment of vesicular basalt, faunal remains (bird, fish, cow, medium mammal, and pig), earthenware ceramic, metal, and glass fragments
8	T-142	55-70	AD 1610-1670	Pit/Indeterminate	Charcoal (coconut, <i>kukui</i> , and <i>kōpiko</i>), shell midden, naturally-occurring marine shell, and faunal remains (fish, pig, medium and small mammal)

Feature	Test Excavation	Depth (cmbs)	Radiocarbon Age (C14)	Type/Function	Contents
9	T-145	74-92	AD 1480-1650 (95.4%)	<i>Imu</i> pit	Charcoal (<i>'ōhi'a lehua</i> , <i>'ilima</i> , <i>lama</i> , and an unidentified monocot), thermally-altered basalt stones, shell midden, naturally-occurring marine shell, and bottle glass fragments
10	T-145	70-110	-	Pit/Indeterminate	Charcoal (<i>kukui</i> , conifer, and monocot), shell midden, naturally-occurring marine and faunal remains of a medium-sized mammal
11	T-146A	67-76	-	Pit/Indeterminate	Charcoal, shell midden, naturally-occurring marine shell, and burned fish bone
12	T-146A	75-95	AD 1630-1690 (51.3%)	Pit/Indeterminate	Charcoal (<i>kukui</i> , <i>hau</i> , <i>'akoko</i> , <i>niu</i> , and <i>'a'ali'i</i>), shell midden, naturally-occurring marine shell, volcanic glass, basalt, and vesicular fire-cracked rock
13	T-146A	83-97	AD 1630-1690 (51.3%)	Pit/Indeterminate	Charcoal (<i>kukui</i> , <i>hau</i> , <i>kolomona</i> , and <i>'ōhi'a lehua</i>), shell midden, fire-cracked rock, and faunal remains (fish and medium-sized mammal)
14	T-146A	84-95	AD 1490-1670 (95.4%)	Pit/Indeterminate	Charcoal (<i>niu</i> and <i>'ōhi'a lehua</i>), shell midden, naturally-occurring marine shell, burned wood, volcanic glass, fire-cracked rock and fish bones
15	T-146A	84-92	AD 1720-1820 (53.5%)	Pit/Indeterminate	Charcoal (<i>kukui</i> and <i>pilo</i>), shell midden, naturally-occurring marine shell, basalt fragments, and faunal remains (pig, dog, fish, medium mammal)
16	T-146A	93-100	-	Pit/Indeterminate	Shell midden, naturally-occurring shell, and fish bones
17	T-146A	121-135	-	Pit/Indeterminate	SIHP #-5820 Feature 17 was subsequently interpreted as natural. As such no sediment samples were collected for analysis.-
18	T-150	75-105	-	Pit/Indeterminate	Worked human bone (proximal tibia shaft), basalt tool fragment, fire-cracked rock, shell midden, naturally-occurring marine shell, and fish remains.

Feature	Test Excavation	Depth (cmbs)	Radiocarbon Age (C14)	Type/Function	Contents
19	T-150	53-95	AD 1810-1920 (67.1%)	Pit/Indeterminate	Charcoal (<i>kukui</i> , <i>kolomana</i> , 'ōhi'a <i>lehua</i> , 'ilima, and 'āheahea or 'āweoweo), shell midden, naturally-occurring shell, and fish remains
20	T-150	90-130	AD 1630-1690 (51.3%)	Pit/Indeterminate	Charcoal (<i>kukui</i> , monocot, and one unidentified species), shell midden, naturally-occurring marine shell, a small fragment of volcanic glass debitage, and fish bones
21	T-151	48-85	-	Pit/Indeterminate	Shell midden and fire-cracked rock
22	T-151	60-90	-	Pit/Indeterminate	Shell midden, cement fragments, 2 fragments of volcanic glass debitage, naturally-occurring marine shell, and medium mammal bone
23	T-151	60-99	-	Pit/Possible Postmold	Shell midden, naturally-occurring marine shell, a red brick fragment (dated 1918-1978), possible coal fragments, glass fragments, fish and medium mammal bones, vesicular basalt fragments, and fire-cracked basalt
24	T-151	70-83	-	Dog burials	2 <i>in situ</i> infant dog burials
25	T-151	90-119	AD 1480-1660 (95.4%)	Pit/Indeterminate	Charcoal (<i>kukui</i> , <i>ko'oko'olau</i> , and one unidentified species), shell midden, and rat bones
26	T-151A	74-80	-	Pit/Indeterminate	Basalt, a fragment of volcanic glass debitage, shell midden, naturally-occurring marine shell, and fish bones
27	T-151A	65-72	-	Pit/Indeterminate	Charcoal, shell midden, naturally-occurring marine shell, white and pink glass fragments, and fish bones
28	T-151A	60-80	-	Pit/Indeterminate	Charcoal, shell midden, naturally-occurring marine shell, ceramic and glass fragments, medium mammal bone, and possible fire-cracked rock
29	T-151A	47-58	-	Pit/Indeterminate	Naturally-occurring shell and fish bone

Feature	Test Excavation	Depth (cmbs)	Radiocarbon Age (C14)	Type/Function	Contents
30	T-142	100	-	Human burial	<i>In situ</i> human burial. Adult or adolescent, traditional Hawaiian burial in a flexed or partially flexed position. Located in the natural Jaucas sand underlying the A-horizon with a faint burial pit outline. No grave goods were observed.
31	T-141	25-135	-	Pit/Indeterminate	Scattered, disarticulated human skeletal remains, faunal remains (pig and chicken)

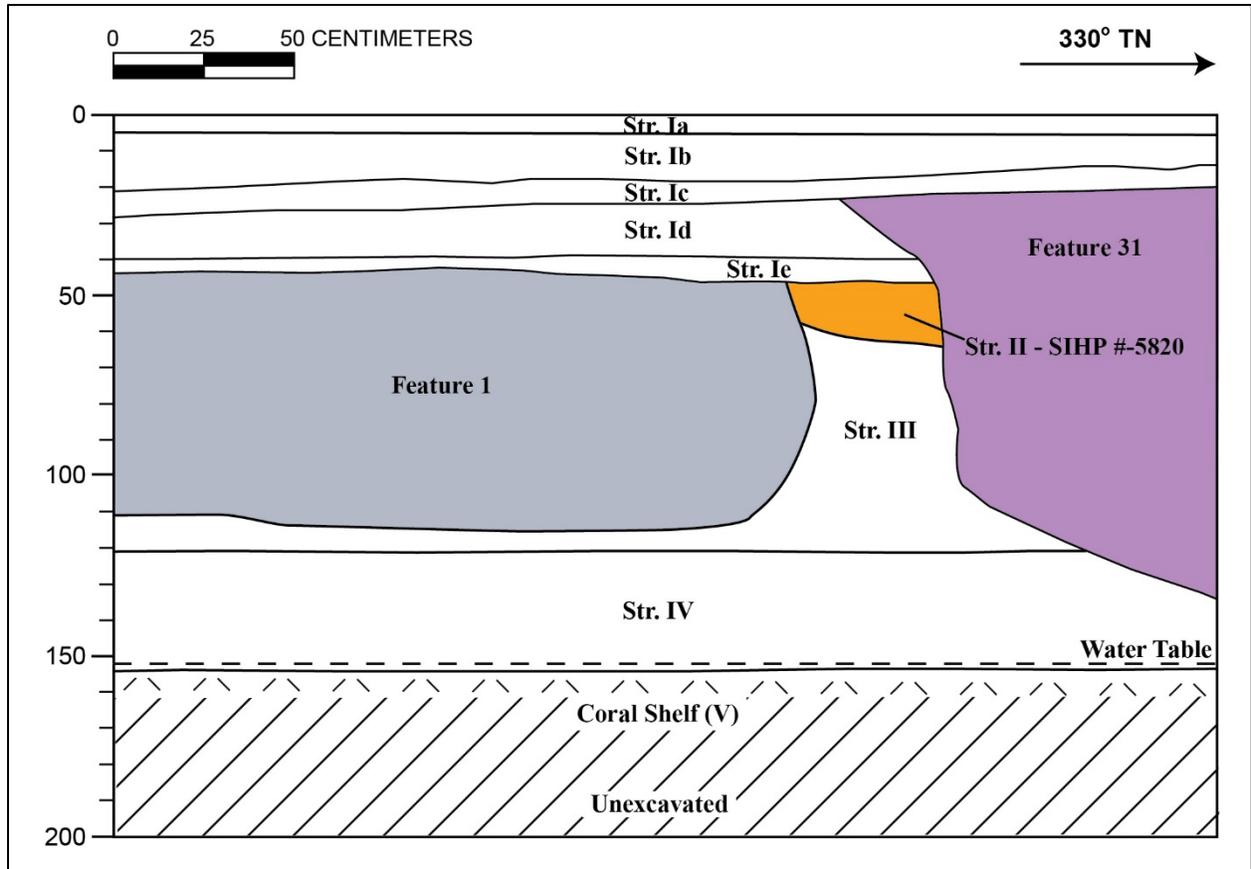


Figure 186. T-141 southwest wall profile showing SIHP #5820 Feature 1 which contained scattered human skeletal elements and an articulated horse burial

Table 27. T-141 Stratigraphic Description of Southwest Profile

Stratum	Depth (cmbs)	Description
Ia	0-6	Asphalt
Ib	6-20	Fill; 2.5 YR 5/4 (reddish brown); very gravelly silt loam; weak, very fine, blocky structure; dry, weakly coherent consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; imported basalt base course
Ic	15-35	Fill; 7.5 YR 3/2 (dark brown); sandy loam; weak, very fine, crumb structure; moist, firm consistency; non-plastic; mixed origin; clear, smooth lower boundary; fill material
SIHP #-5820 Feature 31	25-135	Pit feature originating at the lower boundary of Stratum Ic; gravelly sandy loam mixed fill; contained glass fragments and metal fragments (not collected), and ceramic fragments (collected), and previously disturbed, disarticulated and scattered human skeletal remains; SIHP #-5820 Feature 31
Id	25-40	Fill; 2.5 Y 8/3 (pale yellow); extremely gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, broken/discontinuous lower boundary; fill material
Ie	40-50	Fill; 7.5 YR 3/2 (dark brown); sandy loam; weak, very fine, crumb structure; moist, firm consistency; non-plastic; mixed origin; clear, smooth lower boundary; fill material; contained red brick fragment (collected)
SIHP #-5820 Feature 1	55-115	Pit feature truncated at upper boundary; loamy sand; contained <i>in situ</i> horse burial, previously disturbed and scattered human skeletal remains (incomplete remains of at least 1 infant, 1 adult, and a possible juvenile or adult), charcoal, shell midden, non-cultural shell, and faunal remains of a medium-sized mammal; SIHP #-5820 Feature 1
SIHP #-5820 Feature 3	63-150	Pit feature originating from Stratum Ie; loamy sand; contained rusted metal and ceramic fragments; SIHP #-5820 Feature 3
II	43-72	Natural, 10 YR 6/2 (light brownish gray); loamy sand; weak, very fine, crumb structure; moist, very friable consistency; slightly plastic; mixed origin; diffuse, broken/discontinuous lower boundary; buried A-horizon; former land surface; designated SIHP #-5820, includes SIHP #-5820 Features 2 and 4
SIHP #-5820 Feature 2	71-89	Pit feature originating from Stratum II; loamy sand; contained marine shell and faunal fragments; SIHP #-5820 Feature 2
SIHP #-5820 Feature 4	75-95	Pit feature originating from Stratum II; loamy sand; contained charcoal (<i>kukui</i> nutshell); SIHP #-5820 Feature 4

III	53-121	Natural; 10 YR 6/4 (light yellowish brown); very fine sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; diffuse, smooth lower boundary; Jaucas sand
IV	121-152	Natural; 2.5 Y 8/4 (pale yellow); silty sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; marine origin; abrupt, smooth lower boundary; lagoonal sediment
V	152 (BOE)	Natural; 10 YR 7/4 (very pale brown); bedrock-limestone; structureless, massive; moist, weakly to strongly cemented; discontinuous consistency; non-plastic; marine origin; lower boundary not observed; Pleistocene coral shelf

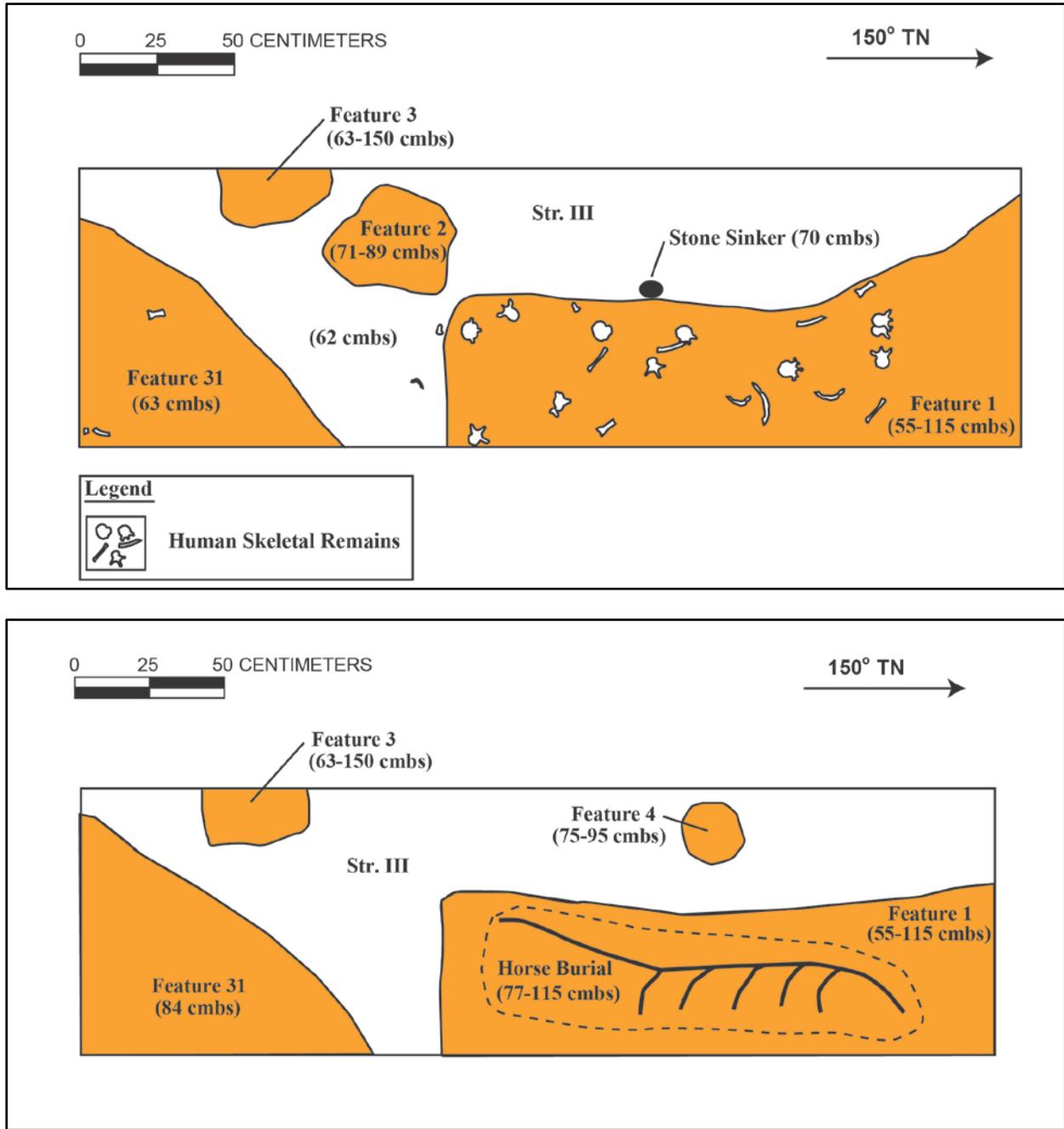


Figure 187. T-141 plan view showing the upper boundary of SIHP #-5820, Feature 1 with scattered and disarticulated human skeletal remains (top) and the lower portion of Feature 1 with an articulated horse burial (bottom); also note SIHP #-5820 Features 2 through 4 and Feature 31



Figure 188. Basalt stone sinker (Acc. # 141-H-1) collected from the natural Jaucas sand adjacent to SIHP #-5820 Feature 1 in T-141



Figure 189. T-141, articulated horse burial in SIHP #-5820 Feature 1 extending into southwest sidewall, view to south

intermediate hand phalanx, two distal hand phalanges, an unsided innominate, and a left calcaneus. The skeletal elements identified as either child or infant remains included mandible fragments, multiple rib fragments, a left radius, and a right innominate. An unidentified long bone was noted as either infant or fetal. The minimum number of individuals (MNI) was based on the age differences and reported duplication of the left second metacarpal. Sex and ancestry were not determined. SIHP #-5820 Feature 1 is interpreted as a pit containing a horse burial and previously disturbed and disarticulated human skeletal remains.

SIHP #-5820 Feature 2 was identified as a pit within the central portion of T-141. It originated from the base of Stratum II at 0.71 mbs and terminated at 0.89 mbs within Stratum III. The feature was irregularly-shaped in plan view, measured a maximum of 0.42 m long by 0.35 m wide, but did not extend into any of the excavation sidewalls (see Figure 187). The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. A single unmodified pig (*Sus scrofa*) cranial fragment was collected from SIHP #-5820 Feature 2. A 10-liter screened sample was collected from within the pit at 0.89 mbs which yielded *Echinothrix diadema* sp. (0.5 g). SIHP #-5820 Feature 2 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 3 was identified within T-141 at the lower boundary of Stratum Ie at 0.63 mbs. The pit appeared truncated by overlying fill layers. It was intrusive into the buried A-horizon (Stratum II) and the underlying natural sands (Strata III and IV), and terminated at the coral shelf at 1.50 mbs. The feature was elongated and irregular-shaped in plan view, measured approximately 0.17 m long by 0.36 m wide, and extended into the northeast sidewall. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. The feature contained historic material including rusted metal and ceramic fragments. SIHP #-5820 Feature 3 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 4 was identified within the central portion of T-141. The pit originated at or near the base of Stratum II at 0.75 mbs, intruded into Stratum III, and terminated at 0.95 mbs. The feature was largely circular-shaped in plan view and measured approximately 0.20 m in diameter. It did not extend into the excavation sidewalls. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. No cultural material was identified within the pit fill. SIHP #-5820 Feature 4 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 5 was identified within T-142. The pit originated at or near the base of Stratum II at 0.44 mbs and terminated within Stratum III at 0.75 mbs. The feature was irregular-shaped in plan view, measured 0.80 m long by 0.30 m wide, and extended into the northeast sidewall (Figure 190). The previously backfilled excavation (probable utility trench) observed within T-142 appeared to crosscut and remove a portion of SIHP #-5820 Feature 5. The sediment matrix with the pit was loamy sand with similar characteristics to Stratum II. A 2-liter bulk sediment sample (0.50–0.75 mbs) and a 7.5-liter field screened bulk sediment sample (0.44–0.52 mbs) were collected for analysis. The combined samples contained charcoal (4.1 g), possible marine shell midden (39.6 g), naturally-occurring marine shell (0.3 g), a rounded vesicular basalt game stone (180.5 g), refined earthenware fragments (23.2 g), rusted metal fragments (7.6 g), an unidentified fish bone (0.1 g), a fragment of a fire-cracked waterworn cobble (>500 g), and fire-cracked vesicular basalt rocks and rock fragments (540.4 g). The shell midden included *Nerita picea* shell (11.2 g) and three opercula (1.7 g), *Nassarius gaudiosus* (1.0 g), *Turbo sandwicensis* (17.2 g), burned shell (4.4 g), *Tellina palatam* (0.5 g), *Isognomon* sp. (0.2 g), Echinoidea (0.3 g),

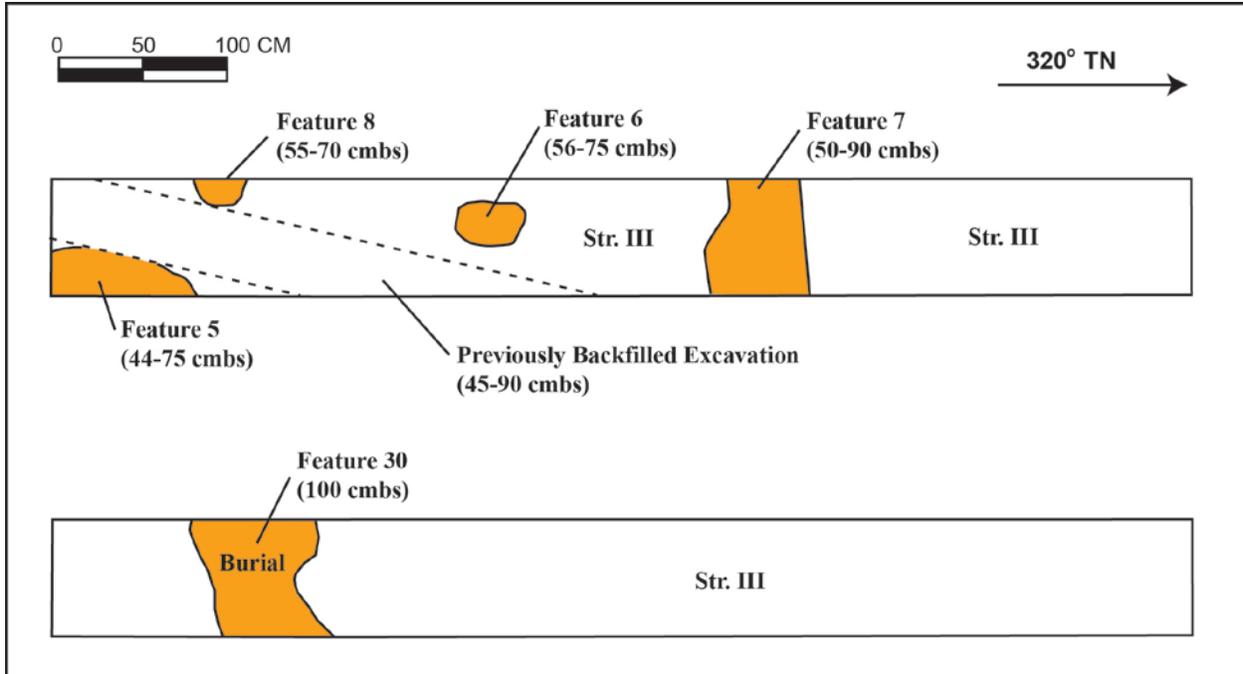


Figure 190. T-142 plan views showing SIHP #-5820 Features 5-8 at the Strata II/III interface (top), and SIHP #-5820 Feature 30 within Stratum III (bottom)

and crustacean (0.1 g). The basalt game stone (Acc. # 142-H-1) is considered a traditional Hawaiian artifact (Figure 191). The basalt game stone was sent for EDXRF analysis, and although specific source material was not available, the results indicated that it had a high ratio of Strontium to Zirconium which does not match O'ahu Island volcanic source samples (see EDXRF discussion in Volume V). SIHP #-5820 Feature 5 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 6 was identified within T-142 as originating at or near the base of Stratum II at 0.56 mbs. This pit feature was intrusive into Stratum III and terminated at 0.75 mbs. The feature was irregular shaped in plan view and measured approximately 0.40 m long by 0.25 m wide (see Figure 190). The pit was observed in plan view near the central portion of the excavation and it did not extend into either sidewall. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. A 2-liter bulk sample (0.560.64 mbs) was collected from within the pit. The screened bulk sample yielded charcoal (6.0 g), possible marine shell midden (226.3 g, see SIHP #-5820 Feature 6 Midden Results Table located at the end of this section), naturally-occurring marine shell (3.1 g), a shell fishhook (0.5 g), rusted metal fragments (0.5 g), glass fragments (1.7 g), possible ceramic fragment (0.7 g), angular basalt gravel (171.6 g), water-worn basalt gravel (32.7 g), unidentified medium mammal bones (17.9 g), an unidentified fish bone (0.6 g), rat (*Rattus* sp.) bone (0.5 g), and human skeletal remains. The shell midden consisted of *Isognomon* sp. (157.2 g), *Nerita picea* (21.7 g), Echinoidea spp. (18.7 g), *Conus* sp. (17.4 g), *Theodoxus neglectus* (8.8 g), *Brachidontes crebristriatus* (1.6 g), and crustacean (0.9 g). The marine shell fishhook (Acc. # 142-H-2) is considered a traditional Hawaiian artifact (Figure 192). Human skeletal remains also were encountered within the bulk sediment sample. The human skeletal remains were identified as a mandibular right lateral incisor with a broken tooth root, an additional tooth crown fragment, and a small cancellous bone fragment. Minimal attrition was noted on the occlusal surface. The biological profile and context (pre- versus post-Contact) of the human skeletal remains is indeterminate, especially as the feature contained artifacts from both periods. The human remains (two teeth and cancellous bone) were reinterred in the nearby excavation T-141. SIHP #-5820 Feature 6 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 7 was identified within T-142 as originating at or near the base of Stratum II at 0.50 mbs. This pit feature was intrusive into Stratum III and terminated at 0.90 mbs (Figure 193 and Table 28). The feature was irregularly shaped in plan view, measured 0.60 m long by over 0.70 m wide, and extended beyond the width of the excavation into both the southwest and northeast sidewalls (see Figure 190). The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. A 2-liter bulk sediment sample (0.50–0.60 mbs), a 17-liter field-screened bulk sample (0.60 mbs), and a 9.5-liter field-screened bulk sample (0.55–0.70 mbs) were collected from within the pit. The combined samples contained charcoal (1.8 g), possible marine shell midden (361.4 g, see SIHP #-5820 Feature 7 Midden Results Table located at the end of this section), naturally-occurring marine shell (23.5 g), stoneware fragments (157.0 g), refined earthenware fragments (75.8 g), rusted metal fragments and debris (31.8 g), glass fragments (14.0 g), an unidentified bird (*Aves*) bone (0.9 g), unidentified medium mammal bone (0.4 g), unidentified burnt medium mammal bones (7.8 g), fish bones (0.2 g), and a vesicular basalt stone (1.1 g). The shell midden consisted of *Isognomon* sp. (281.6 g), *Nerita picea* shell (46.9 g) and an operculum (0.1 g), *Conus* sp. (11.0 g), Echinoidea (10.8 g), *Tellina palatam*



Figure 191. Basalt game stone (Acc. # 142-H-1) collected from SIHP #-5820 Feature 5 in T-142 (scale blocks are in cm)



Figure 192. Marine shell fishhook (Acc. # 142-H-2) collected from SIHP #-5820 Feature 6 in T-142

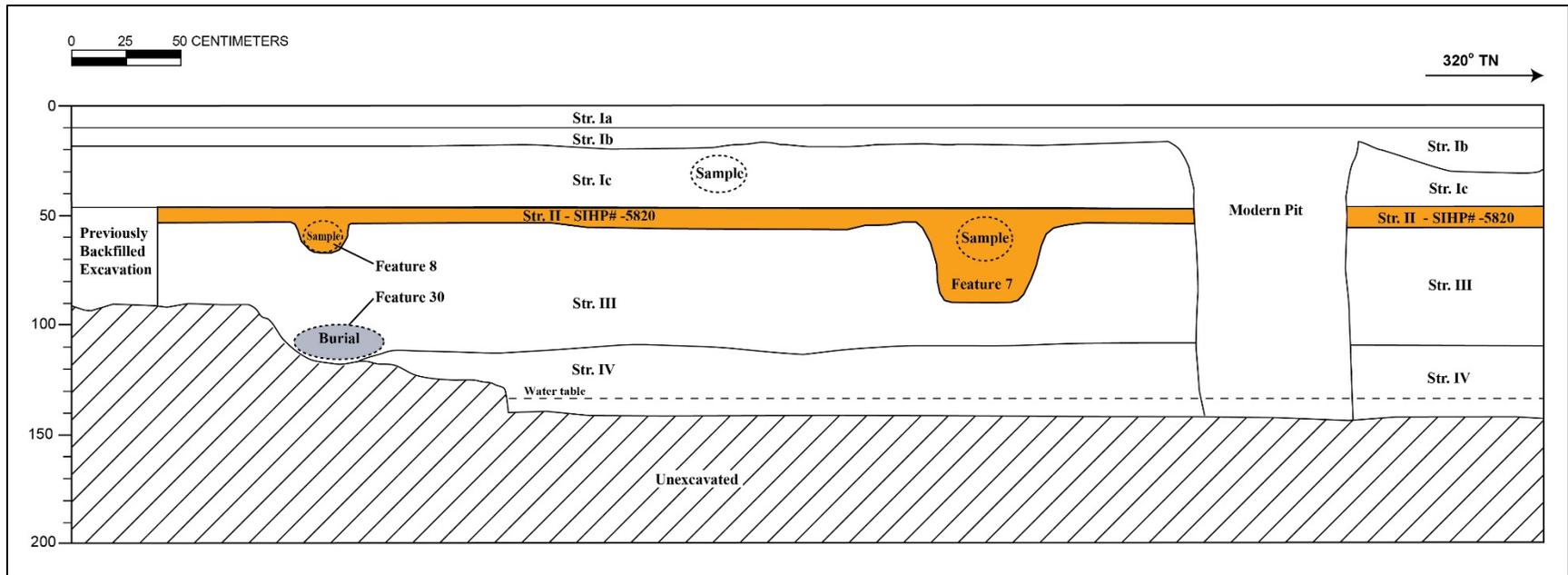


Figure 193. T-142 southwest profile showing SIHP #-5820 Features 7, 8, and 30

Table 28. T-142 Stratigraphic Description of Southwest Profile

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-30	Fill; 2.5 YR 2.5/4 (dark reddish brown); very gravelly silty loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt smooth lower boundary; gravel base coarse
Ic	18-47	Fill; 2.5 YR 8/3 (pale yellow); gravelly cobbly sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; contained faunal bone (collected), ceramic fragments; crushed coral
II	47-90	Natural; 10 YR 4/2 (dark grayish brown); sandy loam; weak, fine, crumb structure; moist, very friable consistency; mixed origin; abrupt smooth lower boundary; contained multiple historic: glass, ceramics, faunal bone (collected), marine shell, tar vine from possible old road way; mixed use of A-horizon, top portion historically used and impacted. Bottom more pre-contact/Hawaiian land use; designated SIHP #-5820, includes SIHP #-5820 Features 5-8
SIHP #-5820 Feature 5	44-75	Pit feature originating from Stratum II; loamy sand; contained a traditional Hawaiian basalt game stone, fire-cracked rock, a water-worn basalt cobble, ceramic fragments, metal pieces, charcoal, fish bones, and naturally-occurring marine shell; SIHP #-5820 Feature 5
SIHP #-5820 Feature 6	56-75	Pit feature originating from Stratum II; loamy sand; contained a traditional Hawaiian shell fishhook, ceramic and glass fragments, metal, charcoal, shell midden, naturally-occurring marine shell, water-worn rocks, fish bone, mammal bone, and human skeletal elements (two teeth and cancellous bone); SIHP #-5820 Feature 6
SIHP #-5820 Feature 7	50-90	Pit feature originating from Stratum II; loamy sand; contained charcoal, shell midden, naturally-occurring marine shell, fish bone, bird bone, ceramic, glass and metal fragments; SIHP #-5820 Feature 7
SIHP #-5820 Feature 8	55-70	Pit feature originating from Stratum II; loamy sand; contained charcoal, shell midden, fish bone, and mammal bone; SIHP #-5820 Feature 8
III	60-115	Natural; 10 YR 8/6 (yellow); very fine to fine grained sand; structureless single-grain; moist, loose consistency; non-plastic; marine origin; diffuse lower boundary; Jaucas sand; Features 5-8 intrude into layer; includes human burial, SIHP #-5820 Feature 30
SIHP #-5820 Feature 30	100	In situ human burial within Jaucas sand (Stratum III); faint burial pit; flexed or partially flexed; SIHP #-5820 Feature 30
IV	110-143 (BOE)	Natural; 10 YR 8/4 (very pale brown); sand; structureless single-grain; moist, loose consistency; non-plastic; marine origin; diffuse lower boundary; common fine roots; increasing clay content toward the base

adhered to corroded metal (4.7 g), *Brachidontes crebristriatus* (3.4 g), burned shell (2.1 g), *Ostrea sandwicensis* (2.0 g), *Turbo sandwicensis* (2.8 g), and burned crustacean (0.7 g). Feature 7 faunal remains consist of *Bos taurus* skeletal elements, unmodified *Sus scrofa* skeletal elements, and unmodified medium mammal (possible *Bos taurus* or *Sus scrofa*) irregular bone fragments. The *Bos taurus* radius and vertebrae had been butchered with a metal saw blade, indicating an historic origin. SIHP #-5820 Feature 7 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 8 was identified within T-142 originating from near or at the base of Stratum II at 0.55 mbs. The pit feature was intrusive into Stratum III and terminated at 0.70 mbs (see Figure 193 and Table 28). The feature was a small, oval shape in plan view. It measured approximately 0.30 mbs long and 0.18 mbs wide, and extended into the southwest sidewall. A 0.25-liter bulk sediment sample was collected from within the pit between 0.55 mbs and 0.70 mbs. The sample yielded charcoal (0.6 g), possible marine shell midden (10.3 g; see SIHP #-5820 Feature 7 Midden Results Table located at the end of this section), naturally-occurring marine shell (3.7 g), pig (*Sus scrofa*) bone (0.5 g), unidentified medium mammal bone (0.4 g), unidentified fish bone (0.1 g), and unidentified small mammal bone (0.1 g). The charcoal was submitted for wood taxa identification and radiocarbon analysis. Wood taxa analysis identified native and Polynesian-introduced trees consisting of *Cocos nucifera* (*Niu*, coconut), *Aleurites moluccana* (*Kukui*), *Psytoria* sp. (*Kōpiko*), and unidentified monocot. Radiocarbon analysis yielded five possible date ranges, with a calibrated 2-sigma date of A.D. 1610 to 1670 (46.7%) being the most probable. SIHP #-5820 Feature 8 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 9 was identified within T-145 a possible *imu* pit originating from the base of Stratum II at 0.74 mbs. The pit was intrusive into Stratum III, terminating at 0.92 mbs (Figure 194 and Table 29). The feature was generally circular in plan view. It measured 0.50 m long by over 0.47 m wide and extended into the southwest sidewall. The sediment matrix within the pit was silty sand with similar characteristics to Stratum II. Several thermally-altered basalt cobbles, charcoal flecking, and faunal bone were observed within the pit fill. A 2.5-liter bulk sample collected from SIHP #-5820 Feature 9 (0.81-0.92 mbs) yielded charcoal (1.4 g), naturally-occurring marine shell (1.6 g), and possible marine shell midden consisting of *Strombus* sp. (0.8 g), burned crustacean (1.8 g), burned gastropod (1.6 g), and *Ethinometra mathaei* sp. (1.4 g).

