Final
Archaeological Assessment for the New Aloha Stadium Entertainment District (NASED), Hālawa Ahupua‘a, ‘Ewa District, O‘ahu TMKs: (1) 9-9-003:055, 061, 070, and 071

Prepared for
Department of Accounting and General Services (DAGS)

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(Job Code: HALAWA 28)

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Management Summary

Reference	Archaeological Assessment for the New Aloha Stadium Entertainment District (NASED), Hālawa Ahupua‘a, ‘Ewa District, O‘ahu, TMKs: (1) 9-9-003:055, 061, 070, and 071 (Turran and Hammatt 2025)
Date	February 2025
Project Number(s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: HALAWA 28
Investigation Permit Number	CSH completed the archaeological inventory survey fieldwork under archaeological fieldwork permit number 21-10, issued by the Hawai‘i State Historic Preservation Division (SHPD) per Hawai‘i Administrative Rules (HAR) §13-282.
Agencies	SHPD; Department of Accounting and General Services (DAGS) Stadium Authority; Department of Business, Economic Development and Tourism (DBEDT)
Land Jurisdiction	State of Hawai‘i
Project Proponent	DAGS on behalf of the Stadium Authority
Project Funding	DAGS
Project Location	The NASED development area is located in coastal Hālawa Ahupua‘a, ‘Ewa District, central south shore of O‘ahu. The NASED development area involves four parcels separated by Salt Lake Boulevard. The larger northeastern parcel is located at Tax Map Key (TMK): (1) 9-9-003:061 at 99-500 Salt Lake Boulevard (approximately 87.59 acres) which includes the existing Aloha Stadium and an adjacent parking area to the southeast generally bounded by Kamehameha Highway on the west, Moanalua Freeway on the north, the H-1 Freeway to the east, and Salt Lake Boulevard to the south. A smaller southwest parcel, TMK: (1) 9-9-003:071 at 99-232 Kamehameha Highway (approximately 7.29 acres) is generally bounded by Kamehameha Highway to the northwest, and legs of Salt Lake Boulevard on the northeast, southeast, and southwest sides. The two other smaller discrete parcels include TMK: (1) 9-9-003:055 (2.57 acres) bounded by Salt Lake Boulevard to the northwest and northeast and a small linear parcel (0.87 acres) at TMK: (1) 9-9-003:070 bounded by Kamehameha Highway on the northwest and Salt Lake Boulevard on the northeast. The NASED development area is depicted on a portion of the Pearl Harbor (1999) and Waipahu (1998) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.
Project Description	The proposed NASED includes redeveloping all four portions of the NASED development area. NASED will involve a “program” comprising various projects to be carried out over time for a common purpose (NASED Program). The NASED Program includes the demolition of the existing Aloha Stadium, the construction of a new multi-purpose stadium, and will include an integrated mixed-use development comprising

	residential, retail, entertainment, hotel, commercial and community facilities within buildings that contain car parking associated with the particular uses in consonance with Transit Oriented Development community revitalization concepts as established by City and County of Honolulu Ordinances 50 and 51, 2023. A characteristic of the mixed-use development surrounding and integrated with the new Aloha Stadium will be a retail and entertainment-oriented District featuring pedestrian plazas, recreational amenities such as activated open spaces and walkable connectivity throughout the District, a neighborhood park, and other ancillary or supporting uses. A pedestrian bridge over Hālawa Stream with local road access on both sides, expanding access to/from the Interstate H-3 Freeway and Moanalua Freeway (H-201), expanding Salt Lake Boulevard, and service access on the south side of the stadium will greatly improve controlled vehicular circulation throughout the site while improving connectivity to the surrounding road network. The “Project Area” is a subset of the NASED development area and is the area where the first proposed project of the NASED Program will be developed. This first proposed project is a stand-alone project, and is not contingent on the completion of any future projects. The first proposed project of the NASED Program, as set forth in the programmatic master plan, includes: • Demolition of the existing stadium • Construction of a new stadium and associated service amenities • Relocation of stadium gates • Site rough grading/turf • Construction new internal roads • Construction of new surface parking • Repair and resurface existing parking • Construction of new retail, entertainment, residential, hotel and commercial buildings • Relocation of bus station • Construction of new land bridge over Salt Lake Boulevard At present, there are no plans for project-related ingress/egress or utility work within Kamehameha Highway. It is possible unexpected conditions may require project-related work to extend into state-owned rights-of-way. Should ground disturbance be determined necessary in a state-owned right-of-way during the project, SHPD and the Hawai‘i Department of Transportation (HDOT) will be consulted.
Project Acreage	The larger northeast parcel (TMK: [1] 9-9-003:061) is 87.59 acres and the smaller southwest parcels are TMK: (1) 9-9-003:055 (2.57 acres), TMK: (1) 9-9-003:070 (0.87 acres), and TMK: (1) 9-9-003:071 (7.29 acres) for a total NASED development area encompassing 98.32 acres (39.79 hectares). The project area is 64.2 acres (26 hectares).

Historic Preservation Regulatory Context	This archaeological inventory survey (AIS) investigation fulfills the requirements of HAR §13-276 and was conducted to identify, document, and assess significance of any historic properties. This document is intended to support the proposed project's historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8 and HAR §13-275, as well as the project's environmental review under HRS §343. It is also intended to support any project-related historic preservation consultation with stakeholders, such as state and county agencies and interested Native Hawaiian Organizations (NHOs) and community groups. William Barrera (1971) conducted an archaeological reconnaissance for the proposed Honolulu Stadium. No historic properties were identified. CSH (Sroat et al. 2012) produced an archaeological inventory survey for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor project (now termed HRTP), which overlaps with a portion of the project area. The study identified no historic properties in the vicinity. The Sroat et al. (2012) study was accepted in an SHPD National Historic Preservation Act (NHPA) Section 106 Consultation review dated 23 May 2012 (Log No.: 2012.1449; Doc. No.: 1205NN23). CSH (Turran et al. 2020) produced an archaeological literature review and field inspection report for the NASED program. CSH (Shideler and Belluomini 2021) produced an archaeological inventory survey testing strategy plan for the NASED project. The testing strategy plan for this project was accepted by the SHPD (Garnet L.K. Clark) in an email to CSH (David Shideler and Scott Belluomini) dated 11 June 2021. A programmatic master plan has been developed for the NASED program (Crawford Architects 2022). FAI Architects (2024) conducted an architectural reconnaissance level survey (RLS) for Aloha Stadium.
Fieldwork Effort	Fieldwork was conducted from 12 to 21 July 2021 by CSH archaeologists Scott Belluomini, B.A., Abundanzia Delavega, B.A., Alexandra Coyle, B.A., Allison Hummel, M.Sc., Rachel Williamson, B.A., Sloane Agruss, M.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett H. Hammatt, Ph.D. This work required approximately 21 person-days to complete.
Consultation	Consultation with the SHPD was conducted regarding an AIS testing plan for this project. CSH also utilized the cultural impact assessment (CIA) report completed by Honua Consulting (Watson et al. 2020).
Results of Fieldwork	No archaeological historic properties were identified within the project area during the AIS, thus this investigation is presented in an archaeological assessment (AA) report per HAR §13-275-5(b)(5)(A).

	This AIS documented minimal evidence of former land surfaces. No evidence of former Land Commission Awards (LCAs) or ca. 1900 homesteading areas were observed in any of the test excavations. The project area was heavily impacted during the development of Aloha Stadium and the former land use remnants were not present. The buried concrete remnants documented in four test excavations within the project area could not be identified as associated with specific former buildings or structures and were possibly related to the development and filling of Aloha Stadium.
Architectural Historic Properties Identified	The FAI Architects (2024) RLS determined that Aloha Stadium is eligible for listing in the Hawai‘i Register of Historic Places (HRHP) and the National Register of Historic Places (NRHP) under Criterion C and that it retains sufficient integrity for significance under Criterion c pursuant to HAR §13-275-6(b).
Effect Determination	One architectural historic property, Aloha Stadium (SIHP # 50-80-13-10114), was identified in an RLS within the project area (FAI Architects 2024). No archaeological historic properties were identified. The Aloha Stadium will be impacted by the first proposed project. Therefore, per HAR §13-275-7, the project-specific effect determination is “Effect, with proposed mitigation commitments” for the first standalone project, the Aloha Stadium Redevelopment project.
Mitigation Commitments	The following proposed mitigation commitments are designed to mitigate the potential effect on significant historic properties that may be impacted by the proposed project: • Historical documentation in the form of a Historic American Building Survey (HABS) report to be completed for the Aloha Stadium and donated to the National Archives. • Historical documentation of the Aloha Stadium to be located within the new stadium and viewable to stadium users. Such documentation should be in the form of approximately ten (10) interpretive panels (or similar) that describe the history of the development of the stadium and the surrounding area, cover the design and moveability features of Aloha Stadium, and feature information on sporting and entertainment events that occurred at Aloha Stadium through maps, drawings, photographs, installations, and narrative. In addition, due to the proximity of human burials outside the project area and presence of LCAs within the project area, archaeological monitoring is proposed to be conducted for the first proposed project for identification purposes. An archaeological monitoring plan meeting the requirements of HAR §13-279-4 will be submitted to the SHPD for review and acceptance.

Future Projects	Future projects associated with the overall NASED Program may require compliance with HRS §6E and/or other historic preservation triggers, such as Section 106 of the National Historic Preservation Act. Consultation with SHPD shall be conducted regarding appropriate documentation for future projects as they are developed.

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Section 1 Introduction

At the request of the State of Hawai‘i Department of Accounting and General Services (DAGS), Cultural Surveys Hawai‘i, Inc. (CSH) has prepared this archaeological assessment (AA) for the New Aloha Stadium Entertainment District (NASED) Project, Hālawa Ahupua‘a, ‘Ewa District, O‘ahu, Tax Map Key (TMK): (1) 9-9-003:055, 061, 070, and 071. The NASED development area is in coastal Hālawa Ahupua‘a, ‘Ewa District, central south shore of O‘ahu. The NASED development area and the project area, as defined below, is depicted on a portion of the 1998 Waipahu and 1999 Pearl Harbor U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles (Figure 1), a TMK plat map (Figure 2), and a 2017 aerial photograph (Figure 3).

1.1 Project Background

The NASED development area involves four parcels. The larger northeastern parcel is within TMK: (1) 9-9-003:061 at 99-500 Salt Lake Boulevard (approximately 87.59 acres) which includes the existing Aloha Stadium and an adjacent parking area to the southeast generally bounded by Kamehameha Highway on the west, Moanalua Freeway on the north, the H-1 Freeway to the east, and Salt Lake Boulevard to the south. A smaller southwest parcel (TMK: [1] 9-9-003:071) at 99-232 Kamehameha Highway (approximately 7.29 acres) is generally bounded by Kamehameha Highway to the northwest, and legs of Salt Lake Boulevard on the northeast, southeast, and southwest sides. The two other smaller parcels include TMK: (1) 9-9-003:055 (approximately 2.57 acres) bounded by Salt Lake Boulevard to the northwest and northeast and TMK: (1) 9-9-003:070 (approximately 0.87 acres) bounded by Kamehameha Highway on the northwest and Salt Lake Boulevard on the northeast. The total NASED development area is approximately 98.32 acres (39.79 hectares).

The proposed NASED includes redeveloping all four portions of the NASED development area. NASED will involve a “program” comprising various projects to be carried out over time for a common purpose (NASED Program). NASED will involve a “program” comprising various projects to be carried out over time for a common purpose (NASED Program). The NASED Program includes the demolition of the existing Aloha Stadium, the construction of a new multi-purpose stadium, and will include an integrated mixed-use development comprising residential, retail, entertainment, hotel, commercial and community facilities within buildings that contain car parking associated with the particular uses in consonance with Transit Oriented Development community revitalization concepts as established by City and County of Honolulu Ordinances 50 and 51, 2023. A characteristic of the mixed-use development surrounding and integrated with the new Aloha Stadium will be a retail and entertainment-oriented District featuring pedestrian plazas, recreational amenities such as activated open spaces and walkable connectivity throughout the District, a neighborhood park, and other ancillary or supporting uses. A pedestrian bridge over Hālawa Stream with local road access on both sides, expanding access to/from the Interstate H-3 Freeway and Moanalua Freeway (H-201), expanding Salt Lake Boulevard, and service access on the south side of the stadium will greatly improve controlled vehicular circulation throughout the site while improving connectivity to the surrounding road network.

The Project Area is a subset of the NASED development area. The project area consists of the first proposed project of the NASED Program will be developed (see Figure 1 through Figure 3),

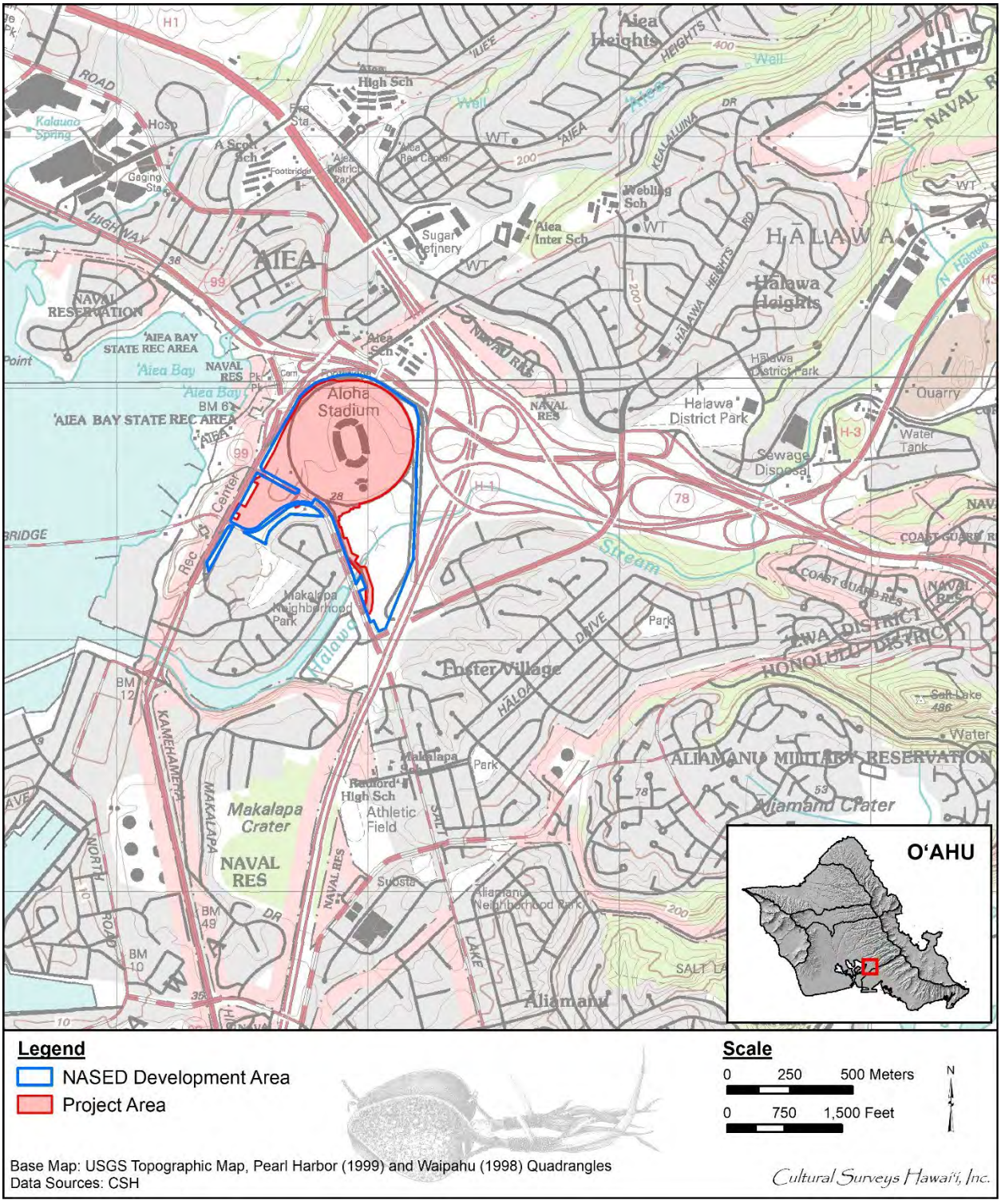

Figure 1. Portion of the 1998 Waipahu and 1999 Pearl Harbor USGS 7.5-minute topographic quadrangles showing the location of the NASED development area and the first proposed project area

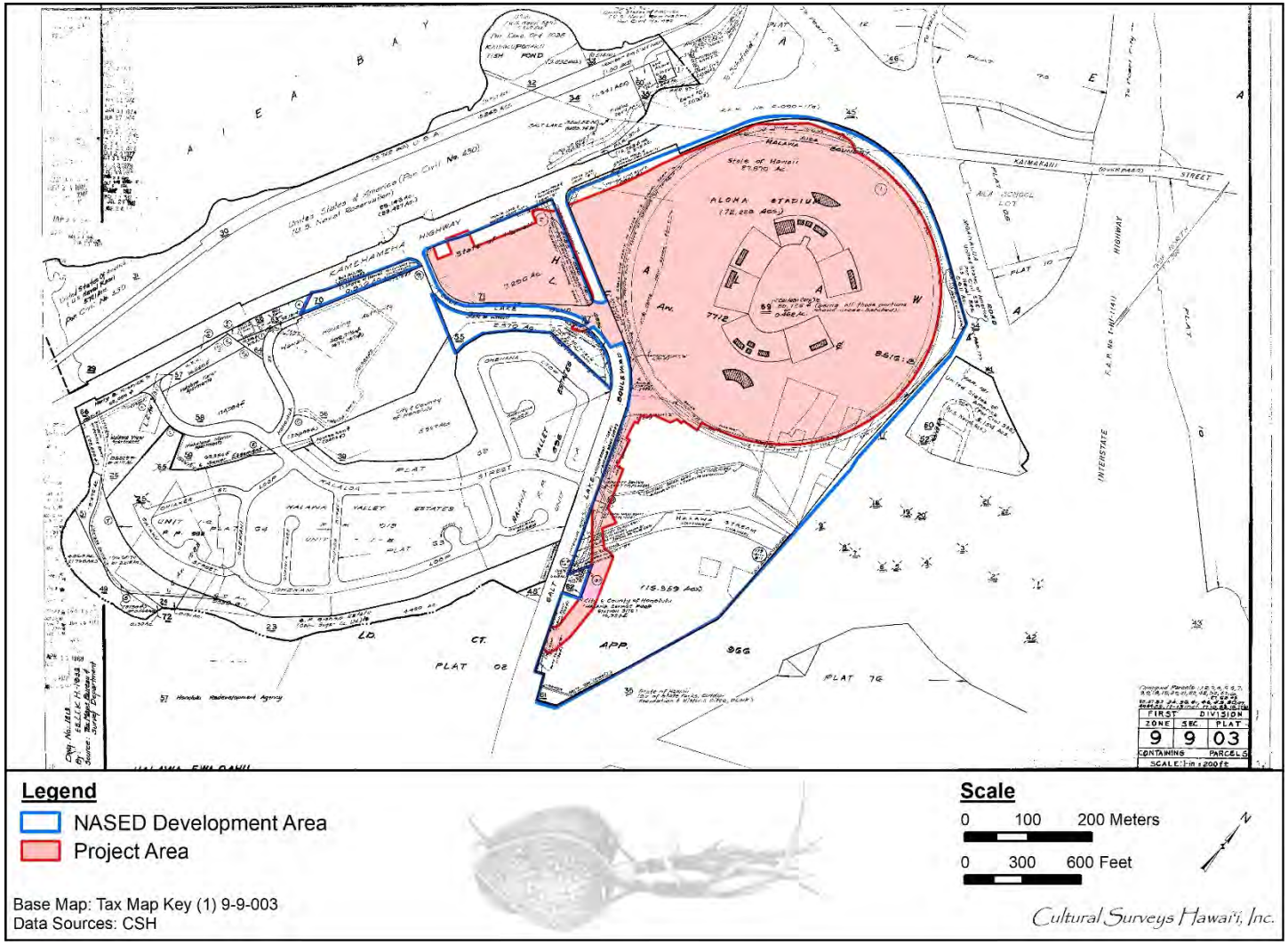

Figure 2. TMK: (1) 9-9-003 showing the NASED development area and the first proposed project area (Hawai‘i TMK Service 2019)

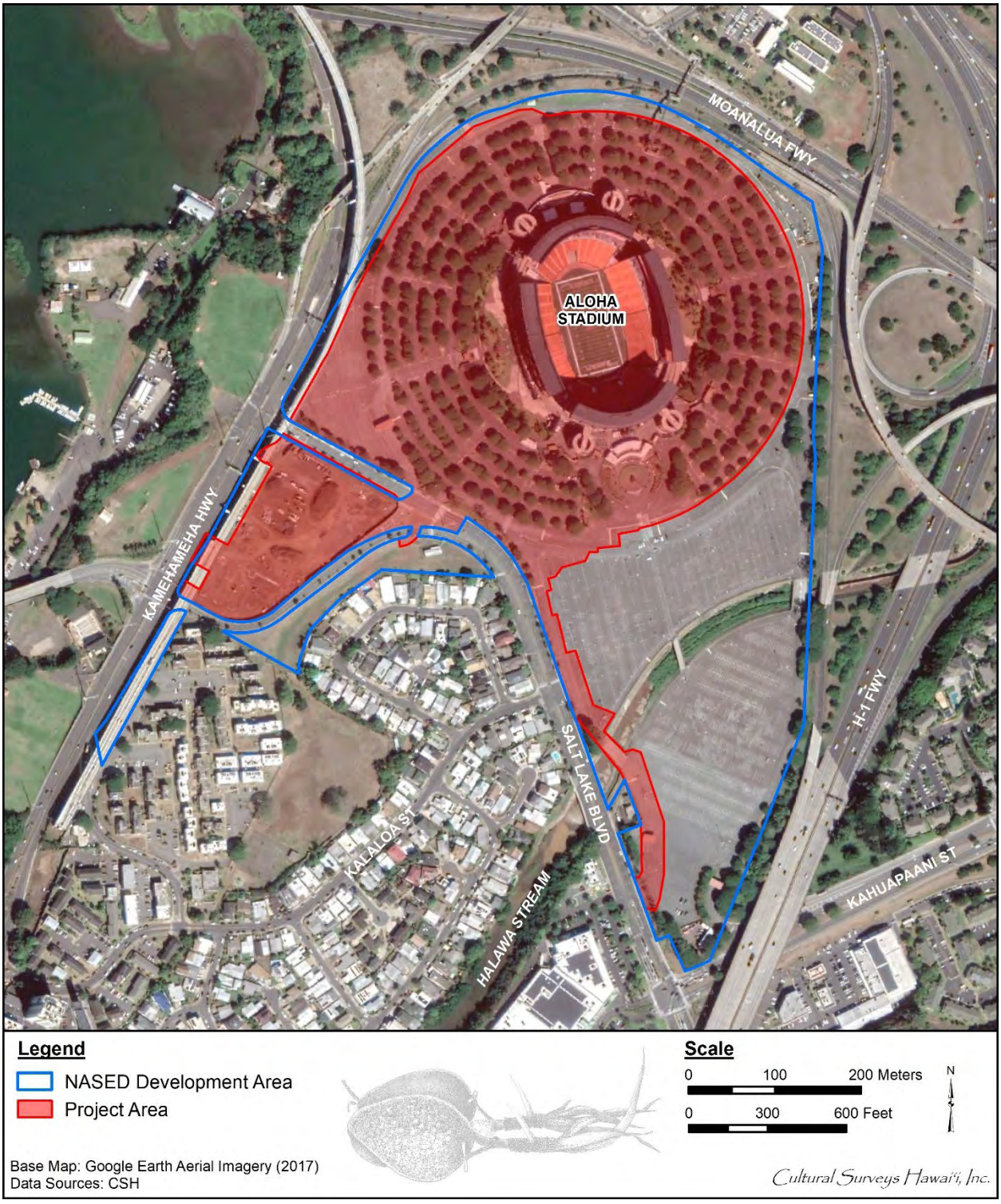

Figure 3. Aerial photograph showing the NASED development area and the first proposed project area (Google Earth 2017)

known as the Aloha Stadium Redevelopment Project. The Project Area is approximately 64.2 acres (26 hectares). This first proposed project is a stand-alone project, and is not contingent on the completion of any future projects. The first proposed project within the Project Area, as set forth in the programmatic master plan, includes:

- Demolition of the existing stadium
- Construction of a new stadium and associated service amenities
- Relocation of stadium gates
- Site rough grading/turf
- Construction new internal roads
- Construction of new surface parking
- Repair and resurface existing parking
- Construction of new retail, entertainment, residential, hotel and commercial buildings
- Relocation of bus station
- Construction of new land bridge over Salt Lake Boulevard

At present, there are no plans for project-related ingress/egress or utility work within Kamehameha Highway. It is possible unexpected conditions may require project-related work to extend into state-owned rights-of-way. Should ground disturbance be determined necessary in a state-owned right-of-way during the project, SHPD and the Hawai‘i Department of Transportation (HDOT) will be consulted.

1.2 Historic Preservation Regulatory Context and Document Purpose

While the NASED Development Area will be developed over time, the first proposed project, covering the “Project Area,” is the primary subject of this archaeological inventory survey (AIS) investigation. This first proposed project is being submitted as one Hawai‘i Revised Statutes (HRS) §6E review, however, may be split into separate permitting processes and/or construction packages/phases, as determined necessary for successful project completion.

Future components of the NASED Program may require compliance with HRS §6E and/or other historic preservation triggers, such as Section 106 of the National Historic Preservation Act (NHPA). Project-specific consultation with State Historic Preservation Division (SHPD) is recommended regarding future historic preservation requirements as future projects are developed.

This AIS investigation fulfills the requirements of Hawai‘i Administrative Rules (HAR) §13-276 and was conducted to identify, document, and assess significance of any historic properties. This document is intended to support the proposed project’s historic preservation review under HRS §6E-8 and HAR §13-275, as well as the project’s environmental review under HRS §343. It is also intended to support any project-related historic preservation consultation with stakeholders, such as state and county agencies and interested Native Hawaiian Organizations (NHOs) and community groups. As no archaeological historic properties were identified within the project area during this AIS, this investigation is presented in an archaeological assessment (AA) report per HAR §13-275-5(b)(5)(A).

William Barrera (1971) carried out an archaeological reconnaissance survey for the then proposed Honolulu Stadium. No historic properties were identified.

CSH (Sroat et al. 2012) produced an archaeological inventory survey for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor project (now termed HRTP) that extended along Kamehameha Highway on the *makai* (seaward, west) side of the stadium parcel (TMK: [1] 9-9-003:061) and included the entirety of TMK: (1) 9-9-003:071 (proposed as the Aloha Stadium Station and a "Park and Ride" lot for the HRTP). The study identified no historic properties in the vicinity. The Sroat et al. (2012) study was accepted in a SHPD NHPA Section 106 Consultation review dated 23 May 2012 (Log No.: 2012.1449; Doc. No.: 1205NN23).

CSH (Turran et al. 2020) produced an archaeological literature review and field inspection (LRFI) report for the overall NASED development area.

CSH (Shideler and Belluomini 2021) produced an archaeological inventory survey testing strategy plan for the NASED development. The testing strategy plan for this project was accepted by the SHPD (Garnet L.K. Clark) in an email to CSH (David Shideler and Scott Belluomini) dated 11 June 2021.

A programmatic master plan has been developed for the NASED program (Crawford Architects 2022).

FAI Architects (2024) conducted an architectural reconnaissance level survey (RLS) for Aloha Stadium. The RLS determined that Aloha Stadium is eligible for the Hawai‘i Register of Historic Places (HRHP) and the National Register of Historic Places (NRHP) and that it retains sufficient integrity for significance under HAR §13-275-6(b).

1.3 Environmental Setting

1.3.1 Natural Environment

The NASED project area is situated east of the East Loch of Pearl Harbor on the central south shore of O‘ahu on a coastal plain straddling Hālawa Stream approximately 220 m from the shoreline. Elevations in the project area range from approximately 1 to 18 m above mean sea level. The project area receives an average of approximately 953 mm (37.5 inches) of annual rainfall (at "Aiea Field 84" gauge; Giambelluca et al. 2013). This is suggested to be marginal for non-irrigated agriculture. The vegetation in the project area and immediate vicinity consists primarily of introduced landscaping trees, shrubs, and ground cover plants.

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area's soils consist of Hanalei Silty Clay, 2 to 6% slopes (HnB); Honouliuli Clay, 0 to 2% slopes (HxA); Kawaihapai Clay Loam, 0 to 2% slopes (KlA); Makalapa Clay, 2 to 6% slopes (MdB); Waipahu Silty Clay, 2 to 6% slopes (WzA); and rock land (rRK) (Figure 4).

Soils of the Hanalei Series (HnB) are described as follows:

> This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from nearly sea level to 300 feet. […]
>
> These soils are used for taro, pasture, sugarcane, and vegetables. The natural vegetation consists of paragrass, sensitiveplant, honohono, Java plum, and guava. [Foote et al. 1972:38]

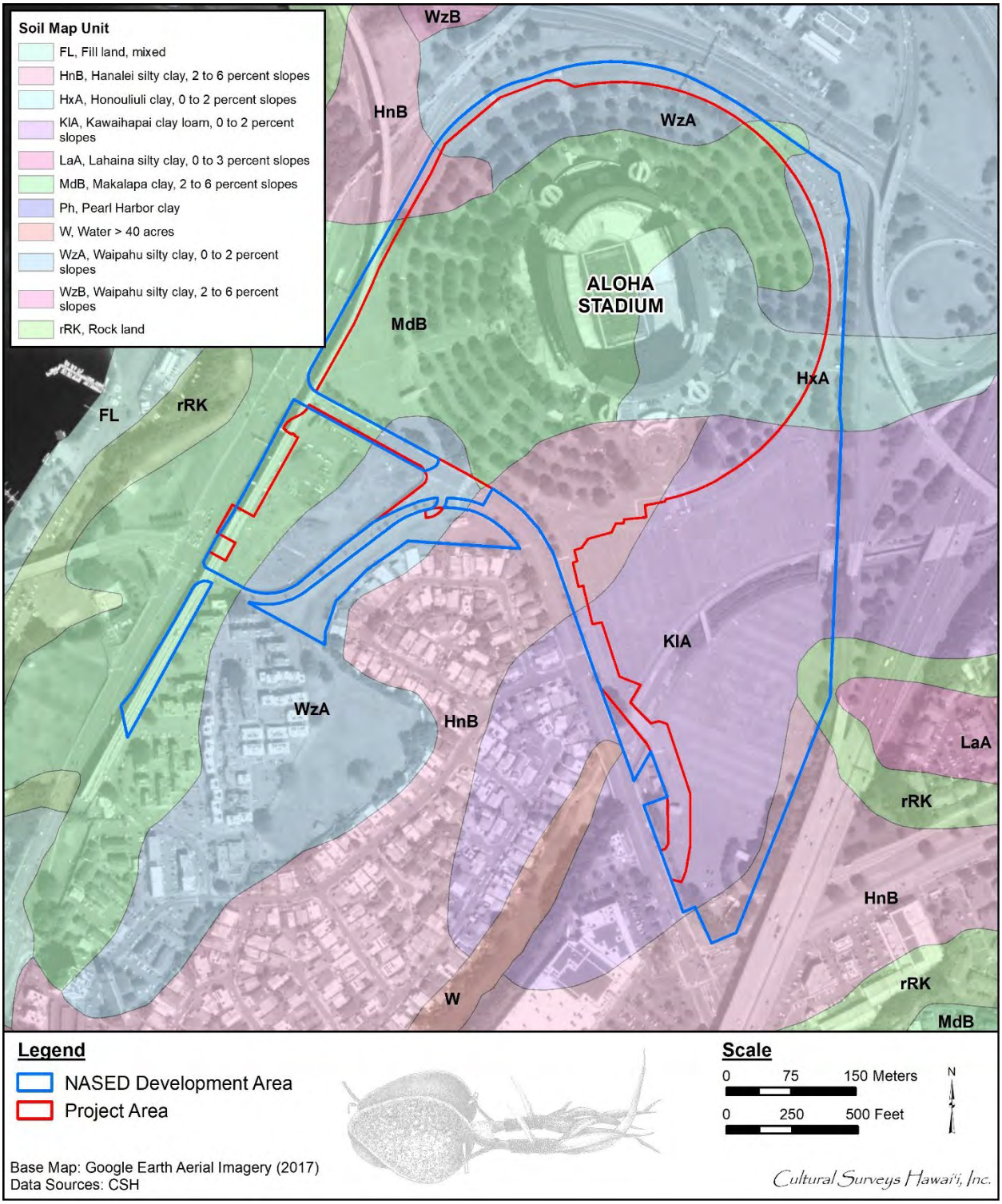

Figure 4. Aerial photograph (Google Earth 2017) with overlay of *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* (Foote et al. 1972; USDA SSURGO 2001), indicating soil types within and surrounding the project area

Hanalei Silty Clay, 2 to 6% slopes (HnB) soils are further described as soils where “runoff is slow and the erosion hazard is slight” (Foote et al. 1972:38).

Soils of Honouliuli Series (HxA) are described as follows:

> This series consists of well-drained soils on coastal plains on the island of Oahu in the Ewa area. These soils developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. Elevations range from 15 to 125 feet […]
>
> These soils are used for sugarcane, truck crops, orchards, and pasture. The natural vegetation consists of kiawe, koa haole, fingergrass, bristly foxtail, and bermudagrass. [Foote et al. 1972:43]

Honouliuli Clay, 0 to 2% slopes (HxA) soils are further described as follows:

> […] occurs in the lowlands along the coastal plains. Included in mapping were small areas of fine-textured alluvial soils that have a stony subsoil. Also included were small areas of shallow, red, friable soils, that are underlain by reef limestone […]
>
> Permeability is moderately slow. Runoff is slow, and the erosion hazard is no more than slight. [Foote et al. 1972:43]

Soils of the Kawaihapai Series are described as follows:

> This series consists of well-drained soils in drainage ways and on alluvial fans on the coastal plains on the islands of Oahu and Molokai. These soils formed in alluvium derived from basic igneous rock in humid uplands.
>
> They are nearly level to moderately sloping. Elevations range from nearly sea level to 300 feet […]
>
> These soils are used for sugar cane, truck crops, and pasture. The natural vegetation consists of kiawe, koa haole, lantana, and bermudagrass. [Foote et al. 1972:63–64]

Kawaihapai Clay Loam, 0 to 2% slopes (KlA) soils are further described as follows:

> This soil occupies smooth slopes. Included in mapping were small areas where the slope is 3 to 7 percent and the texture is silty clay. Also included were small areas of poorly drained soils and small areas of Jaucas soils […] Permeability is moderate. Runoff is slow, and the erosion hazard is no more than slight. [Foote et al. 1972:64]

Soils of the Makalapa Series are described as follows:

> This series consists of well-drained soils on uplands on the island of Oahu, near Salt Lake Crater, Diamond Head, and the Mokapu Peninsula. These soils formed in volcanic tuff. They are gently sloping to moderately steep. Elevations range from 20 to 200 feet […]
>
> These soils are used for urban development and pasture. The natural vegetation consists of kiawe, koa haole, lantana, bermudagrass, and fingergrass. [Foote et al. 1972:87]

Makalapa Clay, 2 to 6% slopes (MdB) soils are further described as follows:

> This soil is gently sloping. Included in mapping were small areas of Mamala soils and small areas of saline soils within Salt Lake Crater and Diamond Head […] Permeability is slow. Runoff is slow, and the erosion hazard is slight. [Foote et al. 1972:87]

Soils of the Waipahu Series are described as follows:

> This series consists of well-drained soils on marine terraces on the island of O‘ahu. These soils developed in old alluvium derived from basic igneous rock. They are nearly level to moderately sloping. Elevations range from nearly sea level to 125 feet. [Foote et al. 1972:134]

Waipahu Silty Clay, 2 to 6% slopes (WzA) soils are further described as follows: “On this soil, runoff is slow and the erosion hazard is slight” (Foote et al. 1972:134).

Rock land (rRK) is “made up of areas where exposed rock covers 25 to 90 percent of the surface” (Foote et al. 1972:119).

1.3.2 Built Environment

The project area is within a predominantly urban landscape, including the current Aloha Stadium, parking for the stadium, and development associated with the stadium. The portion of the Hālawa Stream that crosses the project area is channelized.

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of this AIS under archaeological fieldwork permit number 21-10, issued by the SHPD pursuant to HAR §13-282. Pedestrian inspection was conducted between 20 and 21 May and 5 October 2019 by Alexandra Coyle, B.A., Brittany Enanoria, B.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett H. Hammatt, Ph.D. This work required approximately 2.5 person-days to complete. The AIS fieldwork was conducted between 12 to 21 July 2021 by CSH archaeologists Abundanzia Delavega, B.A., Alexandra Coyle, B.A., Allison Hummel, M.Sc., Rachel Williamson, B.A., Scott Belluomini, B.A., Sloane Agruss, M.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett H. Hammatt, Ph.D. This work required approximately 21 person-days to complete.

In general, fieldwork included 100% pedestrian inspection, GPS data collection, and subsurface testing. Standard forms were used for all aspects of the fieldwork, including but not limited to feature forms, test excavation record forms, bag list forms, photo logs, and stratigraphic record forms.

2.1.1 Pedestrian Survey

A 100%-coverage pedestrian inspection of the NASED development area—including the AIS project area—was undertaken for the purpose of historic property identification and documentation. The pedestrian survey was accomplished in all four TMK parcels. Archaeologists recorded the general characteristics of the area, including vegetation, and took general photographs of the area.

Architectural historic properties were not identified as part of this AIS pedestrian inspection; FAI conducted an architectural RLS study for the Aloha Stadium (FAI Architects 2024).

2.1.2 Subsurface Testing

The subsurface testing program included 21 backhoe-assisted test excavations each measuring approximately 6.0 m by 0.6 m. These test excavation locations include both geographically representative locations as well as specific areas of greater archaeological potential as indicated in the background research. The location and rationale for the test excavations are summarized in Table 1. Particular weight was placed on the pattern of *maka‘āinana* (commoner) Land Commission Awards (LCAs) in the vicinity (Figure 5 and Figure 6). Subsurface testing was also designed to target locations of former military structures within the NASED development area (Figure 7).

The TMK: (1) 9-9-003:071 and 070 parcels have been addressed in a prior AIS (Sroat et al. 2012) accepted by the SHPD (see Appendix A) and no additional subsurface testing work is warranted in those parcels.

The base of excavation was at a maximum depth of 2.0 m (6.0 feet [ft]). If conditions were unsafe, documentation was conducted as best as possible from the surface. When utilities or

Table 1. Summary of proposed test excavations in relation to the current Aloha Stadium and Hālawa Stream

Test Excavation #	**Location**	**Rationale**
1	West side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
2	West side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
3	Southwest side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
4	South side of Aloha Stadium	For geographic representation
5	Southwest side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
6	West side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
7	Northwest side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
8	North side of Aloha Stadium	In an area of WWII infrastructure and for geographic representation
9	Northeast side of Aloha Stadium	For geographic representation
10	South side of Aloha Stadium	For geographic representation
11	South side of Aloha Stadium	For geographic representation
12	South side of Aloha Stadium	For geographic representation
13	North side of Hālawa Stream	LCA 2156:3 *Pāhale* (house lot) area
14	East side of Aloha Stadium	LCA 2047:1 and 9332:1 *Loʻi* (irrigated terrace) area and ca. 1900 homesteading area
15	Southeast side of Aloha Stadium	LCA 2139 *Moʻoʻāina* (narrow strip of land) area and ca. 1900 homesteading area
16	Southeast side of Aloha Stadium	LCA 1996 *Moʻoʻāina* area and ca. 1900 homesteading area
17	Southeast side of Aloha Stadium	LCA 9332:2 *Loʻi* area
18	North side of Hālawa Stream	Ca. 1900 homesteading area
19	South side of Hālawa Stream	Ca. 1900 homesteading area
20	South side of Hālawa Stream	LCA 2156:1 *Loʻi* area
21	South side of Hālawa Stream	LCA 2156:2 *Loʻi* and *kula* (pasture) area and ca. 1900 homesteading area

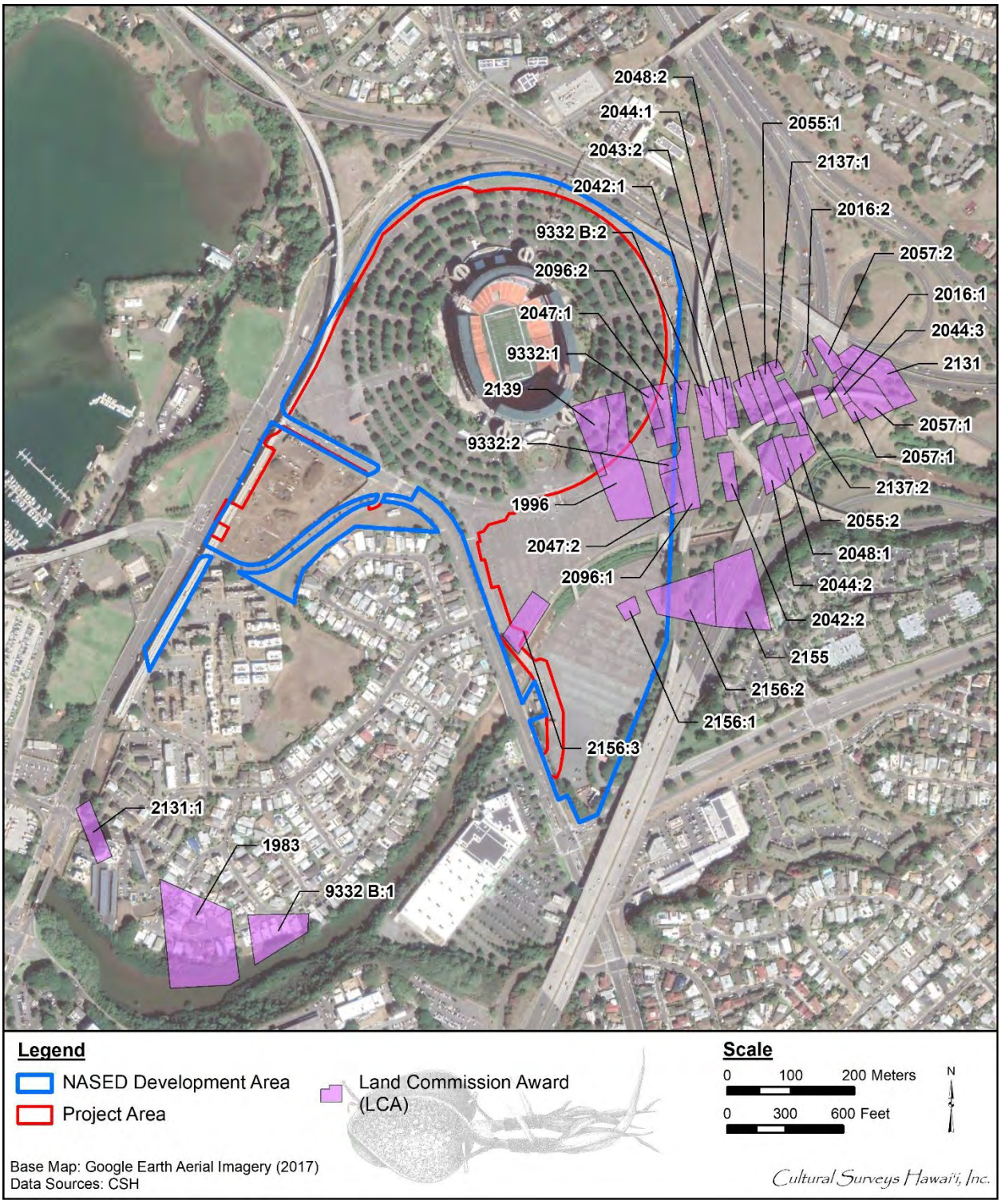

Figure 5. Aerial photograph (Google Earth 2017) showing *maka‘āinana* LCAs in the vicinity of the AIS project area

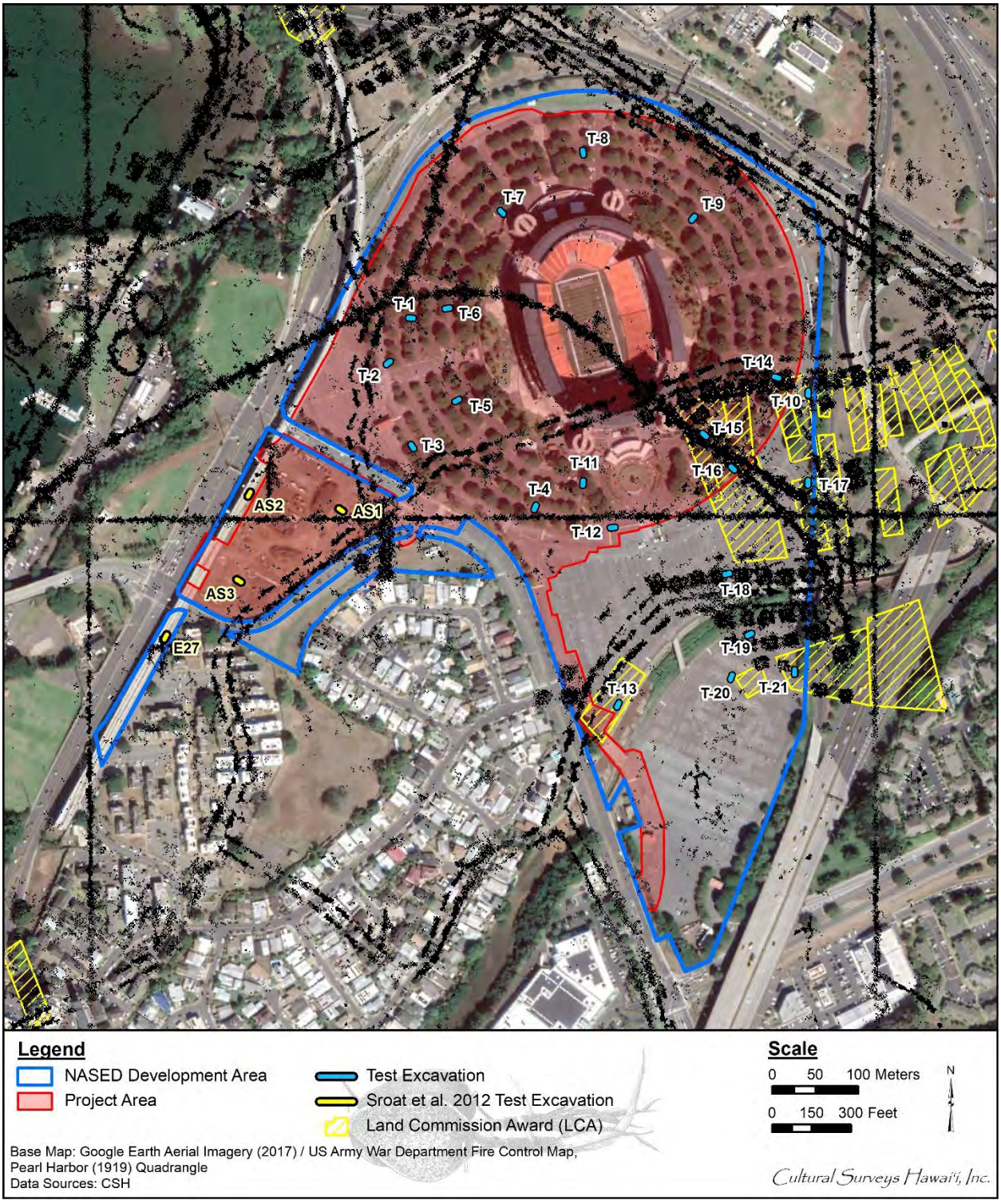

Figure 6. Aerial photograph (Google Earth 2017) with locations of archaeological inventory survey test excavations and the locations of *maka‘āinana* LCAs and homestead homes dating to ca. 1900, with overlay of 1919 U.S. Army War Department fire control map

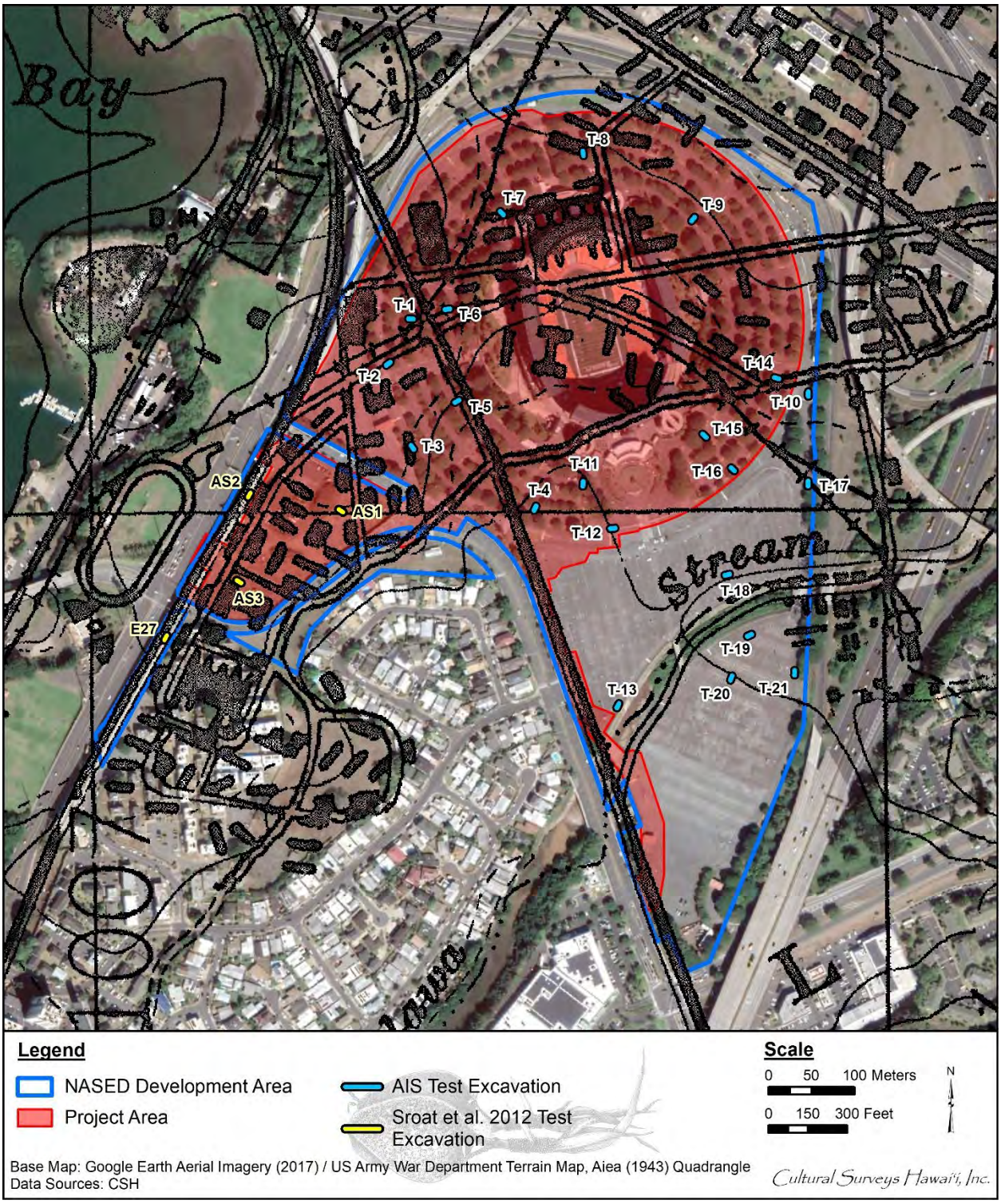

Figure 7. Aerial photograph (Google Earth 2017) with locations of AIS test excavations and overlay of a 1943 Aiea U.S. Army War Department terrain map showing locations of military buildings and roads

subsurface structural elements were encountered, they were kept in place and the excavation was adjusted as necessary.

Initial excavation methods consisted of saw cutting of the asphalt parking lot surface. Removal of the underlying fill deposits was undertaken via backhoe with archaeologists observing the test excavation and backhoe bucket and another closely observing the back dirt. Within natural deposits, mechanized excavation changed to slowly removing thin “shovel-scraped” layers of sediment to enhance the potential of identifying and documenting any in situ cultural deposits or remnants.

Archaeologists photographed the general area and in-progress work, recording on-the-job procedures, personnel, work conditions, and the area’s natural and/or built environment. Additionally, they photographed all subsurface features, cultural deposits, and profiles. Photographs included a photographic scale and north arrow as appropriate.

A stratigraphic profile of each test excavation was drawn and photographed. The observed deposits were described using standard USDA soil description observations/terminology (USDA 2001). Sediment descriptions included Munsell color (Munsell 2000); texture; consistence; structure; plasticity; cementation; origin of sediments; descriptions of any inclusions, such as cultural material and/or roots; lower boundary distinctness and topography; and other general observations. Where stratigraphic anomalies or potential cultural deposits were exposed, these were carefully represented on test excavation profile maps.

2.1.3 GPS Data Collection

Hand-held Garmin GPSMAP 64s were used to record the archaeologists track log during the pedestrian inspection. These handheld units provide horizontal accuracy between 3 and 5 m. The locations of each of the 21 test excavations were recorded using a Trimble GeoExplorer GeoXH 6000 Series GPS unit with real-time differential correction. These units provide sub-meter horizontal accuracy in the field. GPS field data was post-processed, yielding horizontal accuracy between 0.5 and 0.1 m. GPS location information was converted into GIS shape files using Trimble’s Pathfinder Office software, version 5.90, and graphically displayed using ESRI’s ArcMap 10.7. CSH utilizes the NAD 83 HARN datum and UTM Zone 4N coordinate system.

