

---

## Section 2 Zone 6 Waterfront (Test Excavations 96 to 115)

---

### 2.1 Overall Location

For reporting purposes for this AIS, the City Center Section 4 of the HHCTCP has been divided into 11 zones based on geographical and cultural boundaries. The Waterfront Geographic Zone runs along Nimitz Highway from Nuʻuanu Stream at the north end to Richards Street at the south end (Figure 2). The northern boundary of this section represents the southern boundary of the former Kawa Fishpond/historic shoreline and Nuʻuanu Stream (see Volume II Figure 12, Volume II Figure 26, and Volume II Figure 27). The Waterfront Zone corridor is located entirely within Honolulu Ahupuaʻa, although the present-day northern and southern ends of the zone were offshore in traditional Hawaiian times.

The Waterfront Zone includes twenty-two AIS Test Excavations numbered T-096 through T-115, including T-104A and T-111A. Test excavations were generally numbered from north to south. The test excavations within the Waterfront Zone were located within TMKs [1] 1-7-002:026 (Chinatown Station; land owned by 902 Partners, LLC.), [1] 1-7-002, [1] 2-1-001, -002, -013, and -014 (Nimitz Highway; owned by the State of Hawaiʻi), and [1] 2-1-014:003 (Downtown Station; land owned by Pacific Guardian Center).

### 2.2 Transit Infrastructure

HHCTCP infrastructure for the current project within the Waterfront Zone consists of the Chinatown Station, to be constructed north of Kekaulike Street and *mauka* of Nimitz Highway, the Downtown Station to be constructed southeast of Bishop Street on both sides of Nimitz Highway, 24 single columns, 2 column boxes, and 1 straddle-bent column to support the fixed guideway system and stations spaced along the Waterfront Zone corridor, and utility relocation corridors throughout. Test excavations for the project focused on utility relocation corridors for electric lines and fiber optic lines (T-102 through T-107, T-104A, T-110 through T-013, and T-111A), with additional excavations in the footprint of the Chinatown Station (T-096 through T-101), the Downtown Station (T-114), and at column locations (T-108 and T-115) (see Volume I).

### 2.3 Geography, Geology, and Land Forms

The Waterfront Zone is situated along the low-lying coastal flats immediately inland of Honolulu Harbor, generally less than 0.5 km from the shoreline. Elevations within the Waterfront Zone range from approximately 1.9 to 2.4 m amsl, and the average annual rainfall is approximately 691 to 762 mm (27 to 30 inches) (Giambelluca et al. 2011). The present-day topography of the Waterfront Zone is generally flat. As the Waterfront Zone traverses a predominantly urban landscape, vegetation in the immediate vicinity is minimal and consists primarily of introduced (non-indigenous) landscaping trees, shrubs, and ground cover. Nuʻuanu Stream empties into Honolulu Harbor at the north end of the Waterfront Zone.

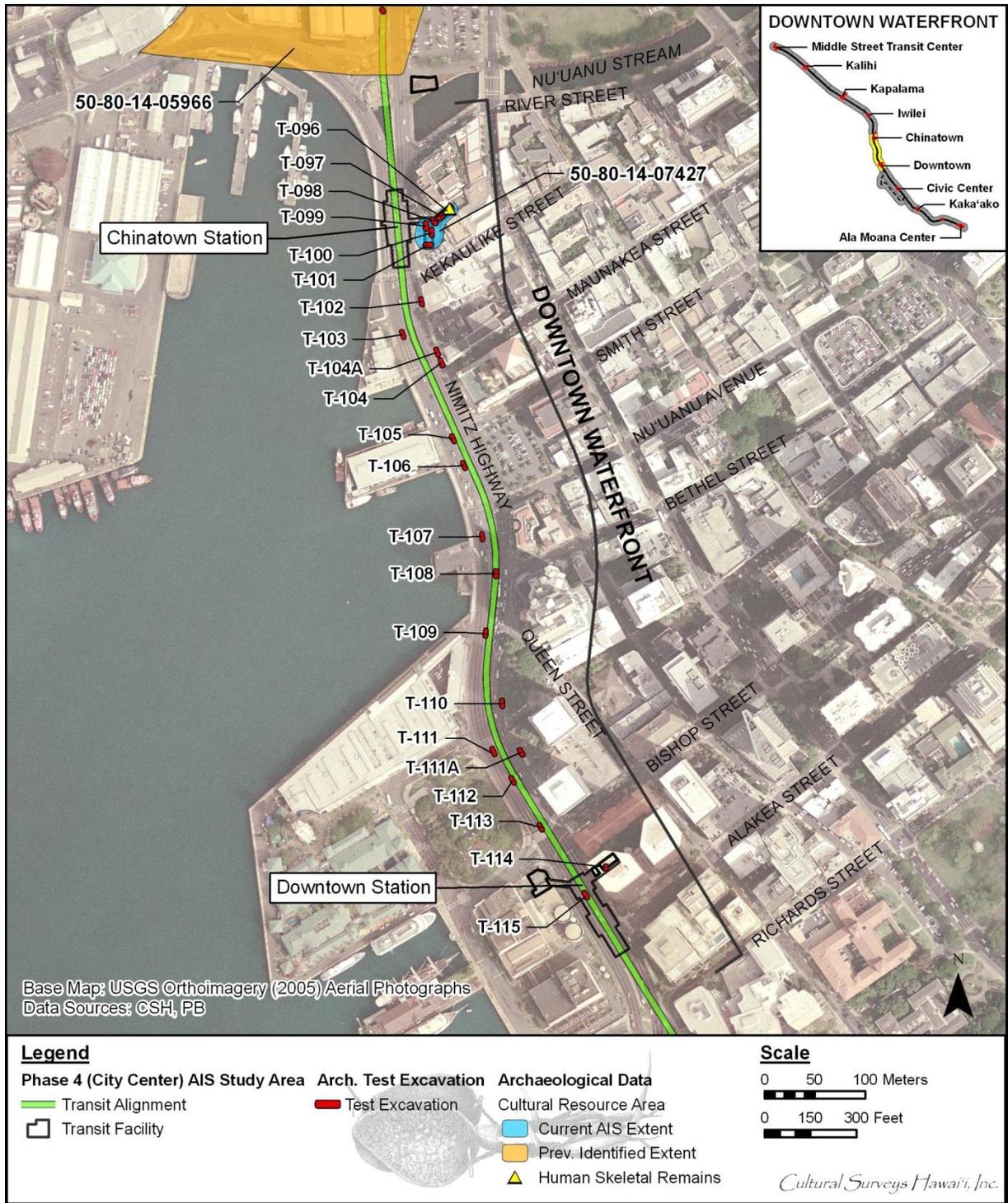


Figure 2. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) showing the location of the Waterfront Zone AIS test excavations (T-095 through T-115, T-104A, and T-111A) along the transit corridor and within the Chinatown and Downtown Stations

According to the U.S. Department of Agriculture Soil Survey Geographic (SSURGO) Database (2001) and soil survey data gathered by Foote et al. (1972), soils within the Waterfront Zone consist predominantly of Fill land (FL), with small areas of Ewa silty clay loam (EmA) at the northeast and southeast ends of the Zone (Figure 3). Fill land soils are described as:

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

Ewa silty clay loam soils are described as:

...well-drained soils in basins and on alluvial fans... [that] developed in alluvium derived from basic igneous rock... These soils are used for sugarcane, truck crops, and pasture. The natural vegetation consists of fingergrass, kiawe, koa haole, klu, and uhaloa [Foote et al. 1972:29].

## 2.4 Traditional and Historic Land Use

### 2.4.1 Traditional Accounts of the Waterfront Zone

As noted above, the Waterfront Zone is situated within Honolulu Ahupua'a. The area that today comprises the portion of Downtown Honolulu that surrounds Honolulu Harbor was known to the Hawaiians as "Kou," a center of population and activity. Kou stretched from "Nu'uaniu to Alakea Streets and from Hotel Street to the sea" (McAllister 1933:80) and possessed shoreward fishponds and irrigated fields fed by streams descending from Nu'uaniu and Pauoa Valleys.

Kou had a long tradition as a royal center where the *ali'i* would meet and entertain. It was "noted for *kōnane* (pebble game, like checkers) and for *ulu maika* (bowling), and is said to be named for the executive officer (*ilāmuku*) of Chief Kākuhihewa of O'ahu" (Pukui et al. 1974). In accounts of the Pele and Hi'iaka saga (Emerson 1915:168; Nogelmeier 2006:402-420), Hi'iaka from Hawai'i Island and Lohi'au, chief of Kaua'i, joined with Pele'ula, chiefess of O'ahu, for pleasure at Kou.

### 2.4.2 LCA Documentation

Twenty LCAs were awarded in the vicinity of the Waterfront Zone (**Table 1**). A detailed map of downtown Honolulu made by Wall in 1886 shows the LCA awards spread along the Waterfront corridor (Figure 4). The LCA testimonies for the Downtown Honolulu area in the vicinity of the Waterfront Zone (see Vol. III Appendix C) were awarded to a variety of Native Hawaiians and foreign settlers who had moved into Honolulu as the city developed. Most of the LCAs in the vicinity of the Waterfront Zone were small awards consisting of house lots, but there were also two commercial properties, two wharves, a vineyard, and royal lands.

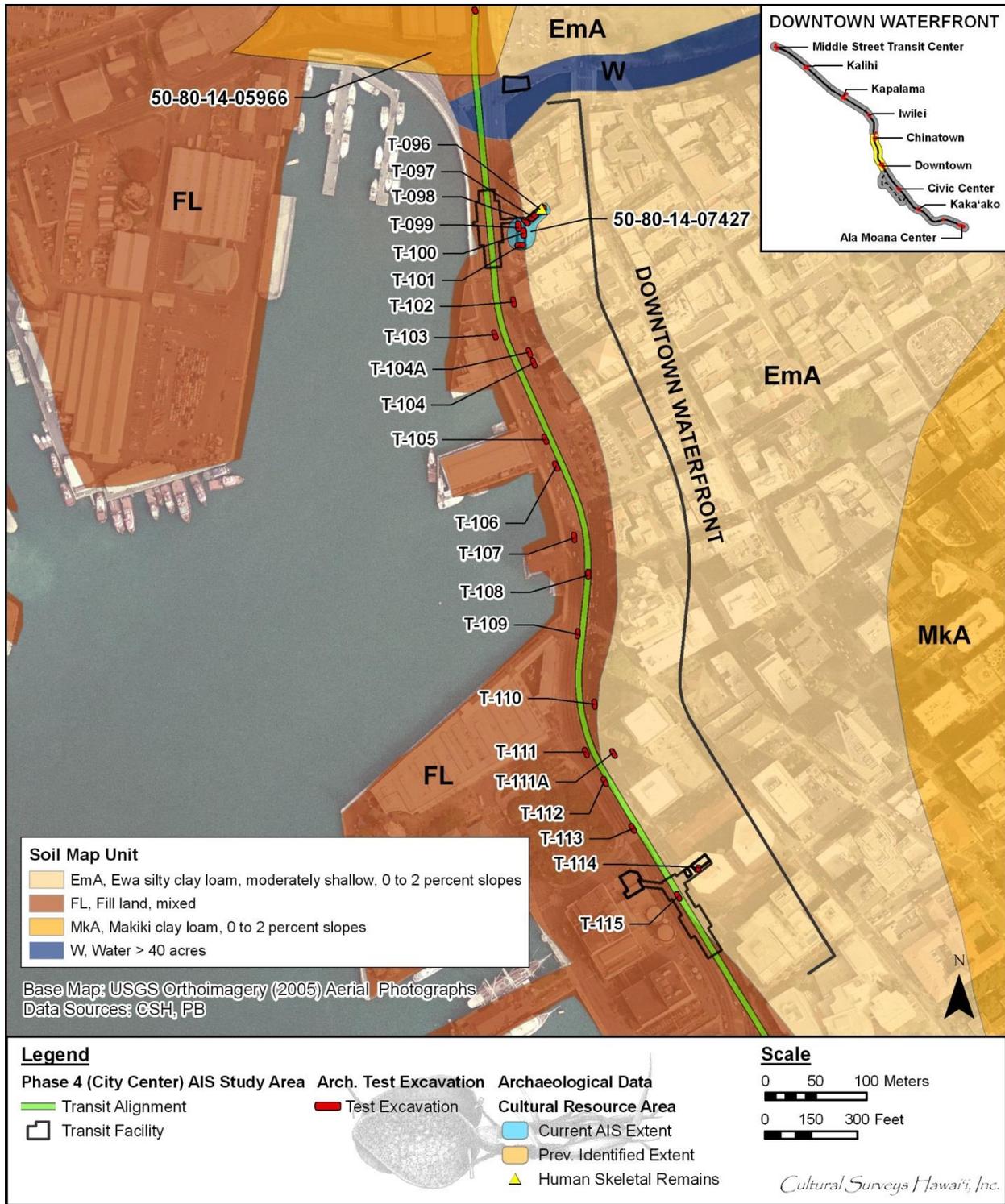


Figure 3. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) with overlay of the Soil Survey of Hawai'i (Foote et al. 1972) showing sediment types within and in the vicinity of the Waterfront Zone

Table 1. LCAs in the vicinity of the Waterfront Zone (in numerical order)

<b>LCA Number</b>	<b>Contents of Award</b>
22	One house lot to G. Kauwaina
30	One house lot (six houses) to Kaho'owaha
38	One house lot (including wharf and dwelling) to Elias and Hiram Grimes
46	Former (Marin) cow yard, small yard, and house to Joseph Maughan for his wife, Cruz (Marin's daughter)
57	One house lot to Simeona Kau
66	One house lot to Napahi
164	One house lot to Mataio Kekūanao'a for Victoria Kamāmalu
170	One house lot to Mataio Kekūanao'a
186 B	"Market House, this place is for M. Kekuanaoa. The claim for this place is that it was Keaumoku's own place, and on his death it went to Kaahumanu, and on her death, to Kinau, on her death to V. Kamamalu....a lot between the lot of John Mana and the Hotel." [Award 186B; R.P. 4872; Queen St. (Aienui) Honolulu Kona; 1 ap.; .06 Ac.; for V. Kamamalu]
191	One house lot to Kekauonohi
247	One of 12 house lots and store lots claimed for Wm. C. Lunalilo by C. Kanaina
256	One house lot to Kalukini
626	0.49-acre lot at Nu'uanu and Merchant Streets, 0.06-acre lot on Merchant Street, to Stephen Reynolds
738	One house lot to Kaunuohua
784 and 9971:1 and 2	The wharf commonly called the point and granted to James Robinson and William Pitt by Karaimoku
810	Two house lots to Francis C. Jones, Rosalie Jones, and John Jones (heirs to Lahilahi, daughter of Francisco Marin)
10806:Part 2	One house lot to Kamehameha III
2065	One house lot to Keo Bolabola for Kawai'i
2938	One vineyard (planted by Francisco Marin) to Juan Marin (grandson of Marin)

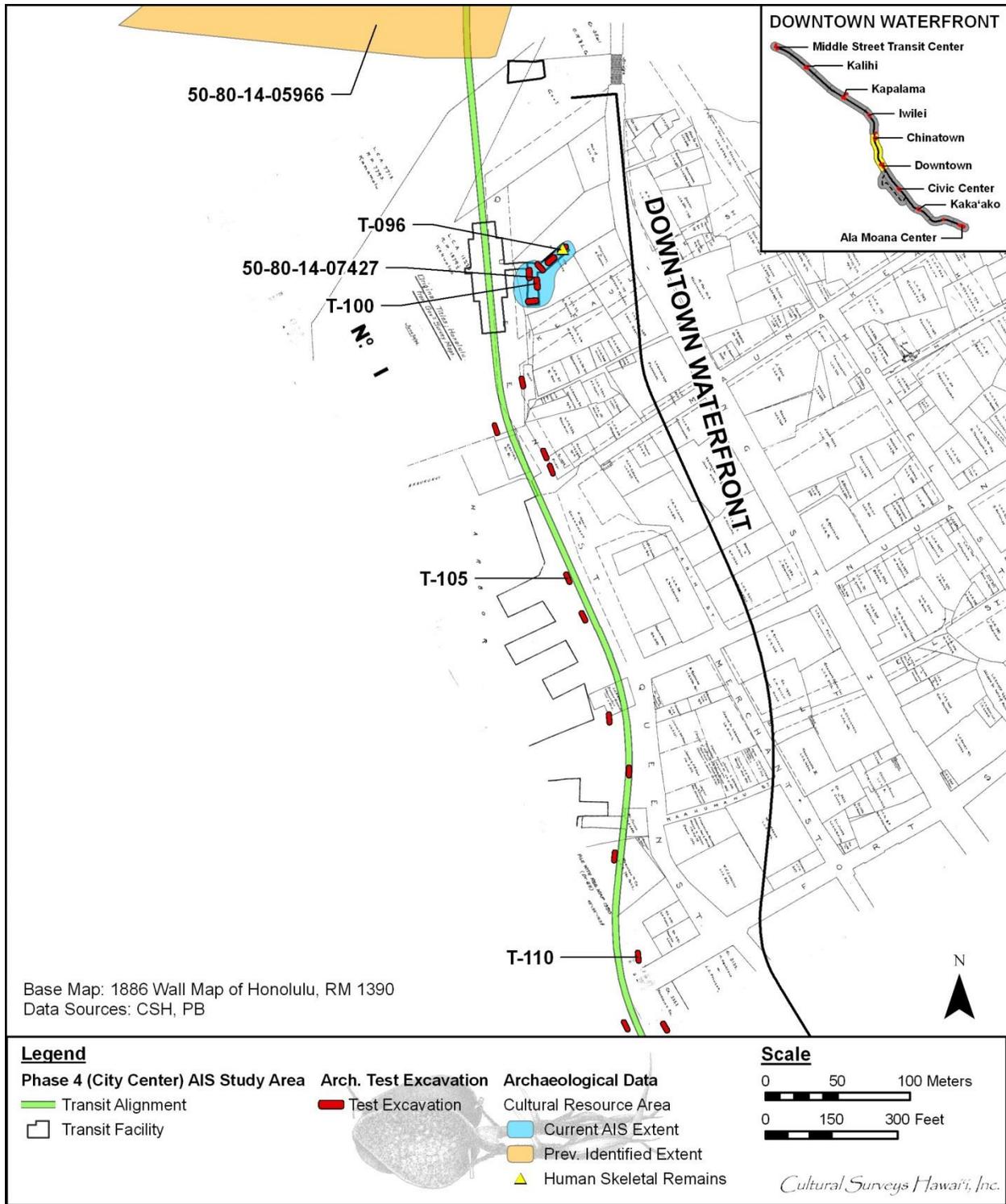


Figure 4. 1886 Wall map showing LCA awards spread along the northern extent of the Waterfront corridor with a portion of the transit corridor and Chinatown Station AIS excavations

### 2.4.3 Historic Land Use

A major factor for the delay in the development of Honolulu as a major population center and port was the relatively late discovery of Honolulu Harbor, attributed to Captain William Brown in early 1793. Additionally, foreigners were wary of landing at O'ahu due to the fear of attack and the difficulty of getting water and food (Portlock 1968). However, western presence expanded within the traditional Hawaiian landscape around Honolulu starting at the turn of the nineteenth century. In 1809, Kamehameha moved his court, government, and residence from Waikīkī to Honolulu. According to John Papa 'Ī'ī (1959), Hawaiian chiefs lived along the beach of the harbor while foreign residents began to build stone houses and buildings, urbanizing Honolulu. In 1816, a large fort was constructed at the end of Fort Street to protect Honolulu Harbor and served as a government center, prison, and asylum as well as a military post. An 1847 Metcalf Downtown map shows "The Fort" located within the current Waterfront corridor, around excavations T-110, T-111, and T-111A (Figure 5). The first harbor facilities were developed on the shore of "Honoruru" town in 1825, when the hulk of an old ship was sunk to create a small wharf (Alexander 1908). This wharf served the growing sandalwood trade and the subsequent whaling industry.

In 1846, Honolulu was made the capitol of the Hawaiian Kingdom and was developing into the commercial and political hub of the islands. During this period there was an obvious increase in density of land use and urbanization. The waterfront of Honolulu also changed significantly during this period. Around 1850, during the peak of the whaling industry, the harbor area became crowded with trading and whaling vessels, and required additional wharves to accommodate them.

In 1857, the old fort was demolished and its walls were repurposed into a 2,000-foot retaining wall used to extend the land surface out onto the shallow reef in the harbor. The remaining fort materials were used as fill to create what came to be known as the Esplanade (Judd 1975:50). Between 1857 and 1870, 22 acres of reef land between Fort and Alakea Streets were filled in with material dredged from the harbor (Bush 1957:14). An 1887 Hawaiian Government Survey map of Honolulu and Vicinity by W. A. Wall shows the dredging and land reclamation activities associated with the continued urban expansion of the Downtown Honolulu area and the development of Honolulu Harbor (see Vol. II Figure 26). During the 1890s and 1900s, additional dredging occurred and new piers and channels were constructed in the harbor (Coles et al. 1999:10).

In 1899, the first case of bubonic plague was identified in Hawai'i. Two other cases were reported on the same day, and the Board of Health enacted a strict quarantine for Chinatown, the area of Honolulu bounded by Nu'uuanu, Kukui, River, and Queen Streets. From December 12, 1899 to March 31, 1900, 71 cases of bubonic plague were reported, resulting in 61 deaths from the disease. Of those casualties, 41 lived within the established Chinatown quarantine area. The Board of Health concluded that they could not contain the plague and decided that the best remedy was to set "sanitary fires" to demolish infected wooden buildings. A total of 41 controlled fires were set between December 31, 1899 and August 13, 1900. One sanitary fire set on January 20, 1900 got out of control and quickly spread throughout Chinatown. Though no one was killed in the fire Chinatown was destroyed.