Wood taxa analysis of the charcoal and identified only native taxa consisting of consisting of cf. *Metrosideros polymorpha* ('*ōhi'a lehua*), cf. *Sida fallax* ('*ilima*), *Diospyros sandwicensis* (*lama*), and an unidentified monocot. Radiocarbon analysis performed on the '*ilima* yielded three possible date ranges, with a calibrated 2-sigma date of AD 1480 to 1650 (95.4%) being the most probable. SIHP #-5820 Feature 9 is interpreted as a possible *imu* pit.

SIHP #-5820 Feature 10 was identified within the southeast end of T-145. The pit feature originated at or near the base of Stratum II at 0.70 mbs. It was intrusive into Stratum III and terminated at 1.10 mbs (see Figure 194 and Table 29). The feature was not documented in plan view. In profile view, SIHP #-5820 Feature 10 was visible in the southwest sidewall. It had straight to slightly sloping walls and a flat base, with a maximum length of 0.40 m. The sediment matrix within the pit consisted of darker-colored silty sand and appeared to be previously disturbed by the overlying fill deposition. A 2-liter bulk sample collected within SIHP #-5820



Figure 194. T-145 southwest profile showing SIHP #-5820 Feature 9, a possible *imu* pit with basalt cobbles visible near the base, view to west

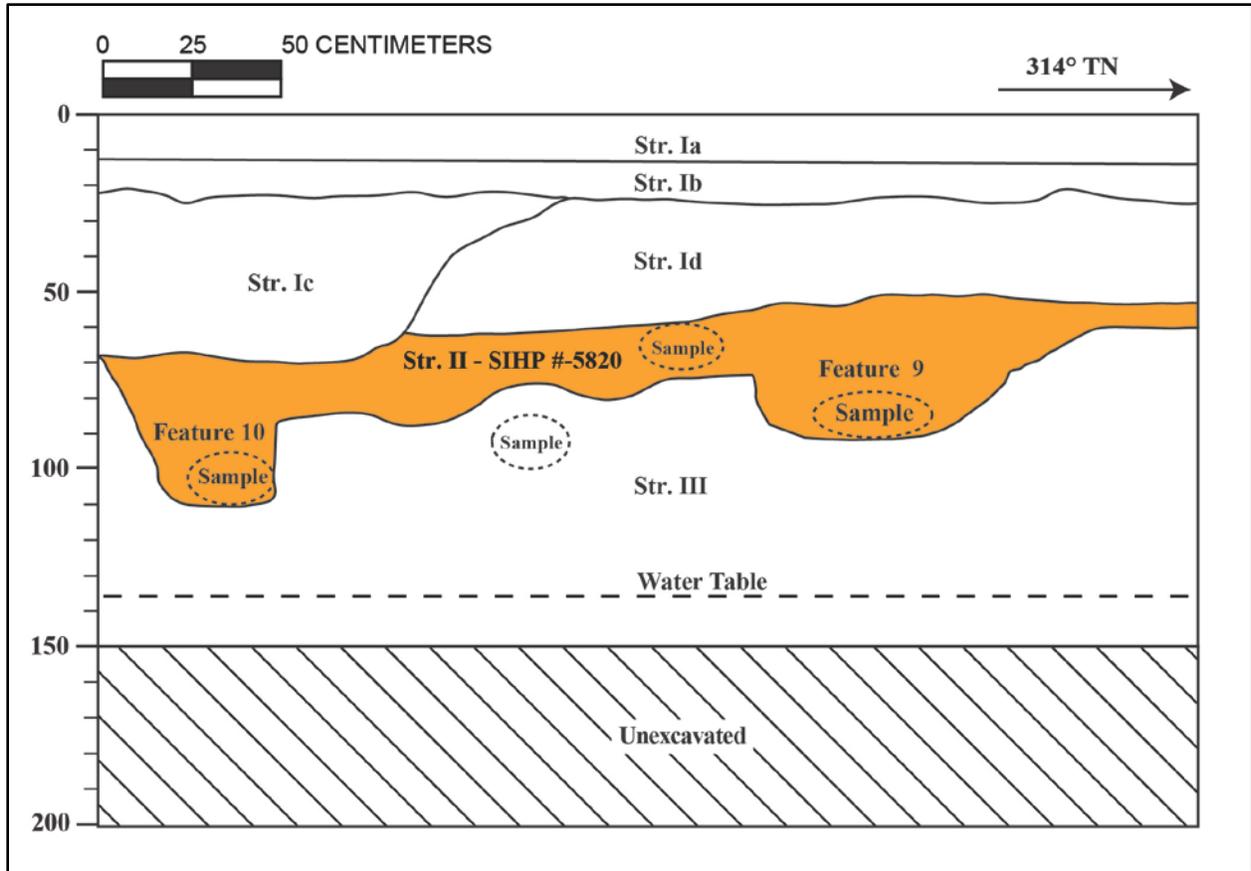


Figure 195. T-145 southwest profile, showing SIHP #-5820 Features 9 and 10

Table 29. Stratigraphic Description, southwest profile

Stratum	Depth (cmbs)	Description
Ia	0-14	Asphalt
Ib	14-25	Fill; 10 YR 4/2 (dark grayish brown); extremely gravelly loam; structureless, single-grain; moist, very friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; imported fill
Ic	23-70	Fill; 10 YR 4/2 (dark grayish brown) with mottles (inclusion, sand) 10.5Y 7/6 (yellow); very gravelly loam; structureless, single-grain; moist, very friable consistency; non-plastic; terrigenous origin; diffuse, broken/discontinuous lower boundary; contains bottle glass, and faunal bone (collected), marine shell; imported fill, sand inclusions
Id	25-64	Fill; 10 YR 8/2 (very pale brown); extremely gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; very abrupt, smooth lower boundary; imported crushed coral fill
II	50-87	Natural; 10 YR 4/3 (brown); silty sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; natural sediment; buried A-horizon (SIHP #50-80-14-5820) including SIHP #-5820 Features 9 and 10
SIHP #-5820 Feature 9	74-92	Possible imu feature originating in Stratum II; silty sand; contained fire-cracked rock, charcoal, faunal bone, and marine shell midden; SIHP #-5820 Feature 9
SIHP #-5820 Feature 10	70-110	Pit feature originating in Stratum II; silty sand; contained charcoal, faunal bone, and marine shell midden; SIHP #-5820 Feature 10
III	75-150 (BOE)	Natural; 10.5 YR 7/6 (yellow); medium to coarse grain sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; marine origins; lower boundary not visible; natural sediment

Feature 10 (0.95-1.10 mbs), yielded charcoal (0.2 g), unidentified medium mammal bone (1.3 g), naturally-occurring marine shell (4.4 g), and marine shell midden consisting of crustacean (1.4 g), *Nerita picea* (1.3 g), *Brachidontes crebristriatus* (0.8 g), *Strombus* sp. (0.7 g), and Echinoidea (0.1 g). Wood taxa analysis of the charcoal identified both native and historically-introduced taxa consisting of *Aleurites moluccana* (*kukui*) and Conifer (i.e., pine, fir, or other cone-bearing variety) as well as unidentified monocot. SIHP #-5820 Feature 10 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 11 was identified in T-146A as originating within Stratum II at 0.67 mbs (Figure 196). The pit was intrusive into Stratum III and terminated at 0.76 mbs. The feature had an irregular shape in plan view, measured 2.50 m long by more than 0.48 m wide, and extended into the southwest sidewall. The sediment matrix within SIHP #-5820 Feature 11 was loamy sand with similar characteristics to Stratum II. Two 5-liter bulk sediment samples were collected from the east and west ends of the pit between 0.67-0.76 mbs. These samples yielded charcoal (1.1 g), naturally-occurring marine shell (1.0 g), unidentified burnt shell fragments (1.2 g), burnt *Tellina palatam* (0.7 g), burnt Neritidae (0.6 g), *Tonna dolium* (0.5 g), *Brachidontes crebristriatus* (0.1 g), burnt crustacean (0.1 g), *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.1 g), and burned fish bone (0.1 g). SIHP #-5820 Feature 11 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 12 was identified within T-146A as originating at or near the base of Stratum II at 0.75 mbs. The pit was intrusive into Stratum III and terminated at 0.95 mbs (see Figure 185 and Figure 196). The feature was irregular shaped in plan view, measured 0.78 m long by over 0.17 m wide, and extended into the northeast sidewall. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. The installation of a subsurface concrete utility jacket immediately adjacent to SIHP #-5820 Feature 12 may have disturbed or truncated the northeast portion of the feature. A 5-liter bulk sediment sample collected within the pit between 0.75-0.90 mbs contained charcoal (1.2 g), two pieces of volcanic glass (0.2 g), naturally-occurring marine shell (2.7 g), and marine shell midden consisting of *Strombus* sp. (0.3 g), *Brachidontes crebristriatus* (0.2 g), *Tellina* spp. (0.1 g), crustacean (0.7 g), unidentified burnt shell (0.4 g), *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.4 g), basalt (788.2 g), and a vesicular fire-cracked rock fragment (176.4 g). The volcanic glass pieces were submitted for EDXRF analysis. The results indicated that the volcanic glass clearly does not match sources from the island of Hawai'i. The sample is from "Group 1," one of two distinct geochemical groups identified from the 35 City Center Section 4 AIS EDXRF volcanic glass samples, likely representing different volcanic sources on O'ahu (see EDXRF discussion in Volume V). The charcoal was submitted for wood taxa analysis and was identified as native and Polynesian-introduced taxa consisting of *kukui* (*Aleurites moluccana*), *hau* (*Hibiscus tiliaceus*), *niu* (*Cocos nucifera*), 'a'ali'i (cf. *Dodonaea viscosa*), and 'akoko (cf. *Chamaesyce* sp.). The *niu* charcoal sample submitted for radiocarbon analysis yielded six possible date ranges, with a calibrated 2-sigma date of AD 1630 to 1690 (51.3%) being the most probable. SIHP #-5820 Feature 12 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 13 was identified within T-146A as originating near the base of Stratum II at 0.83 mbs (see Figure 196, Figure 197 and Table 30). This pit was intrusive into Stratum III and terminated at 0.97 mbs. The feature was an elongated and irregular-shaped in plan view. It measured

	over	1.11
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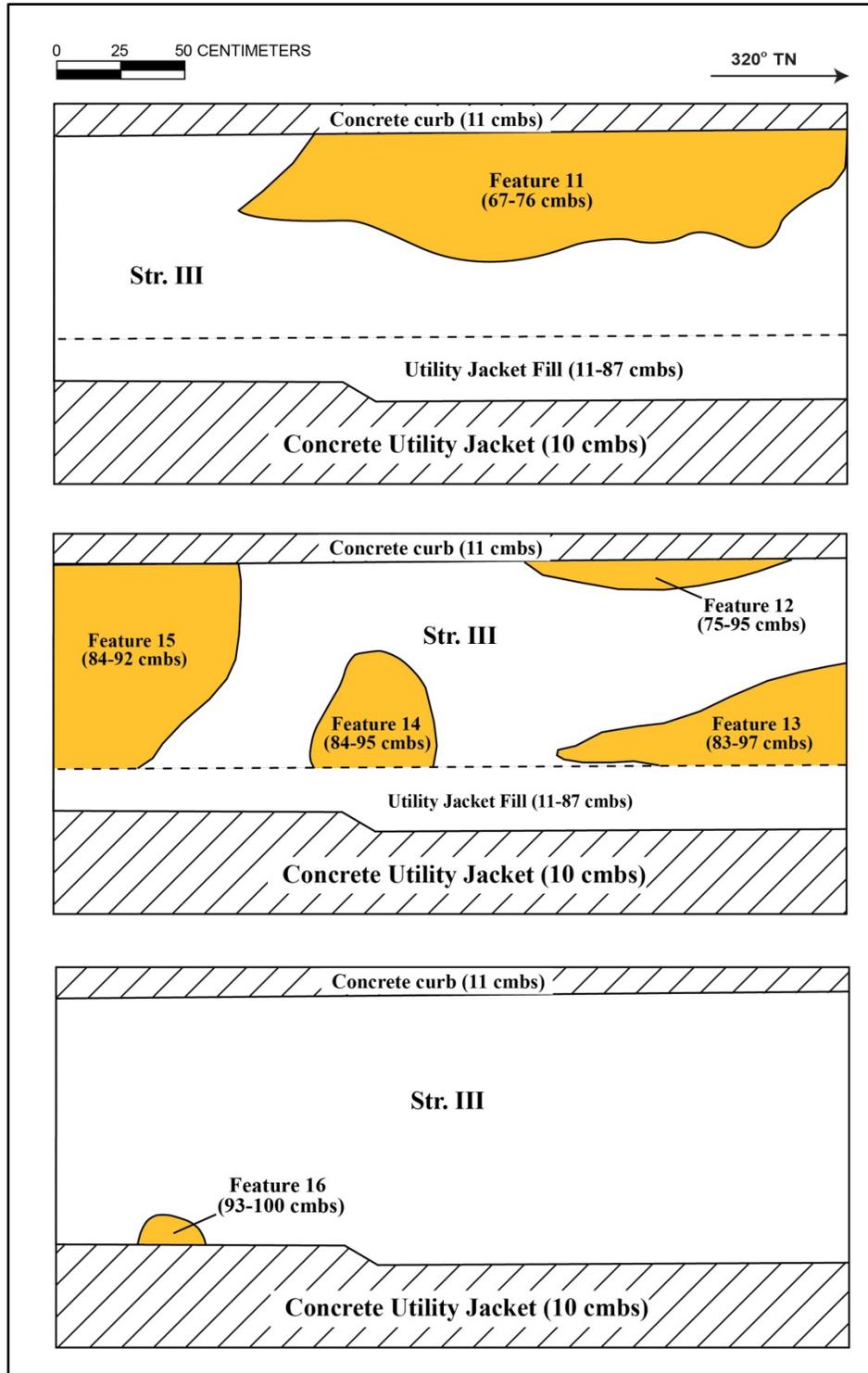


Figure 196. T-146A plan view of the upper boundary of Stratum III showing SIHP #-5820 Features 11-16 (originating within Stratum II and extending into Stratum III)

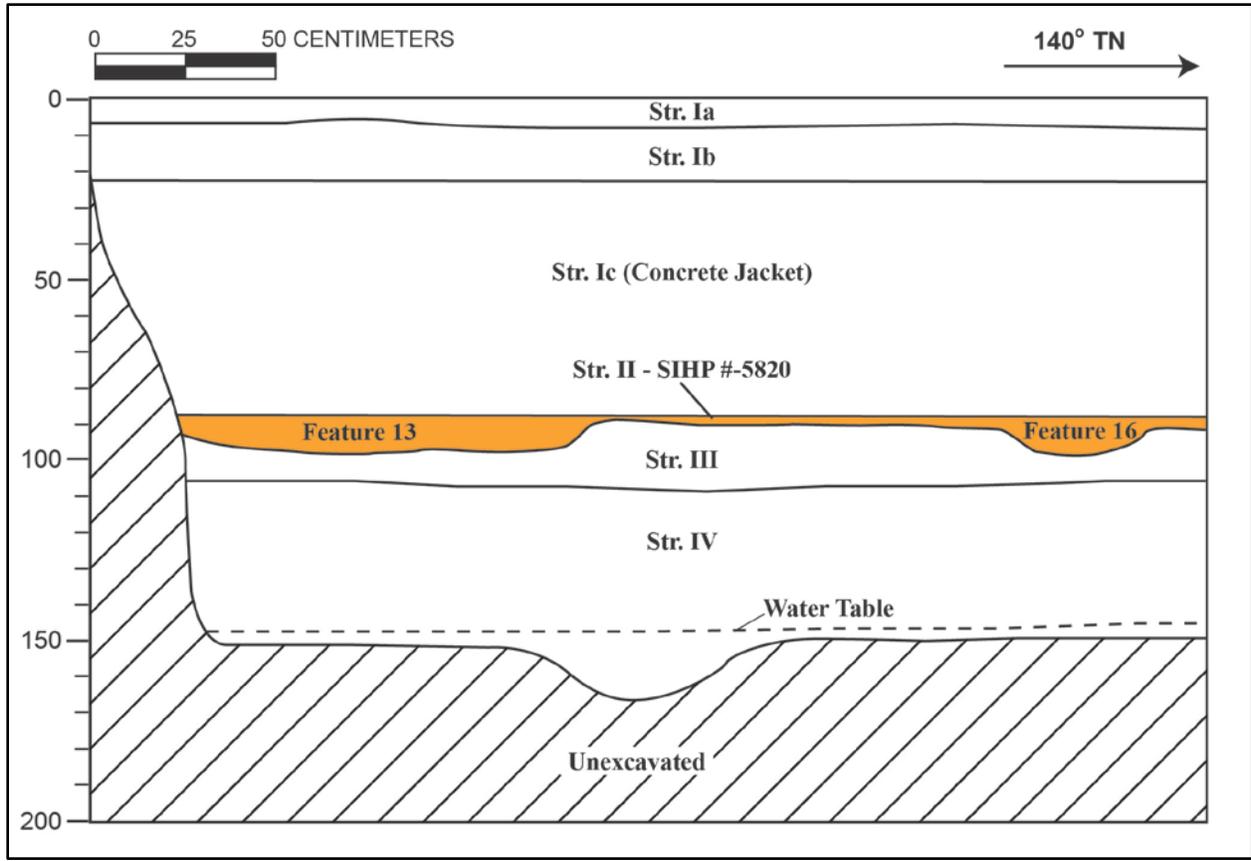


Figure 197. T-146A northeast wall profile

Table 30. T-146A Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-9	Concrete sidewalk
Ib	9-23	Fill; 10 YR 2/2 (very dark brown); gravelly sandy loam; weak, fine, blocky structure; moist, friable consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary
Ic	23-87	Concrete utility jacket (
II	87-110	Natural; 10 YR 3/2 (very dark gray); fine to medium very sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; buried A-horizon (SIHP #50-80-14-5820) including SIHP #-5820 Features 11-17
SIHP #-5820 Feature 11	67-76	Pit feature originating in Stratum II; loamy sand; contained charcoal, burnt marine shell fragments, and burnt fish bone; SIHP #-5820 Feature 11
SIHP #-5820 Feature 12	75-95	Pit feature originating in Stratum II; loamy sand; contained charcoal, burnt marine shell, a fire-cracked rock fragment, and volcanic glass; SIHP #-5820 Feature 12
SIHP #-5820 Feature 13	83-97	Pit feature originating in Stratum II; loamy sand; contained charcoal, fish bone, mammal bone, marine shell midden, and fire-cracked rock; SIHP #-5820 Feature 13
SIHP #-5820 Feature 14	84-95	Pit feature originating in Stratum II; loamy sand; contained charcoal, marine shell midden, burned wood, fish bone, fire-cracked rock, and volcanic glass; SIHP #-5820 Feature 14
SIHP #-5820 Feature 15	84-92	Pit feature originating in Stratum II; loamy sand; contained charcoal, marine shell midden, fish bone, and mammal bone; SIHP #-5820 Feature 15
SIHP #-5820 Feature 16	93-100	Pit feature originating in Stratum II; loamy sand; contained fish bone and marine shell midden; SIHP #-5820 Feature 16
III	90-110	Natural; 10 YR 7/4 (very pale brown); medium to coarse sand; structureless, single-grain; moist, friable consistency; non-plastic; marine origin; lower boundary not visible
SIHP #-5820 Feature 17	121-135	Pit feature originating in Stratum III; loamy sand; SIHP #-5820 Feature 17; subsequently determined to be natural rather than cultural in origin
IV	108-167 (BOE)	Natural; 2.5 Y 8/4 (pale yellow); silty sand; structureless, single-grain; moist, firm consistency; non-plastic; marine origin; lower boundary not visible; increasing gravel content toward base

m long by 0.31 m wide and extended into the northwest end of the excavation. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. A 5-liter bulk sediment sample and a 19-liter screen were collected from SIHP #-5820 Feature 13 between 0.83 and 0.94 mbs. The samples contained charcoal (1.2 g), *Melampus* sp. (0.2 g), unidentified fish bone (0.2 g), unidentified medium mammal bone (0.2 g), fire-cracked rock (63.2 g), and marine shell midden consisting of crustacean (0.2 g), *Echinothrix diadema* sp. (0.1 g), *Brachidontes crebristriatus* (0.9 g), *Natica* sp. (0.5 g), *Tellina* sp. (0.5 g), *Theodoxus neglectus* (0.3 g), *Isognomon* sp. (0.1 g.). The charcoal was submitted for wood taxa analysis and identified as native and Polynesian-introduced taxa consisting of *kolomona* (cf. *Senna* sp.), *kukui* (*Aleurites moluccana*), *'ōhi'a lehua* (cf. *Metrosideros polymorpha*), and *hau* (*Hibiscus tiliaceus*). Two unknown taxa were also represented. A *kukui* charcoal sample submitted for radiocarbon analysis yielded six possible date ranges, with a calibrated 2-sigma date of AD 1630 to 1690 (51.3%) being the most probable. SIHP #-5820 Feature 13 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 14 was identified within the central portion of T-146A (see Figure 196). This pit originated from near the base of Stratum II at 0.84 mbs. It was intrusive into Stratum III and terminated at 0.95 mbs. SIHP #-5820 Feature 14 was an irregular-shaped pit in plan view and measured a maximum of 0.38 m long by 0.40 m wide. The feature was observed in plan view only near the central portion of the excavation and did not extend into the excavation sidewalls. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. A 5-liter bulk sediment sample and 19-liter screened sample were collected from SIHP #-5820 Feature 14 between 0.84 to 0.95 mbs. The samples contained charcoal (0.1 g), naturally-occurring marine shell (0.5 g), burned wood (0.1 g), unidentified fish bone (0.2 g), fire-cracked rock (9.0 g), volcanic glass (1.0), and marine shell midden consisting of *Tellina palatam* (0.9 g), crustacean (0.2 g), *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.2 g), *Brachidontes crebristriatus* (0.2 g), *Strombus* sp. (2.3 g), and Cypraeidae (0.1 g). The volcanic glass was submitted for EDXRF analysis, and the results clearly indicated that the material does not match sources from Hawaii County. The sample is from "Group 1," which is one of two distinct geochemical groups identified from the 35 City Center AIS EDXRF volcanic glass samples, likely representing different volcanic sources on O'ahu (see EDXRF discussion in Volume IV). The charcoal was submitted for wood taxa analysis and identified as native taxa including *niu* (coconut, *Cocos nucifera*) and *'ōhi'a lehua* (cf. *Metrosideros polymorpha*). The *niu* charcoal sample was submitted for radiocarbon analysis and yielded three possible date ranges, with a calibrated 2-sigma date of AD 1490 to 1670 (95.4%) being the most probable. SIHP #-5820 Feature 14 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 15 was identified in the southeast end of T-146A as originating from near the base of Stratum II at 0.84 mbs (see Figure 196). This pit was intrusive into Stratum III and terminated at 0.92 mbs. The feature was an irregular-shaped pit in plan view and measured 0.75 m in length by more than 1.05 m wide. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. Faunal remains encountered during excavation of SIHP #-5820 Feature 15 consisted unmodified *Sus scrofa*, *Canis lupus familiaris* and medium mammal skeletal elements. None of the remains showed any indication of cultural modification. Both identified species (*Sus scrofa* and *Canis lupus familiaris*) are Polynesian introductions common in both pre- and post-Contact contexts. Two 5-liter bulk sediment samples were collected from

within the feature between 0.84-0.92 mbs. The samples contained charcoal (2.3 g), unidentified fish bone (0.1 g), basalt fragments (135.9 g), naturally-occurring marine shell (3.0 g), and marine shell midden consisting of *Strombus* sp. (3.1 g), *Tellina palatam* (2.2 g), *Nerita picea* (2.4 g), *Theodoxus neglectus* (0.5 g), crustacean (1.0 g), Echinoidea (0.7 g), *Echinothrix diadema* sp. (0.2 g), and *Brachidontes crebristriatus* (0.1 g). The faunal remains collected from SIHP #-5820 Feature 15 consisted unmodified *Sus scrofa*, *Canis lupus familiaris* and medium mammal skeletal elements. None of the remains showed any indication of cultural modification. The charcoal was submitted for wood taxa analysis and identified as native and Polynesian-introduced taxa including *kukui* (*Aleurites moluccana*) and *pilo* (cf. *Coprosma* sp.). Three unknown taxa also were represented. The *pilo* charcoal sample was submitted for radiocarbon analysis and yielded six possible date ranges, with a calibrated 2-sigma date of AD 1720 to 1820 (53.5%) being the most probable. SIHP #-5820 Feature 15 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 16 was identified in T-146A as originating from at or near the base of Stratum II at 0.93 mbs and terminating at 1.00 mbs within Stratum III (see Figure 196). This pit was oval shaped in plan view, measured 0.17 m long by over 0.12 m wide, and extended into the southwest sidewall. The sediment matrix within the feature was loamy sand with similar characteristics to Stratum II. A 5-liter bulk sediment sample was collected from within the pit between 0.93-1.00 mbs. This sample yielded gastropods (0.5 g), unidentified fish bone (0.1 g), and marine shell midden consisting of *Brachidontes crebristriatus* (1.1 g), crustacean (0.3 g), and *Isognomon* sp. (0.1 g). SIHP #-5820 Feature 16 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 17 was identified in T-146A. Feature 17 is a circular-shaped pit identified within Stratum III at 1.21 mbs. It intruded into Stratum IV to a depth of 1.35 mbs. It was observed in plan view at the southeastern end of the excavation and did not extend into the excavation sidewalls. SIHP #-5820 Feature 17 was subsequently interpreted as natural. As such no sediment samples were collected for analysis (see Figure 196).