2.2 Laboratory Methods

Materials collected during the AIS fieldwork were identified and catalogued at CSH’s laboratory facilities on O‘ahu. Analysis of collected materials was undertaken using standard archaeological laboratory techniques. Materials were washed, sorted, measured, weighed, described, and/or photographed.

2.2.1 Artifact Analysis

The collected artifacts do not represent 100% collection from the project area. Rather, a grab sample of artifacts was collected with an emphasis on complete artifacts and artifacts with diagnostic traits that could provide information about the history of the area.

Artifact analysis was conducted by CSH lab specialist Allison Hummel, M.Sc. Artifacts were cleaned, sorted, inventoried, measured, weighed, and described. Diagnostic artifacts were discussed by type and a sample of artifacts was photographed.

Historical artifacts were identified and described using BLM/SHA 2021; Florida Museum of Natural History 2020; and Maryland Archaeological Conservation Laboratory 2018, as well as digital and print resources relevant to individual artifact manufacture and history.

Historical artifacts were assessed for material type, function, origin, and date of manufacture. Country of origin was identified where possible. For dating purposes, historical artifacts were assessed to determine date of manufacture first and foremost. Where applicable, manufacture date ranges were modified by available information regarding dates of import of certain materials and immigration of ethnic groups to Hawai‘i. Notable dates frequently used in this capacity are 1850, the date of increased import of goods to support the influx of missionaries, merchants, laborers, and other foreigners from US and Europe; 1852, the date of the first immigration of Chinese workers; and 1868, the date of the first immigration of Japanese workers. *Terminus ante quem* and *terminus post quem* limits for the creation of cultural features and deposition of stratigraphic layers were discussed based on a combination of artifact manufacture/import dates and available land use information. Analyzed materials were tabulated and are presented in Section 5 (see Table 26).

2.2.2 Vertebrate Faunal Analysis

CSH osteologists identified all faunal osseous remains in the field, collecting and recording all faunal remains for further laboratory analysis and curation. Faunal analysis generally focused on species identification and evidence of food consumption. Collected non-human vertebrate skeletal material was identified to the lowest possible taxa and analyzed using an in-house comparative collection and reference texts (i.e., Adams and Crabtree 2008; France 2009) by CSH osteologist, Allison Hummel, M.Sc., with training in faunal analysis. The material was weighed in grams and cataloged according to provenience. A catalogue of collected material was prepared and is presented in Section 5.

2.2.3 Disposition of Materials

Materials collected during the current archaeological inventory survey program (excluding human remains and grave goods) will remain temporarily curated at the CSH offices on O‘ahu. Final disposition of all non-burial materials in an acceptable archive is to be designated by the SHPD, per HAR §13-276-6. All data generated during the AIS program are stored at the CSH offices.

2.3 Research Methods

Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai‘i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona ‘Aina database (Waihona ‘Aina 2022).

This research provided the environmental, cultural, historical, and archaeological background for the NASED development area. The sources studied were used to formulate a predictive model regarding the expected types and locations of historic properties in the project area.

2.4 **Consultation Methods**

Consultation with the SHPD was conducted regarding an AIS testing strategy for this project. The AIS testing strategy was approved by the SHPD (Garnet L.K. Clark) in an email to CSH (David Shideler and Scott Belluomini) dated 11 June 2021. CSH also consulted the cultural impact assessment (CIA) by Honua Consulting (Watson et al. 2020). This CIA was prepared in April 2020 for the current NASED project.

Section 3 Background Research

3.1 Traditional and Historical Background

In 1873, S.K. Kuhano wrote about ancient O‘ahu land divisions. O‘ahu was divided into six *moku* or districts: Kona, ‘Ewa, Wai‘anae, Waialua, Ko‘olauloa, and Ko‘olaupoko. These *moku* were further divided into 86 *ahupua‘a* (land divisions typically running from the mountains to the sea). Within ‘Ewa, there were 12 *ahupua‘a*. They were listed as Hālawa, ‘Aiea, Kalauao, Waimalu, Waiau, Waimano, Mānana, Waiawa, Waipi‘o, Waikele, Hō‘ae‘ae, and Honouliuli (Kame‘eleihiwa 1992:330). Modern maps and land divisions still follow the ancient system and use the same land divisions, with the exception that a distinction is made between North and South Hālawa. This division in the case of Hālawa is due to a land court decision that occurred in 1888 (Bureau of Conveyances 1888, Liber 113:14,17 in Klieger 1995:50). Hālawa is the easternmost *ahupua‘a* of ‘Ewa District, bounded by the ‘Ewa *ahupua‘a* of ‘Aiea and Kalauao to the northwest and by Moanalua Ahupua‘a of Honolulu (Kona) District to the southeast (Figure 8).

3.1.1 Mythological and Traditional Accounts

Considering its rich and varied environment of coastal and stream resources, central plains for *lo‘i* (taro pond fields), and upland forest regions, information regarding pre-Contact and early post-Contact life in Hālawa is limited, especially for the upland sections. Most of the early historic references speak of the fishponds at Pu‘uloa (the Hawaiian name for Pearl Harbor), the coastal resources, and excursions by early visitors to the Pearl River (known variously in Hawaiian as “Wai momi” “Awalau” and “Pu‘uloa”; see Sterling and Summers 1978:46). Most early references in the traditional literature are one-line passages that merely mention Hālawa in passing with little attention to detail. People traveled through Hālawa from ‘Ewa to Honolulu or vice versa, but most of these travels seem to have taken place inland of the Āliamanu and Salt Lake (Āliapa‘akai) craters and well inland of the current project area (Figure 9). Once the trail left the northeast margin of the East Loch of Pearl Harbor, it could have been traversed quickly across the 1.6-km (1-mile) width of Hālawa Ahupua‘a by a traveler heading to Kona District. Perhaps this explains the *‘ōlelo no‘eau* (Hawaiian proverb) *‘Ike ‘ole ‘ia aku Hālawa lā; Āina i ka mole o ‘Ewa lā* (Hālawa is not to be seen; ‘tis a land at the end of ‘Ewa; Fornander 1917:606). This may be a reference to the location of Hālawa on the fringes of ‘Ewa District in relation to Waipi‘o in central ‘Ewa, which was the center of politics during pre-Contact times.

A fourteenth century account speaks of the reign of Mā‘ili-kūkahi, an *ali‘i kapu* (sacred chief) who was born at Kūkaniloko in Wahiawā around the fourteenth century AD (Pukui et al. 1974:113). After consenting to become *mō‘ī* (king) at the age of 29, Mā‘ili-kūkahi was taken by the chiefs to live at Waikīkī. The story tells us he was probably one of the first chiefs to live there. Up until this time, the chiefs had always lived at Waialua and ‘Ewa. Under his reign, the land divisions were reorganized and redefined. In reference to the productivity of the land and the population (including at Hālawa) during Mā‘ili-kūkahi’s reign, Kamakau writes,

> In the time of Mā‘ili-kūkahi, the land was full of people. From the brow, lae, of Kulihemo to the brow of Maunauna in ‘Ewa, from the brow of Maunauna to the brow of Pu‘ukea [Pu‘u Ku‘ua] the land was full of chiefs and people. From Kānewai to Halemano in Wai‘alua, from Halemano to Paupali, from Paupali to Hālawa in ‘Ewa the land was filled with chiefs and people. [Kamakau 1991:55]

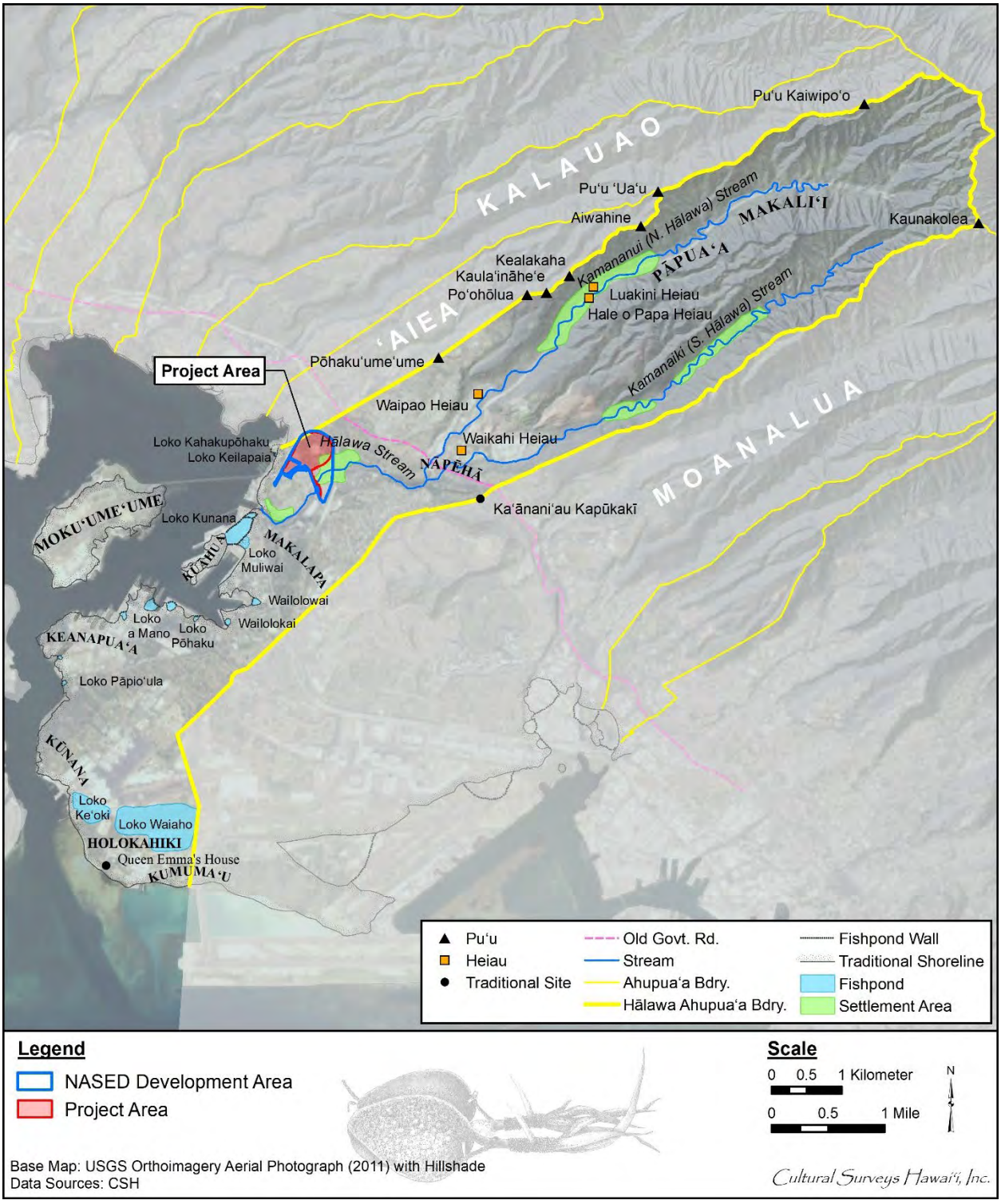

Figure 8. USGS Orthoimagery aerial photograph (2011) with place names of Hālawa Ahupua‘a and location of the NASED development area and project area

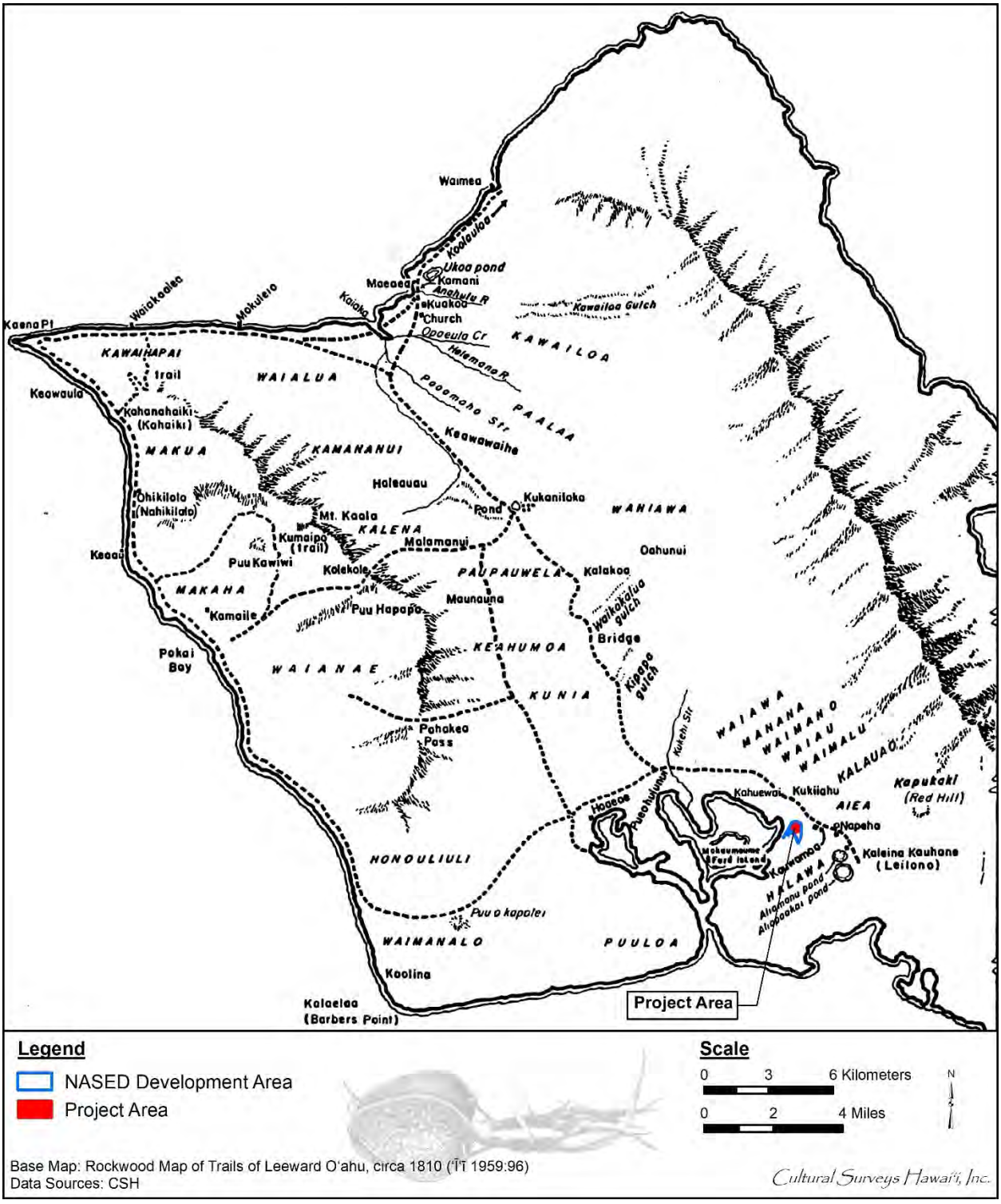

Figure 9. Portion of Rockwood map of trails of Leeward O‘ahu, ca. 1810 (‘Ī‘ī 1959:96) showing the NASED development area and project area

Oral tradition tells us that Hālawa was the home of Papa, where she lived in the uplands with her parents, Kahakauakoko and Kūkalani‘ehu. Papa is known for her generative role as the “earth mother.” Together with her husband, Wākea, they were the progenitors of the Hawaiian race. The Hale o Papa *heiau* (place of worship) and ritual, which is the female component of the ancient *luakini* (large *heiau* where ruling chiefs prayed and human sacrifices were offered) ritual, probably takes its name from her. The Hale o Papa was the *heiau* for the female deities. Only chiefesses of the highest ranks were allowed to enter and partake of the specially dedicated foods (‘Ī‘ī 1959:39; Kamakau 1961:179, 380; Valeri 1985:245).

Mention is made of the travels of Kamapua‘a (the famous pig-god) through Hālawa and of the cave, Keanapua‘a (see place name on Figure 8), where he slept (Kame‘eleihiwa 1996:131).

In the name chant for Kaumuali‘i, reference is made to “*ka ea nō mai Hālawa a Honouliuli*” (the whirlwind which blows from Hālawa to Honouliuli) (Fornander 1919:5:475).

In traditional lore, Hālawa was one of several places noted and remembered for its *‘awa* (*Piper methysticum,* the source of a narcotic drink) (Fornander 1919:5:610). One account tells us that the first *‘awa* plant was brought to Hawai‘i by Oilikūkaheana from Kahiki (Tahiti) and planted on Kaua‘i. He brought it to Hawai‘i for use in fishing. The use of *‘awa* as an offering to a shark guardian by fishermen is noted in Handy and Handy 1972:192. Mō‘īkehā brought some *‘awa* plants with him to O‘ahu and planted them at Hālawa. When they grew, he mentioned it to Oilikukaheana, who told him the name of these *‘awa* plants was Paholei. Mō‘īkehā forgot the name and later, when the plants were much larger, he went to ‘Ewa and told her about the plants. ‘Ewa sent Mō‘īkehā to get some plants. ‘Ewa said,

> ‘Let me first eat of this plant, and should I die, do not plant it for it would be valueless; but should I not die, then we will be rich.’ When ‘Ewa ate it she became drunk and was intoxicated all day. When she awoke she called the plant ‘awa’; from thence forward this plant was called ‘awa, ‘the awa of Kaumaka‘eha, the chief.’ [Fornander 1919:5:608]

On 12 December 1794, the decisive battle of Kūki‘iahu took place at Kalauao (*lit.* the multitude of clouds). It was there that the O‘ahu ruling chief Kalanikūpule defeated and killed the invader Ka‘eokūlani. It is said that the dead bodies were gathered up and taken to Pa‘aiau where they were piled in a great heap. Among the piled-up bodies was Kahulunuika‘aumoku, daughter of Kū‘ohu, a Kaua‘i *kahuna* (priest) who had been slain with Ka‘eokūlani. Late at night, an owl woke her up by flying over and beating its wings on her head. The owl flew *makai* and she crawled after it until reaching the sea. She then swam to the other side at ‘Aiea, where the owl appeared once more and led her up to the mountains in Hālawa valley. There, she took shelter in a cave and fell into an unconscious sleep. The owl flew to a former *kahu* (caretaker) of hers who “knew the country well around Hālawa.” This *kahu* brought her food and nursed her back to health (Kamakau 1961:169–70).

During the construction of the H-3 freeway, Mālama o Hālawa protesters used this story as basis for claiming Hālawa’s importance to women. They maintained that Hālawa was an important and special healing site for women in times past and that it was also home of the protective *‘aumakua* (guardian), the *pueo* (owl) (Omandam 1997).

The following *mo‘olelo* (stories) are accounts regarding people and events that took place in or near Hālawa. These accounts have been preserved through the oral and written record of times long past.

Leilono (see Figure 8)—a supernatural breadfruit tree (‘Ulu o Leiwalo) whose branches appeared through a hole in the ground. This hole was said to be the entrance whereby wandering spirits could enter the afterworld of Milu (*pō pau ‘ole*), the *ao kuewa* or realm of wandering spirits, or the *ao ‘aumakua* (ancestral spirit realm). The tree’s two branches were deceiving to look at, one on the east side of the tree and one on the west side. If a spirit climbed onto the west branch, it would wither and break off and he would plunge into the realm of Milu. If a spirit climbed onto the branch on the east, he would be able to see the *‘aumākua* realm and receive help from his ancestors. This hole is round and about 2 ft wide, on a piece of *pāhoehoe* lava. Leilono is in the neighboring district of Moanalua. However, very specific boundaries are given for it. Kamakau says it was:

> close to the rock Kapūkakī and easterly of it […] directly in line with the burial mound of Āliamanu and facing toward the right side of the North Star […] The boundaries of Leilono were Kapapakōlea on the east, [with] a huge caterpillar (pe‘elua nui) called Koleana as its eastern watchman, and the pool Napeha on the west, with a mo‘o the watchman there. If the soul was afraid of these watchmen and retreated, it was urged on by the ‘aumakua spirits, then it would go forward again and be guided to the ‘aumakua realm. If a soul coming from the Ālia (Āliapa‘akai) side was afraid of the caterpillar, whose head peered over the hill Kapapakōlea, and who blocked the way, it would wander about close to the stream by the harness shop. This was not the government road (alanui aupuni) of former times, but was a trail customarily used by ‘those of Kauhila‘ele’ [figuratively, the common people; the la‘ele, old taro leaves, as contrasted with the liko, the new and choicer leaves—that is, the chiefs]. It was said that if a wandering soul entered within these boundaries it would die by leaping into the pō pau ‘ole; but if they were found by helpful ‘aumākua souls, some wandering souls were saved. Those who had no such help perished in the pō pau ‘ole of Milu. [Kamakau 1964:48–49]

The Napeha pool referred to above as a boundary of Leilono was about 2 km east of the project area (see Figure 8). We know of no subsequent reference to “the burial mound of Āliamanu” but Āliamanu Crater lies about 2.5 km to the east.

Nāpēhā (see Figure 8)—a pool and resting place where people went diving. So named because Kūali‘i stopped and bent over the pool to take a drink. The name means “bend over breath” (‘Ī‘ī 1959:95). Sterling and Summers (1978:10) give the literal meaning as “out of breath.” Also, see Pukui et al. (1974:163) and Pukui and Elbert (1986:262) for variations in diacritical markings.

Kauwamoa (see Figure 8)—a diving place where people liked to gather. It was said that Pe‘ape‘a (son of Kamehamehanui of Maui) liked to dive from a favorite spot five to ten fathoms above the pool (‘Ī‘ī 1959:95).

Waikahi Heiau (see Figure 8)—Site 105. The location was described by McAllister (1933:103) as being “on the flat area on the mountain side of the road where the two gulches of Hālawa meet.” According to Thrum (1906:36), the size was about 80 square (sq) ft, it was a *po‘okanaka* (sacrificial *heiau*), and Manuuokao was the *kahuna*. In 1933, McAllister reported the area was entirely planted in cane and no remains whatsoever could be seen (McAllister 1933:103).

Waipao Heiau (see Figure 8)—Site 106. McAllister lists the location as being “near the mouth of Kamananui Gulch, Hālawa.” He goes on to say:

> The structure was on a narrow flat at the entrance of a small ravine running into the north wall of the gulch. The heiau was destroyed a few years ago when there was an attempt to plant cane on this land, and the lines of stones which follow the old furrows are all that remain. My Hawaiian informant told me that the surrounding caves were formerly used as places of burial. [McAllister 1933:103]

Loko Kūnānā (Kūnānā Pond) (see Figure 8 and Figure 35)—said to be at the base of Hālawa Stream and was at one time connected with Kūāhua Island. It was named after Kūanānā (child of Nānā) who liked to fish there. She was the mother of Ka‘ahupahau, the shark guardian of Pu‘uloa (Sterling and Summers 1978:10).

Keanapua‘a Point (see Figure 8)—(*lit.* the pig’s cave) so named because Kamapua‘a, the legendary pig-God slept in the cave overnight. It is near the beach in Hālawa opposite Waipi‘o Peninsula (Sterling and Summers 1978:10).

Kamapua‘a (Story of)—Upon awaking, after spending the night at Keanapua‘a, Kamapua`a urinated in the ocean. This is the reason the fish at Pu‘uloa have such a strong smell (Sterling and Summers 1978:10).

Kahuawai (Kahuewai) (see Figure 8)—a small waterfall on Kalauao Stream which was a favorite resting place exclusively for chiefs. It was also called Kahuewai (the water gourd) (Pukui et al. 1974:66). It was also referred to by ‘Ī‘ī (1959:20) as “a land with two points” because the fish they were carrying (as food) were stiff and bent like hog tusks by the time they reached this resting spot.

3.1.2 A Note on the Cluff (1970)-reported *Heiau*

Deborah Cluff (1970:2) of the Department of Land and Natural Resources (DLNR) reported on an archaeological survey for a neighboring project to the east of the large stadium parcel (see Section 4.2.1) in which she reports “Halawa residents and members of the Highways Division expressed concern over the location of numerous graves and the remains of a heiau.” Most of the archaeological effort, including substantial excavation) was expended investigating the possible *heiau* site identified by Cluff as “Feature 1” (of subsequently assigned State Inventory of Historic Places [SIHP] # 50-80-09-05306) but the result was “it cannot be ascertained that Feature 1 is the site of the former temple” (Cluff 1970:6). A variety of post-Contact artifacts are reported from the feature (including glass and porcelain fragments, bits of red brick, a clay bead, and a bullet) but a piece of worked mammal bone and “a chip from the cutting edge of a finely polished adze” and *kukui* nutshell are also reported (Cluff 1970:12, 14) indicating a traditional Hawaiian component to the feature. We know of no other account of a *heiau* in the vicinity.

3.1.3 Early Historic Period

Our first details about Hawaiian settlement in Hālawa come from explorers’ accounts and maps such as Otto von Kotzebue’s 1817 map of O‘ahu (Figure 10). While this early survey map should be understood as rather schematic, it indicates the general pattern of coastal residence and agriculture. A quilt of ponded fields of taro (*lo‘i kalo*) and fairly dense associated habitations are shown in the vicinity of the project area and *makai* and extending west. This dense pattern of occupation began in the immediate vicinity of the mouth of Hālawa Stream and extended inland

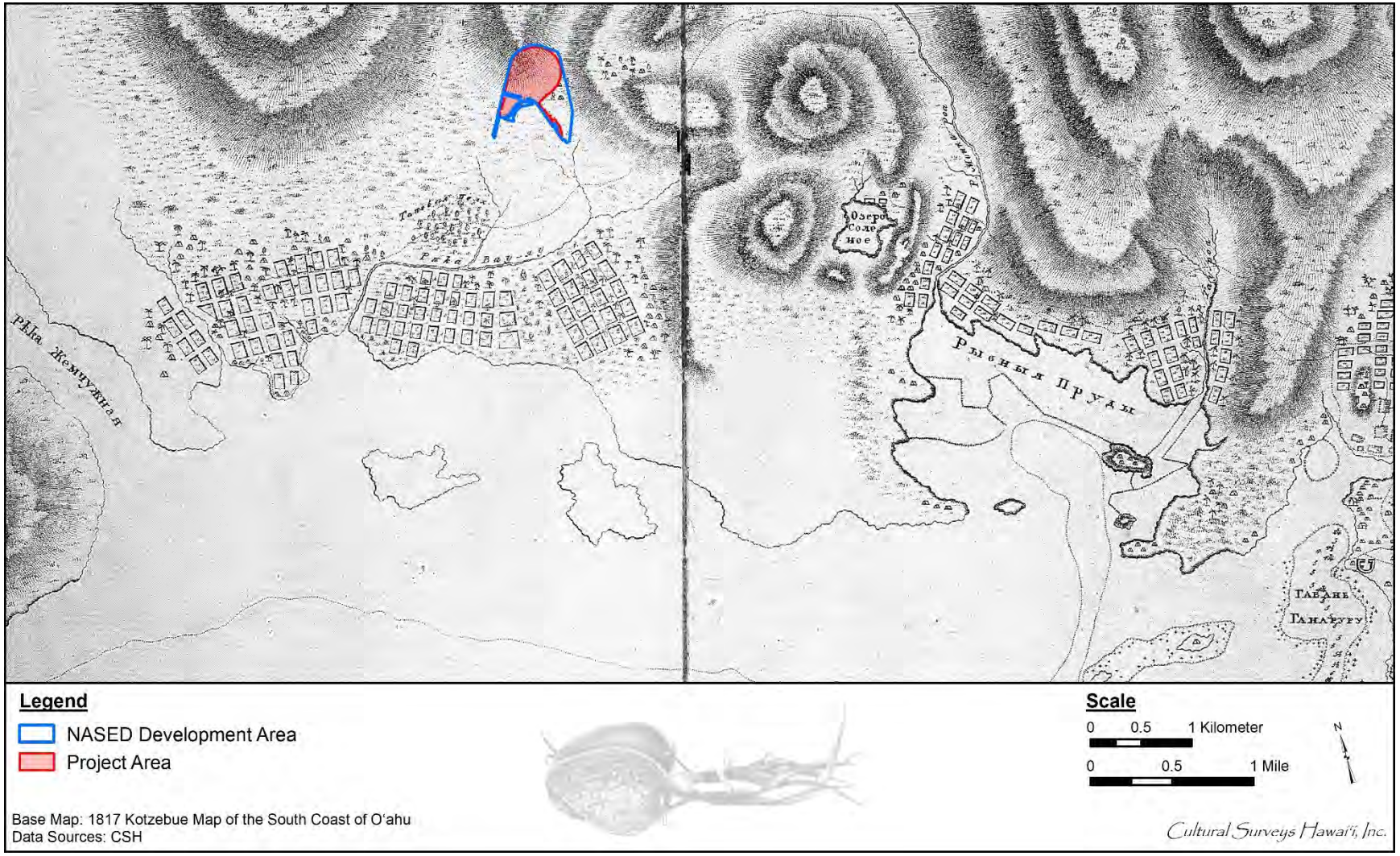

Figure 10. Portion of 1817 Kotzebue map of the South Coast of O‘ahu showing the location of the NASED development area and project area and indicating the rich agricultural (ponded taro) lands on the margins of Pearl Harbor

and westward along the margins of Pearl Harbor with its abundant marine resources, relatively fertile soils, and numerous streams. In contrast is the relative lack of habitation and agriculture to the east. The post-erosional volcanic landforms of Makalapa, Āliamanu Crater, and Salt Lake (Āliapa‘akai) Crater effectively pushed Hālawa Stream to the northwest and Moanalua Stream to the southeast creating dryland in the rain shadow of a rain shadow.

The missionaries are credited with taking the first census in 1831–1832. However, there was no uniformity among the different stations and the census totals cover large geographical areas. In addition, information was not necessarily broken down into smaller *ahupua‘a* and no distinctions were made among sex, age, birth, and death rates (Schmitt 1973:1).

The 1831–1832 census for O‘ahu was 29,755, with Honolulu being the most heavily concentrated area with 13,344 people. The ‘Ewa district was the third largest with a count of 4,015 (Schmitt 1977:8–9). In this census, Hālawa was combined with ‘Aiea. The census shows there were 163 males, 134 females, 72 male children, and 35 female children with a total count of 404 for the two *ahupua‘a* (Schmitt 1977:19). The reasonable inference is that these *ahupua‘a* were well-populated but not densely populated in comparison to the other *ahupua‘a* of ‘Ewa at the time.

There are no separate population figures given for Hālawa until the 1835–1836 census. At that time, there were 104 males, 102 females, 48 male children, 29 female children with a total count of 283 for the *ahupua‘a*. The total for ‘Ewa was 3,423, a decrease of 592 (seemingly a decline of 14.7% over 4 years) from the first census figures.

In 1839, for the purposes of tax assessment, a law was passed to take an official government census which was to be carried out by the tax officers in the various districts. This was intended to be completed in 1840 but was not carried out at the time. In 1846, a new law was enacted giving the responsibility of the computations to school officials. A count was undertaken in 1849, however, the results are suspected to be under reported. It was not until 1850 that a more systematic and accurate census was conducted (Schmitt 1977:3).

3.1.4 The Māhele

The Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—which introduced private property into Hawaiian society. In 1848, the crown and the *ali‘i* (royalty) received their land titles. *Kuleana* awards for individual parcels within the *ahupua‘a* were subsequently granted beginning in 1850. These awards were presented to tenants—Native Hawaiians, naturalized foreigners, non-Hawaiians born in the Islands, or long-term resident foreigners who could prove occupancy on the parcels before 1845.

It is clear that ca. 1850 there was a relatively tight focus of Hālawa Ahupua‘a settlement and agriculture a little more than a kilometer upstream (Figure 5). This likely was a general pattern extending back in time for centuries with Hālawa habitation focused well inland. There were no *kuleana* LCA claims on the coastal plains of Hālawa Ahupua‘a except in the immediate vicinity of Hālawa Stream Table 2 (below) lists the LCAs within the present NASED development area (all were within the large northeastern TMK: (1) 9-9-003:061 present day stadium parcel) which were all arrayed relatively close to Hālawa Stream (see Figure 5). Logically most of these were for ponded taro cultivation (*lo‘i* or *loko kalo*) and must have had irrigation channels (*‘auwai*) bringing in water off the stream. A large rectangular lot (LCA 2156:3 to Opunui) in the southwest portion of the stadium parcel was a house (*pāhale*) lot.

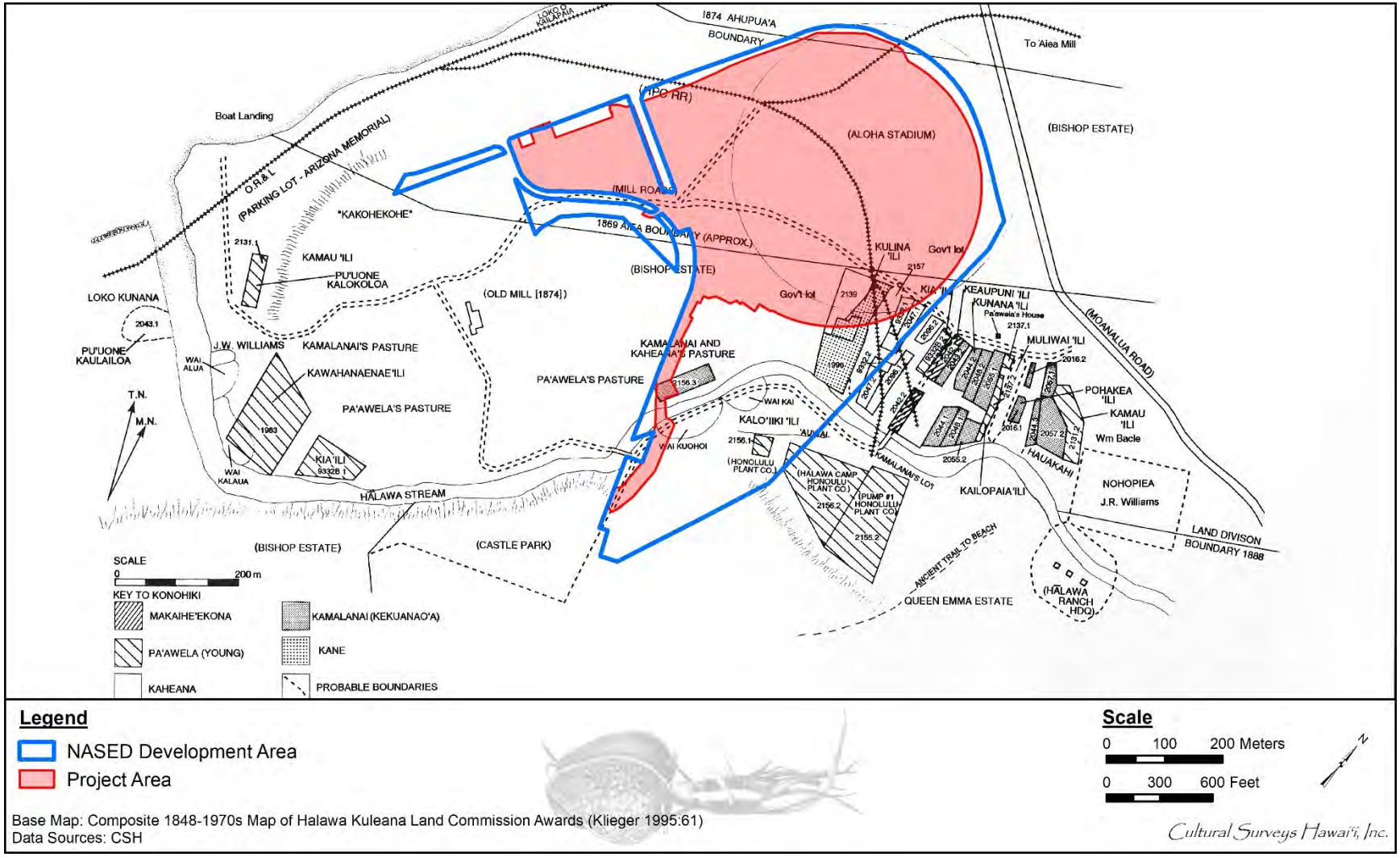

Figure 11. Composite 1848–1970s map of Hālawa Kuleana Land Commission Awards (Klieger 1995:61) with location of the NASED development area and project area

Table 2. LCAs within the NASED development area

LCA #	Claimant	Stated Location	Land use	Comments
1996	Naea	Kulina, Hālawa	"*Mo‘o‘āina*" (narrow strip of land)	Minimal data on land use
2047: 1	Kekio	Kulina, Hālawa	*Lo‘i me kula*	Taro patch and field
2047:2	Kekio	Kulina, Hālawa	*Kula*	Field
2139	Kinilau	Kulina, Hālawa	"*Mo‘o‘āina*"	Minimal data on land use
2156:1	Opunui	Kalo‘iiki, Hālawa	*Lo‘i*	Taro patch, NW side borders a ditch (*‘auwai*)
2156:2	Opunui	Kalo‘iiki, Hālawa	*Lo‘i me ke kula*	Taro patch and field
2156:3	Opunui	Kalo‘iiki, Hālawa	*Pāhale*	House lot, SE side borders the stream (*Kahawai*)
9332:1	Kaheana	Kulina, Hālawa	*Loko kalo*	Taro patch
9332:2	Kaheana	Kulina, Hālawa	*Lo‘i*	Ponded taro patch

The Klieger map (see Figure 11) provides additional detail on the NASED development area in the mid-1800s. Klieger indicates there were several small fishponds developed off Hālawa Stream including two on the south side of the stream in the large stadium parcel (named Wa Kuohoi and Wai Kai)—but no detail is supplied. The route of one *‘auwai* is indicated seemingly watering Opunui's LCA 2156:1 *lo‘i* off Hālawa Stream from well to the northeast.

3.1.5 Land Disputes of the 1800s

During the 1800s, the control of Hālawa Ahupua‘a was under dispute and ever-changing (Figure 12). The following discussion attempts to summarize this period of land disputes. Sometime after Kamehameha conquered O‘ahu in the battle of Nu‘uanu in 1795, he gave his most trusted foreign advisors, Isaac Davis and John Young, lands as a reward for their loyal service to him. As part of this award, each one received half of the *ahupua‘a* of Hālawa. As was the usual custom at the time, the king divided the land among his chiefs who supported him throughout his conquests of the islands (Klieger 1995:31, 36).

The lesser chiefs Isaac Davis and John Young were allowed to work the land as long as they lived. But, as was the traditional custom, upon their death the land reverted back to the *ali‘i nui* or paramount chief. This rule held true even for these two most faithful advisors.

Klieger (1995:38–44) notes that when Isaac Davis died in 1810, the lands under his supervision appear to have been transferred back to Kamehameha I, who likely transferred them to Oliver Holmes. Upon Oliver Holmes' death in 1825, they were probably returned to Liholiho (Kamehameha II) who redistributed them after Holmes' death. Holmes' children did not claim any Hālawa lands in the Māhele, although his son, George Holmes, was awarded a piece of land in Honolulu (LCA 1045). It is this period from 1825 to 1848 that is most unclear.

Major *Haku'āina* and/or Owners of Hālawa

Owner*	Owner*	Date	Comments
——— Kamehameha the Great ———		1795	conquered Kalanikūpule
Isaac Davis	John Young, Sr.	1795	*kālai'āina* gift
Oliver Holmes	"	1812?	Davis d. 1810
Kamehameha II (theor.)	"	1824-1825	Boki governor
Kamehameha III (theor.)	"	1825-1830	Liliha deposed
Kekūanaō'a	"	1830?	Kunana 'Ili only
"	Grace Young Rooke	<1835-1866	John Young dies 1835
"	"	1855	Kekūanaō'a awarded 1/2 Hālawa
"	Fanny Young Na'ea	1866-1868	Kekūanaō'a d. 1868
estate of Lot Kamehameha V and Kekūanaō'a	"	1870s	prolonged probate
Ruth Ke'elikōlani	"	1875	Royal Patent, Ruth d. 1883
Bernice Pauahi Bishop	Emma Rooke	mid-1880s	Bernice d. 1884, Emma d. 1885
Bernice P. Bishop Estate	Queen Emma Estate	1888	partition North & South Hālawa

*Haku'āina or steward of the land before the Mahele, owners afterward

Figure 12. Summary of land disputes in Hālawa Ahupua‘a (Klieger 1995:50)

In 1848, Hālawa Ahupua‘a was awarded jointly to Grace Kama‘iku‘i Young Rooke and Kekūanaō‘a (LCAs 8516B and 7712) (Klieger 1995:41). Kekūanaō‘a ended up with Davis’ Hālawa portion and Grace Kama‘iku‘i Young Rooke (John Young’s daughter) retained the John Young portion. Isaac Davis’ portion of Hālawa passed from Kekūanaō‘a to Ruth Ke‘elekōlani and on to Bernice Pauahi Bishop. Upon Ruth’s death, her lands became part of the Bishop Estate Trust (Klieger 1995:38–40, 44, 46).

John Young tried to make his lands inheritable by requesting that his children, and those of Isaac Davis whom he had adopted, be allowed to retain the lands given to him by the king upon his death. Specifically, he attempted to will Hālawa to his daughter, Grace Kama‘iku‘i. His will states the following:

> […] in behalf of my deceased friend Isaac Davis and for his children as he died without will, the King Kamehameha gave me all the said Isaac Davises [Davis’] lands to take care of them and his children until the children came of age, and now they are come of age so I think it right to leave my last wishes and will that the King, Ka‘ahumanu, Adams and Rooke and all the Chiefs will let Isaac Davises children keep their father’s lands that King Kamehameha gave to him as a reward for assisting the King in his wars in conquering the islands of Hawai‘i, Maui, Molokai, and O‘ahu, and which we have an undoubted right to leave to our children, which I hope in God our young king will fulfill the wishes of his honored father. My own lands, I wish my children to enjoy as I have done, likewise my wife […] [Claim: #595 F.R. 67–72 V2]

Kamehameha III refused to honor Young’s request upon his death (Kame‘eleihiwa 1992:59–60). However, in the Māhele, John Young’s children were allowed to keep lands as *‘āina ho‘olina* or inherited lands. Lilikalā Kame‘eleihiwa (1992:59–60) notes that in all of the *Buke Māhele*, these were the only lands given under this designation.

In 1852, Kekūanaō‘a wrote a letter to the Minister of Interior requesting that a list of the *kapu* (forbidden) fish for Victoria Kamāmalu’s lands on O‘ahu be published in the newspaper. The *kapu* fish for Hālawa was the *‘anae* or full-sized mullet (Kekūanaō‘a 1852).

In 1862 Mataio Kekūanaō‘a and Kama‘iku‘i Rooke (John Young’s daughter) leased a portion of the *ahupua‘a* of Hālawa to a Manuel Paiko of Honolulu for the purpose of cattle ranching (Bureau of Land Conveyance 1862, Liber 9:174–179).

In 1866, Kama‘iku‘i willed to her sister, Fanny Na‘ea, her interest in her portion of Hālawa (Klieger 1995:40).

In 1879, Fanny gave her interest of Hālawa to her daughter, Emma Kaleleonālani Na‘ea Rooke, Queen of Kamehameha IV, by way of a deed (Klieger 1995:48), which stated the following:

> […] the undivided ½ interest of and in to the Ahupua‘a of Hālawa situate in ‘Ewa, Island of O‘ahu, and more fully described in Royal Patent 6717 to Grace Kamaikui and being the same premises devised to me the said Fanny Young Kaleleonalani by the said Grace Kamikui. [Bureau of Land Conveyance 1879, Liber 59:285]

Fanny died one year later in 1880. A listing of *konohiki* (“Headman of an ahupua‘a land division under the chief”; Pukui and Elbert 1986:153) lands on the island of O‘ahu reflects the joint tenancy of Hālawa. Both Ruth Ke‘elikōlani and Queen Emma are listed as owners. The document also lists the lands on O‘ahu that abut the ocean, including the length and whether the land is a lagoon, reef or open sea. The length of the land abutting the sea at Hālawa is 8.52 miles and listed as being a reef and a lagoon (Interior Department Letters 1878-1879). Five years later, Queen Emma died in 1885, leaving no heirs. All her lands became part of the Queen Emma Trust (Klieger 1995:48–49).

Between 1848 and 1888 there seems to have been dispute over the joint tenancy of Hālawa between the families of Kekūanaō‘a and Young (Klieger 1995:43). In 1888, after a new survey was completed, The Supreme Court of the Kingdom of Hawaii under Sanford B. Dole settled the matter by giving the northern portion of Hālawa to the Bernice Pauahi Bishop Estate and the southern portion to the Queen Emma Trust (see “Queen Emma Estate” on Figure 11) (Klieger 1995:50). From this time on, the boundaries have been distinct, and the two portions recognized independently of each other.

3.1.6 Mid- to Late 1800s

From early visitor descriptions of Hālawa and ‘Ewa, one can already begin to see that by the 1820s the demographics and landscape had changed considerably. Where once the area was heavily populated and highly productive, by the 1820s the population had dwindled and there were fewer villages and areas under cultivation.

By 1850, three years after the Māhele, the census for O‘ahu was 25,440, a decline of 14.5% over 18 years. This population decline has been attributed to several factors including disease, high infant mortality, and low fertility rates due to sexually transmitted diseases (Schmitt 1973:15). The decline also is probably due to people moving away from rural areas and closer to Honolulu, which was the center of trade and economic activity. On the island of O‘ahu, a decrease in the population statistics is seen almost yearly until 1884, when the figures show an increase from then on into the twentieth century (Schmitt 1977:11). The increase is probably related in part to the growth of the sugar industry and the imported labor that was needed to work the plantations.

The first Chinese laborers arrived in Hawai‘i in 1852 under contract to work on sugar plantations. As the demand for *kalo* declined and importation of Chinese laborers to the west coast of California and Hawai‘i increased, a market for rice developed. *Lo‘i* lands were ideal for growing rice, and as these lands lay in disuse and became more available, the Chinese farmers snatched them up. Most of the land was “near sea level—undrained areas at the mouths of streams: lowlands, which could be reclaimed without great expense” (Coulter and Chun 1937:11). The Royal Hawaiian Agricultural Society encouraged rice as a new crop. The first rice harvest occurred in 1862. By the mid-1860s, much of the *lo‘i* on O‘ahu had been transformed into rice fields. By 1892, there were about 117 acres of land planted in rice in the lowlands of Hālawa (Coulter and Chun 1937:21).

In many *ahupua‘a*, the lands not claimed by *kuleana* claimants were leased out to entrepreneurs who started ranching and sugar plantations on a large scale (Klieger 1995:71). Such was the case with Hālawa. In 1862, Kama‘iku‘i Rooke and Mataio Kekūanaō‘a leased much of Hālawa to a Manuel Paiko, a Portuguese rancher (Klieger 1995). The lease document reads that the boundaries begin at “a small brook which forms the boundary between Hālawa and Moanalua” and continue “along the ridge of the mountain bordered on the north by ‘Aiea and Kalauao, and on the west by Ko‘olau, to the top of a peak called Aloheo; which forms the boundary between Moanalua and Hālawa” (Klieger 1995:76). The leased area consisted of about 10,000 acres. However, excluded from the lease was the “sea, the lagoons, the fish and all ponds, the enclosed *kalo* lands, all *kuleana* awarded by the Land Commission, and so much of the *kula* lands adjoining the pond, Ka Waiaho.” The lease was taken out for 15 years with a rent of $500 per year (Bureau of Land Conveyance, Liber 9:174–179). Manuel Paiko took on a business partner, James Dowsett of ‘Ulupalakua Ranch fame. By 1870, their herd consisted of 1,400 head (Bureau of Land Conveyance, Liber 29:239).

James Dowsett and another partner, J.R. Williams also attempted to raise sugar in the Hālawa area. Due to lack of a railroad to haul cane and the mill burning down three times, they gave up trying to raise sugar in 1875. Altogether, about 100 acres had been planted in cane (Condé and Best 1973:327).

Maps from the late 1800s (Figure 13 through Figure 15) indicate the current project area was relatively undeveloped with portions of the lands used for rice and sugarcane cultivation. An 1873 Lyons map of Pearl Lochs (see Figure 13) shows a road connecting the short-lived Dowsett and Williams “Halawa Mill” with a boat landing presumably used for exporting sugar prior to the railroad connection. That main “road” crossed the southern portion of the large stadium parcel on the south side of Hālawa Stream. The NASED development area is primarily in an area described as rice fields and shows some other agricultural fields. There is no evidence of an active fishpond or cultivation in this immediate area at that time. Active cultivation is shown on both sides of Hālawa Stream within the south portion of the large stadium parcel. A comparison of the 1873 map (see Figure 13) with the 1888 map (see Figure 15) helps us understand how extensive these 1888 rice lands were (a *mauka* extension of the “Kalo Land” is shown downstream on the 1888 map).