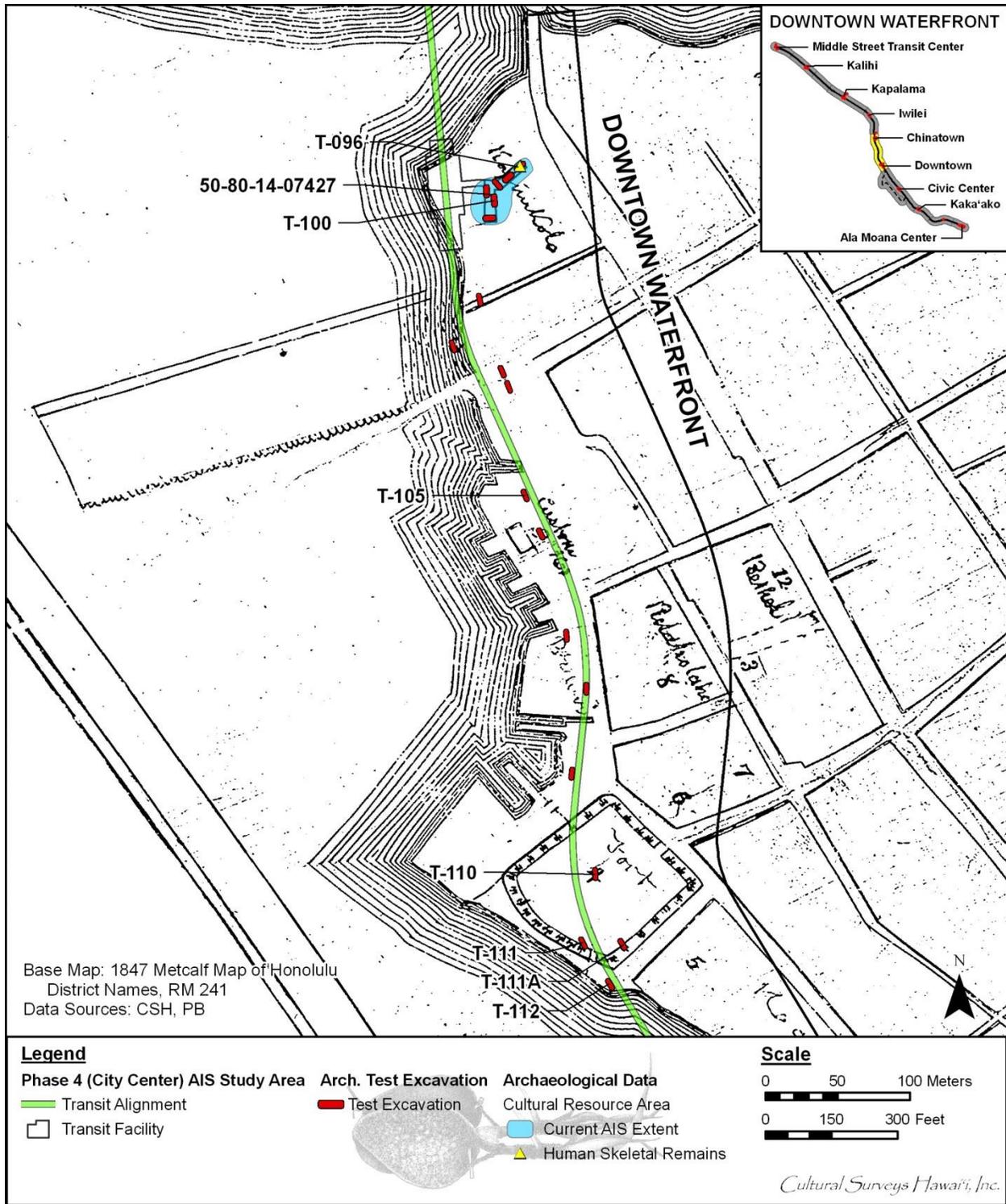


Figure 5. 1847 map of Honolulu by Metcalf showing “The Fort” located within the current Waterfront corridor, around excavations T-110, T-111, and T-111A

As Honolulu became more and more populated throughout the twentieth century, the areas surrounding the harbor became increasingly important for commercial construction, and major development ensued. Development entailed extensive dredging for harbor improvements and land reclamation into coastal tidal flats. An 1897 map of Honolulu by M. D. Monsarrat (Figure 6) shows many wharves scattered along the *makai* edge of downtown Honolulu, *makai* of the Waterfront Zone, as well as reclaimed land at the mouth of Nuʻuanu Stream, increasing the length of the stream and shifting the mouth of the stream farther south between the newly reclaimed land and the existing coastline. The 1906 Dakin Fire Insurance Series maps and the 1914 (Figure 7), 1927 (Figure 8), and 1950 (Figure 9) Sanborn Series maps continue to show many wharves, with industrial buildings and warehouses, several lumber yards, and commercial buildings along the coastline and in the vicinity of the Waterfront Zone corridor. A 1919 U.S. Army War Department Fire Control map (Figure 10), a 1933 U.S. Army War Department Fire Control map (Figure 11), and a 1943 U.S. Army War Department Terrain map (see Vol. II Figure 33) show the Waterfront Zone in a heavily industrialized and commercialized area. Early maps (from 1886 through 1950) showed the present-day Nimitz Highway alignment as Queen Street until it crossed Fort Street, where it continued onto Halekauwila Street. It was not until 1953 that the Nimitz Highway alignment, which the Waterfront corridor follows, is depicted on a map and renamed as such (see Vol. II Figure 34).

#### 2.4.4 Settlement Pattern Summary

At the time of Western contact, the shoreline area to the east of Nuʻuanu Stream was known as the settlement of Kou, which consisted of house sites, agricultural fields, and gaming areas for the chiefs. With the discovery of Honolulu Harbor in 1793 by Captain William Brown, the area of Kou evolved rapidly into a bustling port town and eventual capital city of the island. This rapid change was reflected in the Māhele records within the lower coastal plains around the Waterfront Zone. Most of the LCAs in the vicinity of the study area were small awards given to a variety of Native Hawaiians and foreign settlers and consisted mostly of house lots. This paved the way for the urban growth of Honolulu town and harbor with commercial buildings amidst residential lots.

### 2.5 Previous Archaeology

Several archaeological studies have been conducted in the vicinity of the Waterfront Zone, including 13 conducted within or directly adjacent to the zone (Figure 12 through Figure 14). Table 2 lists and summarizes the 13 studies within or directly adjacent to the Waterfront Zone, and they are described in more detail below. Two Historic Districts have been identified within the vicinity of the Iwilei Zone: The Chinatown Historic District (SIHP # 50-80-14-9986), which covers the northern portion of the Zone, and the Merchant Street Historic District (SIHP # 50-80-14-9905), which lies immediately *mauka* of the center of the Zone.

Several historic properties have been identified outside of the Waterfront Zone, but within the vicinity of it and include: SIHP # 50-80-14-4588, a multi-component site consisting of 53 features of both pre- and post-Contact date (including three burials and isolated fragments dating to both pre- and early post-Contact times) (see Kennedy et al. 1994 and Riley et

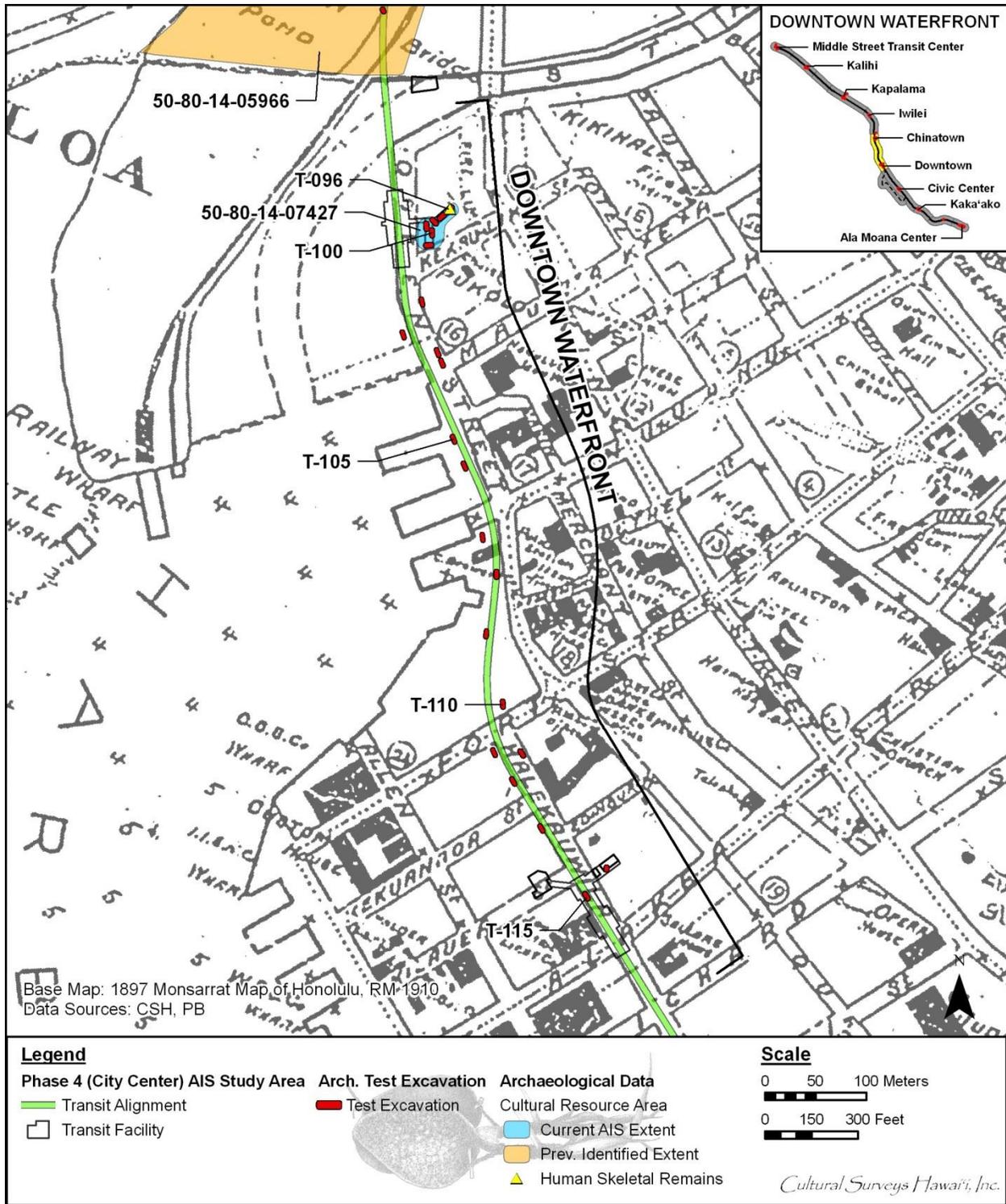


Figure 6. 1897 Map of Honolulu by M. D. Monsarrat (Reg. Map 1910) showing many wharves scattered along the *makai* edge of downtown Honolulu and reclaimed land at the mouth of Nu‘uanu Stream

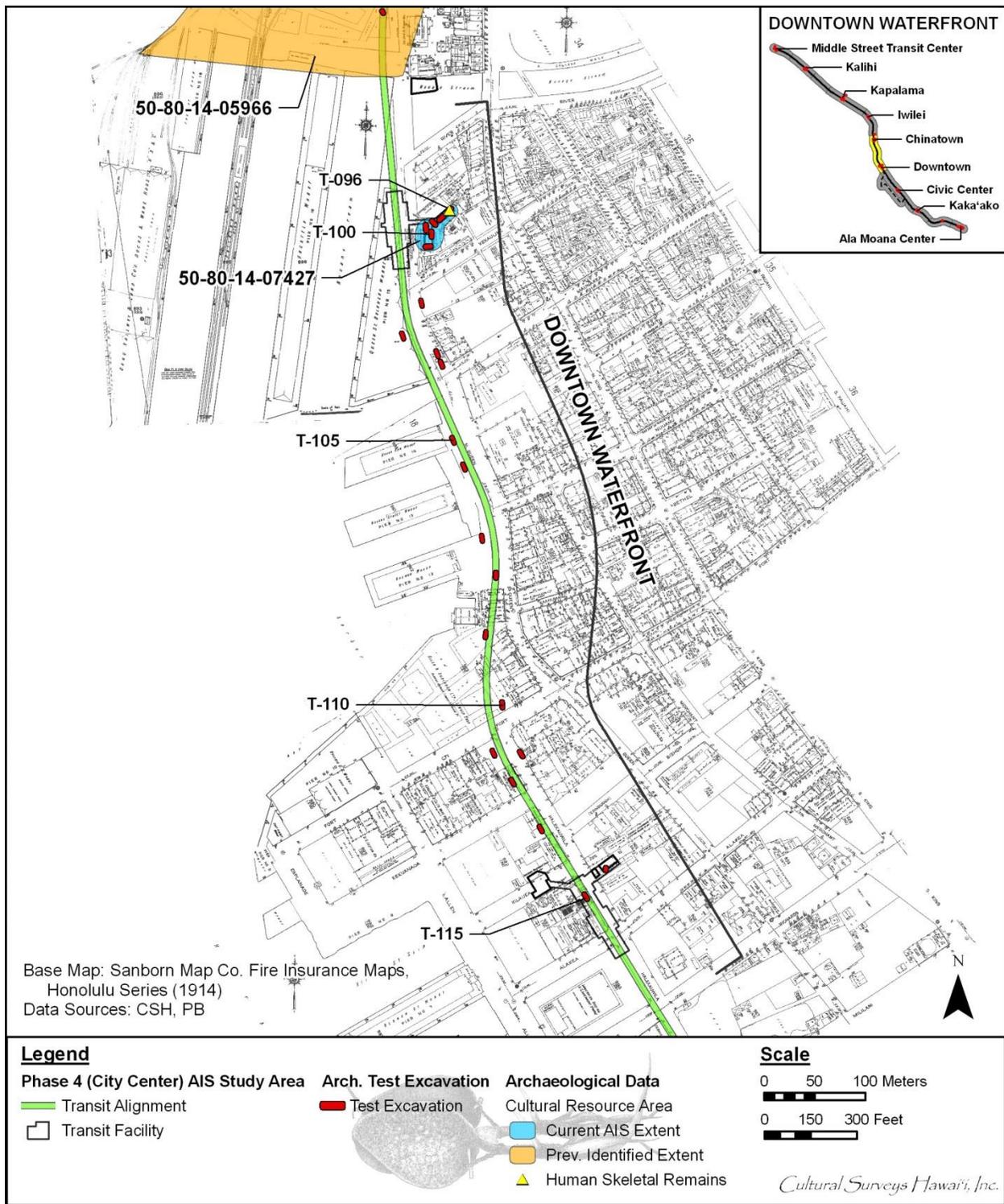


Figure 7. 1914 Sanborn Series map showing the transit corridor in the Waterfront Zone with many wharves with industrial buildings and warehouses, several lumber yards, and commercial buildings along the coastline

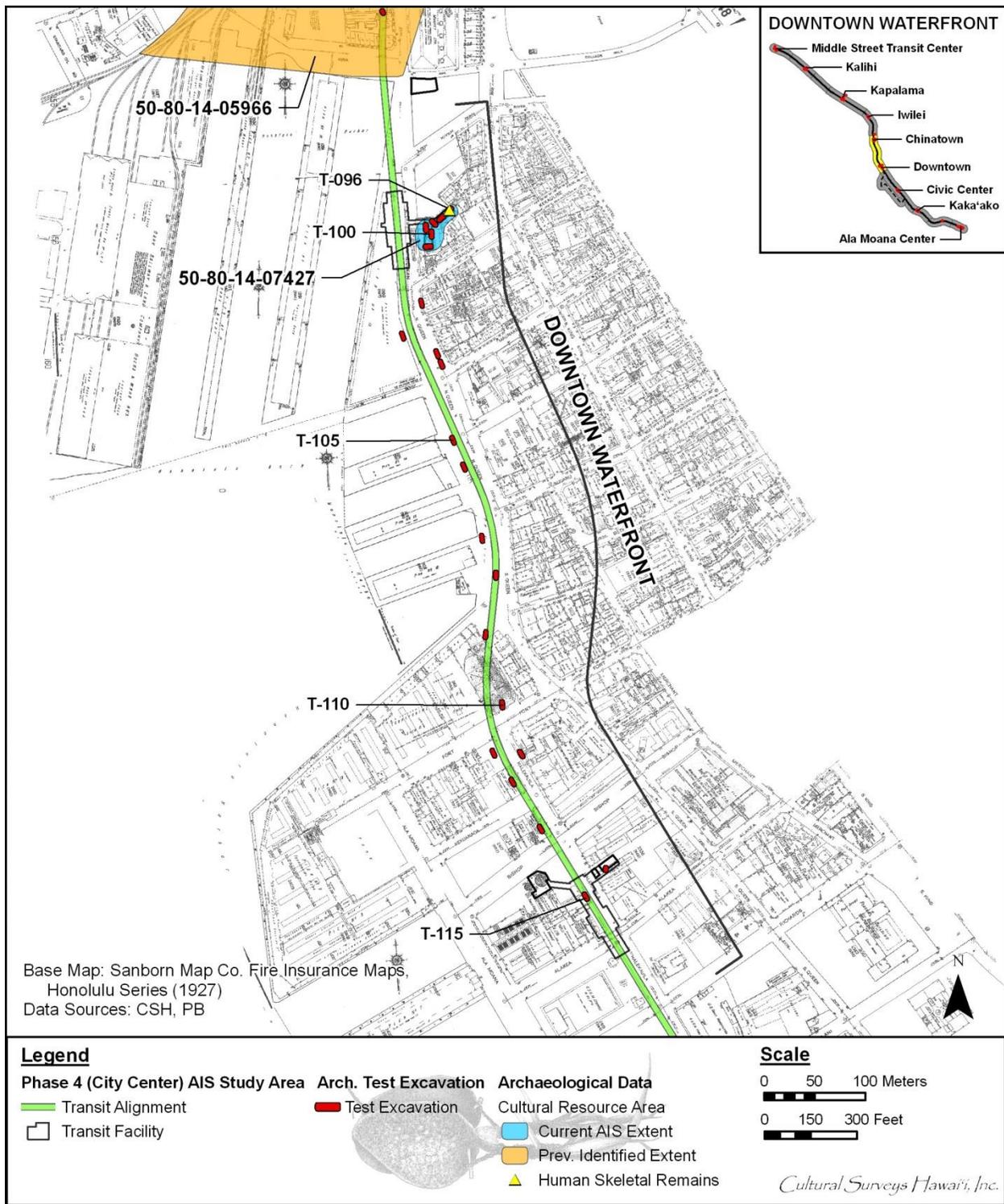


Figure 8. 1927 Sanborn Series map showing the transit corridor in the Waterfront Zone with many wharves with industrial buildings and warehouses, several lumber yards, and commercial buildings along the coastline

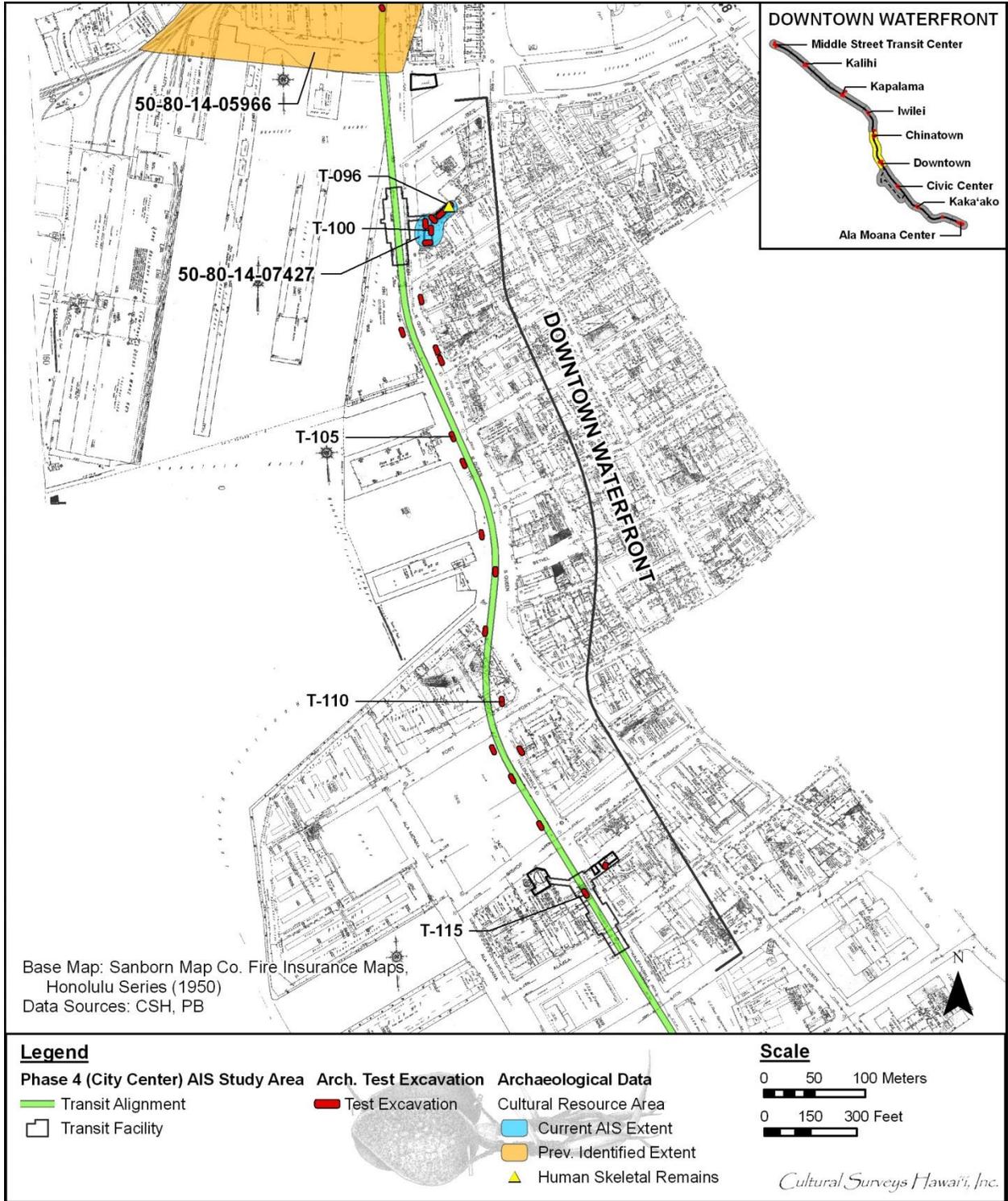


Figure 9. 1950 Sanborn Series map showing the transit corridor in the Waterfront Zone with many wharves with industrial buildings and warehouses, several lumber yards, and commercial buildings along the coastline

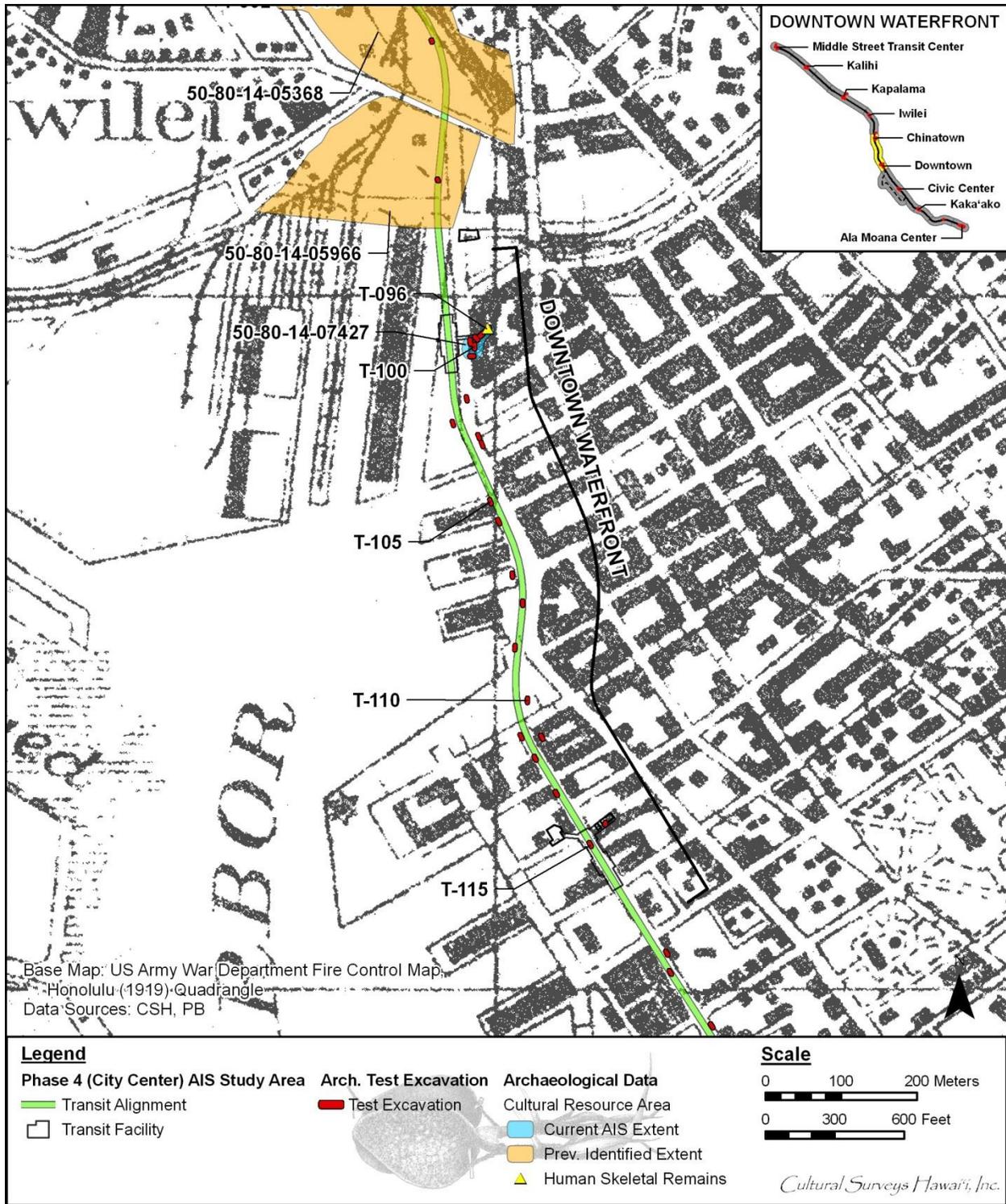


Figure 10. 1919 U.S. Army War Department Fire Control map, Honolulu Quadrangle showing the transit corridor and AIS excavations in the Waterfront Zone