SIHP #-5820 Feature 18 was identified within T-150 as originating from at or near the base of Stratum II at 0.75 mbs. The pit intruded into Stratum IIIa and terminated at 1.05 mbs (Figure 198 and Table 31). SIHP #-5820 Feature 18 was an irregular-shaped pit in plan view. It measured approximately 0.75 m long by over 0.75 m wide and extended beyond the width of the excavation and into both the northeast and southwest sidewalls. The sediment matrix within the pit consisted of loamy sand with similar characteristics to Stratum II, except for additional charcoal flecking, marine shell midden, fish bone and fire-cracked rock. A modified human bone fragment (Acc. # 150-H-1) and a basalt tool fragment (Acc. # 150-H-2) were found within SIHP #-5820 Feature 18. The human bone fragment was discovered at 0.95 mbs. The fragment measured approximately 9.0 cm long, 2.5 cm wide, and 0.5 cm to 1.0 cm thick. The fragment was most consistent with a posterior-proximal portion of a human tibia. The distinguishing features included a mostly flattened shape, a sharp lateral edge, and an oblique muscle marking indicative of the soleal line. The morphology of the fracture margins suggested perimortem fragmentation, meaning the bone fractured when it was still in a fresh state and produced the comminuted fragment. The inferior portion of the fragment appeared to be filed (i.e., polished

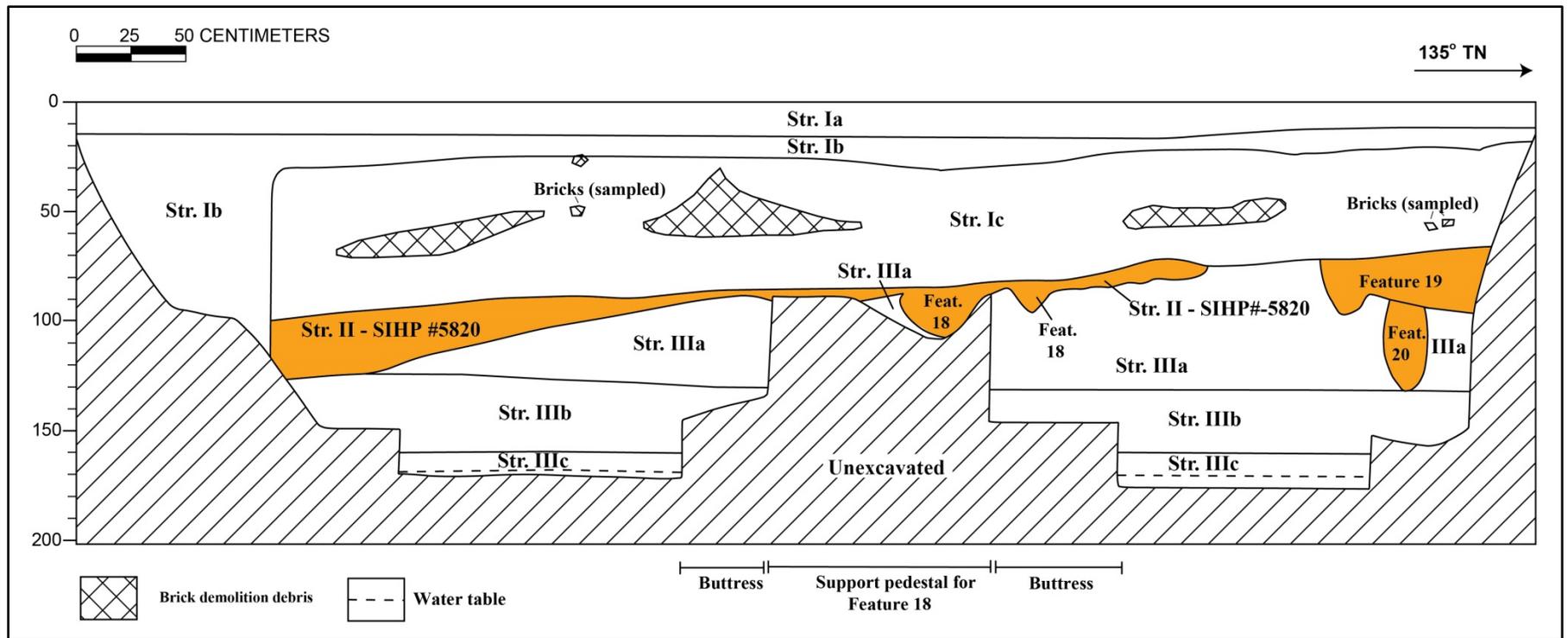


Figure 198. T-150 northeast profile showing SIHP #-5820 Features 18–20

Table 31. T-150 Stratigraphic Description of Northeast Profile

Stratum	Depth (cmbs)	Description
Ia	0-15	Asphalt
Ib	10-116	Fill; 5 YR 5/1 (gray); extremely gravelly silty clay; weak, medium, crumb structure; moist, very friable consistency; plastic; mixed origin; clear, wavy lower boundary; gravel base course
Ic	16-100	Fill; 7.5 YR 4/2 (brown); gravelly silt loam; structureless, single-grain; dry, loose consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; contained brick (collected), metal (not collected), coral inclusions, some shell; disturbed upper boundary
II	70-127	Natural; 10 YR 6/3 (pale brown); loamy sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; clear, broken/discontinuous lower boundary; contained midden, fire-cracked rock; buried A-horizon (SIHP #50-80-14-5820) with three features (Feature 18-20)
SIHP #- 5820 Feature 18	75-105	Pit feature originating in Stratum II; loamy sand; contained charcoal, marine shell midden, fish bone, a fragment of a stone tool, and a fragment of a possibly worked human proximal tibia and fire-cracked rock
SIHP #- 5820 Feature 19	53-95	Pit feature within Stratum II and intrusive into Stratum IIIa and truncated by Stratum Ic; loamy sand; contained charcoal, marine shell midden, fish bone, and fire-cracked rock
SIHP #- 5820 Feature 20	90-130	Pit feature within Stratum II and intrusive into Stratum IIIa; loamy sand; contained charcoal, marine shell midden, fish bone, and volcanic glass
IIIa	75-130	Natural; 10 YR 8/4 (very pale brown); fine to coarse grained sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; contained few small shells; Jaucas sand
IIIb	125-165	Natural; 10 YR 7/4 (very pale brown); very fine to fine grained sand; structureless, single-grain; wet, non-sticky consistency; non-plastic, marine origin; diffuse, smooth lower boundary; Jaucas sand
IIIc	160-175 (BOE)	Natural; 2.5 Y 6/3 (light yellowish brown); medium to very coarse grained sand; structureless, single-grain; wet, slightly sticky consistency; weakly cemented; non-plastic; marine origin; lower boundary not visible; contained larger shells; Jaucas sand

from a repetitive saw-like motion), likely for use as a tool. Based on the stratigraphic context of the fragment, including the association of the cultural material with Stratum II, the bone fragment was most likely Native Hawaiian and is considered to be a traditional Hawaiian human bone artifact. A 49-liter screened sample was collected from Stratum II (SIHP #-5820) Feature 18 at 0.70-1.04 mbs. The sample contained charcoal (2.3 g), fish remains (0.3 g), naturally-occurring marine shell (0.8 g), and marine shell midden consisting of *Cypraea caputserpentis* (0.4 g), *Brachidontes crebristriatus* (1.9 g), *Nerita picea* (12.4 g), *Theodoxus neglectus* (1.9 g), Strombidae (2 g), burned Strombidae (2.4 g), Tellinidae (0.1 g), *Tellina palatam* (3.0 g), *Tonna dolium* (0.2 g), Trochidae (0.1 g), *Turbo sandwicensis* (10.5 g), *Echinometra mathaei* sp. (0.1 g), and crustacean (0.8 g). SIHP #-5820 Feature 18 was interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 19 is a pit identified in the southeast end of T-150 at 0.53 mbs. Historic fill Stratum Ic horizontally truncated the upper limit of Stratum II and associated Features 18 and 19. SIHP #-5820 Feature 19 was intrusive into Stratum IIIa and truncated the upper limit of SIHP #-5820 Feature 20. The pit terminated at 0.95 mbs within Stratum II (see Figure 198 and Table 31; Figure 199). SIHP #-5820 Feature 19 was an irregular-shaped pit in plan view. It measured 1.25 m long by over 0.75 m wide and extended beyond the width of excavation in both the northeast and southwest sidewalls. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II. A 4-liter bulk sediment sample and a 34-liter screened sample were collected from SIHP #-5820 Feature 19 at 0.70–0.95 mbs. The samples were wet screened and contained charcoal (4.5 g), fish remains (0.2 g), *Hipponix* sp. (0.1 g), *Melampus castaneus* (0.3 g), Naticidae (0.1 g), and marine shell midden consisting of *Nerita picea* (35.3 g), Neritidae operculum (4.3 g), *Strombus* sp. (20.5 g), Strombidae (2.4 g), *Brachidontes crebristriatus* (11.2 g), burned shell (10.1 g), *Tellina* spp. (7.1 g), *Isognomon* sp. (1.3 g), Cypraeidae (1.3 g), Cymatiidae (1.5 g), *Trochus* sp. (0.4 g), *Turbo* sp. (5.8 g), crustacean (3.0 g), and *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.2 g). The charcoal was submitted for wood taxa analysis and identified as native and Polynesian-introduced species including *kukui* (*Aleurites moluccana*), *kolomona* (cf. *Senna* sp.), 'ōhi'a *lehua* (cf. *Metrosideros polymorpha*), 'ilima (cf. *Sida fallax*), 'āheaheal/āweoweo (*Chenopodium oahuense*), and monocot. Two unidentified species were also noted. The *kukui* sample was submitted for radiocarbon analysis and yielded seven possible date ranges for SIHP #-5820 Feature 19, with a calibrated 2-sigma date of AD 1810 to 1920 (67.1%) being the most probable. SIHP #-5820 Feature 19 was interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 20 was identified in the southeast end of T-150 as having been truncated by SIHP #-5820 Feature 19. It likely originated within Stratum II was visible at 0.90 mbs. The lower limit extended to the base of Stratum IIIa at 1.30 mbs (see Figure 198, Table 31, and Figure 199). The feature was not documented in plan view. In profile, SIHP #-5820 Feature 20 was an elongated pit in the northeast sidewall with tapering walls and a rounded base. The sediment matrix within the pit was loamy sand with similar characteristics to Stratum II with the addition of charcoal flecking. A 3-liter bulk sediment sample was collected from SIHP #-5820 Feature 20 at 0.90-1.3 mbs. The sample was wet screened and contained charcoal (0.7 g), a volcanic glass fragment (0.1 g), fish remains (0.2 g), naturally-occurring marine shell (10.2 g), and marine shell midden consisting of *Nerita picea/Theodoxus neglectus* (1.3 g), *Tellina palatam* (0.8 g), *Strombus* sp. (1.2 g), *Brachidontes crebristriatus* (0.3 g), Cymatiidae (0.1 g),



Figure 199. T-150 northeast profile showing SIHP #-5820 Features 19 and 20, view to east

Echinometra mathaei sp. (0.1 g), and crustacean (0.8 g). The volcanic glass was sent for EDXRF analysis. The results indicated that the volcanic glass clearly does not match sources from the island of Hawai'i. The sample is from "Group 1," one of two distinct geochemical groups identified from the 35 City Center Section 4 AIS EDXRF volcanic glass samples, likely representing different volcanic sources on O'ahu (see EDXRF discussion in Volume V). The charcoal was submitted for wood taxa analysis and identified as Polynesian-introduced *kukui* (*Aleurites moluccana*), a monocot, and one unidentified species. The *kukui* sample was submitted for radiocarbon analysis and yielded six possible date ranges, with a calibrated 2-sigma date of AD 1630 to 1690 (51.3%) being the most probable. SIHP #-5820 Feature 20 was interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 21 was identified as a pit near the middle of T-151. It originated within fill Stratum Id at 0.48 mbs and was intrusive into fill Stratum Ie (fill) and the underlying Stratum II (buried A-horizon), where it terminated at 0.85 mbs (Figure 200 and see Table 32); both Strata Id and II are designated components of SIHP #-5820. The pit was oval in plan, measured 0.20 m wide by more than 0.40 m long, and extended into the southwest excavation sidewall. The sediment matrix within the pit feature was loam with similar characteristics to Stratum Id. A 5.5-liter bulk sediment sample and a 7.6-liter screened sample collected from SIHP #-5820 Feature 21 were combined, screened, and yielded charcoal (4.6 g), naturally-occurring marine shell (3.9 g), fish remains (1.6 g), fire-cracked rock (253.9 g), and marine shell midden consisting of burned shell (4.9 g), *Brachidontes crebristriatus* (5.7 g), Echinoidea (1.8 g), *Nerita picea* (1.8 g), crustacean (0.4 g), and *Tellina palatam* (0.1 g). SIHP #-5820 Feature 21 was interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 22 was identified near the middle of T-151. The pit originated within fill Stratum Id at 0.60 mbs. It was intrusive into both Stratum Ie (fill) and Stratum II (buried A-horizon), where it terminated at 0.90 mbs (see Figure 200 and see Table 32). SIHP #-5820 Feature 22 was oval in plan and measured 0.30 m wide by more than 0.66 m long. The feature extended into the southwest excavation sidewall. The sediment matrix within the pit feature was loam with similar characteristics to Stratum Id. A 5.5-liter bulk sediment sample and a 15.2-liter screened sample from SIHP #-5820 Feature 22, collectively yielded charcoal (0.2 g), two pieces of volcanic glass (0.4 g), unidentified medium mammal bone (0.3 g), cement fragments (4.2 g), naturally-occurring marine shell (0.7 g), and marine shell midden consisting of *Nerita picea/Theodoxus neglectus* (7.2 g), *Nerita picea* (49.4 g), *Strombus* sp. (9.1 g), unidentified burned shell (0.6 g), crustacean (0.5 g), *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.3 g), *Brachidontes crebristriatus* (0.3 g), *Tellina* sp. (0.1 g), and *Turbo* sp. operculum (0.7 g). Two pieces of volcanic glass were sent for EDXRF analysis. The results indicated that the volcanic glass clearly does not match sources from Hawaii County. The sample is from "Group 1," one of two distinct geochemical groups identified from the 35 City Center Section 4 AIS EDXRF volcanic glass samples, likely representing different volcanic sources on O'ahu (see EDXRF discussion in Volume V). SIHP #-5820 Feature 22 was interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 23 was identified near the middle of T-151. The pit feature originated within Stratum Id at 0.60 mbs, intruded through Stratum II (buried A-horizon) and into Stratum III (Jaucas sand). The feature terminated at 0.99 mbs (see Figure 200 and see Table 32). SIHP #-5820 Feature 23 was oval-shaped in plan and measured 0.49 m wide by more than 0.42 m long.

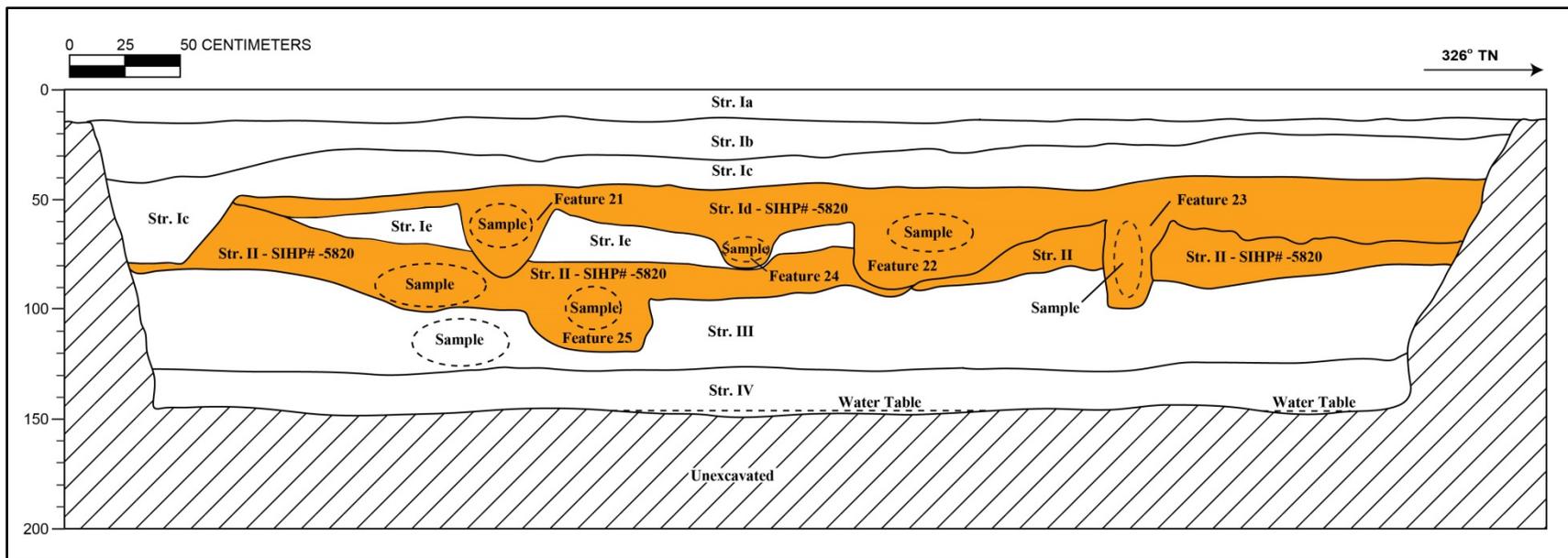


Figure 200: T-151 southwest profile showing SIHP #-5820 Features 21–25

Table 32: T-151 Stratigraphic Description of Southwest Profile

Stratum	Depth (cmbs)	Description
Ia	0-14	Asphalt
Ib	14-42	Fill; 2.5 Y 5/2 (grayish brown); very gravelly sandy loam; structureless, single-grain; moist, very friable consistency; non plastic; terrigenous origin; clear, smooth lower boundary; contained some wire—possibly from construction; gravel base course fill
Ic	20-79	Fill; 2.5 Y 8/2-7/2 (pale yellow to light gray); extremely gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; clear, smooth lower boundary; crushed coral base course/grading fill
Id	40-98	Fill; 7.5 YR 2.5/1 (black); gravelly loam; weak, fine, crumb structure; dry, weakly coherent consistency; non-plastic; terrigenous origin; contained <i>pipipi</i> (Neritidae) shells, fish remains, burnt metal fragments, 1 red brick fragment (collected); truncated by Stratum Ic; previously disturbed A-horizon (SIHP #-5820); contained Features 21-23
SIHP #-5820 Feature 21	48-85	Pit feature originating from Stratum Id; intrusive into Stratum Ie and Stratum II; loam; contained charcoal, marine shell midden, and fish bone; SIHP #-5820 Feature 21
SIHP #-5820 Feature 22	60-90	Pit feature originating from Stratum Id; intrusive into Stratum Ie and Stratum II; loam; contained charcoal, marine shell midden, fish bone, volcanic glass, medium mammal bone, metal and cement fragments; SIHP #-5820 Feature 22
SIHP #-5820 Feature 23	60-99	Possible post mold originating from Stratum Id; intrusive into Stratum II and Stratum III; contained marine shell midden, coal, glass, medium mammal bone, and fire-cracked rock; SIHP #-5820 Feature 23
SIHP #-5820 Feature 24	70-83	Two small pits, each containing an infant dog burial, originating from Stratum Id; SIHP #-5820 Feature 24
Ie	57-80	Fill, 2.5 Y 7/2 (light gray); loamy sand; weak, medium, crumb structure; moist, friable consistency; non-plastic; mixed origin; clear, wavy lower boundary; contained Feature 24
II	51-118	Natural, 2.5 Y 4/2 (dark grayish brown); fine grained silty sand; weak, fine, crumb structure; moist, very friable consistency; non-plastic; mixed origin; diffuse, irregular lower boundary; contained shells, charcoal, pig and fish remains (collected); truncated by Stratum Ic; former A-horizon (SIHP #-5820); contained Feature 25
SIHP #-5820 Feature 25	90-119	Pit originating from Stratum II and intrusive into Stratum III; contained charcoal and faunal bone; SIHP #-5820 Feature 25
III	81-127	Natural; 10 YR 6/4 (light yellowish brown); fine grained sand; structureless, single-grain; moist, very friable consistency; non-plastic; mixed origin; clear, smooth lower boundary; Jaucas sand

Stratum	Depth (cmbs)	Description
IV	125-150 (BOE)	Natural; 10 YR 7/3 (very pale brown) with clay mottles of 10 YR 7/3 very pale brown; medium-grain sand, structureless, single-grain; very friable consistency; non-plastic; marine origin; Jaucas sand

The pit extended into the southwest excavation sidewall. SIHP #-5820 Feature 23 contained marine shell midden, coal, glass, medium mammal bone, and fire-cracked rock. A 5.5-liter bulk sediment sample and a 11.4-liter screened sample from SIHP #-5820 Feature 23 collectively yielded possible coal fragments (33.0 g), glass fragments (0.1 g), unidentified fish bone (0.3 g), unidentified medium mammal bone (0.1 g), fire-cracked basalt rock (344.8 g), vesicular basalt fragments (15.4 g), naturally-occurring marine shell (1.0 g), and marine shell midden consisting of *Nerita picea* (8.0 g), burned shell (2.3 g), *Cymatium* sp. (0.7 g), *Tellina palatam* (1.4 g), *Brachidontes crebristriatus* (0.4 g), *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.3 g), and crustacean (0.6 g). SIHP #-5820 Feature 23 was interpreted as a possible postmold.

SIHP #-5820 Feature 24 was identified near the middle of T-151. The pit originated within Stratum Id (fill) at 0.70 mbs and terminated within Stratum Ie at 0.83 mbs (see Figure 200 and see Table 32). SIHP #-5820 Feature 24 consisted of two oval-shaped pits; one measured 0.30 m wide by 0.50 m long, while the second measured 0.30 m wide, was more than 0.15m long, and extended into the sidewall. Each pit contained the in situ skeletal remains of an infant dog (*Canis lupus familiaris*, one with incompletely formed permanent dentition and one with deciduous dentition. Additional faunal remains were hand collected during excavation from Stratum II at 0.98 mbs, near and below SIHP #-5820 Feature 24. These remains consisted of juvenile *Sus scrofa* fragments and a Fantail Filefish fragment (0.1 g). None of the remains showed any evidence of cultural modification. SIHP #-5820 Feature 24 was interpreted as two dog burials.

SIHP #-5820 Feature 25 was identified near the middle of T-151. The pit originated at or near the base of Stratum II at 0.90 mbs. It intruded into Stratum III and terminated at 1.19 mbs (see Figure 200 and see Table 32). SIHP #-5820 Feature 25 was not recorded in plan view, but was observed in the southwest profile wall. A 5.5-liter bulk sediment sample was collected from within the pit at 0.90–1.07 mbs. The sample was wet screened and contained charcoal (0.5 g), rat (*Rattus* sp.) bone (0.1 g), burned crustacean (0.8 g), and Echinoidea (0.1 g). Charcoal samples from SIHP #-5820 Feature 25 were submitted for wood taxa identification, and the results indicated the presence of native, Polynesian-introduced, and/or historically- introduced species consisting of *kukui* (*Aleurites moluccana*), *ko'oko'olau* (cf. *Bidens* sp.), and one unidentified species. The *ko'oko'olau* charcoal sample was submitted for C14 radiocarbon analysis and yielded three possible date ranges, with a calibrated 2-sigma date of AD 1480 to 1660 (95.4%) being the most probable.

SIHP #-5820 Feature 26 was identified near the southeast end of T-151A. The pit originated at or near the base of Stratum Id at 0.74 mbs. It intruded into Stratum Ie and terminated at 0.80 mbs (, Figure 202, and Table 33). SIHP #-5820 Feature 26 was an irregular-shaped pit in plan view, measured approximately 0.90 m long by over 0.45 m wide, and extended into the southwest sidewall. The sediment matrix within the pit was consistent with that of Stratum Id. A 2-liter bulk sediment sample and a 9.5-liter screened bulk sediment sample collected from SIHP #-5820 Feature 26 collectively yielded charcoal (0.7 g), naturally-occurring marine shell (1.1 g), volcanic glass (0.1 g), fish remains (0.1 g), basalt (0.6 g), and marine shell midden consisting of *Nerita picea* (6.8 g), *Strombus* sp. (4.6 g), *Echinothrix diadema* sp./*Echinometra mathaei* sp. (0.1 g), *Brachidontes crebristriatus* (0.4 g), crustacean (0.7 g), and burned shell (0.2 g). SIHP #-5820 Feature 26 is interpreted as a pit of indeterminate function.

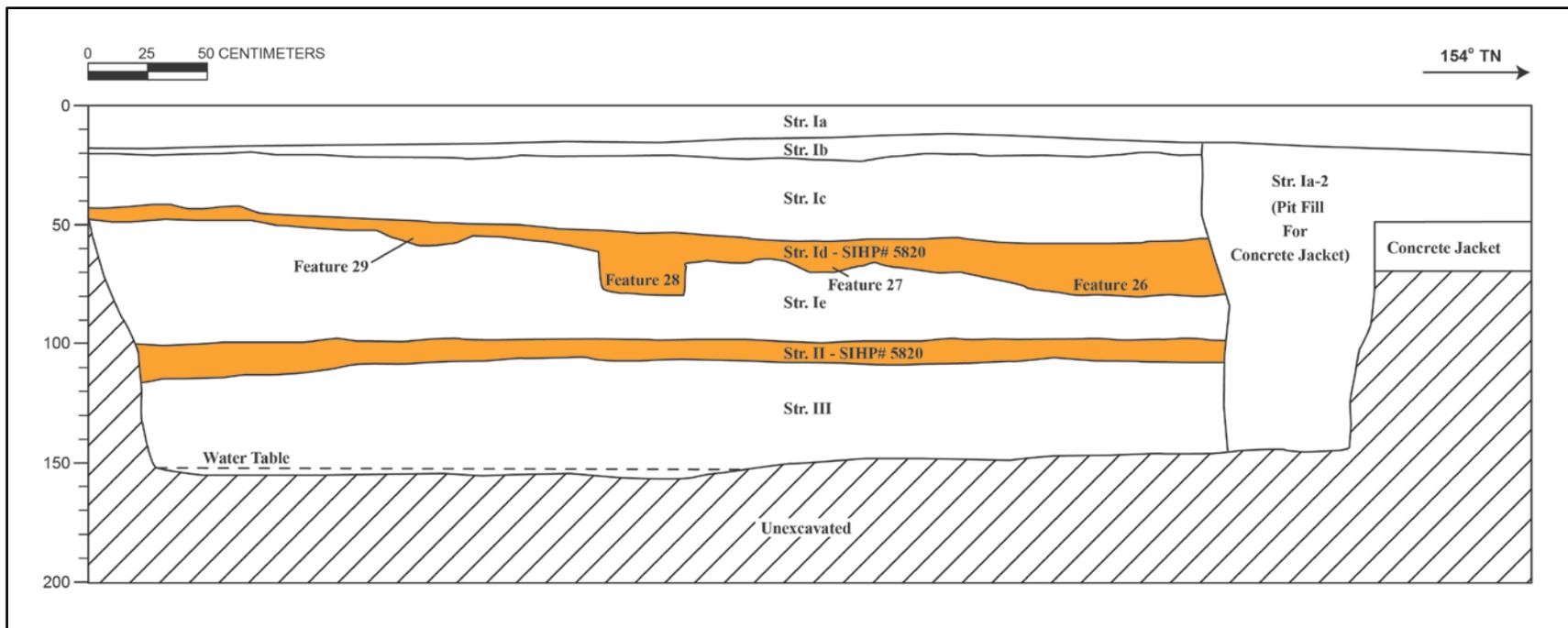


Figure 201. T-151A northeast profile, showing SIHP # -5820 Features 26-29

Table 33. T-151A Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-19	Asphalt
Ia-2	16-145	Fill; 10 YR 4/1 (dark gray); very gravelly sandy loam; structureless; moist, friable consistency; non-plastic; terrigenous origin; lower boundary not visible; fill for concrete jacket
Ib	12-22	Fill; 5 YR 5/1 (gray); very gravelly sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; gravel base course
Ic	19-57	Fill; 2.5 Y 8/3 (pale yellow), very gravelly sand; structureless, single-grain; moist, friable consistency; non-plastic; marine origin; abrupt, smooth lower boundary; contained PVC utility at 0.46 mbs on the northeast sidewall
Id	40-80	Fill; 10 YR 3/2 (very dark grayish brown); gravelly silty sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; abrupt, irregular lower boundary; contained historic, shell material, and faunal remains (collected); locally procured fill; based its on texture and contents it was likely procured from the buried A-horizon sediments in the vicinity (SIHP #-5820); includes Features 26-29
SIHP #-5820 Feature 26	74-80	Pit feature originating from Stratum Id; silty sandy loam; contained marine shell midden, basalt flakes, volcanic glass, and fish remains; SIHP #-5820 Feature 26
SIHP #-5820 Feature 27	65-72	Pit feature originating from Stratum Id; silty sandy loam; contained marine shell midden, glass, charcoal, and fish remains; SIHP #-5820 Feature 27
SIHP #-5820 Feature 28	60-80	Pit feature originating from Stratum Id; silty sandy loam; contained marine shell midden, glass, ceramics, charcoal, medium mammal remains, and possible fire-cracked rock; SIHP #-5820 Feature 28
SIHP #-5820 Feature 29	47-58	Pit feature originating from Stratum Id; silty sandy loam; no cultural material observed; SIHP #-5820 Feature 29
Ie	49-100	Fill; 10 YR 6/3 (pale brown); silty sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary
II	98-115	Natural, 10 YR 3/2 (very dark grayish brown); silty loamy sand; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; clear, smooth lower boundary; contained shell material; faunal remains; buried A-horizon; a component of SIHP #-5820
III	105-155 (BOE)	Natural; 10 YR 6/3 (pale brown); silty sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; marine origin; lower boundary not visible

SIHP #-5820 Feature 27 was identified near the middle of T-151A. The pit originated from at or near the base of Stratum Id at 0.65 mbs. The feature intruded into Stratum Ie and terminated at 0.72 mbs (see Figure 201, Figure 202 and Table 33). SIHP #-5820 Feature 27 was irregular-shaped in plan view. The pit measured approximately 0.38 m long by over 0.35 m wide and extended into the northeast sidewall. The sediment matrix within the feature was consistent with that of Stratum Id. A 1-liter bulk sediment sample and a 3.8-liter screened bulk sediment sample collected from SIHP #-5820 Feature 27 collectively yielded charcoal (0.1 g), naturally-occurring marine shell (2.1 g), white and pink glass fragments (4.8 g), fish remains (0.1 g), and marine shell midden consisting of *Nerita picea* (1.0 g), crustacean (0.4 g), *Brachidontes crebristriatus* (0.2 g), and *Echinometra mathaei* sp. (0.1 g). SIHP #-5820 Feature 27 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 28 was identified near the middle of T-151A. The pit originated from at or near the base of Stratum Id at 0.60 mbs and terminated at 0.80 mbs within Stratum Ie (see Figure 201, Figure 202 and Table 33). SIHP #-5820 Feature 28 was mostly linear in plan view, measured approximately 0.30 m long by over 0.74 m wide, and extended beyond the width of the excavation into both the northeast and southwest sidewalls. The sediment matrix of SIHP #-5820 Feature 28 was consistent with that of Stratum Id. A 2-liter bulk sediment sample and a 3.8-liter screened bulk sediment sample collected from within the pit feature yielded charcoal (16.5 g), naturally-occurring marine shell (0.8 g), ceramics (1.5 g), glass (0.6 g), medium mammal remains (0.2 g), medium mammal remains cut with a metal saw blade (14.7 g), possible fire-affected rock (9.7 g), and marine shell midden consisting of *Nerita picea* (4.6 g), crustacean (0.1 g), Echinoidea (0.1 g), and *Brachidontes crebristriatus* (0.3 g). SIHP #-5820 Feature 28 is interpreted as a pit of indeterminate function.

SIHP #-5820 Feature 29 was identified near the northwest end of T-151A. The pit originated at or near the base of Stratum Id at 0.47 mbs. It was intrusive into Stratum Ie where it terminated at 0.58 mbs (see Figure 201, Figure 202 and Table 33). SIHP #-5820 Feature 29 was not documented in plan view. It was identified in the northeast profile wall, where it measured approximately 0.40 m in length. The sediment matrix within the pit feature was consistent with that of Stratum Id (locally-procured A-horizon). 1-liter bulk sediment sample collected from SIHP #-5820 Feature 29 contained naturally-occurring limpets and gastropods (0.4 g), crustacean (0.2 g), *Echinothrix diadema* sp. (0.1 g), and fish remains (0.1 g). SIHP #-5820 Feature 29 is interpreted as a pit of indeterminate function.

Two additional pit features (Features 30 and 31) not associated with either the culturally-enriched A-horizons (Stratum Id Stratum II) were identified within SIHP #-5820. SIHP #-5820 Feature 30 is an in situ human burial exposed in the Jaucas sand (Stratum III) below the lower cultural layer in T-142. SIHP #-5820 Feature 31 is a large pit intrusive through two fill strata (Id-Ie), the lower cultural layer (Stratum II), the underlying Jaucas sand (Stratum III) and natural marine/lagoonal sediments (Stratum IV), terminating just above the coral shelf.

SIHP #-5820 Feature 30 was identified near the southeast end of T-142 as an in situ human burial within Stratum III (Jaucas sand) and only partially exposed between 1.00 mbs and 1.12 mbs (see Figure 190, Figure 193, and Table 28). A faint, irregular-shaped pit outline was indiscernible until hand excavation was extended to a depth of 1.00 mbs. The SIHP #-5820 Feature 30 pit most likely extended from the lower boundary of the former A-horizon (II), but

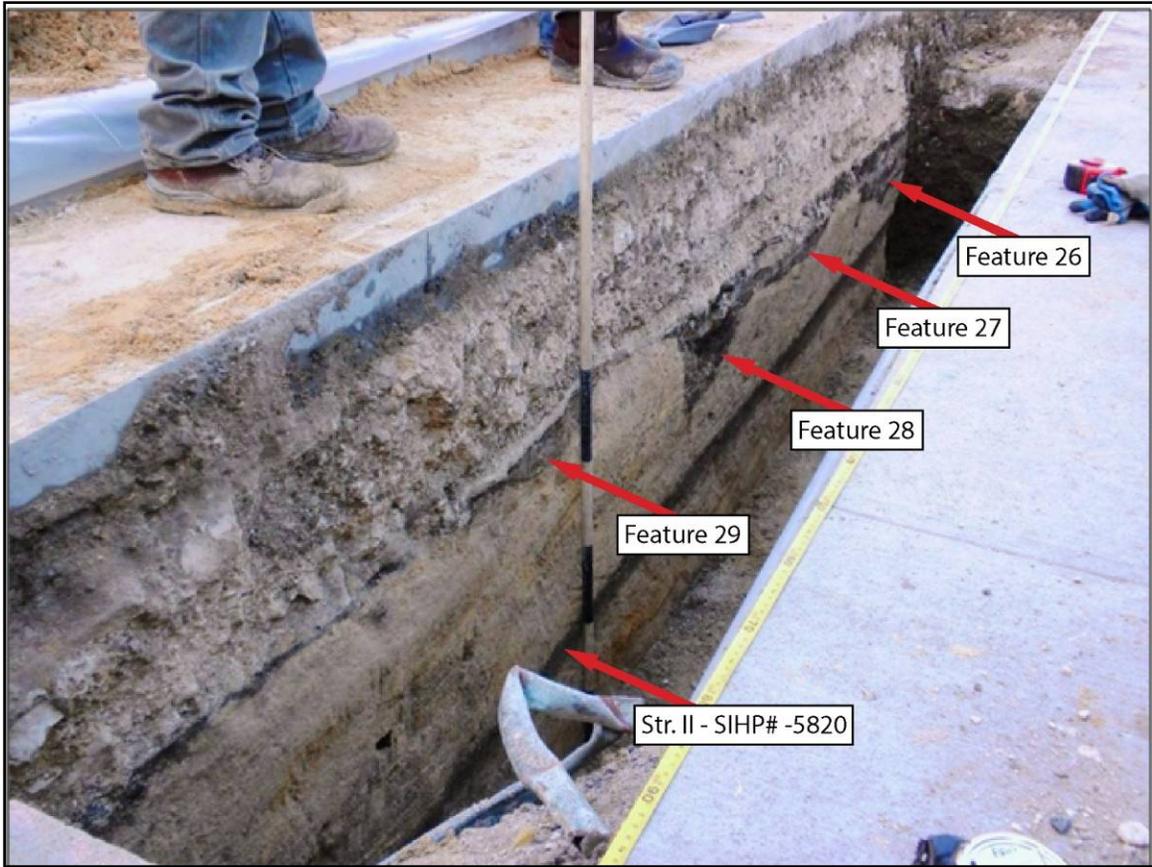


Figure 202. T-151A northeast profile showing SIHP #-5820 (Stratum II) and Features 26-29, view to east

was crosscut by a previously backfilled excavation that terminated at 0.90 mbs. SIHP #-5820 Feature 8, which overlies SIHP #-5820 Feature 30, does not appear to be associated. The burial pit outline was approximately 0.60 m long and over 0.70 mbs wide, extending beyond the width of the excavation into the southwest and northeast sidewalls. The excavation of T-142 resulted in minimal disturbance to the human remains, and all of the sediment from the immediate vicinity of SIHP #-5820 Feature 30 was screened in an effort to recover any fragmented or disturbed human skeletal remains. No grave goods were observed within the feature. The burial was in a flexed position, which typifies traditional Hawaiian practices. The burial was preserved in place, and therefore, a detailed assessment of the remains was not conducted. SIHP #-5820 Feature 30 is identified as a traditional Hawaiian human burial.