Notably several fishponds in the general vicinity are clearly indicated on the 1873 (see Figure 13) and 1888 maps (see Figure 15) in a manner suggesting they were still active, but the locations of the former Pu‘uone Kalokoloa Fishpond and Pu‘uone Kaulailoa Fishpond, previously

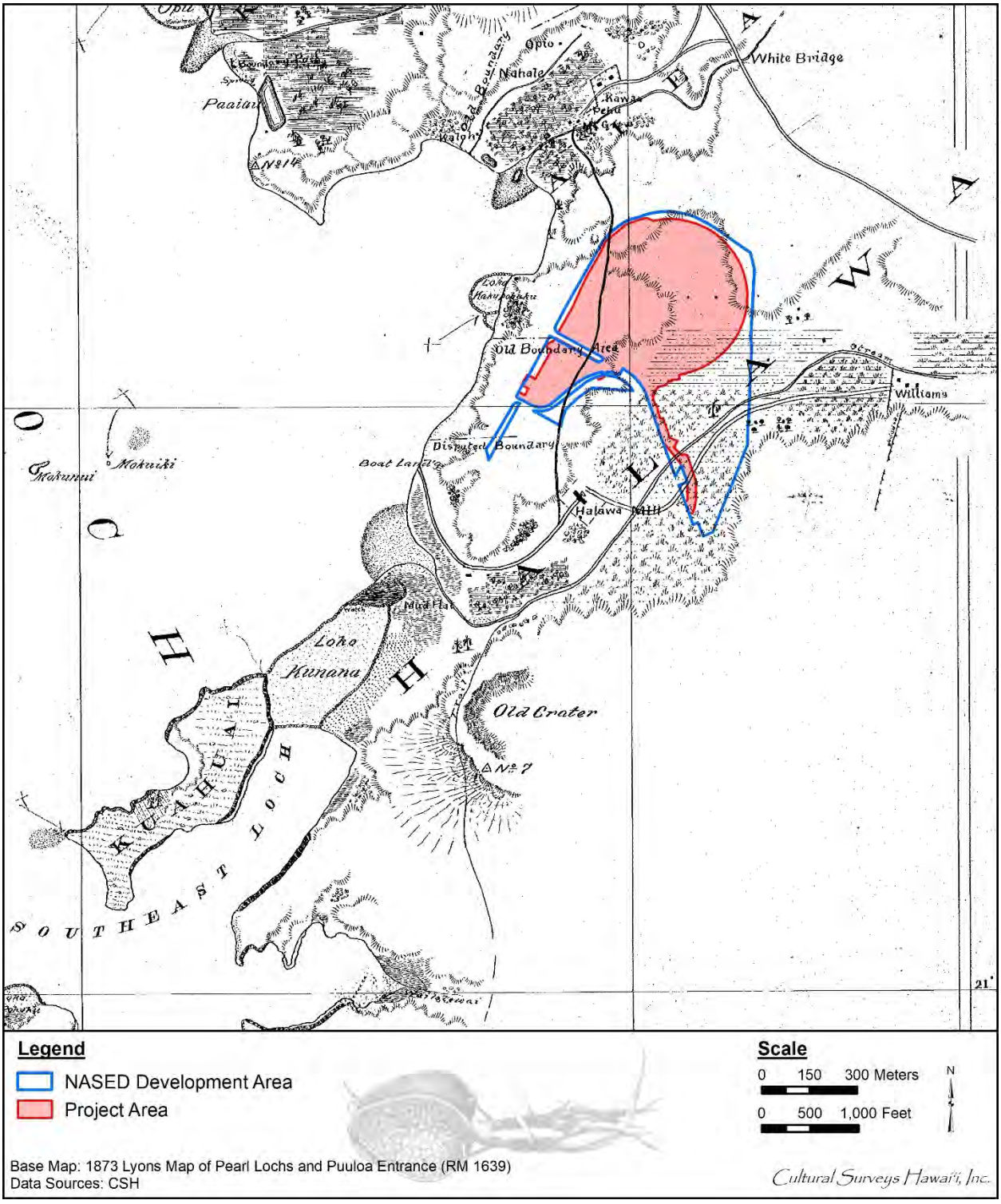

Figure 13. Portion of an 1873 Lyons map of Pearl Lochs and Puuloa Entrance (RM 1639) showing the overlay of the NASED development area and project area in relation to the agricultural fields

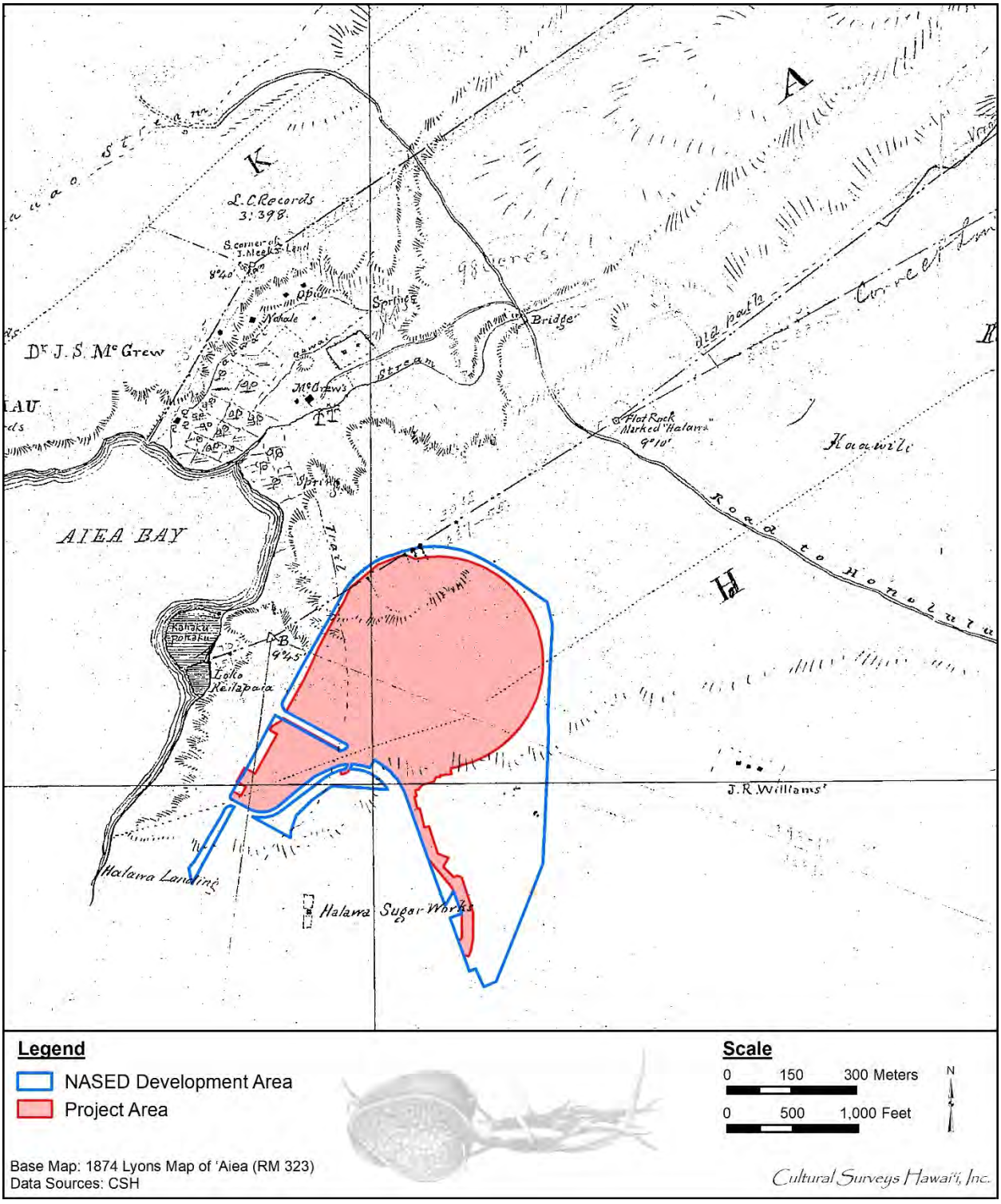

Figure 14. Portion of an 1874 Lyons map of Aiea (RM 323) showing the overlay of the NASED development area and project area in relation to the agricultural fields

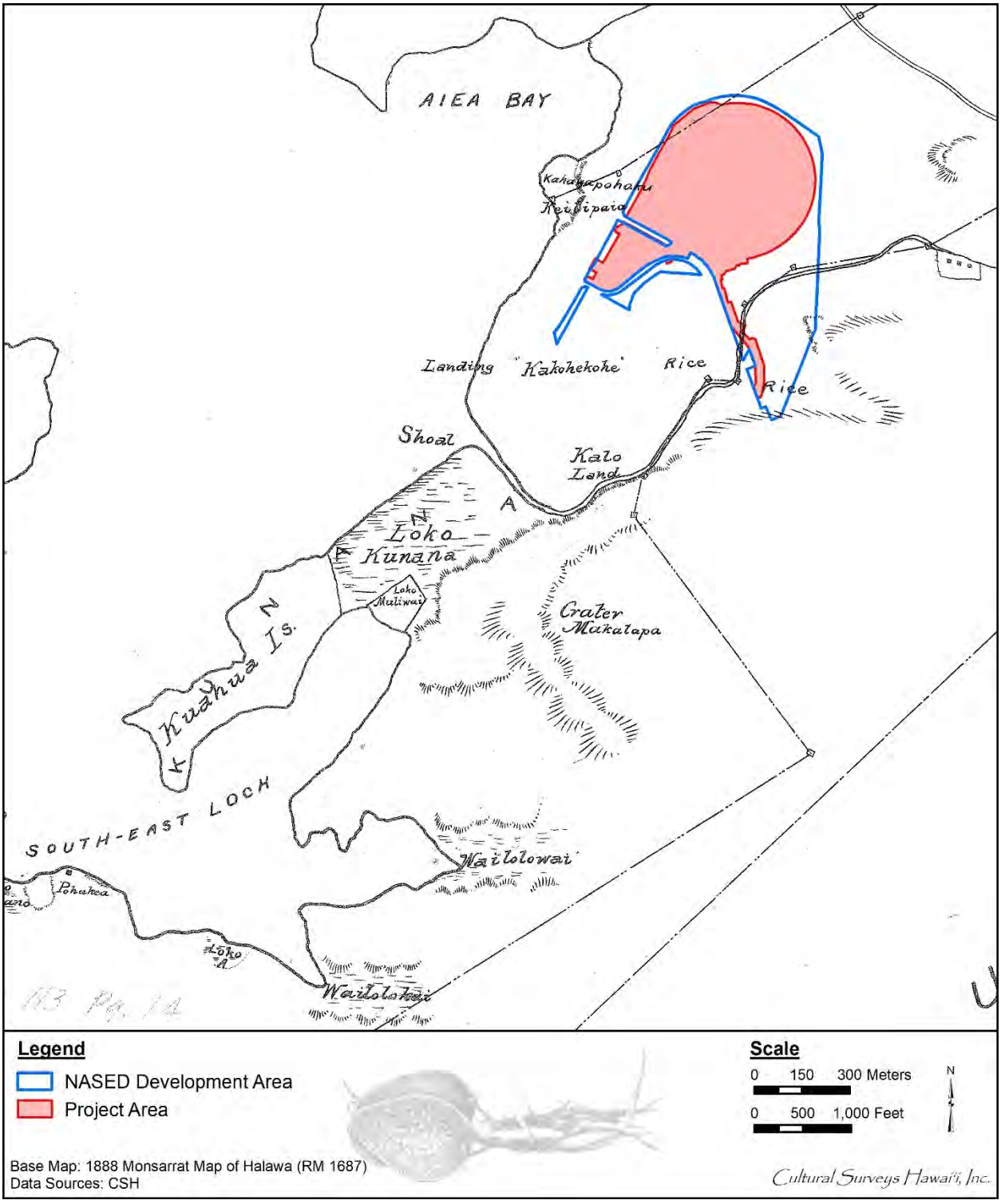

Figure 15. Portion of the 1888 Monsarrat map of Hālawa (RM 1687) showing the NASED development area and project area in relation to the agricultural fields.

bracketing the mouth of Hālawa Stream are identified as “mudflats” (see Figure 13). The 1873 map (see Figure 13), 1874 map (see Figure 14), and 1888 map (see Figure 15) all show fishponds but it seems clear they are actively being silted in or are otherwise going out of production in this timeframe.

Both the 1873 map (see Figure 13) and the 1874 map (see Figure 14) show the main cross-island “Road to Honolulu” trail as well *mauka* (inland) of the NASED development area but they both show a less formal coastal trail arcing through three of the NASED development area.

The development of the Oahu Railway along the coast of Hālawa (Figure 16) in the 1890s opened the Hālawa lands to commercial sugarcane production and the organization of the Honolulu Sugar Company, soon the Honolulu Plantation Company in 1899 by San Francisco investors (Dorrance and Morgan 2000:50). The Beasley map of 1899 shows no development in the vicinity of the NASED development area other than the Oahu Railway. The “Halawa Station” is indicated by a small circle on the rail line just north of the mouth of Hālawa Stream, immediately north of which the railway splits with the main route clinging to the coast and another route arcing more to the east through the NASED development area and then splitting again in the large stadium parcel. The main road, labeled as the “Government Road” is now shown as skirting the north edge of the large stadium parcel.

Klieger indicates two of the LCA parcels (LCA 2156:1 and LCA 2156:2) in the large stadium parcel previously belonging to Opunui became part of the Halawa Camp of the Honolulu Plantation Company (labeled “Honolulu Plant Co” on Figure 11). While not completely clear, these appear to have been areas developed where:

> To help secure a stable labor pool, the Honolulu Plantation Company established an independent homestead program in 1902, whereby individual laborers could receive personal use of land on company property in exchange for their continued employment commitment. [Klieger 1995:82]

Following the Spanish-American war was a period of shifts in labor supply and the indication is these Honolulu Plantation Company resident workers were more likely to be from the Azores, Madeira, or Puerto Rico (Klieger 1995:82).

3.1.7 The Early Twentieth Century and the Rise of the Honolulu Plantation Company

At the end of the nineteenth century, the Honolulu Sugar Company (organized in 1899, renamed the Honolulu Plantation Company by 1906; compare Figure 17 and Figure 18) began leasing 6,500 acres around Pearl Harbor for sugarcane cultivation (Dorrance and Morgan 2000:50). By the mid-1930s, the company had more than 23,000 acres of land leased, having expanded significantly up the coastal plain to the north inland of the East Loch of Pearl Harbor (Figure 19). Sugarcane planting extended quite far seaward, but the Donn map indicates the small coastal floodplain of Hālawa Stream was in rice production ca. 1906 (see Figure 18).

The 1900–1925 map of the property of Honolulu Sugar Company (see Figure 17) shows much of the west portion of the NASED development area as within “Field 2” and much of the east portion of the large stadium parcel as within seed cane plantings (on both sides of Hālawa Stream).

Historic maps show the development of Honolulu Plantation in the vicinity of the NASED development area. The Donn 1906 map of O‘ahu (see Figure 18) appears to show the Honolulu

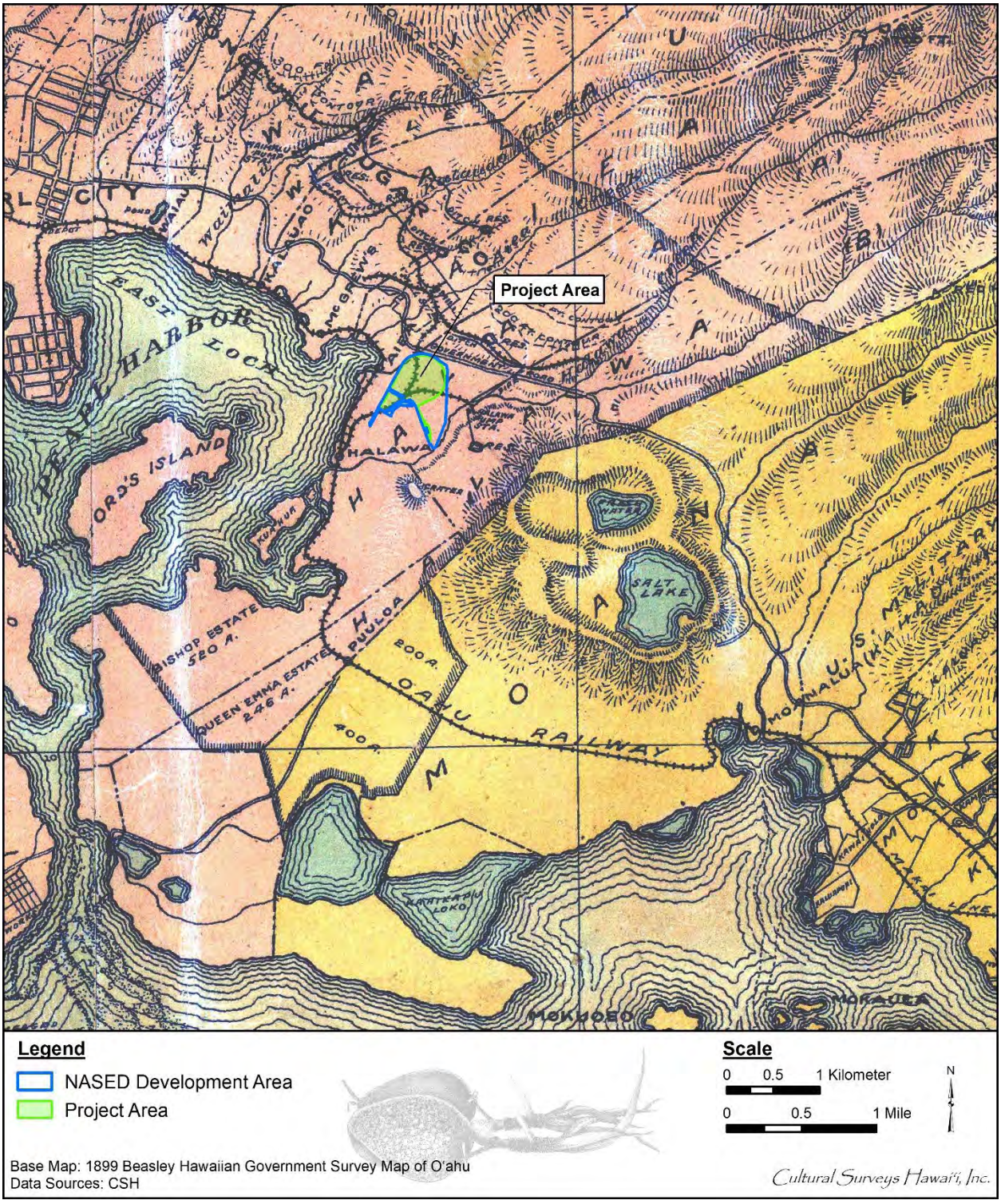

Figure 16. Portion of a 1899 Beasley Hawaiian Government Survey map of O‘ahu showing the NASED development area and project area with the Oahu Railway running through it

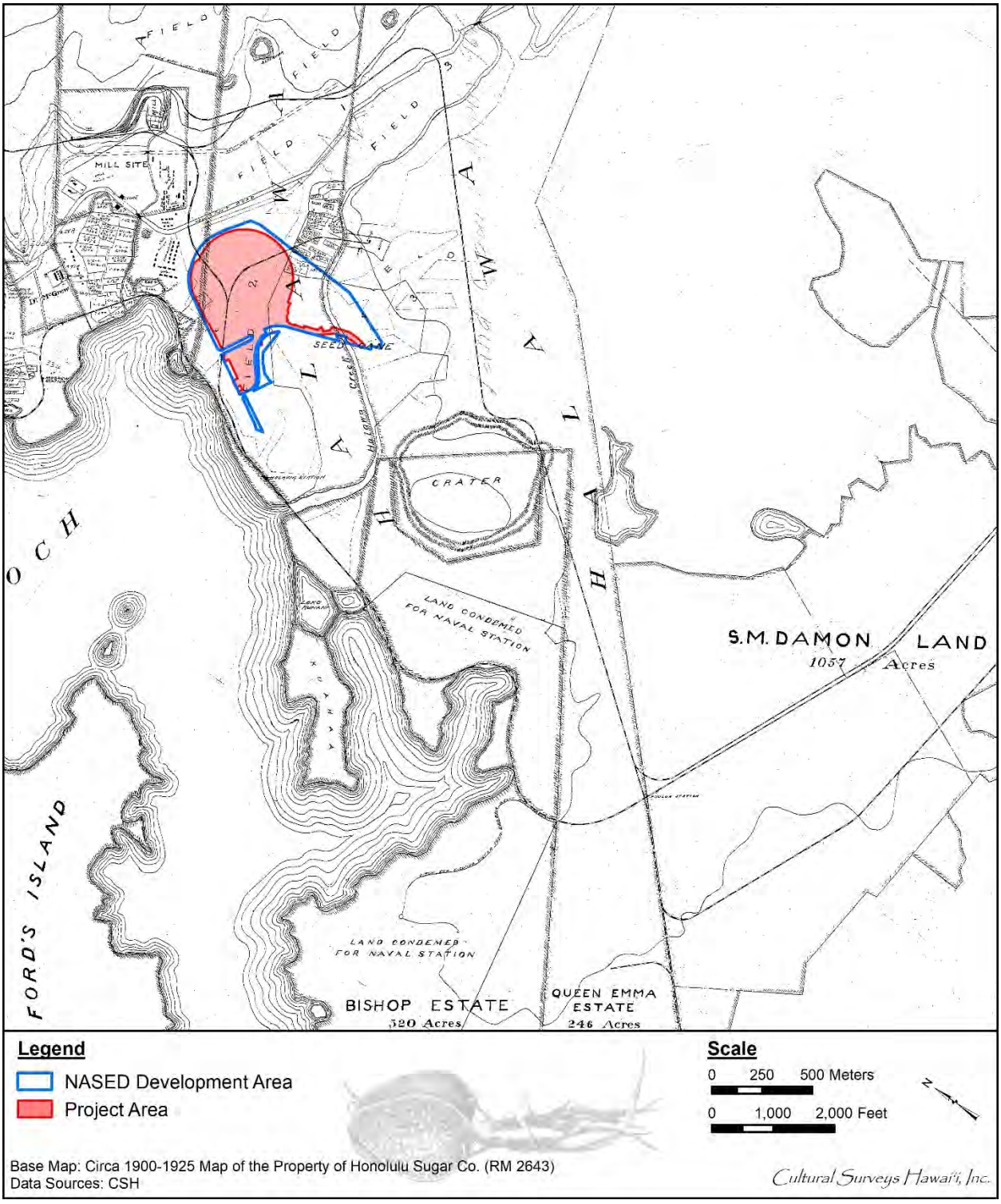

Figure 17. Portion of a 1900–1925 map of the property of Honolulu Sugar Company (RM 2643) showing the NASED development area and project area with development in the central east portion

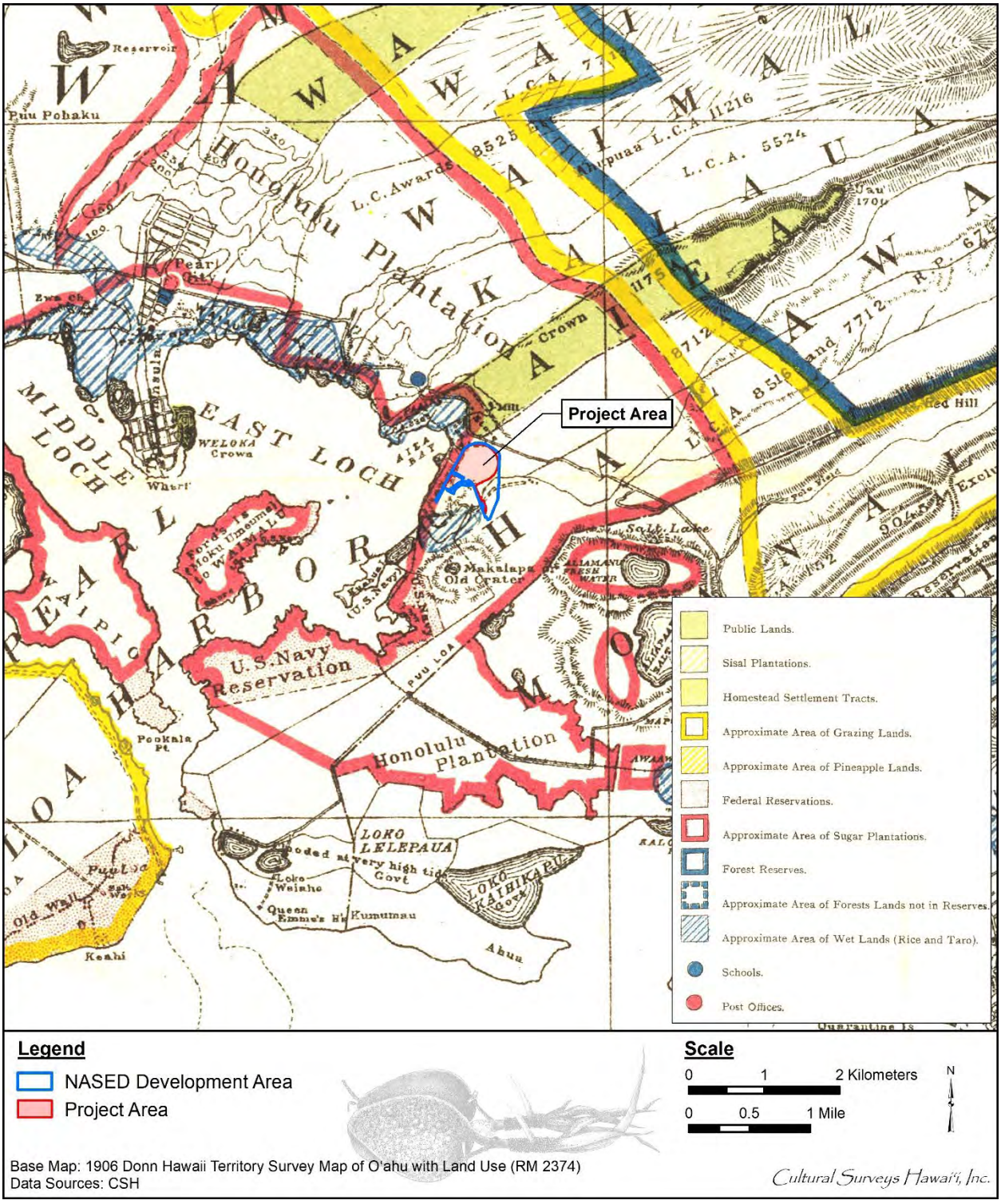

Figure 18. Portion of a 1906 Donn Hawaii Territory Survey map of O‘ahu with land use (RM 2374) showing an overlay of the NASED development area and project area location in a sugar plantation zone

Plantation fields encompassing the entire NASED development area. To the west of the southern portion of the NASED development area is an area marked as “wetlands (rice and taro).” No other development is indicated in the vicinity, other than the Oahu Railway & Land (OR&L) railroad, which runs very close to the eastern margin of Pearl Harbor, and the main government road skirting Pearl Harbor further inland.

A map of the Honolulu Plantation Company (Figure 19; no date) shows the layout of the plantation fields and infrastructure. The low assigned field numbering within the NASED development area (Fields 1, 10, and 13) and the proximity to the mill, 600 m northeast of the NASED development area (see Figure 13) suggests the NASED development area may have been within some of the earliest developed sugarcane fields (ca. 1900).

The 1919 U.S War Department map (Figure 20) shows (faintly) sugarcane symbols throughout the NASED development area with a somewhat complicated layout of roads and railroads crossing the large stadium parcel. Of note are the numerous houses in the central east side of the large stadium parcel believed to relate to an “independent homestead program” of the Honolulu Plantation Company established in a former Hawaiian LCA cluster. There is an array of houses along Hālawa Stream (and a parallel road) within the large stadium parcel with another array of houses just to the north near a railroad and road crossing within the large stadium parcel. Approximately 19 houses are indicated within the NASED development area on this 1919 map.

The Honolulu Plantation Company operated from 1899–1947 with peak production achieved in 1928 and with the refinery (sold to the California & Hawaiian Sugar Company in 1947) continuing operation until 1996 (Dorrance and Morgan 2000:41, 50). A 1933 Land Court Application (see Figure 22) provides detail regarding the south portion of the large stadium parcel showing approximately 16 rectangular buildings south of Hālawa Stream within the parcel. These are understood as plantation workers’ homes. About half of this camp was adjacent (outside) to the NASED development area to the east.

3.1.8 A Note About ‘Aiea Cemetery

The northwest edge of the large stadium parcel lies quite close to the ‘Aiea Cemetery, established ca. 1900 by the Honolulu Plantation Company as a burial ground for the plantation community in the area. A former caretaker “estimated that as many as 3,000 people were buried at Aiea Cemetery” (Pang 2002). The graveyard was originally approximately 2.5 acres located on a bluff overlooking Pearl Harbor (Figure 21). However, to make way for Kamehameha Highway, graves within this *makai* section “were reinterred on the *mauka* side” (Pang 2002). As testified by a long-time area resident of ‘Aiea, during the construction of the highway “all those who were being affected by the road, we had to go and get our bones or whatever was buried” (Higuchi 2003:11). An HDOT 1933 engineering plan map of the development of Kamehameha Highway appears to outline the former extent of the cemetery and notes that 414 graves within ‘Aiea Cemetery were located within the right-of-way of the highway (Figure 23). Presumably these graves within the right-of-way were among those relocated to the *mauka* section. The construction of Kamehameha Highway in the 1930s bisected the bluff on which ‘Aiea Cemetery was located, creating a severe road cut which allowed the new highway to remain on relatively level ground (see Figure 23 and Figure 24). As shown in the 1933 HDOT engineering plan map (see Figure 23), the road cut consisted of an approximately 7.3-m (24-ft) deep slice through the bluff. A 1939 aerial

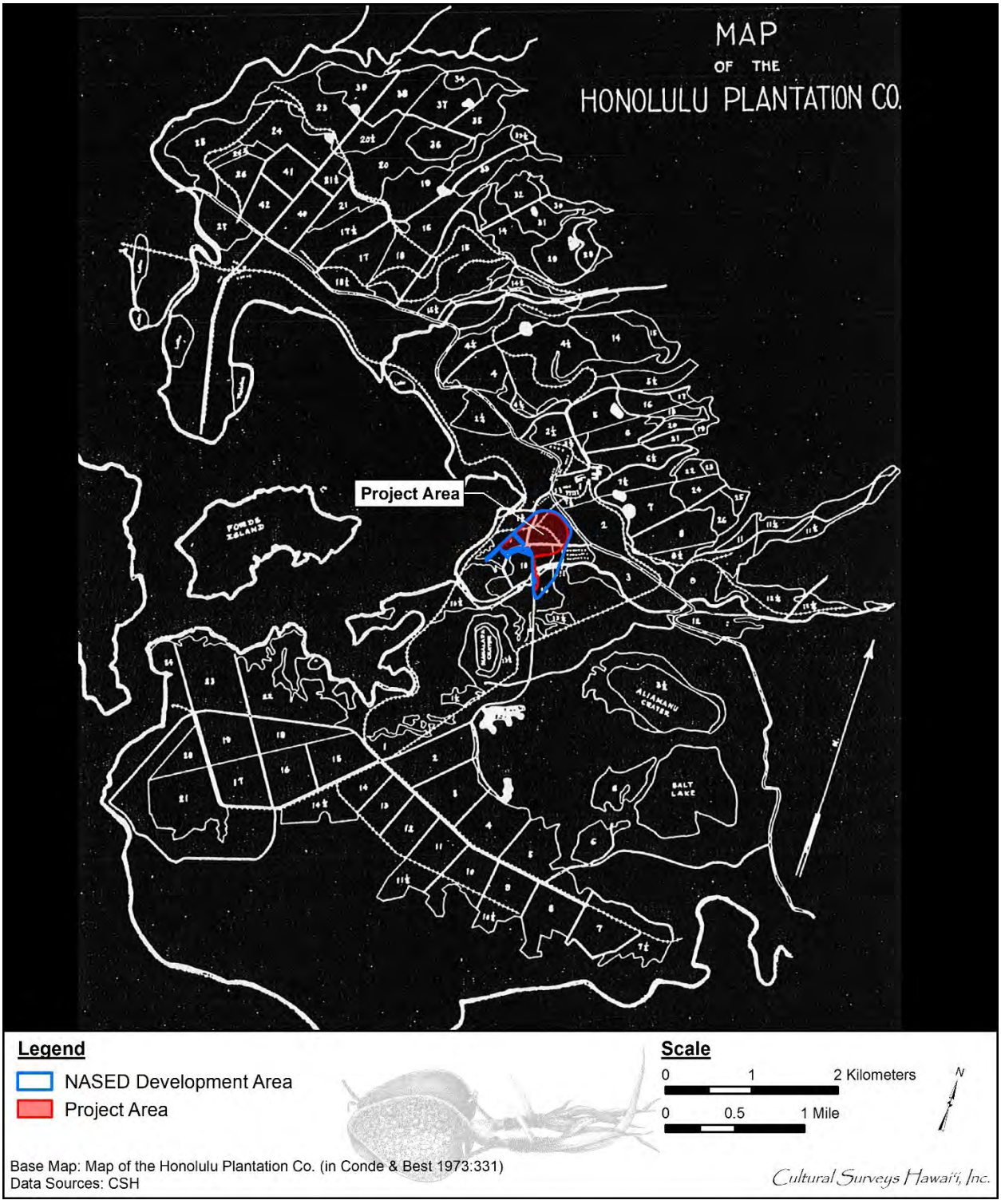

Figure 19. Map of the Honolulu Plantation Company (Condé and Best 1973:331) showing an overlay of the project area and NASED development area within a plantation zone

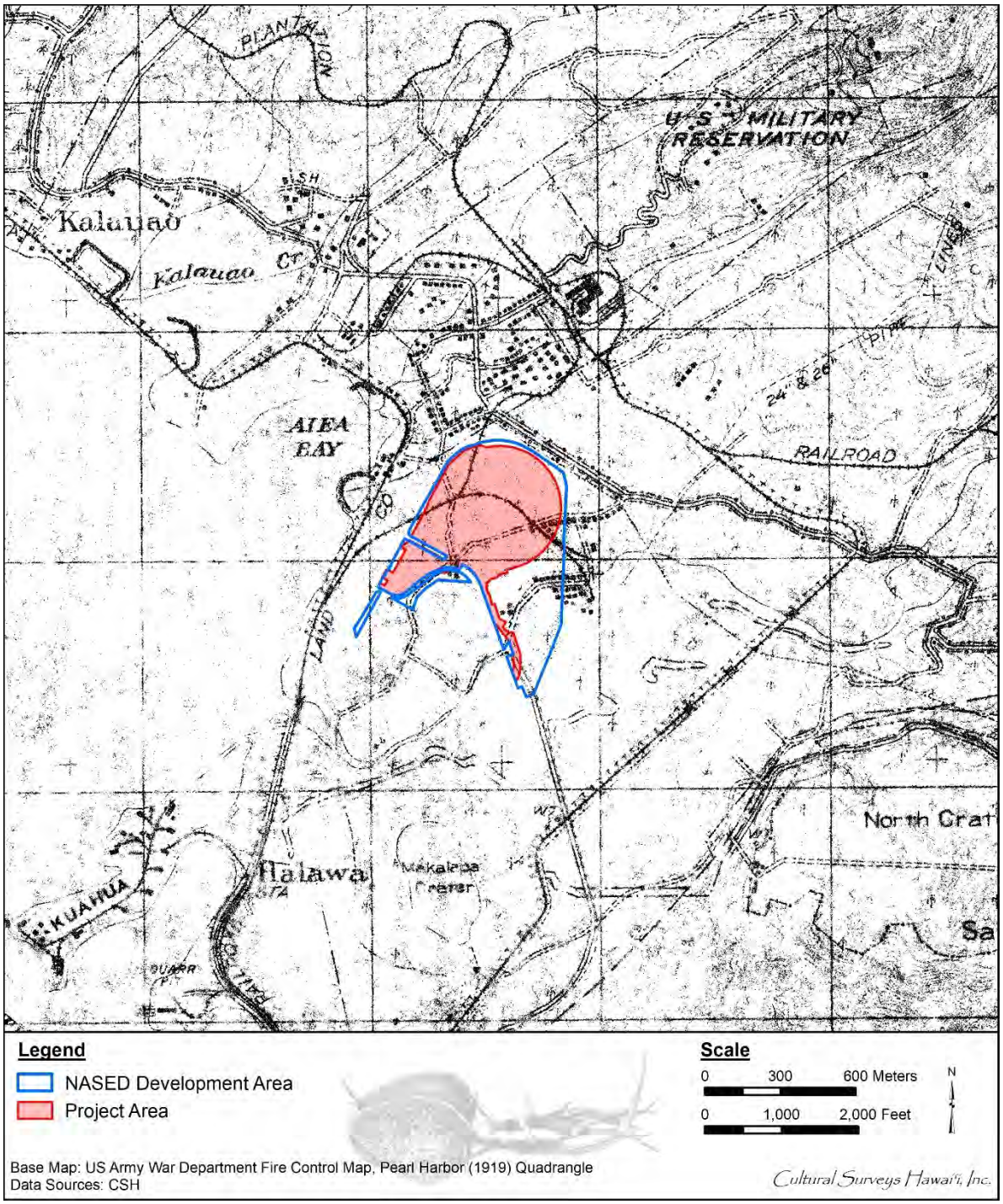

Figure 20. Portion of the 1919 Pearl Harbor U.S. Army War Department fire control map with an overlay of the project area and NASED development area showing branching roads and railroads and numerous houses in the central east side of the large stadium parcel believed to relate to an “independent homestead program” of the Honolulu Plantation Company established in a former Hawaiian LCA cluster

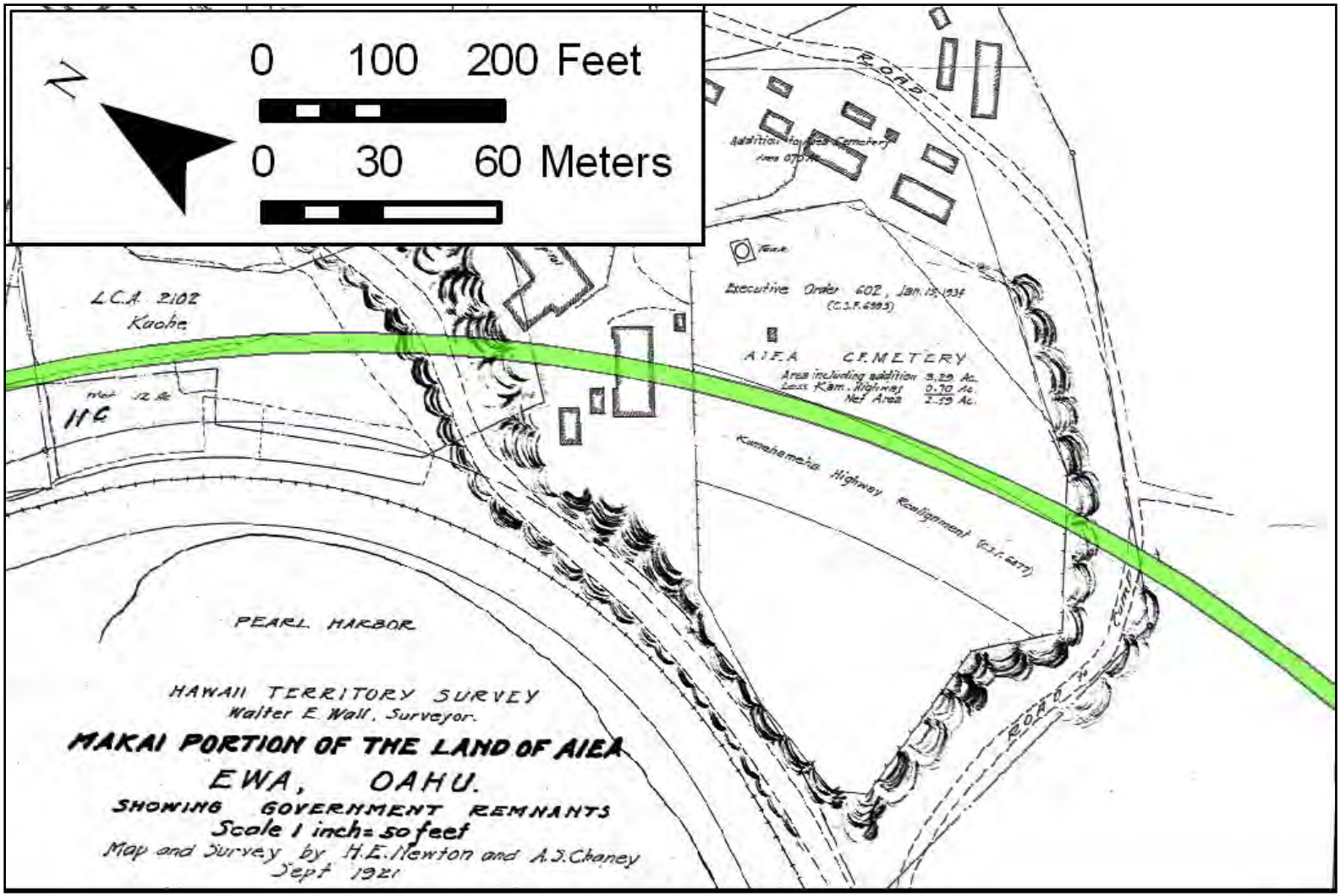

Figure 21. Portion of the 1921 Newton and Chaney Aiea Makai map (RM 2677) showing the ‘Aiea Cemetery on a pronounced bluff—the *makai* (southwest) portion of which was eventually removed by a military activity and Kamehameha Highway construction (from Sroat et al. 2012:227)

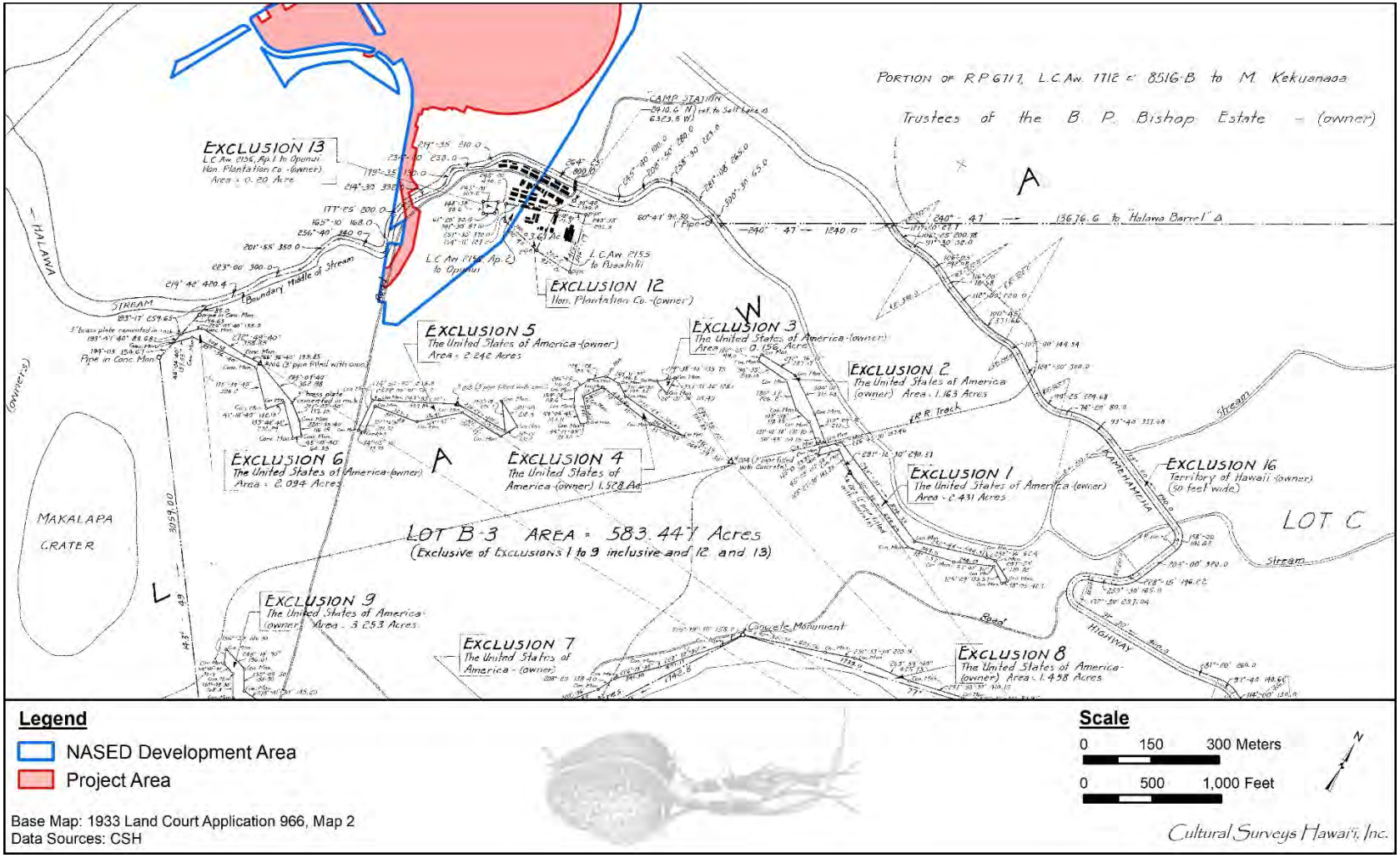

Figure 22. Portion of the 1933 Land Court Application 966, Map 2 showing south portion of the project area and NASED development area with approximately 16 buildings south of Hālawa Stream on the southeast side of the large stadium parcel (there was almost certainly another grouping of houses within the large stadium parcel near the north edge of this map that is not shown)

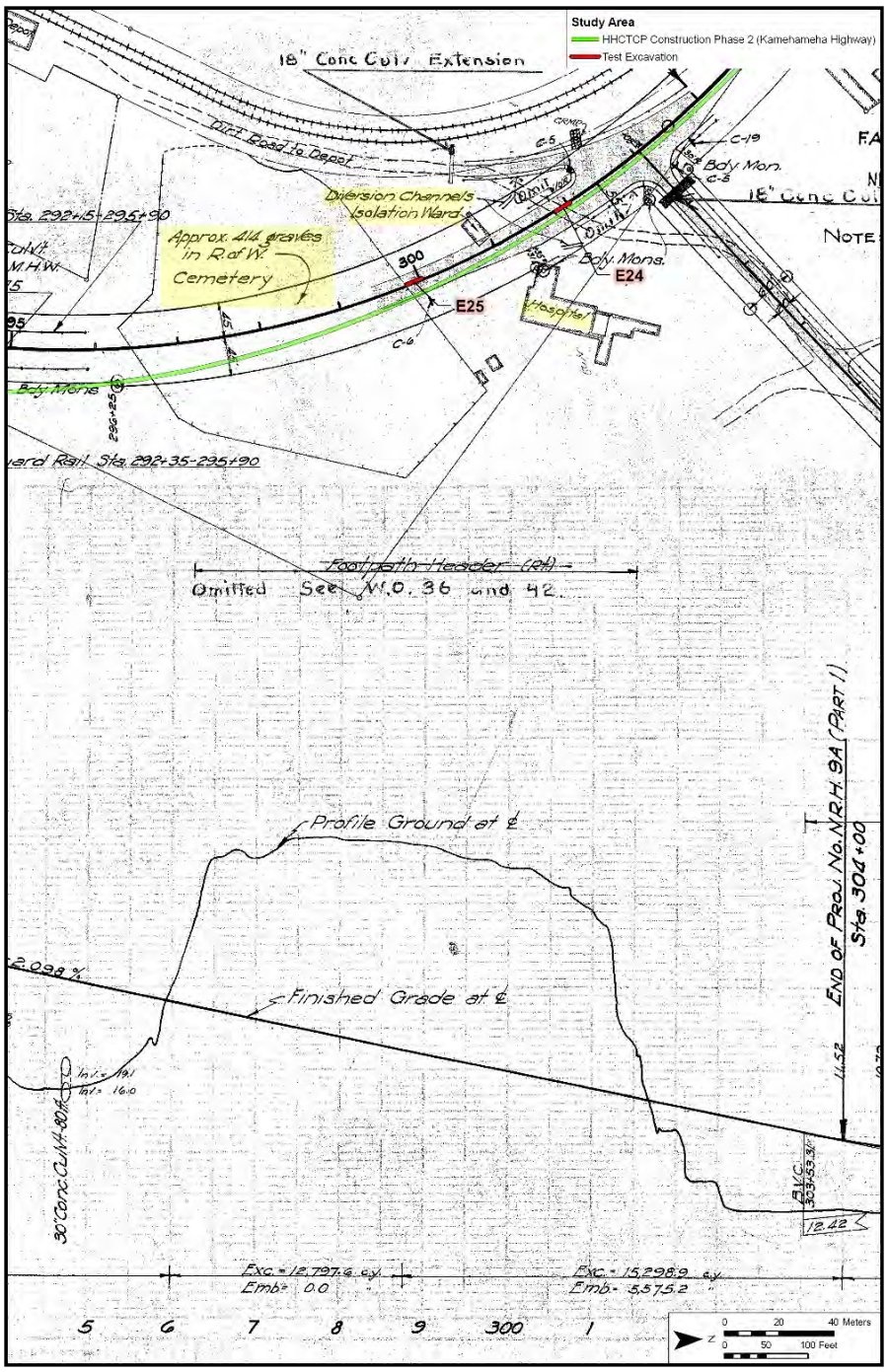

Figure 23. Close-up of 1933 HDOT engineering plan map of the development of Kamehameha Highway, showing what appears to be the area of ‘Aiea Cemetery, the existence of approximately 414 graves in the highway right-of-way, and the grading profile of the highway relative to the previous land; note the significant difference between the “Finished Grade” and “Profile Ground” (1933 Hawaii Department of Transportation engineering plans for the development of Kamehameha Highway, Map 4300.10) (from Sroat et al. 2012:228)

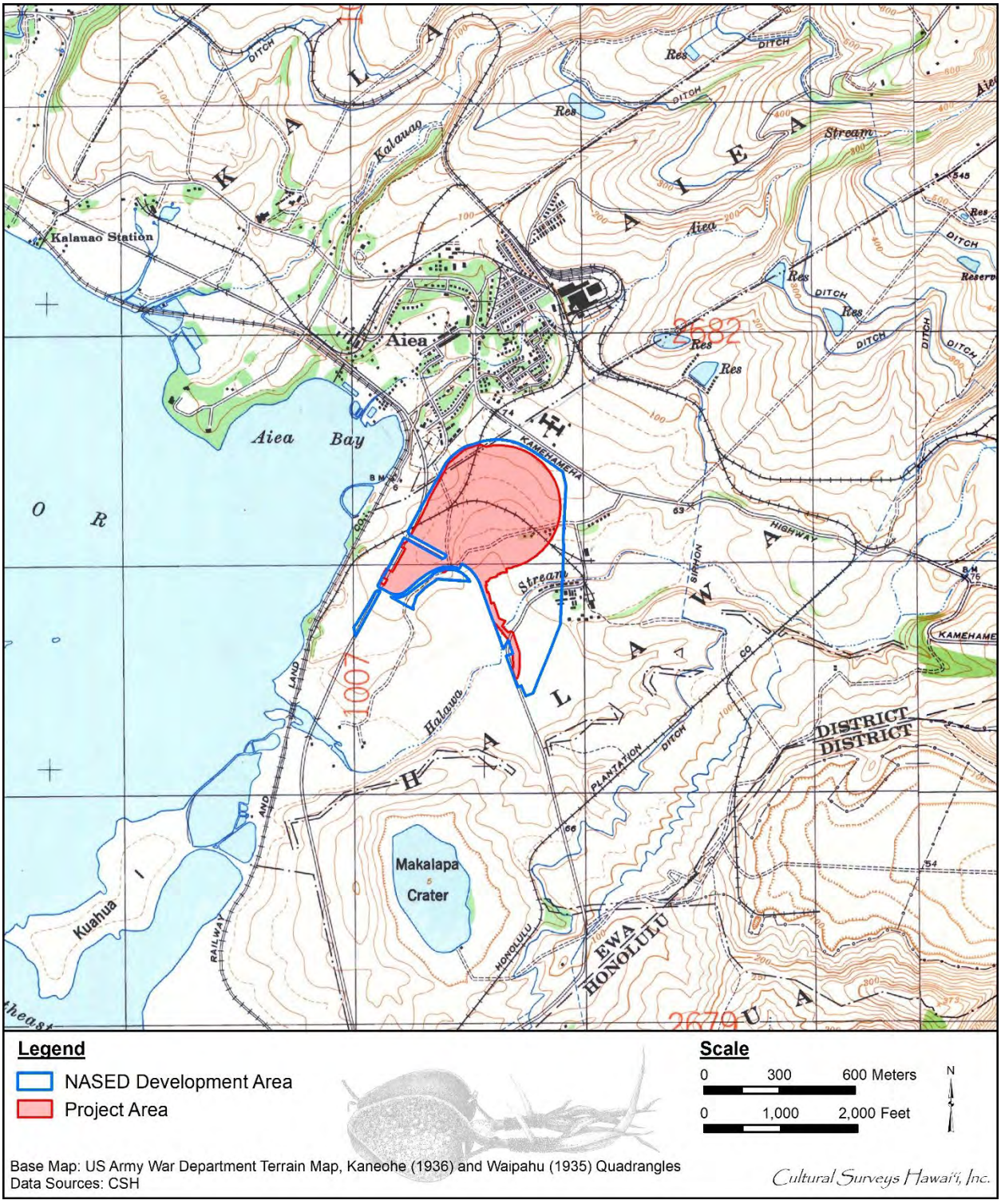

Figure 24. Portion of the 1935 Waipahu and 1936 Kaneohe U.S. Army War Department terrain map quadrangles showing the project area and NASED development area with branching roads and railroads and approximately 18 buildings on the central east side of the large stadium parcel

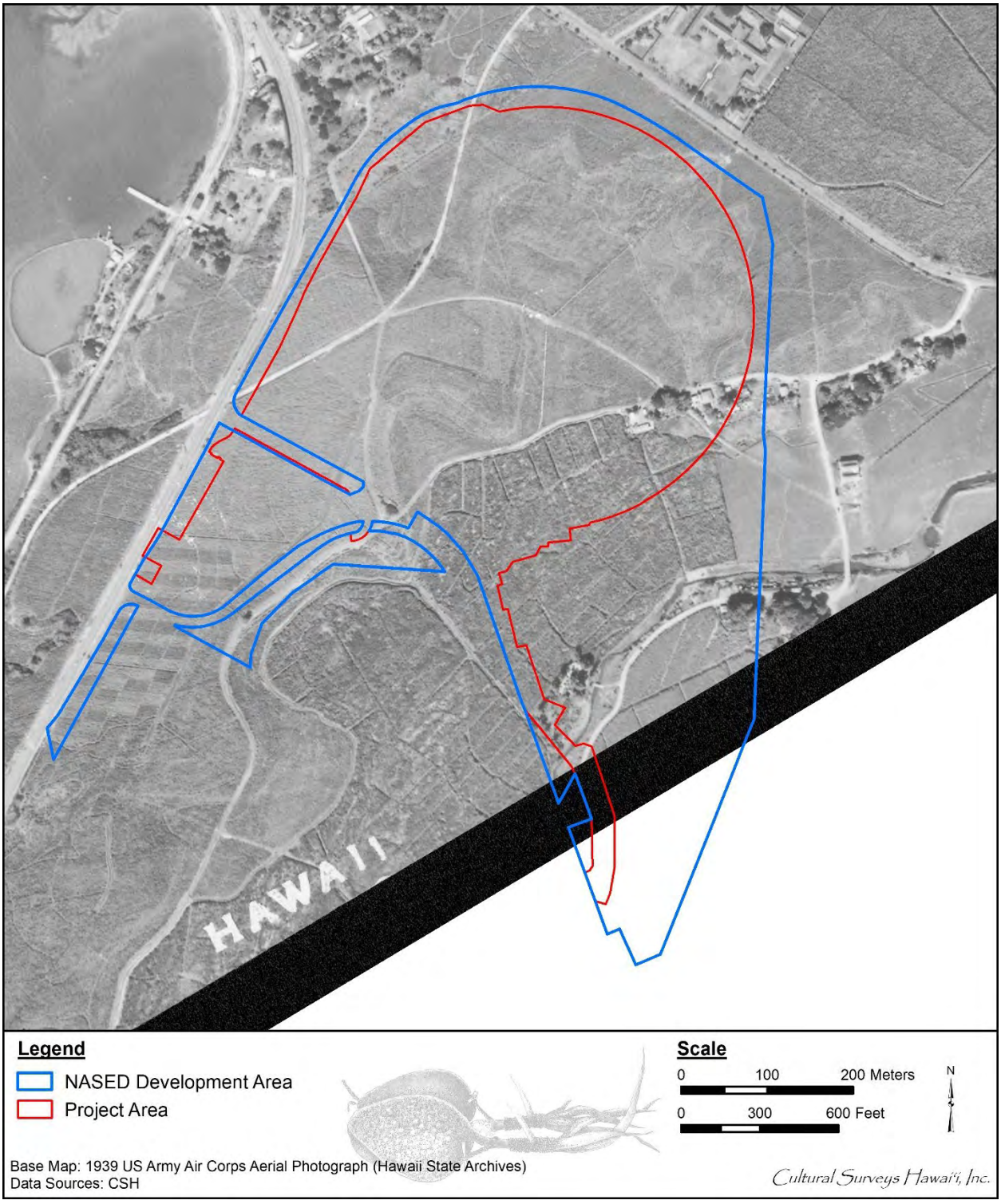

Figure 25. 1939 U.S. Army Air Corps aerial photograph (Hawai‘i State Archives) with the project area and NASED development area overlay, showing structures in the central portion with agricultural fields

photograph (see Figure 25), shows Kamehameha Highway cutting through the coastal bluff on which ‘Aiea Cemetery was located. The 1935 U.S. Army map (see Figure 24) captures the situation at that time with the new highway effectively cutting through the cross symbol denoting the cemetery. The *makai* section of the bluff was later leveled with the roadway. Given the substantial disturbance to the area, the continued existence of any ‘Aiea Cemetery burials outside the presently established cemetery appears low.