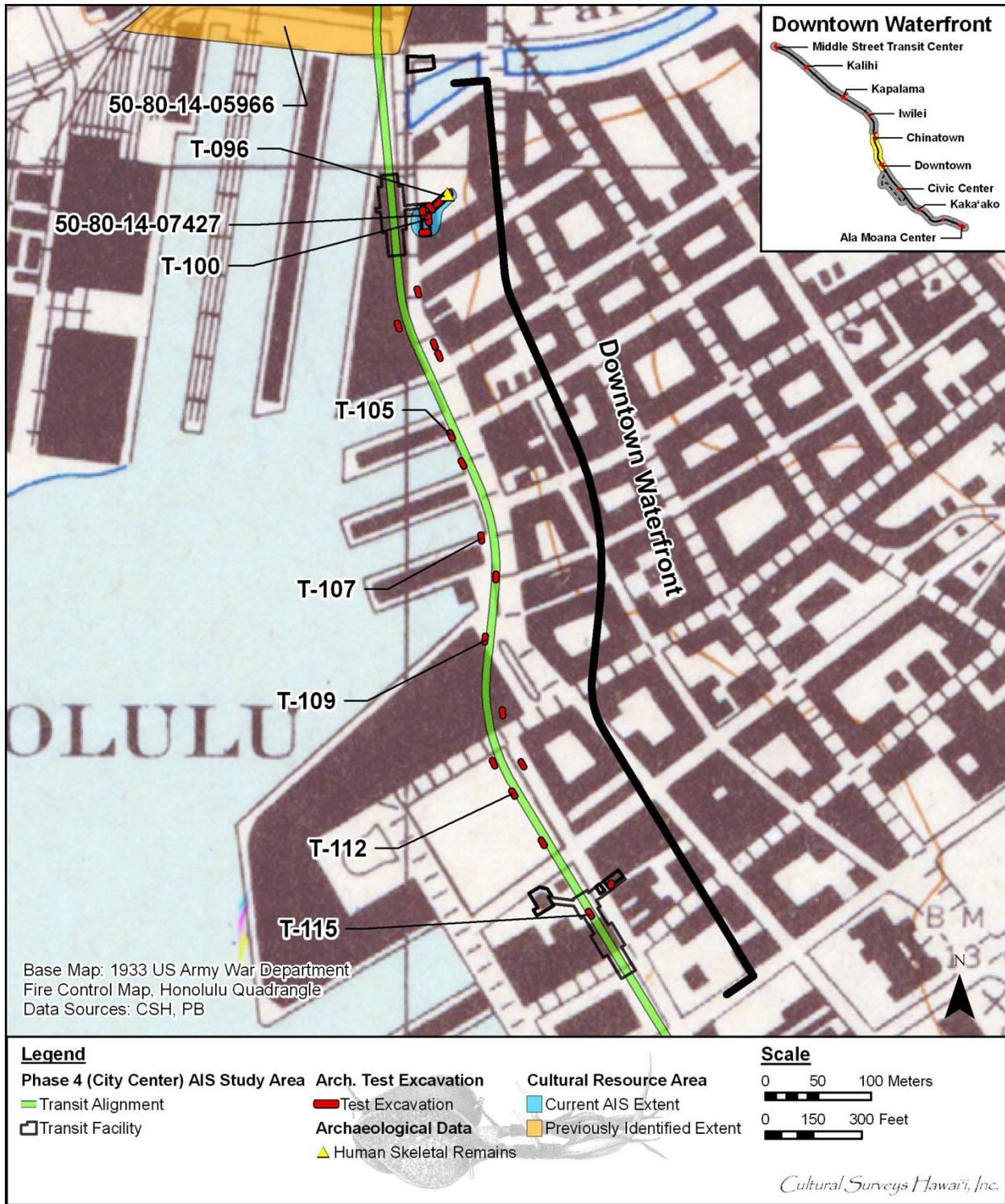


Figure 11. 1933 U.S. Army War Department Fire Control map, Honolulu Quadrangle, showing the transit corridor and AIS excavations in the Waterfront Zone

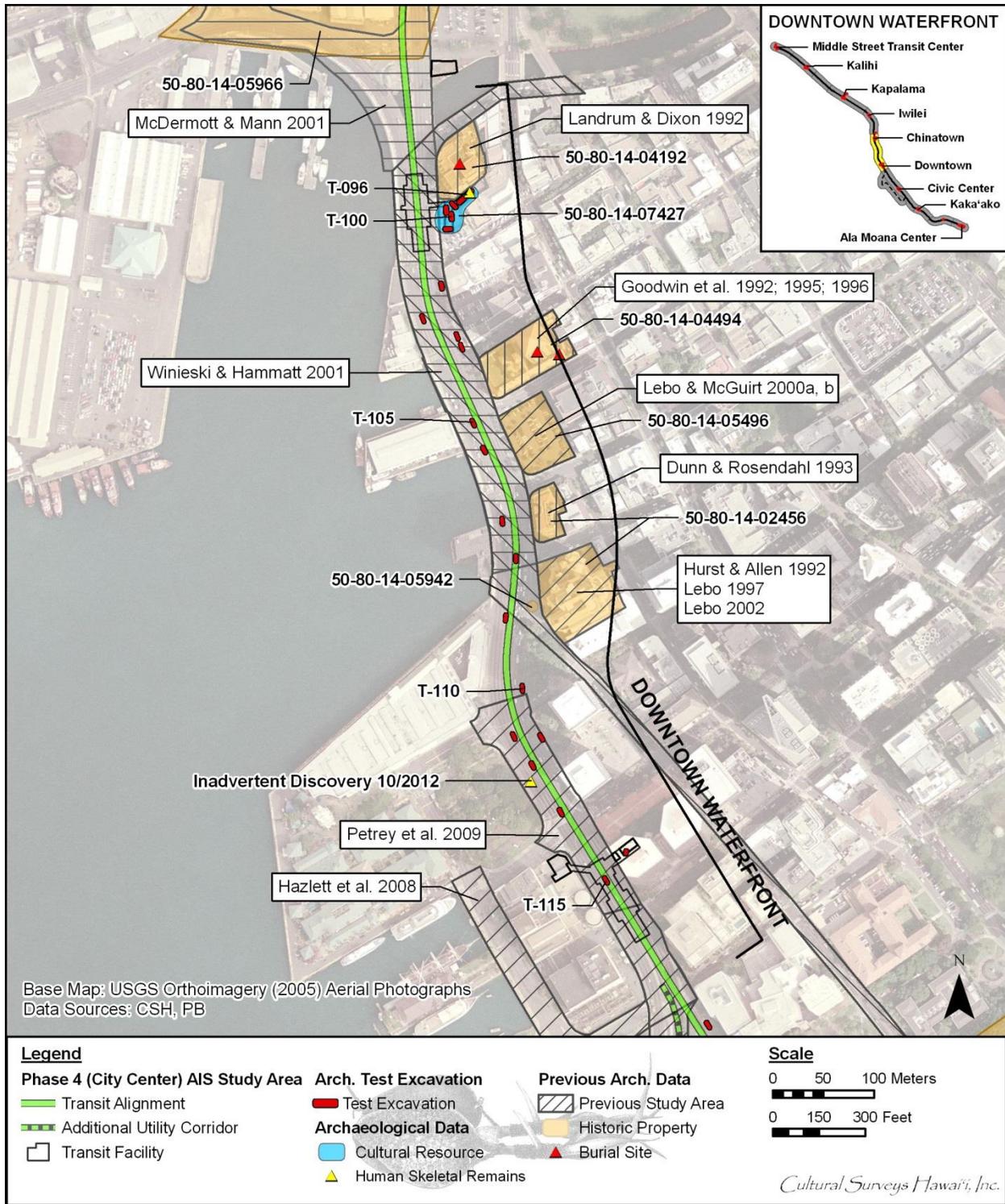


Figure 12. Previous archaeological studies conducted in the vicinity of the Waterfront Zone (base map: U.S. Geological Survey Orthoimagery 2005)

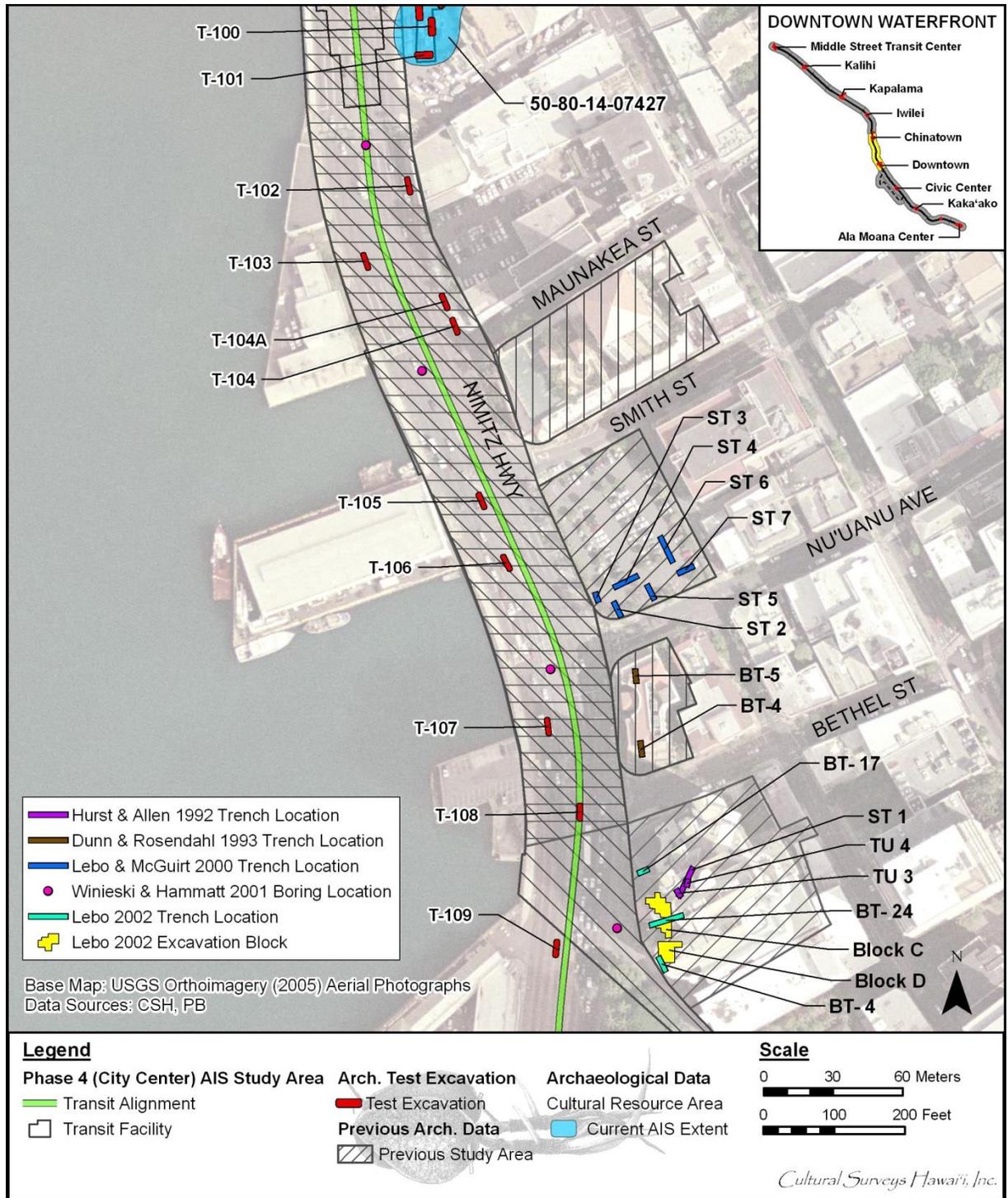


Figure 13. Previous archaeological studies in the vicinity of the northern portion of the Waterfront Zone (base map: U.S. Geological Survey Orthoimagery 2005) showing test excavations of prior studies that are immediately adjacent to the Waterfront Zone corridor

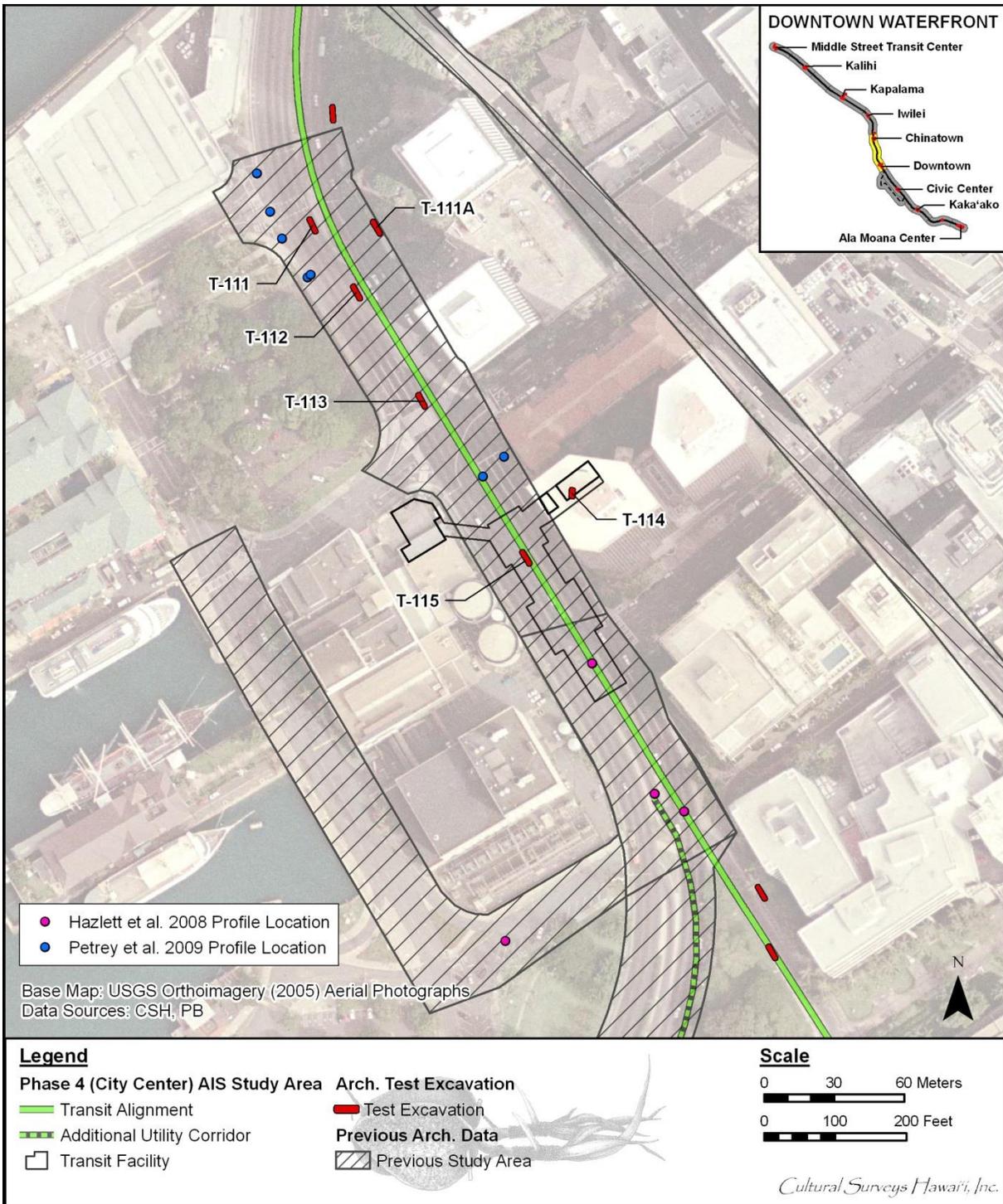


Figure 14. Previous archaeological studies in the vicinity of the southern portion of the Waterfront Zone (base map: U.S. Geological Survey Orthoimagery 2005) showing test excavations of prior studies that are immediately adjacent to the Waterfront Zone corridor

Table 2. Previous archaeological studies conducted in the immediate vicinity of the Waterfront Zone (arranged chronologically)

Author	SIHP # 50-80-14	Report Description and Findings
Goodwin et al. 1992, 1995, and 1996	-4494	Inventory survey, data recovery, and monitoring for the Marin Tower property; identified pre-Contact fire pits, 28 post-Contact burial features and remains of several displaced burials, early post-Contact structural foundations associated with the residence of the Marin family from about 1810 to 1850, and numerous pre- and post-Contact artifacts.
Hurst and Allen 1992	-2456	Archaeological monitoring and inventory survey of the Harbor Court Tower site; documented a subsurface cultural layer containing both pre- and post-Contact elements.
Landrum and Dixon 1992	-4192	Data recovery at the corner of River Street and Nimitz Highway; documented four post-Contact trash pits, a brick and mortar building foundation, and a single pre-Contact human burial.
Dunn and Rosendahl 1993	-2456	Inventory survey of the proposed Nu‘uanu Court site; documented a cultural layer containing both pre- and post-Contact features.
Lebo 1997	-2456	Data recovery of the proposed Harbor Court site; identified 35 new post-Contact features.
Lebo and McGuirt 2000a and 2000b	-5496	Inventory survey and data recovery at 800 Nu‘uanu Avenue; documented one historic property during the AIS, a subsurface cultural layer containing both pre- and post-Contact archaeological features, with additional components identified during data recovery.
Winieski and Hammatt 2001	-5942	Archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project; one historic property encountered: a remnant of a light-gauge rail associated with the historic Honolulu Rapid Transit trolley system.
Lebo 2002	-2456	Data recovery of the pre-Contact deposits from the proposed Harbor Court site; identified 113 features; radiocarbon analysis of the deposits indicated that occupation at the site began between AD 1000 and AD 1200.
Hazlett, Fehrenbach, and Hammatt 2008	N/A	Archaeological monitoring for water main installation on Aloha Tower Drive; no historic properties encountered.

Author	SIHP # 50-80-14	Report Description and Findings
Petrey, Hazlett, Borthwick, and Hammatt 2009	N/A	Archaeological monitoring for the Nimitz Highway and Ala Moana Boulevard Resurfacing Project; no historic properties encountered.
Tulchin, Van Ryzin, and Hammatt 2013 (draft)	N/A	Ongoing archaeological monitoring for the Nimitz and Ala Moana Resurfacing and Lighting Replacement Project; documented human skeletal remains

al. 1995); SIHP # 50-80-14-4587, Pehu's Pond (see Kennedy et al. 1994 and Riley et al. 1995); SIHP # 50-80-14-5966, Kawa Fishpond (see McDermott and Mann 2001); SIHP # 50-80-14-4875, a pre-Contact settlement site and human skeletal remains (MNI = 3) (see Erkelens et al. 1994, Goodwin 1997, and Goodwin and Allen 2005); and SIHP # 50-80-14-5781, a pre-Contact human burial (see Elmore and Kennedy 2001).

#### **Nimitz Highway Reconstructed Sewer Project (Winieski and Hammatt 2001)**

In 2001, CSH conducted archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project (Winieski and Hammatt 2001). The project ran along River Street, Nimitz Highway, Queen Street, South Street, and Ala Moana Boulevard. Only one historic property was encountered: a remnant of a light-gauge rail associated with the historic Honolulu Rapid Transit trolley system (SIHP # 50-80-14-5942) at the intersection of Queen Street and Nimitz Highway (immediately adjacent to the Waterfront Zone corridor). A historic-era brick-lined manhole was also observed at this location. This trench consisted of all fill layers. This trench was near transit excavation T-109, which contained similar stratigraphy (all fill sediment). Three other trenches within the Waterfront Zone corridor documented by Winieski and Hammatt (2001) all contained fill material down to or past the water table. This corresponds to adjacent transit excavations T-102, T-104, and T-107.

#### **River-Nimitz Redevelopment (Landrum and Dixon 1992)**

In 1989, the Applied Research Group at the Bishop Museum conducted emergency data recovery in response to the inadvertent discovery of subsurface archaeological features during River-Nimitz Redevelopment work on the corner of River Street and Nimitz Highway (Landrum and Dixon 1992). Documented archaeological features consisted of four post-Contact trash pits, a brick and mortar building foundation, and a single pre-Contact human burial. The numerous artifacts discovered in the trash pits appeared to be deposited in the early nineteenth century through the early twentieth century. The pre-Contact burial was found within inundated marsh sediments, which preserved some soft-tissue remains, as well as burial goods consisting of braided cordage and matted *pandanus*. All of the documented archaeological features were designated SIHP # 50-80-14-4192. Nearby transit excavations (T-096 through T-099, within the Chinatown Station footprint) were dissimilar to the Landrum and Dixon (1992) trench, and contained fill layers with historic-era building foundations and remnants. However, T-096 did contain human skeletal remains (a single element) found within a fill layer.

### **Marin Tower (Goodwin et al. 1992, Goodwin et al. 1995, and Goodwin et al. 1996)**

Marin Tower, between Smith Street, King Street, Maunakea Street, and Nimitz Highway, was the subject of intensive archaeological research (Goodwin et al. 1992, Goodwin et al. 1995, and Goodwin et al. 1996). Fifteen burial features and several isolated, displaced human skeletal remains were found during the data recovery. Remnants of both adult and child coffins were recovered. A large variety of associated grave goods were also recovered, including glass beads, a copper ring, bone discs and buttons, an iron and wood smoking pipe, a glass bead necklace, copper alloy buttons, shell buttons, ceramics, an iron-bladed kitchen knife, and a copper cross necklace. A Memorandum of Agreement was drawn up with Marin family relatives, and the skeletal remains were disinterred and re-interred elsewhere on the property on March 3, 1994.

Additional documented archaeological features consisted of pre-Contact fire pits and early post-Contact structural foundations associated with the residence of the Marin family from about 1810 to 1850. Also documented were artifacts associated with the use of the *makai* portion of the property as part of the Honolulu Ironworks from 1850 to 1900, as well as the use of the *mauka* portion for shops of Chinese merchants during the same period. Additionally, artifacts and structures related to the commercial development of the property as part of Downtown Honolulu from 1900-1950 were documented. The entire project area was designated SIHP # 50-80-14-4494. Nearby transit excavations, T-104 and T-105, consisted entirely of fill material.

### **800 Nu‘uanu Avenue (Lebo and McGuirt 2000a and 2000b)**

A subsurface inventory survey was conducted by the Bishop Museum in December 1996 (Lebo and McGuirt 2000a) at 800 Nu‘uanu Avenue. Six trenches were excavated in a parking lot bounded by Nimitz Highway, Marin Street, Smith Street, and Nu‘uanu Avenue. An analysis of trench stratigraphy and recovered cultural remains allowed identification of five cultural periods within a cultural deposit, SIHP # 50-80-14-5496: (1) pre-Contact (pre-1810), when the area was inhabited only by Native Hawaiians; (2) 1810 to 1850, when early foreign residents such as the Spaniard Don Francisco de Paula de Marin and the Englishman Isaac Davis began to build dwellings and storehouses in the area; (3) 1850-1890s, when large industrial structures, such as the Honolulu Flour Mill and the Honolulu Iron Works, were built; (4) 1890s-1925, when many smaller wooden structures for businesses took over the area; and (5) 1925 to present, when most buildings were demolished and the study area was used as a parking lot. Few traditional Hawaiian artifacts and numerous historic artifacts were recovered during the excavations.

Data recovery involving the excavation of 10 backhoe trenches was conducted by the Bishop Museum (Lebo and McGuirt 2000b) in October 1997. A total of 76 features were identified, including building foundations, post molds, coral block floors and walls, fire pits, trash deposits, and cast-iron sewer pipes. All features were designated part of SIHP # 50-80-14-5496, previously identified during the AIS (Lebo and McGuirt 2000b). The earliest cultural remains were believed to date to before 1810. Historic artifacts were recovered dating to the early post-Contact period, when the area was used for storehouses, and to the later historic periods when the lot was used for industrial structures, for small businesses, and then as a parking lot.

Nearby transit excavations T-105 and T-106 were dissimilar to the Lebo and McGuirt (2000a and 2000b) studies trenches, in that they were comprised entirely of fill sediments with no features observed.