SIHP #-5820 Feature 31 appeared to be an intrusive pit feature that was identified at the interface of Strata Ic and Id in T-141 (see Figure 186 and Table 27). SIHP #-5820 Feature 31 originated at the lower boundary of Stratum Ic at 0.25 mbs and intruded into Strata Id through IV and terminated at approximately 1.35 mbs. SIHP #-5820 Feature 31 appeared truncated by overlying fill layers (Strata Ia-Ic) but was intrusive into two fill layers (Strata Id and Ie), the buried A-horizon (Stratum II), and underlying natural sands (Strata III and IV). SIHP #-5820 Feature 31 was only observed in the southwest sidewall in the northwestern end of the excavation. A total of seven historic artifacts (Acc. #s 141-A-1 to A-7) were collected from SIHP #-5820 Feature 31 and consisted of Chinese, Japanese, and Euro-American ceramic vessels. The presence of historic material with SIHP #-5820 Feature 31 indicates that the feature post dates the A-horizon and Stratum III. SIHP #-5820 Feature 31 also contained scattered, disarticulated human skeletal remains.

Traditional Hawaiian cultural material identified within the buried culturally-enriched A-horizon included a basalt game stone (SIHP #-5820 Feature 5) (see Figure 191), a shell fishhook (SIHP #-5820 Feature 6) (see Figure 192), volcanic glass pieces (SIHP #-5820 Features 12, 14, 20 and a bulk sediment sample from Stratum II of T-151), a worked human tibia bone fragment likely for use as a tool (SIHP #-5820 Feature 18), and a basalt tool fragment (SIHP #-5820 Feature 18). Notably, SIHP #-5820 Features 22 and 26 and a bulk sediment sample from Stratum Id of T-151 also contained a pieces of volcanic glass; although, these features and the bulk sample originated from fill material postdating the A-horizon. In addition, a basalt stone sinker was found in Stratum III (Jaucas sand) of T-141 adjacent to SIHP #-5820 Feature 1 (see Figure 187 and Figure 188).

Historic cultural material was identified within both the lower (Stratum II) and upper (Stratum Id in T-151 and T-151A) cultural layers (SIHP #-5820). Nine ceramic fragments from three Euro-American and one German (pre-1820) vessel were collected from Feature 7 within the buried A-horizon (Stratum II). The upper cultural layer (Stratum Id) contained one machine-made brick fragment dated between 1918 and 1978 (SIHP #-5820 Feature 23) as well as ceramic and glass fragments collected from bulk sediment samples (Features 27 and 28). Additional historic artifacts were collected from the fill material overlying the cultural layers. They include stone, plastic, and metal (SIHP #-5820 Feature 1), eight Chinese, Euro-American, and Japanese ceramic fragments from seven artifacts (SIHP #-5820 Feature 31), and one small red brick fragment collected from Stratum Id in T-141.

Human skeletal remains were observed in SIHP #-5820 Feature 1 of T-141, Feature 6 of T-142, and SIHP #-5820 Feature 30 of T-142. SIHP #-5820 Feature 1 appears to have been truncated by the overlying fill layer (Stratum Ie). The human skeletal remains associated with SIHP #-5820 Feature 1 were previously disturbed and scattered beyond the boundaries of the feature. The remains were disarticulated and partially represented a minimum of three individuals. The human skeletal remains from SIHP #-5820 Feature 6 were collected from a bulk sediment sample, from the base of Stratum II, and identified as a tooth (mandibular right lateral incisor), a tooth fragment, and a small piece of cancellous bone. SIHP #-5820 Feature 30 was identified as an in situ human burial within the Jaucas sand (Stratum III) and predating the buried culturally-enriched A-horizon. A pit outline was only visible at the level of the human remains; although it is possible that the outline had extended from the base of Stratum II. The burial appeared to be in a flexed position which is indicative of traditional Hawaiian burial practices. SIHP #-5820 Feature 30 was preserved in place, and the general biological profile of the burial was not assessed.

Test excavations comprising SIHP #50-80-14-5820 contained invertebrate and vertebrate faunal material expressing a strong midden signature. This strong midden content was identified within the lower (Stratum II) and upper (Stratum Id in T-151 and T-151A) cultural layers and within SIHP #-5820 Features 1-29. In general, the faunal remains that were collected were either unmodified, or they exhibited evidence of butchering (i.e., cut with a metal saw blade). Faunal remains identified within the features included a horse (*Equus ferus caballus*) burial (SIHP #-5820 Feature 1), two infant dog (*Canis lupus familiaris*) burials (SIHP #-5820 Feature 24), and skeletal elements identified as cow (*Bos taurus*), pig (*Sus scrofa*), chicken (*Gallus gallus*), bird (Aves), rat (*Rattus* sp.), fish, and small/medium-mammal. T-150 also included osseous material identified as a possible cat (*Felis catus*) within the lower cultural layer (Stratum II).

Invertebrate faunal remains predominately were collected from screened and bulk sediment samples of the SIHP #-5820 buried culturally-enriched A-horizon and associated features. Invertebrate fauna included non-cultural shell and shell midden (see Table 26).

Radiocarbon analysis on charcoal samples from SIHP #-5820 Features 8, 9, 12–15, 19, 20, and 25 provided a date range between the late pre-Contact and early post-Contact periods, from as early as AD 1480 to as late as 1920 (see Table 26).

The two culturally-enriched cultural layers (Stratum II and Stratum Id) and the 31 archaeological features identified during the City Center AIS have been combined into SIHP #-5820, previously described by Winieski and Hammatt (2000) (see Figure 183). Winieski and Hammatt (2000) reported 11 burials inadvertently discovered along Mother Waldron Park and Halekauwila Street during archaeological monitoring that occurred between 1990 and 1992. At least eight of the 11 human burials encountered during the project were located within the buried culturally-enriched A-horizon intruding into the underlying natural sand (see Table 25). The general depositional sequence recorded at the burial sites indicated beach sand deposits overlain by a discontinuous buried A-horizon and/or fill layers, similar to the seven City Center Section 4 AIS test excavations designated as SIHP #-5820. In both studies, the cultural layer(s) are capped with one meter or less of fill deposition. Similarities in the depositional environment, location in the stratigraphic column, geographic location, and association with a cultural layer or culturally-

enriched A-horizon provide the basis for a combination of the findings of Winieski and Hammatt (2000) with the findings within T-141, T-142, T-145, T-146A, T-150, T-151, and T-151A.

SIHP #5820 consists of two buried, culturally-enriched layers. SIHP #5820 includes a total of 31 newly-identified archaeological features (Features 1-31) as well as 11 burials previously identified by Winieski and Hammatt (2000). Of the 31 newly-identified features, 19 features (SIHP #5820 Features 2, 4-20, and 25) are associated with the lower, culturally-enriched A-horizon (Stratum II) and include 1 *imu* pit and 18 indeterminate pits. Eight features (SIHP #5820 Features 21-24 and 26-29) were identified within the upper cultural layer (Stratum Id in T-151 and T-151A) and include 1 pit containing two dog burials, 1 possible postmold, and 6 indeterminate pits. Three additional features (SIHP #5820 Features 1, 3, and 31) that were truncated by fill material postdating the buried A-horizon were considered to be part of SIHP #5820 based on proximity. They include 1 horse burial pit with disarticulated and scattered human remains, and 2 indeterminate pits. SIHP #5820 Feature 30 was identified as a traditional Hawaiian burial within the Jaucas sand (Stratum III), which predated the buried A-horizon. SIHP #5820 contained both traditional and post-Contact cultural material, human skeletal remains, vertebrate and invertebrate faunal material, and charcoal. Laboratory analyses of material collected from SIHP #5820 indicate that the former land surface was utilized from the pre- and/or early post-Contact period to the twentieth century, prior to being capped by historic fill deposits.

Based on the guidance of National Register Bulletin No. 15, SIHP #50-80-14-5820 retains its integrity of location, design, materials, and workmanship. Based on past documentation and the results of this investigation, CSH recommends that this cultural resource maintains the integrity to support its historic significance under Criterion D (has yielded, or is likely to yield, information important for research on prehistory or history) and E (has cultural significance to an ethnic group) of the Hawai'i Register, and Criterion D of the National Register, exclusively for its information potential.

SIHP #50-80-14-5820 has provided, and can potentially provide, additional information on late pre- to early post-Contact habitation, historic land use, and pre- and post-Contact burial practices and distribution within Kaka'ako. The potential for additional research warrants the implementation of a data recovery program. Data recovery at SIHP #5820 will focus on data collection from the buried, culturally-enriched sandy loam A-horizon and associated features. Additionally, discrete features within fill layers will be identified and documented. Data recovery will include a more intensive regime of strata- and feature-specific radiocarbon, palynological, and botanical analysis. The analysis will seek to indicate use and function of culturally-enriched strata and features, and attempt to temporally categorize subsurface deposits to distinguish between traditional Hawaiian versus historic deposition. Data recovery will also seek to identify additional burials or human skeletal remains that may be present at SIHP #50-80-14-5820. Data recovery will include detailed stratigraphic documentation of identified burial pits or human skeletal remains. Following the data recovery program, an archaeological monitoring program at SIHP #5820 is recommended. Archaeological monitoring will seek to recover data on the depositional sequence and extent of SIHP #5820 as well as document culturally-enriched strata and features through recordation and sample collection. The previously identified burial and human remains associated with SIHP #5820, will be treated in accordance with HAR §13-300 and HRS §6E-43. In order to alleviate the project's effect on human burials, a project specific

burial treatment plan (a requirement of HAR §13-300) will be prepared for consideration of the OIBC and recognized descendants. The agreed upon treatment is preservation in place, the details of which will be documented in the burial treatment plan.

5.3.5 SIHP #50-80-14-5966

FORMAL TYPE:	Subsurface Kawa Fishpond Sediments
FUNCTION:	Aquaculture
PREVIOUS DOCUMENTATION:	McDermott and Mann 2001
AGE:	Pre- and post-Contact
NUMBER OF FEATURES:	N/A
TYPES OF FEATURES	N/A
DISTRIBUTION:	Approximately 8.13 acres (previously identified)
LOCATION:	West of N Nimitz Highway between Iwilei Road and Awa Street (Iwilei Geographic Zone)
TAX MAP KEY:	TMK [1] 1-5-008:001, 004, 005, 014, 015, 018, 020; [1] 1-5-039; [1] 1-5-039:001, 007, 010; [1] 1-5-040:002, 004; and [1] 2-1-001
LAND JURISDICTION:	Jiriochi Otani Family, Ltd. and the State of Hawai'i
TEST EXCAVATIONS:	T-095

SIHP #50-80-14-5966 is a previously-identified cultural resource that consists of subsurface pond sediments associated with Kawa Fishpond (Figure 203). The SIHP #5966 cultural resource boundary was established based on the 1885 J. F. Brown map of Kapālama (Figure 204). It remains unknown whether fishpond wall(s) exist below the multiple fill deposits documented in this area. Based on historic maps and documents, the former footprint of Kawa Fishpond consists of 8.13 acres. Today the Kawa Fishpond footprint is largely bounded by Iwilei Road, Sumner Street, Awa Street, and N. Nimitz Highway within the Iwilei Geographic Zone. Initial documentation of the fishpond was performed by McDermott and Mann (2001) during an archaeological inventory survey for the Nimitz Highway Water System Improvements, Part I, Project (see Figure 203).

Few oral traditions, legends, or other ethnographic information exist regarding Kawa Fishpond. The Hawaiian word “*kawa*,” however, literally translates as a precipice or leaping place, or as the pool below a precipice into which swimmers leap (Pukui and Elbert 1986:139). The earliest information about the pond comes from historic maps of Honolulu. The location of Kawa Fishpond can be seen in an 1885 map by J. F. Brown and an 1897 map by M. D. Monsarrat (see Figure 204 and Figure 205). Whether Kawa Fishpond dates prior to European Contact or dates to early nineteenth century efforts to feed Kamehameha’s royal court remains unclear as no ethnographic or historical accounts of the construction or use of Kawa Fishpond were found.

Historic photographs dating to the mid 1860s indicate that portions of the Kawa Fishponds walls included approximately four to seven courses of exposed dry-stacked, basalt and/or coral boulders (Figure 206 to Figure 208). The northwestern edge of the pond, nearest to Iwilei Prison, consists of a natural limestone bank (Figure 209). Kikuchi, in his 1973 study of Hawaiian fishponds, classified Kawa Fishpond as a Type I pond or *loko kuapā*. Kikuchi (1973:227) describes this type as “a fishpond of littoral water whose side or sides facing the sea consist of a stone or coral wall containing one or more sluice grates.”

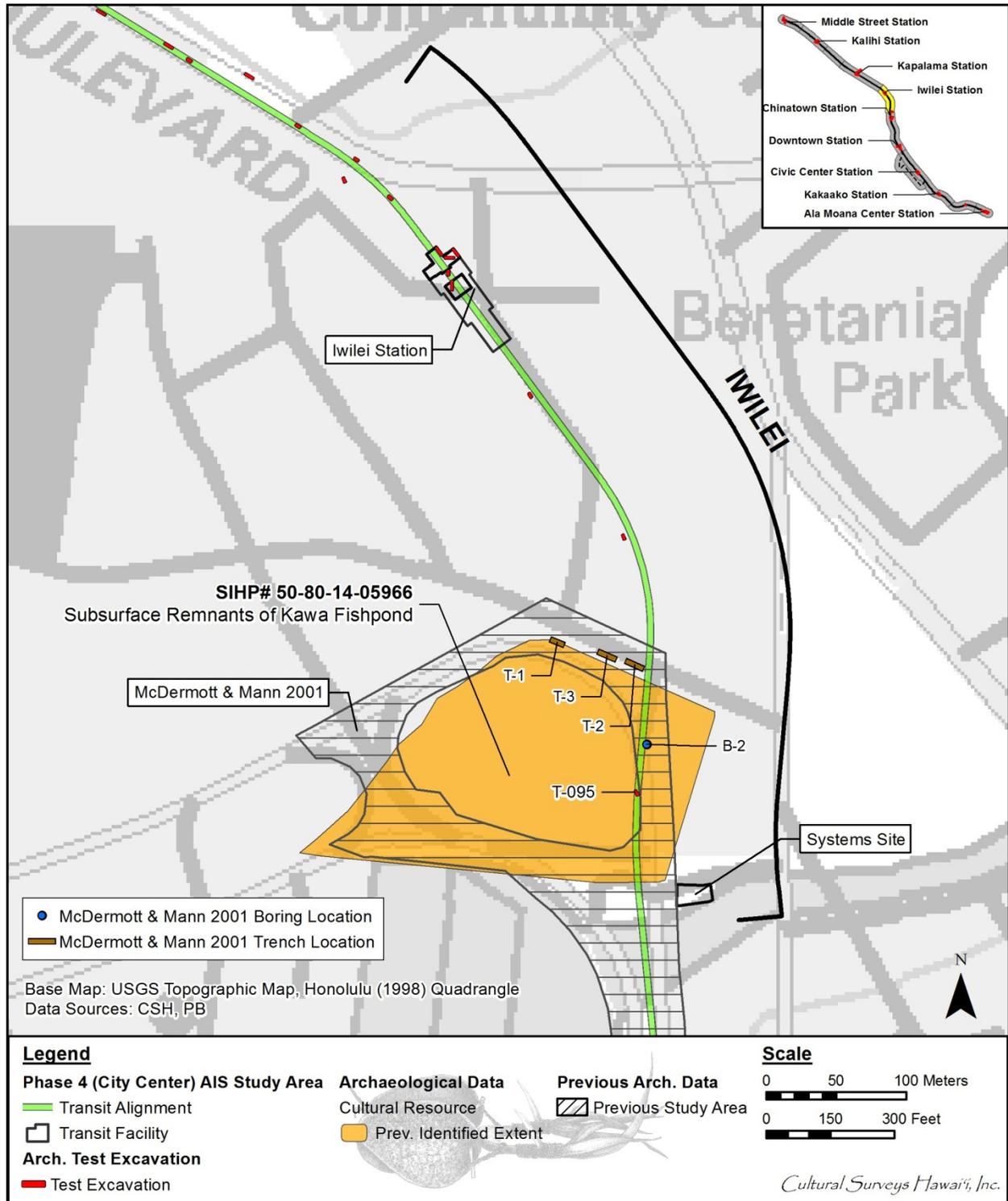


Figure 203. Location and extent of Kawa Fishpond AIS test excavation T-095 and previous archaeological investigations (Trenches T-1 through T-3 and Bore 2) (base map: 1998 U.S. Geological Survey topographic map, Honolulu Quadrangle)

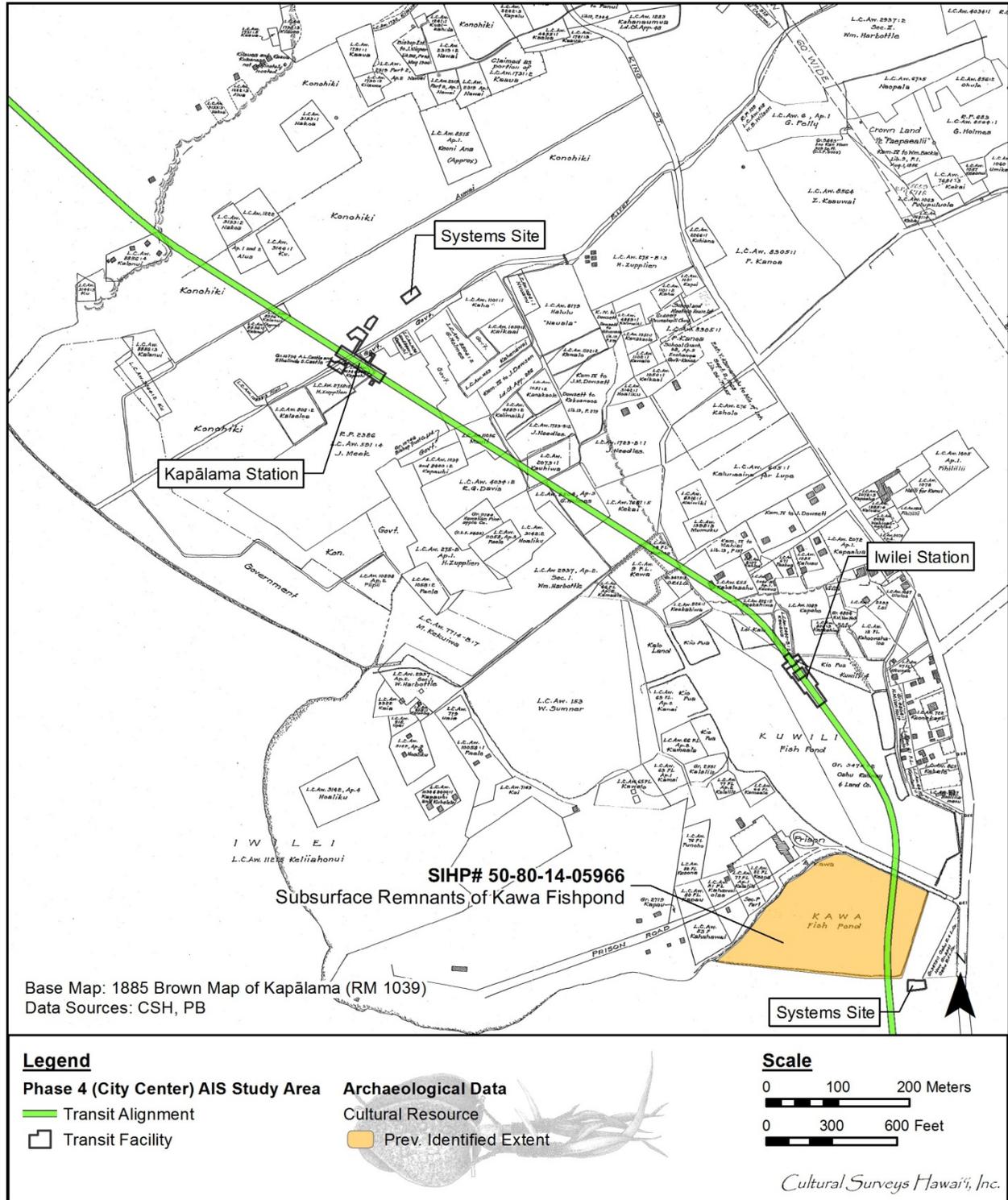


Figure 204. Makai sections of the 1885 map of Kalihi and Kapālama by J. F. Brown showing the general location of Kawa Fishpond (shown in yellow)

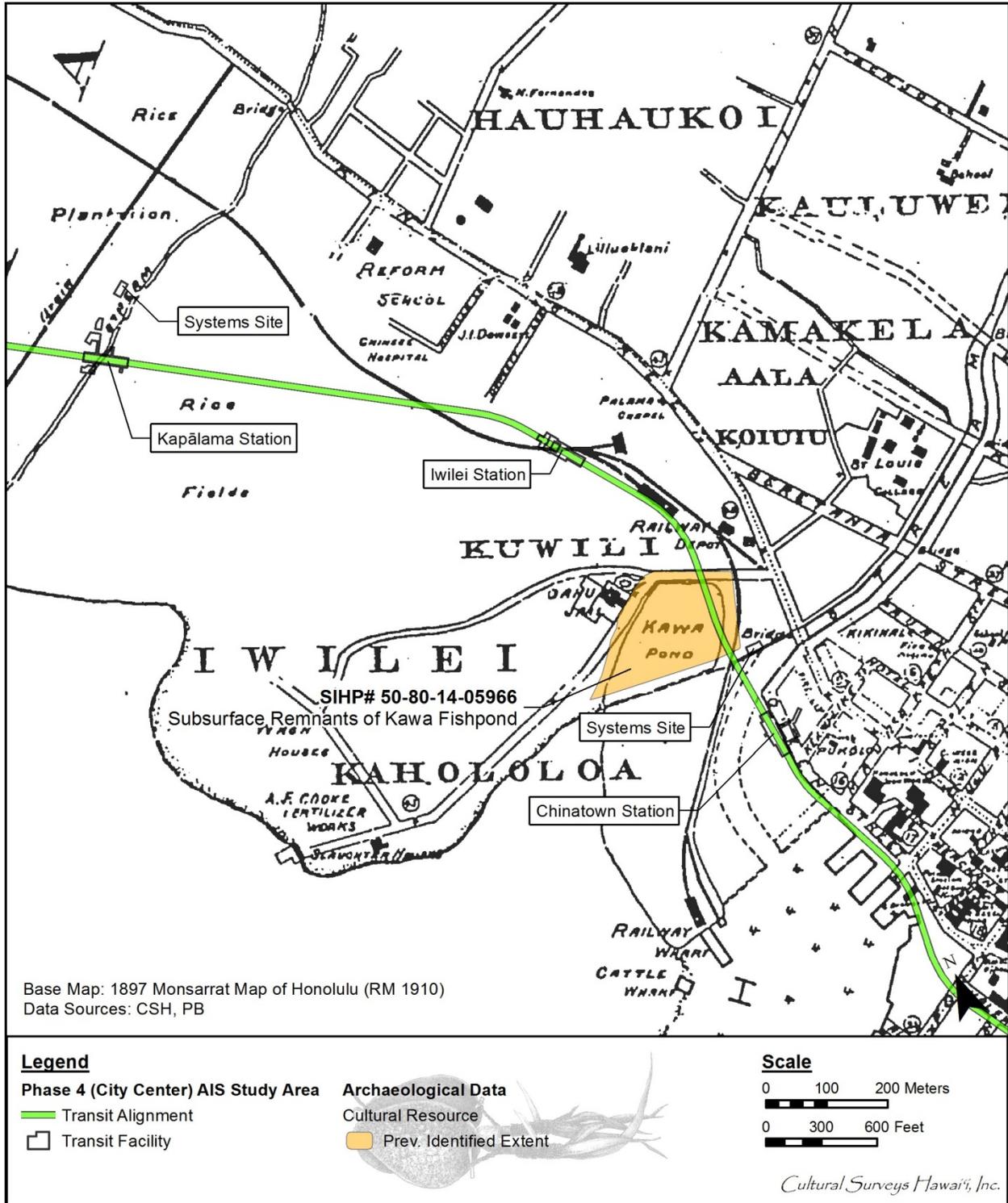


Figure 205. Portion of the 1897 Map of Honolulu by M. D. Monsarrat (Reg. Map 1910) showing the general location of Kawa Fishpond (shown in yellow)

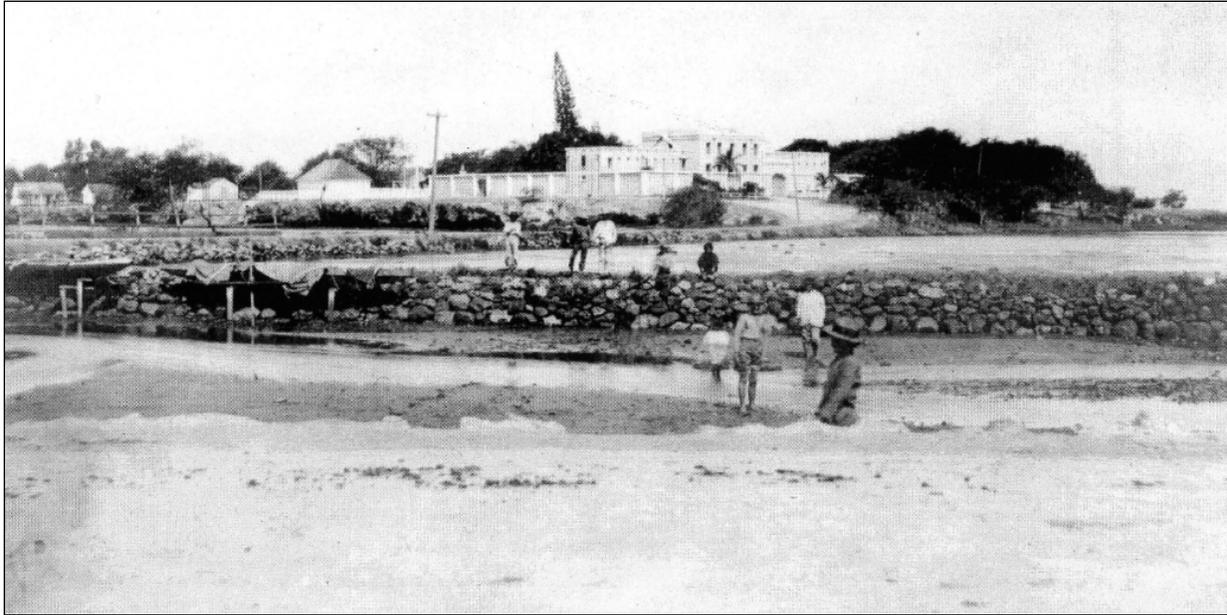


Figure 206. 1860s photograph, shot to the west, of Kawa Fishpond (foreground), Kūwili Fishpond (far right), Iwilei (Prison) Road, and Iwilei Prison, taken at low tide (Hawai'i State Archives)

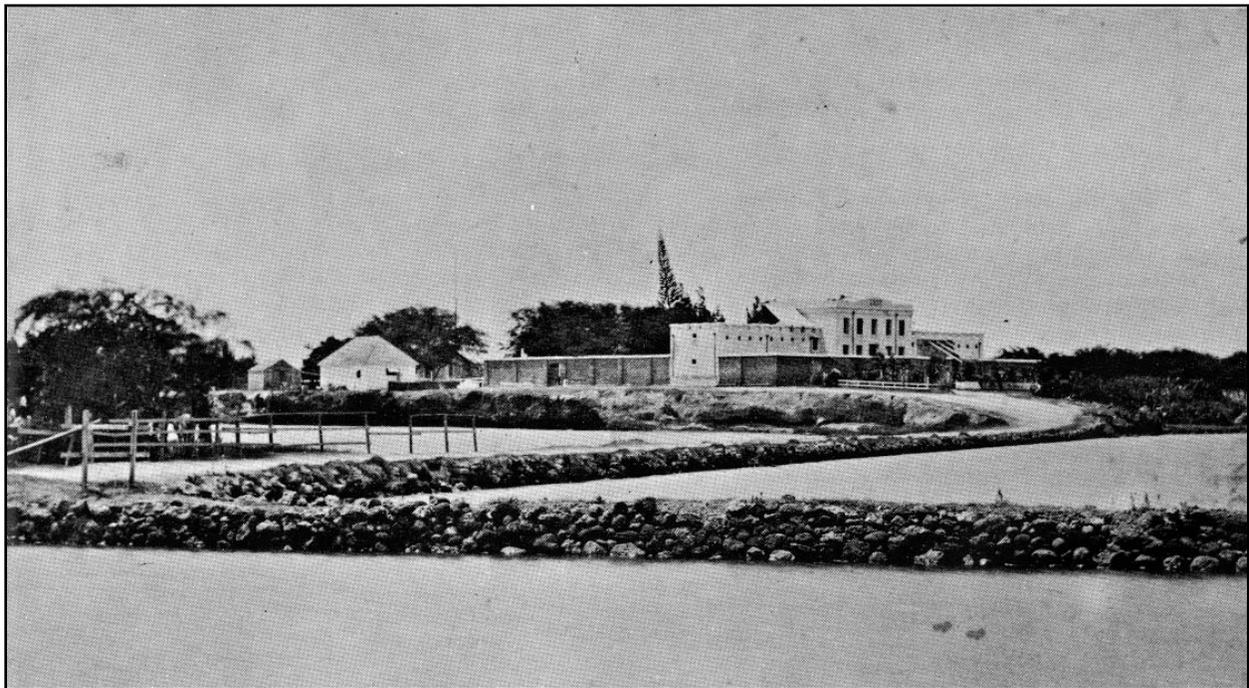


Figure 207. 1860s photograph, shot to the west, of Kawa Fishpond (foreground), Kūwili Fishpond (right), Iwilei (Prison) Road (left), and Iwilei Prison (Hawai'i State Archives)

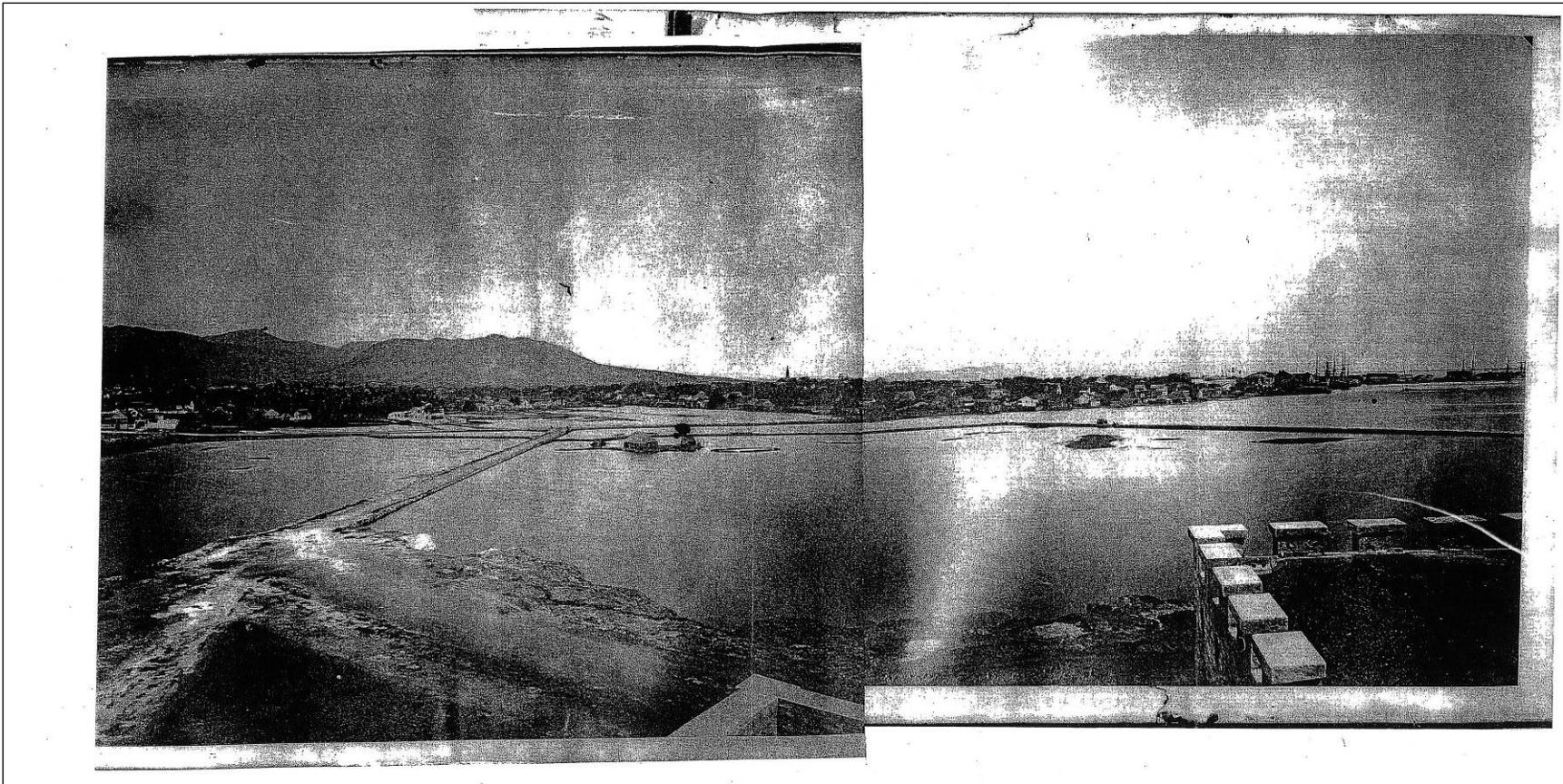


Figure 208. Three 1865 photographs taken from Iwilei Prison ramparts showing a panorama of Kūwili (left) and Kawa (right) Fishponds with Iwilei (Prison) Road (adapted from McDermott and Mann 2001:20)



Figure 209. 1860s photograph of northern portion of Kawa Fishpond with Iwilei Prison in background. A natural limestone bank of the fishpond is clearly visible (Hawai'i state Archives)

Historic maps indicate that the location and shape of Kawa Fishpond remained relatively unchanged into the late 1800s. An outbreak of cholera centered on both sides of the Nu'uānu Stream, however, prompted the Honolulu Board of Health on September 28, 1895, to recommend the infilling of the fishpond (*Pacific Commercial Advertiser*, 2:2).