3.1.9 Mid-Twentieth Century

The 1935 U.S. Army map (see Figure 24) shows the project area encompassing branching roads and railroads and approximately 18 buildings on the central east side of the large stadium parcel. This is very similar to the depiction of 26 years earlier (see Figure 20) with an array of houses along Hālawa Stream (and a parallel road) on the central east side of the large stadium parcel with another array of houses just to the north near a railroad and road crossing within the large stadium parcel. Approximately 18 houses are indicated within the NASED development area on this 1935 map.

A 1939 aerial photograph (see Figure 25) confirms the situation thought to have existed since ca. 1900 where almost all the four parcels appear to be under sugarcane cultivation. Two residential communities are shown along the central east side of the large stadium parcel along two roughly parallel roads.

The 1943 U.S. Army War Department map (Figure 26) depicts a much different world understood as resulting from U.S. military activity during World War II. Comments below address the area by parcel:

- Parcel 055, the small crescent-shaped parcel south of the curve of Salt Lake Boulevard appears to be unaffected by World War II developments to that time but the bounding roads on the northwest and southeast sides are in place (see Figure 26).
- Parcel 061, the large stadium parcel, is largely unchanged in the southern 2/3, but the northern 1/3 is covered with approximately 39 new (on average, quite large) buildings and new roads (see Figure 26).
- Parcel 070, the narrow strip parcel on the southeast side of Kamehameha Highway, appears to have two large new buildings parallel to Kamehameha Highway (see Figure 26).
- Parcel 071, the trapezoidal parcel bound by Kamehameha Highway to the northwest, and legs of Salt Lake Boulevard, appears to be covered with approximately 19 new, large buildings (see Figure 26).

The nature of these new military buildings shown on the 1943 U.S. Army War map (see Figure 26) is unclear but they are assumed to include warehouses and office space. Many of these World War II buildings were very quickly erected and very quickly demolished following the war. The 1952 aerial photograph (Figure 27) provides a clear image of the military constructions and shows a layout very similar to that of the 1943 map (see Figure 26) with seemingly a few additional buildings likely constructed in the last years of the war. Most of the large stadium parcel is still in sugarcane cultivation. The area of plantation housing along Hālawa Stream appears to be done or diminished while the strip of plantation housing to the north seems to still be in place.

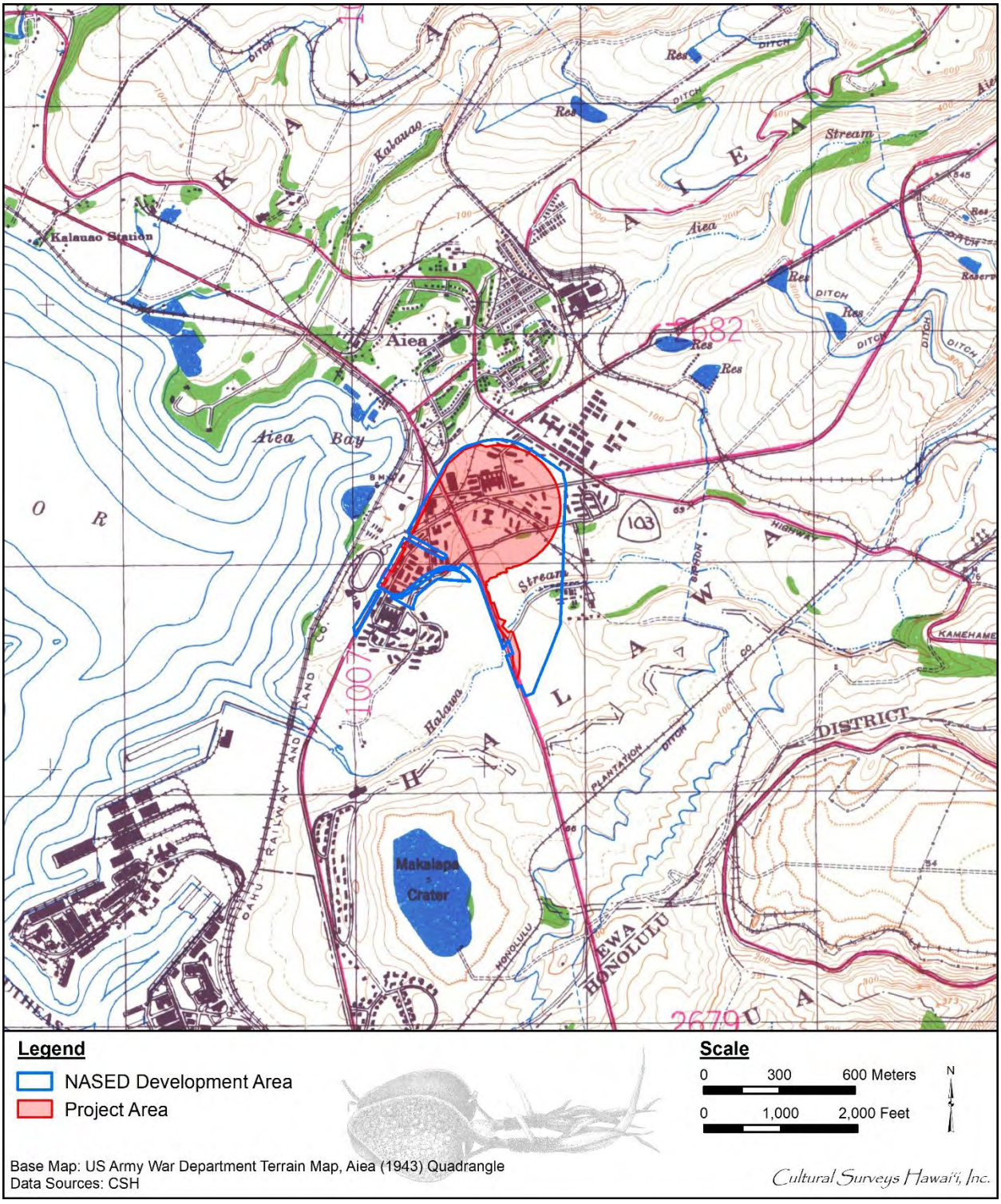

Figure 26. Portion of a 1943 Aiea U.S. Army War Department terrain map showing the project area and NASED development area with new structures in the northern portion

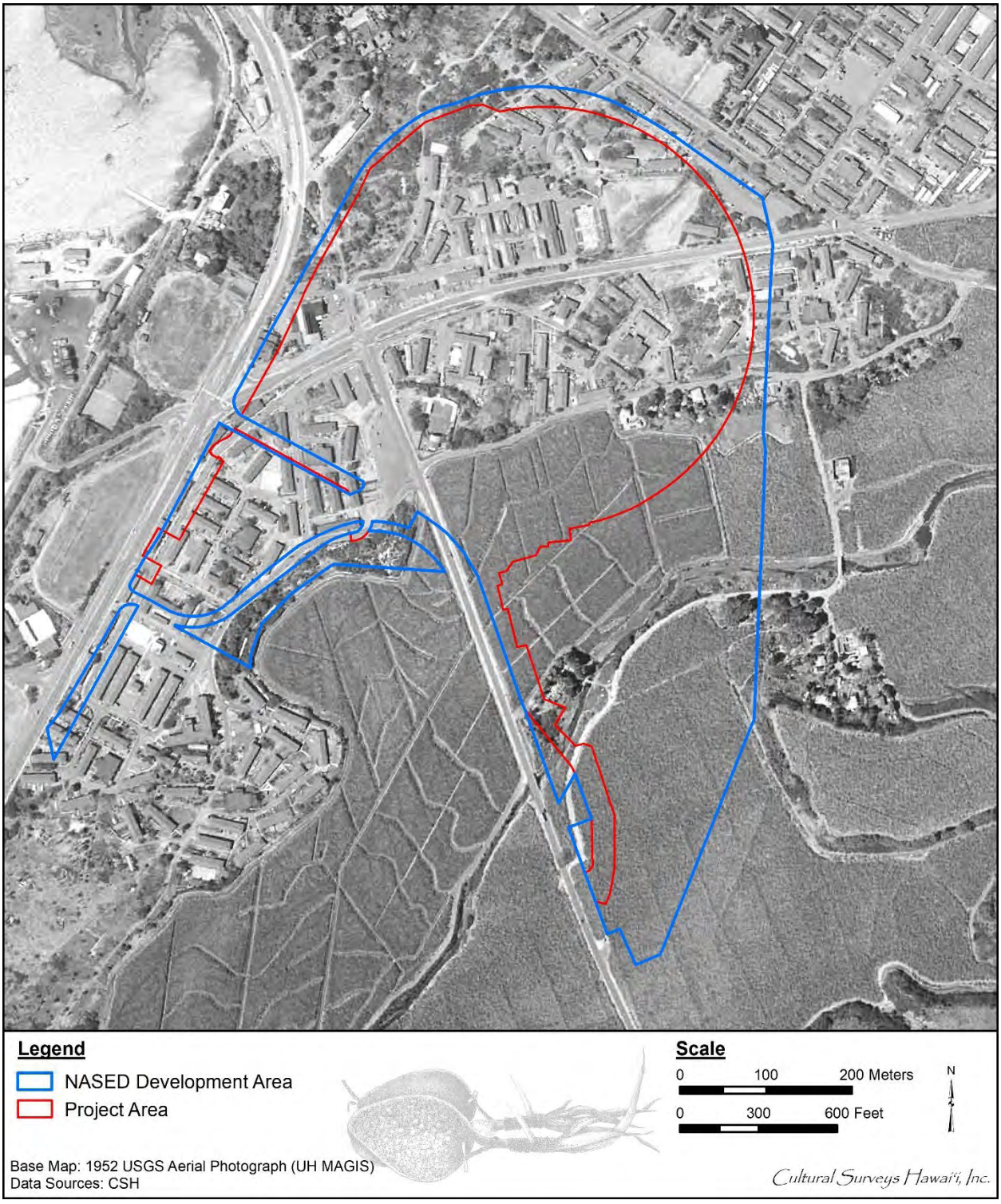

Figure 27. 1952 USGS aerial photograph (UH MAGIS) showing project area and NASED development area with continued development in the northern portion

The depiction in the 1953/1954 USGS map (Figure 28) suggests that almost all the plantation and World War II structures had been swept away but this appears to be just a case of the USGS now using a pink shading to indicate urban areas and only selectively showing some buildings. The 1953/1954 USGS map (see Figure 28) depicts a very large World War II building with nine wings in the north central portion of the large stadium parcel, and a smaller, probable World War II-era structure remains near the west corner of the large stadium parcel. A fire station is depicted in the north central portion of the large stadium parcel, and this may have been a holdover from World War II constructions as well. Many roads are shown in the northwest portion of the NASED development area. There appear to be two small new structures in the large stadium parcel just northwest of Hālawa Stream.

The 1968 USGS map (Figure 29) shows only four buildings in the project area but again this appears to be a misleading result from the USGS using a pink shading to indicate urban areas and only selectively showing some buildings. The large World War II building with nine wings in the north central portion of the large stadium parcel is now the “Halawa Kai School” located on the north side of “Hale Street.” Hale Street, effectively forming a shortcut between Kamehameha Highway and Moanalua Road, is first depicted on the 1943 map (see Figure 26) and ran through the middle of the future stadium for 45+ years until the creation of the present Aloha Stadium. The 1968 USGS aerial (Figure 30) shows that in fact, most of the World War II buildings within the project area were still intact at that time.

3.1.10 Aloha Stadium

Aloha Stadium officially opened on 12 September 1975. A selection of photographs (Figure 31 through Figure 33) of the ongoing construction indicates huge cuts to level the site and massive ground disturbance over much of the parcel. The land and the stadium are owned and managed by the State of Hawai‘i. The stadium has the current capacity to hold a maximum of 50,000 people and includes an 8,000-car parking lot. A variety of events including football, baseball, soccer, boxing, religious and music festivals, swap meets, auto shows, motocross, mud races, tractor pulls, concerts, and carnivals have taken place there over the years.

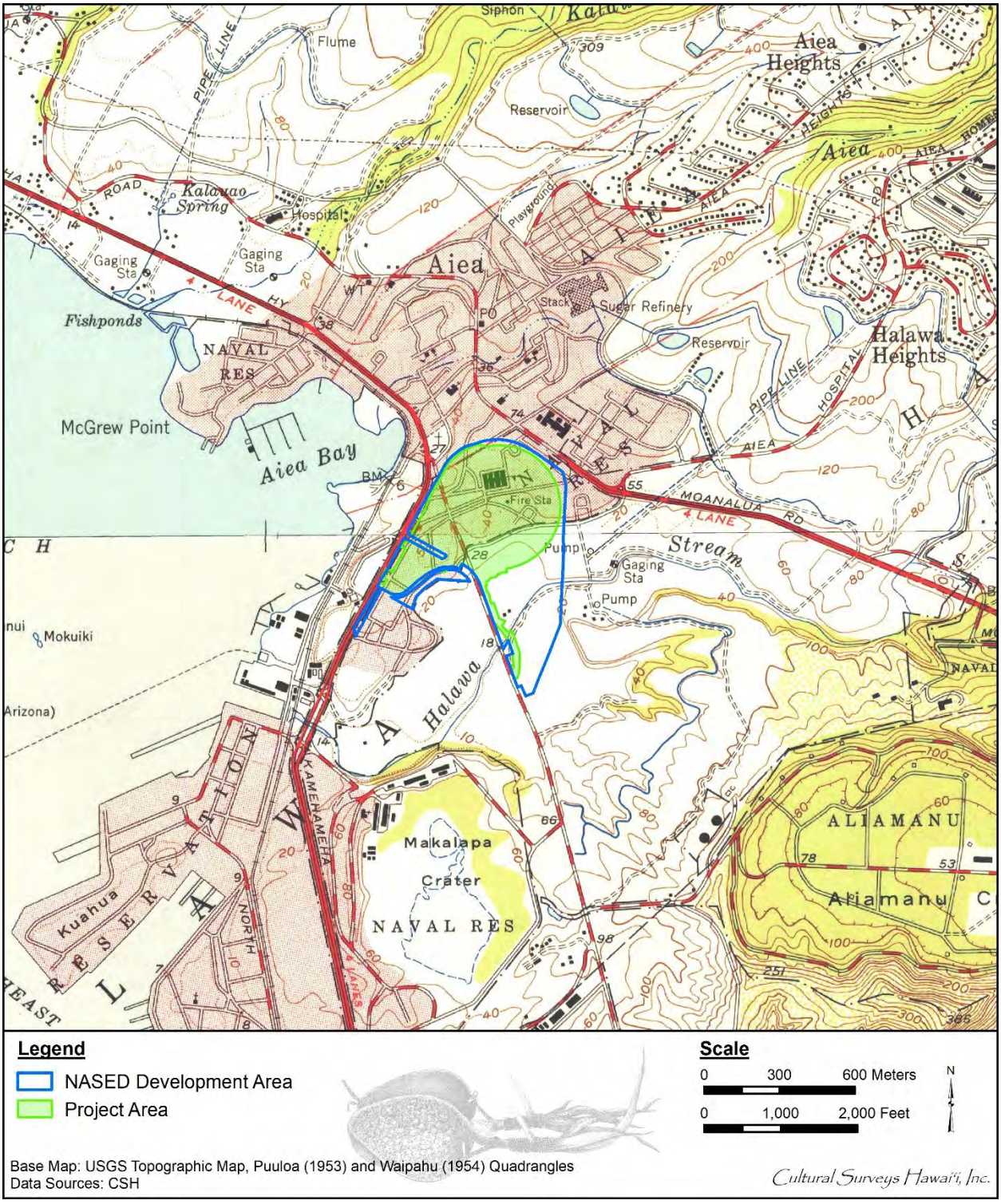

Figure 28. Portion of the 1953 Puuloa and 1954 Waipahu USGS topographic quadrangles showing the NASED development area and project area with development in the northern portion and a fire station

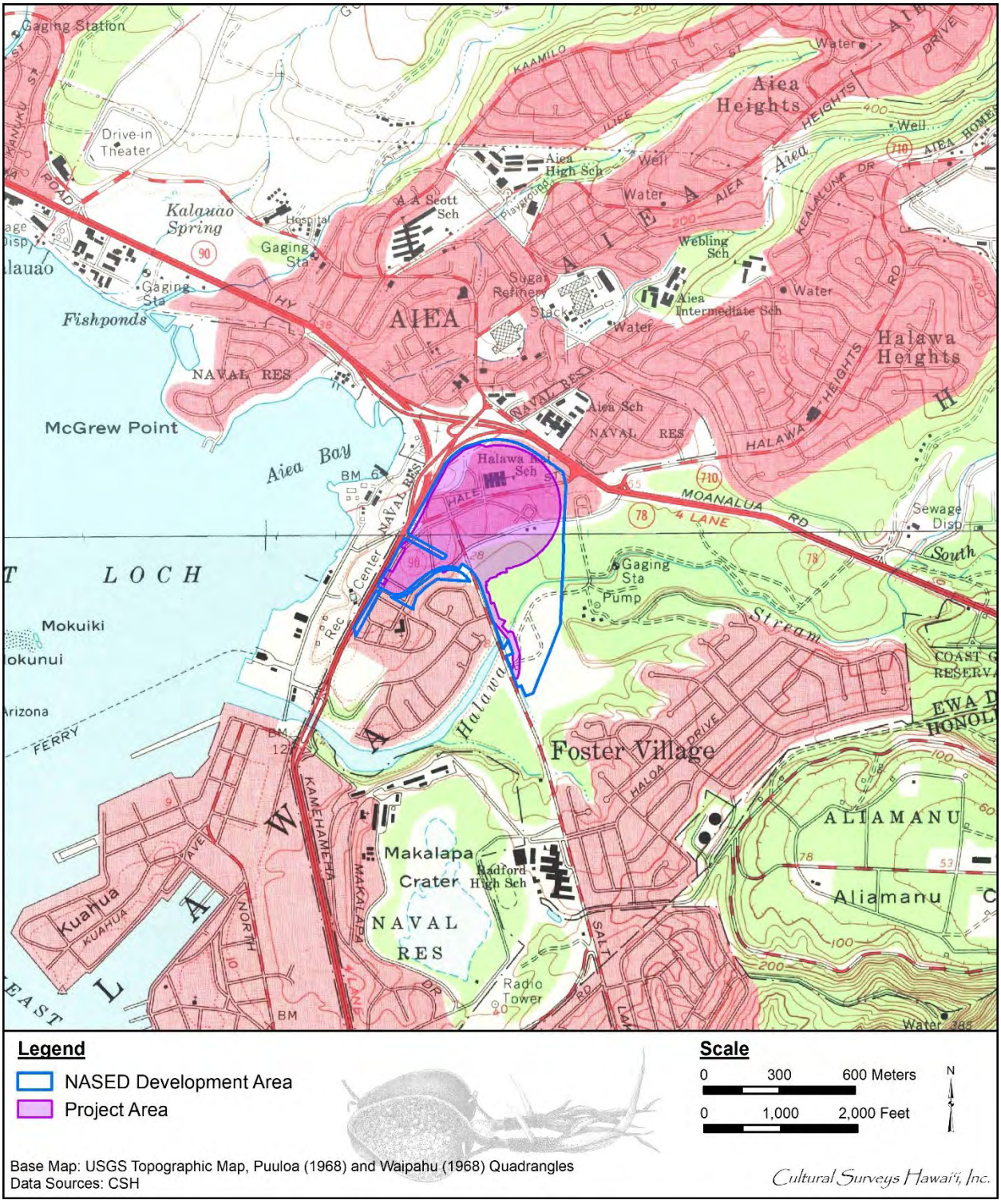

Figure 29. Portion of the 1968 Puuloa and Waipahu USGS topographic quadrangles showing the NASED development area and project area with continued development in the area

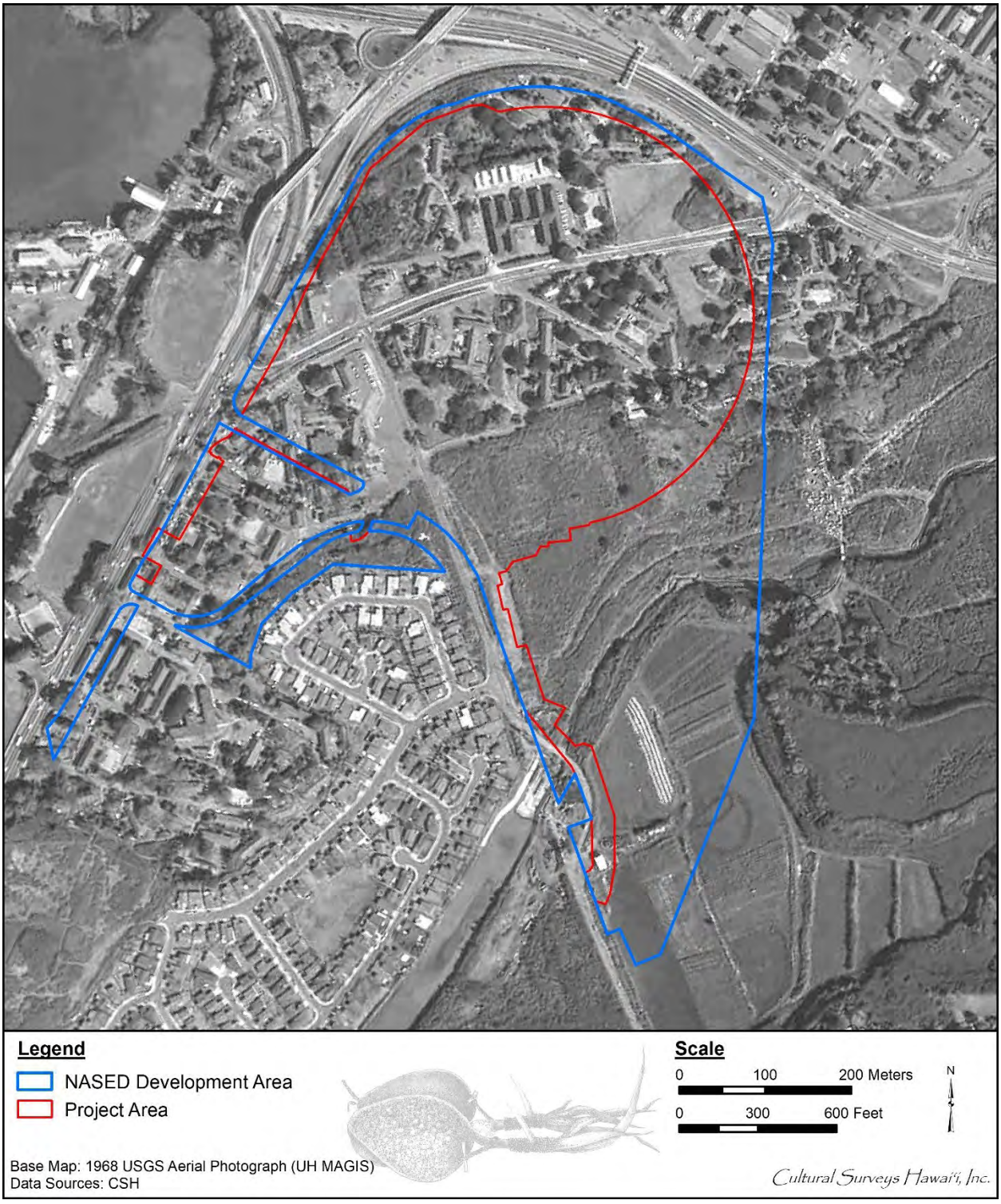

Figure 30. 1968 USGS aerial photograph (UH MAGIS) showing NASED development area and project area overlays with no more structures in the central portion

Figure 31. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019)

Figure 32. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019)

Figure 33. Photograph of the original development of the Aloha Stadium (Aloha Stadium 2019)

3.2 Previous Archaeological Research

Previous archaeological studies in the vicinity of the AIS project area are depicted in Figure 34, summarized in Table 3, and discussed in detail below. Previously identified historic properties in the vicinity of the AIS project area are depicted in Figure 35 and are summarized in Table 4.

3.2.1 Early Archaeological Research at Hālawa

The first recorded sites at Hālawa were documented during the pioneering attempt at a comprehensive survey of archaeological sites on the island of O‘ahu by J. Gilbert McAllister of the Bishop Museum in 1930. McAllister (1933:101–102) recorded ten historic properties (nine coastal fishponds and Ford Island—known to the Hawaiians as Moku‘ume‘ume) within Hālawa Ahupua‘a, giving their approximate locations and describing their conditions at the time of the survey. The historic properties in the vicinity of the project area include the following:

> **Site 101. Makalapa Crater**
>
> Makalapa Crater, now being used for a freshwater pond. Believed to be recent. [McAllister 1933:102]

Makalapa Crater lies just south of Hālawa Stream (the crater rim is about 300 m east of the Kamehameha Highway alignment).

> **Site 102. Loko Kunana and Loko Muliwai, between Hālawa and Kuahua Island.**
>
> Kunana has been partly filled in but was formerly 25 acres in extent. Kuahua island forms one side and the opposing wall is formed by Hālawa. The two walls running between the land and the island are 1800 feet and 1950 feet long, about 5 feet wide, and 3 feet high. Loko muliwai is only 4 acres in extent, a portion of which has been filled. Its wall is 500 feet long with one outlet (*mākāhā*). [McAllister 1933:102]

Loko Kunana and Loko Muliwai lie adjacent to the east side of the East Loch of Pearl Harbor, just south of Hālawa Stream.

> **Site 104. Kahakupohaku pond, near the Aiea Railroad Station.**
>
> A small pond of 3 acres with a semicircular wall of evenly spaced basalt 1050 feet long, 5 feet wide, 3.5 feet high, without outlet gates (*mākāhā*). The name is also spelled ‘Kahakapohaku’ and ‘Kakupohaku.’ [McAllister 1933:102]

Loko Kahakupōhaku, the nearest of the McAllister sites to the current project area, was located 150 m west of the project area on the coast.

> **Site 108. Loko Paaiau, fishpond at Kalauao.**
>
> Rectangular in shape, roughly 190 by 600 feet, surrounded by land on three sides. The wall on the harbor side is 3 to 4 feet wide, 2 feet high with one *mākāhā*. The three sides toward the land have been evenly faced with water worn basalt to a height of about 2 feet. The pond was evidently fed by the water from the surrounding taro patches. Tradition credits its construction to Kalaimanuia. [McAllister 1933:103]

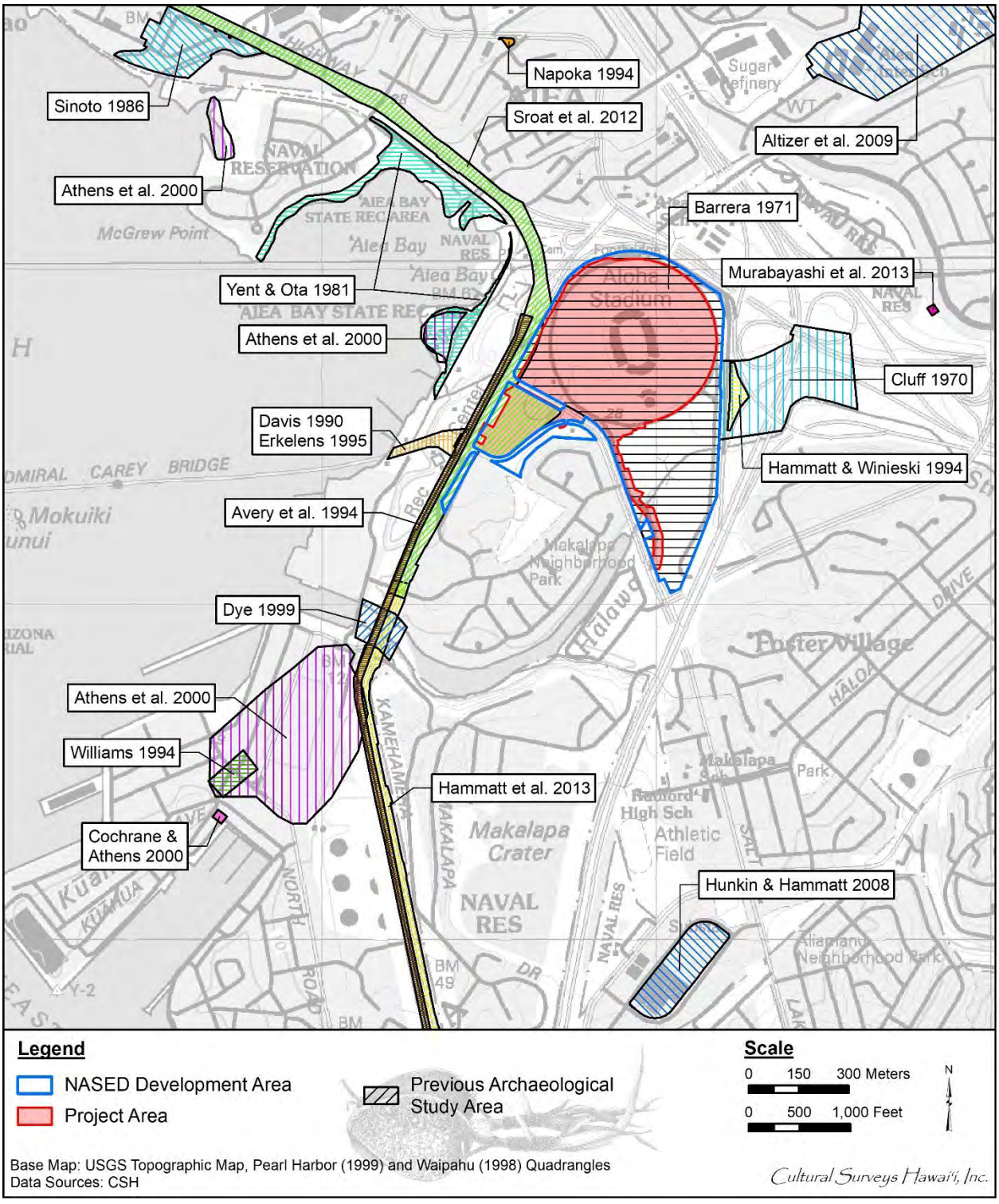

Figure 34. Portion of the 1998 Waipahu and 1999 Pearl Harbor USGS topographic quadrangles with overlay of previous archaeological studies in the vicinity of the project area and NASED development area

Table 3. Previous archaeological studies in the vicinity (within approximately 1 km) of the AIS project area

Source	Type of Investigation	General Location	Results
McAllister 1933	Island-wide survey	O‘ahu Island	Site 101 Makalapa Crater, Site 102 Loko Kunana and Loko Muliwai, and Site 104 Loko Kahakupono, Site 108 Paaiau, and Site 109 Loko Opu
Cluff 1970	Archaeological survey	Hālawa Interchange with H-1 Freeway	Survey focused on vicinity of Saratoga Dr; surface survey identified one possible *heiau*, one historic house platform, a stone wall, and several burial structures (two family plots, three mounds, one concrete enclosure); subsurface excavations of possible *heiau* structure inconclusive; subsequently designated SIHP # 50-80-09-05306
Barrera 1971	Archaeological reconnaissance survey	Proposed Honolulu Stadium	No historic properties identified
Yent and Ota 1981	Archaeological reconnaissance survey	31.0-acre area around margins of ‘Aiea (“Rainbow”) Bay	No historic properties identified; notes presence of abandoned piers, pilings, trash, and LST (Landing Ship Tank) site at tip of McGrew Point
Sinoto 1986	Archaeological reconnaissance survey	Proposed Pearl Promenade, TMKs: (1) 9-8-014:003, 006, 007, 9-8-015:044, 045	Surface survey identified no historic properties; noted area was former marshlands with modern bulldozer-related disturbance
Davis 1990	Literature review and field inspection	Proposed terminus for Ford Island causeway and Ford Island	No historic properties identified
Avery et al. 1994	Archaeological monitoring	Kamehameha Hwy from Aloha Stadium to Makalapa Gate	No historic properties identified; data developed about environmental change in vicinity of mouth of Hālawa Stream, including changes in vegetation and course of stream
Hammatt and Winieski 1994	Archaeological reconnaissance survey	SE of Aloha Stadium	No historic properties identified; notes major impact of commercial sugar cultivation

Source	Type of Investigation	General Location	Results
Napoka 1994	SHPD determination of historic significance	Pōhaku O Ki‘i Nalopaka Place, ‘Aiea	Storied boulder designated SIHP # 50-80-09-04892, traditional cultural property
Williams 1994	Archaeological monitoring	Pearl Harbor NAVBASE, Kunana and Wailolowai fishponds	No additional historic properties identified; conducted within Kunana Fishpond, core indicated fishpond sediments and radiocarbon analysis dated pond construction between AD 1200 to AD 1400
Erkelens 1995	Archaeological study	Ford Island Golf Park and Rainbow Marina, East Loch of Pearl Harbor	No historic properties identified; notes disturbance to entire Hālawa portion of surveyed area
Dye 1999	Archaeological resources survey	Kamehameha Hwy at Hālawa Bridge	No historic properties identified; major twentieth century landscape modifications to vicinity noted
Athens et al. 2000	Archaeological and historical studies	Ancient Hawaiian fishponds of Pearl Harbor on U.S. Navy Land	No additional historic properties identified; includes dating analysis for several fishponds in vicinity: Loko Pōhaku, Loko Wailolokai, Loko Wailolowai, Loko Muliwai, Loko Kunana
Cochrane and Athens 2000	Archaeological monitoring	Pearl Harbor, near Magazine Loch between Hurt Ave and Kuahua Ave	No historic properties identified
Hunkin and Hammatt 2008	Archaeological monitoring	4380 Lawehana St	No historic properties identified
Altizer et al. 2009	Archaeological literature review and field Inspection	‘Aiea Intermediate School erosion control project, TMK: (1) 9-9-005:001, 30.8-acre campus including a 150-ft portion of ‘Aiea Stream corridor	No historic properties identified, and no further archaeological work recommended

Source	Type of Investigation	General Location	Results
Sroat et al. 2012	Archaeological inventory survey	Phase 2 of Honolulu High-Capacity Transit Corridor Project extending along Kamehameha Hwy	Identified one historic property, SIHP # 50-80-09-07150, *lo‘i* deposits (not in vicinity of current project area); southernmost AIS test excavation “E 26” near current project area documented current road surface and base course overlying natural deposits with no evidence of past land utilization or modification
Hammatt et al. 2013	Archaeological inventory survey	Kamehameha Hwy from Kalaloa Dr to Middle St	Documented two newly identified historic properties: SIHP # 50-80-13-07420 (buried asphalt roadway sections, possibly early Kamehameha Hwy alignment) and SIHP # 50-80-13-07421 (buried concrete slabs, prepared coral pavement, and underlying associated base course, likely remnants of military infrastructure ca. 1942–1943)
Murabayashi et al. 2013	Literature review and field inspection	Proposed VZW HON Red Hill Telecom Facility at 99-611 Ulune St in Hālawa	No historic properties identified; noted area heavily disturbed and modified over time

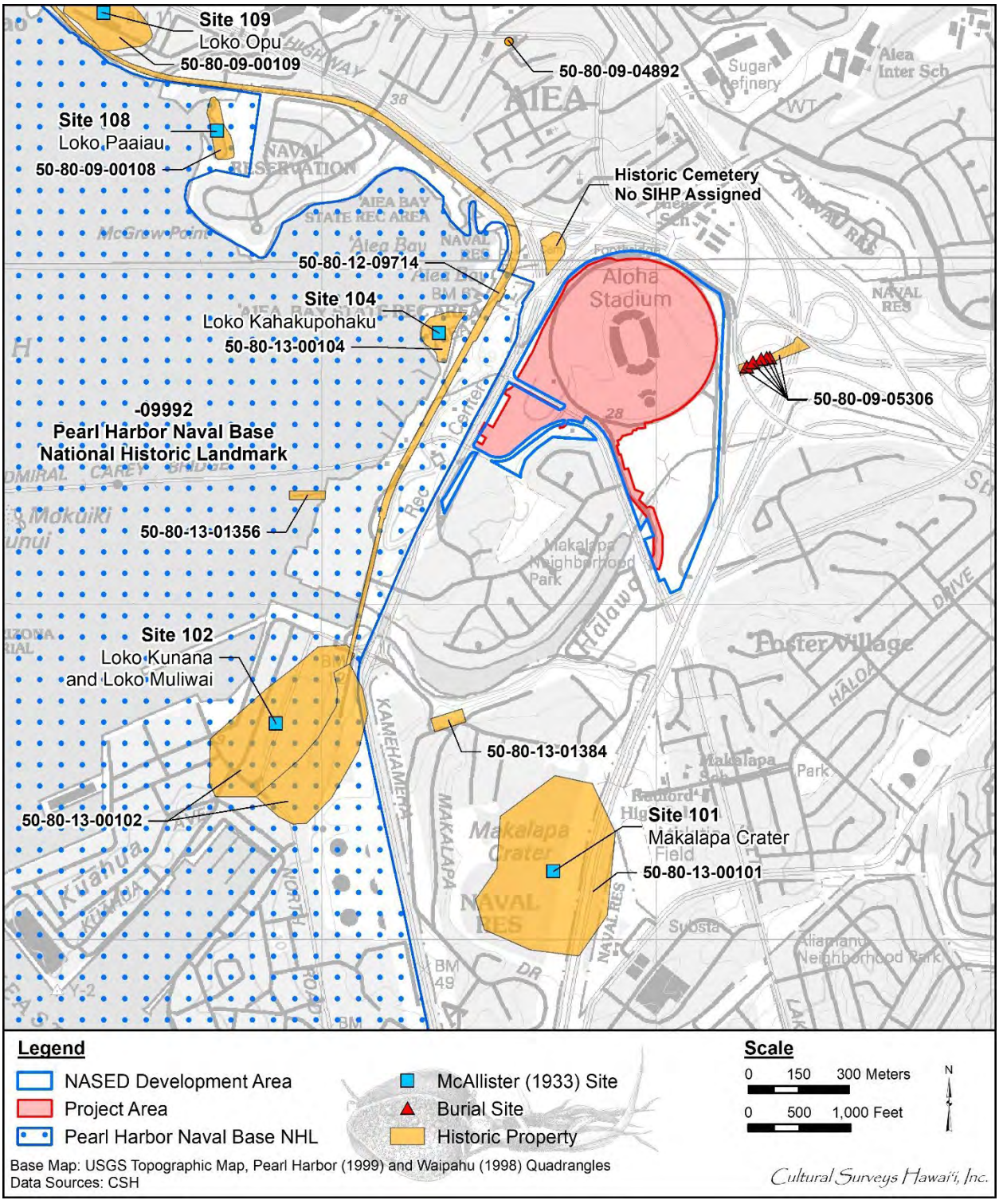

Figure 35. Portion of a 1998 Waipahu and 1999 Pearl Harbor USGS topographic quadrangles with overlay of previously identified historic properties in the vicinity (within approximately 1 km) of the NASED development area and project area

Table 4. Previously identified historic properties in the vicinity (within approximately 1 km) of the AIS project area

SIHP #	Type	Reference	Comments
McAllister Site 108 / 50-80-09-00108	Fishpond, Loko Paaiau	McAllister (1933:103)	Rectangular in shape, roughly 190 by 600 ft, surrounded by land on three sides; wall on harbor side is 3 to 4 ft wide, 2 ft high with one mākāhā; three sides toward land have been evenly faced with waterworn basalt to a height of about 2 ft; pond evidently fed by water from surrounding taro patches; tradition credits its construction to Kalaimanuia
McAllister Site 109 / 50-80-09-00109	Fishpond, Loko Opu	McAllister (1933:103)	Has not been completely filled in; 10.5 acres in size and apparently completely surrounded by a wall 2,700 ft in extent; built by Kalaimanuia
50-80-09-04892	Pōhaku O Ki‘i Nalopaka Place, ‘Aiea	Naupaka 1994	A storied boulder with a legend related by *kumu hula* John Kaimikaua
50-80-09-05306	Possible *heiau*, one historic house platform, a stone wall, and several burial structures (two family plots, three mounds, one concrete enclosure)	Cluff 1970	Not given an SIHP designation in the report, features subsequently assigned SIHP # 50-80-09-05306
50-80-12-09714	OR&L right-of-way	NRHP; Hammatt and Chiogioji 1997	Historic property extends along coast in vicinity of project area westward, (documented to the west in various studies)
McAllister Site 101 / 50-80-13-00101	Fishpond, Makalapa Crater	McAllister (1933:102)	Lake within crater
McAllister Site 102 / 50-80-13-00102	Fishponds, Loko Kunana and Loko Muliwai	McAllister (1933:102)	Loko Kunana: Kuahua Island forms one side, walls from shore to island are 1,800 ft and 1,950 ft long, approx. 5 ft wide and 3 ft high Loko Muliwai: wall 500 ft long with one *mākāhā*

SIHP #	Type	Reference	Comments
McAllister Site 104 / 50-80-13-00104	Fishpond, Loko Kahakupono	McAllister (1933:102)	Small pond of 3 acres with semicircular wall of evenly spaced basalt 1,050 ft long, 5 ft wide, 3.5 ft high, without outlet gates (*mākāhā*); name also spelled “Kahakapohaku” and “Kakupohaku”
50-80-13-01356	USS Bowfin (SS-287)	NRHP	Submarine used during World War II at Pearl Harbor
50-80-13-01384	Commander-in-Chief of the Pacific Fleet (CINCPAC FLT) Headquarters	NRHP	Constructed in 1942, commemorates Admiral Chester W. Nimitz, Commander in Chief, Pacific Fleet from 1941 through December 1944
50-80-13-09992	Pearl Harbor Naval Base National Historic Landmark District	NRHP	Modifications to the area for the development of the naval base began in 1902; significance assessment based on the base’s role in the rise of the United States naval power in the Pacific; historic district encompasses many buildings and structures present on naval base lands
Historic Cemetery	‘Aiea Cemetery	Sroat et al. 2012	Approximately 1.5 acres, established by Honolulu Plantation Co. ca. 1900 and owned by State of Hawai‘i; last burials took place in the late 1940s; groundskeeping still maintained by the state

Loko Paaiau was located 1 km northwest of the project area on the coast.

> **Site 109. Loko Opu, fishpond at Kalauao.**
>
> Has not been completely filled in. It was 10.5 acres in size and apparently completely surrounded by a wall 2700 feet in extent. It was built by Kalaimanuia. [McAllister 1933:103]

Loko Opu was located approximately 1.1 km northwest of the project area on the coast.

3.2.2 Recent Archaeological Research in the Vicinity of the Project Area

3.2.2.1 Cluff 1970

Deborah Cluff (1970) of the DLNR reported on an archaeological survey for the proposed Hālawa Interchange with the H-1 Freeway. The archaeological survey arose from concerns of community members who described numerous graves within the area, including family graves. As the majority of the area encompassed previous cane field lands, the survey concentrated along the immediate vicinity of the southeast side of a road called out as “Saratoga Drive” (see Figure 36 for the Cluff 1970 survey area and SIHP # 50-80-09-05306 feature location map; Figure 34 to see how the Cluff project location relates to the present project area; and Figure 35 to see how the designated historic property SIHP # -05306 relates to the project area).

Eight historic properties were identified, including historic grave structures and one stone house platform. Residents of the area also noted a *heiau* was known to have been in the vicinity. Cluff identified a possible *heiau* structure (Designated Feature 1) and conducted subsurface excavations; however, the function of the structure remained indeterminate. Feature 2 was “a composite of several historic remains” (Cluff 1970:16) including a concrete slab overlying a stone paving, understood as a former road used as a plantation worker’s house platform. Feature 3 was a stone wall in two sections. Feature 4 was comprised of three irregular stone mounds posted as a former grave. Feature 5 was a concrete enclosure posited as a possible burial. Feature 6 was “a burial plot belonging to a family presently [1970] living nearby” (Cluff 1970:19). Feature 7 was “a family burial plot belonging to the family occupying the adjacent house—the same owners of Feature 6” (Cluff 1970:19). Hence four of the seven designated features of SIHP # -05306 were posited to be burials. Six tombstones from within SIHP # -05306 Feature 7 are depicted in the Cluff study (see present Figure 37). Five of the death dates are between 1934 and 1940 and one is significantly earlier (1906). Four of the burials appear to have been Hawaiian and two to have been Portuguese. The death dates and the two Portuguese names fit the understanding that the houses on the south side of the designated “Saratoga Drive” that were the focus of Cluff’s study, and that continued into the east side of the large stadium parcel, relate to an “independent homestead program” of the Honolulu Plantation Company. The graves designated as SIHP # -05306 were only about 80 m east of the present project area (see Figure 35, Figure 36, and Figure 37).

3.2.2.2 Yent and Ota 1981

DLNR Division of State Parks (Yent and Ota 1981) examined an approximately 31-acre area around the margins of ‘Aiea (“Rainbow”) Bay extending from the (then) Ford Island ferry to the tip of McGrew Point for the proposed Rainbow Bay State Park project. They noted the prior presence of Kahakupōhaku fishpond (McAllister Site 104) that was filled in and developed for a Navy firefighting school. It was noted that “The three areas under investigation underwent

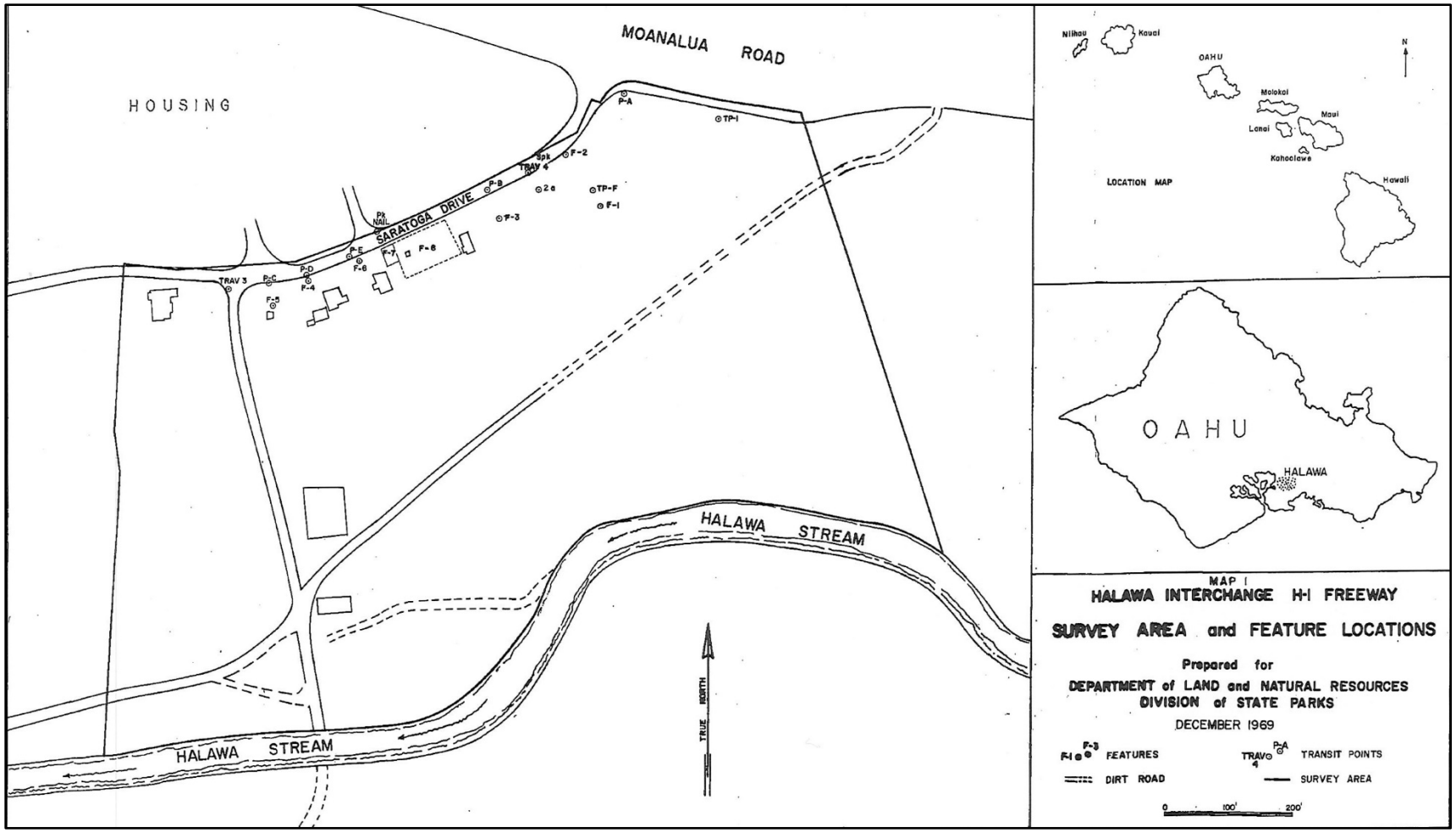

Figure 36. Survey area and SIHP # 50-80-09-05306 feature location map from Cluff (1970:22) (the large NASED development area is immediately to the west [left] side)

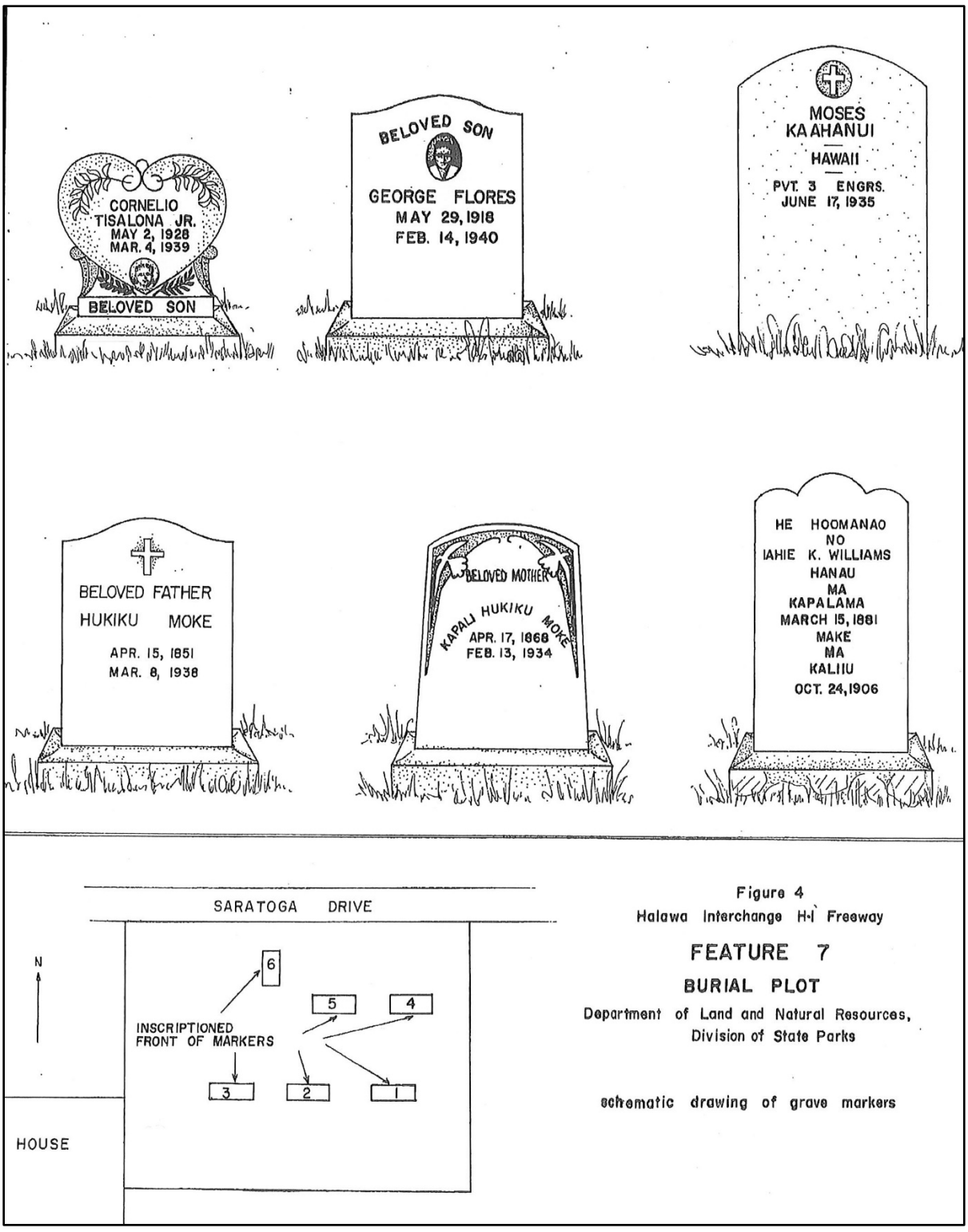

Figure 37. Tombstones of SIHP # 50-80-09-05306 Feature 7 (from Cluff 1970:22); five of the death dates are between 1934 and 1940 and one is significantly earlier (1906); four surnames are Hawaiian in origin and two are likely Portuguese

intensive modification by the Navy prior to and during World War II" (Yent and Ota 1981:12). The field survey noted the presence of abandoned piers, pilings, trash, and the Landing Ship Tank (LST) site at the tip of McGrew Point. The study did indicate the likely presence of subsurface cultural deposits associated with pre-Contact land use, specifically associated with aquaculture (i.e., fishponds). However, no historic properties were identified during the survey.

3.2.2.3 Sinoto 1986

In 1986, Aki Sinoto, then of the Bernice Pauahi Bishop Museum Department of Anthropology conducted an archaeological surface survey for a proposed Pearl Promenade development at the mouth of Kalauao Stream and a portion of the former Loko Opu (McAllister Site 109; SIHP # 50-80-09-0109). It was noted that the fishpond was filled sometime prior to 1928. This infilling changed the topography of the land near Kalauao Stream into marshlands with areas of fill, previous drainage alignments, and dike construction. No historic properties were identified during the surface survey, and modern disturbance such as bulldozer push piles and modern trash were observed.