### **Nu‘uanu Court Project (Dunn and Rosendahl 1993)**

In 1993, Paul H. Rosendahl, Ph.D., Inc. (PHRI) completed an archaeological inventory survey of the proposed Nu‘uanu Court site (Dunn and Rosendahl 1993). During the project, six backhoe trenches were excavated. All of the trenches contained a portion of a single historic property: SIHP # 50-80-14-2456, a subsurface cultural layer containing both pre- and post-Contact features, including marine-shell midden, charcoal, non-human bone, post-holes, pit features, and a variety of artifacts. Pre-Contact traditional Hawaiian artifacts included basalt flakes and modified shell and bone; post-Contact artifacts included metal, glass, and ceramic fragments.

The stratigraphy of nearby transit excavations T-107 and T-108 were dissimilar to stratigraphy recorded by Dunn and Rosendahl (1993) during their study. T-107 and T-108 consisted of fill sediments only, with no cultural deposits observed.

### **Harbor Court (Former Ka‘ahumanu Parking Structure) (Hurst and Allen 1992, Lebo 1997, and Lebo 2002)**

In 1992, the Applied Research Group of the Bishop Museum completed archaeological monitoring and an inventory survey of the Harbor Court site (formerly the Ka‘ahumanu Parking Garage). One historic property was documented: SIHP # 50-80-14-2456, a subsurface cultural layer containing both pre- and post-Contact elements. The cultural layer contained primarily post-Contact features (building foundation ruins) associated with nineteenth century urban development. Post-Contact artifacts included nineteenth century bottles and ceramics, while pre-Contact traditional Hawaiian artifacts included basalt and volcanic glass flakes and modified marine shell.

In 1997, the Applied Research Group of the Bishop Museum completed data recovery at SIHP # 50-80-14-2456. Data recovery focused on post-Contact deposits and involved an analysis of “Native Hawaiian occupations associated with the village of Kou/Honolulu from late eighteenth to mid-nineteenth century” (Lebo 1997:195). Data recovery excavations identified 35 new features associated with SIHP # -2456. These included: fire pits, pavements, building foundations, post molds, and trash pits. All observed artifacts were of post-Contact origin, but represent the influence of Western material culture upon the traditional Hawaiian lifestyle. Documented artifacts included: bottles, ceramics, glass beads, buttons (wood, shell, and bone), metal nails, adzes (stone and shell), flakes (basalt, quartz, chert, flint, jasper, and volcanic glass), modified manufactured glass, fish hook blanks, bone awls, hammer stones, and grinding stones.

In 2002, PHRI (Lebo 2002) completed data recovery of the pre-Contact deposits at SIHP # 50-80-14-2456. Radiocarbon analysis of the SIHP # -2456 pre-Contact deposits indicated that occupation at the site began between AD 1000 and AD 1200 (Lebo 2002:14-1). Numerous features (113) were identified within the pre-Contact deposits and include: 86 post molds, 25 in-filled pits, and two firepits. Traditional Hawaiian artifacts collected consisted of primarily basalt tools and flakes and were recovered from non-feature contexts. Observed midden consisted primarily of fish, bird, sea turtle, and marine mollusks. Dog and pig remains were also documented, but to a lesser extent.

Nearby transit excavations T-108 and T-109 contained fill sediments only with no cultural deposits identified, unlike the Hurst and Allen (1992), and Lebo (1997 and 2002) excavations.

### **Water Main Installation on Aloha Tower Drive (Hazlett, Fehrenbach, and Hammatt 2008)**

In 2007, CSH completed archaeological monitoring for a water main installation on Aloha Tower Drive. No historic properties were encountered during project construction. Observed stratigraphy consisted entirely of fill associated with modern road and utility construction as well as historic land filling activities associated with the expansion of Honolulu Harbor. Documented fill sediments consisted of dredge material associated with the construction of Honolulu Harbor, as well as terrestrial sediments imported from other land areas of O'ahu. This is consistent with nearby transit excavations T-115 and T-116.

### **Nimitz Highway/Ala Moana Boulevard (Petrey et al. 2009; Tulchin, Van Ryzin, and Hammatt 2013 [draft])**

The Petrey et al. (2009) study was an archaeological monitoring program for resurfacing along Nimitz Highway and Ala Moana Boulevard. Five profiles (#1-5) were recorded during excavations at the intersection of Fort Street and Nimitz Highway, within the Waterfront Zone corridor. The stratigraphy of these profiles consisted of layers of material associated with road infrastructure, including asphalt, concrete, base course, and imported fill overtop various historic fill layers. No natural sediments were observed. In one of the profiles, #5, cemented limestone blocks and bricks were observed, which may be associated with the historic Honolulu Fort. These profiles are similar to the adjacent transit excavations at T-111 and T-112, which revealed fill layers containing historic debris. Note, however, that T-112 was excavated to a much deeper depth and revealed natural volcanic cinder at its base, beneath the historic fill layers.

### **Inadvertent Discovery 10/2012**

The inadvertent discovery of human skeletal remains in October 2012 was made by CSH during an ongoing archaeological monitoring program for the Nimitz and Ala Moana Resurfacing and Lighting Replacement Project. The inadvertent discovery was located in front of Aloha Tower on Ala Moana Boulevard, near the intersection of Bishop Street. The remains were identified as an isolated left femur from an adult male. The femur was found in a gravelly loam fill layer containing historic artifacts (glass bottles and ceramics), bricks, and faunal bone. It is believed that this fill layer was mixed with a former A-horizon (Tulchin, Van Ryzin, and Hammatt 2013; draft).

## **2.6 Modern Land Use and Built Environment**

The Waterfront Zone traverses an urban environment centered around Honolulu Harbor. Today, the harbor area still functions as the state's major port facility. The centerline of the project alignment within the Waterfront Zone lies within Nimitz Highway. Honolulu Harbor lies immediately adjacent to the highway throughout much of its length, with many wharves and industrial warehouses fronting the harbor. Parcels bordering Nimitz Highway *mauka* contain largely commercial and residential structures with associated parking lots. A massive utility corridor is also present throughout the Waterfront Zone containing electrical, gas, water, sewer, and storm lines. The number and distribution of these existing utilities indicates that this portion of the transit corridor has been heavily disturbed in the past.

## 2.7 Test Excavation 96 (T-096)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	170
<b>TMK#:</b>	1-7-002:026
<b>Elevation:</b>	2.3 m
<b>UTM:</b>	617756.48 mE, 2357176.35 mN
<b>Max Length/Width/Depth:</b>	6.74 m / 0.65 m / 2.16 m
<b>Orientation:</b>	240 / 60° TN
<b>Targeted Project Component:</b>	Station Building
<b>USDA Soil Designation:</b>	Ewa silty clay loam (EmA)

**Setting:** Test Excavation 96 (T-096) was located in a parking lot east of Nimitz Highway and north of Kekaulike Street. T-096 was on private property owned by 902 Partners LLC. Nearby utilities included an electric line 30 m west of T-096 and a gas line 34 m west. The original location of T-096 was offset by 2.0 m to the southwest. The test excavation was slightly elevated from the surrounding land surface as it was in a parking lot.

**Summary of Background Research and Land Use:** The 1847 Metcalf map showed T-096 approximately 20 m east of the historic shoreline. According to the 1886 Wall map, T-096 was within LCA 170, which consisted of one house lot to Mataio Kekūanāo'a, and police, fire and church buildings were present in the area. The 1887 Wall map showed substantial urban development with a street grid system in place and T-096 located north of Kekaulike Street. By 1897 T-096 was located 330 m southeast of O'ahu Prison and 450 m southwest of St. Louis College. Honolulu Harbor and a railway were present, and the shoreline had been extended (1897 Monsarrat map). According to the 1914 Series Sanborn Fire Insurance map, T-096 was located between Rigging Loft and O'ahu Market, approximately 30 m north of North Queen Street. This map showed the northeast end of the test excavation located under a structure measuring approximately 3.3 m by 3 m. By 1933 massive urban development had spread throughout the Waterfront area (1933 War map). The 1953 Army Mapping Service map showed major streets and highways present, as well as Aloha Tower southwest of T-096. By this time T-096 was located 67 m east of the shoreline.

Several archaeological studies were conducted in the vicinity of T-096. Emergency archaeological data recovery was performed at the River-Nimitz Redevelopment Project site, 30 m northwest of T-096, when a pre-Contact, traditional Hawaiian human burial (SIHP # 50-80-14-4192) was inadvertently discovered during construction activities (Landrum 1992). Approximately 30 m east of T-096, Winieski and Hammatt (2001) performed archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project. During the study, a remnant of light gauge trolley rail (SIHP # 50-80-14-5942) associated with the historic Honolulu Rapid Transit trolley system was observed at the Nimitz Highway and Queen Street intersection. A monitoring project mauka of T-096 resulted in the discovery of a pre-Contact human burial (SIHP # 50-80-14-05781) 160 m southeast of the test excavation (Elmore and Kennedy 2001). An inventory survey with subsurface testing was conducted 80 m northeast of T-096. The study

resulted in several findings, including a fishpond (SIHP # 50-80-14-4587) which was in use during the nineteenth century, and a multi-component site (SIHP # 50-80-14-4588) comprised of 53 features dating from the twentieth century to pre-Western contact, as well as three human burials (Kennedy et al. 1994). An archaeological inventory survey conducted by Goodwin (1997), 70 m southeast of T-096, revealed more than 100 archaeological features and several cultural stratigraphic layers (SIHP # 50-80-14-4875). An inventory survey for the proposed Nimitz Highway Water System was conducted 145 m northwest of T-096. The study focused primarily on the prehistorically-constructed Kawa Fishpond (SIHP # 50-80-14-05966). Historic artifacts were recovered from fishpond sediments and it was determined that the fishpond had been accumulating sediment since approximately AD 1150-1350 (McDermott and Mann 2001).

**Documentation Limitations:** T-096 was excavated to the coral shelf at a maximum depth of 2.16 mbs. Five features associated with a subsurface cultural deposit (SIHP #350-80-14-07427) were observed, including a human talus which was found in backfill and caused excavation to temporarily halt. Further exploration of T-096 was conducted by trowel and by hand-screening backfill. A void in the southeast wall at the northeast end of T-096 created instability and prevented exploration inside the test excavation.

**Stratigraphic Summary:** The stratigraphy of T-096 was composed of fill material (Ia-Ij) overlying natural sediment (II) to the coral shelf. Observed strata in the southeast wall included asphalt (Ia), very gravelly loam base course (Ib), very gravelly loam grading fill (Ic), very gravelly sandy loam fill (Id), gravelly sandy loam (Ie), gravelly sandy loam fill (If), gravelly sandy loam fill (Ig), silty clay loam fill (Ih), gravelly silty clay loam fill (Ii), and very gravelly loam fill (Ij) overlying previously disturbed natural gravelly clay loam (II) to the coral shelf

The stratigraphy generally conforms to the USDA soil survey designation of Ewa silty clay loam (EmA). Stratum II (gravelly clay loam) appears to be previously disturbed natural sediment.

**Artifacts Discussion:** Two traditional Hawaiian artifacts (Acc. # 096-H-1 to H-2) were collected from Stratum II, including four pieces of volcanic glass debitage, and one bone net mender. A total of 25 historic artifacts (Acc. # 096-A-1 to A-25, see following table and photographs) were collected from Strata Id and Ii, Feature 3. Historic artifacts collected from Id consisted of building material fragments including bricks and nails that may date from the late 1800s to the early 1900s. Historic artifacts collected from Stratum Ii, Feature 3 consisted of bottle fragments that date to post-1800, and ceramic fragments including one with an Asian decoration. An Asian porcelain rice bowl was also collected from Stratum Ii. Artifacts collected from Stratum Ii are consistent with late 1800s to early 1900s fill events.

**Features Discussion:** A total of five features (Feature 1-4, and 16) were identified within T-096 and were designated as features of SIHP# 50-80-14-7427.

SIHP# -7427 Feature 1 consisted of a portion of an in situ building foundation that was comprised of two courses of mortared red brick overlying and secured to a concrete pad or foundation. Feature 1 originated at 0.27 mbs and terminated at 0.1.10 mbs. Feature 1 measured more than 1.4 m long by more than 0.15 m wide, extending beyond the length and width of the test excavation. The feature was observed in situ within the northwest sidewall of the excavation. The feature may be contemporaneous with the deposition of Stratum Ig (possible hydraulic fill), and appeared to be overlain by Stratum Ic (very gravelly sandy loam fill).

SIHP# -7427 Feature 2 consisted of an in situ concrete slab. Feature 2 originated at approximately 0.27 mbs and terminated at approximately 0.43 mbs. Feature 2 measured more than 2.33 m long by more than 0.65 m wide, extending beyond the length and width of the test excavation. The feature was observed in situ within T-096 and extended into both the northwest and southeast sidewalls. The feature may be contemporaneous with the deposition of crushed coral fill, which has been designated Stratum Id.

SIHP# -7427 Feature 3 consisted of a buried culturally-enriched fill deposit containing faunal bone fragments, burnt and rusted metal fragments, glass fragments, ceramic fragments and slag within a gravelly silty clay loam sediment matrix. Feature 3 originated at approximately 1.15 mbs and terminated at approximately 1.35 mbs. Feature 3 measured more than 5.74 m long by more than 0.65 m wide, extending beyond the length and width of the test excavation. The feature was observed as a continuous deposit within T-096, extending into the excavation sidewalls in all directions. The feature (Ii) has been deposited over crushed coral (Ij) and previously disturbed natural sediment (II), and was overlain by possible hydraulic fill (Ih).

SIHP# -7427 Feature 4 included human skeletal remains identified as a single human talus bone, and was identified during excavation within the backfill pile. The talus bone was estimated to originate from approximately 0.70 mbs within Stratum If (gravelly sandy loam) as documented within the southeast sidewall.

SIHP# -7427 Feature 16 originated at approximately 1.21 mbs and terminated at approximately 2.16 mbs. The feature was observed as a continuous deposit within T-096, extending into the excavation sidewalls in all directions. The feature (Stratum II) has been deposited over the natural coral shelf and was overlain by crushed coral (Ij) and a culturally-enriched fill deposit (Ii, Feature 3). Sample analysis (see below) has documented the presence of marine shell midden, faunal material, and artifacts within Feature 16. Feature 16 measured more than 5.74 m long by more than 0.65 m wide, extending beyond the length and width of the test excavation. SIHP# -7427 Feature 16 was also observed in adjacent archaeological test bores, T-097 through T-101.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected individually during excavation from three strata (Id, Ii, and II). Faunal remains, collected from Stratum Id of T-096 (0.35-0.7 mbs) include *Bos taurus*, *Sus Scrofa*, *Capra aegagrus hircus* and *Capra aegagrus hircus* (possible) skeletal elements. In addition to the mammalian remains recovered, there were also unmodified rib fragments and vertebrae, from an unidentified *Osteidhyes* recovered from Stratum Id.

Faunal remains collected from Stratum Ii (1.32-1.35 mbs) include *Canis lupus familiaris*, *Sus scrofa*, *Bos taurus* and medium mammal skeletal elements. This Stratum (Ii), a culturally enriched fill with historic, was included in Feature 3 of SIHP #50-80-14-07427.

The faunal remains collected from Stratum II (1.7 mbs) consisted of *Sus scrofa*, *Canis lupus familiaris*, and other medium mammal skeletal elements. This Stratum (II), a culturally enriched and reworked natural sediment, was included in Feature 16 of SIHP #50-80-14-07427.

Some of the bones showed marks consistent with butchering by a metal blade, which (in addition to the introduced species) indicated an historic origin, not traditional Hawaiian: *Bos taurus*, *Capra aegagrus hircus* and possible *Capra aegagrus hircus* from Id; *Bos taurus* from Ii; and the

medium mammal fragment from II. The *Sus scrofa* femur from Ii showed butcher marks from some other type of blade, and the rest of the bones showed no indication of cultural modification.

**Sample Results:** A total of four bulk sediment samples and one screened sample were collected from within T-096.

A two-liter bulk sediment sample collected from Stratum Ii (Feature 3) between 1.15 mbs and 1.20 mbs in the southeast excavation sidewall contained charcoal (1.5 g), calcified shell fragments (1.0 g), *Echinodermata diadema sp./mathaei sp.* (0.1 g), burnt or melted glass fragments (20.5 g), ceramic fragments (0.6 g), slag (0.1 g), unidentified fish remains (0.7 g), and an unidentified medium mammal bone fragment (0.1 g).

A five-liter bulk sediment sample collected from Stratum II (Feature 16) between 1.34 mbs and 1.64 mbs in the northwest excavation sidewall (not depicted on stratigraphic profile) contained charcoal (0.3 g), midden (8.3 g), naturally-occurring marine shell (1.1 g), a burned *kukui* nut fragment (0.1 g), a piece of volcanic glass (0.1 g), ceramic fragments (0.2 g), an unidentified medium mammal bone fragment (0.6 g), unidentified fish remains (0.3 g), Scaridae teeth (0.1 g), a shark tooth (0.1 g), and vesicular basalt pebbles (4.5 g). Midden collected included Mytilidae *Brachidontes crebristriatus* (2.8 g), Neritidae *Nerita picea* (2.7 g), Isognomidae *Isognomon* sp. (1.3 g), Tellinidae *Tellina palatum* (0.8 g), crustacean (0.3 g), and Echinodermata *diadema* sp. and *mathaei* sp. (0.1 g).

A 15-liter screened sample collected from Stratum II (Feature 16) between 1.45 and 1.70 mbs in the southeast excavation sidewall contained charcoal (0.5 g), marine shell midden (39.6 g), a dog (*Canis lupus familiaris*) spinous process fragment (0.3 g), and a waterworn basalt pebble (13.4 g). Midden collected included Isognomidae *Isognomon* spp. (23.6 g), Tellinidae *Tellina palatum* (7.4 g), Neritidae *Nerita picea* (4.5 g), Mytilidae *Brachidontes crebristriatus* (3.6 g), and Trochidae *Trochus* sp. (0.5 g).

A five-liter bulk sediment sample collected from Stratum II (Feature 16) between 1.54 mbs in the southeast excavation sidewall and 1.73 mbs contained charcoal (1.1 g), marine shell midden (2.9 g), a rat (*Rattus sp.*) bone (0.3 g), and a pig (*Sus scrofa*) bone fragment (0.1 g). Midden collected included Isognomidae *Isognomon* sp. (0.1 g), Trochidae *Trochus* sp. (1.1 g), Tellinidae *Tellina palatum* (0.5 g), bivalves and gastropods (0.4 g), Neritidae *Nerita picea* (0.4 g), Mytilidae *Brachidontes crebristriatus* (0.3 g), and Echinodermata *diadema* sp. (0.1 g).

A 5-liter bulk sediment sample collected from Stratum II (Feature 16) at 1.66 mbs in the southeast excavation sidewall contained charcoal (1.0 g), marine shell midden (97.3 g), an unidentified medium mammal bone fragment (0.4 g), an unidentified fish bone (0.2 g), and vesicular angular basalt gravel (149.3 g). Midden collected included Isognomidae *Isognomon* sp. (58.3 g), Tellinidae *Tellina palatum* (13.6 g), Mytilidae *Brachidontes crebristriatus* (10.5 g), Conidae *Conus* sp. (7.1 g), Neritidae *Nerita picea* (4.7 g), burned shell (2.0 g), Echinodermata *diadema* sp. and *mathaei* sp. (0.9 g), burned crustacean (0.1 g), and Neritidae *Theodoxus neglectus* (0.1 g).

Volcanic glass samples from Stratum II (1.34-1.64 mbs) were submitted for EDXRF analysis. Specific source information was not available; however the volcanic glass samples clearly did not match sources derived from Hawaii County. The samples were from both “Group 1” and “Group 2” sources. The samples represent two distinct geochemical groups identified from the

35 City Center AIS EDXRF volcanic glass samples, suggesting different volcanic sources on O'ahu (see EDXRF discussion in Volume V).

The results of sample analysis documented the presence of historic artifacts and industrial slag within Stratum Ii (Feature 3), and the presence of marine shell midden, faunal material, and artifacts within Stratum II (Feature 16). The presence of cultural material within both Stratum Ii and Stratum II supports the identification of these strata as culturally-enriched deposits and features of SIHP# -7427.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features which might indicate the presence of utilities although a concrete slab and a brick building foundation were encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.75 mbs.

GPR depth profiles for T-096 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.20 mbs. The profile did show an anomaly on the southeast end of the excavation which could correspond to a concrete slab that was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-096 was excavated to the coral shelf at a maximum depth of 2.16 mbs. The stratigraphy of T-096 was composed of fill material (Ia-Ij) overlying natural sediment (II) to the coral shelf. The stratigraphy generally conforms to the USDA soil survey designation of Ewa silty clay loam (EmA). Stratum II (gravelly clay loam) appears to be previously disturbed natural sediment. A total of two traditional Hawaiian artifacts (Acc. 096-H-1 to H-2) were collected from Stratum II and included one bone net mender and four pieces of volcanic glass debitage. Artifacts collected from Stratum Ii were consistent with late 1800s to early 1900s fill events. A total of five features (Feature 1-4, and 16) were identified within T-096 and were designated as features of SIHP# 50-80-14-7427. Faunal remains were collected from three strata (Ii, Ii, and II) within T-096. The results of sample analysis documented the presence of historic artifacts and industrial slag within Stratum Ii (Feature 3), and the presence of marine shell midden, faunal material, and artifacts within Stratum II (Feature 16). The presence of cultural material within both Stratum Ii and Stratum II supports the identification of these strata as culturally-enriched deposits and features of SIHP# -7427. A complete description of SIHP# -7427 is provided in Volume I.