McDermott and Mann (2001) identified Kawa Fishpond sediments within two of three backhoe test excavations (Trench 1 and Trench 3) and one geotechnical test bore (B-2) performed during the archaeological inventory survey for the Nimitz Highway Water System Improvements, Part I, Project. These fishpond sediments were identified ranging in depth from 2.04 mbs to 3.50 mbs. They described them as “fine grained, relatively homogenous, dark gray silty sediments” underlying fill deposits (McDermott and Mann 2001:43).

Documentation of Trench 3 in the McDermott and Mann (2001) study identifies Kawa Fishpond sediments as Stratum XIII (204-230 cmbs) (Figure 210, Figure 211, and Table 34). A total of four samples were collected from the Kawa Fishpond sediments within Trench 3 for radiocarbon, micro-charcoal, and palynomorph analysis. The two samples depicted on the Trench 3 profile include Beta 157193 (AD 1450 to 1650, 95.4% probability) and Beta 157454 (AD 1670 to 1770, 30.3% probability/AD 1800 to 1960, 61.5% probability) (see Figure 211). No samples were analyzed from Trench 1 as the deepest layers of the excavation were considered to be heavily contaminated with petroleum (McDermott and Mann 2001:45).

McDermott and Mann (2001:59) attempted to provide data on the age of construction of Kawa Fishpond and summarized the radiocarbon results as follows:

The radiocarbon dating evidence, albeit tentative, combined with indisputable historic evidence, indicate that the low-energy, finely-sorted Stratum XIII, presumed to be the floor of Kawa Fishpond (in Trench 3), was extant from between the period A.D. 1150-1350 and c. A.D. 1890.

Micro-charcoal particle counts and palynomorph analysis of Kawa Fishpond sediments identified only native and Polynesian-introduced taxa, with no historically-introduced taxa present. These results were considered anomalous considering the known historic use of the fishpond (McDermott and Mann 2001:60). In addition, glass bottle fragments dating to the mid-to late-nineteenth century were recovered from within the fishpond sediments.

Subsurface Kawa Fishpond sediments were not encountered in T-095, the only test excavation located within the former Kawa Fishpond footprint during the current archaeological inventory survey (Figure 212, Figure 213, and Table 35). No additional test excavations within the fishpond footprint were attempted due to the presence of existing numerous subsurface utilities and the potential disruption to vehicular traffic and adjacent business access. The observed stratigraphy within T-095 consisted of fill layers down to 1.45 mbs, where excavation was halted due to the presence of contaminated sediment. The lower fill deposits likely are associated with the initial late-nineteenth century infilling of Kawa Fishpond, as McDermott and Mann (2001) indicate they encountered fishpond sediments only 20 cm below this, at 2.04 mbs in Trench 3. However, since pond sediments were not encountered within (T-095), it is unknown how many more fill layers may exist below the contaminated layer. In addition, it remains unknown if buried fishpond sediments occur below the lowest fill deposits.



Figure 210. Trench 3 sidewall, view to northeast (McDermott and Mann 2001:53)

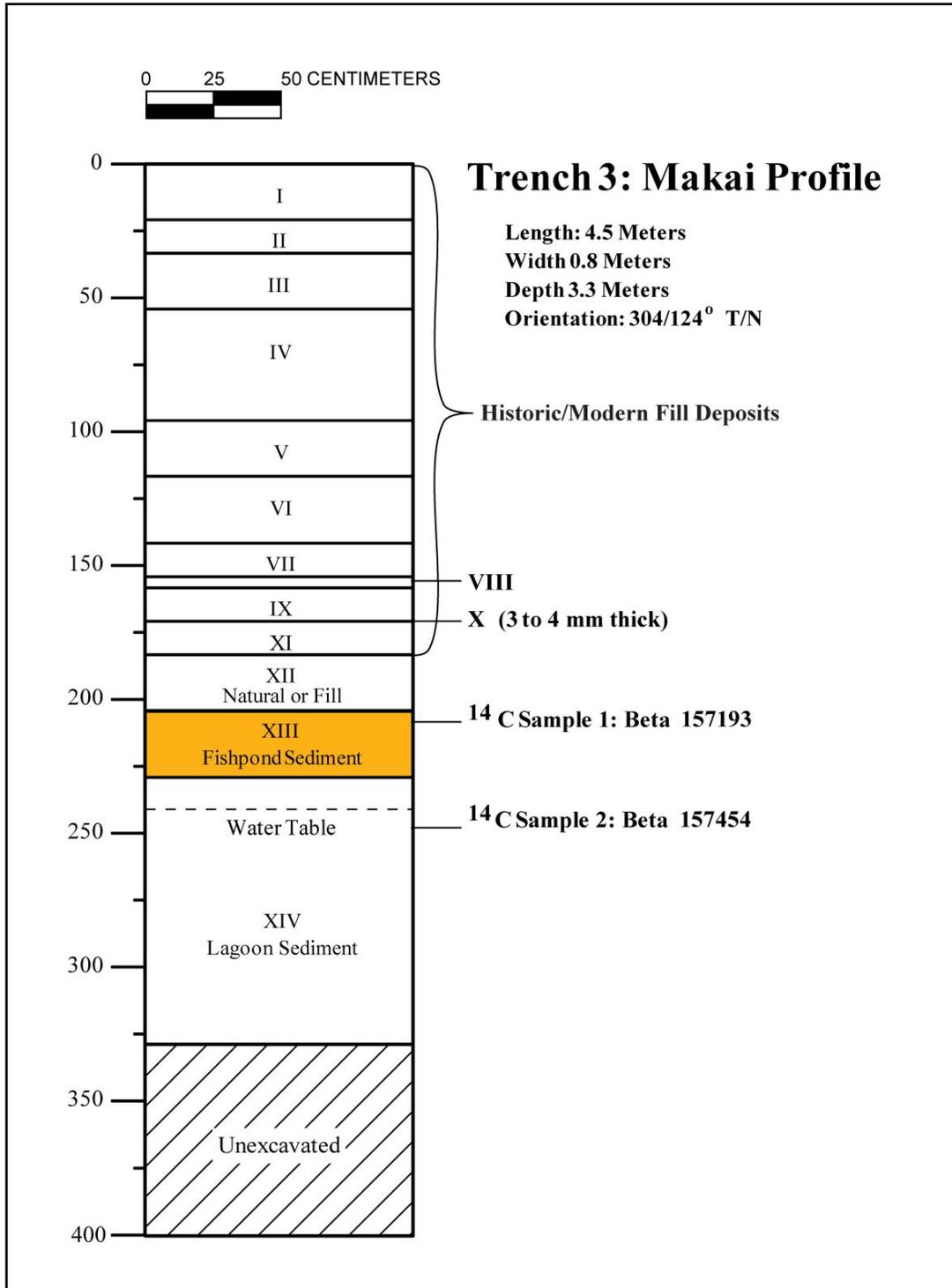


Figure 211. Trench 3 (T-3) Profile showing fishpond sediment (Layer XIII) below natural or fill sediment (Layer XII) and atop natural lagoonal sediments (Layer XIV) (adapted from McDermott and Mann 2001:54)

Table 34. Trench 3 Stratigraphic Description (adapted from McDermott and Mann 2001)

Stratum	Depth (cmbs)	Description
I	0-20	(Dry) 5YR 3/3 dark reddish brown; non-coherent; clay loam; weak, fine, subangular blocky structure; contains roots and rootlets, some construction gravels and modern trash; L/B abrupt/smooth; modern landscaping fill sediment
II	20-30	Crushed coral fill material
III	30-55	Basalt construction gravel, 5-10 cm diameter, in a sandy loam matrix, bed for overlying crushed coral surface
IV	55-90	(Dry) 10YR 5/4 yellowish brown; slightly hard; loamy sand; structureless; contains basalt and coral construction gravel, a few roots and rootlets; L/B clear smooth; modern fill material
V	90-115	(Dry) 10YR 4/2 dark grayish brown; slightly hard; medium sand; structureless; contains a few subangular coral cobbles; L/B abrupt smooth; fill material
VI	138-156	(Dry) 7.5YR 4/4 brown; slightly hard; gravelly loamy sand; structureless; contains some roots, a piece of shell; L/B abrupt wavy; fill layer
VII	138-156	(Dry) 7.5YR 3/3 dark brown; slightly hard; sandy loam; structureless; contains roots and rootlets and some pockets of marine sand with shell fragments; L/B abrupt/smooth; fill layer.
VIII	156-161	(Moist) 5YR 4/4 brown; very friable; very fine silty sand; structureless; contains charcoal fragments; L/B very abrupt/smooth; fill layer
IX	161-174	(Moist) 10YR 4/1 dark gray; very friable; very fine microstratigraphy (layers c. 2 mm-3 cm thick) consisting of interbedded layers of clay and silty clay, some of the layers are heavily enriched with decomposing organic material; structureless; L/B very abrupt/smooth; fill material, most likely that result of the settling of pumped, very fine sediments
X	174	(Moist) 10YR 5/1 gray; slightly sticky; sandy clay; structureless; layer only approximately 3-4 mm thick; L/B very abrupt/smooth; fill material, similar to the overlying Stratum IX
XI	174-176	(Wet) 7.5YR 4/3 brown; slightly sticky; coarse sand; structureless; contains small shell fragments; L/B very abrupt smooth; fill material
XII	176-204	(Wet) dark gray; non sticky; medium to fine sand; structureless; contains shell fragments and some whole shells, also water rounded basalt gravels; L/B abrupt/smooth; Dr. Ward found micro-charcoal particles within this sediment, a low concentration of 2.3 mm ² /cc; it is not clear whether this well-sorted sand is a natural sediment or fill layer. Based on superposition it post-dates the silty clay fishpond sediments immediately below (Strata XIII). It apparently contains no historically-introduced palynomorphs

XIII	204-230	(Wet) 10YR 4/1 dark gray; slightly sticky; silty clay; structureless; contains a coconut shell fragment, and fragments of two glass bottles manufactured between 1870 and 1900; charcoal particles were collected from this sediment during wet screening with 1/16 inch mesh; also Dr. Ward calculated a micro-charcoal particle concentration of 54.6 mm ² /cc for this sediment; good palynomorph preservation; L/B abrupt/smooth; natural fishpond sediment; Kawa Fishpond sediment; component of SIHP #-5966
XIV	230-330	(Wet) 10YR 4/1 dark gray; slightly sticky; cobbly, gravelly, silty clay; structureless; contains subangular to rounded coral gravels and cobbles, also water rounded basalt gravels and cobbles, and angular shell fragments and whole shells; charcoal particles were collected from this sediment during wet screening with 1/16 inch mesh; also Dr. Ward calculated a micro-charcoal particle concentration of 38.3 mm ² /cc for this sediment; palynomorph preservation was good; natural lagoonal sediment



Figure 212. T-095 northeast wall profile, showing fill deposits only, view to northeast

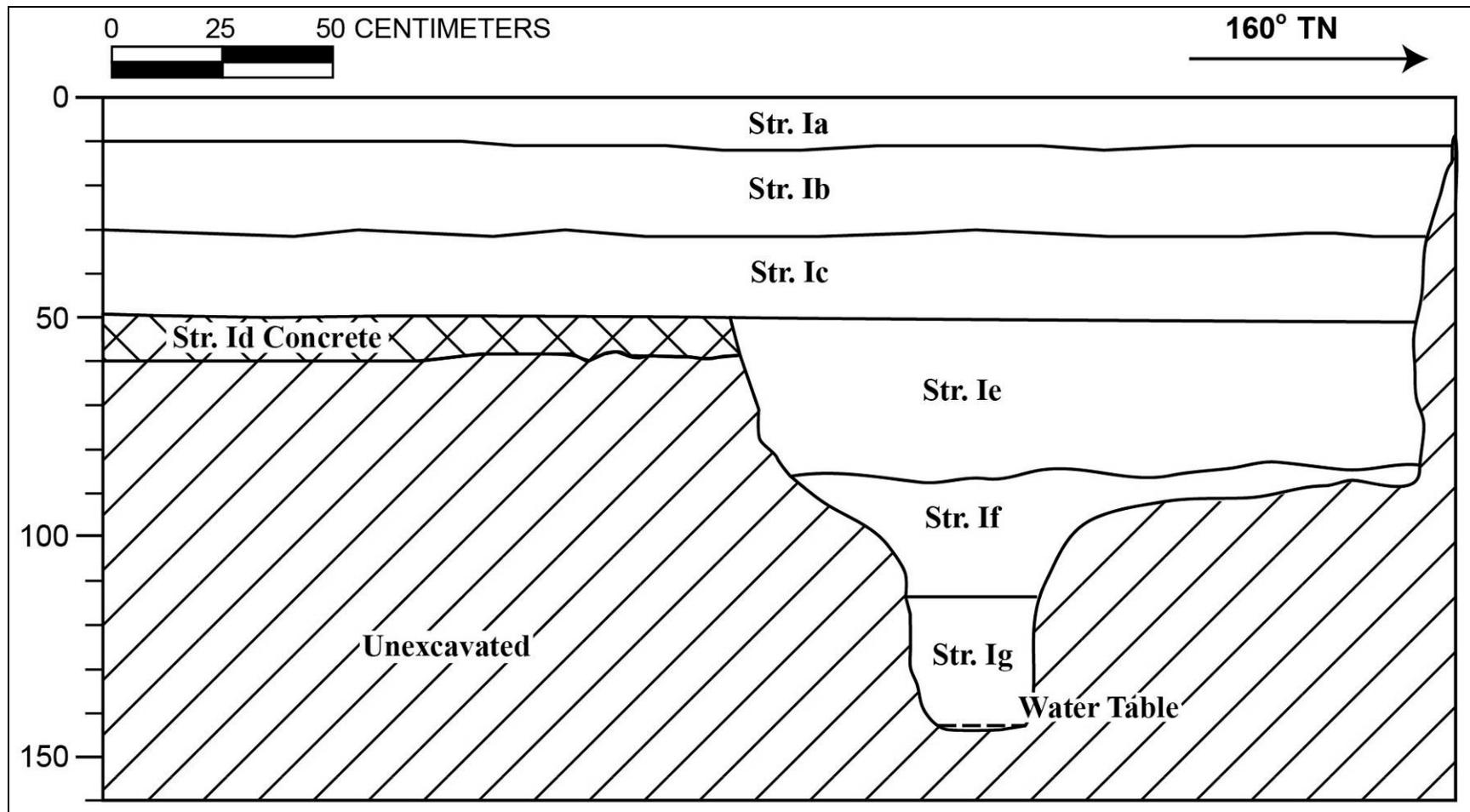


Figure 213. T-095 northeast wall profile

Table 35 T-095 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-11	Asphalt
Ib	11-31	Fill; 10 YR 7/3 (very pale brown); gravelly cobbly coarse sand; structureless, single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral base course
Ic	31-50	Fill; 10 YR 3/3 (dark brown); clay loam; weak, very fine, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; imported fill layer with coral gravel inclusions
Id	50-60	Fill; 2.5" concrete slab, possible sidewalk
Ie	50-87	Fill; 10 YR 3/2 (very dark grayish brown); sandy loam; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; contained construction debris fill, ABM bottle fragment, ceramic plate fragment, bakelite fragment, and red brick chunks (not collected), coral and basalt chunks
If	85-115	Fill; 10 YR 4/2 (dark grayish brown); clay loam; weak, very fine, blocky structure; moist, friable consistency; plastic; terrigenous origin; abrupt lower boundary; contained some charcoal flecking ~5%; imported fill, 0.5 m x 0.5 m x 0.3 m coral block
Ig	115-145 (BOE)	Fill; 10 YR 2/1 (black); very fine sandy loam; structureless, single-grain; moist, friable consistency; plastic; terrigenous origin; lower boundary not visible; contaminated fill layer

SIHP #-5966 (Kawa Fishpond) is an aquacultural locality that, based on background research and previous archaeological studies, may have been constructed pre-Contact or in the early nineteenth century with continued use to the end of the nineteenth century. Kikuchi (1973:227) classified Kawa Fishpond as a Type I pond or *loko kuapā*, and photographs from the 1860s document the presence of fishpond walls consisting of about four to seven exposed courses of dry-stacked, basalt and/or coral boulders. McDermott and Mann (2001) identified Kawa Fishpond sediments within two of three backhoe test excavations (T-1 and T-3) and one geotechnical test bore (B-2). Radiocarbon analysis of fishpond pond sediment samples collected by McDermott and Mann (2001) provided evidence for pre-Contact deposition. One test excavation (T-095) was excavated within the footprint of Kawa Fishpond during the current archaeological inventory survey. The observed stratigraphy within T-095 consisted of fill layers down to 1.45 mbs, where excavation was halted due to the presence of contaminated sediment. Although direct evidence of Kawa Fishpond was not encountered during the current investigation, there is a possibility that fishpond sediments are present below the documented fill deposits in T-095 based on findings reported in McDermott and Mann (2001).

Based on the guidance of National Register Bulletin No. 15, SIHP # 50-80-14-5966 (Kawa Fishpond) retains its integrity of location and possibly also of materials and workmanship. SIHP #-5966 was previously determined eligible to the Hawai'i and National Registers under significance Criterion D (has yielded, or is likely to yield information important for research on prehistory or history) by McDermott and Mann (2001).

SIHP #-5966 has provided information, and has potential to provide additional information, on the construction and use history of Kawa Fishpond, as well as the nature and sequence of sedimentation within the fishpond and its subsequent infilling near the end of the nineteenth century. The potential for additional research warrants the implementation of a data recovery program. Data recovery will compare previous and current data in an attempt to provide information on the relationship between Kawa Fishpond (SIHP #-5966) and adjacent Kūwili Fishpond (SIHP #-5368). In addition, data recovery will focus on identifying Kawa Fishpond sediments within the HHCTCP project APE and establishing a more refined chronology of the fishpond through intensive sampling of sediments for micro- and macro-botanical, radiocarbon, and other analytical studies. Sediment column samples and/or sediment cores will be incrementally partitioned (1-3 cm increments) and submitted for palynological and radiocarbon analysis. Following the data recovery program, an archaeological monitoring program is recommended at SIHP #-5966. Archaeological monitoring will seek to obtain additional data on the depositional sequence and extent of SIHP #-5966 as well as document any potential structural remnants of Kawa Fishpond such as fishpond walls that may be encountered during construction. Archaeological monitoring will involve additional intensive sampling of any exposed Kawa Fishpond sediments for palynological and radiocarbon analysis for comparison to data from previous archaeological research within Kawa fishpond and with data from other Hawaiian fishponds, especially the adjacent Kūwili Fishpond.

5.3.6 SIHP #50-80-14-6636

FORMAL TYPE:	Subsurface Kewalo wetland remnants
FUNCTION:	Agriculture, aquaculture, and habitation
PREVIOUS DOCUMENTATION:	O'Hare et al. 2003, O'Hare et al. 2004, Tulchin and Hammatt 2005, Clark and Grosser 2005, Hammatt 2008, Altizer et al. 2011, Runyon et al. 2011, and Morriss et al. 2013
AGE:	Pre- and post-Contact
NUMBER OF FEATURES:	1
TYPES OF FEATURES:	1 Berm, associated coral wall and post (O'Hare et al. 2003)
DISTRIBUTION:	Approximately 1.22 acres (within current project area), 62.8 acres (total interpolated area)
LOCATION:	Bounded by Keeaumoku Street, Ala Moana Boulevard, Cummins Street, and Hoolai Street (East Kaka'ako and Kālia Geographic Zones)
TAX MAP KEY:	[1] 2-3-004, [1] 2-3-004:069, [1] 2-3-007, [1] 2-3-007:033 [1] 2-3-038:006, [1] 2-3-039:004 and 011 (current project area); [1] 2-3-010:028 (O'Hare et al. 2003); [1] 2-3-006:014, 017 (O'Hare et al. 2004); [1] 2-3-004:073, [1] 2-3-005:027, [1] 2-3-006:014, and [1] 2-3-007:002 (Tulchin and Hammatt 2005); [1] 2-3-003:075 (Clark and Grosser 2005); [1] 2-3-010:019, 020, 021, 024, 025, 026 (Altizer et al. 2011); [1] 2-3-004:080, [1] 2-3-006:014 (Runyon et al. 2011); [1] 2-3-007:026 and 049 (Runyon et al. 2012); [1] 2-3-038:001 (Morriss et al. 2013)
LAND JURISDICTION:	The City and County of Honolulu; Cody Properties, LLC; Kaka'ako Associates, LLC; General Growth Properties Ala Moana; Kewalo Development LLC; Sam House Development, LLC; and Izuo Brothers, Ltd. (within current project area)
TEST EXCAVATIONS:	T-186 through T-193, T-195, T-196, T-198 through T-200, T-202, T-202A, T-203, T-205, T-207 through T-212, T-214, T-219, T-220, and T-221

SIHP #50-80-14-6636 is a previously-identified subsurface deposit representing the former Kewalo wetland, including pond sediments, berm(s), and possible associated coral retaining wall and wooden post. The subsurface deposit has been identified in numerous previous archaeological studies. SIHP #-6636 is primarily bounded by Keeaumoku Street, Ala Moana Boulevard, Cummins Street, and Hoolai Street within the East Kaka'ako and Kālia Geographic Zones (Figure 214).

The 1884 Bishop Map of Honolulu indicates that the entire current interpolated extent of SIHP #-6636 is located within wetlands or marsh with minimal development in the vicinity (Figure 215). LCA records document fishponds, taro patches, house lots, and pasture land. LCA

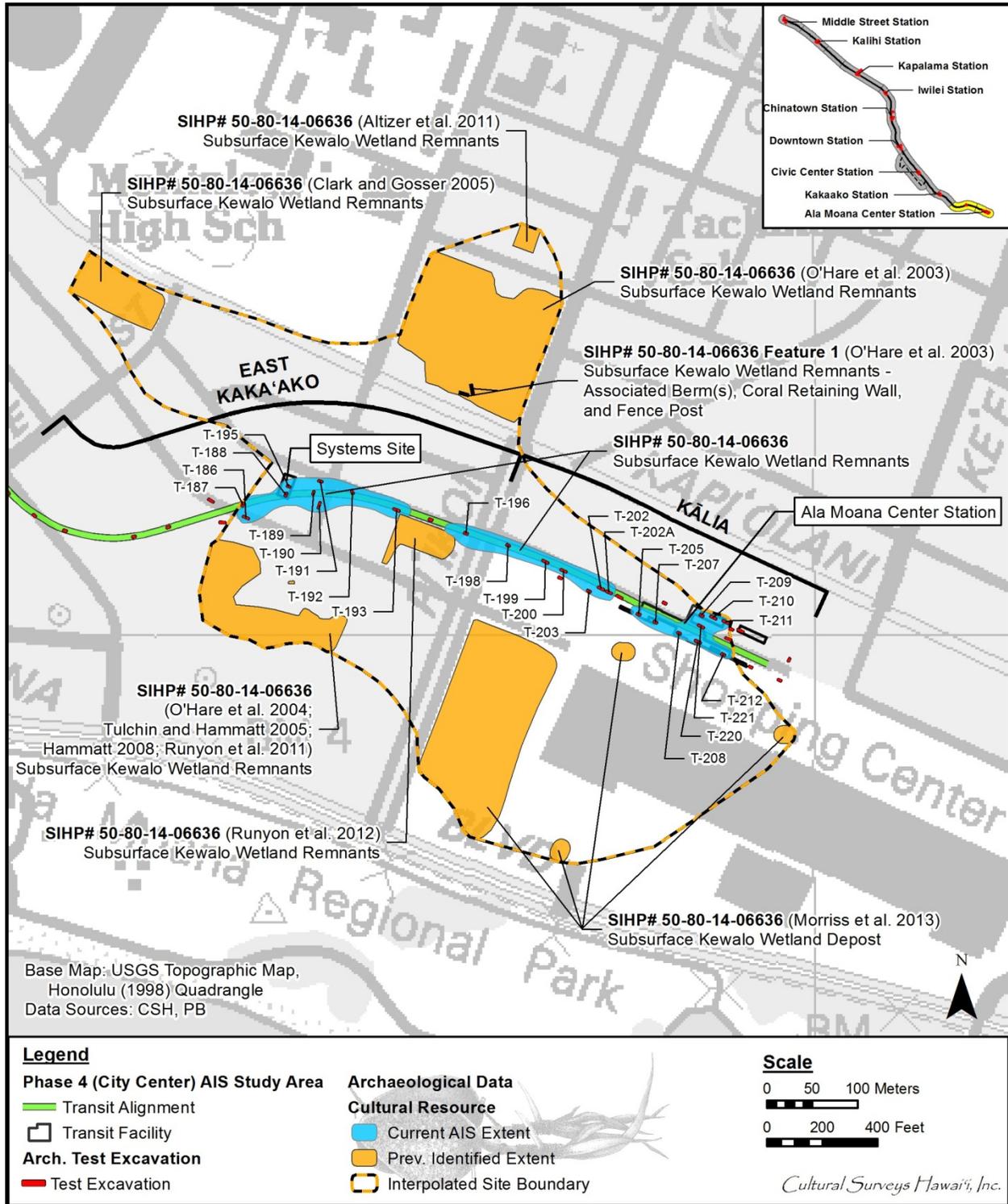


Figure 214. Locations of former- and newly-identified portions of SIHP # 50-80-14-6636 in the vicinity of the East Kaka'ako and Kālia Geographic Zones

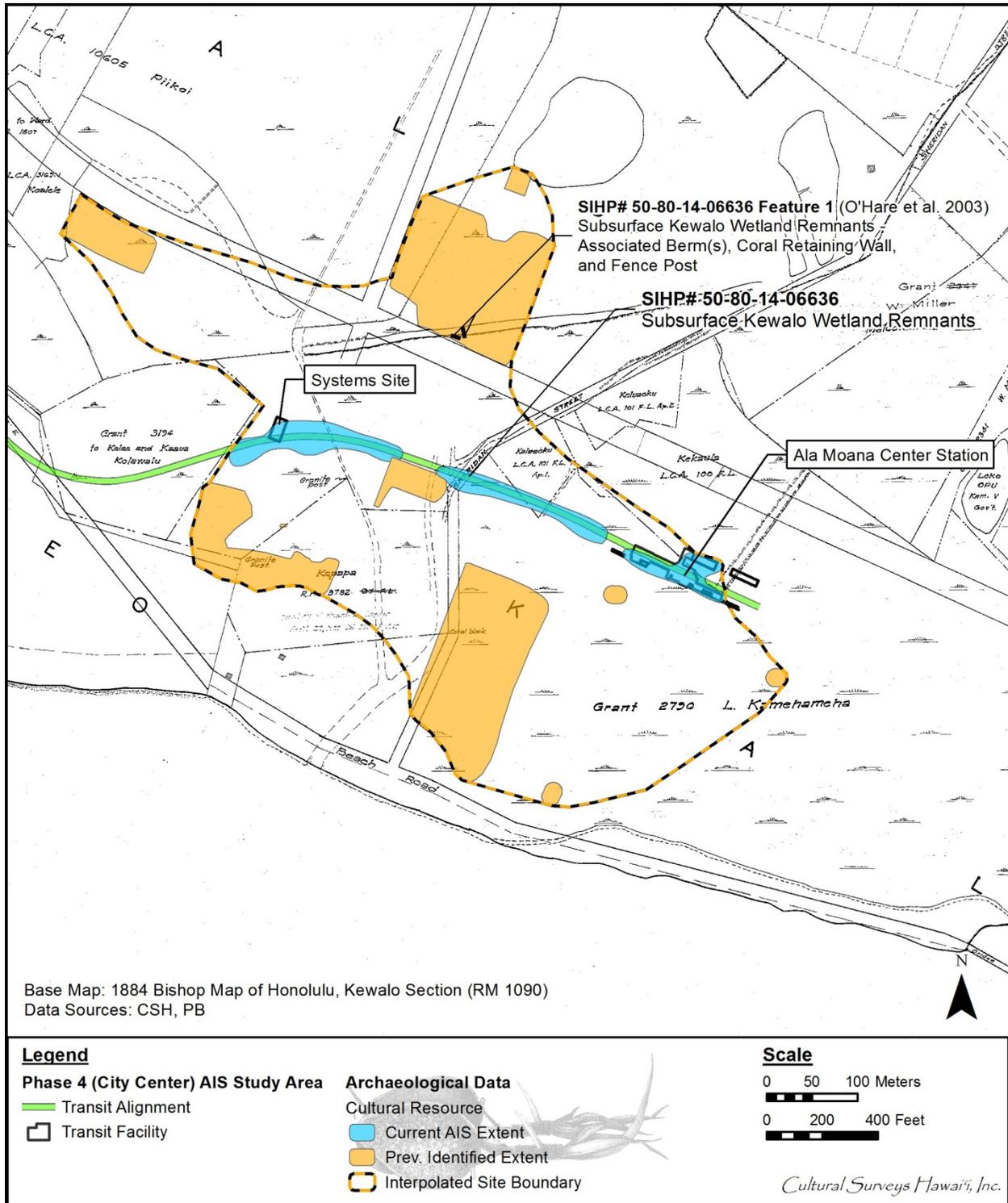


Figure 215. 1884 Map of Honolulu, Kewalo Section, by S. E. Bishop (Reg. Map 1090), showing the extend of wetland and/or marsh within the East Kaka‘ako and Kālia Geographic Zones

records for 100 F.L. (Fort Lands) describe two ponds, five fry ponds (*ki'o pua*), one taro patch (*lo'i*), one house lot, and one pasture (*kula* land). LCA records for 101 F.L. (Fort Lands) also document two ponds and three *ki'o pua*. The 1926 Land Court Application 709 Map 1 depicts several unnamed ponds, roadways or paths, small structures, and an area of salt pans within a portion of the SIHP #-6636 interpolated boundary (Figure 216). A 1927 aerial photograph depicts ponds, wetland agricultural fields, fallow or unmodified wetland, possible salt pan areas, and several structures within the SIHP #-6636 interpolated boundary (Figure 217). Historic maps and aerial photography confirm the extent of the Kewalo wetland, which includes a large portion of the current HHCTCP project APE as well as numerous previous archaeological studies.