3.2.2.4 Davis 1990

The International Archaeological Research Institute, Inc. (IARII) (Davis 1990) reported on an archaeological literature review and field inspection of proposed developments at the U.S. Naval Base, Pearl Harbor that focused on a proposed terminus for a Ford Island causeway (that became the terminus for the Admiral Carey Bridge to Ford Island) and the southeast side of Ford Island. No historic properties were identified by the study.

3.2.2.5 Avery et al. 1994

Archaeological Consultants of Hawaii, Inc. (Avery et al. 1994) produced a study entitled *Paleoenvironmental Reconstruction Adjacent to the Mouth of Halawa Stream: Monitoring Report of the Waiau-Makalapa No. 2 138 kV Overhead Lines (Phase II).* A series of 26 bore holes of varying depth were completed along the *makai* portion of Kamehameha Highway extending approximately 800 m. No historic properties were encountered during the subsurface excavations of the bore holes, and most of the stratigraphy was culturally sterile. The northernmost five boreholes, P29 to P33, were in the vicinity of the present project area. For reasons that are not clear, "No information" was available for the two bore holes (Bore Hole 29 and Bore Hole 30) closest to Aloha Stadium (Avery et al. 1994:25). The results for the next closest three bore holes are described briefly below.

Bore Hole 31, located just south of the intersection of Salt Lake Boulevard and Kamehameha Highway, had a loam matrix with basalt rocks, angular gravel, and sub-rounded cobbles from the surface to a depth of 1.8 m below surface (mbs) and is referred to as a historic fill layer. From 1.8 mbs to 2.1 mbs was a clay loam layer and from 2.1 m to 3.3 m was a silty clay loam layer.

Bore Hole 32, located across Kamehameha Highway from the middle of the TMK: (1) 9-9-003:071 parcel, had the same loam matrix with basalt rocks, angular gravel, and sub-rounded cobbles from the surface to a depth of 2.1 mbs and is referred to as a historic fill layer. Tuff bedrock was encountered at 2.1 mbs.

Bore Hole 33, located west of the south end of TMK: (1) 9-9-003:071, had the same loam matrix with basalt rocks, angular gravel, and sub-rounded cobbles from the surface to a depth of 2.4 mbs and is referred to as a historic fill layer. Tuff bedrock was encountered at 2.4 mbs.

The study explains that the upper layer in the stratigraphic column was historic fill (Layer I). This anthropomorphic deposit is of little interest (Avery et al. 1994:35).

Pollen analysis from Avery et al. (1994) allowed for a recreation of the native ecosystem for the area at Bore Hole 39, located a kilometer southwest of the Stadium. According to the report, “The assemblage was dominated by *loulu* (*Pritchardia* sp.) pollen” (Avery et al. 1994:50). The report concluded with the following:

> Layer II, pollen zone B, represented a landscape significantly altered by human settlement inland. Pollen zone B reflected the vegetation communities which became established after more intensive use of the land in the lowland portion of Halawa watershed. The shell sample which dated to AD 890-1294 from this layer was collected near the base of this sediment. The land use changes inferred from the pollen record were most likely more recent than this date. [Avery et al. 1994:51]

3.2.2.6 Hammatt and Winieski 1994

In 1994, CSH conducted a reconnaissance survey for a proposed Hālawa Well just southeast of the Aloha Stadium (Hammatt and Winieski 1994). No historic properties were identified, and the study noted all evidence of earlier activity was likely eradicated by commercial sugarcane cultivation.

3.2.2.7 Napoka 1994

Nathan Napoka (1994) of the SHPD prepared a *Determination of Historic Significance of Pōhaku O Ki‘i State Site No. 50-80-09-489: A Traditional Cultural Property of Nalopaka Place, Aiea*. Napoka relates a legend, told to him by hula instructor John Kaimikaua, of a commoner named Ki‘i who loved a beautiful woman of chiefly rank and was given a task to make a *lei* of rare white lehua blossoms. He failed to return in the allotted time and was turned to stone. The story is associated with a boulder located near the ‘Aiea Post Office.

3.2.2.8 Williams 1994

Ogden Environmental and Energy Services, Inc. completed an end-of-fieldwork report (Williams 1993) and a final report (Williams 1994) on coring results of Kunana and Wailolowai ponds on the Pearl Harbor Naval Base. The cores in Wailolowai Pond were too shallow to expose fishpond sediments, and only one core in the Kunana Fishpond area indicated fishpond sediments. Pollen and radiocarbon analysis of the Wailolowai Pond core indicated the pond was constructed sometime between AD 1200 and 1400. Seven sediment layers were analyzed using a Bayesian statistical approach to the integration of archaeological models and radiocarbon dates. The pollen data indicated contrasting indications of healthy or poor maintenance of the pond over time.

3.2.2.9 Erkelens 1995

Erkelens (1995) of IARII completed an archaeological study of the proposed Ford Island Golf Park and Saratoga Boulevard relocation for the Ford Island Bridge project. This was considered an addendum report for the Davis (1990) report on the Ford Island Causeway. Eight test

excavations were completed for the study, documenting six stratigraphic layers. Layer VI consists of the coral reef over basalt bedrock, while Layer V consists of a terrigenous sediment, the result of the slow silting of the Pearl Harbor Basin. Layer IV represented a redeposition of marine material, possibly during a time of a short-term rise in sea level or a catastrophic storm. Terrigenous sediments were again found in Layers I and II, during the infilling of the basin. Layer I was formed when the island was exposed above the water level. No historic properties were identified, and no artifacts were collected from the test excavations.

3.2.2.10 Dye 1999

IARII completed a literature search for the Hālawa Bridge replacement project (Dye 1999), which is near the former location of Kunana Pond. The archaeologists also conducted a pedestrian survey of the banks of the Hālawa Stream near the bridge. No historic properties were identified. Marine shell could be seen in the deposits, but Dye attributed the shell to tidal deposits rather than to cultural deposits.

3.2.2.11 Athens et al. 2000

In 2000, IARII conducted coring projects for 21 Pearl Harbor fishponds (Athens et al. 2000), including Loko Kunana and Loko Muliwai (collectively SIHP # 50-80-13-00102) a kilometer southwest of the NASED development area, Loko Kahakupōhaku immediately to the west, and Loko Paaiau, a kilometer northwest.

It was concluded that Loko Muliwai, the more inland portion of the double fishpond designated by McAllister as site 102, likely dates to AD 1540–1791 (Athens et al. 2000:25). Unfortunately, no field investigations were conducted at the fishpond closest to the present project, Loko Kahakupōhaku. “Due to possible hazardous waste contamination of the overlying fill” (Athens et al. 2000:31). A photo caption notes, “The lawn entirely covers the fishpond. Hazardous material is said to be in the fill” (Athens et al. 2000:32).

The study noted that Loko Paaiau:

> […] is one of the few in the Pearl Harbor area that is not covered by fill. There is about 1 m of standing water in the pond. The outer pond wall, except for its northeast section, appears mostly intact although overgrown with mangroves. [Athens et al. 2000:31]

The dating for this fishpond was problematic and the reason for error was unknown (Athens et al. 2000:42).

3.2.2.12 Cochrane and Athens 2000

IARII (Cochrane and Athens 2000) conducted archaeological monitoring for bilge and oily wastewater collection facilities near Magazine Loch, approximately 700 m southwest of the Halawa View Apartments II property. Limited trenching was undertaken in proximity to the former Loko Kunana fishpond (SIHP # 50-80-13-00102). Trenching did not exceed the depth of fill material, which extended to the base of excavation at 1.8 mbs.

3.2.2.13 Hunkin and Hammatt 2008

CSH (Hunkin and Hammatt 2008) conducted archaeological monitoring for the Target/ Bougainville redevelopment project at 4380 Lawehana Street. No archaeological deposits or historic properties were identified.

3.2.2.14 Altizer et al. 2009

CSH (Altizer et al. 2009) prepared a literature review and field inspection report for an ‘Aiea Intermediate School erosion control project (TMK: [1] 9-9-005:001). The study addressed the 30.8-acre campus including an eroded 150-ft portion of the ‘Aiea Stream corridor. No historic properties were observed and no further archaeological work was recommended for the proposed project.

3.2.2.15 Hammatt et al. 2013

CSH (Hammatt et al. 2013) conducted an AIS for the Airport Section (Construction Section 3) of the Honolulu High-Capacity Transit Corridor Project. Two historic properties were identified, both at least 3 km south and southeast of the present project area including sections of buried asphalt roadway likely associated with an early alignment of Kamehameha Highway, or possibly another unidentified mid-twentieth century road (SIHP # 50-80-13-07420) and buried concrete slabs, a prepared coral pavement, and underlying base course identified as probable remnants of warehouses and/or other infrastructure erected by the military in 1942–1943 (SIHP # 50-80-13-07421).

3.2.2.16 Murabayashi et al. 2013

T.S. Dye & Colleagues, Archaeologists, Inc. (Murabayashi et al. 2013) completed a literature review and field inspection for a proposed VZW HON Red Hill Telecommunications Facility at 99-611 Ulune Street in Hālawa. No historic properties were identified, and the study concluded the area has been heavily modified by urban development and the installation of the existing telecommunications facility, suggesting it is very unlikely there are any remaining subsurface cultural deposits.

3.2.3 Previous Archaeological Work in the Project Area

3.2.3.1 Barrera 1971

William Barrera (1971) of the Bernice Pauahi Bishop Museum Anthropology Department conducted an archaeological survey in South Hālawa Valley for the proposed Honolulu Stadium. His letter report dated 30 April 1971 basically consists of three paragraphs with no figures, photographs, tables, or references (Figure 38). There were no historic properties identified.

Barrera concluded any sites that may have been present at one time have been destroyed by housing areas, truck farming areas, or cane fields. Independent conversations with three local informants revealed that those areas not now covered by houses or farm plots were once extensively planted in cane:

> These same informants stated knowledge of recent burial areas in the vicinity of the houses along Saratoga Drive. Many of these graves are unmarked, and their locations only generally known. Construction foremen should be advised to inform the State Health Department if any human remains are uncovered during

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To Mufet J.	From Toni H.
Co. DLNR	Co. Bishop M.
Dept. Hist. Sites	Phone # 848-4190
Fax # 587-0018	Fax # 842-1914

PROJECT 48

April 30, 1971

Dr. T. Stell Newman, Archaeologist
Department of Land and Natural Resources
State Parks Division
465 South King Street
Honolulu, Hawaii 96813

Dear Dr. Newman:

On April 29, 1971, Bishop Museum conducted an archaeological site survey of the proposed Honolulu Stadium site at Halawa. No archaeological sites were found.

Any sites that may have been present at one time have been destroyed by housing areas, truck farming areas, or canefields. Independent conversations with three local informants revealed that those areas not now covered by houses or farm plots were once extensively planted in cane.

These same informants stated knowledge of recent burial areas in the vicinity of the houses along Saratoga Drive. Many of these graves are unmarked, and their locations only generally known. Construction foremen should be advised to inform the State Health Department if any human remains are uncovered during construction activities. As for the marked graves, the people now living along Saratoga Drive should be consulted, as most, if not all, of these burials contain known relatives of these residents. The proper Health Department personnel should be contacted, and the bones relocated as soon as possible before construction is started.

The cost of the project was $93.20.

Sincerely yours,

William Barrera, Jr.
Field Director in Anthropology

WB/pb

Figure 38. Barrera (1971) Archaeological Site Survey of the proposed Honolulu Stadium site at Halawa, O'ahu

> construction activities. As for the marked graves, the people now living along Saratoga Drive should be consulted, as most, if not all, of these burials contain known relatives of these residents. The proper Health Department personnel should be contacted, and the bones relocated as soon as possible, before construction is started. [Barrera 1971:1]

3.2.3.2 Sroat et al. 2012

CSH (Sroat et al. 2012) conducted an AIS for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor project that extended along Kamehameha Highway on the *makai* (west) side of the stadium parcel (TMK: [1] 9-9-003:061) and included the entirety of TMK: (1) 9-9-003:071 (proposed as the Aloha Stadium Station and a “Park and Ride” lot for the transit project).

Two test excavations (E24 and E25) were conducted along Kamehameha Highway approximately 100 m northwest of the Aloha Stadium parcel and three test excavations (AS1, AS2, and AS3) were conducted within the Aloha Stadium Station and surrounding Park and Ride Facility (Appendix B). The closest historic property identified in the Sroat et al. (2012) study was SIHP # 50-80-09-07150 (buried *lo‘i* or irrigated pond-field deposits) approximately 2.5 km to the northwest.

3.3 Background Summary and Predictive Model

The NASED development area is near the perennial Hālawa Stream (which extends through the southern third of the large stadium parcel) and extend to within 200 m of the ‘Aiea Bay portion of the East Loch of Pearl Harbor. While no historic properties have been previously identified within the project area, McAllister (1933) designated three fishponds as historic properties within 500 m of the project area. In fact, there appear to have been at least six other small fishponds along the immediate stretch of Hālawa Stream, however, these have not been previously designated as historic properties. The relatively high density of fishponds in the vicinity testifies to the abundance of marine and stream resources on the margins of Pearl Harbor.

Our earliest map (1817 Kotzebue map; see Figure 10), while lacking cartographic precision, clearly conveys that the margins of Hālawa Stream were well-settled and that areas of ponded field taro agriculture irrigated from Hālawa Stream were extensive. More detailed plotting of LCAs ca. 1848 (see Figure 11 and Figure 12) indicate there were approximately ten claimed parcels in the larger NASED development area near Hālawa Stream. While most of these were for ponded field taro agriculture, a large rectangular lot (LCA 2156:3 to Opunui) in the southwest portion of the stadium parcel was a house (*pāhale*) lot. The pattern of LCAs in this area is indicative of a general pattern of agriculture and residence extending back in time for centuries. We cannot rule out that traces of agricultural features such as *‘auwai* and field walls would still be present; the vicinity of the indicated habitation parcel is suggested to have an elevated prospect of cultural deposits relating to the pre-Contact and early post-Contact periods as well as a heightened prospect for intact burials and/or previously disturbed human skeletal remains. Remnants of the Wai Kuohoi and Wai Kai fishponds, such as fishpond walls, may also be present at those indicated locations (see Figure 11).

In the late 1800s much of the area near Hālawa Stream (particularly in the southern portion of the large stadium parcel) was developed for rice production largely by Chinese immigrants (see Figure 13 and Figure 15). While this rice production may have disturbed any record of prior

Hawaiian activity, it may also have left archaeological traces of that cultivation and immigrant life.

The project area was surrounded by Honolulu Plantation Company sugarcane fields from approximately 1900 to World War II (see Figure 25) with portions of the project area continuing sugarcane agriculture into the 1950s (see Figure 27). The Honolulu Plantation Company also had significant infrastructure in the project area in the form of roads, railroads, and housing developments that may have left archaeological evidence.

Klieger indicates two of the LCA parcels (LCA 2156:1 and LCA 2156:2) within the large stadium parcel previously belonging to Opunui became part of the Halawa Camp of the Honolulu Plantation Company ("Honolulu Plant Co"; see Figure 11). While not completely clear, these appear to have been areas where the Honolulu Plantation Company established an independent homestead program in 1902, "whereby individual laborers could receive personal use of land on company property in exchange for their continued employment commitment" (Klieger 1995:82).

It is understood that many of the Honolulu Plantation Company resident workers were from the Azores, Madeira, or Puerto Rico (Klieger 1995:82). A 1919 U.S. Army map (see Figure 20) suggests quite a number of plantation worker households were established along Hālawa Stream in the project area and also along a roughly parallel road to the north in this 1898-1919 period. An indicated 16–18 plantation homes are also prominent as of 1933 (see Figure 22), and many appear to be still present while others appear to be gone as of 1943 (see Figure 26). Some of these families may have lived their lives in the project area for 40 years.

There are indications of two burial areas near the NASED development area associated with the Honolulu Plantation Company. The first, a neighboring large ‘Aiea Cemetery, dating back possibly as far as 1901 and associated with 3,000 burials, appears to have always been defined and is not anticipated to extend into the NASED development area. The other area is a row of burials that looks to be associated with LCA lots.

Deborah Cluff (1970) of the DLNR reported on an archaeological survey for the proposed Hālawa Interchange with the H-1 Freeway that arose from concerns of community members who described numerous graves within the area, including family graves. Historic grave structures were identified with a grave function attributed to four of the seven designated features (Features 4 through 7; see Figure 36 and Figure 37). The graves designated as SIHP # -05306 were only about 80 m east of the present project area (see Figure 35).

To the east of the current project area, Cluff (1970) documented graves sites (see Figure 35), extending along the southeast side of a road she knew as "Saratoga Drive"—the road extending southwest from Moanalua Road—as seen on a 1919 map (Figure 39). These maps indicate the grave sites were associated with a row of houses on the east side of the large stadium parcel. They were located about 250 m north of where Hālawa Stream intersects the east side of the parcel. The east half of this row of houses was east (outside) of the large stadium parcel but the west half of this row of houses extended well into the large stadium parcel (see Figure 39). A similar posited "independent homestead program" housing development of the Honolulu Plantation Company on the south side of Hālawa Stream within the east portion of the NASED development area is also depicted on the 1919 map (see Figure 20 and Figure 39), a 1935 map (see Figure 24), and a 1939 aerial photo (see Figure 25). Whether these similar plantation housing areas within the large stadium parcel are associated with similar burial customs as documented by Cluff (1970) remains

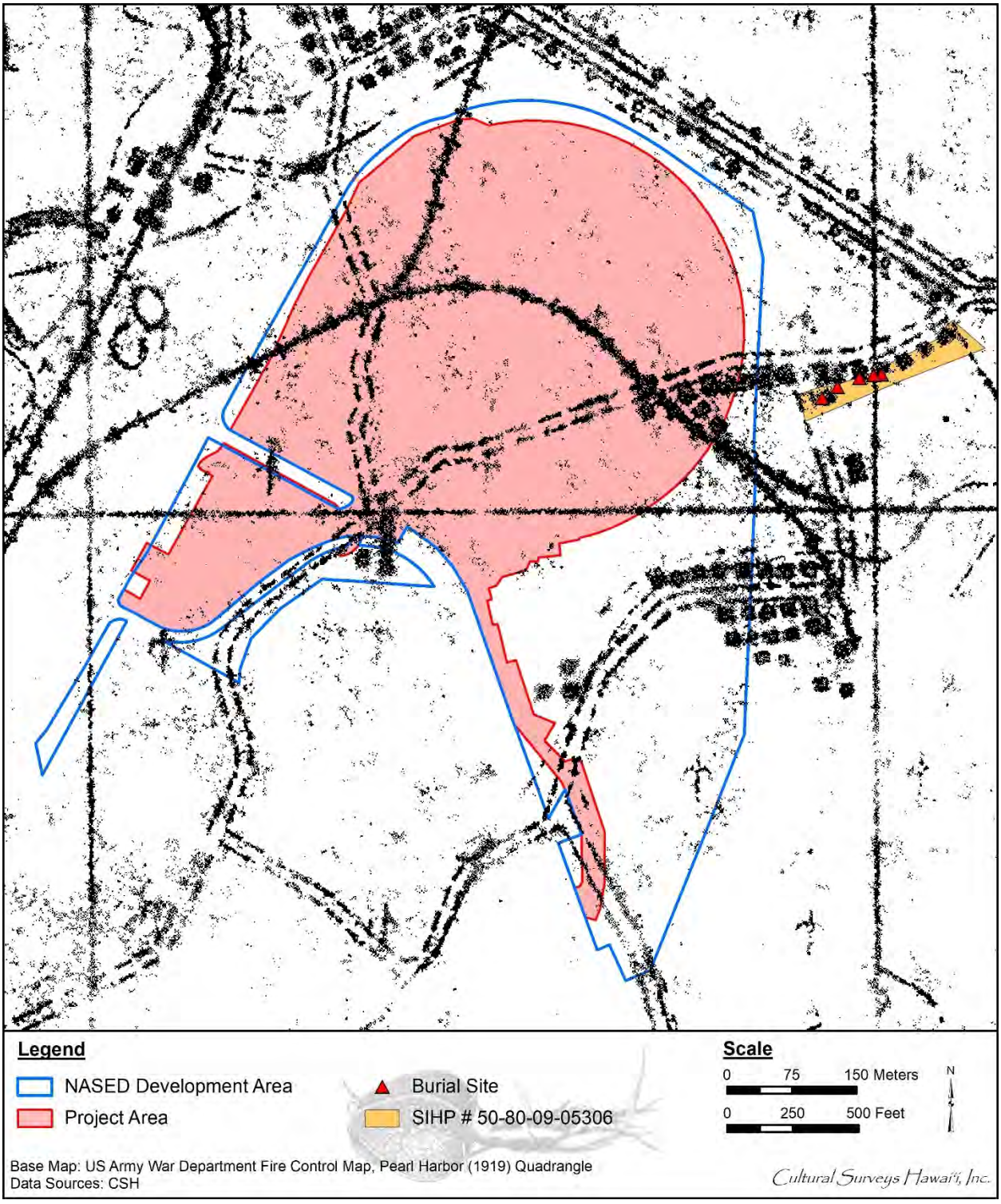


Figure 39. Close-up of a portion of the 1919 U.S. Army War Department fire control map, Pearl Harbor quadrangle showing plantation homes within the project area and NASED development area, with a superimposition of the Cluff (1970) designated historic property with seven features (SIHP # -05306 including four burial features)

uncertain. There could be foundations or remnants of these plantation homes and associated features (privies, trash pits, burials) within the indicated areas of former plantation housing in the large stadium parcel. The prior archaeological study for the present stadium parcel noted, “These same [indicated as three, local] informants stated knowledge of recent burial areas in the vicinity of the houses along Saratoga Drive. Many of these graves are unmarked, and their locations only generally known” (Barrera Jr. 1971:1).

The 1943 Aiea U.S. Army War Department terrain map (see Figure 7) shows extensive military use of the area during World War II. A portion of the test excavations were located to test for subsurface historic properties as may have been related to the World War II use (see Table 1 and Figure 7).

Based on the background research, it is possible that traditional, historical, and agricultural sites may be present in the current AIS project area and in the NASED development area overall. Due to major ground disturbance over the years from agriculture and development there is also a chance that the previous land use and sites have been removed or destroyed.

Section 4 Results of Fieldwork

CSH completed the fieldwork component of this AIS under archaeological fieldwork permit numbers 19-07 and 21-10, issued by the SHPD pursuant to HAR §13-282. Pedestrian inspection was conducted between 20 and 21 May and 5 October 2019 by Alexandra Coyle, B.A., Brittany Enanoria, B.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett H. Hammatt., Ph.D. This work required approximately 2.5 person-days to complete. The AIS fieldwork was conducted between 12 and 21 July 2021 by CSH archaeologists Abundanzia Delavega, B.A., Alexandra Coyle, B.A., Allison Hummel, M.Sc., Rachel Williamson, B.A., Scott Belluomini, B.A., Sloane Agruss, M.A., and Tyler Turran, B.A., under the general supervision of Principal Investigator Hallett H. Hammatt, Ph.D. This work required approximately 21 person-days to complete.

4.1 Pedestrian Inspection Results

The field inspection consisted of 100% pedestrian inspection, with the exception of building and structure interiors, and the results were detailed in the project LRFI report (Turran et al. 2020). The NASED development area consisted of the four discrete, neighboring parcels, divided by legs of Salt Lake Boulevard for a total area of approximately 98.32 acres (39.79 hectares) and includes the current Aloha Stadium development, associated parking lots, a portion of the Hālawa Stream, and the HRTP Hālawa Station.

No evidence of traditional Hawaiian occupation or potential historic properties was observed during the field inspection. All structures and infrastructure present within the NASED development area appear to be associated with the Aloha Stadium and the current construction of the HRTP Hālawa Station.

The northeastern portion of the NASED development area (TMK: [1] 9-9-003:061) is composed of Aloha Stadium and associated asphalt-paved parking lots. The area appears to have been almost entirely, if not entirely, graded and transformed during the development of the Aloha Stadium (see Figure 31 through Figure 33). Generally, the asphalt parking lot areas are flat in the south and the parking areas surrounding Aloha Stadium contain mild sloping with landscaped areas between parking sections (Figure 40 through Figure 43). The landscaping consists of monkey pod trees (*Albizia* sp.), bougainvillea (*Bougainvillea* sp.), white spider lily (Amaryllidaceae), *ti* varieties (*Cordyline terminalis)*, coconut palm trees (*Cocos nucifera)*, decorative palm trees (Arecaceae), and eucalyptus trees (*Eucalyptus* sp.). The southern portion of the Aloha Stadium parking lot contains a portion of the Hālawa Stream running east/west (Figure 44 and Figure 45). The Hālawa Stream is composed of a concrete canal with three concrete overpass bridges for vehicular and pedestrian access. The front entrance of Aloha Stadium contains a monument (Figure 46) and a statue (Figure 47), both of which have plaques dating to the 1980s (Figure 48 and Figure 49).

The northwestern portion of the NASED development area (TMK: [1] 9-9-003:071) contains a mixture of a Kiewit construction base yard and ongoing construction activities related to the HRTP Hālawa Station (Figure 50). Any evidence of buildings or parking lots in the area has been demolished and removed. The area appears to have been completely graded and transformed during current construction activities. No potential historic properties were identified in this area.

Figure 40. Overview of the property with Aloha Stadium in the background, view to northwest

Figure 41. Overview of the south end of the Aloha Stadium parking lot, view to southeast

Figure 42. Overview of the west corner of the parking lot with the HRTP rail line; view to north

Figure 43. Overview of the east portion of the Aloha Stadium parking lot; view to east

Figure 44. Overview of the portion of the Hālawa Stream that is in the NASED development area; view to north

Figure 45. Overview of the portion of the Hālawa Stream that is in the NASED development area; view to southwest

Figure 46. Monument at front entrance of the Aloha Stadium; view to east

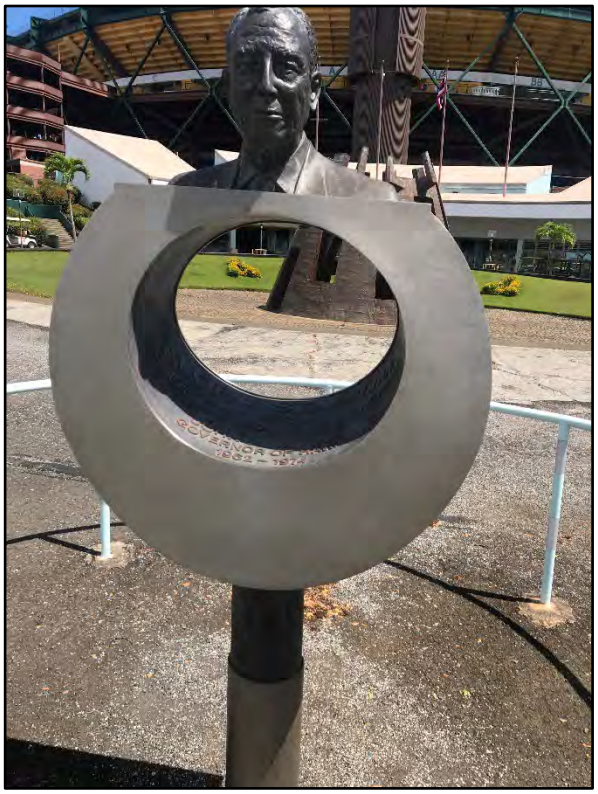


Figure 47. Statue on display at the front entrance of Aloha Stadium; view to northwest

Figure 48. Close-up of a plaque on the monument fronting Aloha Stadium with 1980 date; view to northeast

Figure 49. Close-up of a metal plaque on the statue with a date of 1981; view to northwest

Figure 50. Northwestern portion of the NASED development area showing construction activities for the HRTP Hālawa Station; view to southwest

The southern portion of the NASED development area (TMK: [1] 9-9-003:035) contains an irregular-shaped area that appears of have been graded for the development of Aloha Stadium and surrounding residential areas. The eastern portion is being utilized as a Kiewit construction mobile office and small asphalt-paved parking lot (Figure 51). The western portion contains an open grassy area with various grasses and shrubs. The area contains a swale with a few associated manholes (Figure 52). The northwestern portion of the area contains the edge of the sidewalk off a portion of Salt Lake Boulevard and has a steep slope extending into the swale. The southern border is fenced off by residential homes. No potential historic properties were identified in this area.

The southwestern portion of the NASED development area (TMK: [1] 9-9-003:070) encompasses a thin strip beneath the newly constructed HRTP rail line. The majority of the area is fenced off and contains ongoing construction activities related to the HRTP Hālawa rail line (Figure 53). The area appears to have been completely graded for construction activities and contains new utilities and sidewalks for the HRTP rail line. No potential historic properties were observed in this area.

FAI conducted an architectural RLS for the Aloha Stadium. The study noted that the Aloha Stadium structure will be over 50 years of age in 2025, as well as several surrounding structures including the Halawa Stream bridges, parking attendant booths, parking lot landscaping, and the Lower Halawa Lot garage. The study evaluated Aloha Stadium as eligible for listing on the HRHP and the NRHP. The accessory features were evaluated as not significant or eligible for listing on the HRHP or NRHP. The Aloha Stadium has been designated SIHP # 50-80-13-10114.

4.2 **Subsurface Testing Results**

The subsurface testing program included 21 backhoe-assisted test excavations (T-1 through T-21) (Figure 54). The findings of each test excavation are described below.

The base of excavation was determined either by excavating through sterile natural material, or by reaching 2.0 m (6 ft) in depth, unless otherwise dictated by an encountered utility, as in T-9. When utilities or subsurface structural elements were encountered, they were kept in place and the excavation was adjusted as necessary.

The stratigraphy within the current AIS project area consists of the current asphalt parking lot surface and basalt base course, overlying various deposits of terrigenous fill, and a natural deposit of silty clay, clay, and clay loam.

Stratigraphic designations within the project area were assigned using Roman numerals (e.g., Strata I, II, III, IV), with substrata designated using an alphabetic system (e.g., Strata Ia, Ib, Ic). Due to the overall consistency of the stratigraphic sequence within the project area, the various fill deposits are designated as Stratum I deposits. Former land surfaces and natural deposits encountered were designated as Stratum II.

The fill deposits represented by Stratum I include asphalt, basalt gravel base course, and various layers of fill material that likely functioned to raise and level the ground surface in association with the development of the Aloha Stadium. In general, these deposits were culturally sterile. A few glass fragments and one saw-cut faunal osseous fragment were collected from the fill deposits

Figure 51. Southern portion of the NASED development area showing current Kiewit construction mobile office and parking lot; view to northwest

Figure 52. Southern portion of the NASED development area showing swale, residential areas to the left, and a portion of Salt Lake Boulevard to the right; view to southwest

Figure 53. Southwestern portion of the NASED development area showing ongoing construction activities of the HRTC Hālawa rail line; view to southwest

Figure 54. Google Earth Aerial Imagery (2017) depicting the NASED development area and the first proposed project area with locations of AIS test excavations (T-1 through T-21)

within three trenches (T-13, T-19, and T-21). Fragmentary materials, including metal, glass, and brick, were also identified in fill deposits in T-13 and T-17, which were photographed in the field rather than collected. Artifacts photographed in the field are depicted in Sections 4.2.13 and 4.2.15.

Natural deposits were designated Stratum II. The natural layers consisted of silty clay, clay, and clay loam. In some of the test excavations oxidized and decomposing basalt was observed in the naturally deposited soil.

The TMK: (1) 9-9-003:071 and 070 parcels have been addressed in a prior AIS (Sroat et al. 2012) accepted by the SHPD (see Appendix B) and no additional subsurface testing work is warranted in those parcels. The applicable test excavations will be summarized in this section.

The vicinity of the former LCAs and the margins of Hālawa Stream that extend into the NASED development area were targeted during subsurface testing. This is due to burials documented in LCAs near the NASED development area and a heightened probability of subsurface historic properties in these areas. No evidence of traditional Hawaiian occupation or potential historic properties was observed during subsurface testing. The entire project area has been greatly modified by agriculture followed by development of the stadium and other urban infrastructure. Due to the impact of the Aloha Stadium development, minimal evidence of former land use was observed.

4.2.1 Test Excavation 1 (T-1)

T-1 is on the west side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-1 was chosen to target an area of World War II infrastructure and for geographic representation. T-1 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.5 mbs and is oriented east/west.

The stratigraphy observed in T-1 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly silty clay fill (Stratum Ic), extremely gravelly silty loam fill (Stratum Id), and gravelly clay loam (Stratum II) (Figure 55 through Figure 58, and Table 5). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a fill layer associated with the development of Aloha Stadium and contains a utility line. Stratum Id is a fill layer used for grading and leveling the area. Stratum II is a naturally deposited clay loam and was encountered at 0.68 mbs. No cultural material or historic properties were identified.

A utility line was encountered 0.6 mbs in the middle of T-1 extending perpendicular to the trench (Figure 59 and Figure 60). The utility line was a concrete drain line, 3.0 m from the east end of the trench, measuring 0.34 m in diameter.

4.2.2 Test Excavation 2 (T-2)

T-2 is on the west side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-2 was chosen to target an area of World War II infrastructure and for geographic representation. T-2 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.82 mbs and is oriented northwest/southeast.

The stratigraphy observed in T-2 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and clay (Stratum II) (Figure 61 through Figure 64, and Table 6). Strata Ia and Ib are asphalt and base course associated with

Figure 55. T-1 north sidewall; view to east

Figure 56. T-1 south sidewall; view to west

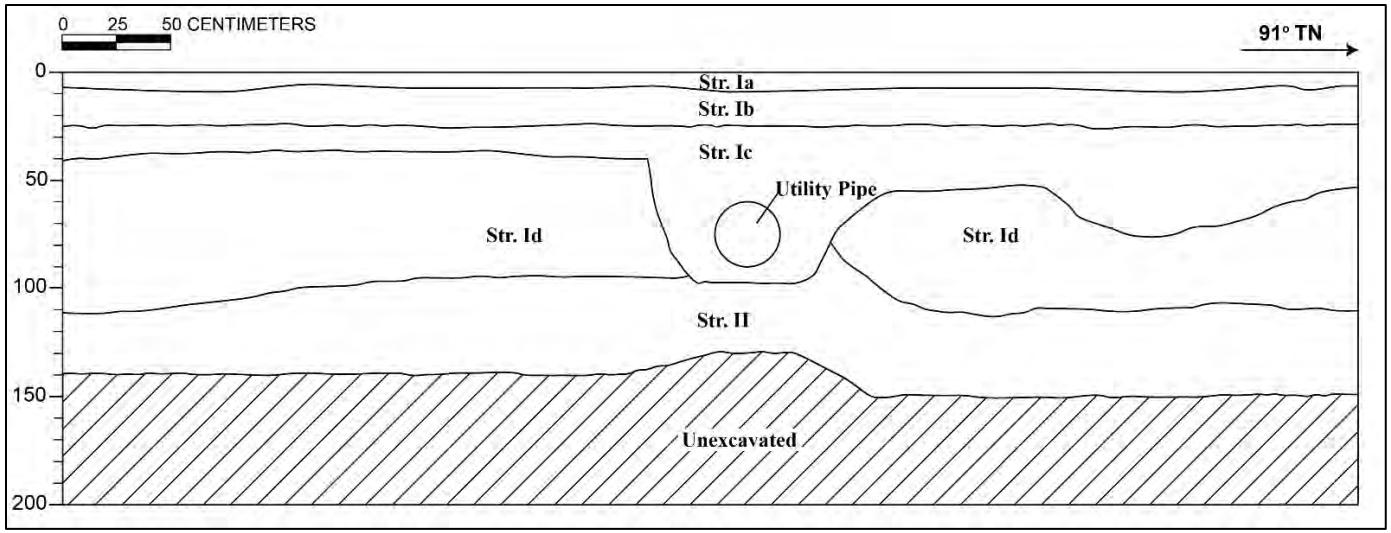


Figure 57. T-1 north sidewall profile

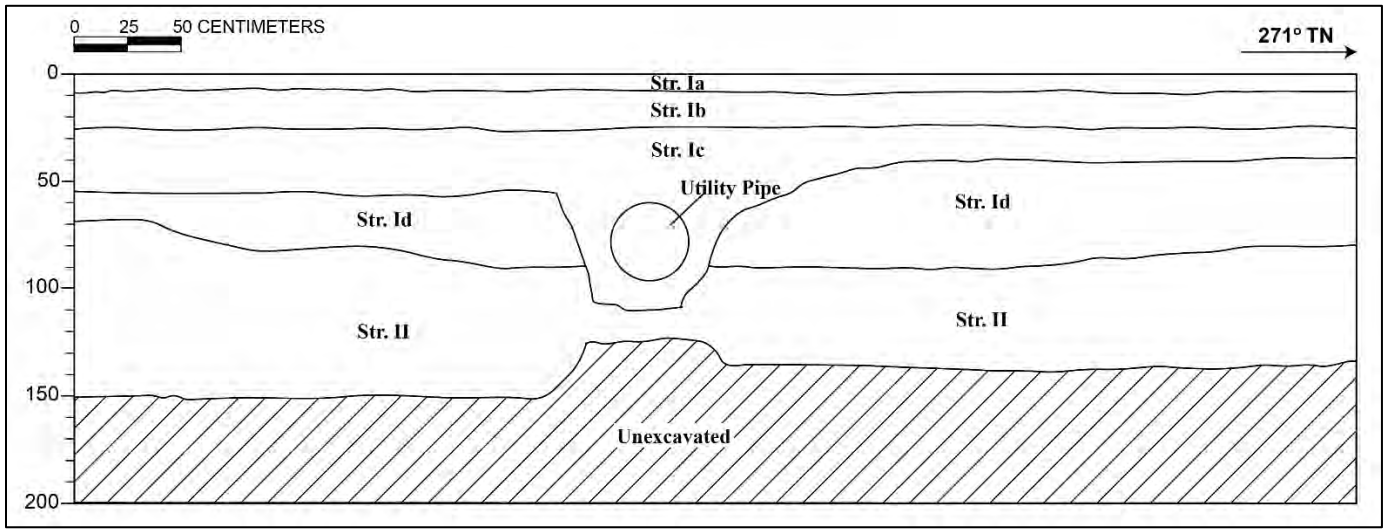


Figure 58. T-1 south sidewall profile

Table 5. T-1 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–25	Base course; 10YR 5/2, grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; clear, smooth lower boundary
Ic	25–110	Fill; 10YR 3/4, dark yellowish brown; gravelly silty clay; strong, medium, blocky structure; moist, extremely firm consistence; no cementation; plastic; mixed origin; no roots observed; very abrupt, irregular lower boundary
Id	36–114	Fill; 10YR 3/6, dark yellowish brown; extremely gravelly silt loam; weak, very fine, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; few, fine roots; very abrupt, broken lower boundary
II	68–175 (BOE)	Natural; 10YR 4/4, dark yellowish brown; gravelly clay loam; weak, fine, granular structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

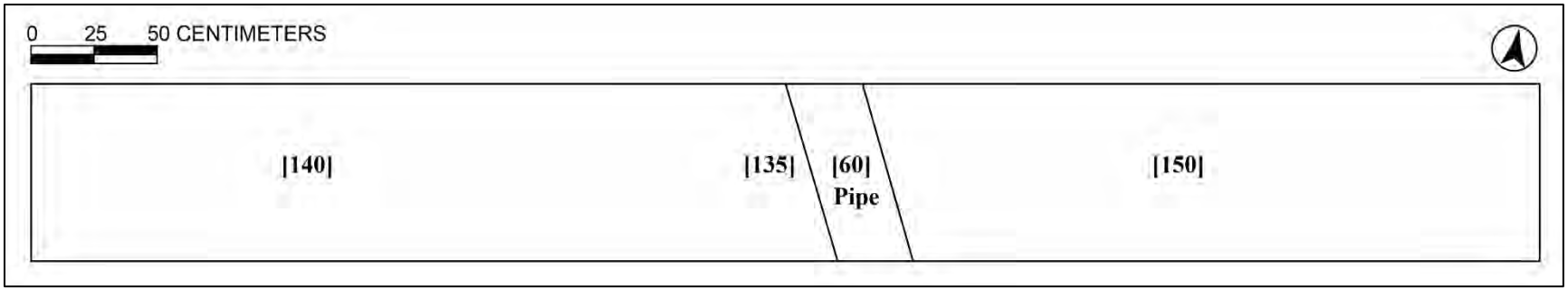


Figure 59. T-1 plan view map

Figure 60. T-1 plan view showing the utility line

Figure 61. T-2 northwest sidewall; view to north

Figure 62. T-2 southeast sidewall; view to east

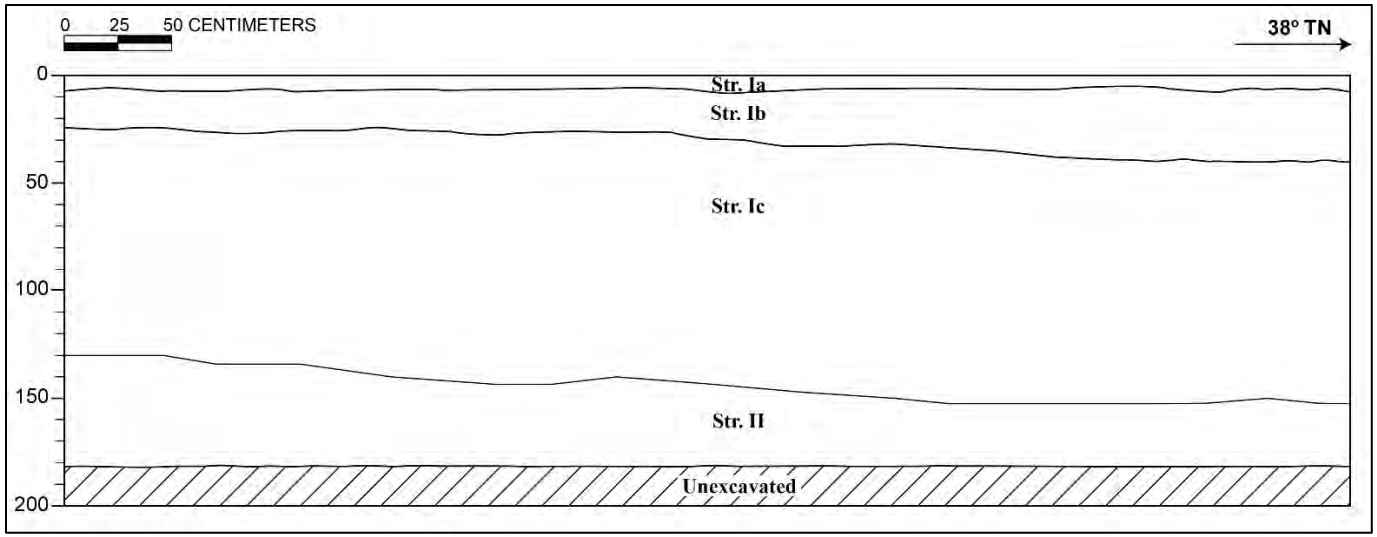


Figure 63. T-2 northwest sidewall profile

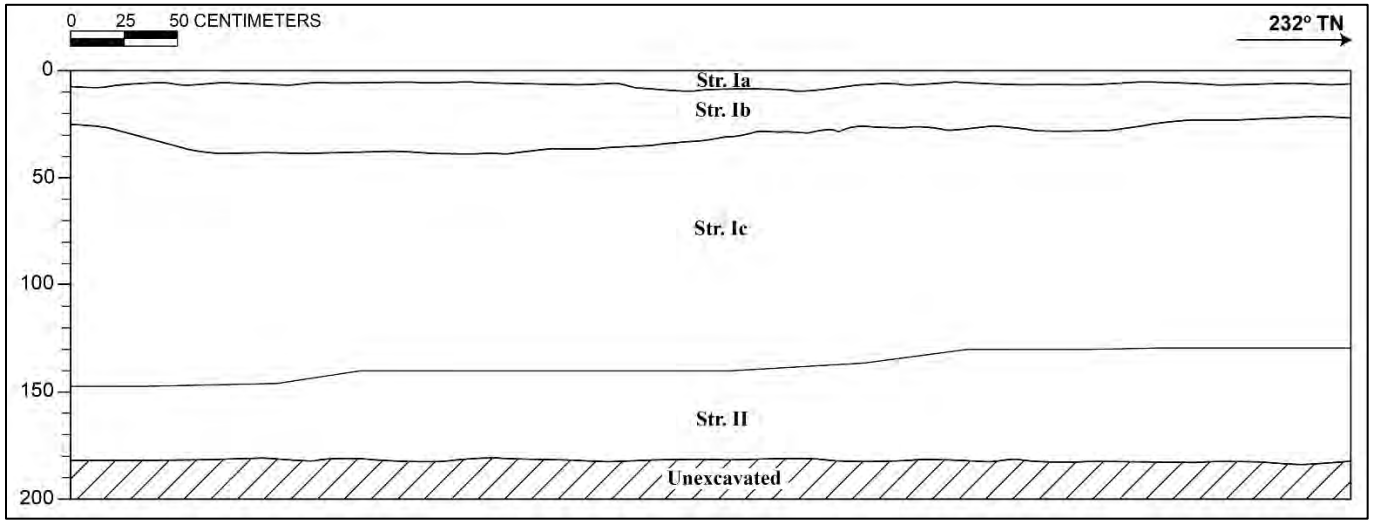


Figure 64. T-2 southeast sidewall profile

Table 6. T-2 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–7	Asphaltic concrete
Ib	7–40	Base course; 10YR 6/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; clear, smooth lower boundary
Ic	25–147	Fill; 10YR 4/3, brown; gravelly clay loam; moderate, medium, blocky structure; moist, firm consistence; weak cementation; plastic; terrigenous origin; few, medium roots; clear, smooth lower boundary
II	130–182 (BOE)	Natural; 10YR 3/3, dark brown; clay; moderate, medium, blocky structure; moist, firm consistence; weak cementation; very plastic; terrigenous origin; no roots observed; lower boundary not visible

the current stadium parking lot. Stratum Ic is a fill layer associated with the development of Aloha Stadium. Stratum II is a natural deposited clay layer; it was encountered at 1.3 mbs. No cultural material or historic properties were identified.

4.2.3 Test Excavation 3 (T-3)

T-3 is on the southwest side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-3 was chosen to target an area of World War II infrastructure and for geographic representation. T-3 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.9 mbs and is oriented northwest/southeast.

The stratigraphy observed in T-3 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay fill (Stratum Ic), and gravelly clay (Stratum II) (Figure 65 through Figure 68, and Table 7). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay fill layer associated with the development of Aloha Stadium. Stratum II is a naturally deposited clay layer encountered at 0.90 mbs that has oxidation from decomposing basalt. No cultural material or historic properties were identified.

A utility line was encountered at 0.92 mbs in the southeast end of T-3 (Figure 69). The utility was a large concrete drain line cutting through 1.1 m of the trench.

4.2.4 Test Excavation 4 (T-4)

T-4 is on the south side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-4 was chosen for geographic representation. T-4 measures 5.8 m in length by 0.7 m wide with a maximum depth of 1.82 mbs and is oriented north/south.

The stratigraphy observed in T-4 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly sandy clay loam fill (Stratum Ic), extremely gravelly loamy sand fill (Stratum Id), and clay loam (Stratum II) (Figure 70 through Figure 73, and Table 8). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay loam fill related to grading and leveling during the stadium development. Stratum Id is basalt gravel fill likely related to raising the height of the parking lot and possibly helping with water ponding or flow issues. Stratum II is a naturally deposited clay loam encountered at 0.90 mbs. No cultural material or historic properties were identified.

4.2.5 Test Excavation 5 (T-5)

T-5 is on the southwest side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-5 was chosen to target an area of World War II infrastructure and for geographic representation. T-5 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.8 mbs and is oriented northeast/southwest.

The stratigraphy observed in T-5 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and gravelly clay loam (Stratum II) (Figure 74 through Figure 77, and Table 9). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay loam fill related to grading and leveling during the stadium development. Within Stratum Ic, there is a basalt gravel lens used as a cushion around the electrical conduit. Stratum II is a naturally deposited clay loam encountered at 1.40 mbs. No cultural material or historic properties were identified.