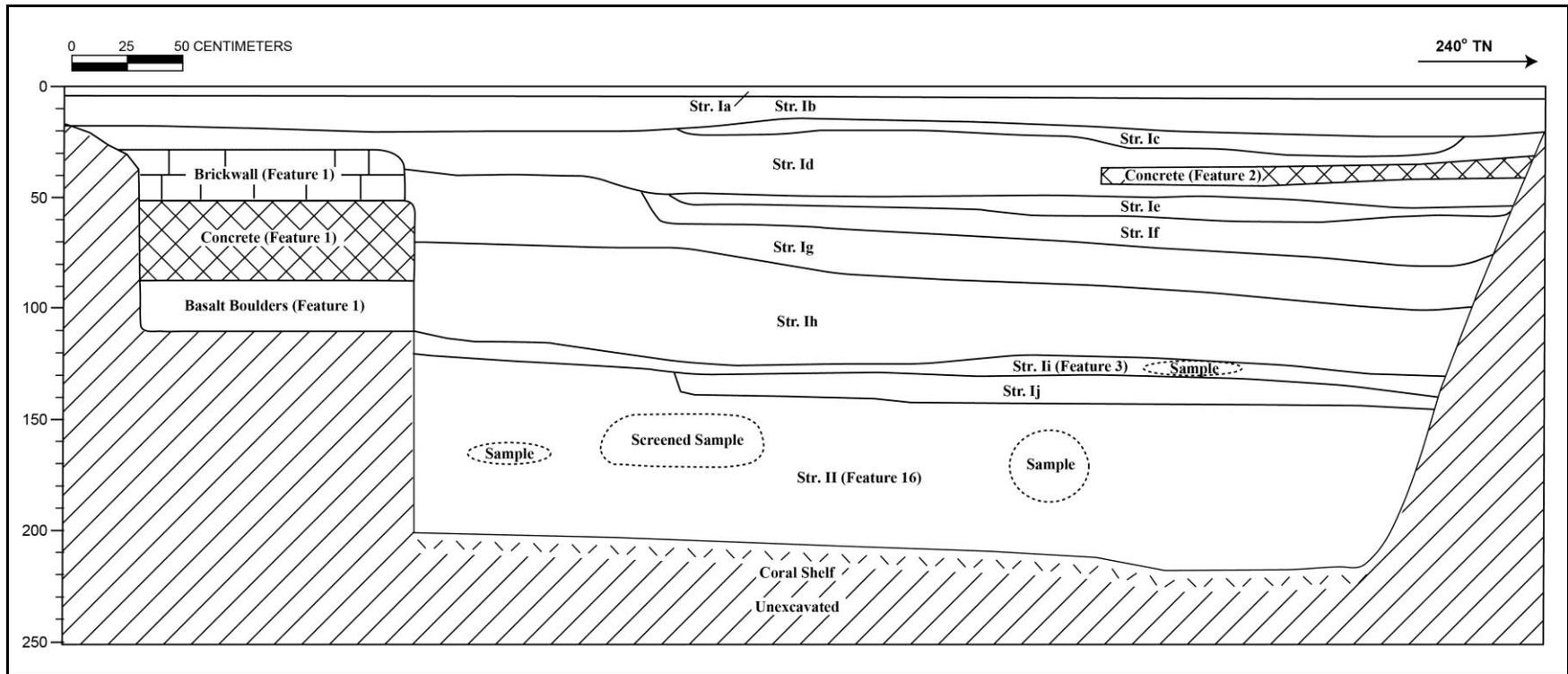
T-096: General location photo, view to southwest



T-096: Northwest profile wall (view to north)



T-096: Southeast profile wall (view to east)



T-096: Southeast wall profile

## T-096 Stratigraphic Description (southeast wall)

<b>Stratum</b>	<b>Depth (cmbs)</b>	<b>Description</b>
Ia	0-3	Asphalt
Ib	3-20	Fill; 10 YR 5/1 (gray); very gravelly loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	15-30	Fill; 2.5 Y 8/1 (white); very gravelly loam; weak, medium, blocky structure; moist, friable consistency; non-plastic; mixed origin; abrupt, broken/discontinuous lower boundary; contained concrete and brick wall inclusions; crushed coral grading fill with concrete fragments
Id	20-50	Fill; 2.5 Y 4/1 (dark gray); very gravelly sandy loam; weak, fine, crumb structure; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contained faunal remains, red brick, basalt brick, cement brick, building foundation, pipe, nails and glass; historical layer
Ie	45-60	Fill; 5 Y 3/1 (very dark gray); gravelly sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed; abrupt, broken/discontinuous lower boundary; crushed coral
If	60-75	Fill; 2.5 Y 4/1 (dark gray); gravelly sandy loam; weak, fine, crumb structure; moist, loose consistency; non-plastic; mixed origin; abrupt, broken/discontinuous lower boundary; contained nails, ceramic and glass fragments; human talus bone at 70 cmbs
Ig	40-86	Fill; 10 YR 2/2 (very dark brown); gravelly silty loam; weak, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; contained nails, glass, ceramics and burnt inclusions
Ih	70-120	Fill; 7.5 YR 3/3 (dark brown); silty clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; had bands of stream-deposited soil—some very sandy, some more clayey
Ii	115-120	Fill; 10 YR 2/2 (very dark brown); gravelly silty clay loam; weak, medium, blocky structure; moist, friable, consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; contained faunal remains, rusted metal, slag inclusions, ceramic and glass
Ij	130-144	Fill; 2.5 Y 8/1 (white); very gravelly loam; weak, medium, blocky structure; moist, friable consistency; non-plastic; mixed origin; abrupt, broken/discontinuous lower boundary; crushed coral
II	121-216	Natural; 10 YR 2/2 (very dark brown); gravelly clay loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origins; contained faunal bone and light shell midden; previously disturbed natural sediment

## T-096 Artifacts Analysis Table

Acc.# 096- A-	Prov.	Ceramic Vessel Type	Portion	No.	Paste; Decoration	Origin; Age	Comments
1	T-096, St. Ii	Hollowware - bowl	Body	1	Porcelain	Asian	Yellow; Shallow bowl with high foot
2	T-096, St. Ii, Fea. 3	Dinnerware	Body	2	Earthenware		White
3	T-096, St. Ii, Fea. 3	Dinnerware	Body	1	Earthenware		Yellow
4	T-096, St. Ii, Fea. 3	Dinnerware	Body	2	Porcelain; Painted underglaze	Asian	Bluish-white; Asian design
Acc.# 096- A-	Prov.	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
5	T-096, St. Ii, Fea. 3	Bottle	Base	1	Amber	1800- post	
6	T-096, St. Ii, Fea. 3	Bottle	Body	2	Clear	1870s- post	
7	T-096, St. Ii, Fea. 3	Bottle	Body	3	Olive, Dark		
8	T-096, St. Ii, Fea. 3	Bottle	Body	11	Olive, Dark		
Acc.# 096- A-	Prov.	Misc. Type	Portion	No.	Material	Origin; Age	Comments
9	T-096 St. Id	Brick	Fragment	2	--		Red color
10	T-096 St. Id	Brick	Fragment	2	--		Yellow color
11	T-096 St. Id	Brick	Fragment	1	--	ca. 1900	Red color, machine-made
12	T-096 St. Id	Brick	Fragment	1	--	1886- 1918	Yellow color, circular impression on one long side
13	T-096 St. Id	Brick	Fragment	1	--	1807- 1860	Tan-yellow color, machine made
14	T-096 St. Id	Brick	Fragment	1	--	1807- 1860	Tan-yellow color, machine made
15	T-096 St. Id	Metal	Fragment	1	Metal		Possible Iron Ore or Hematite
16	T-096, St. Id	Nail	Complete	1	Metal		Large nail, but not tapered at end like a spike
17	T-096, St. Id	Nail	Frag. (3)	1	Metal	1790- 1920	Square profile; possibly cut nails
18	T-096, St. Id	Pipe Stem	Fragment	1	Porcelain		Painted near bore "TITA..."
19	T-096, St. Ii, Fea. 3	Button	Complete	1	Wood		4-hole, recessed panel, convex-concave, polished
20	T-096, St. Ii, Fea. 3	Slag	Fragment	2	Slag		Chunk of slag with small piece broken off

<b>Acc.# 096-A</b>	<b>Prov.</b>	<b>Misc. Type</b>	<b>Portion</b>	<b>No.</b>	<b>Material</b>	<b>Age; Origin</b>	<b>Comments</b>
21	T-096, St. Ii, Fea. 3	Slate?	Fragment	1	Slate?		
22	T-096, St. Ii, Fea. 3	Unknown	Fragment	1	Composite		Mass of metal and leather
23	T-096, St. Ii, Fea. 3	Unknown	Fragment	1	Metal		Rusted object
24	T-096, St. Id	Brick	Fragment	1	--		Yellow color, coral inclusions
25	T-096, St. Id	Brick	Fragment	1	--		Red color, machine-made



T-096 net mender (ACC. # 096-H-3) from Stratum II



T-096 net mender (ACC. # 096-H-3) from Stratum II



T-096 ceramic artifact fragments (Acc. # 096-A-1 to A-4) from Stratum Ij



T-096 ceramic artifact fragments (Acc. # 096-A-1 to A-4) from Stratum Ij



T-096 glass fragments (Acc. # 096-A-5 to A-8) from Stratum II



T-096 miscellaneous glass and ceramic fragments (Acc. # 096-A-5 to A-8-) from Stratum II

## T-096 Terrestrial vertebrate material collected individually during excavation

Acc. #	Stratum	Depth (cmbs)	Feature	Family/ Class	Species	Element	Description	Modification
096-F-1	Id	35-70	-	Bovidae (cow)	<i>Bos taurus</i>	Diaphysis section	Fragment	Butchered (cut with metal blade)
096-F-2	Id	35-70	-	Suidae (pig)	<i>Sus scrofa</i>	Incisor	Complete	None
096-F-3	Id	35-70	-	Bovidae (goat)	<i>Capra aegagrus hircus</i>	Metacarpal; Metatarsus; Phalanges; Vertebra	Complete/ fragments	Phalanges butchered (cut with metal blade)
096-F-4	Id	35-70	-	Bovidae (goat)	<i>Capra aegagrus hircus</i> (possible goat)	Cranial; diaphysis sections; ulna	Fragments	Ulna butchered (cut with metal blade)
096-F-5	Ii	132-135	7427-3	Suidae (pig)	<i>Sus scrofa</i>	Incisor; Mandible; Mandible portion; Teeth; Molars	Complete/ fragments	None
096-F-6	Ii	132-135	7427-3	Canidae (dog)	<i>Canis lupus familiaris</i>	Radius; Diaphysis sections; Femur; Coracoid process; Cranial; Petrous process; Possible metatarsal	Complete/ fragments	None
096-F-7	Ii	132-135	7427-3	Mammalia	Medium mammal	Diaphysis sections; Irregular bones	Fragments	None

Acc. #	Stratum	Depth (cmbs)	Feature	Family/ Class	Species	Element	Description	Modification
096-F-8	Ii	133	7427-3	Bovidae (cow)	<i>Bos taurus</i>	Ribs	Fragments	Butchered (cut with metal blade)
096-F-9	Ii	133	7427-3	Suidae (pig)	<i>Sus scrofa</i>	Femur; Left supra orbital margin; Proximal end of rib; Diaphysis section (possible pig)	Fragments	Butcher marks on femur
096-F-10	II	170	7427-16	Suidae (pig)	<i>Sus scrofa</i>	Mandibular tusk; Mandible	Fragments	None
096-F-11	II	170	7427-16	Canidae (dog)	<i>Canis lupus familiaris</i>	Distal tibia; Rib; Metatarsal	Fragments	None
096-F-12	II	170	7427-16	Mammalia	Medium mammal	Diaphysis section	Fragment	Butchered (cut with metal blade)

## 2.8 Test Excavation 97 (T-097)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	170
<b>TMK#:</b>	1-7-002:026 [Plat]
<b>Elevation Above Sea Level:</b>	2.4 m
<b>UTM:</b>	617748.34 mE, 2357168.74 mN
<b>Max Length/Width/Depth:</b>	6.1 m / 1.22 m / 2.22 m
<b>Orientation:</b>	230 / 50° TN
<b>Targeted Project Component:</b>	HHCTCP Station Building
<b>USDA Soil Designation:</b>	Ewa silty clay loam (EmA)

**Setting:** Test Excavation 97 (T-097) was located in a parking lot east of Nimitz Highway and north of Kekaulike Street. T-097 was on private property owned by 902 Partners LLC. Nearby utilities included an electric line 21 m west of T-097 and a gas line 25 m west. T-097's original location was offset 3.0 m to the southwest. The test excavation was level with the surrounding parking lot surface.

**Summary of Background Research and Land Use:** The 1847 Metcalf map showed the southwest end of T-097 inside a stream. According to the 1886 Wall map, T-097 was within LCA 170, which consisted of one house lot to Mataio Kekūanao'a, and the test excavation was in the corner of Queen Street and Kekaulike Street. The 1887 Wall map showed substantial urban development with a street grid system in place and a post office, fire department and police court in the area. The 1891 Dakin Fire Insurance map indicated that T-097 was formerly located under the northwest corner of a structure labeled "Joss Ho." By 1897 Honolulu Harbor and a railway were present, and the shoreline had been built up (1897 Monsarrat map). According to the 1914 Series Sanborn Fire Insurance map, T-097 was located between a Rigging Loft and O'ahu Market, approximately 15 m northwest of property owned by City Mill Co. Ltd. Planing & Rice Mill. By 1933 massive urban development had spread throughout the Waterfront area (1933 War map). The 1950 Series Sanborn Fire Insurance map showed T-097 located between two small properties labeled "Small Stage" and "Poultry." The 1953 Army Mapping Service map showed major streets and highways present, in addition, Aloha Tower to southwest of T-097.

Several archaeological studies were conducted in vicinity of T-097. Emergency archaeological data recovery was performed at the River-Nimitz Redevelopment Project site, 4 m northwest of T-097, when a pre-Contact, traditional Hawaiian human burial (SIHP # 50-80-14-4192) was inadvertently discovered during construction activities. Several other archaeological features were found at the site, including four post-Contact trash pits with numerous artifacts and a brick and mortar building foundation (Landrum and Dixon 1992). Approximately 20 m west of T-097, Winieski and Hammatt (2001) performed archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project. During the study a remnant of light gauge trolley rail (SIHP # 50-80-14-5942) associated with the historic Honolulu Rapid Transit trolley system was observed at the Nimitz Highway and Queen Street intersection. A monitoring project *mauka* of T-097 resulted in the discovery of a pre-Contact human burial (SIHP # 50-80-14-05781) 160 m

southeast of the test excavation (Elmore and Kennedy 2001). An inventory survey with subsurface testing was conducted 90 m northeast of T-097. The study resulted in several findings, including a fishpond (SIHP # 50-80-14-4587) which was in use during the nineteenth century and a multi-component site (SIHP # 50-80-14-4588) comprised of 53 features, including three human burials, dating from the twentieth century to pre-Western contact (Kennedy et al. 1994). Goodwin (1997) conducted an archaeological inventory survey of the Kekaulike Diamond Head Project 78 m southeast of T-097 which revealed more than 100 archaeological features and several cultural stratigraphic layers (SIHP # 50-80-14-4875). An inventory survey for the proposed Nimitz Highway Water System was conducted 145 m northwest of T-097. The study focused primarily on the prehistorically-constructed Kawa Fishpond (SIHP # 50-80-14-5966). Historic artifacts were recovered from fishpond sediments and it was determined that the fishpond had been accumulating sediment since approximately AD 1150-1350, although no specific date of construction was determined (McDermott and Mann 2001).

**Documentation Limitations:** T-097 was excavated to a maximum depth of 2.22 mbs, where the coral shelf was present. The test excavation could not be entered due to unstable sidewalls.

**Stratigraphic Summary:** The stratigraphy of T-097 consisted of fill strata overlying natural sediment. Observed strata included asphalt (Ia), extremely gravelly sandy loam base course (Ib), gravelly sandy loam fill (Ic), gravelly sandy loam fill (Id), very gravelly sandy loam fill (Ie), and silty clay loam fill (If), overlying natural sandy loam (II-III). Stratum II was considered to be previously disturbed or reworked natural sediment. The stratigraphy generally conformed with the USDA soil survey designation of Ewa silty clay loam (EmA).

**Artifacts Discussion:** A total of 16 historic artifacts (Acc. # 097-A-1 to A-16, see following table and photographs) were collected from Strata Ic, Id, and Ie. Artifacts from Stratum Ic consisted of one ceramic fragment with an Asian decoration, five bottle fragments, some of which have embossing that indicates ages ranging from circa post 1865 to as recently as the 1940s, and miscellaneous historic artifacts including an amethyst color glass fragment with manganese addition that dates from 1820 to 1930s. Artifacts from Stratum Id consisted of three ceramic fragments, two with Asian forms/decorations; one Asian rice bowl has a blue character stamped on the base, indicating it may have been exported to the U.S. before 1921. Other datable artifacts collected from Stratum Id include a post-1903 glass jar, and a machine-made brick fragment that dates from 1918 to 1978 from SIHP# -7427 Feature 5. A mass of building material that lacked datable attributes was collected from Stratum Ie. Artifacts collected from Strata Ic, Id, and Ie were consistent with late 1800 to early 1900 fill events for development.

**Features Discussion:** A total of five features (Feature 5-8, and 16) were identified within T-097 and were designated as features of SIHP# 50-80-14-7427.

SIHP# -7427 Feature 5 consisted of a red brick and mortar wall overlying a concrete slab that was considered to be a possible building foundation remnant. Feature 5 was observed in situ between 0.55 mbs and 1.0 mbs within the southeast excavation sidewall of T-097. Feature 5 measured 0.91 m long by more than 0.20 m wide, extending into the southeast excavation sidewall. The feature may be contemporaneous with the deposition of Stratum Ie (very gravelly sandy loam fill).

SIHP# -7427 Feature 6 consisted of an in situ concrete slab that was considered to be a possible building foundation. Feature 6 was observed between 0.50 mbs and 0.65 mbs within the southern half of T-097. Feature 6 measured 3.23 m long by more than 1.22 m wide, extending beyond the width of the test excavation. The feature may be contemporaneous with the construction of Feature 5. The feature was constructed over Stratum Ie (very gravelly sandy loam fill) and is overlain by Stratum Id (gravelly sandy loam fill), which contained a utility pipe.

SIHP# -7427 Feature 7 consisted of a concrete slab that was considered to be a possible building foundation. Feature 7 was observed between 0.90 mbs and 1.36 mbs within the central portion of T-097. Feature 7 measured 1.47 m long by more than 1.22 m wide, extending beyond the width of the test excavation. The feature appears to pre-date the deposition of the overlying fill (Stratum Ie), and may have been constructed on the upper boundary or surface of Stratum II (Feature 16).

SIHP# -7427 Feature 8 consisted of stacked basalt cobbles overlying a basalt slab that were considered to be possible building foundation remnants. Feature 8 was observed between 0.80 mbs and 1.43 mbs at the southern end of T-097. Feature 8 measured more than 0.87 m long by more than 1.22 m wide, extending beyond the width of the excavation and into the southern end of T-097. The feature appears to be contemporaneous with the deposition of Stratum If (silty clay loam fill).

SIHP# -7427 Feature 16 originated at approximately 1.35 mbs and terminated at approximately 1.80 mbs. The feature was observed as a continuous deposit within T-097, extending into the excavation sidewalls in all directions. The feature (Stratum II) has been deposited over natural sandy loam sediment (III) and was overlain by silty clay loam fill. Sample analysis (see below) has documented the presence of marine shell midden, faunal material, and artifacts within Feature 16. Feature 16 measured more than 1.66 m long by more than 1.22 m wide, extending beyond the length and width of the test excavation. SIHP# -7427 Feature 16 was also observed in adjacent archaeological test bores, T-096 and T-198 through T-101.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected individually during excavation from Stratum Ic (0.45 mbs and at 0.59 mbs), Stratum Ie (1.04 mbs) and the Stratum II/III interface (1.8 mbs). Stratum Ic faunal remains consisted of *Bos taurus* and *Rattus norvegicus* (possible) fragments. Faunal remains within Stratum Ie consisted of *Bos taurus* (possible) fragments. The Stratum III/II remains consisted of *Equus ferus caballus* with perimortem trauma on the distal metapodial. The *Bos taurus* fragments from Ic were cut with a metal blade, indicating an historic origin (not traditional Hawaiian) while the *Bos taurus* fragments from Ie, showed butcher marks other than from a metal blade. The *Equus ferus caballus* skeletal elements (with Perimortem trauma on the distal metapodial) were collected at the interface of Strata II and III, at the base of SIHP# 50-80-14-7427, Feature 16. Due to the fact that horses (*Equus ferus caballus*) were not introduced in Hawai'i until the early 1800s, the presence of this bone at the base of Stratum Feature 16 provides an early 19<sup>th</sup> century *terminus post quem* for this depositional event.

**Sample Results:** A total of two bulk samples were collected from Stratum II at 1.50-1.8 mbs (5.0 L) and 1.8 mbs (1.5 L). Both bulk sediment samples were wet-screened. The sample from Stratum II at 1.50-1.80 mbs contained charcoal (1.5 g), midden (8.0 g), seed pods (0.1 g), bottle glass fragments (1.4 g), ceramic fragments (0.2 g), *Canis lupus familiaris* remains (5.9 g), fish

remains (3.5 g), and naturally-deposited shells (1.8 g). Midden collected included Cymatiidae *Cymatium* sp. (1.5 g), Mytilidae *Brachidontes crebristriatus* (1.5 g), Tellinidae *Tellina palatum* (1.2 g), Echinodermata (0.3 g), crustacean (0.1 g), and Neritidae *Nerita picea* (0.1 g).

The sample from Stratum II at 1.8 mbs contained charcoal (5.1 g), midden (0.2 g), naturally deposited shell (6.1 g), ceramics (0.6 g), glass (0.1 g), medium mammal remains (1.6 g), and fish remains (0.8 g). Midden collected included burned crustacean (0.1 g) and Echinodermata *diadema* sp. and *mathaei* sp. (0.1 g).

The results of the analysis of bulk sediment samples documented the presence of historic artifacts, terrestrial and marine shell content within the matrix of Stratum II.

**GPR Discussion:** A review of amplitude slice maps indicated no linear features although several utilities were encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.75 mbs.

GPR depth profiles for T-097 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs. An anomaly was observed in the profile and it could correspond with one or two of the abandoned utility pipes encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

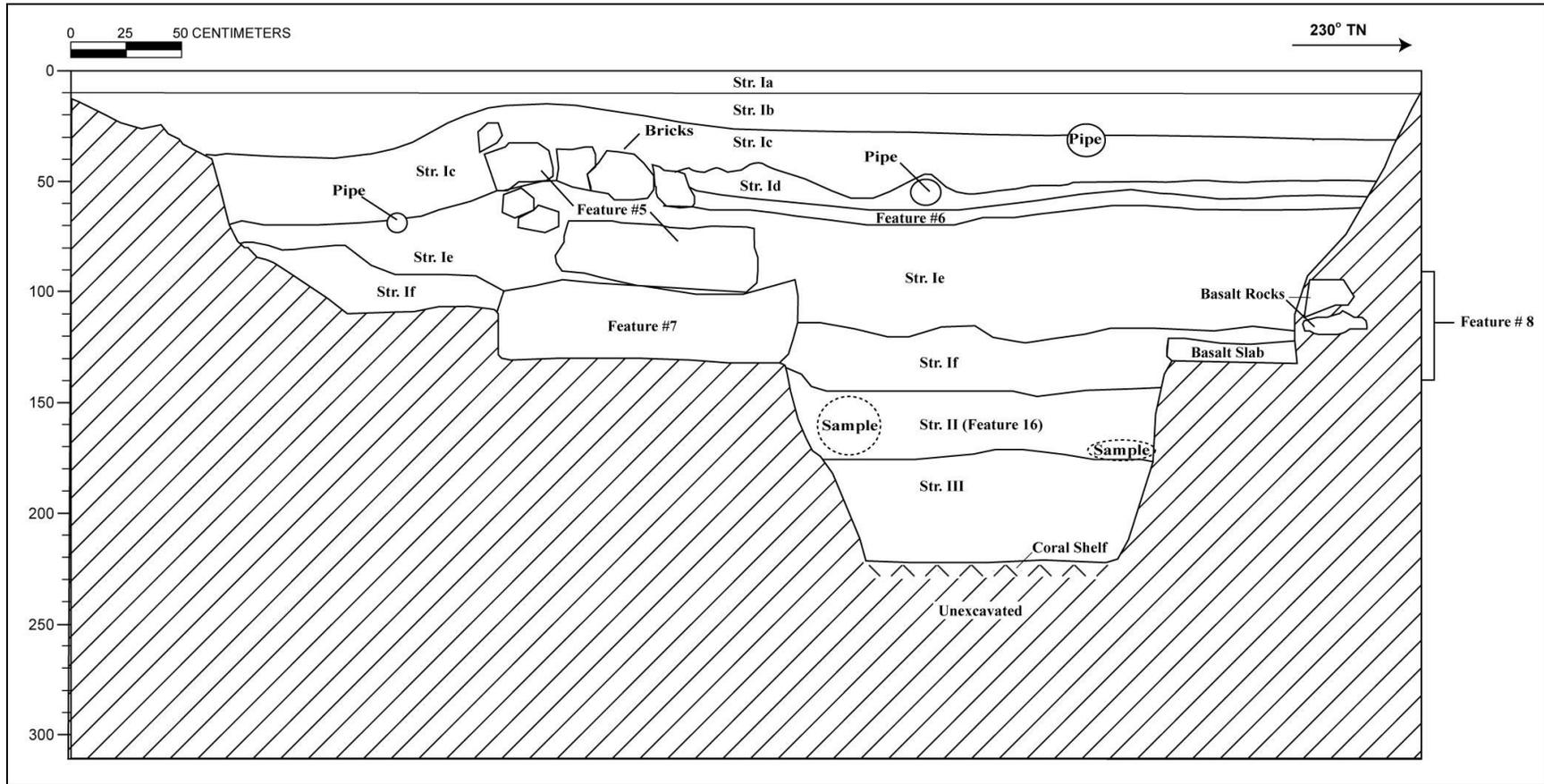
**Summary:** T-097 was excavated to a maximum depth of 2.22 mbs, where the coral shelf was present. The stratigraphy of T-097 consisted of fill strata (Ia to If) overlying natural sediment (II and III). The stratigraphy generally conformed with the USDA soil survey designation of Ewa silty clay loam (EmA). A total of 16 historic artifacts (Acc. # 097-A-1 to A-16, see following table and photographs) were collected from Strata Ic, Id, and Ie. Artifacts collected from Strata Ic, Id, and Ie are consistent with late 1800 to early 1900 fill events for development. A total of five features (Feature 5-8, and 16) were identified within T-097 and were designated as features of SIHP# 50-80-14-7427. Faunal remains were collected from Stratum Ic (0.45 mbs and at 0.59mbs), Stratum Ie (1.04 mbs) and Stratum III (1.8 mbs). The results of the analysis of bulk sediment samples documented the presence of historic artifacts, terrestrial and marine shell content within the matrix of Stratum II. The presence of cultural material within Stratum II supports the identification of the stratum as a culturally-enriched deposit and feature of SIHP# -7427. A complete description of SIHP# -7427 is provided in Volume I.