SIHP #-6636 was initially identified by O'Hare et al. (2003) during an archaeological inventory survey for a six-acre property in Waikiki (Figure 218). Kewalo wetland sediments were identified within 22 of 24 backhoe test excavations (Trenches 1-8, 10, 11, and 13-24) during the survey (Figure 219). These sediments were identified ranging in depth from 0.90 mbs to 2.20 mbs and were designated as Strata IIIa and IIIb. O'Hare et al. (2003:69) describe SIHP #-6636 as follows:

Site 50-80-14-6636 consists of the pre-contact to early 20th century land surface that underlays the dredged fill materials from the Kewalo and Ala Wai Canal land reclamation projects, which took place in the 1920s and the 1930s. This land surface is a wetland deposit (Stratum III), which probably extends across the entire project area. This site also contains a sand berm that crosses the southeast corner of the project area. This sand berm is illustrated on an 1884 map, but may have been constructed earlier. Radiocarbon date determinations for the sand berm do not give a definitive date for the construction of this feature.

O'Hare et al. (2003:54) describe the Kewalo wetland sediments as follows:

Substratum IIIa is a very dark brown sandy clay loam with a high percentage of platy organic material. The layer contained charcoal, marine gastropods and bivalves, and fish scales. Substratum IIIb is a very dark grayish brown sandy loamy clay with less organic material. It also contains charcoal, marine invertebrates, and fish scales; in addition it was also characterized by inclusion of rounded basalt gravel.

An artificially-constructed sand berm (Feature 4) was identified in Trenches 12 and 23 within the southeast corner of the O'Hare et al. (2003) project area (see Figure 219) (see Figure 214). The composition of the sand berm is described within Trench 12 as dark grayish brown sandy clay with marine gastropods and 67 cm in thickness, and in Trench 23 as dark gray clay loam with microstratigraphy of sand lenses (O'Hare et al 2003:55). The berm in Trench 23 was associated with a concentration of coral boulders, which may represent a retaining wall for the berm, and a wooden fence post, which may suggest a fence lining (Figure 220 and Table 36); the possible retaining wall and fence post are designated along with aforementioned Feature 4 berm as SIHP #-6636 Feature 1 for the current AIS study. Radiocarbon analysis of the sand berm produced a two-sigma calibrated date of AD 1660 to 1890 (78.1% probability) (O'Hare et al. 2003).

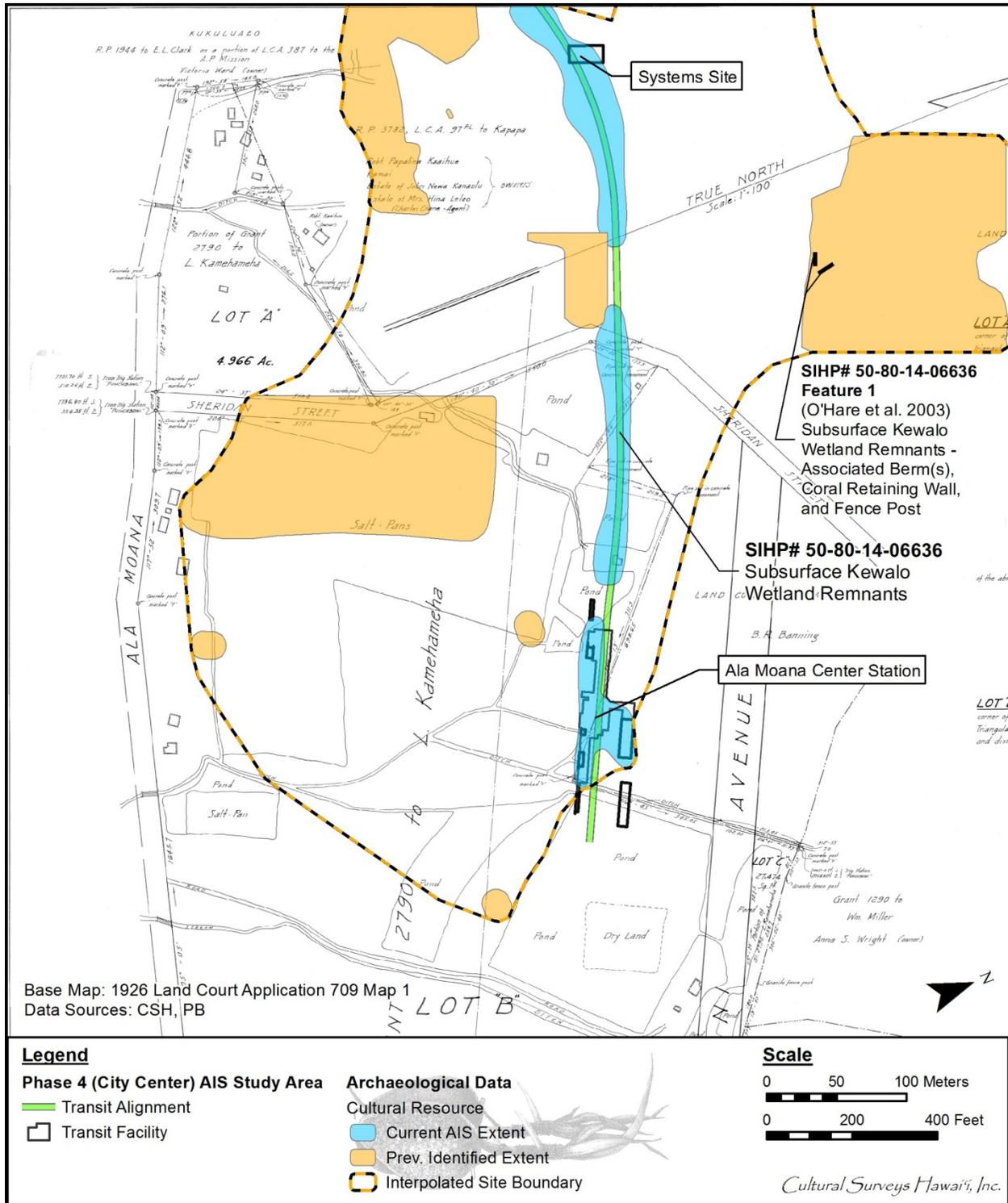


Figure 216. Portion of the 1926 Land Court Application 709 Map 1 showing various land use within the SIHP # 50-80-14-6636 interpolated boundary

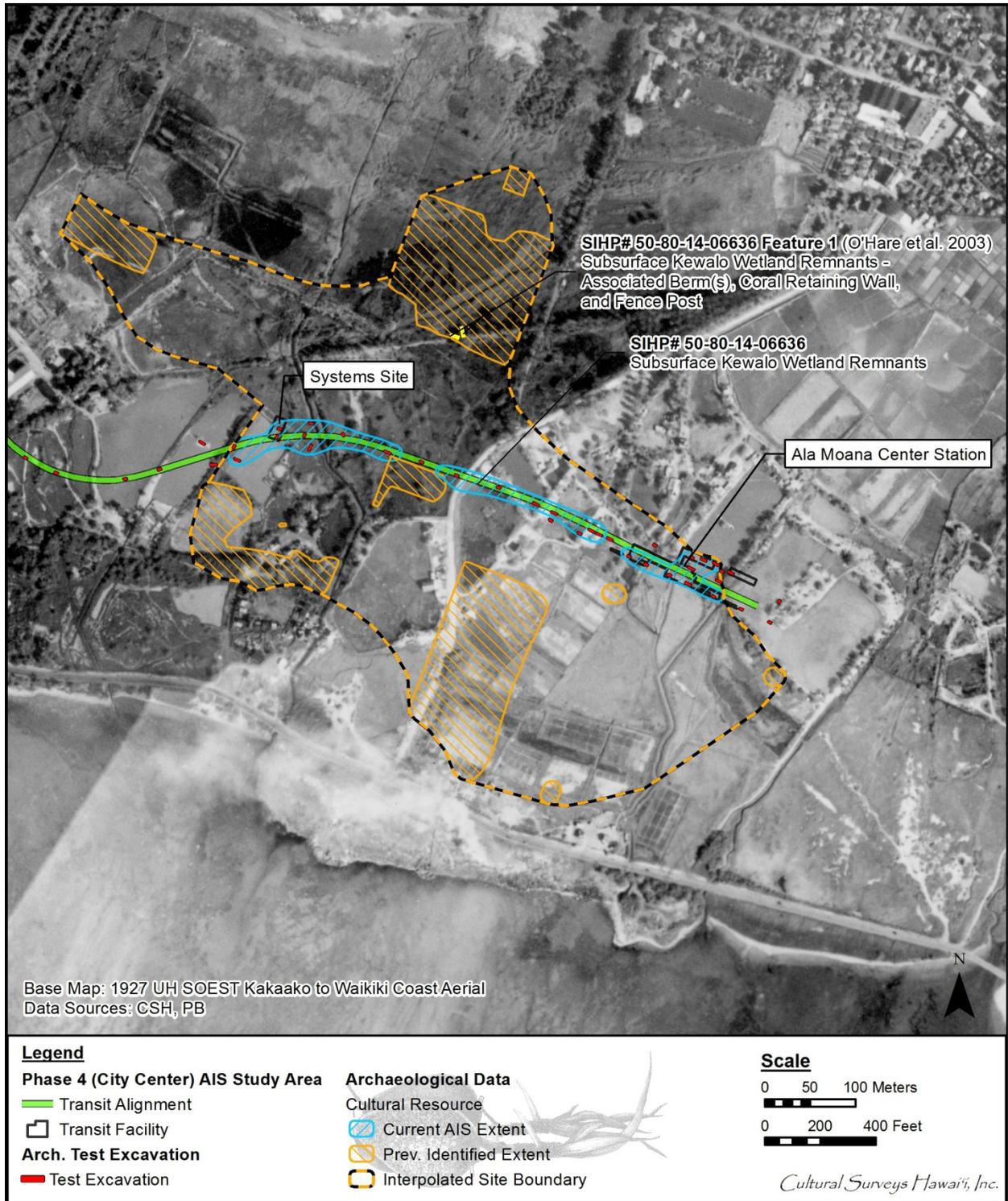


Figure 217. Portion of the 1927 UH SOEST aerial photograph of the Kaka'ako coast showing various land use within the SIHP # 50-80-14-6636 interpolated boundary

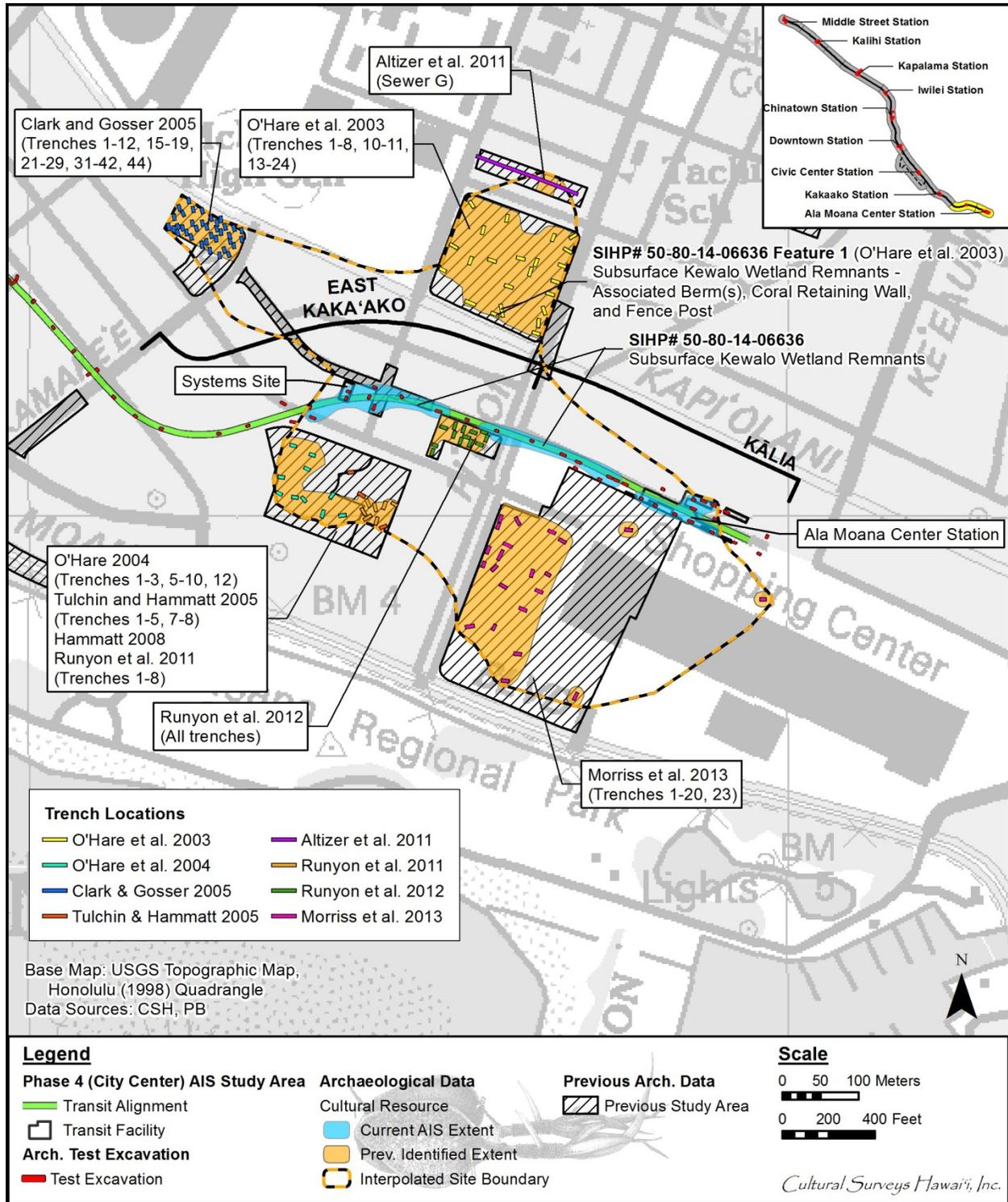


Figure 218. Locations of former- and newly-identified portions of SIHP # 50-80-14-6636 including excavation locations in the vicinity of the East Kaka'ako and Kālia Geographic Zones

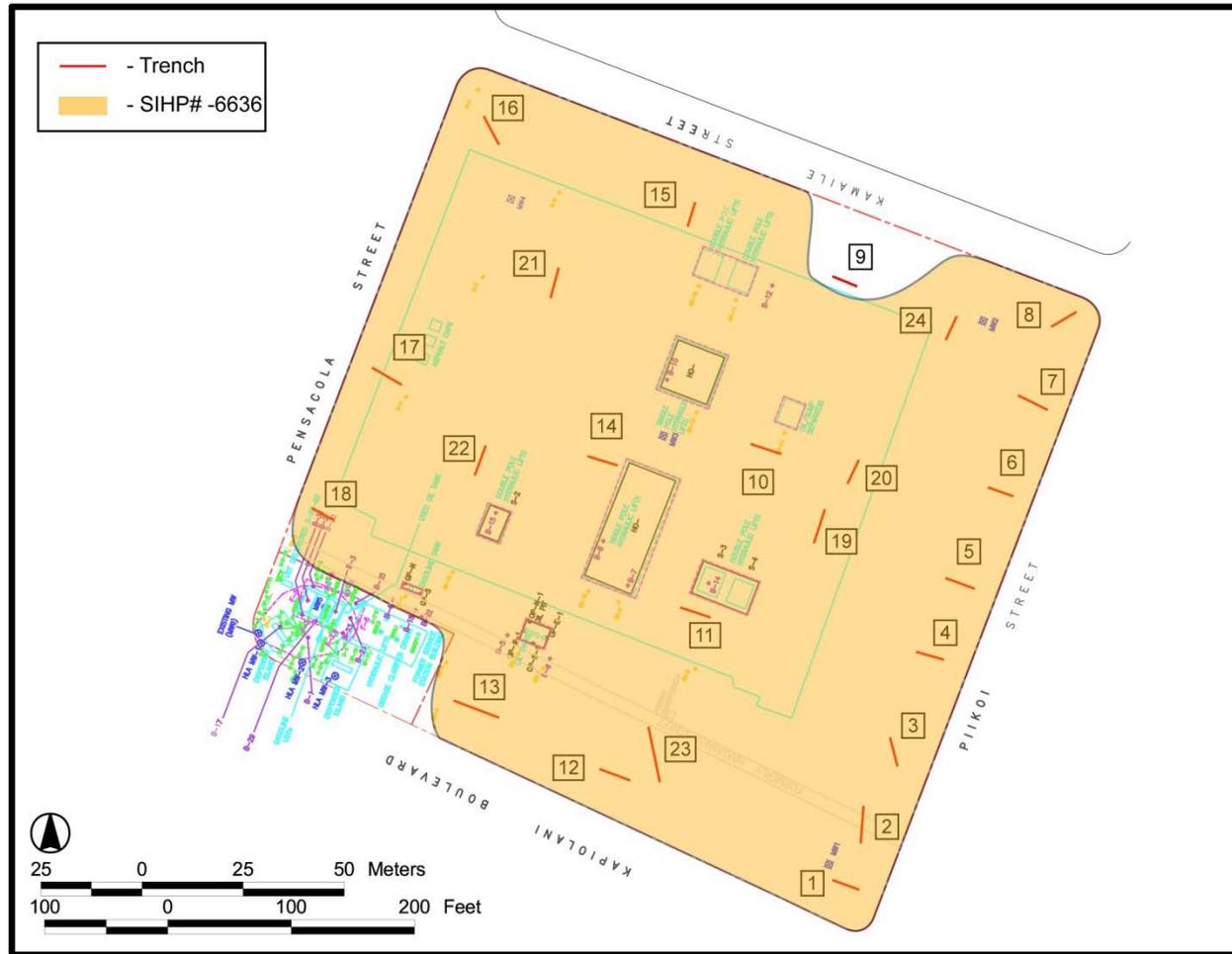


Figure 219. O’Hare et al. (2003:52) study area map showing the locations of Trenches 1-24 and the distribution of SIHP #50-80-14-6636; see Figure 218 for location of O’Hare et al. (2003) study area

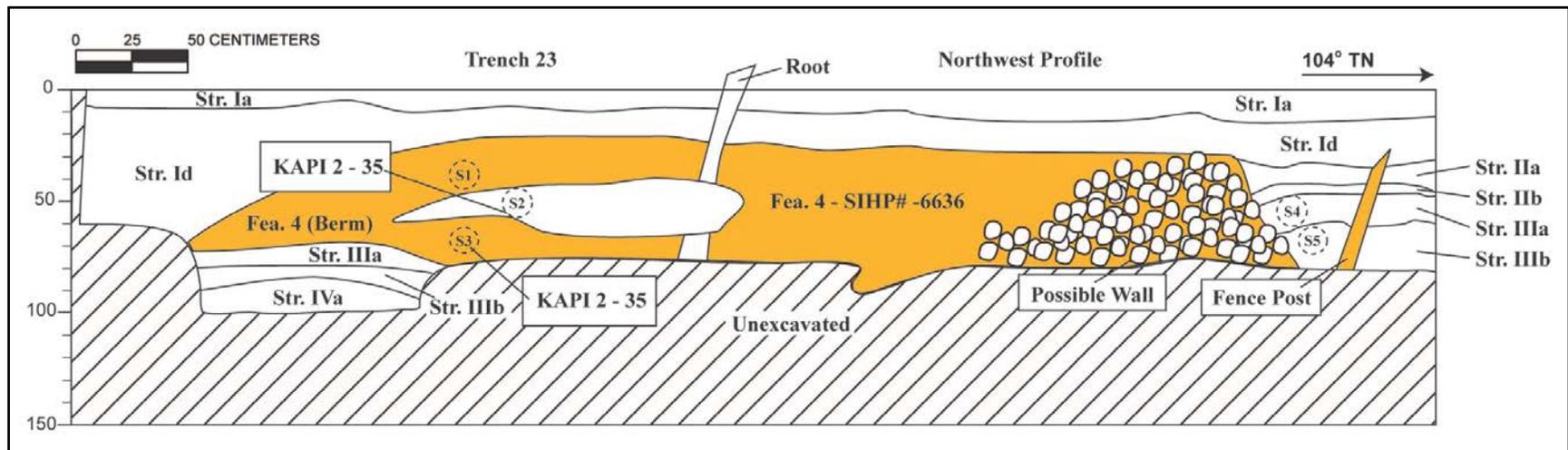


Figure 220. Trench 23 profile showing artificially-constructed sand berm, coral retaining wall, and wooden fence post (shown in orange) (adapted from O'Hare et al. 2003:56); the berm, wall, and fence post were designated in current AIS as SIHP # - 6636 Feature 1 (see Figure 214 for location of SIHP #-6636 Feature 1)

Table 36. Trench 23 Stratigraphic Description (adapted from O'Hare et al. 2003)

Stratum	Depth (cmbs)	Description
Ia	0-18	Fill; dark brown (7.5YR 3/3) gravelly silt loam with 25% basalt and calcareous gravels present; weak, fine to medium, subangular blocky structure; very friable, non-sticky, and slightly plastic; many fine to medium tubular roots; very abrupt wavy, boundary.
Id	18-62	Fill; brown (10YR 5/3) sandy loam with 5% coral cobbles; weak, fine, granular structure; loose, non-sticky, and non-plastic; many fine to medium interstitial roots; abrupt, wavy boundary.
Feature 4	38-140	Sand Berm; very dark gray (10YR 3/1) clay loam with micro-stratigraphy; very friable, sticky and plastic; clear, wavy boundary over a Dk. Grayish Brown (10 YR 4/2) clay loam, very friable, sticky and plastic; abrupt, wavy boundary; designated during current City Center AIS as SIHP # -6636 Feature 1, also including associated coral retaining wall and possible fence lining (see Figure 220)
Ila	62-78	Pumped Fill; very pale brown (10YR 8/3) fine sand (60%) with bands of Lt. Gray (10YR 7/2) silty clay (35%) mixed with 5% coral gravel; structureless; very abrupt, smooth boundary.
Ilb	78-90	Pumped Fill; blue light gray (10YR 7.2) silty clay (90%) with a few bands of Very Pale Brown (10YR 8/3) fine sand (10%) sticky, very plastic; structureless; no coral inclusions; very abrupt, smooth boundary.
IIIa	90-111	Organic Strata; very dark brown (10YR 2/2) sandy clay loam; friable, slightly sticky, non-plastic; 80% humic organics in a platy structure; terrestrial gastropods present; clear, smooth boundary.
IIIb	111-153	Organic Strata; very dark grayish brown (10YR 3/2) sandy loamy clay; very friable, sticky, very plastic; some humic material (10%) in widely spaced bands throughout samples; terrestrial gastropods and rounded basalt gravel present; upright fence post at base of strata; very abrupt, smooth boundary.
IV	153-195+	Sand/Coral Substrate; greenish-gray gley (6/1) coarse sand at water level with 75% coral cobbles and boulders; structureless, sticky and very plastic; fence post found at base of trench

Subsequent investigations identified additional portions of SIHP #-6636 throughout the Kewalo/greater Kaka'ako area (see Figure 218). These studies consist of the following: O'Hare et al. (2004), Tulchin and Hammatt (2005), Clark and Grosser (2005), Hammatt (2008), Altizer, et al. (2011), Runyon et al. (2011), Runyon et al. (2012), and Morriss et al. (2013).

O'Hare et al. (2004) identified Kewalo wetland sediments within 10 of 13 backhoe test excavations (Trenches 1-3, 5-10, and 12) during an archaeological inventory survey for the Ko'olani Condominium Project (Figure 221). The wetland sediments were identified as ranging from 0.85 mbs to 2.35 mbs. O'Hare et al. (2004:74) describe SIHP #-6636 as follows:

This site was the original wetlands surface, before the dredging and land reclamation projects filled in the area ca. 1930. The full dimensions are not known, as this layer is discontinuous due primarily to 20th century landfill operations. Additionally, when encountered it was obvious that the layer extends past the trenches, in all directions.

The layer in certain areas contains charcoal flecking and marine shell, suggestive of pre-contact utilization. Subsequently in the 1920s, and 1930s, this layer was completely covered with fill material for the expanding urbanization of Honolulu.

O'Hare et al. (2004) designated Kewalo wetlands sediments as Stratum IIIa and IIIb (Figure 222 and Table 37). Kewalo wetland sediments were described as "sandy clay loams with various high percentages of organic material to fine, well-sorted coralline sands" underlying fill sediments (O'Hare et al. 2004:56). These layers contained marine shell including *Natica* sp., *Nerita* sp., *Bittium* sp., and *Brachidontes* sp.

Tulchin and Hammatt (2005) identified Kewalo wetland sediments within seven of eight backhoe test excavations (Trenches 1-5, 7, and 8) during the Phase 2 portion of the archaeological inventory survey for the Ko'olani Condominium Project (Figure 223). The depths of these sediments were identified as ranging from 1.65 mbs to 2.60 mbs. Tulchin and Hammatt (2005:29) describe SIHP #-6636 as follows:

Site -6636 consisted of the original wetland surface of the Kewalo area, previously identified by O'Hare et al. (2003). Site -6636 was also identified within the Phase 1 portion of the current project area (O'Hare et al. 2004). Within the Phase 2 testing area, Site -6636 consisted of gleyed sandy clay to clay sediments, immediately overlying the coral shelf. Site -6636 was observed in varying thickness within seven of the eight excavated test trenches, at depths ranging from 165-260 cmbs. Within Trench 7, Site -6636 contained loam-type sediments, containing abundant organic material and land snail shells. The entire extent of Site-6636 is unclear, as the layer is discontinuous, primarily due to 20th

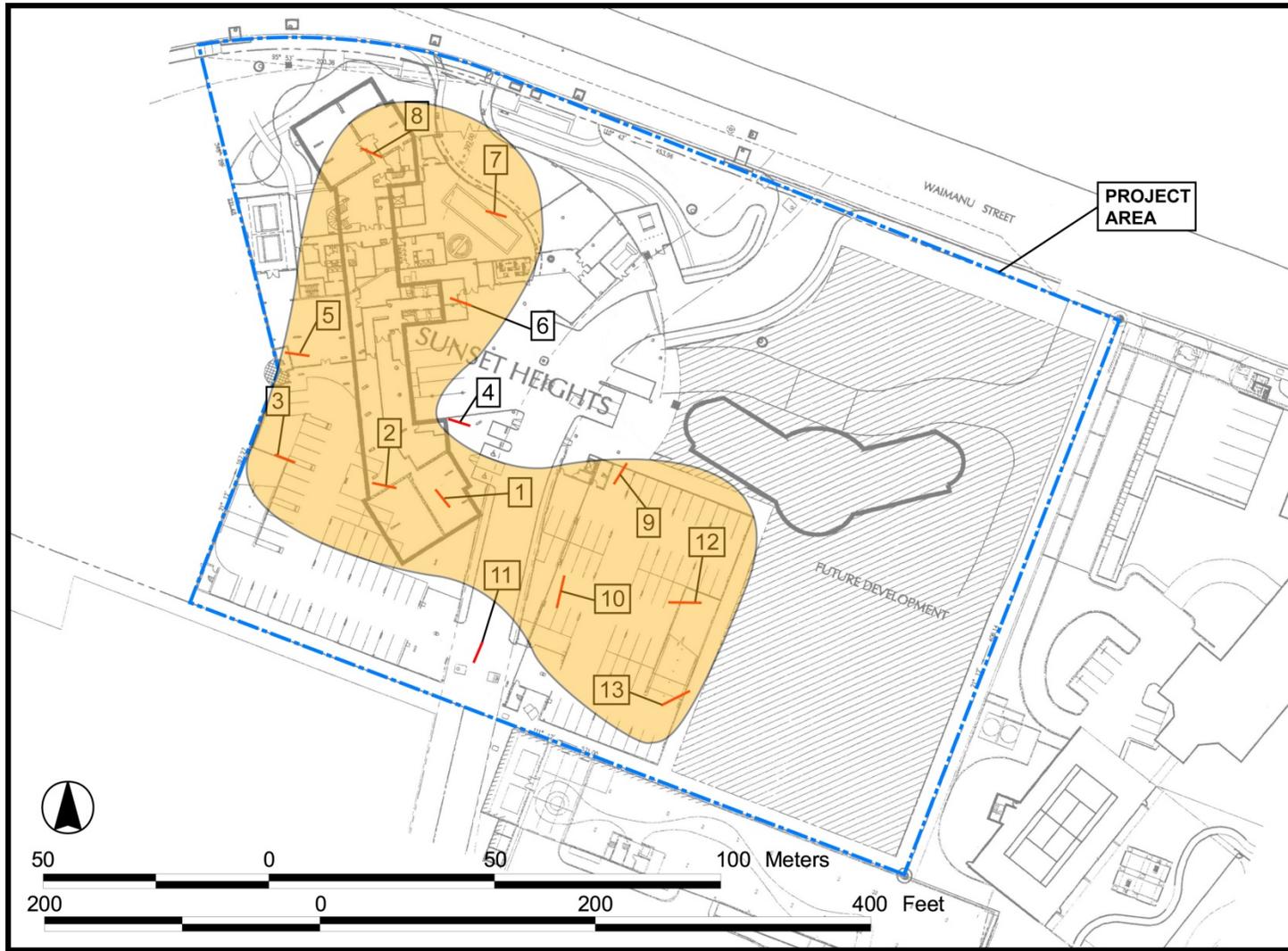


Figure 221. O’Hare et al. (2004:57) study area map showing the location of Trenches 1-13

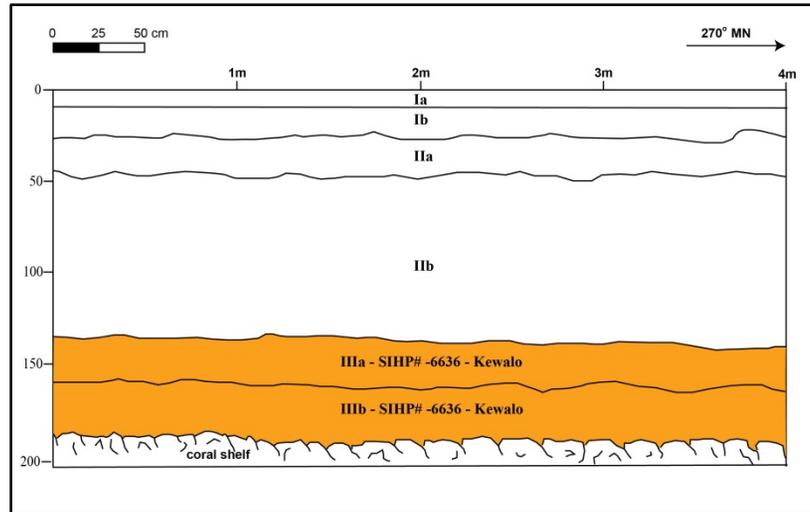


Figure 222. Trench 5 profile showing Kewalo wetland (SIHP # -6636), Strata IIIa and IIIb (O’Hare et al. 2004:64)