Figure 65. T-3 northeast sidewall; view to northwest

Figure 66. T-3 southwest sidewall; view to southeast

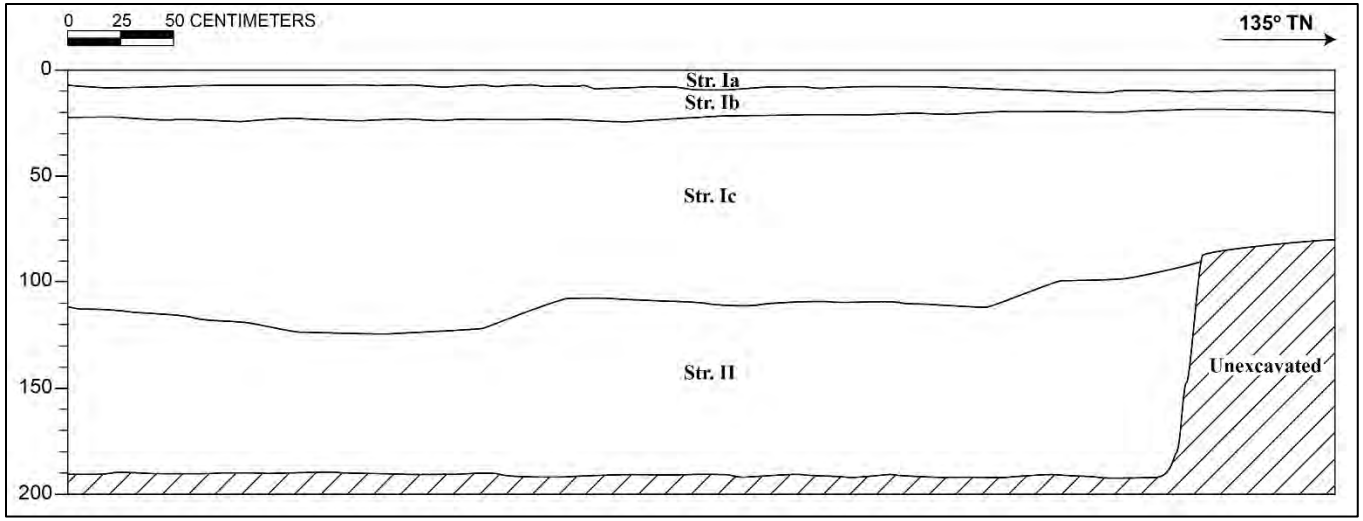


Figure 67. T-3 northeast sidewall profile

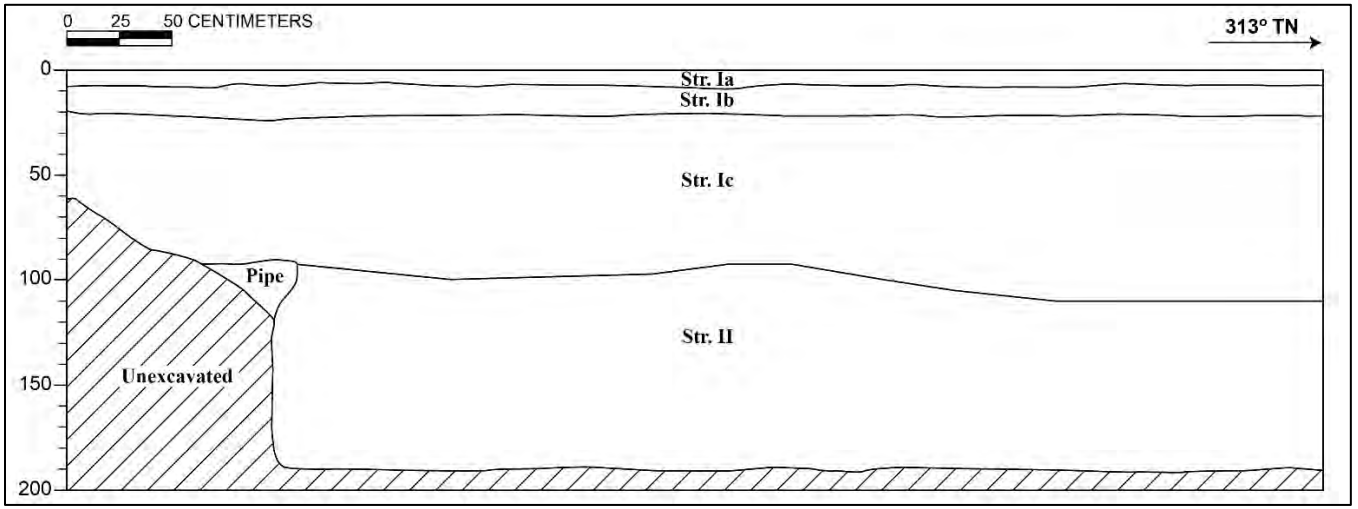


Figure 68. T-3 southwest sidewall profile

Table 7. T-3 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–23	Base course; 10YR 5/2, grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	20–120	Fill; 10YR 3/2, very dark grayish brown; gravelly clay; strong, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; abrupt, smooth lower boundary
II	90–190 (BOE)	Natural; 5YR 3/3, dark reddish brown; gravelly clay; strong, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

Figure 69. T-3 plan view showing the utility line; view to northwest

Figure 70. T-4 east sidewall; view to southeast

Figure 71. T-4 west sidewall; view to southwest

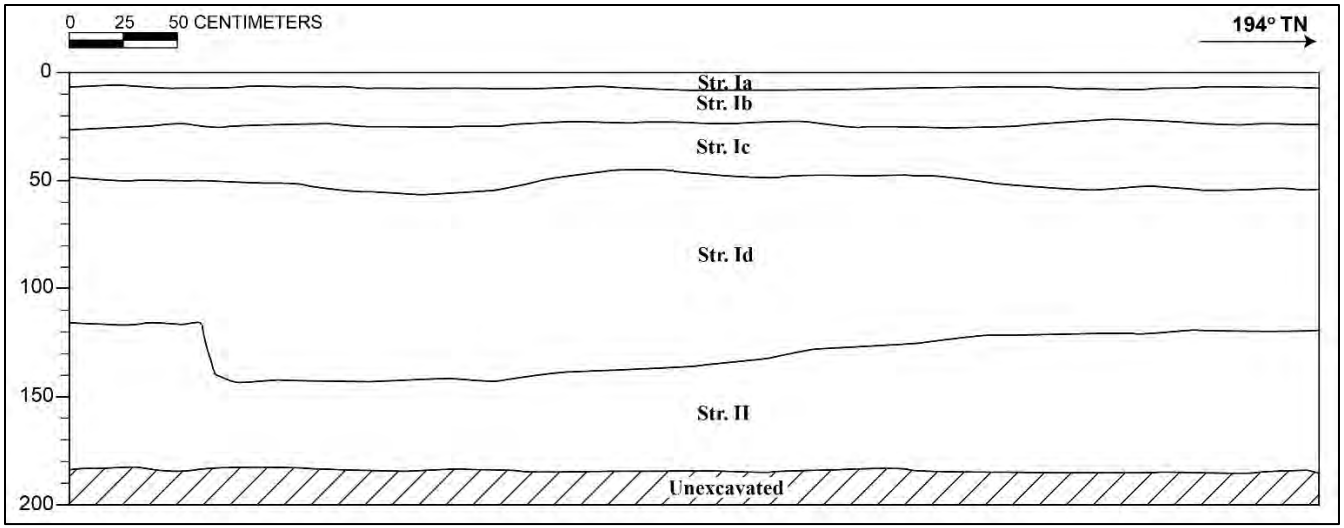


Figure 72. T-4 east sidewall profile

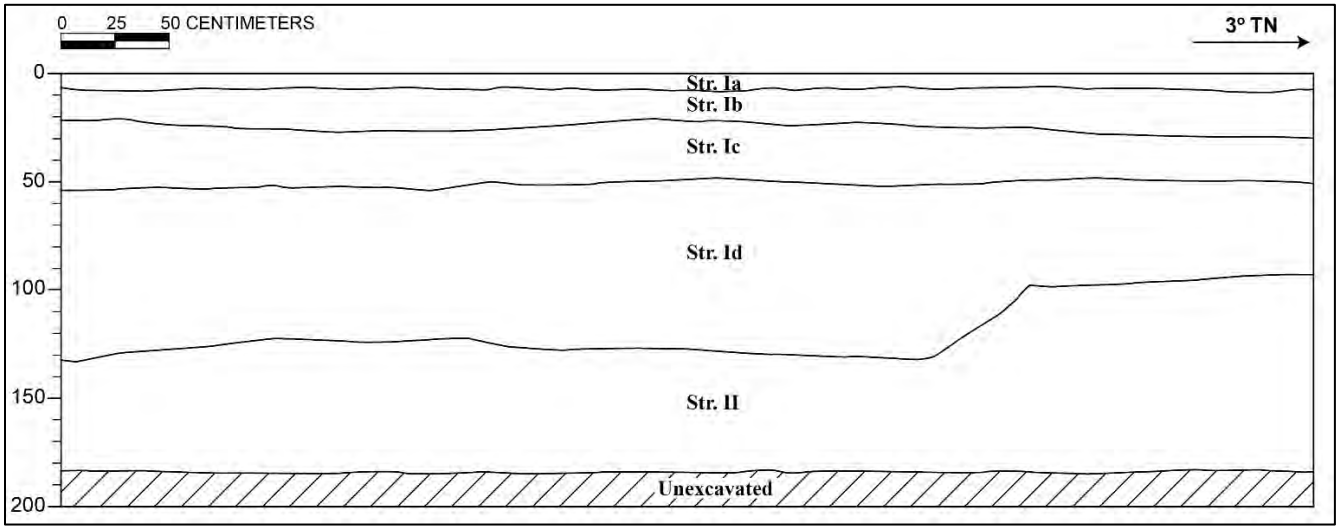


Figure 73. T-4 west sidewall profile

Table 8. T-4 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–25	Base course; 10YR 6/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	21–55	Fill; 10YR 3/2, very dark grayish brown; gravelly sandy clay loam; moderate, medium, granular structure; moist, firm consistence; weak cementation; slightly plastic; terrigenous origin; few, medium roots; clear, smooth lower boundary
Id	44–140	Base course; 10YR 6/1, gray; extremely gravelly loamy sand; weak, fine, granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; no roots observed; clear, smooth lower boundary
II	90–182 (BOE)	Natural; 10YR 3/2, very dark grayish brown; clay loam; moderate, medium, blocky structure; moist, firm consistence; weak cementation; plastic; terrigenous origin; few, fine roots; lower boundary not visible

Figure 74. T-5 northwest sidewall; view to west

Figure 75. T-5 southeast sidewall; view to east

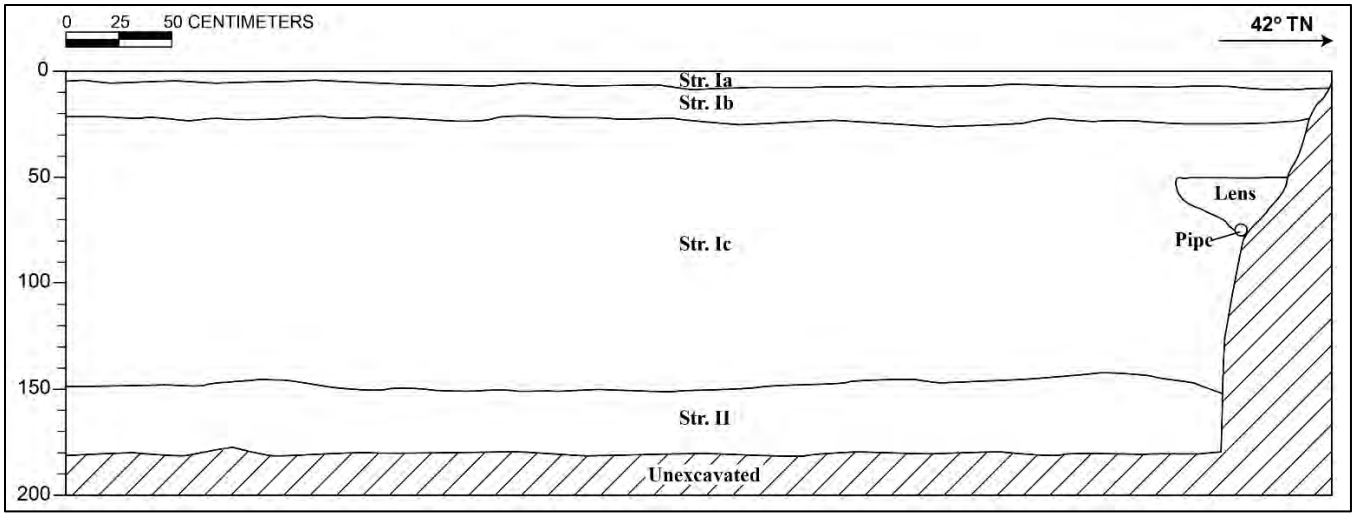


Figure 76. T-5 northwest sidewall profile

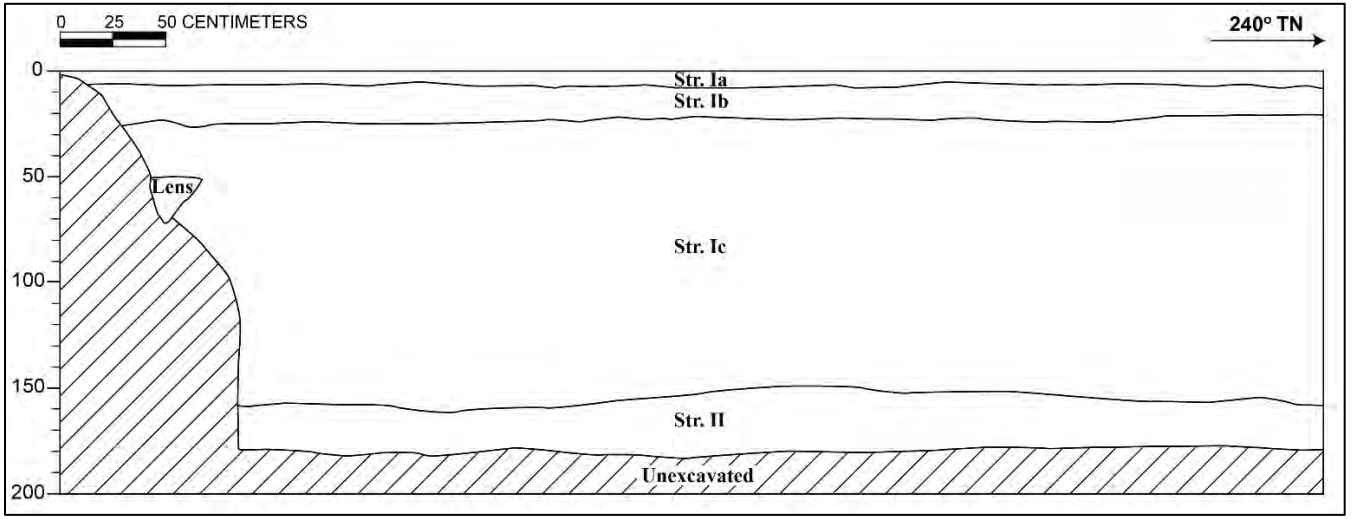


Figure 77. T-5 southeast sidewall profile

Table 9. T-5 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–7	Asphaltic concrete
Ib	5–25	Base course; 10YR 4/2, dark grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; clear, smooth lower boundary
Ic	21–160	Fill; 10YR 4/3, brown; gravelly clay loam; moderate, fine, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; medium roots common; diffuse, smooth lower boundary
II	140–181 (BOE)	Natural; 10YR 3/4, dark yellowish brown; gravelly clay loam; strong, fine, blocky structure; moist, firm consistence; strong cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

A utility line was encountered at the northwest end of T-5 running perpendicular to the trench (Figure 78). It is an abandoned electrical conduit and was encountered 0.40 m from the northwest end at 0.72 mbs.

4.2.6 Test Excavation 6 (T-6)

T-6 is on the west side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-6 was chosen to target an area of World War II infrastructure and for geographic representation. T-6 measures 5.5 m in length by 0.7 m wide with a maximum depth of 1.5 mbs and is oriented east/west.

The stratigraphy observed in T-6 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and very cobbly loamy sand (Stratum II) (Figure 79 through Figure 82, and Table 10). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay loam fill related to grading and leveling during the stadium development. The upper boundary of Stratum II was very hard to dig through but once fractured, very friable and structureless. Stratum II was encountered at 0.30 mbs. Stratum II contains decomposing basalt; the basalt has a rounded weathering pattern. No cultural material or historic properties were identified.

4.2.7 Test Excavation 7 (T-7)

T-7 is on the north side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-7 was chosen to target an area of World War II infrastructure and for geographic representation. T-7 measures 5.4 m in length by 0.7 m wide with a maximum depth of 2.0 mbs and is oriented northwest/southeast.

The stratigraphy observed in T-7 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly sandy clay loam fill (Stratum Ic), extremely cobbly loam fill (Stratum Id), and clay (Stratum II) (Figure 83 through Figure 86, and Table 11). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay loam fill related to grading and leveling during the stadium development. Stratum Id is a fill containing concrete, likely related to the demolition of a concrete slab. Stratum II is a naturally deposited clay. No cultural material or historic properties were identified.

A concrete slab was present at the southeast end of T-7 (Figure 87). The concrete slab was encountered at 0.55 mbs within fill (Stratum Ic). The exposed portion of the concrete slab is 1.4 m in length by 0.5 m wide and 0.10 m thick.

4.2.8 Test Excavation 8 (T-8)

T-8 is on the west side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-8 was chosen to target an area of World War II infrastructure and for geographic representation. T-8 measures 5.8 m in length by 0.7 m wide with a maximum depth of 1.85 mbs and is oriented north/south.

The stratigraphy observed in T-8 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), very gravelly clay loam (Stratum IIa), and clay (Stratum IIb) (Figure 88 through Figure 91, and Table 12). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum IIa is a naturally deposited, oxidized basalt layer with

Figure 78. T-5 close-up of utility; view to north

Figure 79. T-6 south sidewall; view to west

Figure 80. T-6 north sidewall; view to east

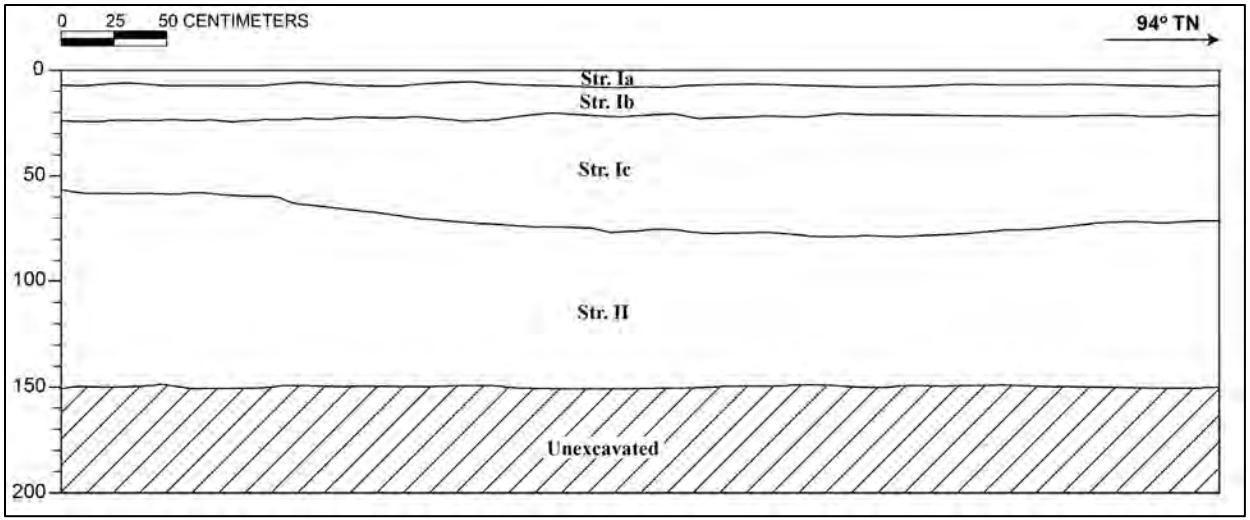


Figure 81. T-6 north sidewall profile

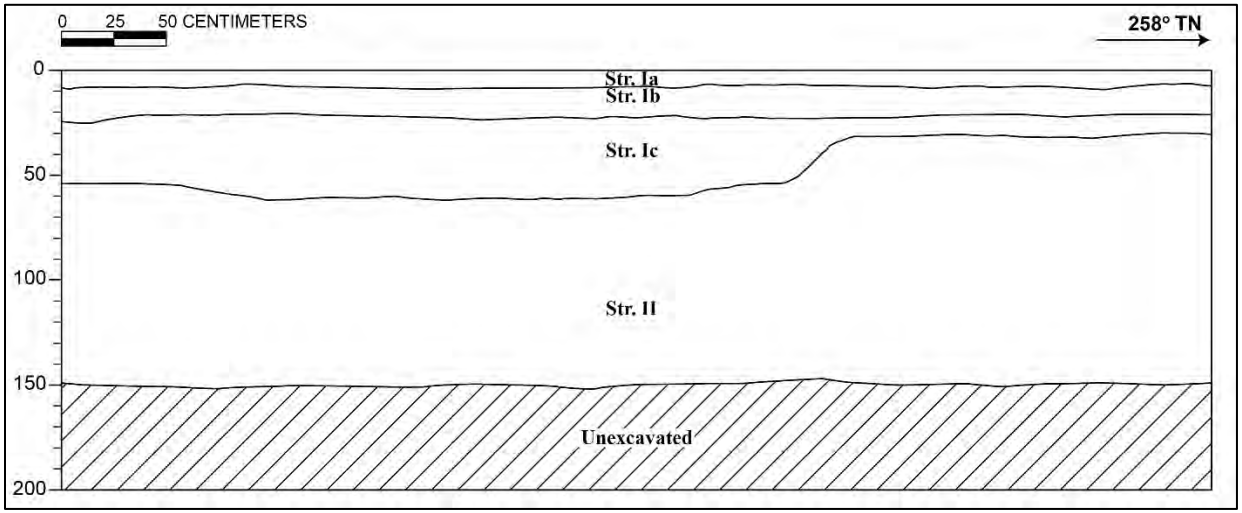


Figure 82. T-6 south sidewall profile

Table 10. T-6 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–5	Asphaltic concrete
Ib	5–25	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	22–62	Fill; 10YR 3/2, very dark grayish brown; gravelly clay loam; moderate, fine, granular structure; moist, firm consistence; no cementation; slightly plastic; terrigenous origin; few, medium roots; abrupt, smooth lower boundary
II	30–150 (BOE)	Natural; 7.5YR 5/2, brown; very cobbly loamy sand; structureless (single-grain); moist, friable consistence; no cementation; non-plastic; terrigenous origin; no roots observed; lower boundary not visible

Figure 83. T-7 northeast sidewall; view to east

Figure 84. T-7 southwest sidewall; view to south

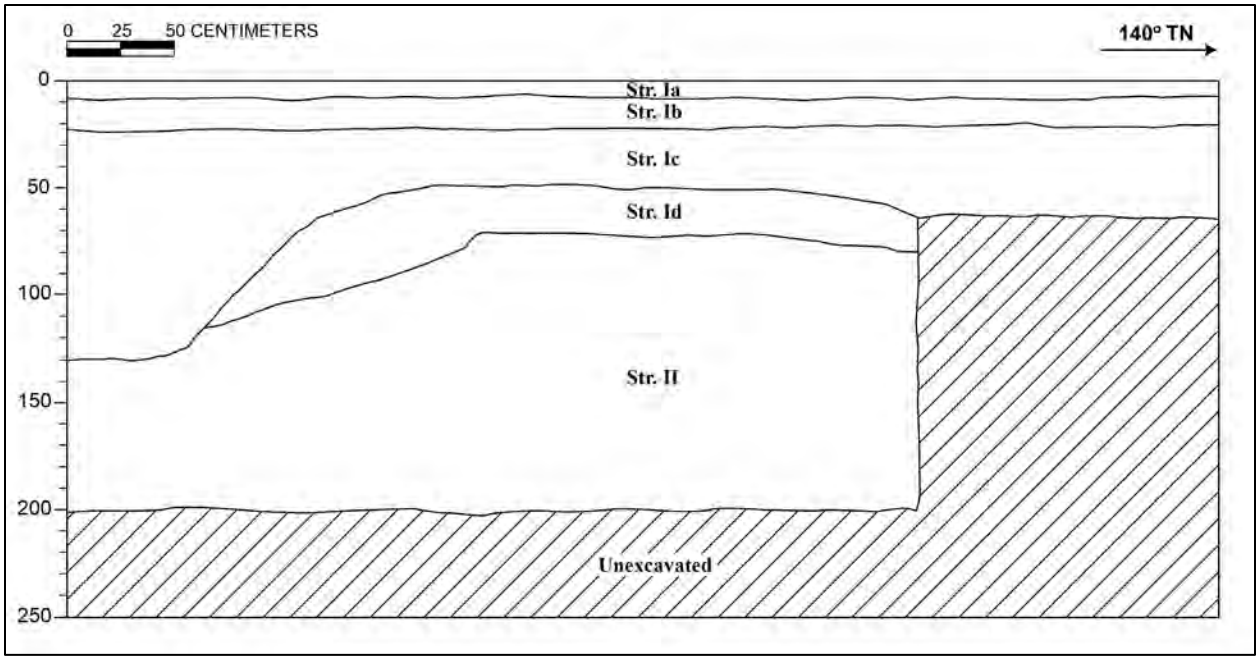


Figure 85. T-7 northeast sidewall profile

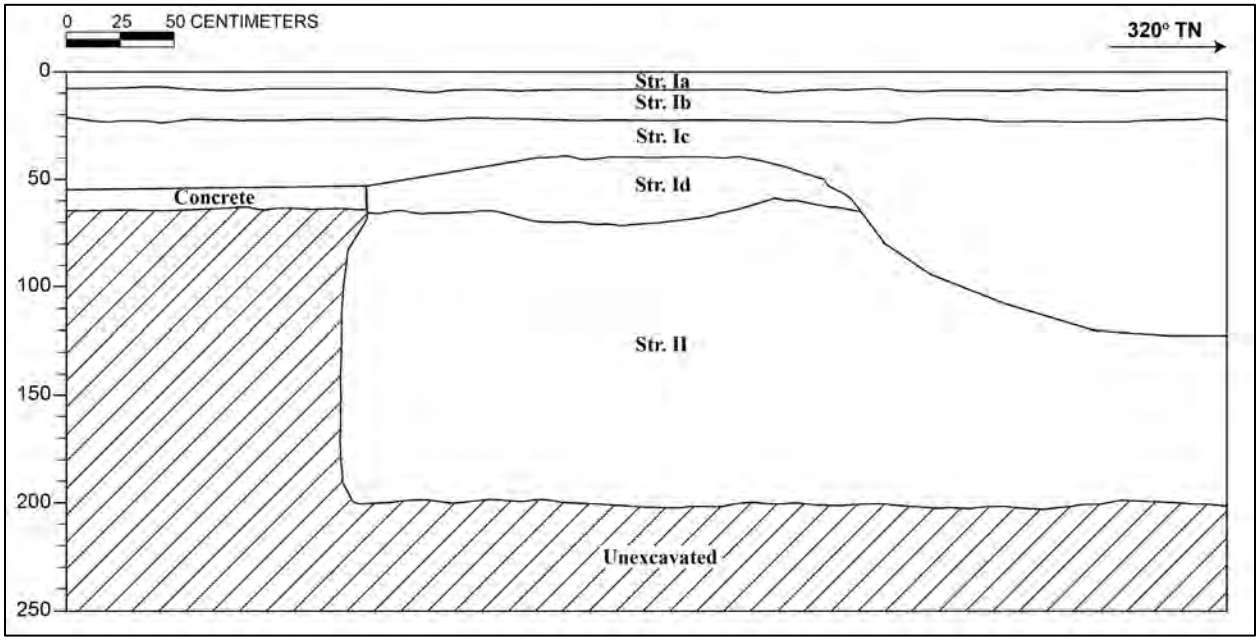


Figure 86. T-7 southwest sidewall profile

Table 11. T-7 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–24	Base course; 10YR 6/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	22–130	Fill; 10YR 3/3, dark brown; gravelly sandy clay loam; moderate, medium, granular structure; moist, friable consistence; weak cementation; slightly plastic; terrigenous origin; few, medium roots; abrupt, wavy lower boundary
Id	38–70	Fill; 10YR 4/2, dark grayish brown; extremely cobbly loam; moderate, medium, granular structure; moist, firm consistence; weak cementation; non-plastic; terrigenous origin; no roots observed; abrupt, discontinuous lower boundary
II	55–200 (BOE)	Natural; 10YR 3/2, very dark grayish brown; clay; moderate, fine, blocky structure; moist, firm consistence; no cementation; very plastic; terrigenous origin; no roots observed; lower boundary not visible

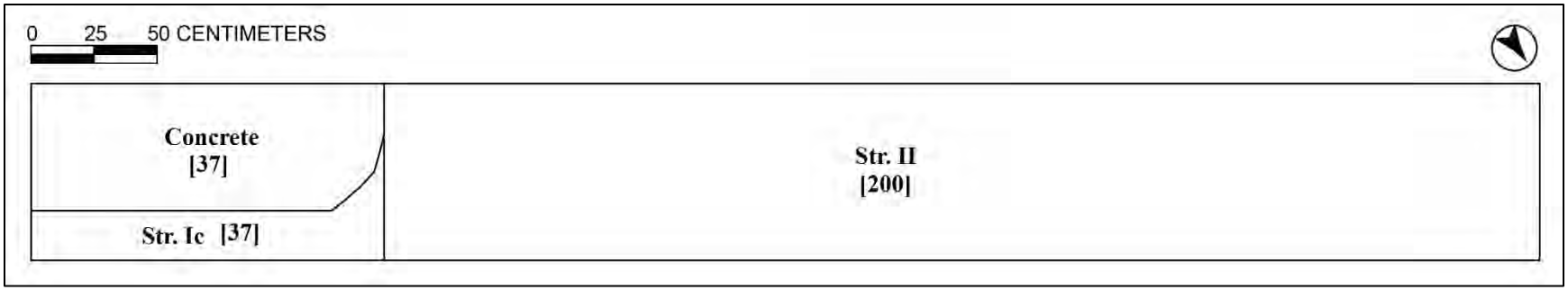


Figure 87. T-7 plan view map

Figure 88. T-8 east sidewall; view to southeast

Figure 89. T-8 west sidewall; view to northwest

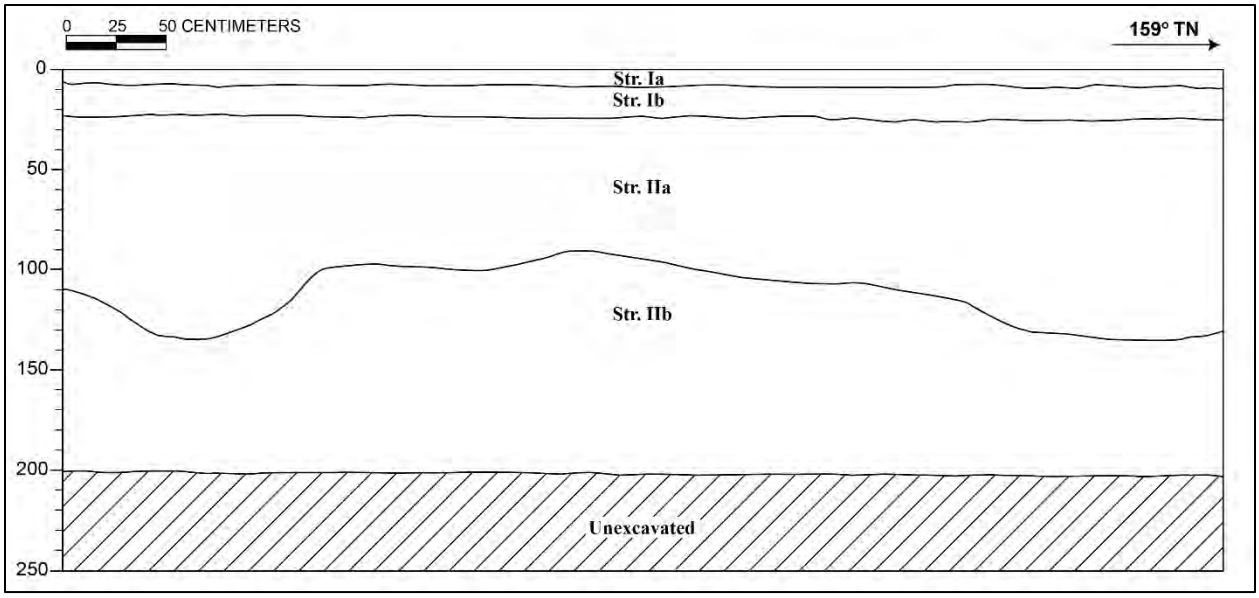


Figure 90. T-8 east sidewall profile

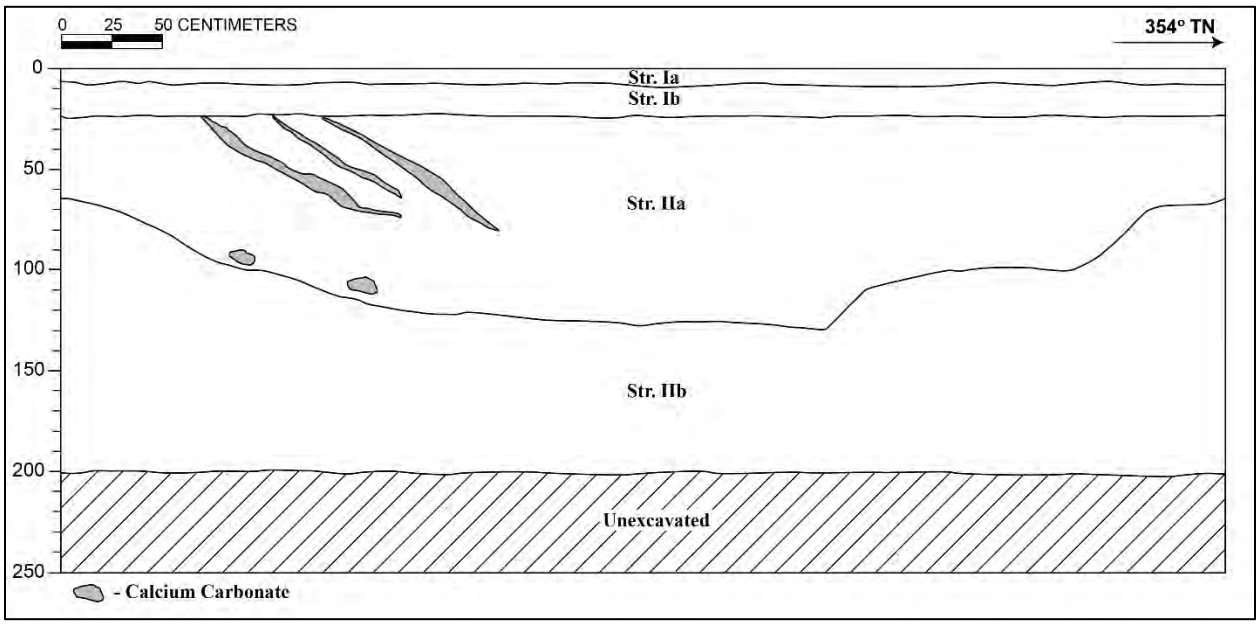


Figure 91. T-8 west sidewall profile

Table 12. T-8 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–25	Base course; 10YR 5/2, grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Id	23–134	Natural; 10YR 3/4, dark yellowish brown; very gravelly clay loam; moderate, fine, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots observed; clear, wavy lower boundary
II	55–200 (BOE)	Natural; 10YR 3/3, dark brown; clay; strong, coarse, blocky structure; moist, extremely firm consistence; no cementation; very plastic; terrigenous origin; no roots observed; lower boundary not visible

calcium deposits. Stratum IIa had been truncated during the development of the stadium. Stratum IIa was encountered at 0.55 mbs. Stratum IIb is naturally deposited clay. No cultural material or historic properties were identified.

Observed in the sidewalls of T-8 were white lenses running diagonally through Stratum IIa. These white inclusions are possibly former tree root casts that have been filled in with calcium carbonate.

4.2.9 Test Excavation 9 (T-9)

T-9 is on the northeast side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-9 was chosen for geographic representation. T-9 measures 5.8 m in length by 0.7 m wide with a maximum depth of 1.6 mbs and is oriented northwest/southeast.

The stratigraphy observed in T-9 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), and gravelly clay loam fill (Stratum Ic) (Figure 92 through Figure 95, and Table 13). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay loam fill layer related to utility installation during the stadium development. Natural soil was not encountered in this excavation, likely due to the encountered utility line. No cultural material or historic properties were identified.

A large concrete drain line was encountered in the southeast sidewall of T-9 at 1.3 mbs (Figure 96 and Figure 97). The drain line was running parallel to the trench.

4.2.10 Test Excavation 10 (T-10)

T-10 is on the west side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-10 was chosen to target a portion of LCA 2741:1, which was labeled taro and field. T-10 measures 5.1 m in length by 0.7 m wide with a maximum depth of 1.9 mbs and is oriented north/south. T-10 was shortened due to a utility line encountered 0.7 m from the north end of the trench.

The stratigraphy observed in T-10 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), silty clay fill (Stratum Id), gravelly clay loam fill (Stratum Ie), and gravelly clay (Stratum II) (Figure 98 through Figure 101, and Table 14). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a clay loam fill layer related to grading and leveling during the stadium development. Stratum Ic contained metal rebar and green plastic hose observed in the backdirt pile. Stratum Id is a silty clay fill related to the stadium development. Stratum Ie is a clay loam layer related to the stadium development, containing asphalt, red brick, and coral fragments. Stratum II is a naturally deposited clay with red and gray modeling from oxidation. Stratum II was encountered at 1.79 mbs. No evidence of the former LCA was observed. No cultural material or historic properties were identified.

A utility line was encountered at 0.35 mbs in the north end of T-10, extending perpendicular to the trench. The utility was a blue PVC line (likely irrigation).

Figure 92. T-9 northwest sidewall; view to west

Figure 93. T-9 profile view of southeast wall; view to east

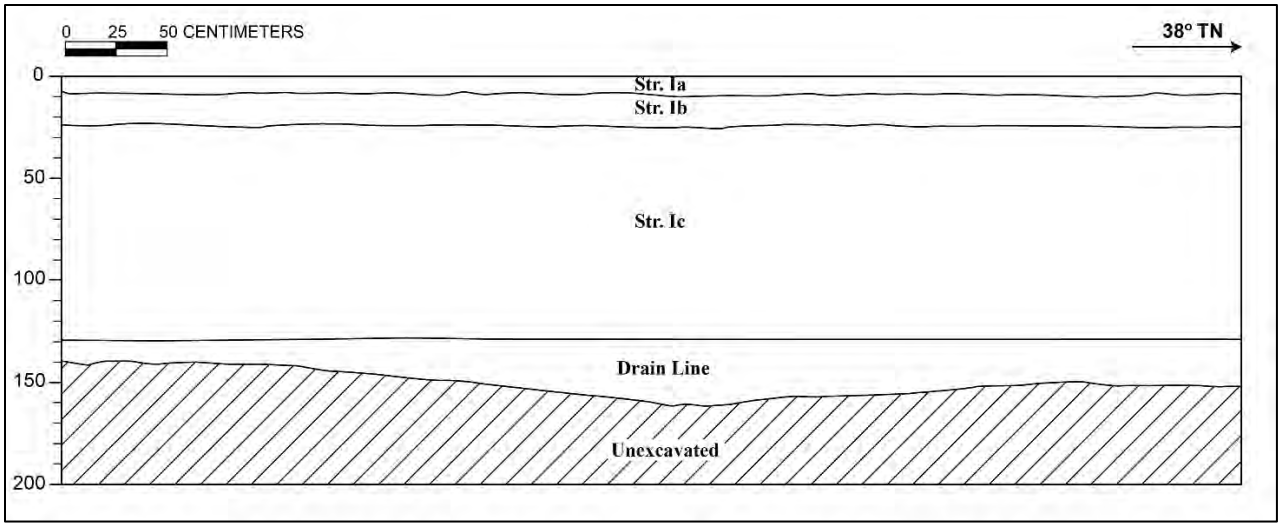


Figure 94. T-9 northwest sidewall profile

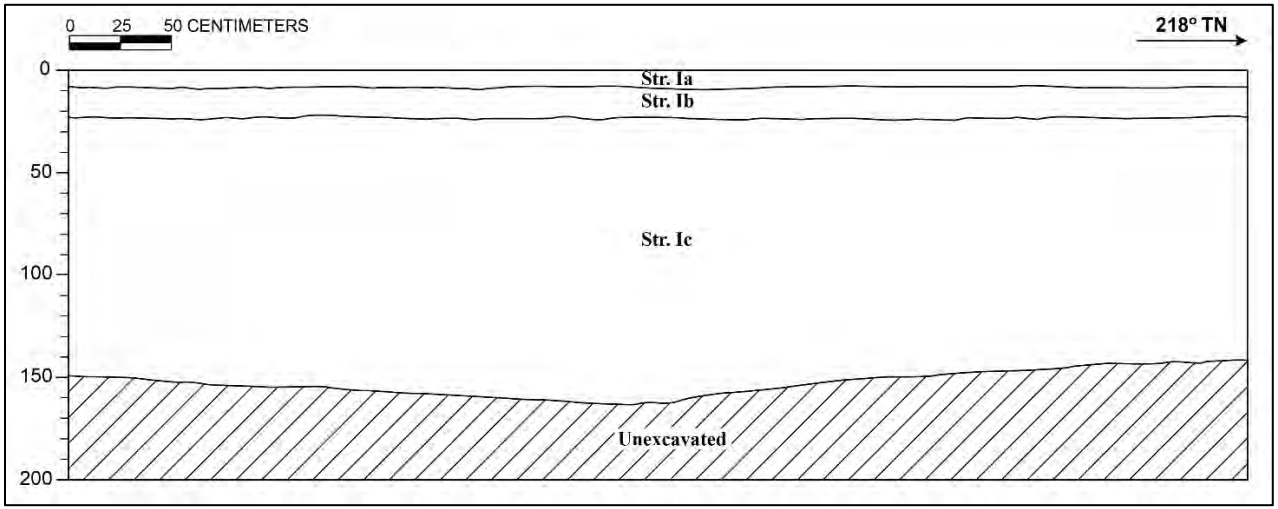


Figure 95. T-9 southeast sidewall profile

Table 13. T-9 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–24	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	24–160 (BOE)	Fill; 5YR 3/3, dark reddish brown; gravelly clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

Figure 96. T-9 overview showing stratigraphy and encountered utility, view to south

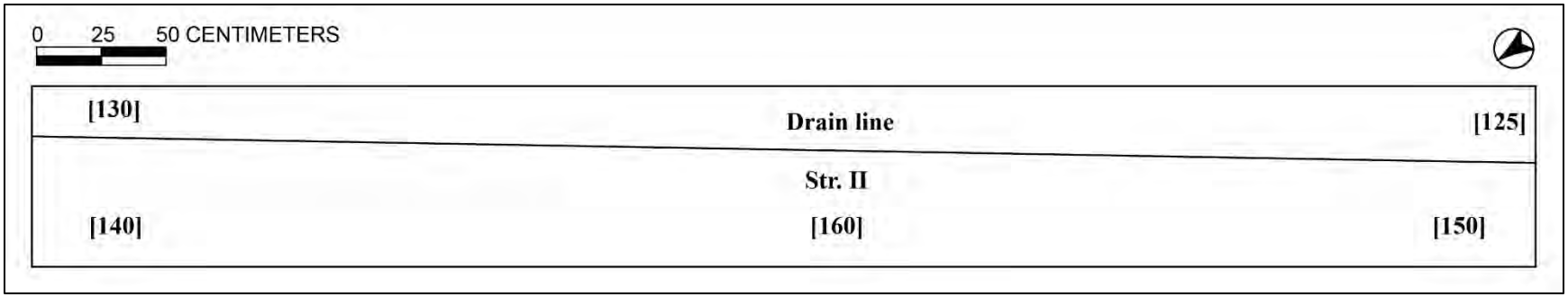


Figure 97. T-9 plan view map

Figure 98. T-10 east sidewall; view to northeast

Figure 99. T-10 west sidewall; view to southwest

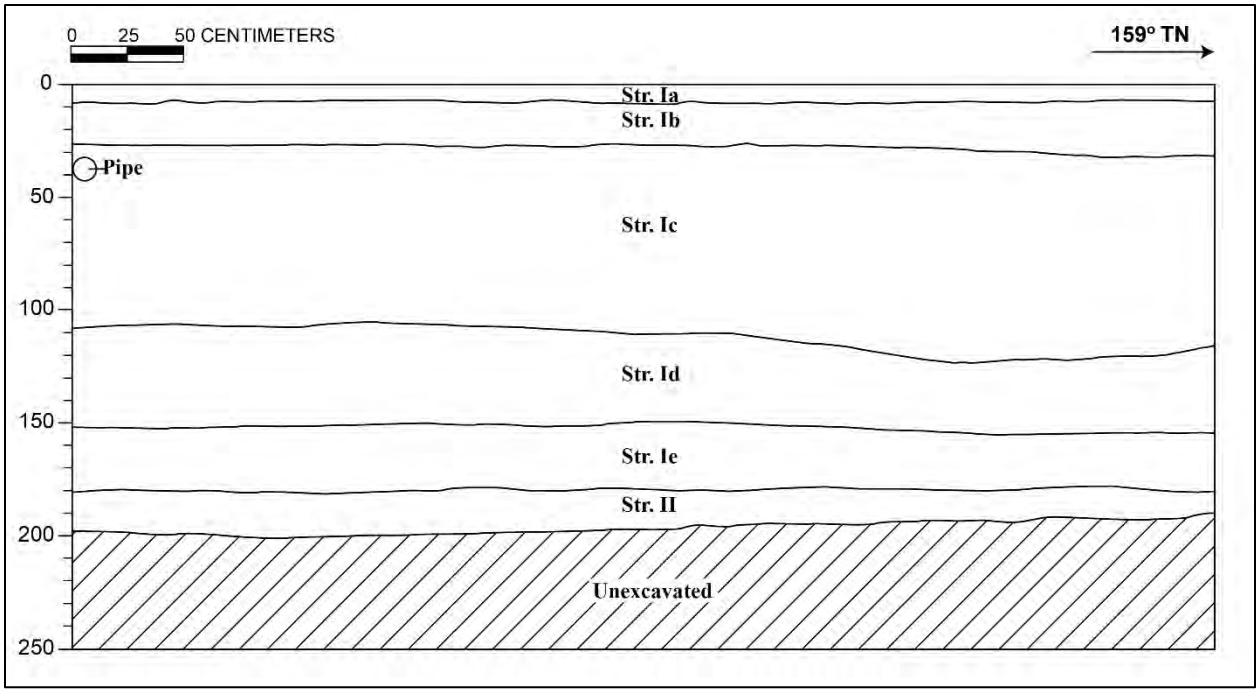


Figure 100. T-10 east sidewall profile

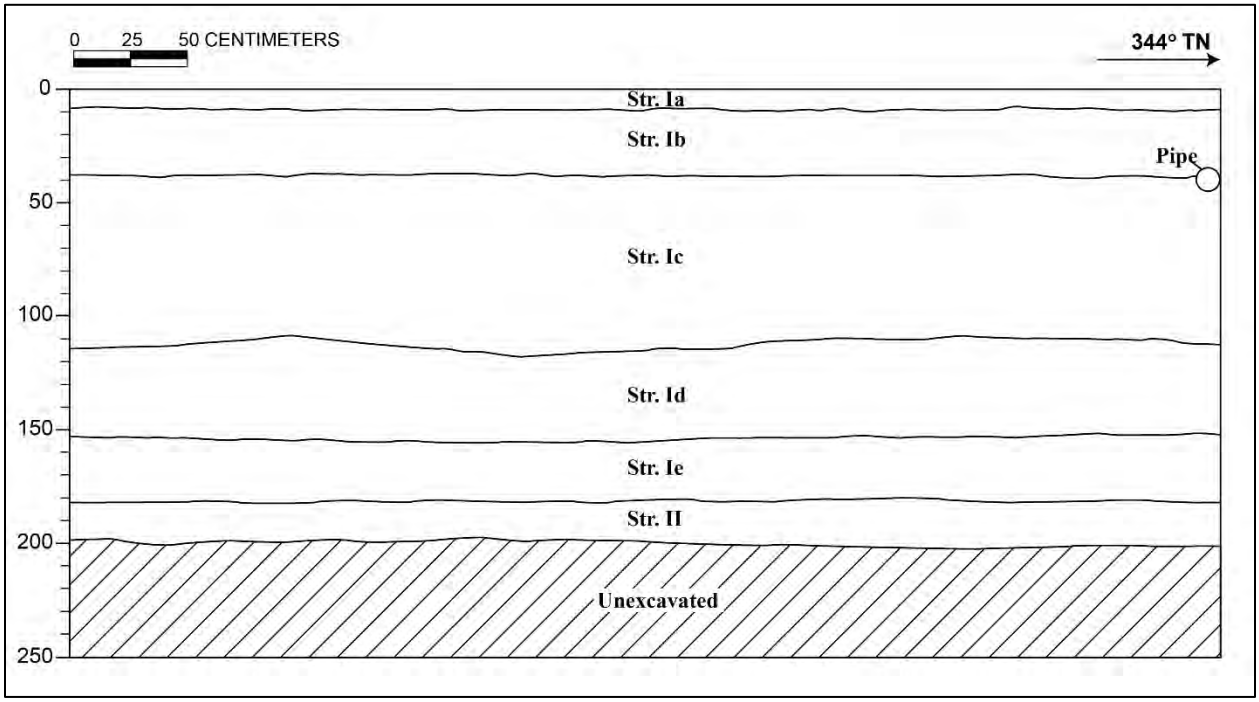


Figure 101. T-10 west sidewall profile

Table 14. T-10 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–9	Asphaltic concrete
Ib	9–38	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	38–124	Fill; 5YR 3/2, dark reddish brown; gravelly clay loam; moderate, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; few, coarse roots; abrupt, smooth lower boundary
Id	106–155	Fill; 7.5YR 3/3, dark brown; silty clay; weak, fine, granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; no roots observed; abrupt, smooth lower boundary
Ie	150–182	Fill; 10YR 3/2, very dark grayish brown; gravelly clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; abrupt, smooth lower boundary
II	179–190 (BOE)	Natural; 10YR 4/1, dark gray; gravelly clay; strong, coarse, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

4.2.11 Test Excavation 11 (T-11)

T-11 is on the south side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). T-11 location was chosen for geographical representation. T-11 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.9 mbs and is oriented north/south.

The stratigraphy observed in T-11 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly sandy clay loam fill (Stratum Ic), gravelly sandy clay loam fill (Stratum Id), clay loam (Stratum IIa), and very cobbly clay loam (Stratum IIb) (Figure 102 through Figure 105, and Table 15). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic and Id are clay loam fill layers related to grading and leveling during the stadium development. Stratum IIa is a naturally deposited clay loam. Stratum IIa was encountered at 0.90 mbs. Stratum IIb is a naturally deposited clay loam with decomposing basalt throughout.

During the excavation for T-11, a concrete cylinder with a metal pipe extending from it was encountered at 0.92 mbs and the base was at 1.09 mbs (Figure 106). The object was approximately 0.17 m tall by 0.14 m wide and originated and terminated within Stratum IIa. The object is likely a fence post remnant; however, it does not line up with any historic maps and was likely displaced during previous demolition of the area.

4.2.12 Test Excavation 12 (T-12)

T-12 is on the south side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-12 was chosen for geographic representation. T-12 measures 5.9 m in length by 0.7 m wide with a maximum depth of 2.0 mbs and is oriented east/west.

The stratigraphy observed in T-12 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and gravelly clay loam fill (Stratum Id) (Figure 107 through Figure 110, and Table 16). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Strata Ic and Id are clay loam fill layers related to grading and leveling during the stadium development. Stratum Ic contained a portion of blocky clay with a black substance which appeared to be a petroleum product (Figure 111). No naturally deposited layers were encountered. No cultural material or historic properties were identified.

4.2.13 Test Excavation 13 (T-13)

T-13 is on the southwest side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-13 was chosen to target a portion of LCA 2156:3 *pāhale* area and the north side of the stream. T-13 measures 6.0 m in length by 0.7 m wide with a maximum depth of 2.05 mbs and is oriented northeast/southwest.