T-097 general location photo, view to south



T-097 southeast wall profile



T-097 southeast profile wall

## T-097 Stratigraphic Description

Stratum	Depth (cmts)	Description
Ia	0-10	Asphalt
Ib	10-35	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket; base course imported fill
Ic	35-60	Fill; 10 YR 4/2 (light gray); gravelly sandy loam; weak, medium, blocky structure; moist, friable consistency; non-plastic; mixed origin; broken/discontinuous lower boundary; appeared to be associated with metal pipe remains
Id	40-60	Fill; 10 YR 3/2 (very dark gray brown); gravelly sandy loam; weak, fine, crumb structure; moist, loose consistency; non-plastic; contained glass bottle fragments and metal; upper boundary consisted of a thin layer of burnt trash
Ie	60-123	Fill; 10 YR 3/3 (dark brown); very gravelly sandy loam; weak, medium to coarse, crumb structure; moist, very friable consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; contained glass and ceramics
If	80-145	Fill; 7.5 YR 3/3 (dark brown); silty clay loam; structureless, massive; moist, very firm consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; contained metal, a rounded fiberglass dish (bowl/cup); distinct striations present, possibly caused by water
II	135-180	Natural; 10 YR 2/2 (very dark brown); sandy loam; structureless, single-grain; moist, firm consistency; non-plastic; mixed origin; clear, smooth lower boundary; contained abundant charcoal and shell fragments, faunal bone; previously disturbed or reworked natural sediment
III	175-222	Natural; 10 YR 4/3 (brown); sandy loam; structureless, single-grain; moist, loose to very friable consistency; non-plastic; mixed origin; abrupt lower boundary; in situ natural sediment

T-097 Artifacts Analysis Table

Acc. # 096-A-	Prov.	ID	Portion	No.	Paste; Decoration	Origin; Age	Comments
1	T-097, St. Ic	Hollow-ware - cup	Body	1	Porcelain; Painted underglaze	Asian	White with blue flowers
2	T-097, St. Id	Hollow-ware - bowl	Base to body	1	Porcelain; Painted underglaze	Asian	White with blue swirls at base; high foot
3	T-097, St. Id	Hollow-ware	Base	1	Porcelain	Asian	Celadon; Asian blue character stamped on base
4	T-097, St. Id	Flatware	Rim	1	Earthenware , Refined	None	White
Acc. # 096-A-	Prov.	Type	Portion	No.	Color	Origin; Age	Comments
5	T-097, St. Ic	Bottle, Cleaner	Base	1	Amber	1940s	"REG /CLOROX / PAT" on-body (Clorox 2013)
6	T-097, St. Ic	Bottle	Base	1	Aqua	ca. 1865- post	Embossed on base - a diamond; on heel "1500"
7	T-097, St. Ic	Bottle	Neck-lip	1	Aqua	1920s- 1930s	"REGISTERED PATENTED 'PRIOF'" (BLM/SHA)
8	T-097, St. Ic	Bottle	Base	1	Clear	1870s- post	
9	T-097, St. Ic	Bottle	Lip	1	Clear	1907- post	
10	T-097, St. Id	Jar	Complete	1	Clear	1903- post	
Acc. # 096-A-	Provenience	Type	Portion	No.	Material	Origin; Age	Description
11	T-097, St. Ic, Fea. 7	Building material	Fragment	1	Composite		Basalt / mortar/ concrete mass
12	T-097, St. Ic	Insulator Cleat	Fragment	1	Stoneware		Rectangular cleat, unglazed
13	T-097, St. Ic	Pressed Glass	Fragment	1	Glass	1820- 1930s	Amethyst color; manganese addition used from 1820-1930s; fluted pattern
14	T-097, St. Ic	Seed, Burr	Complete	1	Plant Seed		<i>Caesalpinia bonduc</i> ; Hawaiian pearl; sometimes used by children as marbles; sometimes strung in lei
15	T-097, St. Ic	Strap - Harness?	Fragment	4	Leather		Seams sewn; metal on one end
16	T-097, St. Id, Fea. 5	Brick	Fragment	1		1918- 1978	red color, machine-made



T-097 ceramic fragment artifacts (Acc. # 097-A-2, A-3, A-4) from Stratum Id



T-097 ceramic fragment artifacts (Acc. # 097-A-2, A-3, A-4) from Stratum Id



T-097 glass bottle fragments (Acc. # 097-A-5, A-7, A-8, A-9) from Stratum Ic



T-097 glass bottle artifact (Acc. # 097-A-10) from Stratum Id

## T-097 Terrestrial vertebrate material collected individually during excavation

Acc. #	Stratum	Depth (cmbs)	Feature	Family/Class	Species	Element	Description	Modification
097-F-1	Ic	45	-	Bovidae (cow)	<i>Bos taurus</i>	Diaphysis sections	Fragments	Butchered (cut with metal blade)
097-F-2	Ic	59	-	Muridae (rat)	<i>Rattus norvegicus</i> (possible)	Calcaneus; Metacarpals/metatarsals	Fragments	None
097-F-3	Ie	104	-	Bovidae (cow)	<i>Bos taurus</i> (possible)	Diaphysis sections (Mostly thin cortical bone)	Fragments	Butcher marks on cortical bone
097-F-4	II/III	180	7427-16	Equidae (horse)	<i>Equus ferus caballus</i>	Distal metapodial; Metatarsals (possible); Unfused diaphysis section (possible horse)	Complete/fragments	Perimortem trauma on distal metapodial

## 2.9 Test Excavation 98 (T-098)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	170
<b>TMK#:</b>	1-7-002:026 [Plat]
<b>Elevation Above Sea Level:</b>	2.2 m
<b>UTM:</b>	617740.89 mE, 2357163.86 mN
<b>Max Length/Width/Depth:</b>	6.74 m / 0.62 m / 1.10 m
<b>Orientation:</b>	140 / 320° TN
<b>Targeted Project Component:</b>	HHCTCP Station Building
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 98 (T-098) was located within the center of a level parking lot at the corner of Kekaulike Street (45m to the southeast) and Nimitz Highway (24m southwest and 0.12m below T-098 surface). T-098 was located within privately owned property. There were no utilities indicated within the vicinity of T-098. The original location of T-098 was offset to an orientation of 140/320 TN in order to mitigate the potential of encountering utilities and safety concerns. The excavation surface was level with the surrounding topography.

**Summary of Background Research and Land Use:** The 1847 Metcalf map showed T-098 approximately 28 m east of the historic shoreline. The southeastern portion of the unit was within a small inlet. According to the 1886 Wall map, T-098 was within LCA 170, which consisted of one house lot awarded to Mataio Kekūānāo'a. The 1887 Wall map showed substantial urban development with a street grid system in place and a post office, fire department and police court in the area. By 1897 Honolulu Harbor and a railway were present, and the shoreline had been built up (1897 Monsarrat map). According to the 1914 Series Sanborn Fire Insurance map, T-098 was located between a Rigging Loft and O'ahu Market, and approximately 30 m northwest of property owned by City Mill Co. Ltd. The 1933 War Honolulu map showed large scale urban development had continued to the Waterfront area. The 1953 Army Mapping Service map showed T-098 in its modern setting, as well as Aloha Tower southwest of T-098. By this time T-098 was located 58 m southeast of the shoreline.

Several archaeological studies were conducted in vicinity of T-098. Emergency archaeological data recovery was performed at the River-Nimitz Re-development Project site, 45 m northwest of T-098, where a pre-Contact, traditional Hawaiian human burial (SIHP # 50-80-14-4192) was inadvertently discovered during construction activities. Several other archaeological features were found at the site, including four post-Contact trash pits with numerous artifacts and a brick and mortar building foundation (Landrum and Dixon 1992). 8 m west of T-098, Winieski and Hammatt (2001) performed archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project. During the study a remnant of light gauge trolley rail (SIHP # 50-80-14-5942) associated with the historic Honolulu Rapid Transit trolley system was observed at the Nimitz Highway and Queen Street intersection. A monitoring project northeast of T-098 resulted in the discovery of a pre-Contact human burial (SIHP # 50-80-14-05781) 85 m southeast of T-098 (Elmore and Kennedy 2001). An inventory survey with subsurface testing was conducted 115 m

northeast of T-098. The study resulted in several findings, including a fishpond (SIHP # 50-80-14-4587) which was in use during the nineteenth century and a multi-component site (SIHP # 50-80-14-4588) comprised of 53 features, including three human burials, dating from the twentieth century to pre-Western contact (Kennedy et al. 1994). An archaeological inventory survey of the Kekaulike Diamond Head Project was conducted by Goodwin (1997). This study was located 115 m east of T-098 and revealed more than 100 archaeological features and several cultural stratigraphic layers (SIHP # 50-80-14-4875). An inventory survey for the proposed Nimitz Highway Water System was conducted 16 m west of T-098. The study focused primarily on the pre-Contact constructed *Kawa* Fishpond (SIHP # 50-80-14-5966). Historic artifacts were recovered from fishpond sediments and it was determined that the fishpond had been accumulating sediment since approximately AD 1150-1350, although no specific date of construction was determined (McDermott and Mann 2001).

**Documentation Limitations:** T-098 was excavated to a depth of 1.10 mbs. A subsurface concrete utility jacket within the southeast portion of the excavation and unstable sidewalls throughout the excavation were limiting factors within T-098.

**Stratigraphic Summary:** The stratigraphy of T-098 consisted of fill strata to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly sandy loam fill (Ib), gravelly loam fill (Ic), clay fill (Id), and very gravelly clay loam fill (Ie). The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

**Artifact Discussion:** A single red brick fragment (Acc. # 098-A-1) that lacked datable attributes was collected from Stratum If.

**Features Discussion:** Two features (Feature 9 and Feature 16) were identified within T-098 and designated as a part of SIHP# 50-80-14-7427.

SIHP# -7427 Feature 9 consisted of an in situ concrete slab and an adjacent formed concrete structure that were considered to be possible building foundation remnants. Feature 9 was observed between 0.45 mbs and 1.05 mbs within the central portion of T-098. Feature 9 measured 2.70 m long by more than 0.62 m wide, extending beyond the width of the test excavation. The feature was constructed over or within Stratum Ie (very gravelly clay loam fill) and is overlain by Stratum Id (clay fill).

SIHP# -7427 Feature 16 was not observed during excavation, as T-098 was terminated before the layer was reached. Feature 16 was however identified in adjacent boring between 1.53 mbs and 2.13 mbs in Core 1 West. The feature consisted of very gravelly sandy clay with charcoal flecking. It was deposited over natural sandy clay sediment and was overlain by stony silt fill. Feature 16 was also identified in T-096, T-97 and T-99 through T-101.

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

**Sample Results:** No bulk sediment samples were collected during the investigation of T-098.

**GPR Discussion:** A review of amplitude slice maps indicated linear features, one which might correspond to the concrete slab and the other to the utility pipes encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-098 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs. Anomalies were observed in the profile and correspond to the utility pipes and the concrete slab that were encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-098 was excavated to a depth of 1.10 mbs. The stratigraphy of T-098 consisted of fill strata to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). Two features (Feature 9 and Feature 16) were identified and designated as features of SIHP# 50-80-14-7427. A complete description of SIHP# -7427 is provided in Volume I.



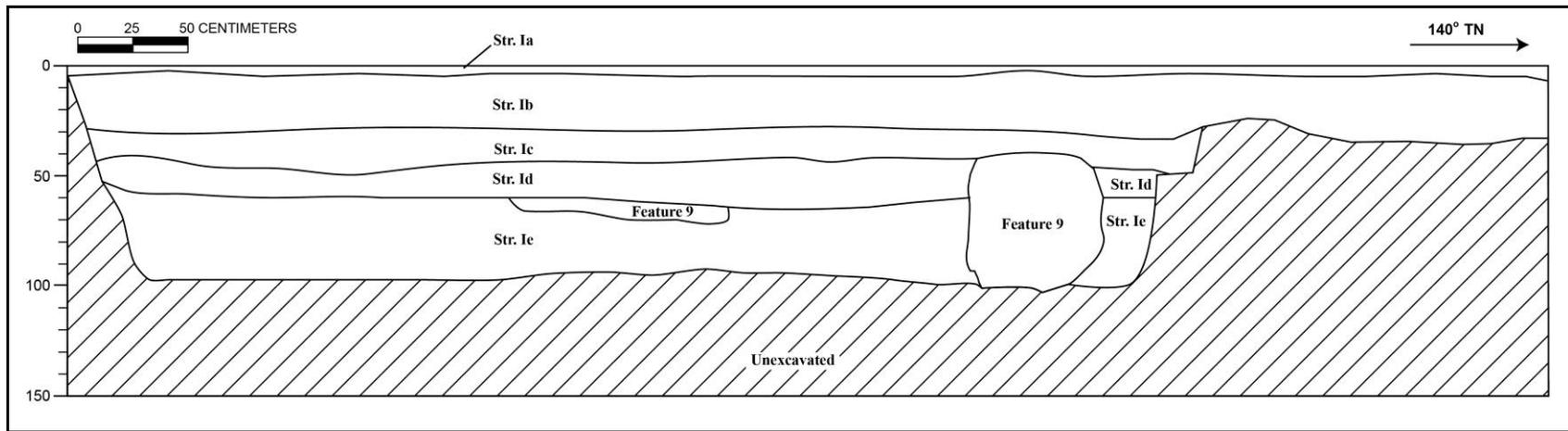
T-098 general location, view to northwest



T-098 northeast profile wall



T-098 southwest profile wall



T-098 northeast wall profile

T-098 Stratigraphic Description, *mauka* wall

Stratum	Depth (cmbs)	Description
Ia	0-5	Asphalt
Ib	5-30	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket
Ic	30-45	Fill; 7.5 YR 3/2 (dark brown) with mottles of 7.5 YR 8/1 (white); gravelly loam; moderate, medium, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; diffuse, smooth lower boundary; contained construction gravel
Id	40-65	Fill; 2.5 YR 3/3 (dark reddish brown), with mottles of 10 YR 2/1 (black); clay; moderate, fine, blocky structure; moist, firm consistency; slightly plastic; terrigenous origin; diffuse, smooth lower boundary
Ie	55-110	Fill; 2.5 YR 2.5/1 (reddish black), with mottles of 7.5 YR 8/1 (white); very gravelly clay loam; medium, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; contained red brick fragments, cement fragments, and a rusted metal nail

## 2.10 Test Excavation 99 (T-099)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	170
<b>TMK#:</b>	1-7-002:026
<b>Elevation Above Sea Level:</b>	1.96 m
<b>UTM:</b>	617733.31 mE, 2357159.15 mN
<b>Max Length/Width/Depth:</b>	6.10 m / 0.122 m / 0.88 m
<b>Orientation:</b>	170 / 350° TN
<b>Targeted Project Component:</b>	Chinatown Station Building
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 99 (T-099) was located in a parking lot east of Nimitz Highway and north of Kekaulike Street. T-099 was on private property owned by 902 Partners LLC. Nearby utilities included an electric line 9 m west of T-099 and a water line 12 m west. The test excavation was level with the surrounding parking lot surface.

**Summary of Background Research and Land Use:** The 1847 Metcalf map showed T-099 15m east of the historic shoreline and south of a small inlet. According to the 1886 Wall map, T-099 was within LCA 170, which consisted of one house lot awarded to Mataio Kekūānāo'a. The 1887 Wall map showed substantial urban development with a street grid system in place and a post office, fire department and police court in the area. By 1899, Honolulu Harbor and a railway were present. The shoreline had been built up (1899 Monsarrat map). According to the 1914 Series Sanborn Fire Insurance map, T-099 was located between a Rigging Loft and O'ahu Market, and approximately 25 m northwest of property owned by City Mill Co. Ltd. This map showed the northeast end of the test excavation located under a structure measuring roughly 3.3 m by 3.0 m. The 1933 War Honolulu map showed large scale urban development had continued to the Waterfront area. The 1953 Army Mapping Service map showed T-099 in its modern setting, as well as Aloha Tower southwest of T-099. By this time T-099 was located 50 m southeast of the shoreline.

Several archaeological studies were conducted in vicinity of T-099. Emergency archaeological data recovery was performed at the River-Nimitz Re-development Project site, 50 m northwest of T-099, where a pre-Contact, traditional Hawaiian human burial (SIHP # 50-80-14-4192) was inadvertently discovered during construction activities. Several other archaeological features were found at the site, including four post-Contact trash pits with numerous artifacts and a brick and mortar building foundation (Landrum and Dixon 1992). 12 m west of T-099, Winieski and Hammatt (2001) performed archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project. During the study a remnant of light gauge trolley rail (SIHP # 50-80-14-5942) associated with the historic Honolulu Rapid Transit trolley system was observed at the Nimitz Highway and Queen Street intersection. A monitoring project northeast of T-099 resulted in the discovery of a pre-Contact human burial (SIHP # 50-80-14-05781) 80 m southeast of T-099 (Elmore and Kennedy 2001). An inventory survey with subsurface testing was conducted 120 m

northeast of T-099. The study resulted in several findings, including a fishpond (SIHP # 50-80-14-4587) which was in use during the nineteenth century and a multi-component site (SIHP # 50-80-14-4588) comprised of 53 features, including three human burials, dating from the twentieth century to pre-Western contact (Kennedy et al. 1994). An archaeological inventory survey of the Kekaulike Diamond Head Project was conducted by Goodwin (1999). This study was located 120 m east of T-099 and revealed more than 100 archaeological features and several cultural stratigraphic layers (SIHP # 50-80-14-4875). An inventory survey for the proposed Nimitz Highway Water System was conducted 18 m west of T-099. The study focused primarily on the prehistorically-constructed Kawa Fishpond (SIHP # 50-80-14-5966). Historic artifacts were recovered from fishpond sediments and it was determined that the fishpond had been accumulating sediment since approximately AD 1150-1350, although no specific date of construction was determined (McDermott and Mann 2001).

**Documentation Limitations:** T-099 was excavated to a depth of 0.88 mbs, but was terminated due to the loss of structural integrity of the walls and safety concerns. The structural integrity of the walls limited the excavation of T-099.

**Stratigraphic Summary:** The stratigraphy of T-099 consisted of fill to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly sandy loam base course (Ib), extremely gravelly sandy loam fill (Ic), extremely stony clay fill (Id), and extremely stony silt loam fill (Ie). The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

**Artifacts Discussion:** A single artifact (Acc. # 099-A-1), a composite slab fragment, was collected from Stratum Id/Ie. The artifact collected from Stratum Id/Ie was consistent with other findings of structural foundation debris, including Feature 10 of SIHP# 50-18-14-07427.

**Features Discussion:** Two features (Feature 10 and Feature 16) were identified within T-099 and designated as features of SIHP# 50-80-14-7427.

SIHP# -7427 Feature 10 consisted of a composite slab (tile and concrete) and an overlying concrete block that were considered to be possible building foundation remnants. Feature 10 was observed between 0.05 mbs and 0.46 mbs throughout the excavation of T-098. Feature 10 measured more than 6.10 m long by more than 1.22 m wide, extending beyond the length and width of the excavation. The stratigraphy of T-099 indicated that while the western portion of Feature 10 appeared to be in situ, the eastern portion of the feature was uplifted and previously disturbed as evidenced by fill strata that were overlying the in situ portion being redeposited beneath the uplifted portion. The in situ portion was constructed over and appeared to post-date Stratum Ie (extremely stony silt loam fill).

SIHP# -7427 Feature 16 was not observed during excavation, as T-099 was terminated before the layer was reached. Feature 16 was however identified in adjacent boring between 1.53 mbs and 2.13 mbs in Core 3 South. The feature consisted of sandy loam with mollusk shells and charcoal flecking. It was deposited over natural gravelly sandy clay and loamy sand and was overlain by extremely gravelly sand. Feature 16 was also identified in T-096, T-97 and T-99 through T-101.

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

**Sample Results:** No bulk sediment samples were collected during the investigation of T-099

**GPR Discussion:** A review of amplitude slice maps indicated a linear feature which might correspond to the concrete slab encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-099 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs. An anomaly was observed in the profile and could correspond to the utility pipes encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-099 was excavated to a depth of 0.88 mbs, but was terminated due to the loss of structural integrity of the walls and safety concerns. The stratigraphy of T-099 consisted of fill (Ia to Ie) to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). A single artifact (Acc. # 099-A-1), a composite slab fragment, was collected from Stratum Id/Ie. One feature (Feature 10) was identified within T-099 and was designated as a feature of SIHP# 50-80-14-7427. A complete description of SIHP# -7427 is provided in Volume I.



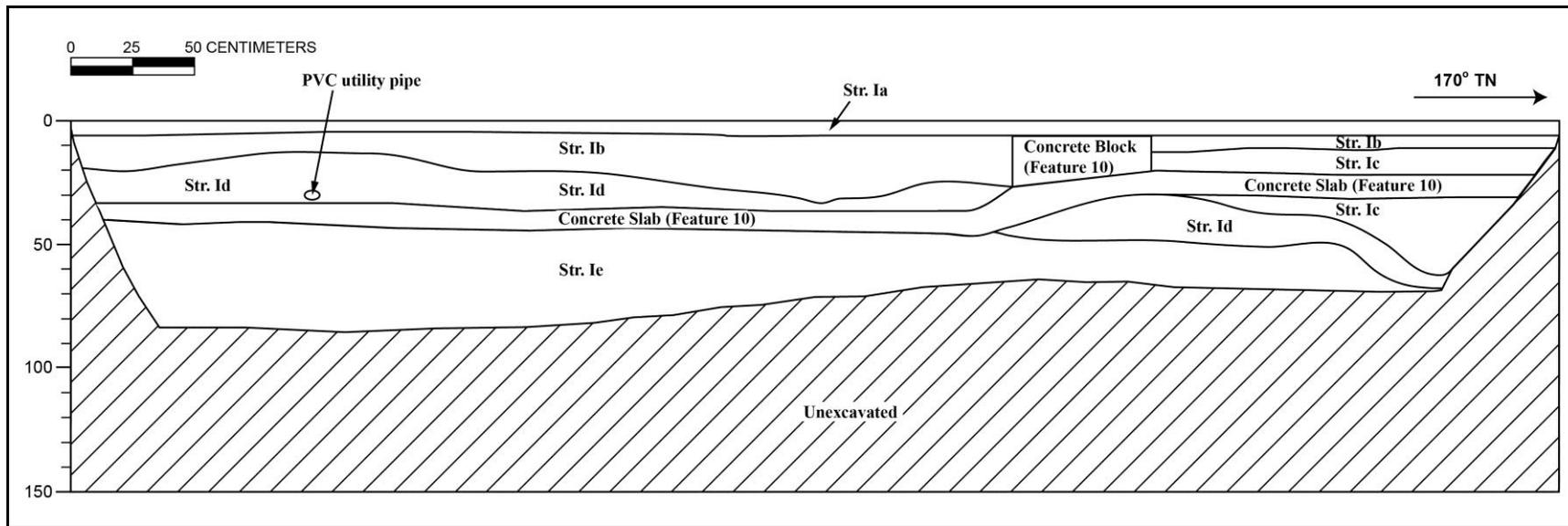
T-099: General location photo, view to southwest



T-099: West profile wall, view to southwest



T-099: East profile wall, view to southeast



T-099 East wall profile

## T-099 Stratigraphic Description, east wall

<b>Stratum</b>	<b>Depth (cmbs)</b>	<b>Description</b>
Ia	0-5	Asphalt
Ib	5-26	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket; base course imported fill
Ic	12-23 to 35-65	Fill; 10 YR 4/2 (dark grayish brown); extremely gravelly sandy loam; structureless, single-grain; moist, loose consistency; non-plastic; terrigenous origin; imported fill
Id	16-68	Fill; 7.5 YR 4/2 (brown); extremely stony clay; structureless, massive; moist, firm consistency; very plastic; terrigenous origin; lower boundary not visible; contained coral cobbles and small boulders
Ie	40-88	Fill; 10 YR 4/3 (brown); extremely stony silt loam; structureless, single-grain; moist, loose structure; non-plastic; terrigenous origin; lower boundary not visible; imported fill

## 2.11 Test Excavation 100 (T-100)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	170
<b>TMK#:</b>	1-7-002:026
<b>Elevation Above Sea Level:</b>	2.1 m
<b>UTM:</b>	617738.74 mE, 2357152.76 mN
<b>Max Length/Width/Depth:</b>	6.1 m / 1.24 m / 2.2 m
<b>Orientation:</b>	176 / 356° TN
<b>Targeted Project Component:</b>	Station Building
<b>USDA Soil Designation:</b>	Ewa silty clay loam (EmA)

**Setting:** Test Excavation 100 (T-100) was located in a parking lot east of Nimitz Highway and north of Kekaulike Street, on private property owned by 902 Partners LLC. Nearby utilities included an electric line 20.5 m west of T-100 and a water line 24 m west. The original location of T-100 was offset by 4.1 m to the west. The test excavation was level with the surrounding parking lot surface.