Table 37. Trench 5 Stratigraphic Description (adapted from O’Hare et al. 2004)

Stratum	Depth (cmbs)	Description
Ia	0-8	10YR 2/1 black; abrupt and smooth lower boundary
Ib	8-35	10YR 3/4 very dark grey gravel fill; abrupt and wavy lower boundary; gravel fill as base course for overlying asphalt
IIa	35-45	10YR 6/3 to 10YR 8/1 pale brown to very pale brown medium to coarse sand; coarse or thick structure; loose consistency; non-plastic; no cementation; abrupt and wavy lower boundary
IIb	45-135	10YR 7/3 to 7/4 very pale brown fine to medium sand; structureless, loose consistency; non-plastic; no cementation; abrupt and wavy lower boundary
IIIa	135-160/163	10Y 6/1 greenish gray silty clay; weak, fine structure; loose consistency; slightly plastic; no cementation; abrupt and smooth lower boundary; Kewalo wetlands; component of SIHP # -6636
IIIb	160/163	10Y 5/1 greenish gray fine silty clay; fine, structure; loose consistency; slightly plastic; no cementation; Kewalo wetlands; component of SIHP # -6636

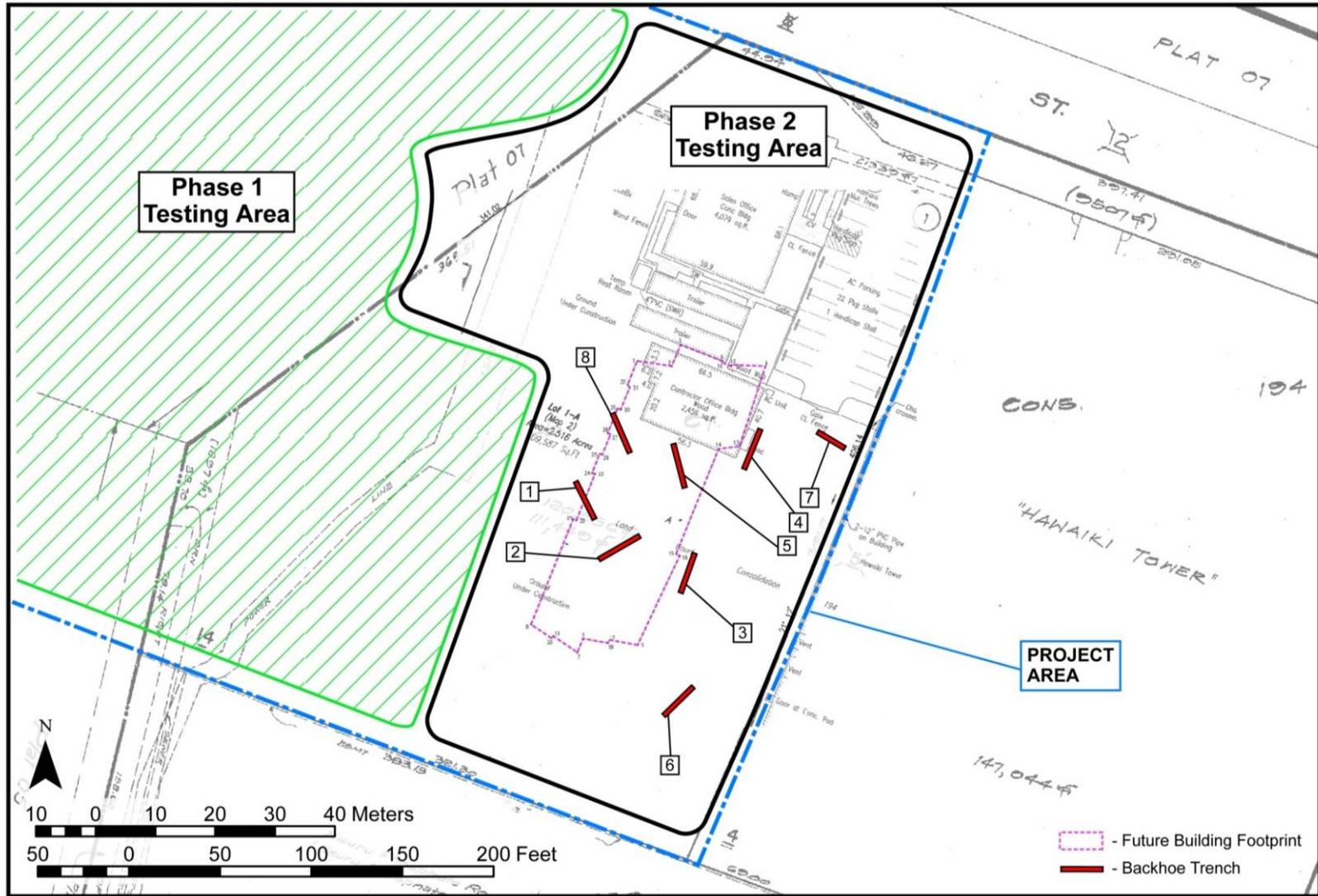


Figure 223. Tulchin and Hammatt (2005:10) study area map showing the location of Trenches 1-8, see Figure 218 for location of Tulchin and Hammatt (2005) study area

century land filling operations. In the 1920s and 1930s, the original wetland surface of the Kewalo area (i.e. Site-6636) was completely covered with fill material for the expanding urbanization of Honolulu.

Tulchin and Hammatt (2005) designated Kewalo wetland sediments as Stratum II (Figure 224, Figure 225, and Table 38). Kewalo wetland sediments were described as “gray sandy clay to clay sediments” to “dark gray loam, containing abundant organic material and land snail shells” underlying fill sediments (Tulchin and Hammatt 2005:27). No cultural material was observed in Stratum II. The base of the Stratum II sediments was the coral shelf at approximately 2.5 meters below the current ground surface.

Clark and Grosser (2005) identified SIHP #-6636 as the subsurface remnant of a small pond within 37 of 45 backhoe trenches (TR-1-12, 15-19, 21-25, 27-29, 31-34, 36-42, and 44) during an archaeological inventory survey of TMK: (1) 2-3-003:075, 085, and 086 (Figure 226). Clark and Grosser (2005:47) described SIHP #-6636 as follows:

This unnamed pond is represented by gleyed deposits of Layer II Pond Facies...Layer II Pond Facies is the uppermost intact stratigraphic layer found in the northern portion of the parcel, and is a very dark brown to black organic deposit similar to peat. Ranging from 1.0 to 15.0 cm thick, Layer II Pond Facies was found at or below the water table, and is discontinuous probably due to disturbance during deposition of historic fill layers.

It is not certain whether this pond was a fishpond or a salt pond used for salt manufacture. Abundant fresh water snail remains, identified as *Melanoides tuberculata*, were found among the organic materials within Layer II Pond Facies, indicating a freshwater environment. However, a freshwater environment may reflect post-use changes.

Clark and Grosser (2005) designated SIHP #-6636 as “Layer II Pond Facies” (Figure 227 and Table 39). Radiocarbon analysis of the pond sediment yielded calibrated (two sigma) date ranges of AD 1530 to 1560, AD 1630 to 1690, AD 1730 to 1810, and AD 1920 to 1950, suggesting that the pond sediment had begun accumulating as early as AD 1530 to 1560 (Clark and Grosser 2005:34). The pond sediment was found beneath thick historic and modern fill layers.

Hammatt (2008) identified Kewalo wetland sediments during archaeological monitoring for the Ko‘olani Condominium Project; the parcel was subject to a previous archaeological inventory survey (O’Hare et al. 2004). Although the distribution of SIHP # -6636 within the study area was not recorded during monitoring, the wetland sediments were described as being composed of sandy clay found generally between 1.0 mbs to 1.86 mbs and designated Stratum III. Hammatt (2008:37) described Kewalo wetland sediments as:

Stratum III represents the original ground surface before the Kewalo area was filled with marine and other sediments in the early part of the 20th century. It was divided into two sub-strata. It contained a limited amount and variety of charcoal flecking and marine invertebrates.

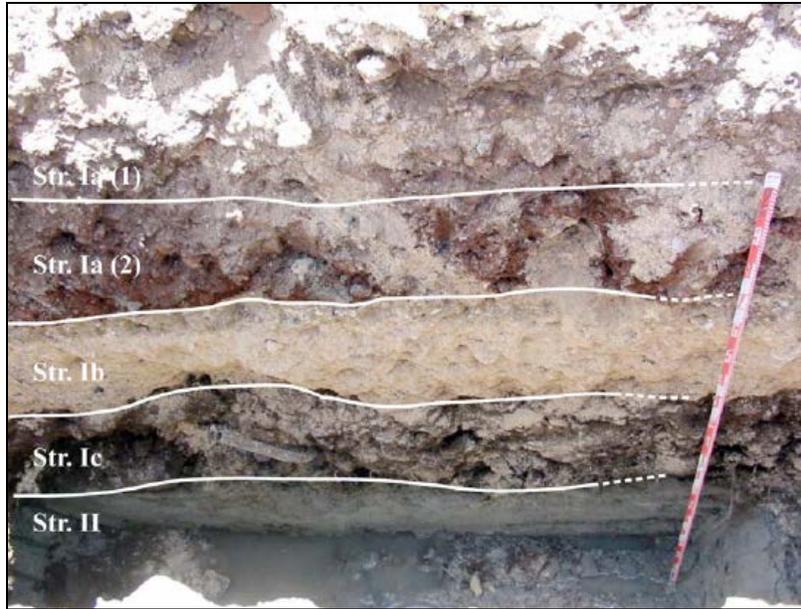


Figure 224. Trench 3 west sidewall, view to west (adapted from Tulchin and Hammatt 2005:16)

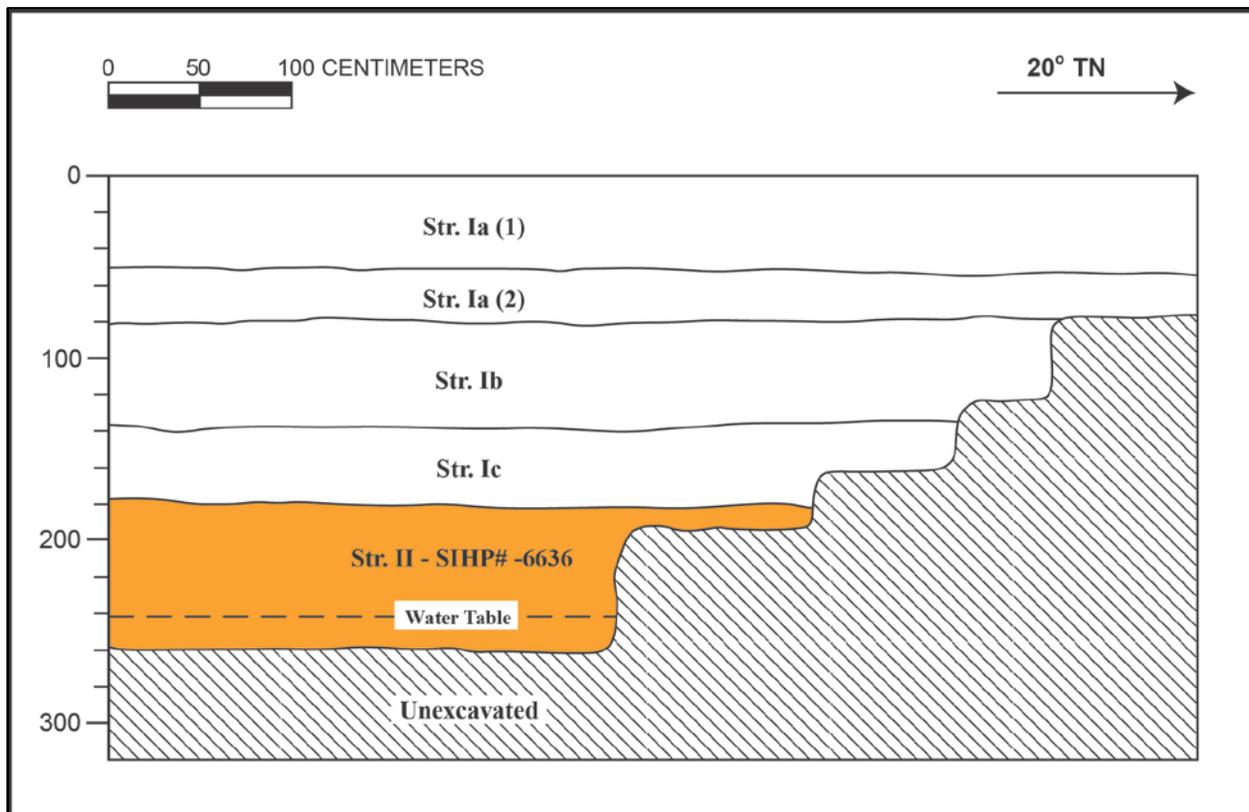


Figure 225. Trench 3 west wall profile, showing Kewalo wetland (SIHP # -6636), Stratum II (adapted from Tulchin and Hammatt 2005:16)

Table 38. Trench 3 Stratigraphic Description (adapted from Tulchin and Hammatt 2005)

Stratum	Depth (cmbs)	Description
Ia(1)	0-50	Fill; 10YR 5/3 (brown) sandy loam; weak, fine, single grain structure; dry, loose consistency; non-plastic; no cementation; terrestrial origin; Lower Boundary (LB) is abrupt, smooth.
Ia(2)	50-80	Fill; 7.5YR 4/4 (brown) sandy loam; weak, fine, single grain structure; dry, loose consistency; non-plastic; no cementation; terrestrial origin; includes 50% gravel; LB is abrupt, smooth.
Ib	80-140	Fill; 10YR 7/3 (very pale brown) crushed coral gravel; moderate, medium crumb structure; dry, hard consistency; non-plastic; weak cementation; mixed origin; LB is abrupt, smooth.
IC	140-180	Fill; 10YR 2/1 (black) sandy loam; weak, fine, single grain structure; dry, slightly hard consistency; non-plastic; weak cementation; terrestrial origin; includes 60% historic garbage (glass, wood, metal fragments); LB is abrupt, smooth
II	180-BOE	10YR 6/1 (gray) sandy clay; weak, fine, blocky structure; moist, friable consistency; slightly plastic; no cementation; mixed origin; LB is at coral shelf; Kewalo wetland; designated a component of SIHP # - 6636

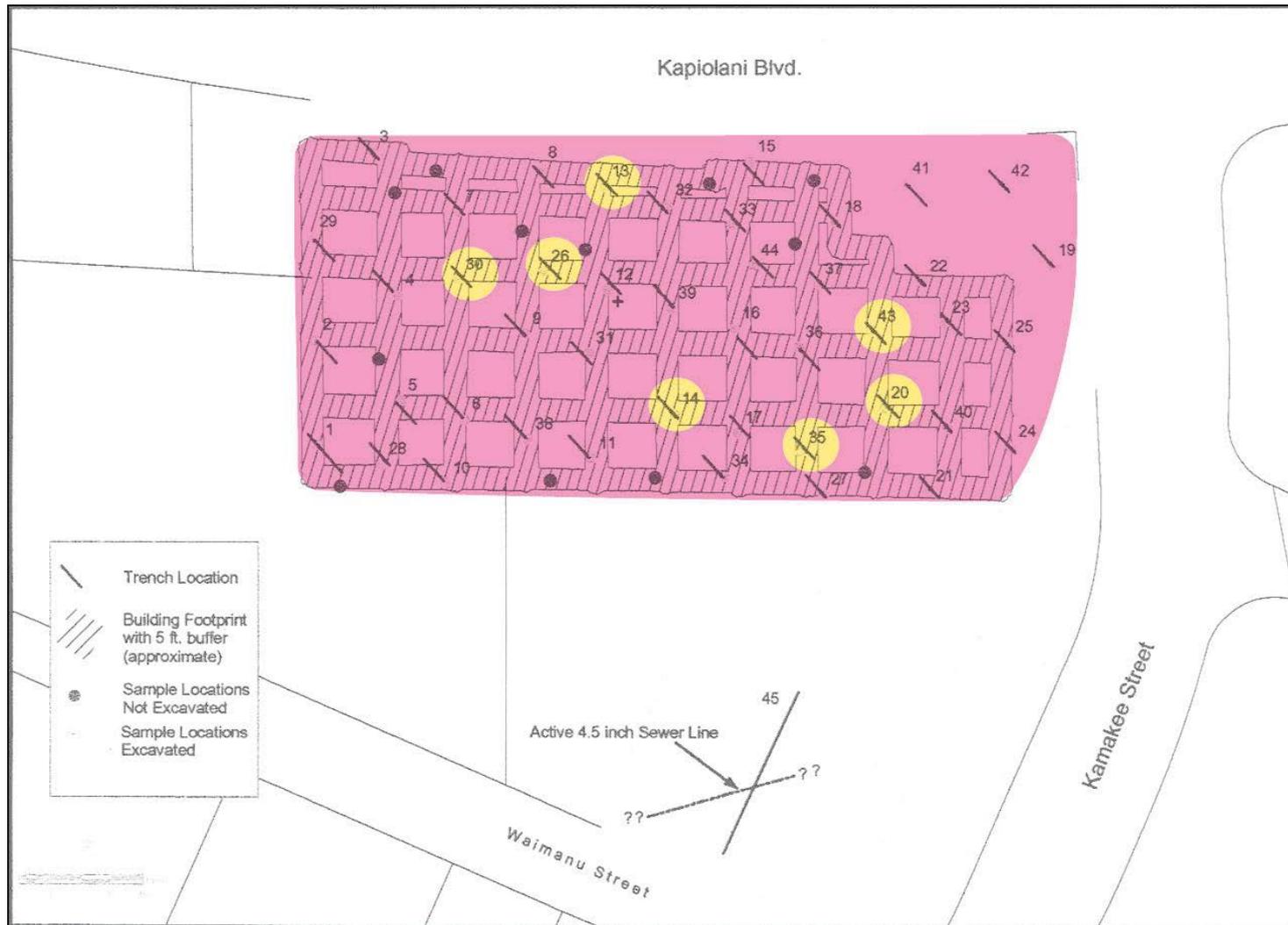


Figure 226. Clark and Gosser (2005:20) study area map showing the location of Trenches 1-45 and distribution of SIHP # -6636 throughout excavated area in all but seven trenches (13, 14, 20, 26, 30, 35, and 43) (yellow), see Figure 218 for locations of Clark and Gosser (2005) project area

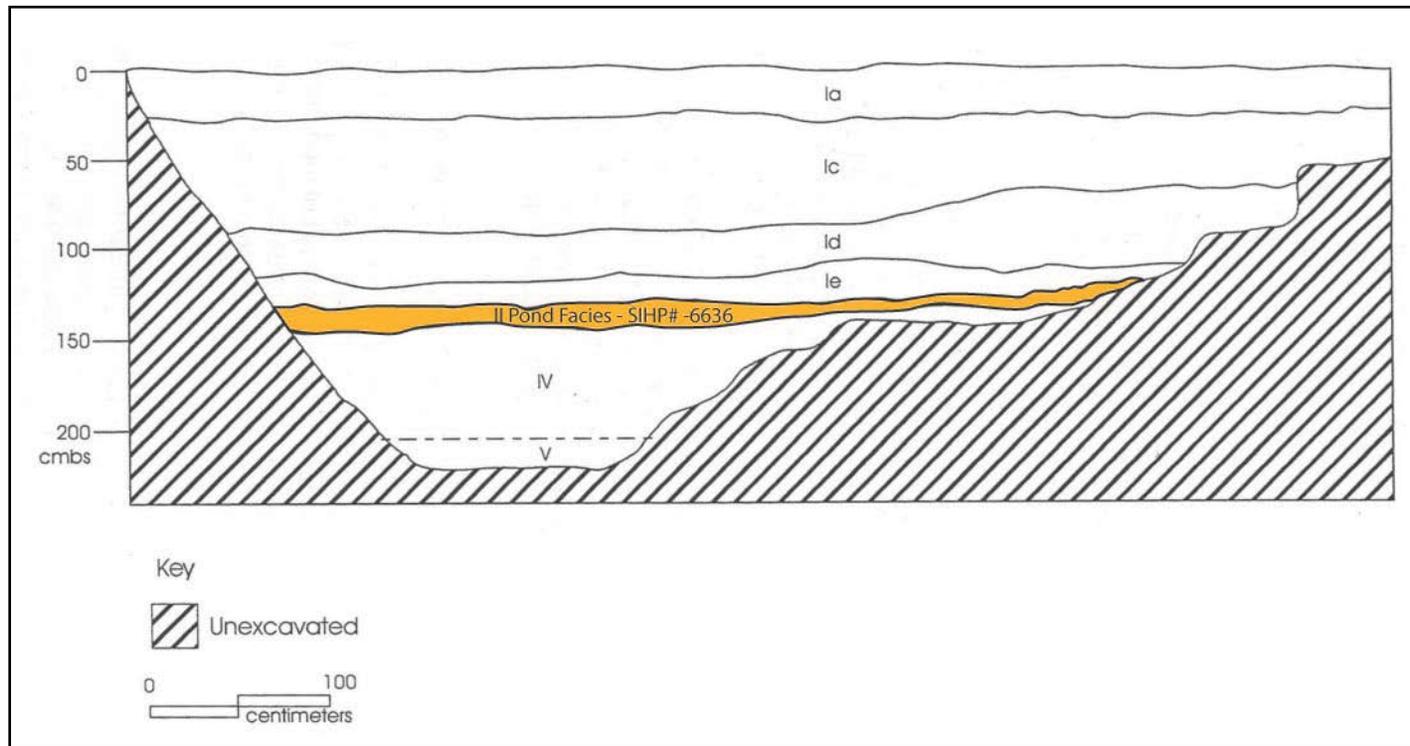


Figure 227. TR-3 west profile showing Kewalo wetland pond sediments (SIHP # -6636), Stratum II (adapted from Clark and Gosser 2005:41)

Table 39. TR-5 Stratigraphic Description (adapted from Clark and Grosser 2005)

Stratum	Thickness Range (cm)	Description
Ia	10.0 – 225.0	Brown to yellowish brown (10YR 5/4, moist) sandy loam; hard, firm, slightly sticky, slightly plastic; contains recent items and construction debris.
Ic	35.0 – 130.0	Very pale brown (10YR 8/2) to light gray (10YR 7/1, moist) coral fill of cobbles, pebbles, gravel and sands; hard, firm, non-sticky, non-plastic; contains recent items and construction debris.
Id	5.0 – 50.0	Yellow (10YR 7/4, moist) fine to very fine coral sand; loose, non-sticky, non-plastic; no cultural materials observed.
Ie	12.0 – 70.0	Alternating micro-layers of clay, silty clay and sandy clay; greenish gray (10GY 6/1, wet) grading into pale yellow (2.5YR 7/3, wet); hard, firm, sticky, plastic; no cultural materials observed.
II Pond Facies	1.0 – 15.0	Very dark brown (10YR 2/2, wet) to black (10YR 2/1, wet) organic deposit in a sandy silt matrix; firm, non-sticky, non-plastic; contains concentrated organic materials and fresh-water mollusks; Kewalo wetland; designated a component of SIHP # -6636
III	30.0 – 50.0	Very pale brown (10YR 8/2) to pale yellow (2.5Y 8/2, moist) very fine to medium coral sand with less than 5% coral gravel and marine shell fragments; loose, non-sticky, non-plastic; no cultural materials observed.
IV	2.0 + - 65.0	Dark greenish gray (10GY 4/1, wet) fine to very fine sandy silt; firm, non-sticky, non-plastic; no cultural materials observed.
V	5.0+ - 10.0+	Conglomerate of coral, coralline algae, and marine shell fragments in a matrix of greenish gray (5GY 6/1, wet) fine to coarse coral sand; no cultural materials observed.

Altizer et al. (2011) identified Kewalo wetland sediments within Sewer Line G during archaeological monitoring for the Kapi'olani Area Revised Sewer System project (Figure 228). These sediments were identified as ranging in depth from 1.8 mbs to 2.2 mbs. Altizer et al. (2011:69) described SIHP #-6636 within Sewer Line G as follows:

The stratigraphic sequence of Line G at STA 3+25, where SIHP #50-80-14-6636 was encountered, is consistent with the 1884 Bishop Waikiki Survey Map (RM # 1090) and the 1897 Monsarrat map (RM #1910), which show a pond present in the vicinity of the current project area. The pond is not named on either map, but is present within former rice fields. The sediments encountered during monitoring activities associated with Sewer Line G are described as black clay loam, which is not typical of pond sediments on Oahu, but does correspond with wetland deposits. The abundance of land snails, also documented in Sewer Line G, are indicative of wetland deposits as well.

They designated SIHP #-6636 as Strata IIa and IIb (Figure 229, Figure 230, and Table 40). These sediments were described as being "black clay loam" and "very dark gray silt loam" underlying thick historic and modern fill layers (Altizer et al. 2011:48).

Runyon et al. (2011) identified Kewalo wetland sediments below fill deposits within three of 29 test excavations (Trenches 6, 14, and 27) dug during an archaeological inventory survey for the Ko'olani phase II project (Figure 231). They described SIHP #-6636 as follows:

SIHP #50-80-14-6636 consists of portions of the former wetland surface of the Kewalo area, originally identified by O'Hare et al. (2003) and also identified within the Phase 1 portion of the Ko'olani Condominium project (O'Hare et al. 2004) and associated Addendum Inventory Survey (Tulchin and Hammatt 2005). The characteristics that define SIHP #-6636 would have extended beyond the designated site boundaries before modern fill events took place. Cultural modifications to the site likely included but were not limited to channelized ditches, ponds, *lo'i*, berms, and habitation areas as shown on historic maps. The cultural modifications impacted the wetland sediments as evidenced by the frequent charcoal flecking found within the sediment.

The existence of this site is known only within tested areas. It is likely that wetland sediments very similar to those encountered during this project, exist under fill deposits throughout the greater Kewalo Kaka'ako region (as indicated in O'Hare et al. 2003).

The site consists of dark grayish brown and very dark brown clay loam sediments with a high organic (peaty) content, abundant land snail shells and charcoal flecking. The wetland sediment overlies marine sediments and the coral shelf. SIHP #-6636 was observed in three of the test trenches (Trenches 6, 14 and 27) during the current inventory survey investigation. SIHP #-6636 was observed from 1.3 to 2.4 m below the current ground surface.

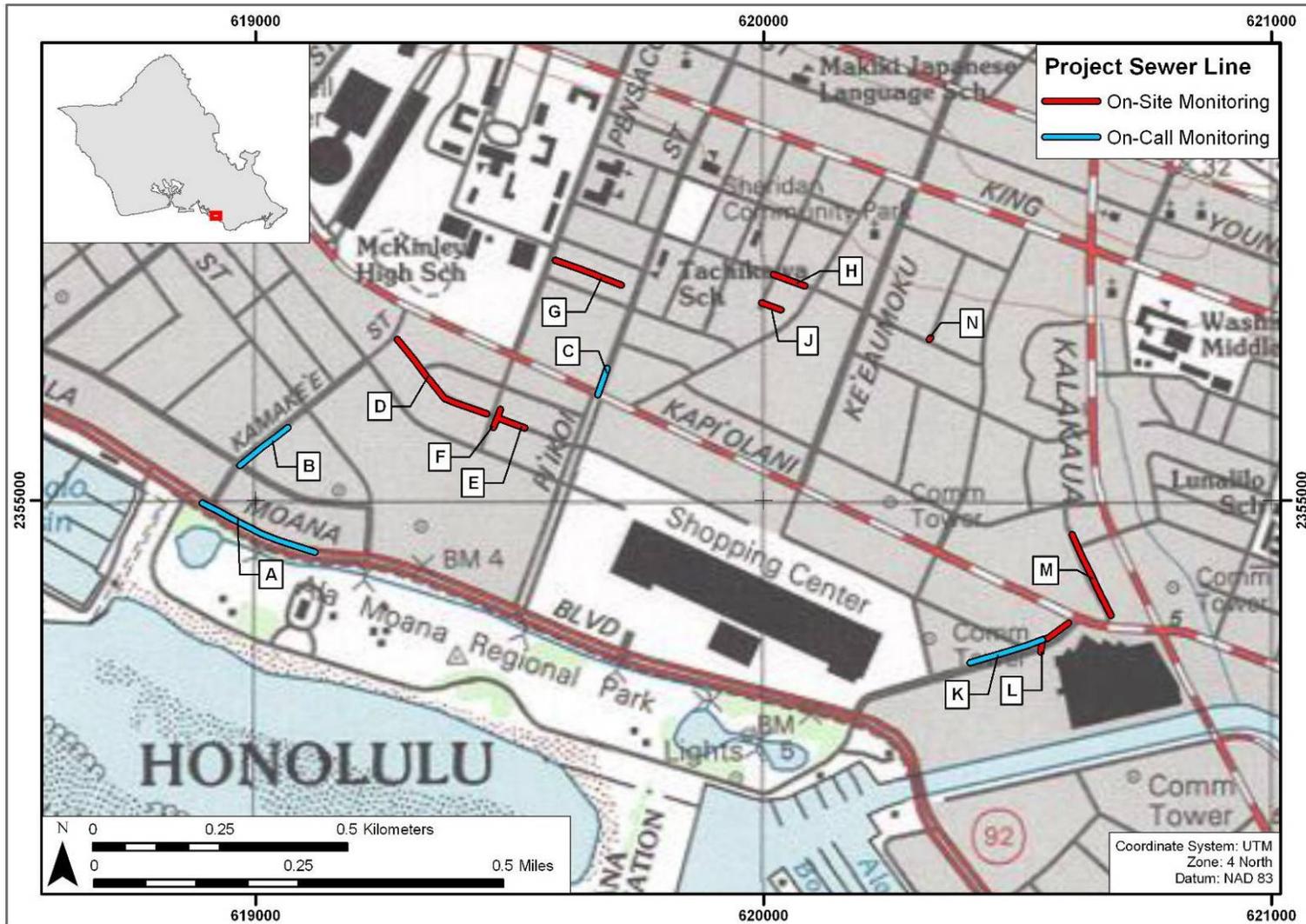


Figure 228. Altizer et al. (2011:44) Sewer Line G monitored trench locations shown on a portion of the 1998 U.S. Geological Survey topographic map, Honolulu quadrangle



Figure 229. Sewer line G, view to southwest (Altizer et al. 2011:50)

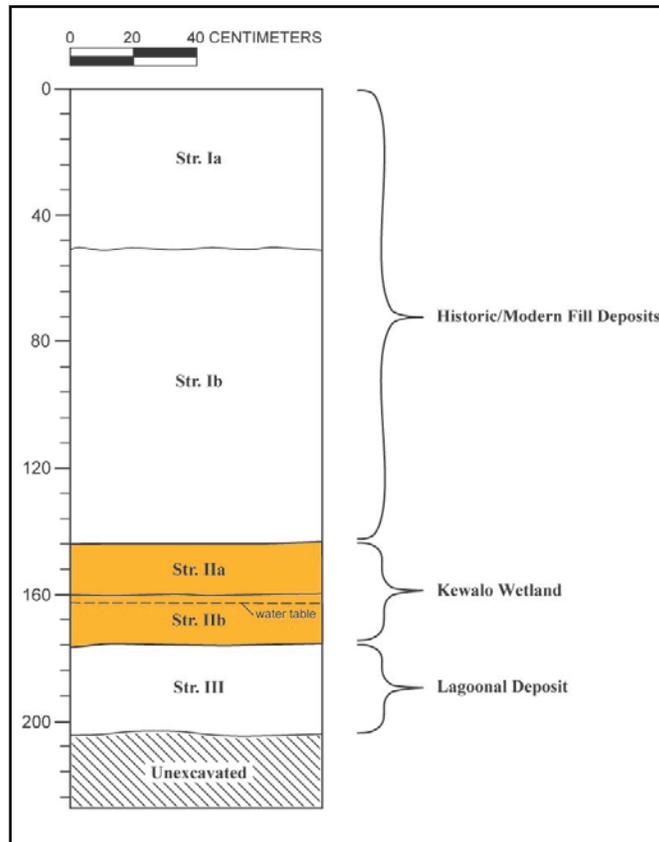


Figure 230. Sewer line G profile, south wall, showing Kewalo wetland (SIHP # -6636), Strata IIa and IIb (adapted from Altizer et al. 2011:49)

Table 40. Sewer line G Stratigraphic Description (adapted from Altizer et al. 2011)

Stratum	Depth (cmbs)	Description
Ia	0-65	7.5YR 3/2, dark brown; clay loam; moderate, fine, granular structure; moist friable to wet non-sticky consistency; plastic; weak cementation; terrestrial in origin; very abrupt boundary; smooth topography. Fill layer with modern trash including plastic and metal.
Ib	65-180	7.5YR 3/4 dark brown; clay; moderate, fine granular structure; moist firm to wet sticky consistency; plastic; strong cementation; terrestrial in origin; abrupt boundary; smooth topography. Fill material
IIa	180-200	7.5YR 3/1, very dark gray; silt loam; weak, medium, granular structure; moist, very friable to wet, non-sticky consistency; non-plastic; weak cementation; terrestrial in origin; abrupt boundary; smooth topography. Former wetland or marsh with a lot of land snail shells; Kewalo wetland; designated a component of SIHP # -6636
IIb	200-220	7.5YR 2/0, black; clay loam; moderate, fine, granular structure; moist very friable consistency; slightly plastic; weak cementation; terrestrial in origin; diffuse boundary; smooth topography. Former wetland or marsh; water table encountered at 210 cmbs; Kewalo wetland; designated a component of SIHP # -6636
III	220-255 BOE	Gley 5/N, greenish-gray, fine clay; single grain structure; moist very friable to wet non-sticky consistency; non-plastic; weak cementation; Natural lagoonal sediment with coral pebble inclusions.