The stratigraphy observed in T-13 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), silty clay loam fill (Stratum Ic), and silty clay loam (Stratum II) (Figure 112 though Figure 115, and Table 17). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a silty clay loam fill layer related to grading and leveling during the stadium development, which has a strong smell of petroleum. Stratum Ic contained metal, glass fragments, asphalt, and saw cut faunal bones. The faunal bones were collected; however, the artifacts were not collected due to the lack of diagnostic

Figure 102. T-11 east sidewall; view to northeast

Figure 103. T-11 west sidewall; view to southwest

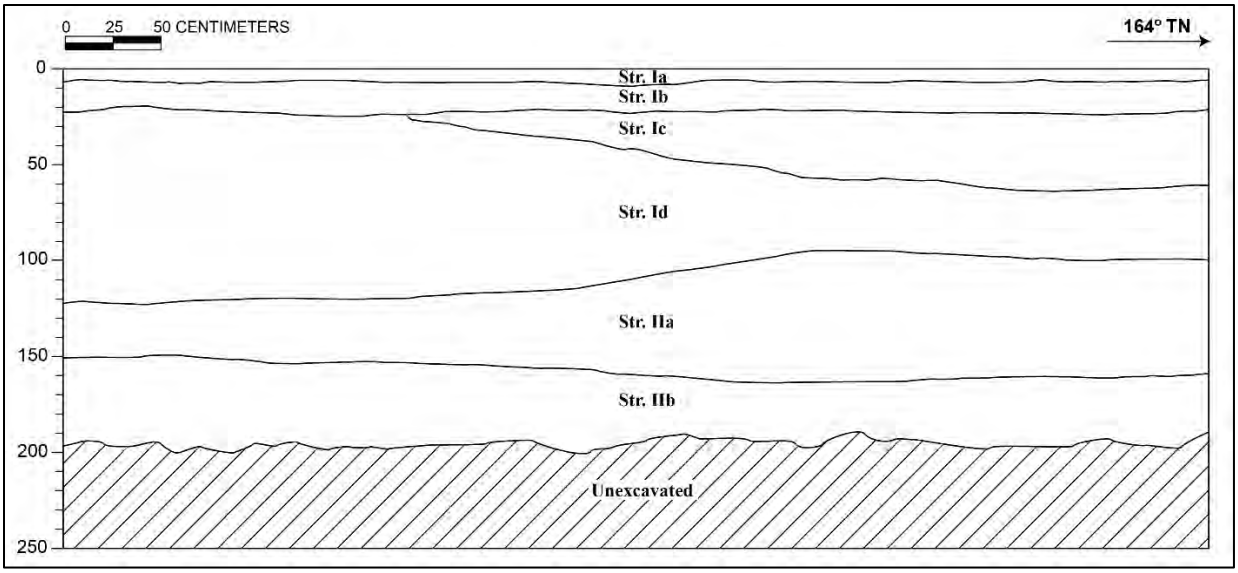


Figure 104. T-11 east sidewall profile

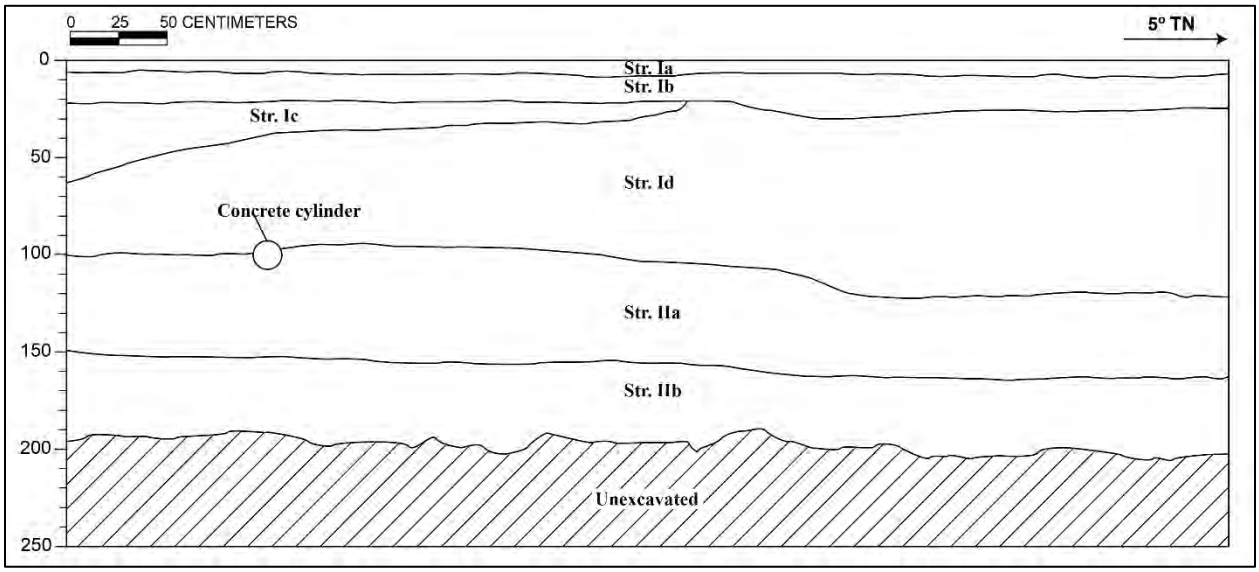


Figure 105. T-11 west sidewall profile

Table 15. T-11 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–5	Asphaltic concrete
Ib	5–30	Base course; 10YR 6/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	21–64	Fill; 7.5YR 3/4, dark brown; gravelly sandy clay loam; weak, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; few, medium roots; clear, discontinuous lower boundary
Id	20–123	Fill; 10YR 3/3, dark brown; gravelly sandy clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; few, fine roots; clear, smooth lower boundary
IIa	90–162	Natural; 10YR 4/2, dark grayish brown; clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; very plastic; terrigenous origin; fine roots common; clear, smooth lower boundary
IIb	149–190 (BOE)	Natural; 10YR 3/3, dark brown; very cobbly clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; very plastic; terrigenous origin; fine roots common; lower boundary not visible

Figure 106. T-11 overview of concrete cylinder; view to southwest

Figure 107. T-12 north sidewall; view to east

Figure 108. T-12 south sidewall; view to southeast

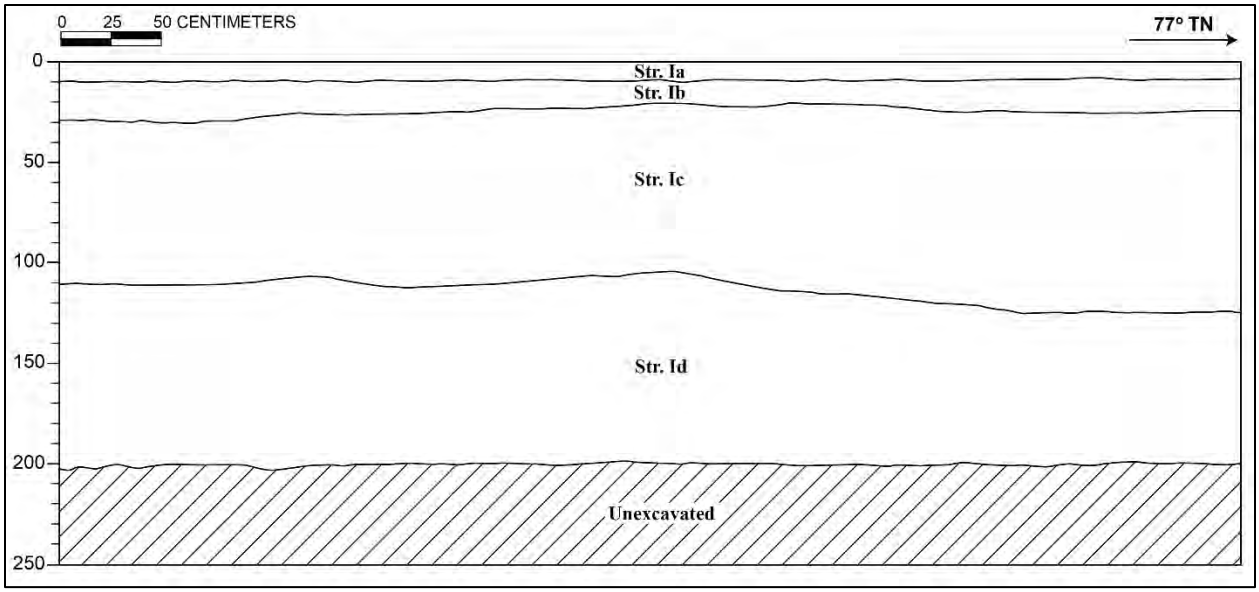


Figure 109. T-12 north sidewall profile

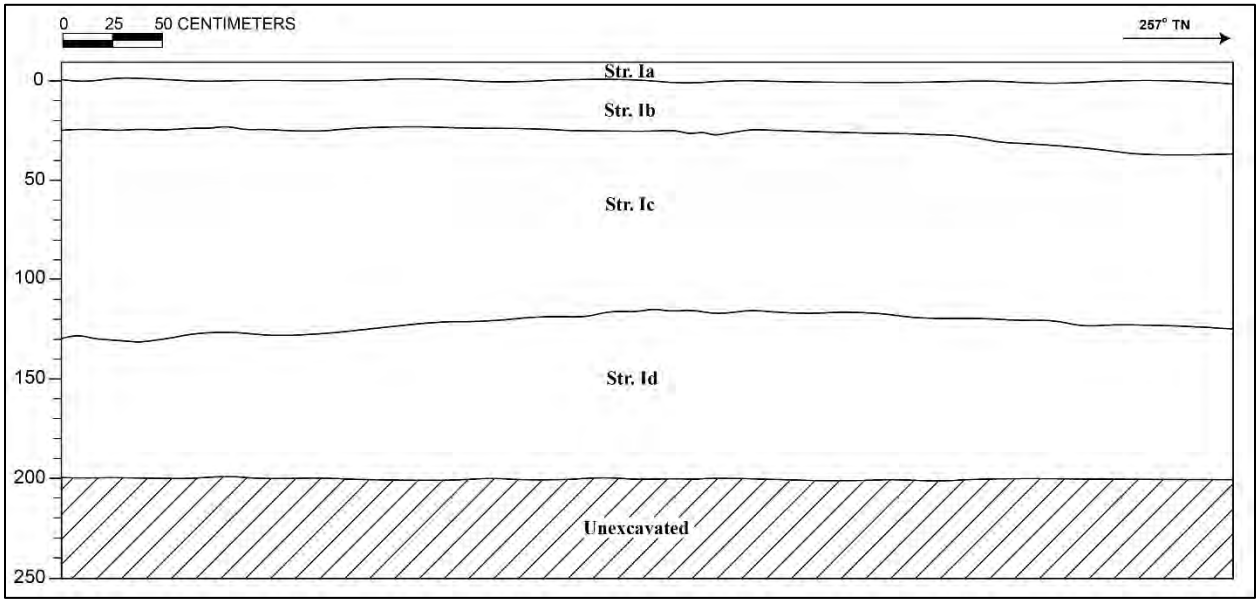


Figure 110. T-12 south sidewall profile

Table 16. T-12 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–10	Asphaltic concrete
Ib	10–35	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	25–130	Fill; 5YR 3/3, dark reddish brown; gravelly clay loam; moderate, fine, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots observed; abrupt, smooth lower boundary
Id	115–200 (BOE)	Fill; 5YR 3/2, dark reddish brown; gravelly clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

Figure 111. T-12 close-up of Stratum Ic clay with possible petroleum contamination

Figure 112. T-13 northwest sidewall; view to west

Figure 113. T-13 southeast sidewall; view to south

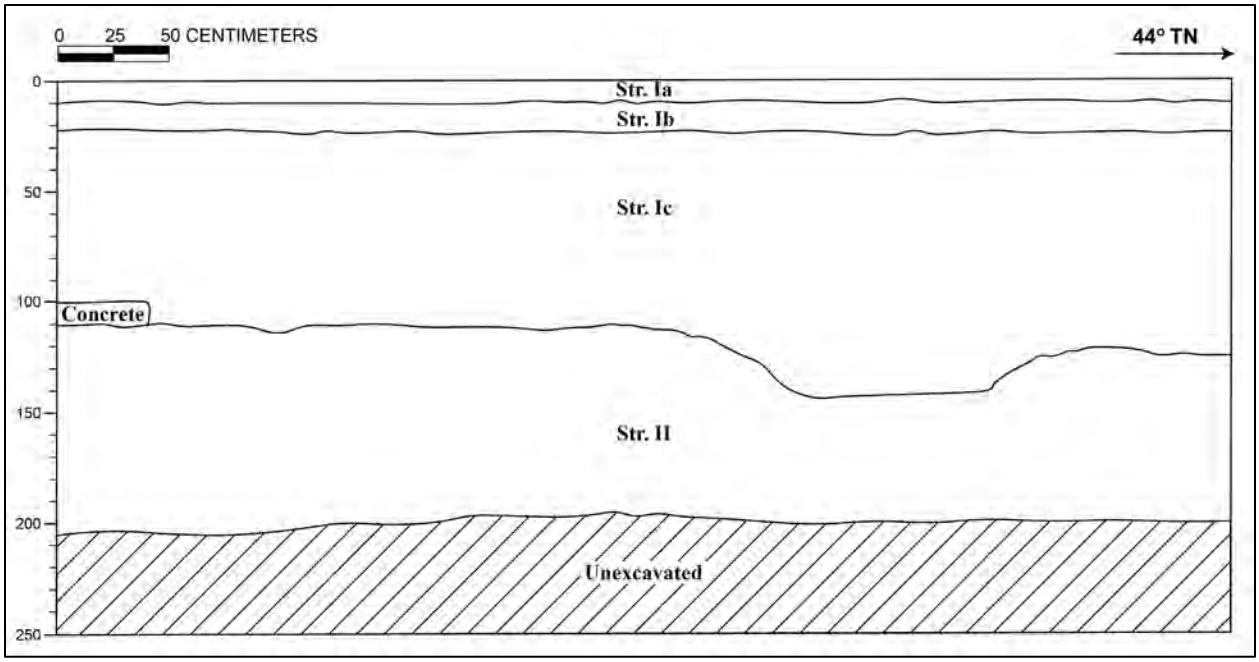


Figure 114. T-13 northwest sidewall profile

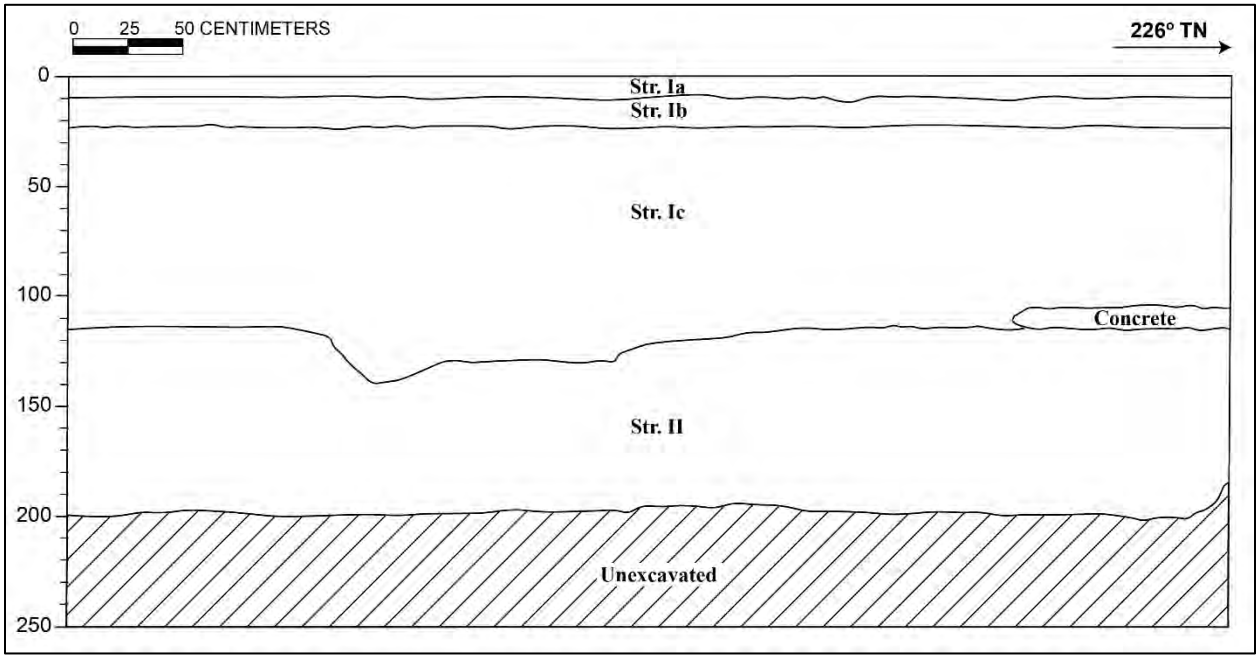


Figure 115. T-13 southeast sidewall profile

Table 17. T-13 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–10	Asphaltic concrete
Ib	10–24	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	24–140	Fill; 10YR 3/6, dark yellowish brown; silty clay loam; moderate, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots observed; abrupt, smooth lower boundary
II	110–205 (BOE)	Natural; 10YR 2/2, very dark brown; silty clay loam; moderate, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots observed; lower boundary not visible

characteristics and the possible petroleum contamination within the excavation; the artifacts were photographed in the field (Figure 116). Stratum II is a naturally deposited silty clay loam and was encountered at 1.1 mbs.

During excavation for T-13 a thin concrete layer was encountered at 1.05 mbs (Figure 117). The concrete is 0.10 m thick and terminates at 1.15 mbs, at the interface of Strata Ic and II.

4.2.14 Test Excavation 14 (T-14)

T-14 is on the east side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-14 was chosen to target a portion of LCA 2047:1 and LCA 9332:1 *lo‘i* area and ca. 1900 homesteading area. T-14 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.5 mbs and is oriented east/west.

The stratigraphy observed in T-14 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly silty clay loam fill (Stratum Ic), and very cobbly clay loam (Stratum II) (Figure 118 through Figure 121, and Table 18). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a silty clay loam fill layer related to grading and leveling during the stadium development. Stratum II is a naturally deposited clay loam with decomposing basalt encountered at 0.8 mbs. No cultural material or historic properties were identified.

4.2.15 Test Excavation 15 (T-15)

T-15 is on the southeast side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-15 was chosen to target a portion of LCA 2139 *mo‘o‘aina* area and ca. 1900 homesteading area. T-15 measures 5.5 m in length by 0.7 m wide with a maximum depth of 2.0 mbs and is oriented northwest/southeast.

The stratigraphy observed in T-15 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), silty clay fill (Stratum Ic), and cobbly silty clay loam fill (Stratum Id) (Figure 122 through Figure 125, and Table 19). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a silty clay fill related to grading and leveling during the stadium development. Stratum Id is a silty clay loam fill containing large basalt cobbles and coral gravel inclusions. No cultural material or historic properties were identified.

4.2.16 Test Excavation 16 (T-16)

T-16 is on the southeast side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-16 was chosen to target a portion of LCA 1996 *mo‘o‘aina* area and ca. 1900 homesteading area. T-16 measures 6.0 m in length by 0.7 m wide with a maximum depth of 2.05 mbs and is oriented northwest/southeast.

The stratigraphy observed in T-16 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and cobbly clay loam fill (Stratum Id) (Figure 126 through Figure 129, and Table 20). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Strata Ic and Id are fill layers related to grading and leveling during the stadium development. Stratum Id contained coal, water-rounded basalt, and concrete gravel and cobbles. No cultural material or historic properties were identified.

Figure 116. T-13 artifacts observed but not collected from Stratum Ic

Figure 117. T-13 close-up of thin concrete layer in southwest sidewall; view to southwest

Figure 118. T-14 north sidewall; view to east

Figure 119. T-14 north sidewall; view to west

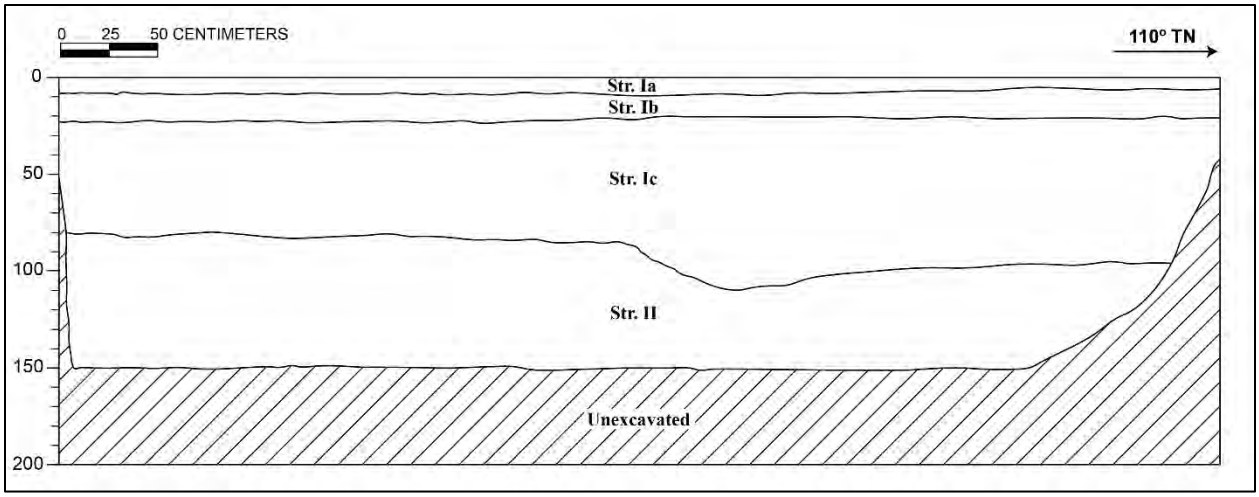


Figure 120. T-14 north sidewall profile

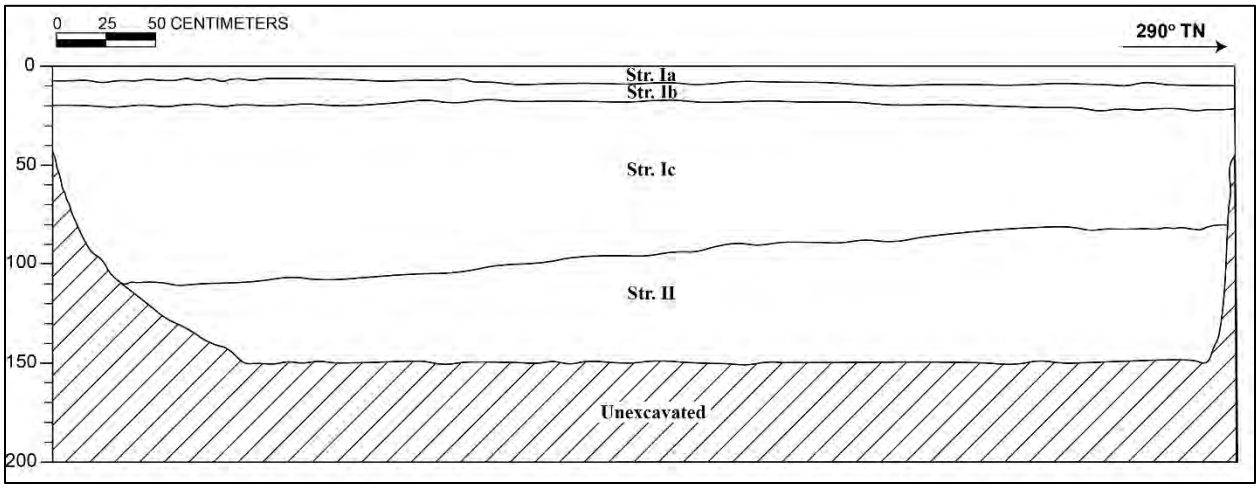


Figure 121. T-14 south sidewall profile

Table 18. T-14 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–23	Base course; 10YR 6/2, light brownish gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	18–110	Fill; 10YR 4/3, brown; gravelly silty clay loam; weak, medium, granular structure; moist, firm consistence; weak cementation; slightly plastic; terrigenous origin; few, medium roots; clear, smooth lower boundary
II	80–150 (BOE)	Natural; 10YR 3/6, dark yellowish brown; very cobbly clay loam; moderate, medium, blocky structure; moist, firm consistence; weak cementation; slightly plastic; terrigenous origin; few, medium roots; lower boundary not visible

Figure 122. T-15 northeast sidewall; view to west (north arrow is pointing the wrong direction)

Figure 123. T-15 southwest wall; view to southwest (north arrow is pointing the wrong direction)

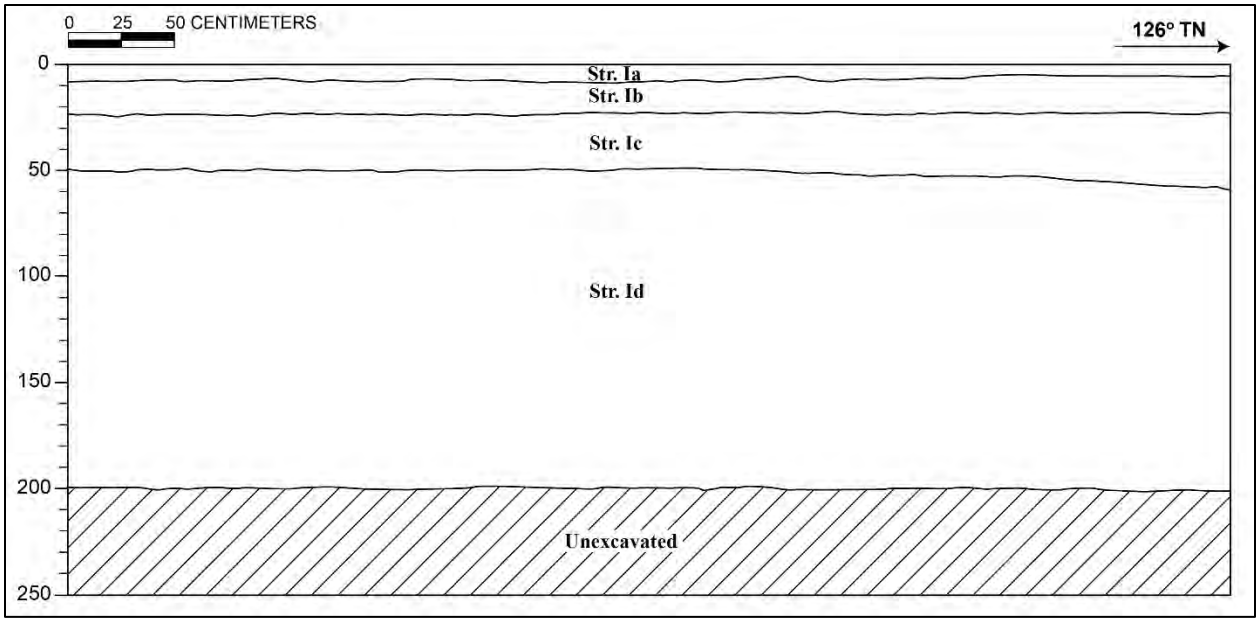


Figure 124. T-15 northeast sidewall profile

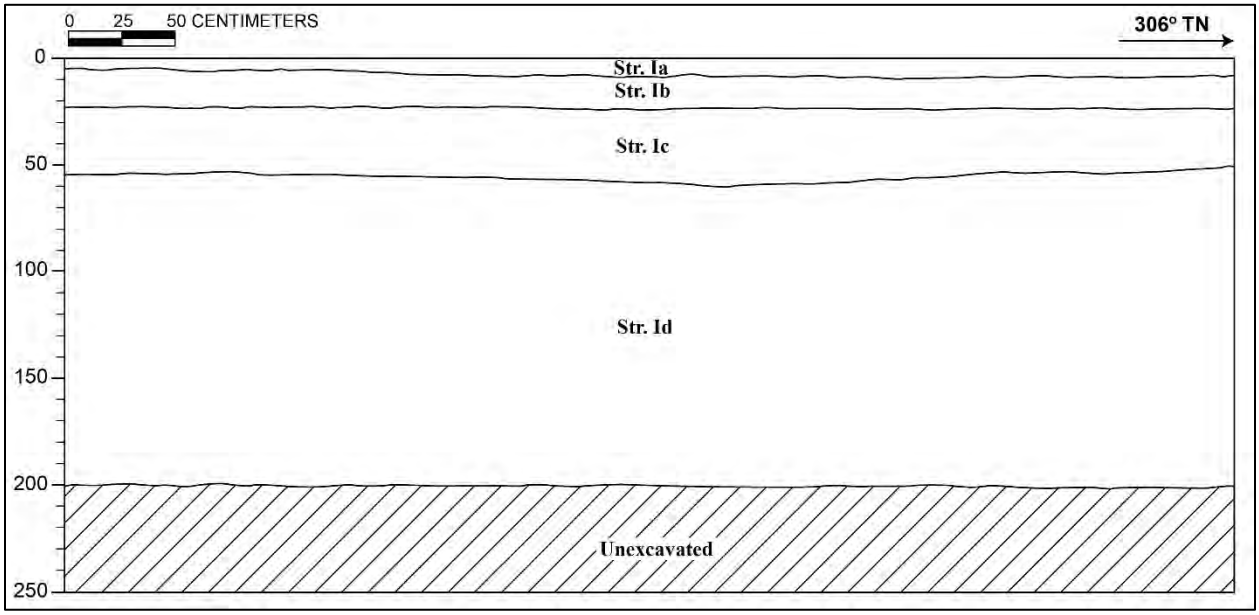


Figure 125. T-15 southwest sidewall profile

Table 19. T-15 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	5–24	Base course; 10YR 5/2, grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	24–60	Fill; 10YR 3/4, dark yellowish brown; silty clay; strong, coarse, blocky structure; moist, extremely firm consistence; no cementation; very plastic; mixed origin; no roots observed; abrupt, smooth lower boundary
Id	50–200 (BOE)	Fill; 10YR 3/3, dark brown; cobbly silty clay; strong, coarse, blocky structure; moist, extremely firm consistence; no cementation; plastic; mixed origin; no roots observed; lower boundary not visible

Figure 126. T-16 northeast sidewall; view to north

Figure 127. T-16 southwest sidewall; view to south

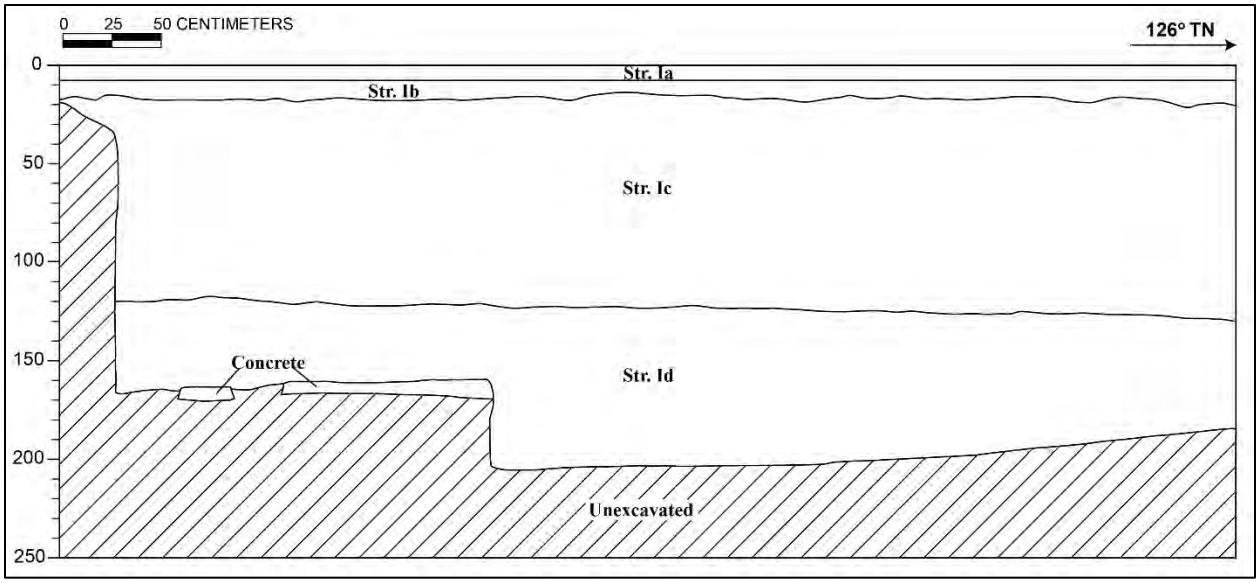


Figure 128. T-16 northeast sidewall profile

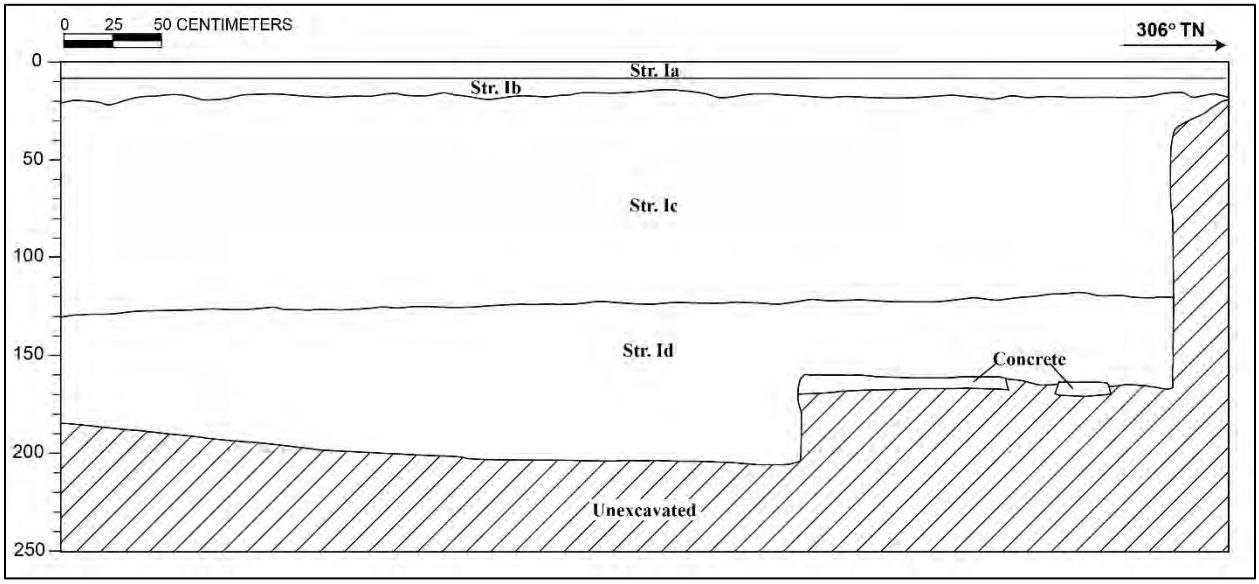


Figure 129. T-16 southwest sidewall profile

Table 20. T-16 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–7	Asphaltic concrete
Ib	7–20	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	15–130	Fill; 5YR 3/3, dark reddish brown; gravelly clay loam; moderate, fine, granular structure; moist, firm consistence; no cementation; plastic; terrigenous origin; few, fine roots; abrupt, smooth lower boundary
Id	120–205 (BOE)	Fill; 10YR 3/2, very dark grayish brown; cobbly clay loam; strong, coarse, blocky structure; moist, extremely firm consistence; no cementation; very plastic; terrigenous origin; no roots observed; lower boundary not visible

A large piece of concrete was encountered at the northwest end of T-16 at 1.6 mbs (Figure 130 and Figure 131). The concrete was approximately 1.95 m long and 0.10 m thick. The extent of the concrete is unknown due to it extending into both sidewalls. The concrete is within fill. There was no disruption observed in Stratum Id, suggesting the concrete was deposited in this location at the same time as Stratum Id fill was deposited. The concrete is not considered in situ; it was likely displaced during previous demolition activities.

4.2.17 Test Excavation 17 (T-17)

T-17 is on the southeast side of Aloha Stadium in an open-air asphalt parking lot (see Figure 54). The location of T-17 was chosen to target a portion of LCA 9332:2 *lo‘i* area. T-17 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.8 mbs and is oriented north/south.

The stratigraphy observed in T-17 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and gravelly clay loam fill (Stratum Id) (Figure 132 though Figure 135, and Table 21). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ib has a pit associated with a former utility that extends to 1.0 mbs. Strata Ic and Id are fill layer related to grading and leveling during the stadium development. Stratum Id had red brick fragments, nails, and a metal pin likely related to construction activities. This material was not collected due to lack of diagnostic features but was photographed in the field (Figure 136).

A large boulder was encountered in Stratum Id at 1.03 mbs (Figure 137). No cultural material or historic properties were identified.

4.2.18 Test Excavation 18 (T-18)

T-18 is along the north side of Hālawa Stream in an open-air asphalt parking lot (see Figure 54). T-18 location was chosen to target the ca. 1900 homesteading area. T-18 measures 5.6 m in length by 0.7 m wide with a maximum depth of 1.95 mbs and is oriented northeast/southwest.

The stratigraphy observed in T-18 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), clay loam fill (Stratum Ic), cobbly clay loam fill (Stratum Id), and clay loam fill (Stratum Ie) (Figure 138 though Figure 141, and Table 22). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Strata Ic through Ie are fill layer related to grading and leveling during the stadium development.

Stratum Id had metal and wood fragments in the northwest wall. Stratum Ie smelled of petroleum; it also contained metal, wood, and a bottle glass fragment. No historic properties were identified. This material was not collected due to the lack of diagnostic features.

4.2.19 Test Excavation 19 (T-19)

T-19 is along the south side of Hālawa Stream in an open-air asphalt parking lot (see Figure 54). The location of T-19 was chosen to target a portion of the ca. 1900 homesteading area. T-19 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.75 mbs and is oriented northeast/southwest.

The stratigraphy observed in T-19 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly sandy clay loam fill (Stratum Ic), cobbly sandy clay loam

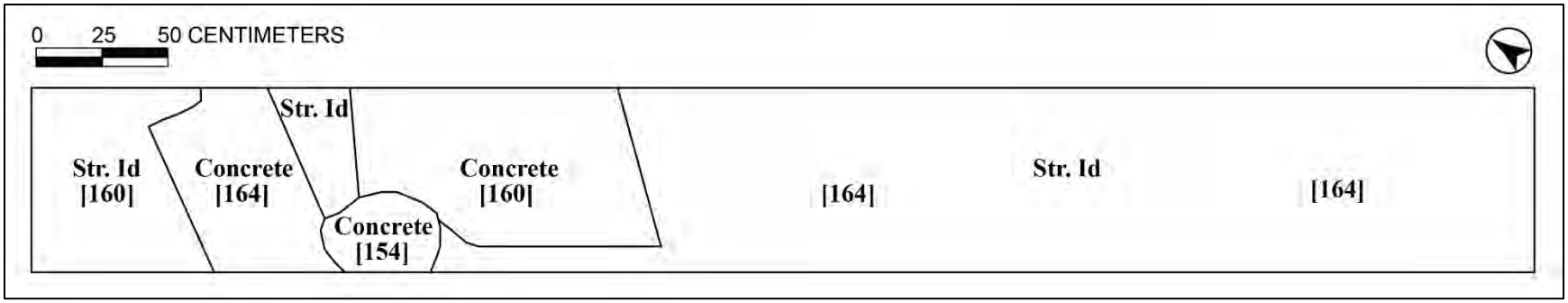


Figure 130. T-16 plan view map

Figure 131. T-16 overview of encountered concrete; view to northwest

Figure 132. T-17 east sidewall; view to southeast

Figure 133. T-17 west sidewall; view to northwest

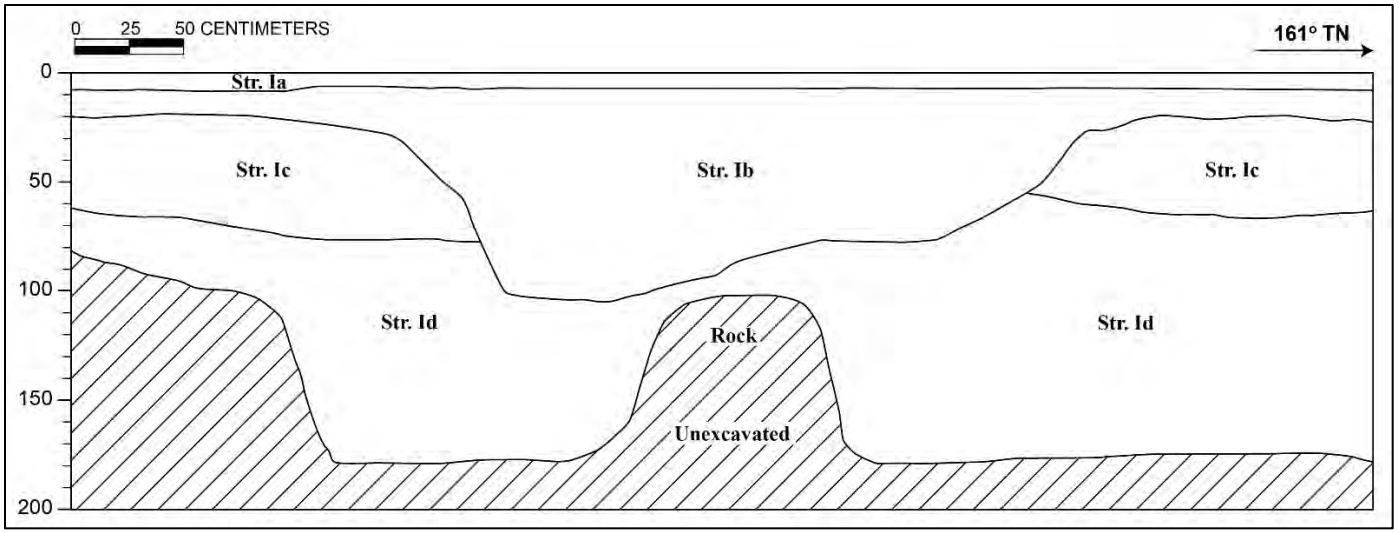


Figure 134. T-17 east sidewall profile

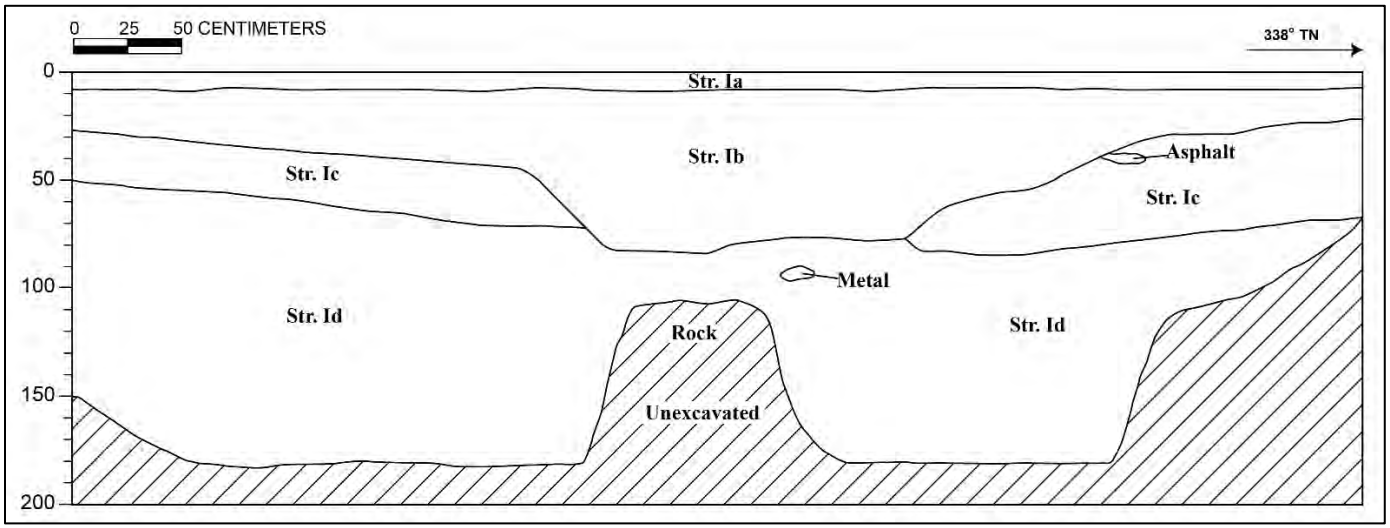


Figure 135. T-17 west sidewall profile

Table 21. T-17 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–8	Asphaltic concrete
Ib	8–100	Base course; 10YR 5/1, gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	20–80	Fill; 10YR 3/3, dark brown; gravelly clay loam; moderate, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; no roots observed; abrupt, broken lower boundary
Id	50–180 (BOE)	Fill; 5YR 3/2, dark reddish brown; gravelly clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

Figure 136. Artifacts observed within T-17 Stratum Id; artifacts were not collected

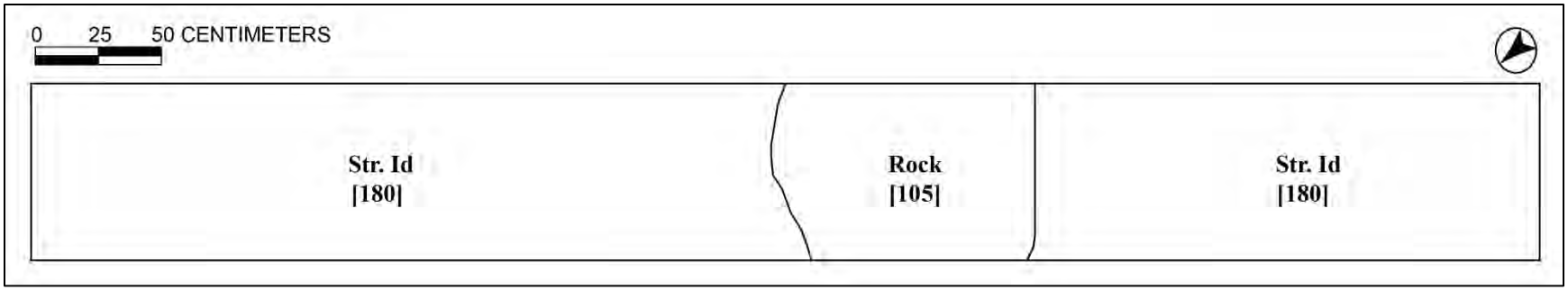


Figure 137. T-17 plan view map

Figure 138. T-18 northwest sidewall; view to north

Figure 139. T-18 southeast sidewall; view to east

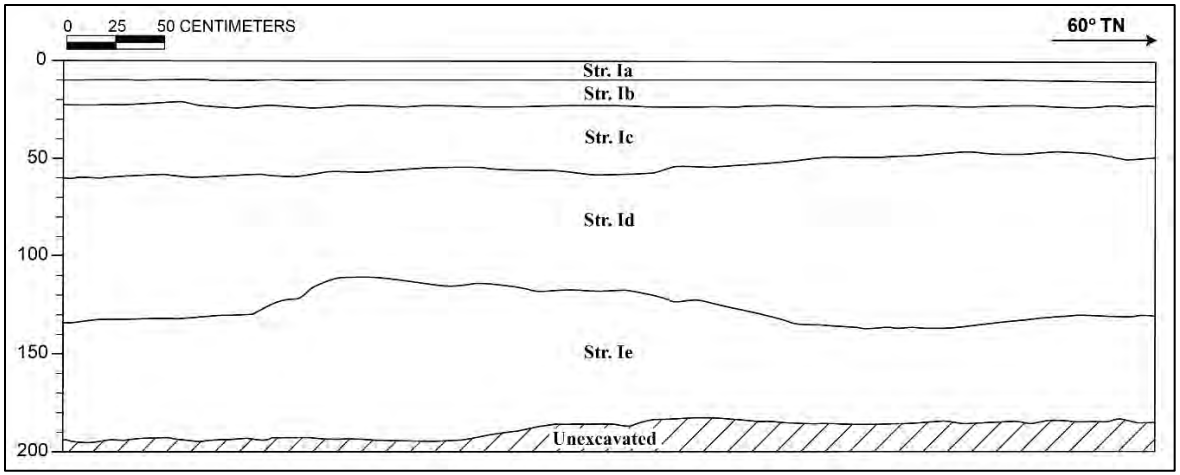


Figure 140. T-18 northwest sidewall profile

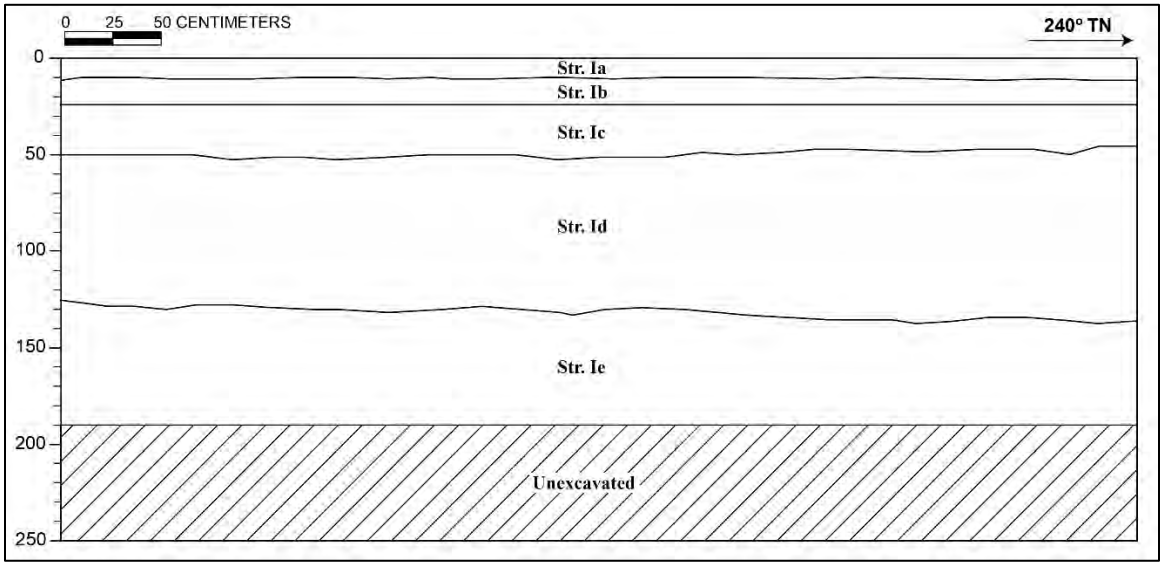


Figure 141. T-18 southeast sidewall profile

Table 22. T-18 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–10	Asphaltic concrete
Ib	10–24	Base course; 10YR 3/2, very dark grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	24–60	Fill; 10YR 3/3, dark brown; clay loam; strong, very coarse, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Id	45–136	Fill; 10YR 3/3, dark brown; cobbly clay loam; strong, very coarse, blocky structure; moist, firm consistence; no cementation; plastic; mixed origin; no roots observed; very abrupt, smooth lower boundary
Ie	110–195 (BOE)	Fill; 10YR 3/2, very dark grayish brown; clay loam; moderate, medium, blocky structure; moist, friable consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

fill (Stratum Id), gravelly sandy clay loam fill (Stratum Ie), clay loam (Stratum IIa), and silty clay (Stratum IIb) (Figure 142 though Figure 145, and Table 23). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Strata Ic through Ie are fill layers related to grading and leveling during the stadium development. Stratum IIa is a clay loam former A horizon. Stratum IIa contained milled wood and a few glass fragments; the glass fragments were collected for further analysis (see Section 5.1). Stratum IIb is a naturally deposited silty clay. No historic properties were identified.

4.2.20 Test Excavation 20 (T-20)

T-20 is along the south side of Hālawa Stream in an open-air asphalt parking lot (see Figure 54). The location of T-20 was chosen to target a portion of LCA 2156:1 *lo‘i* area. T-20 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.9 mbs and is oriented north/south.

The stratigraphy observed in T-20 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly sandy clay loam fill (Stratum Ic), silty clay (Stratum IIa) and gravelly silty clay loam (Stratum IIb) (Figure 146 though Figure 149, and Table 24). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a fill layer related to grading and leveling during the stadium development. Stratum IIa is a clay loam former A horizon. Stratum IIb is a naturally deposited silty clay. No historic properties were identified.

4.2.21 Test Excavation 21 (T-21)

T-21 is on the south side of Hālawa Stream in an open-air asphalt parking lot (see Figure 54). The location of T-21 was chosen to target a portion of LCA 2156:2 *lo‘i* and *kula* (pasture) area and ca. 1900 homesteading area. T-21 measures 6.0 m in length by 0.7 m wide with a maximum depth of 1.95 mbs and is oriented north/south.

The stratigraphy observed in T-21 consists of asphalt (Stratum Ia), extremely gravelly loamy sand base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), gravelly clay loam fill (Stratum Id), gravelly sandy loam (Stratum Ie), and gravelly clay loam (Stratum II) (Figure 150 through Figure 153, and Table 25). Strata Ia and Ib are asphalt and base course associated with the current stadium parking lot. Stratum Ic is a fill layer related to grading and leveling during the stadium development. Strata Id and Ie are possible demolition fills. Debris consisting of glass, metal, and milled wood was observed within these layers at the interface with the underlying natural deposit (Stratum II), suggesting prior demolition activity may have disturbed or truncated the natural layer.

The east sidewall of T-21 did not contain Strata Id and Ie. This could be due to geographical location, topography of the area, and or development-related disturbances. No historic properties were identified.