**Summary of Background Research and Land Use:** The 1847 Metcalf map showed T-100 east of the historic shoreline and south of a stream. According to the 1886 Wall map, T-100 was within LCA 170, which consisted of one house lot to Mataio Kekūanāo'a. The 1887 Wall map showed substantial urban development with a street grid system in place and a post office, fire department and police court in the area. By 1897 Honolulu Harbor and a railway were present, and the shoreline had been built up (1897 Monsarrat map). According to the 1914 Series Sanborn Fire Insurance map, T-100 was located between a Rigging Loft and O'ahu Market, and approximately 30 m northwest of property owned by City Mill Co. Ltd. This map showed the northeast end of the test excavation located under a structure measuring approximately 3.3 m by 3 m. The 1933 War Honolulu map showed massive urban development had spread throughout the Waterfront area. The 1953 Army Mapping Service map showed major streets and highways present, as well as Aloha Tower southwest of T-100. By this time T-100 was located 67 m east of the shoreline.

Several archaeological studies were conducted in vicinity of T-100. Emergency archaeological data recovery was performed at the River-Nimitz Re-development Project site, 55 m northwest of T-100, when a pre-Contact, traditional Hawaiian human burial (SIHP # 50-80-14-4192) was inadvertently discovered during construction activities. Several other archaeological features were found at the site, including four post-Contact trash pits with numerous artifacts and a brick and mortar building foundation (Landrum and Dixon 1992). Approximately 18 m west of T-100, Winieski and Hammatt (2001) performed archaeological monitoring for the Nimitz Highway Reconstruction Sewer Project. During the study a remnant of light gauge trolley rail (SIHP # 50-80-14-5942) associated with the historic Honolulu Rapid Transit trolley system was observed at the Nimitz Highway and Queen Street intersection. A monitoring project *mauka* of T-100 resulted in the discovery of a pre-Contact human burial (SIHP # 50-80-14-05781) 75 m southeast

of T-100 (Elmore and Kennedy 2001). An inventory survey with subsurface testing was conducted 115 m northeast of T-100. The study resulted in several findings, including a fishpond (SIHP # 50-80-14-4587) which was in use during the nineteenth century and a multi-component site (SIHP # 50-80-14-4588) comprised of 53 features, including three human burials, dating from the twentieth century to pre-Western contact (Kennedy et al. 1994). An archaeological inventory survey of the Kekaulike Diamond Head Project was conducted by Goodwin (1997). This study was located approximately 115 m east of T-100 and revealed more than 100 archaeological features and several cultural stratigraphic layers (SIHP # 50-80-14-4875). An inventory survey for the proposed Nimitz Highway Water System was conducted 18 m west of T-100. The study focused primarily on the prehistorically-constructed Kawa Fishpond (SIHP # 50-80-14-5966). Historic artifacts were recovered from fishpond sediments and it was determined that the fishpond had been accumulating sediment since approximately AD 1150-1350, although no specific date of construction was determined (McDermott and Mann 2001).

**Documentation Limitations:** T-100 was excavated to a depth of 2.2 mbs and beneath the water table at 2.1 mbs. There were no specific factors that limited documentation.

**Stratigraphic Summary:** The stratigraphy of T-100 consisted of fill overlying natural sediment. Observed strata included asphalt (Ia), extremely gravelly sandy loam base course (Ib), a buried asphalt surface (Ic), extremely gravelly sandy loam fill (Id), very gravelly sandy loam fill (Ie), very gravelly loam fill (If), loam fill (Ig), loam fill (Ih), loam fill (Ii), gravelly sandy clay loam fill (Ij), very gravelly sandy loam fill (Ik), and sandy loam fill (II) overlying previously disturbed natural gravelly sandy loam (II). The stratigraphy generally conformed to the USDA soil survey designation of Ewa silty clay loam (EmA).

**Artifacts Discussion:** A total of five traditional Hawaiian artifacts (Acc. # 100-H-1 to H-5) were collected from Stratum II at 1.37-1.78 mbs. The traditional artifacts consisted of one basalt adze flake, and four possible basalt flake debitage. A total of nine historic artifacts (Acc. # 100-A-1 to A-9) were collected from Strata Ic, Id/Ie, If, and II. Historic artifacts were collected from Stratum Ic, Feature 12 and Stratum Id/Ie. Feature 12 solely consisted of construction debris. A single ceramic fragment with an Asian garden design that is not necessarily Asian in origin was collected from Stratum If. Stratum II historic artifacts included one complete spirits bottle with an applied lip that dates from ca. 1820 to 1890, and construction debris. Artifacts collected from Strata Ic, Id/Ie, If are consistent with fill events; Stratum II artifacts are consistent with disturbance from construction and fill events in the late 1800s.

**Features Discussion:** A total of four features (Feature 11, 12, 13, and 16) were identified within T-100 and were designated as features of SIHP# 50-80-14-7427.

SIHP# -7427 Feature 11 was observed between 0.19 mbs and 0.28 mbs within the northern half of the test excavation. Feature 11 consisted of an in situ concrete slab that was considered to be a possible building foundation remnant. The feature was constructed over and appeared to post-date Stratum Ie (very gravelly sandy loam). Feature 11 measured more than 2.74 m long by more than 1.24 m wide, extending beyond the length and width of the test excavation.

SIHP# -7427 Feature 12 was observed between 0.24 mbs and 0.50 mbs near the center of the test excavation. Feature 12 consisted of an in situ concrete drainage channel that was considered to be a possible building foundation remnant. The feature was constructed over and appeared to

post-date Stratum Ie (very gravelly sandy loam). Feature 12 measured more than 0.08 m long by more than 1.24 m wide, extending beyond the width of the test excavation.

SIHP# -7427 Feature 13 was observed between 0.55 mbs and 0.60 mbs near the center of the test excavation. Feature 13 consisted of an in situ mortared cut basalt stone slab that was considered to be a possible building foundation remnant. The feature was located within and appeared to be contemporaneous with Stratum Ig (loam fill). Feature 13 measured more than 0.29 m long by more than 0.26 m wide, extending into the west excavation sidewall.

SIHP# -7427 Feature 16 originated at approximately 1.41 mbs and terminated at approximately 2.20 mbs. The feature was observed as a continuous deposit within T-100, extending into the excavation sidewalls in all directions. The feature (Stratum II) extended to beneath the water table and was overlain by sandy loam fill (Ik and Il). Sample analysis (see below) has documented the presence of marine shell midden, faunal material, and artifacts within Feature 16. Feature 16 measured more than 1.66 m long by more than 1.22 m wide, extending beyond the length and width of the test excavation. SIHP# -7427 Feature 16 was also observed in adjacent archaeological test bores, T-096 through T-099, and T-101.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected individually during excavation from Stratum If/Ik (0.85mbs) consisted of a single *Bos taurus* fragment, with striations on one end (possibly taphonomic) and cut marks (from a non-metal blade) along the exterior. *Bos taurus* is an introduced species and its presence is indicative of a post-Contact context. T-100 was associated with SIHP# 50-80-14-7427; however the faunal remains originated in non-feature strata.

**Sample Results:** A total of three bulk sediment samples were collected from Stratum II at 1.37-1.78 mbs (4.0 L), 1.74-2.07 mbs (6.0 L) and 2.05-2.2 mbs (9.0 L). The sediment samples were wet screened for content analysis.

The bulk sediment sample collected from Stratum II at 1.37-1.78 mbs contained small amounts of charcoal (1.0 g), naturally-occurring marine shell (4.7 g), medium mammal remains (0.4 g), fish remains (0.2 g), medium mammal tooth fragment (0.1 g), glass (0.1 g), and basalt flakes (0.9 g), and midden (17.8 g). Midden collected included Tellinidae *Tellina palatum* (6.1 g), Neritidae *Nerita picea* (4.3 g), Echinodermata *diadema* sp. and *mathaei* sp. (0.8 g), Cymatiidae *Cymatium* sp. (0.7 g), Ostreaeidae (0.7 g), and Isognomidae *Isognomon* sp. (0.5 g).

The bulk sediment sample collected from Stratum II at 1.74-2.07 mbs contained naturally deposited shell (8.7 g) and burned *kukui* (1.1 g).

The bulk sediment sample from Stratum II at 2.05-2.2 mbs contained small amounts of charcoal (1.4g), naturally deposited shell (1.4g) and one fire cracked rock (73.8g) and midden (17.7g). Midden collected included Mytilidae *Brachidontes crebristriatus* (6.5 g), Conidae *Conus* sp. (5.6 g), Neritidae *Nerita picea* (2.0 g), Tellinidae *Tellina palatum* (1.6 g), Tellinidae *Tellina* sp. (1.1 g), burned crustacean (0.5 g), Ostreidae (0.2 g), Echinodermata *diadema* sp. and *mathaei* sp. (0.1 g), and Isognomidae *Isognomon* sp. (0.1 g).

The results of the analysis of bulk sediment samples documented the presence of traditional artifacts, fire-cracked rock, marine shell midden, historic artifacts, and small amounts of charcoal with Stratum II. The results support the identification of Stratum II as a culturally-enriched previously disturbed natural sediment (SIHP# -7427 Feature 16).

**GPR Discussion:** A review of amplitude slice maps indicated no linear features although a utility and a concrete slab were encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs and increases again around 0.75 mbs, possibly due to large coral boulders encountered 0.70-1.30 mbs.

GPR depth profiles for T-100 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.05 mbs and again around 0.30 mbs. One large and one small anomaly were observed in the profile. The large anomaly did not correspond to the utility or concrete slab that was encountered but the small anomaly corresponds to the pipe that was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-100 was excavated to a depth of 2.2 mbs and beneath the water table at 2.1 mbs. The stratigraphy of T-100 consisted of fill (Ia to II) overlying natural sediment (II). A total of five traditional Hawaiian artifact (Acc. # 100-H-1 to 100-H-5) consisting of five pieces of basalt, and on adze flake were collected from Stratum II at 1.37-1.78 mbs. A total of nine historic artifacts (Acc. # 100-A-1 to A-9) were collected from Strata Ic, Id/Ie, If, and II. Artifacts collected from Strata Ic, Id/Ie, and If are consistent with fill events; Stratum II artifacts are consistent with disturbance from construction and fill events in the late 1800s. A total of four features (Feature 11-13, and 16) were identified within T-100 and were designated as features of SIHP# 50-80-14-7427. Faunal remains that were observed are considered to be modern/historic and not considered to be culturally significant. The results of the analysis of bulk sediment samples documented the presence of traditional artifacts, fire-cracked rock, marine shell midden, historic artifacts, and small amounts of charcoal with Stratum II. The results support the identification of Stratum II as a culturally-enriched previously disturbed natural sediment (SIHP# -7427 Feature 16). A complete description of SIHP# -7427 is provided in Volume I.



T-100: General location photo (view to northwest).



T-100 plan view Feature 11 and 12 (view north)



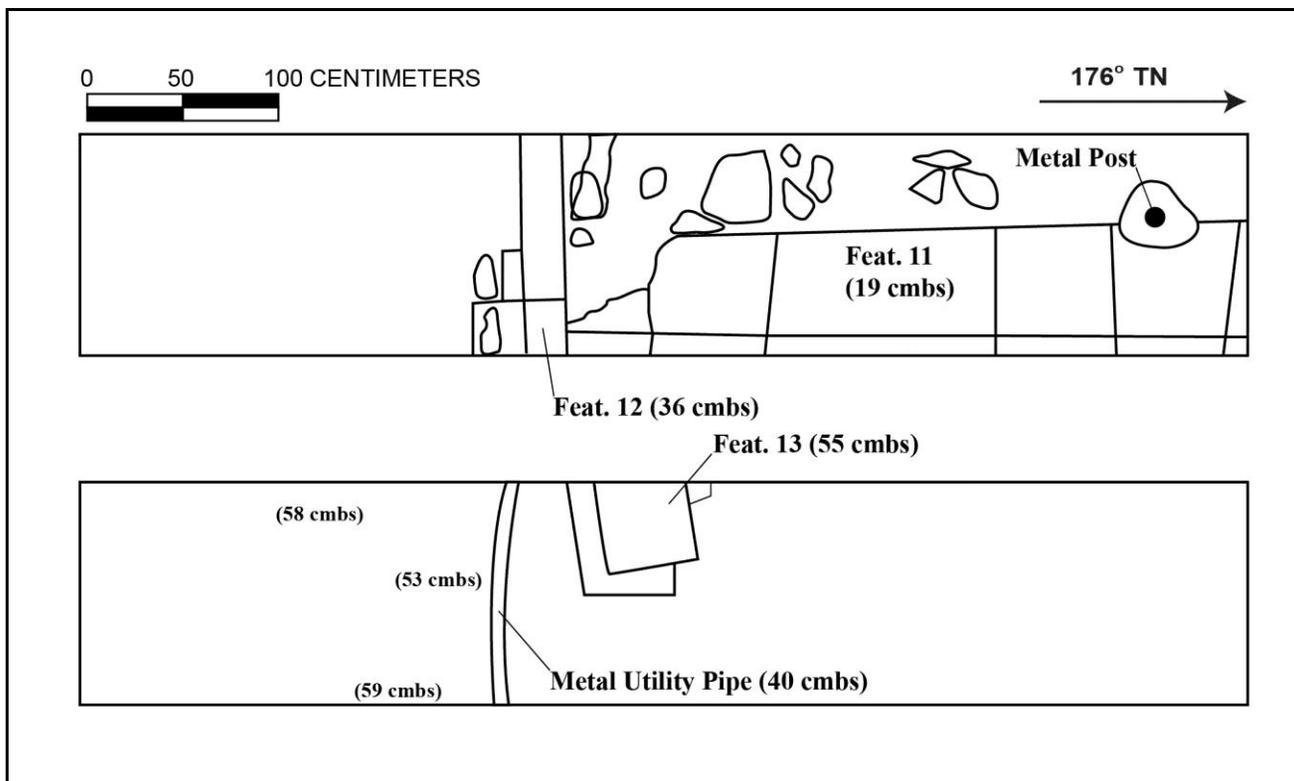
T-100 plan view Feature 13, (view north)



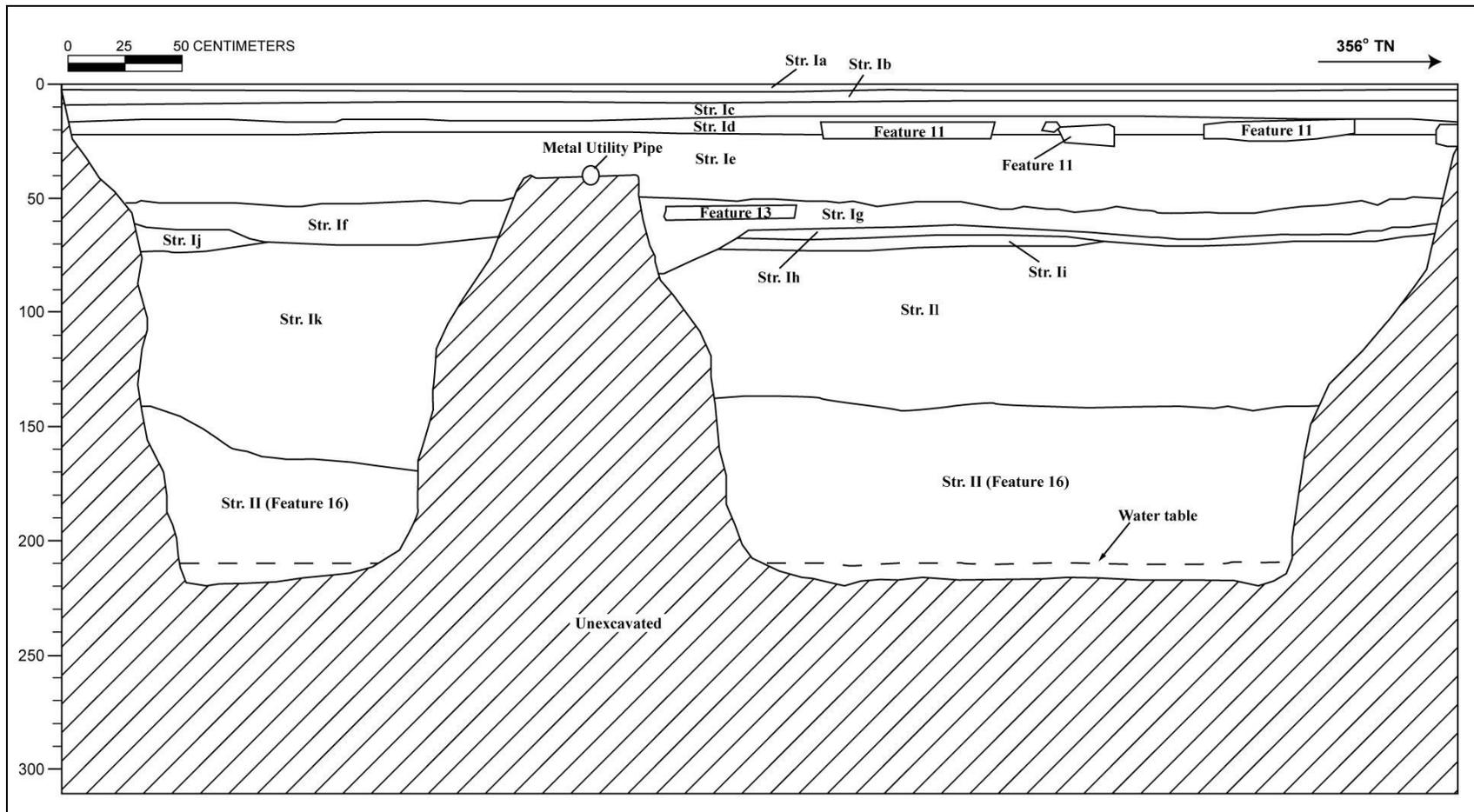
T-100: West profile wall (view to northwest), northern section



T-100: West profile wall (view to southwest), southern section



T-100 plan views depicting SIHP# -7427 Features 11, 12, and 13 (Strata Ie and Ig).



T-100 west wall profile depicted SIHP# -7427 Feature 11, 13, and 16

## T-100 Stratigraphic Description, west wall

Stratum	Depth (cmbs)	Description
Ia	0-3	Asphalt
Ib	3-9	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket; base course imported fill
Ic	9-17	Buried asphalt surface
Id	15-23	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket; base course imported fill; concrete inclusions (Fea. 1)
Ie	23-58	Fill; 10 YR 8/2 (very pale brown) with mottles of 10 YR 4/2 (dark grayish brown); very gravelly sandy loam; strong, fine, blocky structure; moist, firm, strong consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; contained utilities
If	52-71	Fill; 10 YR 3/2 (very dark grayish brown) with mottles of 10 YR 8/2 (very pale brown); very gravelly loam; weak, fine, granular structure; moist, very friable, weak consistency; slightly plastic; mixed origin; lower boundary visible; contained rusted nail and charcoal
Ig	51-84	Fill; 10 YR 3/1 (very dark gray); loam; weak, fine, crumb structure; moist, very friable, weak consistency; slightly plastic; terrigenous origin; very abrupt, smooth lower boundary
Ih	59-70	Fill; 10 YR 3/1 (very dark gray) with (C, 1) mottles 10 YR 8/2 (very pale brown); loam; weak, fine, crumb structure; moist, friable, weak consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary
Ii	64-86	Fill; 7.5 YR 4/4 (brown); loam; weak, fine, crumb structure; moist, very friable, weak consistency; slightly plastic; mixed origin; diffuse, smooth lower boundary
Ij	62-75	Fill; 10 YR 4/4 (dark yellowish brown); gravelly sandy clay loam; weak, fine, crumb structure; moist, very friable, weak consistency; non-plastic; terrigenous origin
Ik	70-170	Fill; 2.5 Y 3/2 (very dark grayish brown); very gravelly sandy loam; weak, fine, crumb structure; moist, very friable, weak consistency; non-plastic; mixed origin; lower boundary not visible; marine shell fragments

Stratum	Depth (cmbs)	Description
I/	65-145	Fill; 10 YR 3/2 (very dark grayish brown) with mottles of 10 YR 8/2 (very pale brown); sandy loam; moderate, coarse, blocky structure; moist, firm, strong consistency; slightly plastic; lower boundary not visible; contained ceramic fragment, bottle glass
II	141-220	Natural; 10 YR 4/2 (dark grayish brown); gravelly sandy loam; structureless, single-grain; moist, friable consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; contained glass bottle, rusted metal, glass, charcoal flecks; previously disturbed natural sediment

## T-100 Artifacts Analysis Table

Acc. # 100-A-	Prov.	Ceramic Vessel Type	Portion	No.	Paste; decor.	Origin; Age	Comments
1	T-100, St. If	Flatware - plate/ saucer	Base to body	1	Porcelain; Transfer- print		Pagodas and fern-like trees; blue
Acc. # 100-A-	Prov.	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
2	T-100, St. II	Bottle, Spirits	Complete	1	Olive, Dark	1820- 1890	Base: kick-up
Acc. # 100-A-	Prov.	Misc. Type	Portion	No.	Material	Origin; Age	Comments
3	T-100, St. Ic, Fea. 12	Concrete Pipe	Fragment	1	Composite		Drainage pipe
4	T-100, St. Ic, Fea. 12	Unknown	Fragment	1	Stoneware		Buff color; brown slip; architectural; not from a vessel
5	T-100, St. Id/Ie, Fea. 12	Concrete Slab	Fragment	1	Composite		Basalt / mortar/ concrete slab
6	T-100, St. II	Handle	Fragment	1	Metal		Very corroded
7	T-100, St. II	Unknown	Fragment	1	Glass		Heat-modified, warped
8	T-100, St. II	Unknown	Fragment	1	Metal		Flat metal, mesh-like pattern
9	T-100, St. II	Unknown	Fragment	1	Metal		Unidentifiable metal mass



T-100 ceramic fragment (Acc. # 100-A-1) from Stratum If



T-100 glass bottle (Acc. # 100-A-2) from Stratum II

## 2.12 Test Excavation 101 (T-101)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	170
<b>TMK #:</b>	1-7-002: 026
<b>Elevation Above Sea Level:</b>	2.0 m
<b>UTM:</b>	617735.40 mE, 2357140.47 mN
<b>Max Length/Width/Depth:</b>	6.15 m / 1.2m / 1.15 m
<b>Orientation:</b>	74 / 254° TN
<b>Targeted Project Component:</b>	Station Building
<b>USDA Soil Designation:</b>	Ewa silty clay loam (EmA)

**Setting:** Test Excavation 101 (T-101) was located approximately 22 meters northeast of North Nimitz Highway and Kekaulike Street intersection. T-101 was located in a parking lot on private property owned by 902 Partners LLC. The excavation surface was slightly elevated to the surrounding land surface.