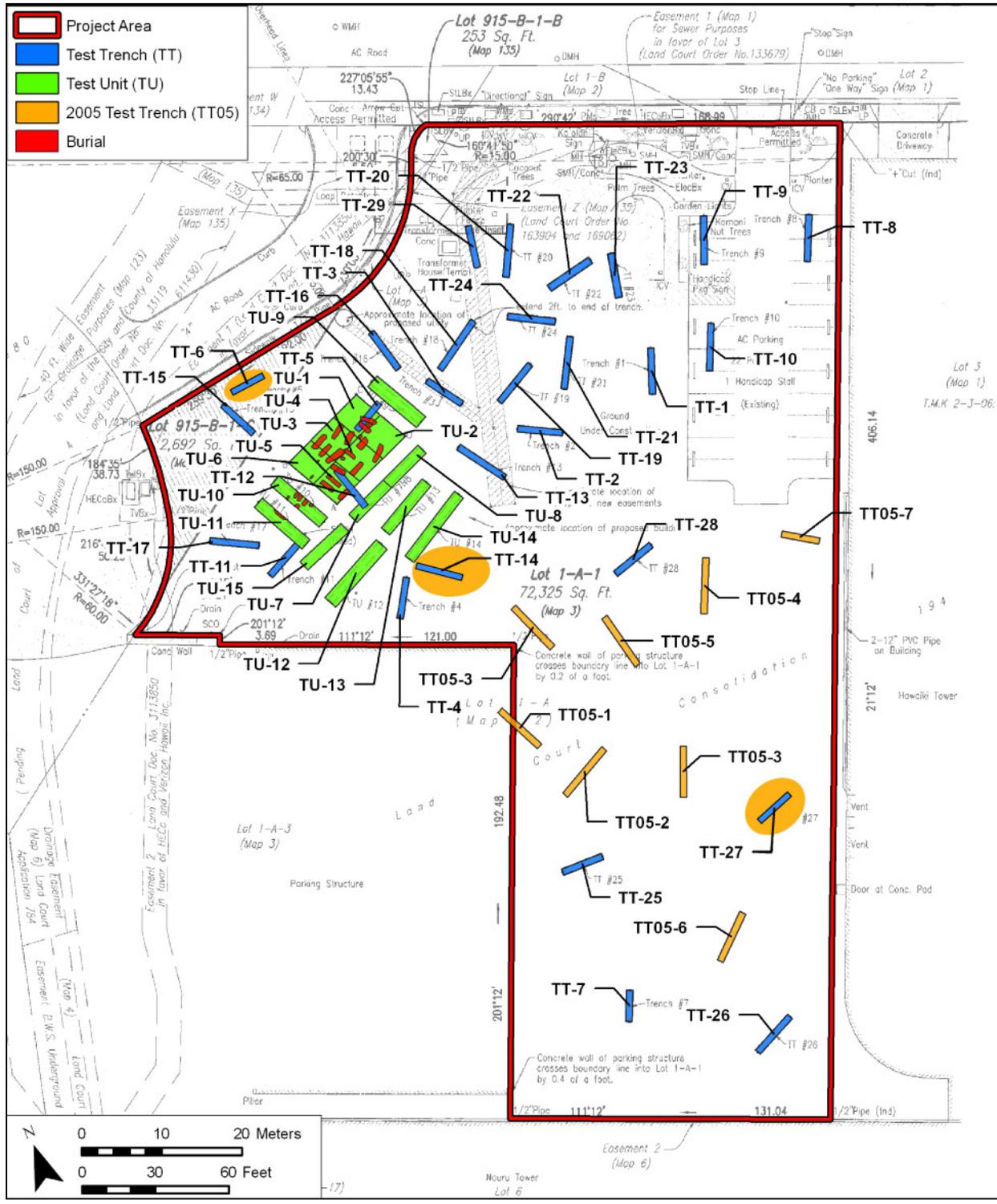


Figure 231. Runyon et al. (2011:107) study area showing excavation locations including Trenches 6, 14, and 27 which exposed Kewalo wetland (SIHP # -6636) in strata below thick fill deposits; see Figure 218 for locations of Runyon et al. (2011) study area

The entire extent of SIHP #-6636 is unclear, as the layer is discontinuous, primarily due to twentieth century land filling operations. In the 1920s and 1930s, the original wetland surface of the Kewalo area was completely covered with fill material for the expanding urbanization of Honolulu. (Runyon et al. 2011:262-264)

Runyon et al. (2011) designated Kewalo wetland sediments below fill deposits as Stratum II in Trenches 6 and 27, and Stratum IV in Trench 14 (Figure 232, Figure 233, and Table 41).

Runyon et al. (2012) identified Kewalo wetland sediments within all 13 test excavations (Trenches 1-13) dug during an archaeological inventory survey for the Senior Residence at Pi'ikoi (Figure 234). They designated Kewalo wetland sediments as Stratum IIa, IIb, and IIc (Figure 235, Figure 236, and Table 42). These sediments ranged from 1.6 mbs to 2.5 mbs. Runyon et al. (2012:146) described SIHP #-6636 as follows:

SIHP #50-80-14-6636 consists of portions of the former wetland surface of the Kewalo area, originally identified during a study by O'Hare et al. (2003) and also identified within the Phase I and Phase II portions of the Ko'olani Condominium project (O'Hare et al. 2004, Tulchin and Hammatt 2005, and Runyon et al. 2011). The site boundary within the current project area is known only within tested portions of the project area. However, based on the distribution of SIHP #-6636 in the vicinity of the project area, this portion of SIHP #-6636 is likely discontinuous with wetland deposits documented both *mauka* (O'Hare et al. 2003) and *makai* (O'Hare et al. 2004, Tulchin and Hammatt 2005, and Runyon et al. 2011) of the project.

Within the current project area, SIHP #50-80-14-6636 was found beneath thick layers of various fill materials (hydraulic fill or pump dredge and crushed coral) that were imported during early twentieth century Land Reclamation fill events. In general, the natural wetland contained two distinct strata. The upper stratum of SIHP #-6636 consisted of a silty clay loam containing abundant decomposing organic materials (peat), snail shells, rootlets and charcoal flecking representing an intact buried A-Horizon. The lower strata of SIHP #-6636 consisted of gleyed sandy clay wetland sediment containing rootlets and small snail shells. The buried wetland sediments (SIHP #-6636) were observed within all excavated trenches and were found directly overlying the coral shelf.

The stratigraphy observed during this study is similar to studies in the near vicinity which have documented SIHP #-6636.



Figure 232. Trench 6 northwest sidewall, showing Kewalo wetland (SIHP # -6636), Stratum II below thick fill deposits, view to northwest (adapted from Runyon et al. 2011:128)

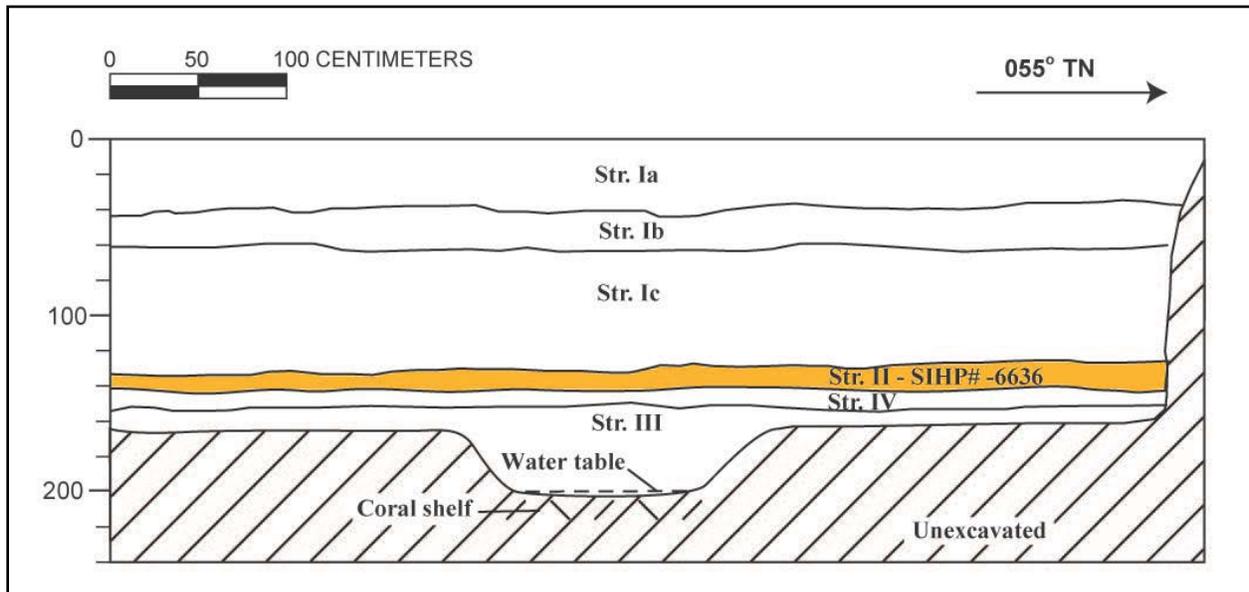


Figure 233. Trench 6 northwest profile showing Kewalo wetland (SIHP # -6636), Stratum II (adapted from Runyon et al. 2011:128)

Table 41. Trench 6 Stratigraphic Description (adapted Runyon et al. 2011)

Stratum	Depth (cmbs)	Description
Ia	0-40	Fill Layer; 10YR 4/3 brown; silt loam; structureless; dry loose consistency; non-plastic; no cementation; mixed origin; abrupt smooth lower boundary
Ib	40-60	Fill Layer; Gley 2 7/5BG light greenish gray; concrete; structureless; dry extremely hard consistency; non-plastic; strong cementation; terrestrial origin; abrupt smooth lower boundary
Ic	60-130	Fill Layer; 10YR 8/3 very pale brown; crushed coral; structureless; moist loose consistency; non-plastic; no cementation; marine origin; abrupt smooth lower boundary
II	130-140	Wetland Sediment; 10YR 4/2 dark grayish brown; peaty clay loam; moderate medium crumb structure; moist friable consistency; slightly plastic; no cementation; mixed origin; abrupt smooth lower boundary; peaty sediment, contains decomposing plant material and land snail shells; Kewalo wetland; designated a component of SIHP # -6636
III	140-153	Jaucas sand; 10YR 8/3 very pale brown; sand; weak fine single grain structure; moist loose consistency; non-plastic; no cementation; marine origin; abrupt smooth lower boundary
IV	150-200	Marine Sediment; Gley 2 6/5B bluish gray; clay; moderate medium blocky structure; moist friable consistency; very plastic; no cementation; marine origin; marine clay over coral shelf

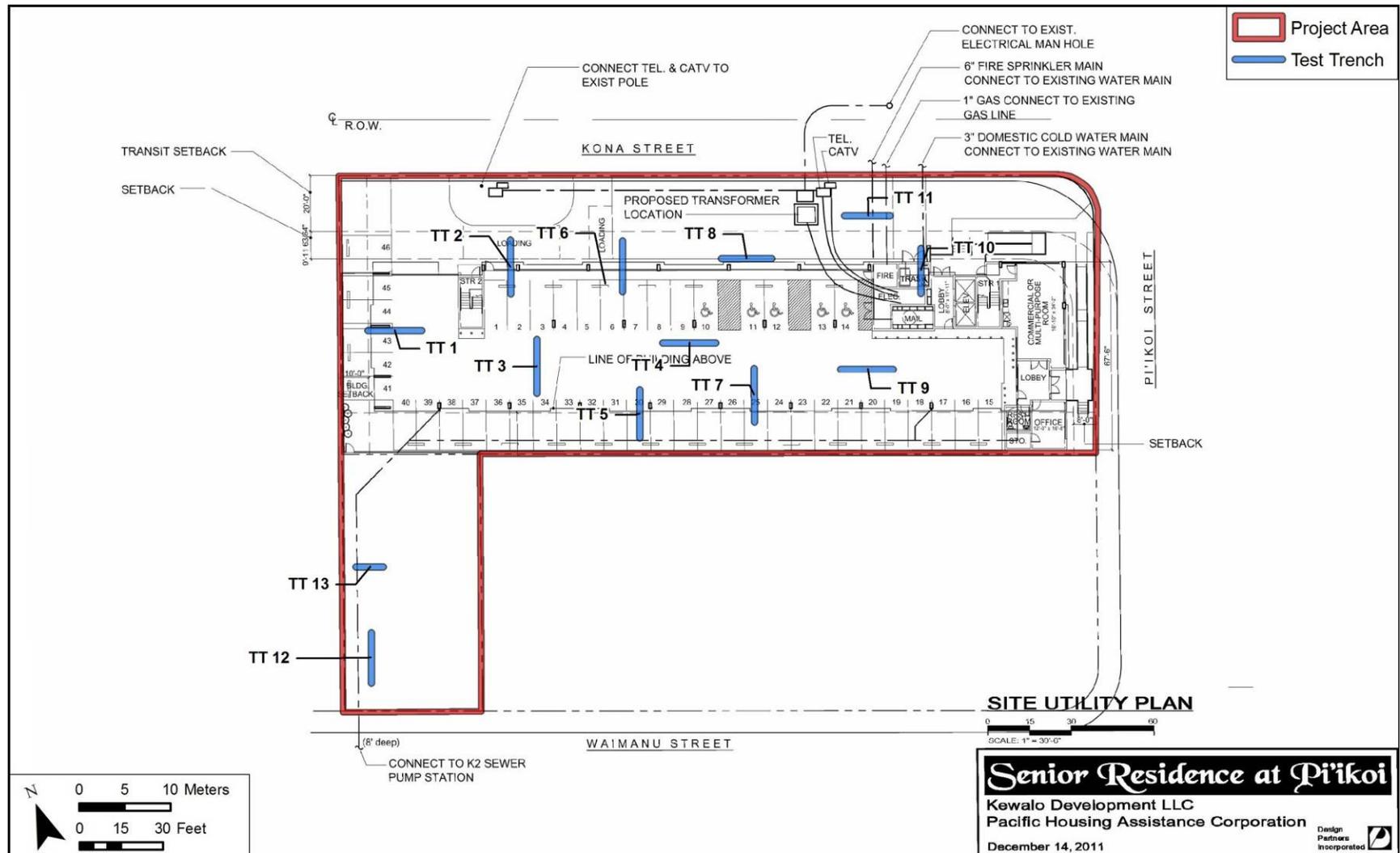


Figure 234. Runyon et al. (2012:113) study area showing locations of Trenches 1-13, all of which exposed Kewalo wetland (SIHP # - 6636) sediments; see Figure 218 for location of Runyon et al. (2012) study area

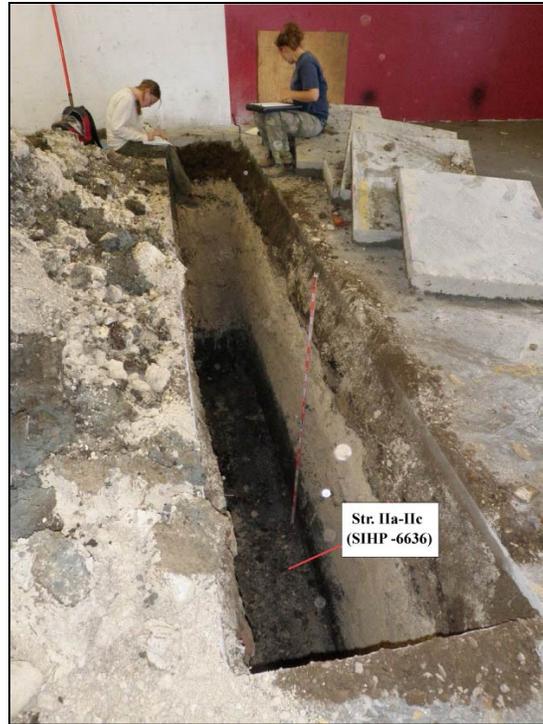


Figure 235. Trench 8, northeast wall, showing Kewalo wetland (SIHP # -6636), Strata IIa-IIc, view to west (adapted from Runyon et al. 2012:132)

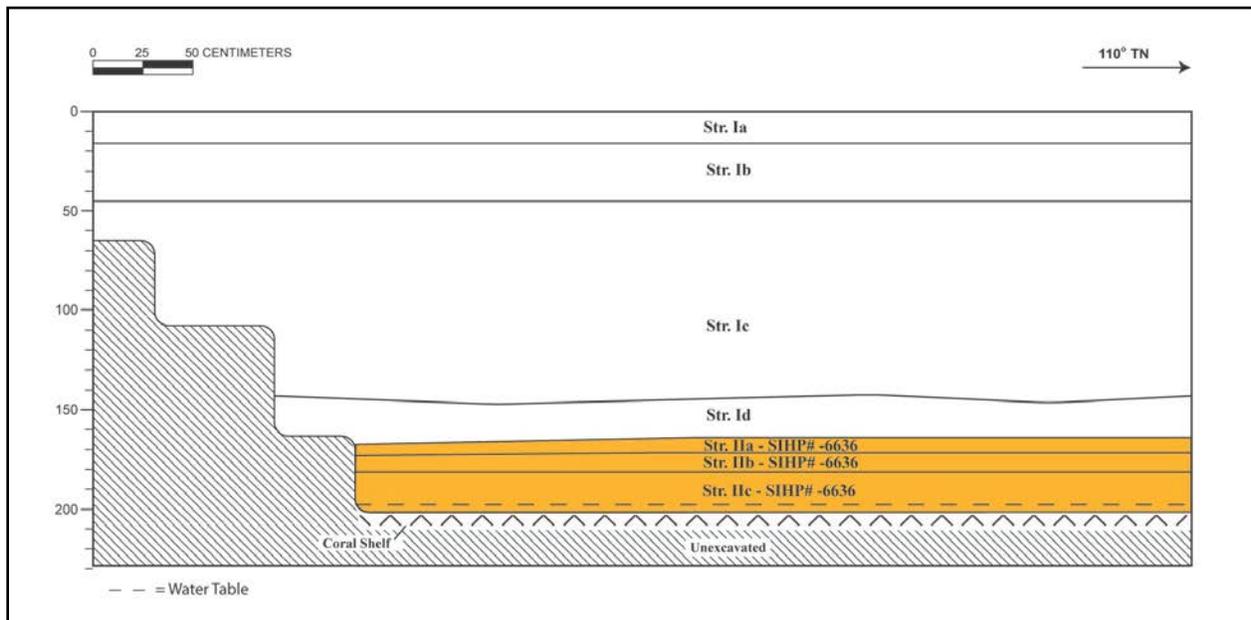


Figure 236. Trench 8 profile showing Kewalo wetland (SIHP # -6636), Strata IIa-IIc (adapted from Runyon et al. 2012:132)

Table 42. Trench 8 Stratigraphic Description (adapted from Runyon et al. 2012)

Stratum	Depth (cmbs)	Sediment Description
Ia	0-15	Concrete Surface.
Ib	15-45	Fill; 10YR 4/3 (brown); gravelly sandy clay; structureless, fill; dry, loose consistency; non-plastic; mixed sediment; clear, smooth lower boundary; base course fill material.
Ic	45-145	Fill; 10YR 6/2 (light brownish gray); crushed coral; structureless, fill; dry, loose consistency; non-plastic; marine sediment; clear, smooth lower boundary; coral fill.
Id	145-165	Fill; 10YR 4/2 (light gray); silty clay; structureless, massive; wet, very sticky; plastic; marine sediment; diffuse, smooth lower boundary; hydraulic fill (pump dredge) material.
IIa	165-170	Natural; 10 YR 2/2 (very dark brown); silty clay loam; weak, medium, crumb structure; moist, very friable consistency; slightly plastic; terrigenous; clear, smooth lower boundary; many very fine to fine rootlets; natural organically-enriched A-Horizon containing thick peat, very small snails, rootlets and charcoal flecking; Kewalo wetland sediment; designated a component of SIHP # -6636.
IIb	170-185	Natural; Gley 1 4/5GY (dark greenish gray); sandy clay; weak, fine, granular structure; wet, sticky consistency; plastic; marine sediment; diffuse, smooth lower boundary; common, fine rootlets; contains snail shell; Kewalo wetland sediment; designated a component of SIHP # -6636.
IIc	185-200	Natural; 10YR 3/1 (very dark gray); silty clay loam; moderate, medium, crumb structure; moist, friable consistency; plastic; terrigenous sediment; many, fine rootlets; contains very small snails; Kewalo wetland sediment; designated a component of SIHP # -6636.

Morriss et al. (2013) identified Kewalo wetland sediments within 22 of 26 backhoe test excavations (Trenches 1-20, 23, and 26) dug during the archaeological inventory survey for the Ala Moana Center (AMC) 'Ewa Mall Expansion project (Figure 237). They described SIHP #-6636 as follows:

The wetland sediments observed within the current project area consist primarily of greenish-gray sandy clays containing decomposing organics, charcoal, and snail shells. These sediments were documented at depths ranging from 99 to 190 cm below the surface (cmbs), with an average upper boundary of 141 cmbs. Peat was observed as distinct layers, usually directly above the sandy clays, and as inclusions within the sandy clays. No cultural materials were observed within the wetland surface, except where this surface was disturbed in historic times. Microscopic charcoal fragments were identified in the wetland samples examined for pollen. The presence of charcoal in these deposits corresponds with the region being inhabited throughout the prehistoric/historic period, and utilized for agriculture, aquaculture, and salt production. (Morriss et al. 2013:168-170)

The Kewalo wetlands sediments were designated as Stratum II (Figure 238, Figure 239, and Table 43). Pollen and phytolith analysis showed that the wetland sediments within the AMC project area were indicative of a sedge marshland. The margins of the marsh were dominated by grasses, sedges, and *kolea* trees. A variety of sea grass known as, *Ruppia maritima*, grew within the marsh. Local vegetation in the vicinity included native 'ahea, *kolokolo*, *ahakea lau li'i* or 'akupa, coconut, *loulou* palm, 'a'ali'i, legumes, kadua, *aulu*, 'ihi, as well as grasses and ferns. This wetland environment was modified at some point during the nineteenth- or twentieth-century based on the presence of alien (introduced) *kiawe* pollen and the lack of sedge and non-wind dispersed pollen. This may have been related to making the region viable for agriculture, aquaculture, salt pan operations, and/or due to land reclamation efforts (Morriss et al. 2013).

During the current City Center archaeological inventory survey, a buried land surface comprised of wetland sediments was identified in 27 test excavations within the East Kaka'ako and Kālia Geographic Zones (T-186 through T-193, T-195, T-196, T-198 through T-200, T-202, T-202A, T-203, T-205, T-207 through T-212, T-214, T-219, T-220, and T-221). The depositional sequence in these 27 test excavations was similar. In general, the wetland sediments were documented as variations of brown and gray silty clays, sandy clays, clay loams, and black silt loam peat layers at or near the water table. The wetland sediments ranged from 0.78 mbs to 2.38 mbs, were developed over natural marine lagoonal deposits and/or the coral shelf, and were capped by historic and/or modern fill deposits. The wetland sediments generally contained organic material, freshwater snail shells and/or marine shells. The profile recorded for T-186 is representative of this local stratigraphic sequence (Figure 240, Figure 241, and Table 44).

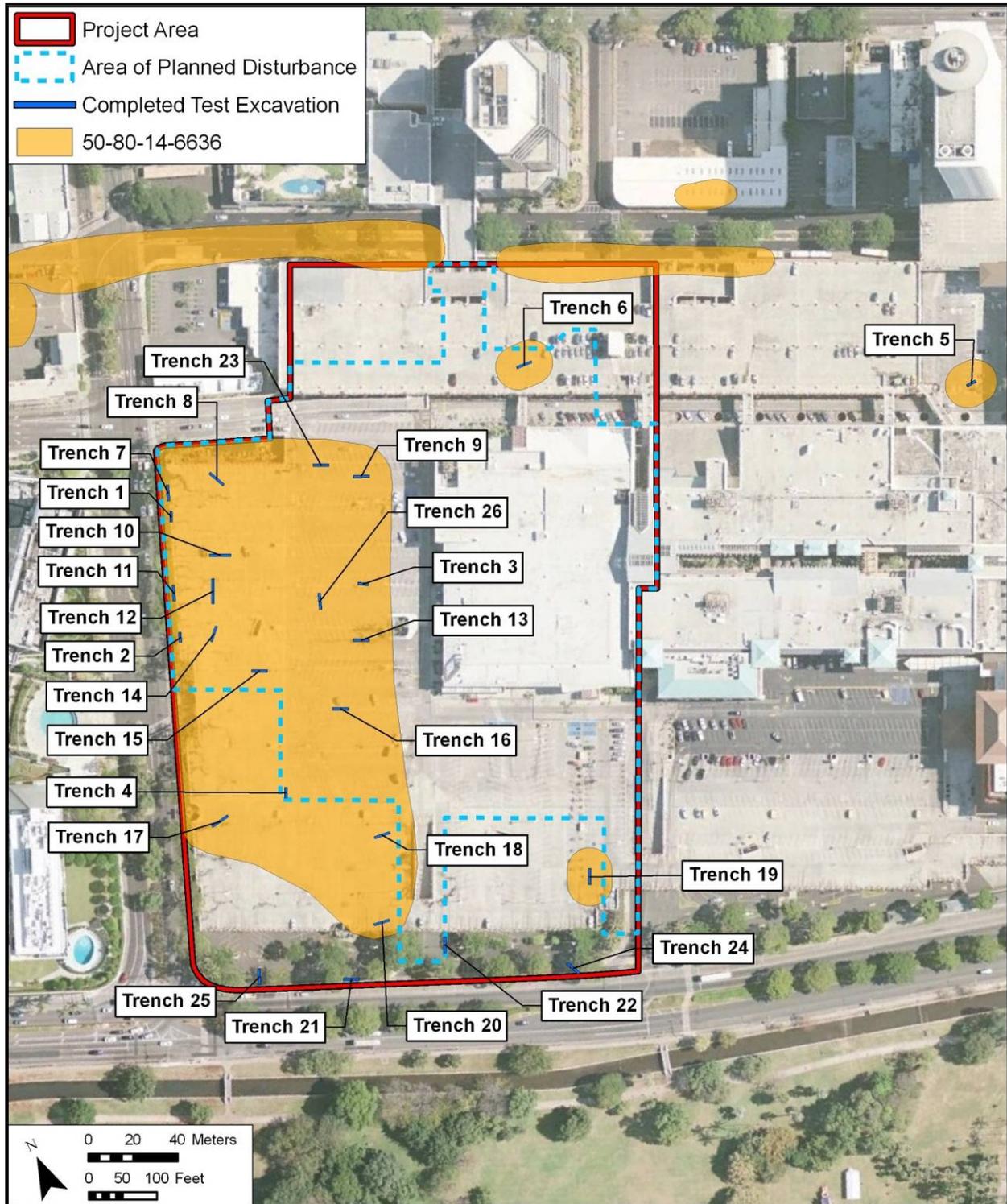


Figure 237. Morriss et al. (2013:162) study area Trenches 1-27 and distribution of SIHP # -6636; see Figure 218 for location of Morriss et al. (2013) study area



Figure 238. Trench 5 north sidewall showing Kewalo wetland (SIHP # -6636), Strata II and III (adapted from Morriss et al. 2013:90)

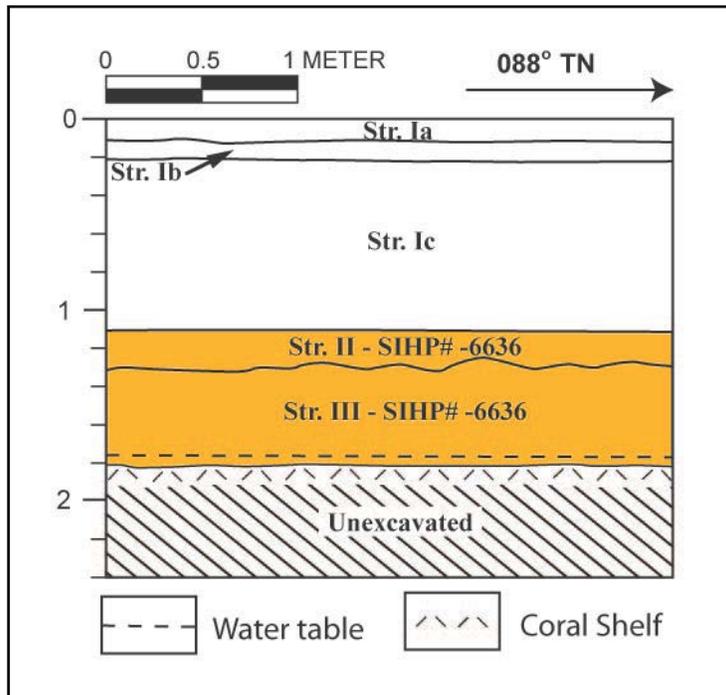


Figure 239. Trench 5 north profile showing Kewalo wetland (SIHP # -6636), Strata II and III (adapted from Morriss et al. 2013:90)

Table 43. Trench 5 Stratigraphic Description (adapted from Morriss et al. 2013)

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-20	2.5YR 3/3, dark reddish brown; mottles, 10YR 5/1, gray, 50%, coarse; gravelly silt loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; very abrupt lower boundary; smooth topography; no roots observed; reddish brown basalt gravel base course
Ic	20-110	10YR 5/3, brown; mottles, 10YR 8/1, white, 20%, fine to coarse; gravelly cobbly coarse sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt lower boundary; smooth topography; no roots observed; crushed coral fill
II	110-130	10YR 6/2, light brown, gray; sandy clay; massive structure; wet, sticky consistency; plastic; mixed origin; abrupt lower boundary; wavy topography; few, fine roots observed; disturbed wetland sediment; Kewalo wetland; designated a component of SIHP #-6636
III	122-180	GLEY 2 G/1, bluish gray; sandy clay; massive structure; wet, sticky consistency; plastic; mixed origin; lower boundary not visible; few, fine roots observed; naturally-deposited wetland sediment containing land snails and decomposing organics overlying the natural coral shelf; Kewalo wetland; designated a component of SIHP #-6636