**Summary of Background Research and Land Use:** The 1847 Metcalf map showed T-101 within the vicinity of the historic shoreline and located east of an unnamed stream. According to the 1886 Wall map, T-101 was within LCA 170, which consisted of one house lot to Mataio Kekūānao'a. The 1887 Wall map showed substantial urban development with a street grid system in place and a post office, fire department and police court in the area. By 1897 OR & L were present, and the shoreline had been built up (1897 Monsarrat map). According to the 1914 Series Sanborn Fire Insurance map, T-101 was located between a Rigging Loft and O'ahu Market, and approximately 30 m northwest of property owned by City Mill Co. Ltd. This map showed the northeast end of the test excavation located under a structure measuring approximately 3.3 m by 3 m. By 1933 massive urban development had spread throughout the Waterfront area (1933 War map). The 1953 Army Mapping Service map showed major streets and highways present, as well as Aloha Tower southwest of T-101. By this time T-101 was located 67 m east of the shoreline.

Several archaeological studies were conducted in vicinity of T-101. Emergency archaeological data recovery was performed at the River-Nimitz Redevelopment Project site, 65 m north of T-101, when a pre-Contact, traditional Hawaiian human burial (SIHP # 50-80-14-4192) was inadvertently discovered during construction activities. Several other archaeological features were found at the site, including four post-Contact trash pits with numerous artifacts and a brick and mortar building foundation (Landrum and Dixon 1992). Approximately 15 m west of T-101, Winieski and Hammatt (2001) performed archaeological monitoring for the Nimitz Highway Reconstructed Sewer Project. During the study a remnant of light gauge trolley rail (SIHP # 50-80-14-5942) associated with the historic Honolulu Rapid Transit trolley system was observed at the Nimitz Highway and Queen Street intersection. A monitoring project *mauka* of T-101 resulted in the discovery of a pre-Contact human burial (SIHP # 50-80-14-05781) 85m east of T-101 (Elmore and Kennedy 2001). An inventory survey with subsurface testing was conducted

130 m northeast of T-101. The study resulted in several findings, including a fishpond (SIHP # 50-80-14-4587) which was in use during the nineteenth century and a multi-component site (SIHP # 50-80-14-4588) comprised of 53 features, including three human burials, dating from pre-Contact times to the twentieth century (Kennedy et al. 1994). An archaeological inventory survey of the Kekaulike Diamond Head Project was conducted by Goodwin (1997). This study was located approximately 125 m east of T-101 and revealed more than 100 archaeological features and several cultural stratigraphic layers (SIHP # 50-80-14-4875). An inventory survey for the proposed Nimitz Highway Water System was conducted 15 m west of T-101. The study focused primarily on the prehistorically-constructed Kawa Fishpond (SIHP # 50-80-14-5966). Historic artifacts were recovered from fishpond sediments and it was determined that the fishpond had been accumulating sediment since approximately AD 1150-1350, although no specific date of construction was determined (McDermott and Mann 2001).

**Documentation Limitations:** T-101 was excavated to a depth of 1.15 mbs. T-101 was unexcavated beneath 1.15 mbs due to unsafe and unstable excavation sidewalls.

**Stratigraphic Summary:** The stratigraphy of T-101 consisted of fill strata overlying previously disturbed natural sediment. Observed strata included asphalt (Ia), extremely gravelly sandy loam (Ib), clay fill (Ic), sandy loam fill (Id), sandy loam fill (Ie) and gravelly sandy loam fill (If) overlying previously disturbed or re-worked natural loamy clay (II). The stratigraphy generally conformed to the USDA soil survey designation of Ewa silty clay loam (EmA).

**Artifacts Discussion:** A total of 17 artifacts were collected, including two artifacts from Stratum Ib, a single artifact from Stratum Ic, and a total of 13 artifacts from Stratum Ie/If, Feature 15. One of the Stratum Ib artifacts is a standard sized brick dating from 1886-1978. Stratum Ic contains an aqua bottle fragment with a possible Asian character (possibly Japanese or Chinese) stamped on the base. Ceramic fragments collected from Stratum Ie/If, Feature 15 include a cup with an Asian character on the base indicating that the cup was exported to the U.S. before 1921. Bottles/fragments from Stratum Ie/If consist of four bottles, dating from the 1860s to the 1920s, based on the type of mold (turn mold), and one beer bottle embossed with a trademark used from 1885-1900. A second beer bottle was made from 1883-1896. Artifacts collected from Stratum Ie/If and Feature 15 are consistent with an 1880s-1890s trash pit.

**Features Discussion:** A total of three features (Feature 14, 15 and 16) were identified within T-101 and were designated as features of SIHP# 50-80-14-7427.

SIHP# -7427 Feature 14 was observed between 0.15 mbs and 0.28 mbs within the southern end of the test excavation. Feature 14 consisted of an in situ concrete slab that was considered to be a possible building foundation remnant. The feature was constructed over and appeared to post-date Stratum Id (sandy loam fill). Feature 14 measured more than 1.80 m long by more than 1.20 m wide, extending beyond the width and into the southern end of the test excavation.

SIHP# -7427 Feature 15 was observed between 0.50 mbs and 1.27 mbs within the central portion of the excavation. Feature 15 consisted of an historic refuse pit that was considered to be remnants of historic habitation. The feature appeared to have been deposited over the previously disturbed natural sediment (Stratum II, Feature 16). Feature 15 measured 2.91 m long by more than 1.20 m wide, extending beyond the width of the test excavation.

SIHP# -7427 Feature 16 originated at approximately 0.52 mbs and terminated beyond 1.15 mbs. The feature was observed in situ within the southern end of T-101, but has been truncated by the historic refuse pit (Stratum If, Feature 15) within the central portion of the excavation. The feature (Stratum II) extended beneath the base of excavation and was overlain by sandy loam fill (Id). Feature 16 measured more than 2.55 m long by more than 1.20 m wide, extending beyond the length and width of the test excavation. SIHP# -7427 Feature 16 was also observed in adjacent archaeological test bores, T-096 through T-100.

**Terrestrial Faunal Remains Collected During Excavation:** Faunal remains were collected individually during excavation from Stratum Ic and from a pit feature within Stratum Ie/II (SIHP# 50-80-14-7427, Feature 15). Faunal remains from Stratum Ic (0.40 mbs) included unmodified *Felis catus* skeletal elements. Faunal remains from Stratum Ie/II (Feature 15) consisted of a single *Bos taurus* (possible) fragment at 0.67 mbs, as well as *Bos taurus*, *Sus scrofa* and unidentified *Aves* skeletal elements between 0.90 and 1.10 mbs. The *Bos taurus* and possible *Bos taurus* bone fragments were butchered using a metal blade, indicating an historic origin, not traditional Hawaiian. The other bones show no signs of cultural modification.

**Sample Results:** No bulk sediment samples were collected during the investigation of T-101

**GPR Discussion:** A review of amplitude slice maps indicated no linear features although a concrete slab was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.50 mbs.

GPR depth profiles for T-101 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. No utilities were observed in the profile although a concrete slab was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

**Summary:** T-101 was excavated to a depth of 1.15 mbs. The stratigraphy of T-101 consisted of fill strata to the base of excavation. The stratigraphy of T-101 consisted of fill strata overlying previously disturbed natural sediment. The stratigraphy generally conformed to the USDA soil survey designation of Ewa silty clay loam (EmA). A total of 17 artifacts were collected, including two artifacts from Stratum Ib, a single artifact from Stratum Ic, and a total of 13 artifacts from Stratum Ie/If, Feature 15. Artifacts collected from Stratum Ie/If and Feature 15 are consistent with an 1880s-1890s trash pit. A total of three features (Feature 14, 15 and 16) were identified within T-101 and were designated as features of SIHP# 50-80-14-7427. Faunal remains were collected from Stratum Ic and from a pit feature within Stratum Ie/II (SIHP# 50-80-14-7427, Feature 15). A complete description of SIHP# -7427 is provided in Volume I.



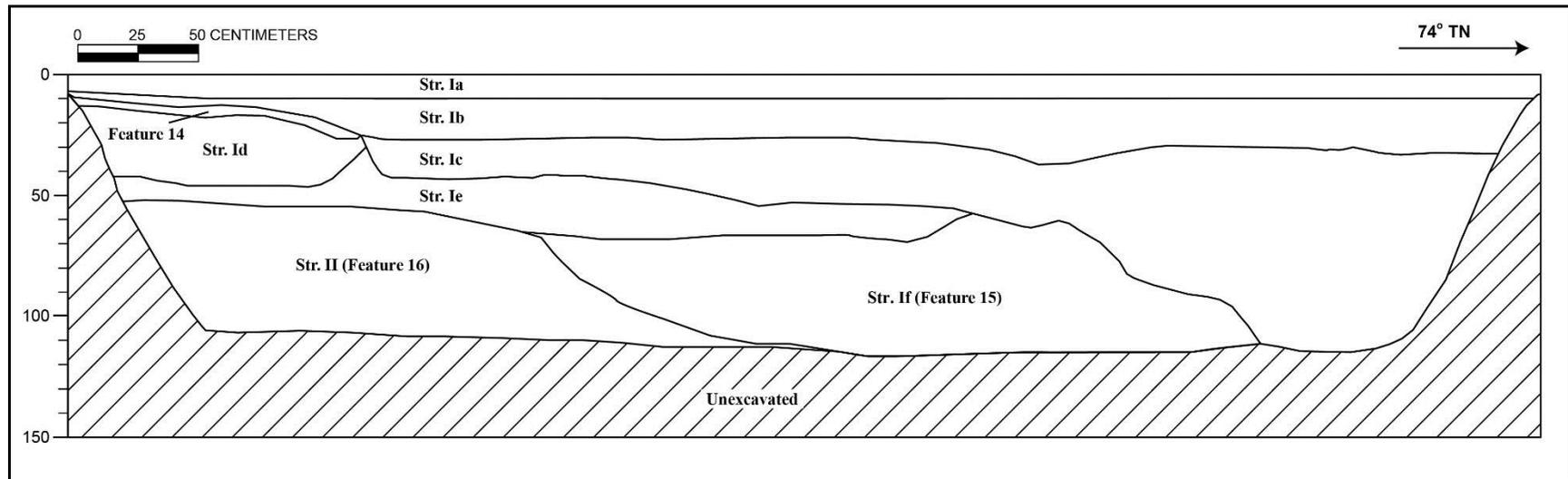
T-101: General location photo (view to west)



T-101: Northwest profile wall (view to northwest)



T-101: Southeast profile wall (view to southwest)



T-101 northwest wall profile

## T-101- Stratigraphic Description, northwest wall

Stratum	Depth (cmbs)	Description
Ia	0-11	Asphalt
Ib	11-37	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket; imported base course fill
Ic	26-115	Fill; 2.5 YR 4/1 (dark reddish gray), with common, fine mottles of 2.5 YR 4/8 (red); clay; structureless, massive; moist, very firm consistency; very plastic; terrigenous origin; diffuse, irregular lower boundary; clay fill
Id	15-47	Fill; 7.5 YR 3/2 (dark brown), with mottles of 7.5 YR 6/3 (light brown); sandy loam; structureless, single-grain; friable consistency; non-plastic; mixed origin; diffuse lower boundary; coral inclusion
Ie	30-69	Fill; 5 YR 3/1 (very dark gray), with mottles of 5 YR 8/1 (white); sandy loam; structureless, single-grain; moist, friable consistency; non-plastic; mixed origin; clear lower boundary; contained red brick, charcoal flakes, faunal; fill deposit
If	52-112	Fill; 10 YR 5/1 (gray), gravelly sandy loam; weak, fine, crumb structure; moist, loose consistency; non-plastic; mixed origin; lower boundary not observed; contained historic refuse (Feature 15)
II	52-112	Natural; 5 YR 2.5/1 (black); loamy clay; moderate, medium, blocky structure; moist, firm consistency; slightly plastic; mixed origin; lower boundary not visible; contains charcoal flaking; fill, previously disturbed natural sediment

## T-101 Artifact Analysis Table

Acc. # 101-A-	Prov.	Ceramic Vessel Type	Portion	No.	Paste; Decoration	Origin; Age	Comments
1	T-101, St. Ie/If, Fea. 15	Hollowware - cup	Base to rim	1	Porcelain; Transfer print	Asian	Asian design, Asian character stamped on base
2	T-101, St. Ie/If, Fea. 15	Dinnerware	Rim	1	Earthenware; Painted underglaze		Large floral pattern
3	T-101, St. Ie/If, Fea. 15	Dinnerware	Rim	1	Earthenware, Refined; Transfer-print		blue lines and dots
Acc. # 101-A-	Prov.	Glass Bottle Type	Portion	No.	Color	Origin; Age	Comments
4	T-101, St. Ic	Bottle	Body	1	Aqua		Asian character, or I or T embossed
5	T-101, St. Ie/If, Fea. 15	Bottle, Beer	Base-neck	1	Brown	1885- 1900	Wisconsin Glass Co., Milwaukee
6	T-101, St. Ie/If, Fea. 15	Bottle, Beer	Base- body	1	Brown	1883- 1896	Frederick Heitz Glass Works, St. Louis, Mo.
7	T-101, St. Ie/If, Fea. 15	Bottle, Spirits	Complete	1	Green	1860- 1920s	Base: push up
8	T-101, St. Ie/If, Fea. 15	Bottle, Spirits	Base-neck	1	Green, Light	1860- 1920s	Base: push up
9	T-101, St. Ie/If, Fea. 15	Bottle, Spirits	Complete	1	Olive, Dark	1860- 1920s	Base: kick-up
10	T-101, St. Ie/If, Fea. 15	Bottle	Base- body	1	Olive, Dark	1800-post	
11	T-101, St. Ie/If, Fea. 15	Bottle, Spirits	Complete	1	Olive, Dark	1860- 1920s	Base: kick up
Acc. # 101-A-	Prov.	Misc. Type	Portion	No.	Material	Origin; Age	Comments
12	T-101, St. Ib	Brick	Fragment	1	--		Red color, machine- made
13	T-101, St. Ib	Insulator	Complete	1	Composite		White porcelain and metal
14	T-101, St. Ie/If, Fea. 15	Bead?	Fragment	1	Bone		Tubular bead; offset machine-drilled hole
15	T-101, St. Ie/If, Fea. 15	Brick	Fragment (2)	2	--		Red color

<b>Acc. # 101-A-</b>	<b>Prov.</b>	<b>Misc. Type</b>	<b>Portion</b>	<b>No.</b>	<b>Material</b>	<b>Origin; Age</b>	<b>Comments</b>
16	T-101, St. Ie/If, Fea. 15	Strap	Fragment	1	Metal		
17	T-101, St. Ie/If, Fea. 15	Window glass	Fragment	1	Glass		



T-101 ceramic artifact fragments (Acc. # 101-A-1 to A-17) from Stratum Ie and Stratum If



T-101 ceramic artifact fragments (Acc. # 101-A-1 to A-3) from Stratum Ie and Stratum If



T-101 glass bottle artifacts (Acc. # 101-A-5 and A-9) from Feature 15



T-101 glass bottle artifacts (Acc. # 101-A-6, A-7, A-8, A-11) from Stratum Ie and Stratum If

## T-101 Terrestrial vertebrate material collected individually during excavation

Acc. #	Stratum	Depth(cmbs)	Feature	Family/Class	Species	Element	Description	Modification
101-F-1	Ic	40	-	Felidae (cat)	<i>Felis catus</i>	Left and right humeri	Complete/fragment; Distal 2/3 of right humerus	None
101-F-2	Ie/II	67	7427-15	Bovidae (cow)	<i>Bos taurus</i> (possible)	Flat bone portion (Possible scapula, rib, or transverse process)	Fragment	Butchered (cut with metal blade)
101-F-3	Ie/II	90-110	7427-15	Bovidae (cow)	<i>Bos taurus</i>	Tooth; Diaphysis section	Fragment	Diaphysis section butchered (cut with metal blade)
101-F-4	Ie/II	90-110	7427-15	Suidae (pig)	<i>Sus scrofa</i>	Teeth (2) (molar and incisor); Diaphysis sections (possible <i>Sus scrofa</i> )	Fragments	None
101-F-5	Ie/II	90-110	7427-15	Aves (bird)	Unidentified	Metatarsus	Complete	None

## 2.13 Test Excavation 102 (T-102)

<b>Ahupua'a:</b>	Honolulu
<b>LCA:</b>	N/A
<b>TMK #:</b>	1-7-002 [Plat]
<b>Elevation Above Sea Level:</b>	2.03 m
<b>UTM:</b>	617729.21 mE, 2357084.16 mN
<b>Max Length/Width/Depth:</b>	6.20 m / 0.84 m / 0.45 m
<b>Orientation:</b>	332 / 152° TN
<b>Targeted Project Component:</b>	Utility relocation
<b>USDA Soil Designation:</b>	Fill land (FL)

**Setting:** Test Excavation 102 (T-102) was located within the northbound bicycle lane of Nimitz Highway. T-102 was located on property owned by the State of Hawai'i. Utilities within the vicinity of T-102 included three gas lines running parallel, located 1.4 m west, 1.3 m east, 2.3 m south, and a water utility line located 2.3 m north of T-102. The excavation surface was level with the surrounding land surface.

**Summary of Background Research and Land Use:** According to the 1847 Metcalf Downtown map, T-102 was 5.6 m east of the old shore line. Although T-102 was not within an LCA, T-102 was 19 m west of LCA 57 (where one house lot was awarded to Simeona Kau) and 19.2 m northwest of LCA 2065 (where one house lot was awarded to Keo Bolabola). A small group of LCAs were located nearby T-102 and the land use was described as habitation. The 1886 Wall map shows urban reclamation and development. The 1897 Monsarrat Honolulu map indicated urban and industrial development. The 1953 Army Mapping Service Honolulu map shows T-102 located within what is now modern day Nimitz Highway.

Previous archaeology in the area surrounding T-103 included several studies. T-102 was located within the site of a 2001 archaeological inventory survey for proposed Nimitz Highway water system improvements in the downtown Honolulu area. The study focused primarily on investigating Kawa Fish Pond (SIHP # 50-80-14-5966) where the pond boundaries were identified and test excavations were positive for fishpond sediments. A clear construction date for Kawa Fish Pond was not determined but sample analysis suggested fishpond sediments were accumulating since at least AD 1150-1350 (McDermott and Mann 2001). Approximately 95 m southwest of T-102, Wong, Smith, and Rosendahl (1990) conducted an historic assessment study of the proposed Aloha Tower Complex project site. The study determined that the area sat on historic period fill which had been placed in a formerly submerged area. It was determined there were no pre-Contact remains in the area, or if remains were present they were subsurface and brought in with fill.

**Documentation Limitations:** T-102 was excavated to a depth of 0.45 mbs. T-102 was unexcavated beneath 0.45 mbs due to the presence of a concrete utility jacket.

**Stratigraphic Summary:** The stratigraphy of T-102 consisted of fill strata to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly sandy loam base course

(Ib), very gravelly sand fill (Ic) to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL).

**Artifacts Discussion:** No artifacts were observed.

**Features Discussion:** No features were observed.

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

**Sample Results:** No bulk sediment samples were collected during the investigation of T-102.

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

GPR depth profiles for T-102 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.15 mbs and again around 0.40 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 1.0 mbs.

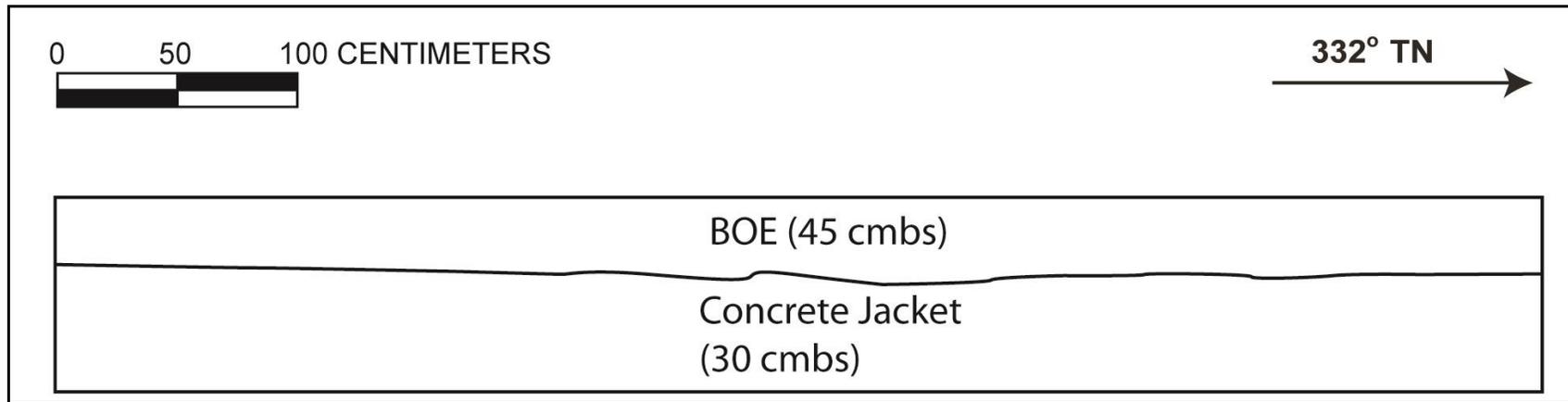
**Summary:** T-102 was excavated to a depth of 0.45 mbs. The stratigraphy of T-102 consisted of fill strata (Ia-Ic) to the base of excavation. The stratigraphy conformed to the USDA soil survey designation of Fill land (FL). No natural sediment was observed. No cultural resources were identified within T-102.



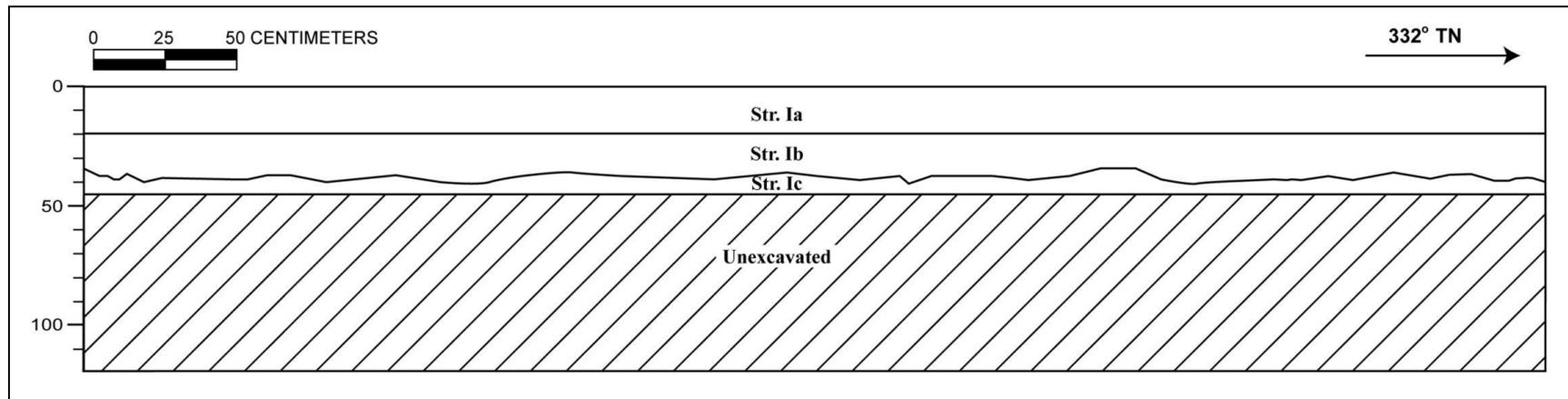
T-102 general location, view to the northeast



T-102 west profile wall, view to the southwest



T-102 plan view



T-102 east wall profile

## T-102 Stratigraphic Description

<b>Stratum</b>	<b>Depth (cmbs)</b>	<b>Description</b>
Ia	0-20	Asphalt
Ib	20-40	Fill; 5 YR 4/1 (dark gray); extremely gravelly sandy loam; structureless, single-grain; dry loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; contained concrete utility jacket; base course imported fill 3b
Ic	40-45	Fill; 10 YR 8/3 (very pale brown); very gravelly sand; structureless, single-grain; dry, weakly coherent consistency; non-plastic; marine origin; lower boundary not visible; crushed coral fill