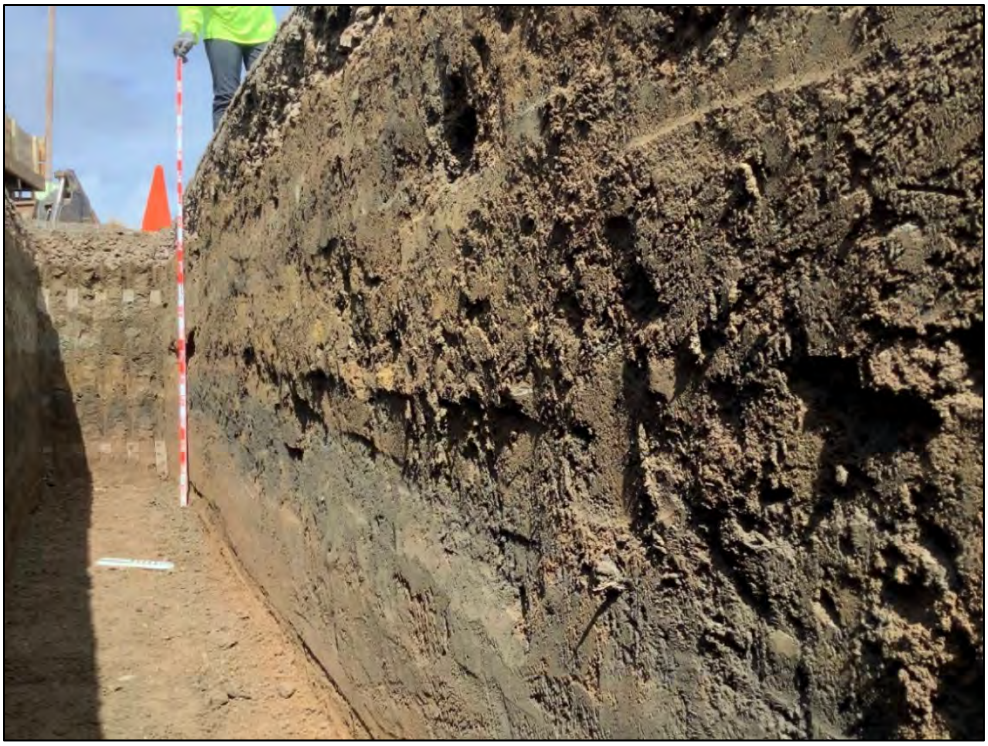


Figure 142. T-19 northwest sidewall; view to west

Figure 143. T-19 southeast sidewall; view to south

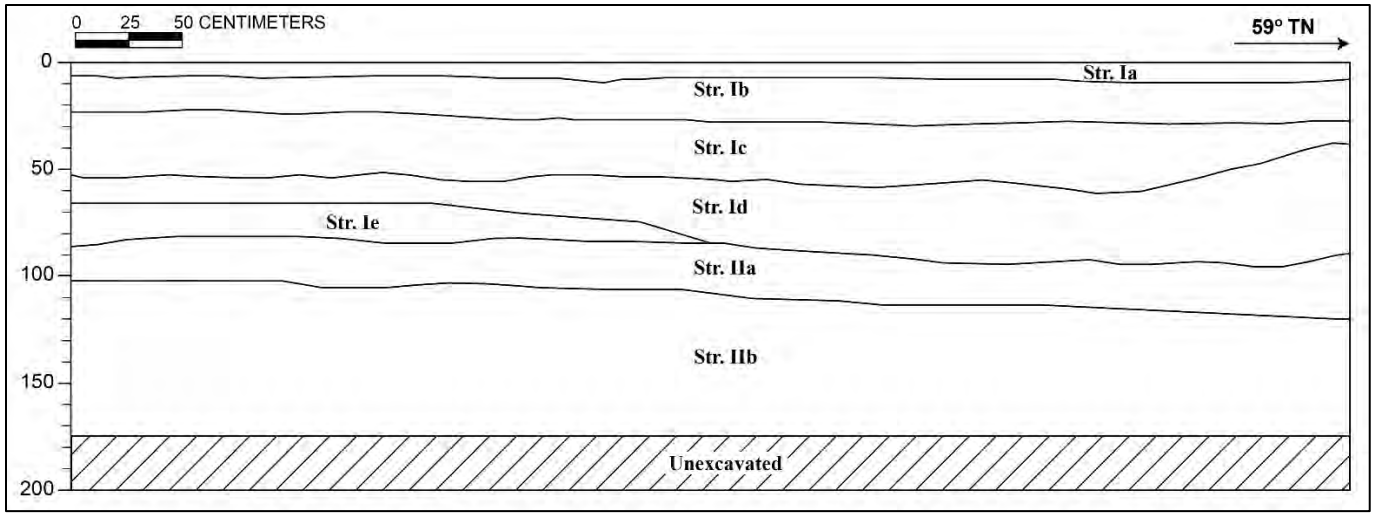


Figure 144. T-19 northwest sidewall profile

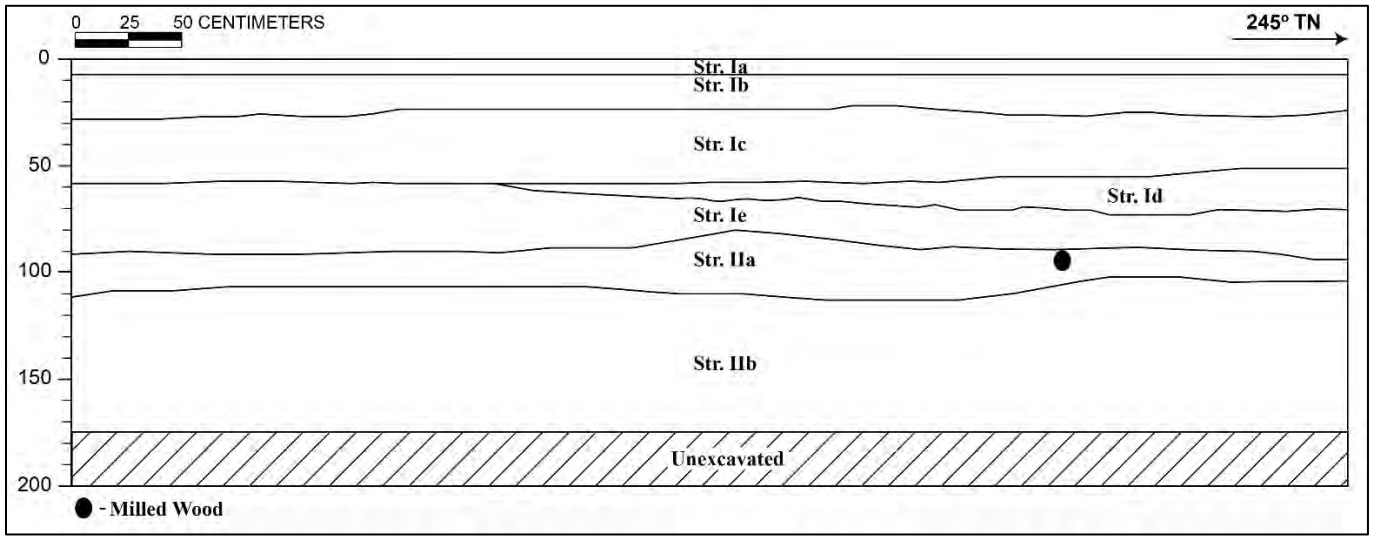


Figure 145. T-19 southeast sidewall profile

Table 23. T-19 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–7	Asphaltic concrete
Ib	7–28	Base course; 10YR 4/2, dark grayish brown; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	28–57	Fill; 10YR 3/3, dark brown; gravelly sandy clay loam; moderate, medium, granular structure; moist, friable consistence; weak cementation; non-plastic; terrigenous origin; no roots observed; clear, smooth lower boundary
Id	52–71	Fill; 10YR 6/2, light brownish gray; cobbly sandy clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; slightly plastic; mixed origin; no roots observed; diffuse, broken lower boundary
Ie	57–90	Fill; 10YR 4/6, dark yellowish brown; gravelly sandy clay loam; moderate, medium, granular structure; moist, firm consistence; no cementation; slightly plastic; mixed origin; no roots observed; clear, smooth lower boundary
IIa	81–113	A horizon; 2.5Y 3/1, very dark gray; clay loam; moderate, fine, granular structure; moist, friable consistence; weak cementation; plastic; terrigenous origin; no roots observed; diffuse, smooth lower boundary
IIb	102–175 (BOE)	Natural; 10YR 3/2, very dark grayish brown; silty clay; weak, fine, granular structure; moist, friable consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

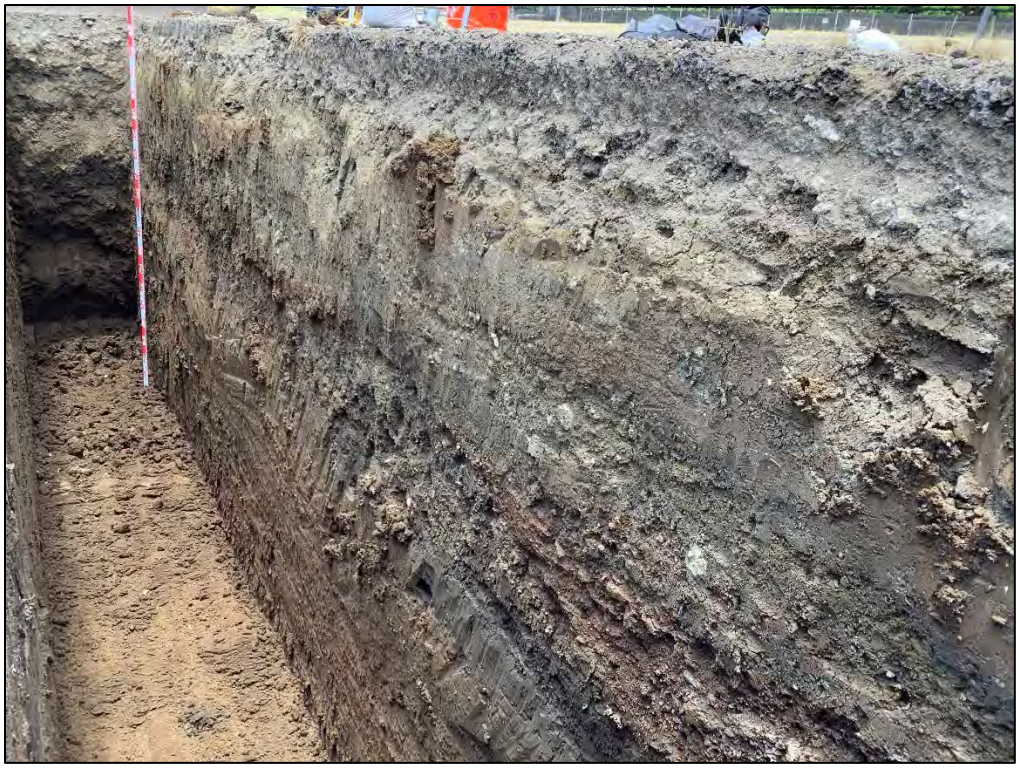


Figure 146. T-20 east sidewall; view to northeast

Figure 147. T-20 west sidewall; view to northwest

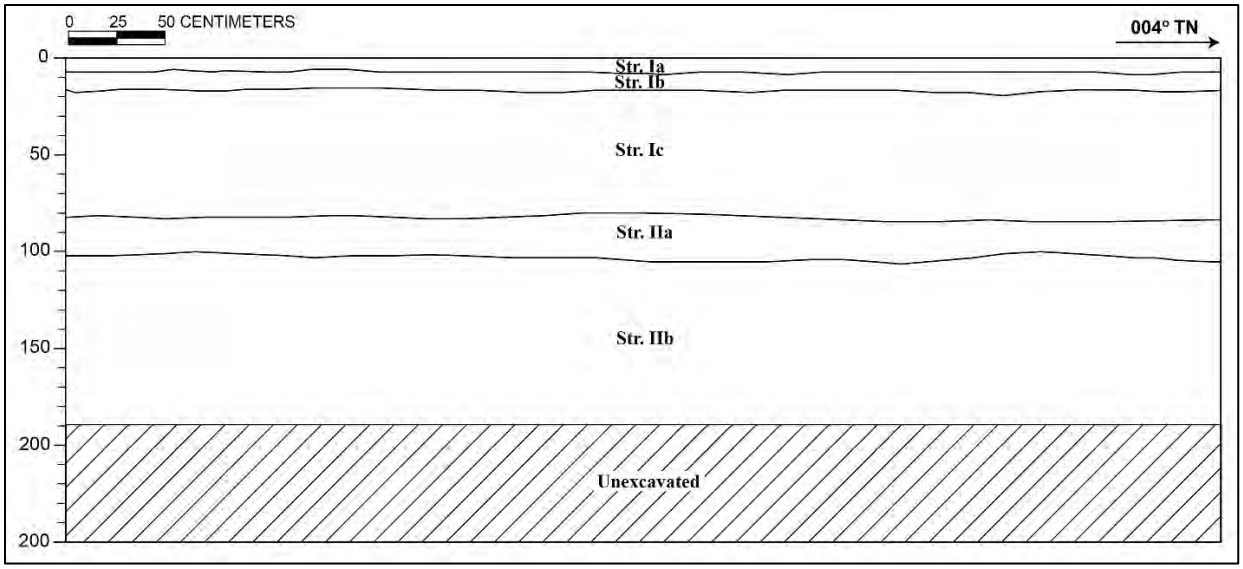


Figure 148. T-20 east sidewall profile

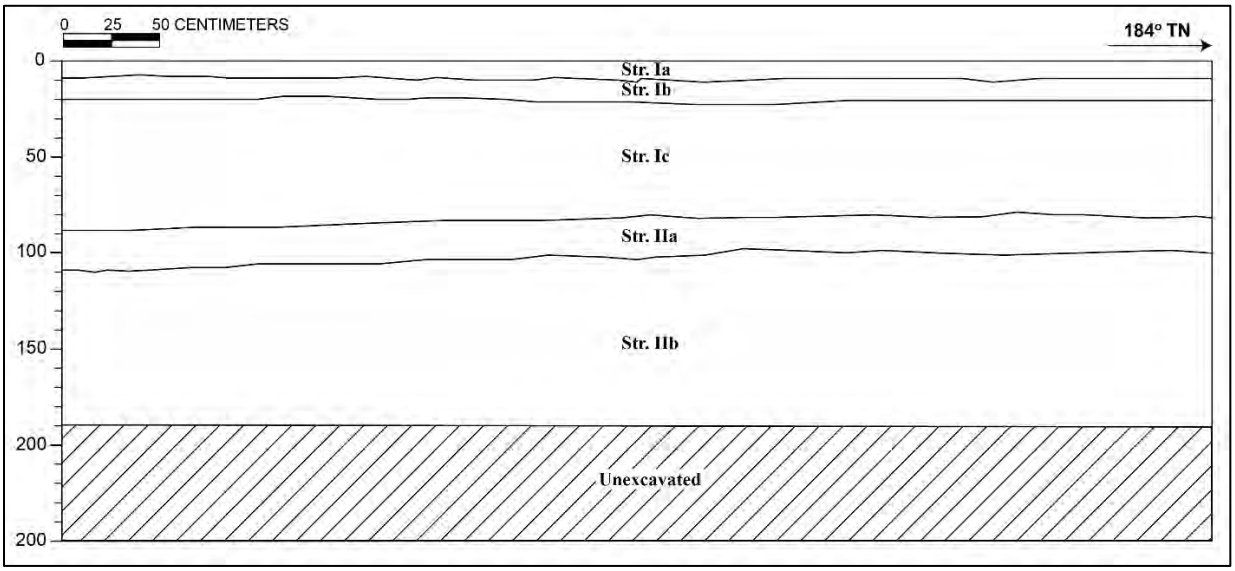


Figure 149. T-20 west sidewall profile

Table 24. T-20 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–9	Asphaltic concrete
Ib	9–20	Base course; 10YR 4/1, dark gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	15–90	Fill; 10YR 6/3, pale brown; gravelly sandy clay loam; moderate, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; mixed origin; no roots observed; very abrupt, smooth lower boundary
IIa	80–110	A horizon; 10YR 3/1, very dark gray; silty clay; strong, fine, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; diffuse, smooth lower boundary
IIb	96–190 (BOE)	Natural; 10YR 4/3, brown; gravelly silty clay loam; strong, fine, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; lower boundary not visible

Figure 150. T-21 east sidewall; view to north

Figure 151. T-21 west sidewall; view to northwest

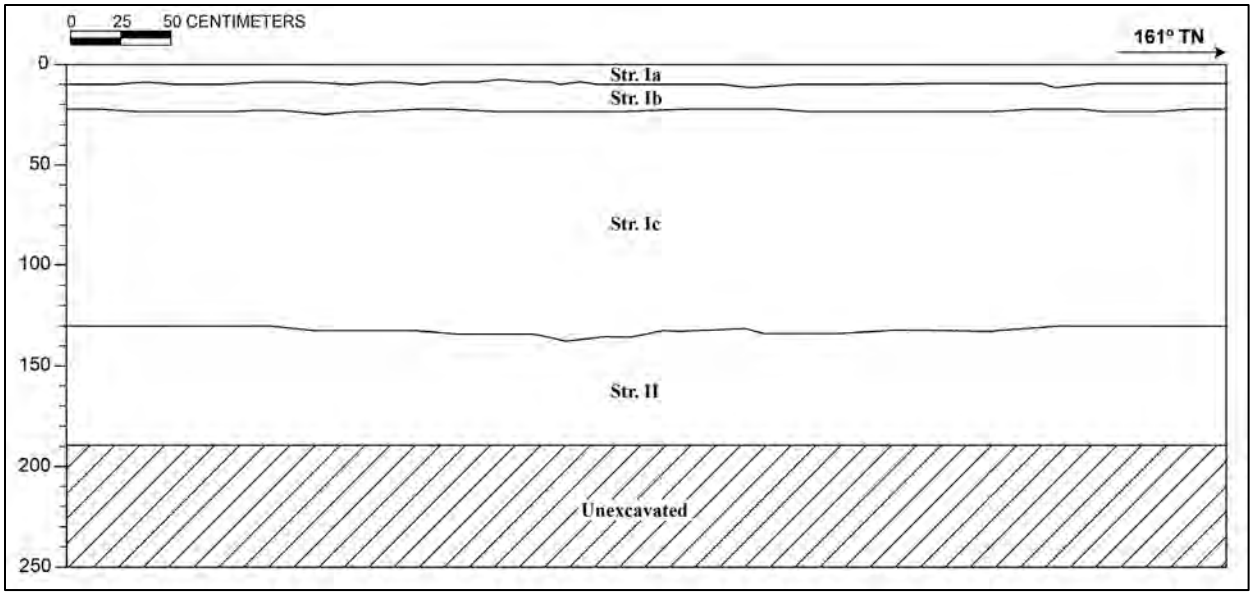


Figure 152. T-21 east sidewall profile

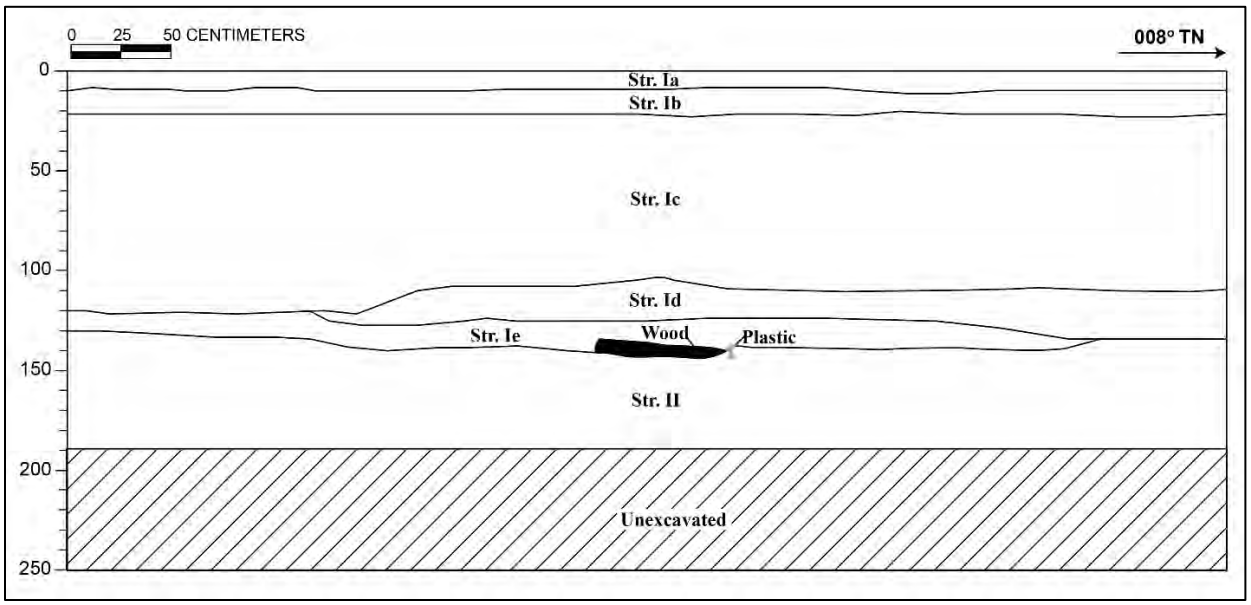


Figure 153. T-21 west sidewall profile

Table 25. T-21 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0–10	Asphaltic concrete
Ib	9–22	Base course; 10YR 4/1, dark gray; extremely gravelly loamy sand; structureless (single-grain); moist, loose consistence; no cementation; non-plastic; terrigenous origin; no roots observed; very abrupt, smooth lower boundary
Ic	20–137	Fill; 10YR 4/4, dark yellowish brown; gravelly clay loam; moderate, medium, blocky structure; moist, firm consistence; no cementation; plastic; terrigenous origin; no roots observed; abrupt, smooth lower boundary
Id	103–135	Fill; 10YR 3/4, dark yellowish brown; gravelly clay loam; moderate, fine, granular structure; moist, friable consistence; no cementation; non-plastic; terrigenous origin; no roots observed; abrupt, broken lower boundary; possible demolition layer containing metal, glass, and milled wood
Ie	120–144	Fill; 10Y 2.5/1, greenish black; gravelly sandy loam; weak, medium, granular structure; moist, friable consistence; no cementation; slightly plastic; terrigenous origin; fine roots common; very abrupt, broken lower boundary; possible demolition layer containing metal, glass, and milled wood
II	135–195 (BOE)	Natural; 10YR 2/1, black; gravelly clay loam; moderate, medium, blocky structure; moist, friable consistence; no cementation; plastic; terrigenous origin; few, medium roots; lower boundary not visible

Figure 154. T-21 close-up of wood and plastic observed in Stratum Ie; view to northwest

Section 5 Results of Laboratory Analysis

Materials collected in the field were curated and analyzed by CSH personnel as described in Section 2. Historical artifacts and faunal osseous remains were analyzed by Allison Hummel, M.Sc. Seven historical artifacts were collected from two of the 21 test excavations (T-19 and T-21), and faunal remains were collected from one of the test excavations (T-13). The artifacts do not represent 100% collection from the project area. Rather, a sample of artifacts was collected with an emphasis on complete artifacts and artifacts with diagnostic traits that could provide information about the history of the area. The artifacts are described in Table 26 and the faunal osseous remains are described in Table 27.

5.1 Artifact Analysis

All seven artifacts collected during the project are historical artifacts, a term used to describe artifacts made using non-traditional Hawaiian methods. These artifacts date to the post-Contact period (post-1778) and were almost certainly deposited post-1850, the date of increased import of goods to the Islands to support the influx of missionaries.

Artifacts were assessed for type, material, origin, and date to the greatest extent possible, but six of the seven artifacts lacked diagnostic characteristics necessary to assess origin or narrow the manufacture date range.

One artifact is a length of corroded metal wire (Acc. # 7; Figure 155), and six of the artifacts are bottle glass fragments (Acc. #s 1–6; Figure 156). Acc. # 1 (Figure 157) was identified as a fragment of an amber glass non-returnable beer bottle with base and heel stippling. After the repeal of Prohibition in 1933, glass bottle manufacturers were confronted with competition in the renewed beer bottle market in the form of the tin can, resulting in the introduction of the non-returnable beer bottle in 1935 (Schulz et al. 2019:1). These bottles were intended to be compact, lightweight, and disposable. Stippling on bottle exteriors was found to both make it more difficult to clean the bottles for unintended reuse, and to reinforce the bottles which had been made thinner to save money (Schulz et al. 2019:12). Owens-Illinois Glass Company created the first stippled bottle base in 1940, and stippled heel bands, often called Murgatroyd belts, first appeared on “Modified Tavern” type non-returnable bottles produced in 1953 (Schulz et al. 2019:3, 19). There were many versions of the non-returnable beer bottle on the market until they were phased out due to changes to bottle deposit laws in the 1970s (Schulz et al. 2019:1). This date is consistent with what is known about the history of the area and deposition of Statum IIa, a clay loam A horizon layer.

5.2 Faunal Analysis

Archaeologists collected faunal osseous remains from a fill deposit within one of the 21 test excavations (T-13), which were identified as cow (*Bos taurus*), a species first introduced to the Islands in 1793 (Henke 1929). The remains show evidence of post-Contact butchering methods, identified by uniform saw mark striations left behind on the cortical bone, indicating they are most likely food refuse.

Table 26. Artifact analysis summary

Provenience	Acc. #	Material	Type	Description	Origin	Age
T-19 Str. IIa 81–112 cmbs (spoils)	1	Glass	Bottle	Amber glass non-returnable beer bottle, base to heel fragment, round shape, flat base, machine-made, stippled base and heel	United States	1953–1971
	2	Glass	Bottle	Amber glass bottle, body fragment, unknown method of manufacture	—	Post-1850
	3	Glass	Bottle	Olive glass bottle, body fragment, unknown method of manufacture	—	Post-1850
T-21 Str. II 130–195 cmbs (spoils)	4	Glass	Bottle	Amber glass bottle, body fragment, unknown method of manufacture	—	Post-1850
	5	Glass	Bottle	Aqua glass bottle, body fragment, unknown method of manufacture	—	Post-1850
	6	Glass	Bottle	Blue aqua glass bottle, body fragment, unknown method of manufacture	—	Post-1850
	7	Metal	Wire	Length of corroded ferrous metal wire	—	Post-1850

Table 27. Faunal analysis summary

Provenience	Species; Mass (grams)	Description
T-13 Str. Ic 24–140 cmbs (spoils)	Cow (*Bos taurus*); 390.9 g	Femur shaft portion, tibia shaft portion, radius shaft section, rib shaft portion and section, subadult vertebra body portion and section, likely scapula sections, long bone shaft fragments (most remains saw-cut)

Figure 155. Acc. #7, ferrous metal wire

Figure 156. Acc. #s 2–6, bottle glass fragments

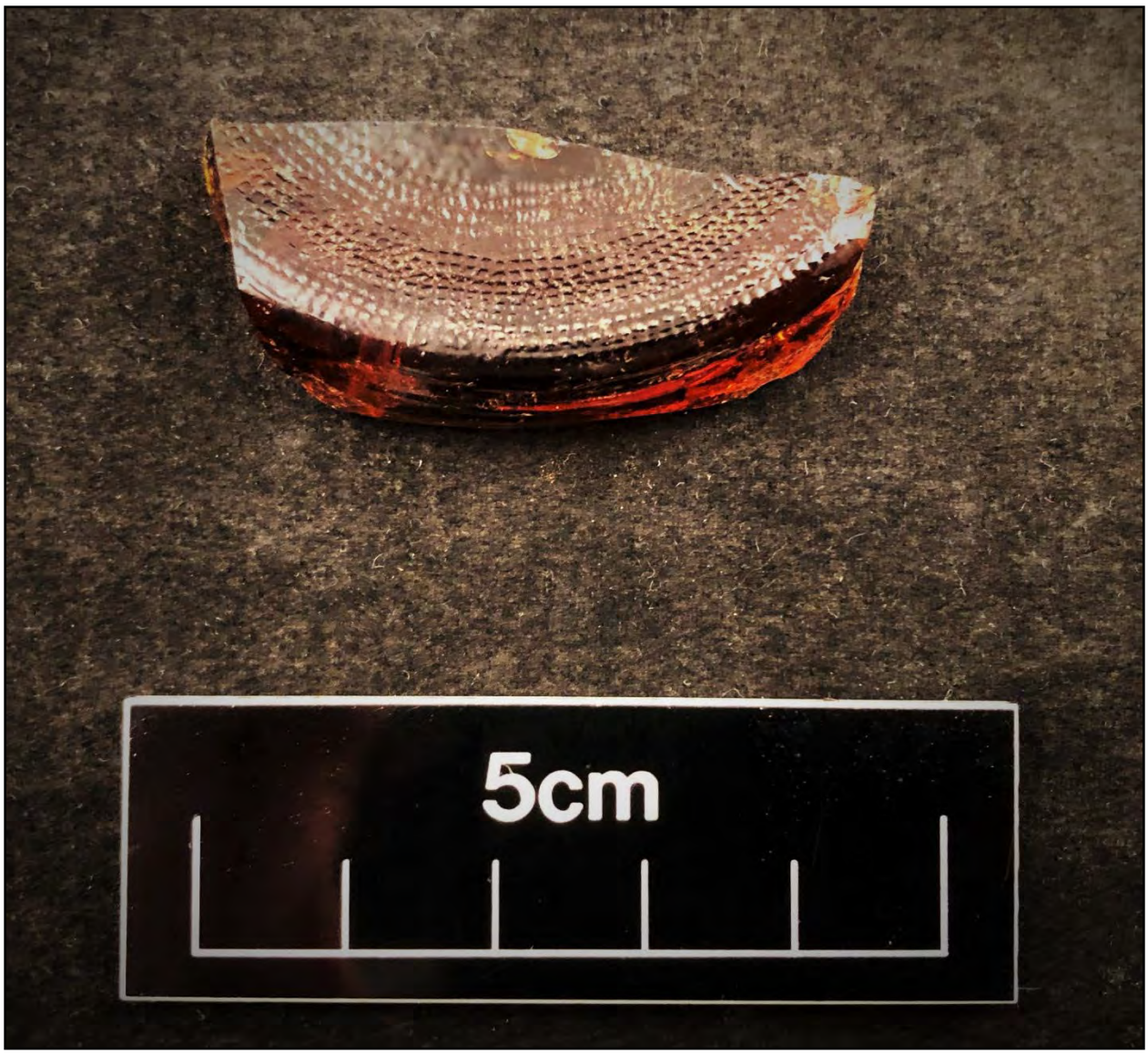


Figure 157. Acc. # 1, machine-made amber glass non-returnable beer bottle fragment with stippled base and heel

Section 6 Summary of the RLS for Aloha Stadium (FAI Architects 2024)

FAI Architects (2024) conducted an architectural RLS for the Aloha Stadium. The following summary is provided. The stadium and associated complex architectural features are located on only TMKs (1) 9-9-003:061 and (1) 9-9-003:069, totaling 87.88 acres. Only these two TMKs were surveyed as part of the RLS. TMKs (1) 9-9-003:055, 070, and 071 were not surveyed as part of the RLS due to an absence of architectural features. For more information on TMKs included in the project, please see the attached RLS. The Aloha Stadium and associated features have been assigned SIHP # 50-80-13-10114.

The RLS documents the Aloha Stadium complex which includes one primary structure, Aloha Stadium, and twelve auxiliary architectural features. The auxiliary features include the three Halawa Stream Bridge structures, four Parking Attendant Booth structures, one Lower Halawa Lot Garage building, two Parking Lot Restroom buildings, and the Perimeter Parking Lot Landscaping site.

Aloha Stadium was designed by Los Angeles architect Charles Luckman and was constructed in 1975 by Hawaiian Dredging and Construction. Auxiliary features also designed by Charles Luckman and constructed in 1975 with the primary stadium structure include the three Halawa Stream Bridges, the four Parking Attendant Booths, and the Perimeter Parking Lot Landscaping. As this survey assumes that demolition will not occur prior to 2025, the Aloha Stadium structure and these auxiliary features are defined as historic properties per HRS §6E-2. The stadium and these features are not listed in the HRHP or NRHP.

The Lower Halawa Lot garage’s date of construction is unknown, and it is not included in the original plans for the stadium. However, the architectural features of the garage suggest that it may have been added to the stadium complex close to or at the time of construction. Since this survey assumes that the garage was added to the stadium complex in 1975, it is defined as a historic property per HRS §6E-2. The Lower Halawa Lot garage is not listed in the HRHP or NRHP.

The Parking Lot Restrooms’ date of construction is unknown, but it was determined from newspaper coverage that the restrooms were constructed sometime after 1983. Thus, the Parking Lot Restrooms are not defined as historic properties per HRS §6E-2. A completed a SIHP Number request form for the Aloha Stadium complex is provided with the RLS.

The RLS report determined that Aloha Stadium is eligible to be listed in the HRHP and NRHP at the state level. Aloha Stadium retains all aspects of historic integrity and historic significance under criteria c/C as a good example of a multipurpose sport stadium built in Hawaii in the 1970s. The Aloha Stadium structure is in good condition and retains moderate to high levels of integrity of location, design, setting, materials, workmanship, feeling, and association.

The three Halawa Stream Bridges are in good condition and retain integrity of location, design, setting, materials, workmanship, feeling, and association. The bridges are not individually eligible for listing on the HRHP and NRHP but are considered contributing resources to the Aloha Stadium complex. The four Parking Attendant Booths are in good condition and retain integrity of location, design, setting, materials, workmanship, feeling, and association. The booths are not individually

eligible for listing on the HRHP and NRHP but are considered contributing resources to the Aloha Stadium complex.

The Lower Halawa Lot Garage is in good condition and retains integrity of location, design, setting, materials, workmanship, feeling, and association. The garage is not individually eligible for listing on the HRHP and NRHP but is considered a contributing resource to the Aloha Stadium complex. The Perimeter Parking Lot Landscaping is in good condition and retains integrity of location, design, setting, materials, workmanship, feeling, and association. The landscaping is not individually eligible for listing on the HRHP and NRHP but is considered a contributing resource to the Aloha Stadium complex.

As a later addition to the Aloha Stadium complex, the two Parking Lot Restrooms are not 50 years old, have not achieved exceptional significance within this time frame, and are not contributing resources to the Aloha Stadium complex.

For more information, please reference the RLS report (FAI Architects 2024) and the data sheet included in the RLS.

Section 7 Summary and Interpretation

At the request of the State of Hawai‘i DAGS, CSH has prepared this AIS for the NASED project, Hālawa Ahupua‘a, ‘Ewa District, O‘ahu, TMKs: (1) 9-9-003:055, 061, 070, and 071.

The project area currently consists largely of paved parking lots with several structures, including the large Aloha Stadium structure. No archaeological historic properties were observed during pedestrian inspection of the project area.

One architectural historic property, Aloha Stadium (SIHP # 50-80-13-10114), was documented in a RLS (FAI Architects 2024). The RLS documents the Aloha Stadium complex which includes one primary structure, Aloha Stadium, and twelve auxiliary architectural features. The auxiliary features include the three Halawa Stream Bridge structures, four Parking Attendant Booth structures, one Lower Halawa Lot Garage building, two Parking Lot Restroom buildings, and the Perimeter Parking Lot Landscaping site. The RLS report determines that Aloha Stadium is eligible to be listed in the HRHP and NRHP at the state level. Aloha Stadium retains all aspects of historic integrity and historic significance under criteria c/C as a good example of a multipurpose sport stadium built in Hawaii in the 1970s. The Aloha Stadium structure is in good condition and retains moderate to high levels of integrity of location, design, setting, materials, workmanship, feeling, and association. 10 of the ancillary structures were determined to not be individually eligible to the HRHP or NRHP, but contributing resources to the Aloha Stadium complex. The two parking lot restrooms were determined to not be 50 years or older, have not achieved exceptional significance within this time frame, and are not contributing resources to the Aloha Stadium complex. Please refer to the RLS (FAI Architects 2024) for additional information.

The subsurface testing program included 21 backhoe-assisted test excavations (each measuring approximately 6.0 m by 0.6 m); this included both geographical representation and specific targeted areas of greater archaeological potential as indicated in the background research. All test excavations were excavated by a backhoe excavator to a terminal depth determined by sterile material or to 6 ft for safety constraints. The test excavation base depth ranged from 1.5 m to 2.05 mbs. One exception was T-9, which had a large drain line running the entire length of the excavation and prevented the excavation from going any deeper.

The general observed stratigraphy from open trenching primarily consists of imported and locally procured fill deposits (Stratum I) and a naturally occurring deposit (Stratum II). In the southern portion of the project area, T-19 and T-20 contained a buried A horizon with minimal historic artifacts. These observations are consistent with the USDA soil data for the project area and its vicinity (Foote et al. 1972). All excavations were backfilled after completion of documentation.

Naturally occurring silty clay, clay, and clay loam was encountered in test excavations around the stadium as well as in the southern portion of the project area. These natural layers were truncated by previous land use and the development of the stadium leaving them culturally sterile.

In the central portion of the project area no naturally occurring soil layers were present. The test excavations in this portion of the project area include T-12, T13, T-15, T-16, T-17, and T-18. Based on these findings, it is likely that the central portion was raised substantially during the development of Aloha Stadium.

To the north of the stadium, natural soil was encountered relatively shallow, suggesting this portion of the project area was graded rather than raised in elevation.

Although no test excavations were conducted within the stadium footprint, the deep excavation is unlikely to have left any intact cultural deposits extant.

Artifacts collected from the project area included an array of glass artifacts with a date range from the mid-nineteenth to mid-twentieth century. Most artifacts collected came from strata associated with fill events related to construction of the parking lot and stadium development. The assemblage most likely represents a twentieth century deposit.

In summary, this AIS documented minimal evidence of former land uses. No evidence of former LCAs or ca. 1900 homesteading areas was observed in any of the test excavations. The area was heavily impacted during the development of Aloha Stadium and it appears any evidence of former land use has been removed or displaced. The buried concrete remnants documented in T-7, T-11, T-13, and T-16 could not be identified as associated with specific former buildings or structures and were possibly related to or displaced by prior development phases of Aloha Stadium. Although no historic properties were identified during the current investigation, caution should still be exercised for any ground disturbance conducted in areas of LCAs within the AIS project area.

Section 8 Project Effect and Mitigation Commitments

8.1 Project Effect

One architectural historic property, Aloha Stadium (SIHP # 50-80-13-10114), was identified in an RLS within the project area (FAI Architects 2024). The Aloha Stadium will be impacted by the first proposed project. Therefore, per HAR §13-275-7, the project-specific effect determination is "Effect, with proposed mitigation commitments" for the first standalone project.

8.2 Mitigation Commitments

The following proposed mitigation commitments per HAR §13-275-8 are designed to mitigate the potential effect on significant historic properties that may be impacted by the proposed project:

- Historical documentation in the form of a Historic American Building Survey (HABS) report to be completed for the Aloha Stadium and donated to the National Archives.
- Historical documentation of the Aloha Stadium to be located within the new stadium and viewable to stadium users. Such documentation should be in the form of approximately ten (10) interpretive panels (or similar) that describe the history of the development of the stadium and the surrounding area, cover the design and moveability features of Aloha Stadium, and feature information on sporting and entertainment events that occurred at Aloha Stadium through maps, drawings, photographs, installations, and narrative.

In addition, due to the proximity of human burials outside the project area and presence of LCAs within the project area, archaeological monitoring is proposed to be conducted for the first proposed project for identification purposes. An archaeological monitoring plan meeting the requirements of HAR §13-279-4 will be submitted to the SHPD for review and acceptance.

Section 9 References Cited

Adams, Bradley and Pamela Crabtree

2008 Comparative Skeletal Anatomy: A Photographic Atlas for Medical Examiners, Coroners, Forensic Anthropologists, and Archaeologists. Humana Press, Totowa, New Jersey.

Aloha Stadium

2019 State of Hawai‘i. Available online at http://alohastadium.hawaii.gov/stadium-info/about/; images : https://alohastadium.hawaii.gov/stadium-info/40-years-of-aloha/attachment/pict0058/#gallery, https://alohastadium.hawaii.gov/stadium-info/40-years-of-aloha/attachment/pict0028/#gallery.

Altizer, Kendy, Nifae Hunkin, Douglas F. Borthwick and Hallett H. Hammatt

2009 Literature Review and Field Inspection Report for the Aiea Intermediate School Erosion Control Project, ‘Aiea Ahupua‘a, ‘Ewa District, O‘ahu TMK: [1] 9-9-005:001. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Athens, J. Stephen, Dean W. Blinn, Caitlin E. Buck, J. Andrés Christen, Robert H. Cowie, Tom Dye, Gail M. Murakami, and Jerome V. Ward

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

Avery, Serge, Peter Brennan, Tim Denham, Joseph Kennedy, and Jerome Ward

1994 Paleoenvironmental Reconstruction Adjacent to the Mouth of Halawa Stream: Monitoring Report of the Waiau-Makalapa No. 2 138 kV Overhead Lines (Phase II) Halawa Ahupua‘a, ‘Ewa District, Island of O‘ahu. Archaeological Consultants of Hawaii, Inc., Hale‘iwa, Hawai‘i.

Barrera, William

1971 Archaeological Site Survey of the Proposed Honolulu Stadium Site at Halawa, O‘ahu. Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu.

Beasley, T.D.

1899 *Oahu, Hawaiian Islands*. Compiled from maps of government surveys and other reliable sources. Britton & Ray, San Francisco, California.

BLM/SHA (Bureau of Land Management/Society for Historical Archaeology)

2021 Historic Glass Bottle Identification & Information Website. Electronic document, www.sha.org/bottle/index.htm.

Bureau of Conveyance

1862 Deed of Halawa Lands to Manuel Paiko. BC. Liber (Land Record Books) 9:174–179. Bureau of Conveyances, Territory of Hawaii: Commissioner of Public Lands, Honolulu.

1879 Deed of Halawa from Fanny Na‘ea to Emma Rooke. BC, Liber (Land Record Books) 59:285. Bureau of Conveyances, Territory of Hawaii: Commissioner of Public Lands, Honolulu.

1888 Partition of North and South Halawa. BC, Liber (Land Record Books) 113:14–17. Bureau of Conveyances, Territory of Hawaii: Commissioner of Public Lands, Honolulu.

Cluff, Deborah

1970 The Archaeological Survey of a Portion of Halawa Interchange, FAP No. 1-H1-1 (41), Halawa, O‘ahu Island. Department of Land and Natural Resources, Honolulu.

Cochrane, Ethan and J. Stephen Athens

2000 Archaeological Monitoring for Job No. 82050: Bilge and Oily Waste Water Collection Facilities, Phase I. International Archaeological Research Institute, Inc., Honolulu.

Condé, Jesse C. and Gerald M. Best

1973 *Sugar Trains: Narrow Gauge Rails of Hawai‘i*. Glenwood Publishers, Felton, California.

Coulter, John Wesley and Chee Kwon Chun

1937 *Chinese Rice Farmers in Hawaii.* UH Research Publications Number 16. University of Hawai‘i, Honolulu.

Crawford Architects

2022 *New Aloha Stadium Entertainment District Programmatic Master Plan*. Crawford Architects LLC, Kansas City, Missouri.

Davis, Bertell D.

1990 Archaeological Assessment of Proposed Developments at the U.S. Naval Base, Pearl Harbor, O‘ahu, Hawaii. International Archaeological Research Institute, Inc., Honolulu.

Donn, John M.

1906 *Oahu, Hawaiian Islands.* Registered Map 2374. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at http://dags.hawaii.gov/survey/search.php

Dorrance, William H. and Francis S. Morgan

2000 Sugar Islands: The 165-Year Story of Sugar in Hawaii. Mutual Publishing, Honolulu.

Dye, Thomas

1999 Completion of Archaeological Resources Survey Hālawa Bridge Replacement EA, Hālawa, ‘Ewa, O‘ahu TMK 9-9-01:1, 9-9-02:04; 9-9-03:26, 29 and 56. International Archaeological Research Institute, Inc., Honolulu.

Erkelens, Conrad

1995 Archaeological Study of the Proposed Ford Island Golf Park and Saratoga Boulevard Relocation, Ford Island Bridge Project, O‘ahu, Hawai‘i. International Archaeological Research Institute, Inc., Honolulu.

FAI Architects

2024 *Reconnaissance Level Survey for Aloha Stadium*. FAI Architects, Honolulu.

Florida Museum of Natural History

2020 Historical Archaeology Digital Type Collections (historic ceramics). Electronic document, www.flmnh.ufl.edu/histarch.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens

1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the University of Hawai‘i Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham

1917 *Fornander Collection of Hawaiian Antiquities and Folk-Lore,* Vol. IV, Part III. Bishop Museum Press, Honolulu.

1919 *Fornander Collection of Hawaiian Antiquities and Folklore*. T.G. Thrum, editor. Memoirs of the Bernice Pauahi Bishop Museum (Vol. V, Part II). Bishop Museum Press, Honolulu.

France, Diane L.

2009 *Human and Nonhuman Bone Identification: A Color Atlas.* Taylor & Francis Group, Boca Raton, Florida.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte

2013 Online Rainfall Atlas of Hawai‘i. *Bulletin of the American Meteorological Society volume 94, pp. 313-316, doi: 10.1175/BAMS-D-11-00228.1.* Electronic document, http://rainfall.geography.hawaii.edu (accessed 26 February 2020).

Google Earth

2017 Aerial Photograph of Hawai‘i. Google Inc., Mountain View, California. Available online at www.google.com/earth.html.

Hammatt, Hallett H., David W. Shideler, and Matthew McDermott,

2013 *Archaeological Inventory Survey for the Airport Section (Construction Section 3) of the Honolulu High-Capacity Transit Corridor Project, Hālawa and Moanalua Ahupua‘a, ‘Ewa and Honolulu Districts, Island of O‘ahu TMK Sections [1] 1-1 and 9-9 (Various Plats and Parcels)* Volumes 1 and 2. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Hammatt, Hallett H. and John Winieski

1994 *Archaeological Reconnaissance Survey of Proposed Halawa Well, Halawa, ‘Ewa, O‘ahu (TMK 9-9-03:35).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Handy, E.S. Craighill and Elizabeth Green Handy

1972 *Native Planters in Old Hawai‘i Their Life, Lore, and Environment.* Bishop Museum Press, Honolulu.

Hawai‘i State Archives

1939 U.S. Army Air Corps aerial photograph. Hawai‘i State Archives, Honolulu.

Hawai‘i TMK Service

2019 Tax Map Key [1] 9-9-003. Hawai‘i TMK Service, Honolulu.

HDOT (Hawai‘i Department of Transporation)
1933 Engineering map. HDOT, Honolulu.

Henke, Louis Albert
1929 *A Survey of Livestock in Hawaii.* University of Hawaii Research Publication No. 5, Honolulu.

Higuchi, Pauline
2003 *‘Aiea Oral History Project.* Aiea Community Association, Aiea, Hawai‘i.

Honolulu Sugar Company
1900-1925 Honolulu Sugar Company map. Registered Map 2643. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at http://dags.hawaii.gov/survey/search.php

Hunkin, Nifae and Hallett H. Hammatt
2008 *Archaeological Monitoring Report for the Target/Bougainville Redevelopment Project (Former Costco Wholesale Property) Hālawa Ahupua‘a, ‘Ewa District, O‘ahu Island TMK [1] 9-9-071:013-029.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

‘Ī‘ī, John Papa
1959 *Fragments of Hawaiian History*. Mary Pukui, translator. Bishop Museum Press, Honolulu.

Interior Department Letters
1878/1879 Table of Konohiki Lands, on the Island of O‘ahu. *Document No. 15.* U.S., Department of the Interior, Washington, D.C., 9 February. Copy available at Hawai‘i State Archives, Honolulu.

Kamakau, Samuel M.
1961 *Ruling Chiefs of Hawai‘i*. Kamehameha Schools Press, Honolulu.

1964 *Ka Po‘e Kahiko: The People of Old*. Bishop Museum Press, Honolulu.

1991 *Nā Mo‘olelo a ka Po‘e Kahiko: Tales and Traditions of the People of Old.* Bishop Museum Press, Honolulu.

Kame‘eleihiwa, Lilikalā
1992 *Native Land and Foreign Desires: Pehea Lā E Pono Ai?* Bishop Museum Press, Honolulu.

1996 *A Legendary Tradition of Kamapua‘a, the Hawaiian Pig-God.* Bishop Museum Special Publication 89. Bernice Pauahi Bishop Museum, Honolulu.

Kekūanaō‘a, Mataio
1852 Letter to Minister of Interior, Keoni Ana. Interior Department Land Letters (Incoming). Letter of August 12. Hawai‘i State Archives, Honolulu.

Klieger, Paul Christiaan
1995 *Nā Maka o Hālawa: A History of Hālawa Ahupua‘a, O‘ahu*. Bishop Museum Technical Report 7. Bishop Museum Press, Honolulu.

Kotzebue, Otto von

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

Lyons, C.J.

1873 *Pearl River.* Registered Map 1639. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at http://dags.hawaii.gov/survey/search.php

1874 Map of Aiea. Registered Map 323. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at http://dags.hawaii.gov/survey/search.php

Maryland Archaeological Conservation Lab

2018 *Maryland Archaeological Conservation Laboratory.* Maryland Department of Planning, Jefferson Patterson Park & Museum website. Available online at http://www.jefpat.org/mac_lab.html.

McAllister, J. Gilbert

1933 *Archaeology of Oahu*. Bishop Museum Bulletin 104. Bishop Museum Press, Honolulu.

Monsarrat, M.D.

1888 Map of Halawa. Registered Map 1687. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at http://dags.hawaii.gov/survey/search.php

Munsell

2000 *Munsell Soil Color Chart.* Revised edition. Kollmorgen Instruments Corporation, New York.

Murabayashi, Krickette, Elaine H.R. Jourdane, and Thomas S. Dye

2013 *Historic Properties Assessment for the Proposed VZW HON Red Hill Telecommunications Facility Hālawa Ahupua‘a, ‘Ewa District, O‘ahu Island, TMK: (1) 9–9–074:019.* T.S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

Napoka, Nathan

1994 *Determination of Historic Significance of Pohaku O Kii State Site No. 50-80-09-489: A Traditional Cultural Property of Nalopaka Place, Aiea, ‘Ewa, O‘ahu.* State Historic Preservation Division, Department of Land and Natural Resources, State of Hawai‘i, Honolulu.

Newton and Chaney

1921 Aiea Makai map. Registered Map 2677. Hawai‘i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at http://dags.hawaii.gov/survey/search.php

Omandam, Pat

1997 H-3, Rocky Road. *Honolulu Star-Bulletin*, 4 December.

Pang

2002 Article. *Honolulu Star-Bulletin*, 12 June.

Pukui, Mary Kawena and Samuel H. Elbert

1986 *Hawaiian Dictionary*. University of Hawaii Press, Honolulu.

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

1974 *Place Names of Hawaii*. University of Hawaii Press, Honolulu.

Schmitt, Robert C.

1973 The Missionary Censuses of Hawai‘i. *Pacific Anthropological Records* No. 20. Bernice Pauahi Bishop Museum, Honolulu.

1977 *Historical Statistics of Hawai‘i*. University of Hawaii Press, Honolulu.

Schulz, Pete, Bill Lockhart, Carol Serr, Bill Lindsey, and Beau Schriever

2019 *A History of Non-Returnable Beer Bottles.* Electronic document, https://sha.org/bottle/pdffiles/NRBeers.pdf.

Shideler, David W. and Scott A. Belluomini

2021 *Archaeological Inventory Survey Testing Strategy for the New Aloha Stadium Entertainment District (NASED), Hālawa Ahupua‘a, ‘Ewa District, O‘ahu, Tax Map Key (TMK): [1] 9-9-003:055, 061, 070, and 071.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sinoto, Akihiko

1986 *Archaeological Surface Survey of the Proposed Pearl Promenade, Kalauao, Ewa, Oahu.* Anthropology Department, Bernice Pauahi Bishop Museum, Honolulu.

Sroat, Ena M., Douglas Thurman, and Matthew McDermott

2012 *Archaeological Inventory Survey for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor Project, Waiawa, Mānana, Waimano, Waiau, Waimalu, Kalauao, ‘Aiea, and Hālawa Ahupua‘a, ‘Ewa District, Island of O‘ahu TMK: [1] 9-7, 9-8, and 9-9 (Various Plats and Parcels).* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

Sterling, Elspeth P. and Catherine C. Summers

1978 *Sites of O‘ahu*. Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu.

Thrum, Thomas G.

1906 *Hawaiian Almanac and Annual for 1907*. Thomas G. Thrum, Honolulu.

Turran, Tyler, David W. Shideler, and Hallett H. Hammatt

2020 *Archaeological Literature Review and Field Inspection for the New Aloha Stadium Entertainment District (NASED) Project, Hālawa Ahupua‘a, ‘Ewa District, O‘ahu, Tax Map Key (TMK): [1] 9-9-003:055, 061, 070, and 071.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

U.S. Army War Department

1919 U.S. Army War Department fire control map of Oahu, Pearl Harbor quadrangle. USGS Information Services, Denver, Colorado.

1935 U.S. Army War Department terrain map, Waipahu quadrangle. USGS Information Services, Denver, Colorado.

1943 U.S. War Department terrain map, Aiea quadrangle. USGS Information Services, Denver, Colorado.

USDA (U.S. Department of Agriculture)

2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/ (accessed March 2005).

USGS (U.S. Geological Survey)

1952 USGS aerial photograph. (UH MAGIS) (http://guides.library.manoa.hawaii.edu/magis).

1953 Puuloa USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

1954 Waipahu USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

1968 Puuloa and Waipahu USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

1968 USGS aerial photograph. (UH MAGIS) (http://guides.library.manoa.hawaii.edu/magis).

1998 Waipahu USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

1999 Pearl Harbor USGS 7.5-minute series topographic quadrangle. USGS Information Services, Denver, Colorado.

2011 USGS Orthoimagery (aerial photograph). USGS Information Services, Denver, Colorado.

Valeri, Valerio

1985 *Kingship and Sacrifice: Ritual and Society in Ancient Hawai‘i.* University of Chicago Press, Chicago, Illinois.

Waihona ‘Aina

2022 *The Māhele Database*. Electronic document, http://waihona.com (accessed 10 April 2014).

Watson, Trisha K., Kepā Maly, Julie Au, and Kulani E. Boyne

2020 *Cultural Impact Assessment Report for the New Aloha Stadium Entertainment District Hālawa and ‘Aiea Ahupua‘a, ‘Ewa District, O‘ahu Island, TMKs: [1] 9-9-003:061, [1] 9-9-003:055, [1] 9-9-003:070, and [1] 9-9-003:071*. Honua Consulting, LLC. Honolulu.

Williams, Scott

1993 *End of Field Summary for Monitoring and Testing of CTO-039 Trenching at Pearl Harbor, O‘ahu, Hawai‘i.* Ogden Environmental and Energy Services, Inc., Honolulu.

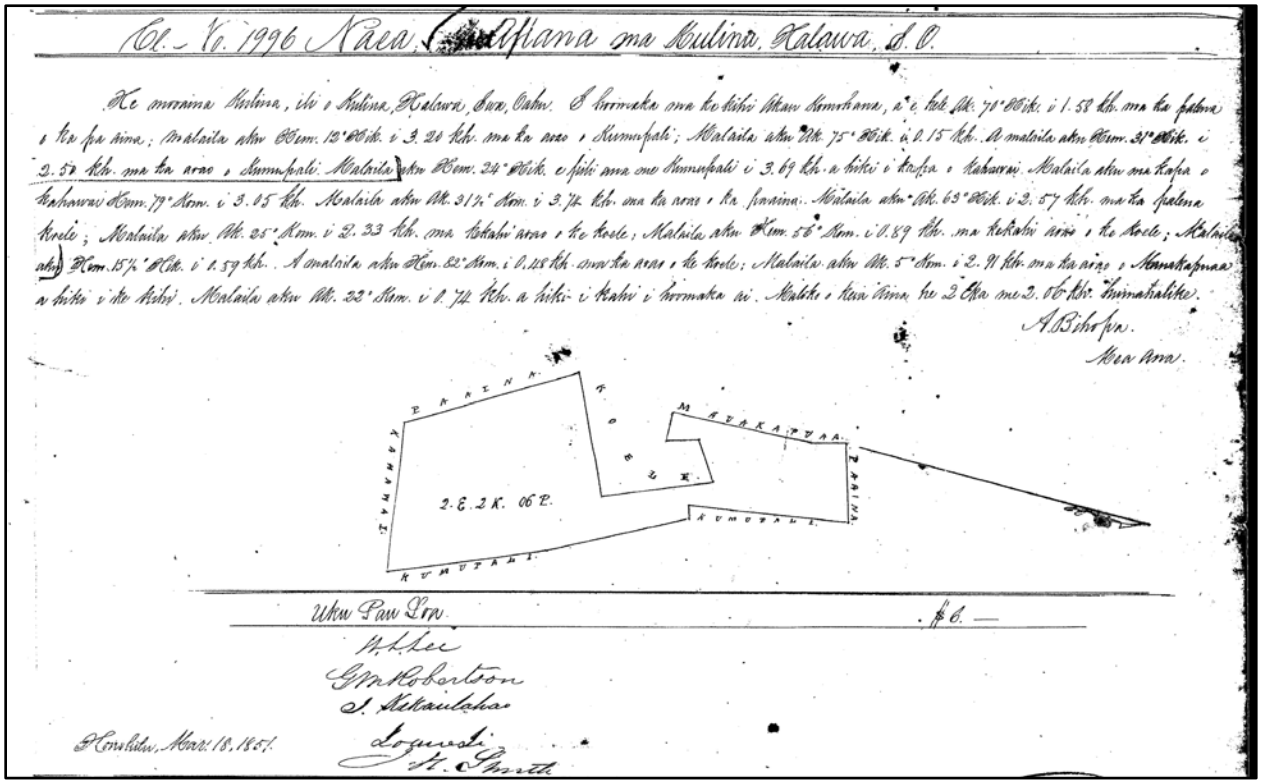
1994 *Results of Subsurface Archaeological Investigation at Pearl Harbor*. Ogden Environmental and Energy Services, Inc., Honolulu.

Yent, Martha and Jason Ota

1981 *Memorandum re Rainbow Bay Reconnaissance Report.* State of Hawai‘i Department of Land and Natural Resources, Honolulu.

Appendix A LCA Data

LCA 1996 to Naea



Cl. No. 1996 Naea Apana ma Kulina, Halawa. E.O.

He mooaina Kulina, ili o Kulina, Halawa, Ewa, Oahu. E hoomaka ma ke kihi akau komohana, a e hele aku 70º Hik. i 1.58 k.h. ma ka palena o ka pa aina; malaila aku Hem. 12º Hik. i 3.20 k.h. ma ka aoao o Kumupali; Malaila aku Ak. 75º Hik. i 0.15 k.h. a malaila aku Hem. 31º Hik. i 2.5 k.h. ma ka aoao o Kumupali. Malaila aku Hem. 24º Hik. e pili ana me Kumupali i 3.69 k.h. a hiki i kapa o kahawai. Malaila aku ma kapa o kahawai Hem. 79º Kom. i 3.05 k.h. Malaila aku Ak. 31 1/2º Kom. i 3.74 k.h. ma ka aoao o ka paaina. Malaila aku Ak. 63º Hik. i 2.57 k.h. ma ka palena koele; Malaila aku Ak. 25º Kom. i 2.33 k.h. ma kekahi aoao o ke koele; Malaila aku Hem. 56º Kom. i 0.89 k.h. ma kekahi aoao o ke koele; Malaila aku Hem. 15 1/2º Hik. i 0.59 k.h. A malaila aku Hem. 82º Kom. i 0.48 k.h. ma ka aoao o ke koele; Malaila aku Ak. 5º Kom. i 2.91 k.h. ma ka aoao o Manakapuaa a hiki i ke kihi. Malaila aku Ak. 22º Kom. i 0.74 k.h. a hiki i kahi i hoomaka ai. Maloko o keia aina he 2 Eka me 2.06 k.h. huinahalike.

A. Bihopa

Mea ana

[Diagram in Original]

Uku Pau Loa $6.—
W.L. Lee
G.M. Robertson
J. Kekaulahao
Honolulu Mar. 18, 1851 *Ioane Ii*
J.H. Smith

Translation:

Cl. No. 1996 Naea land division in Kulina, Hālawa. E.O.

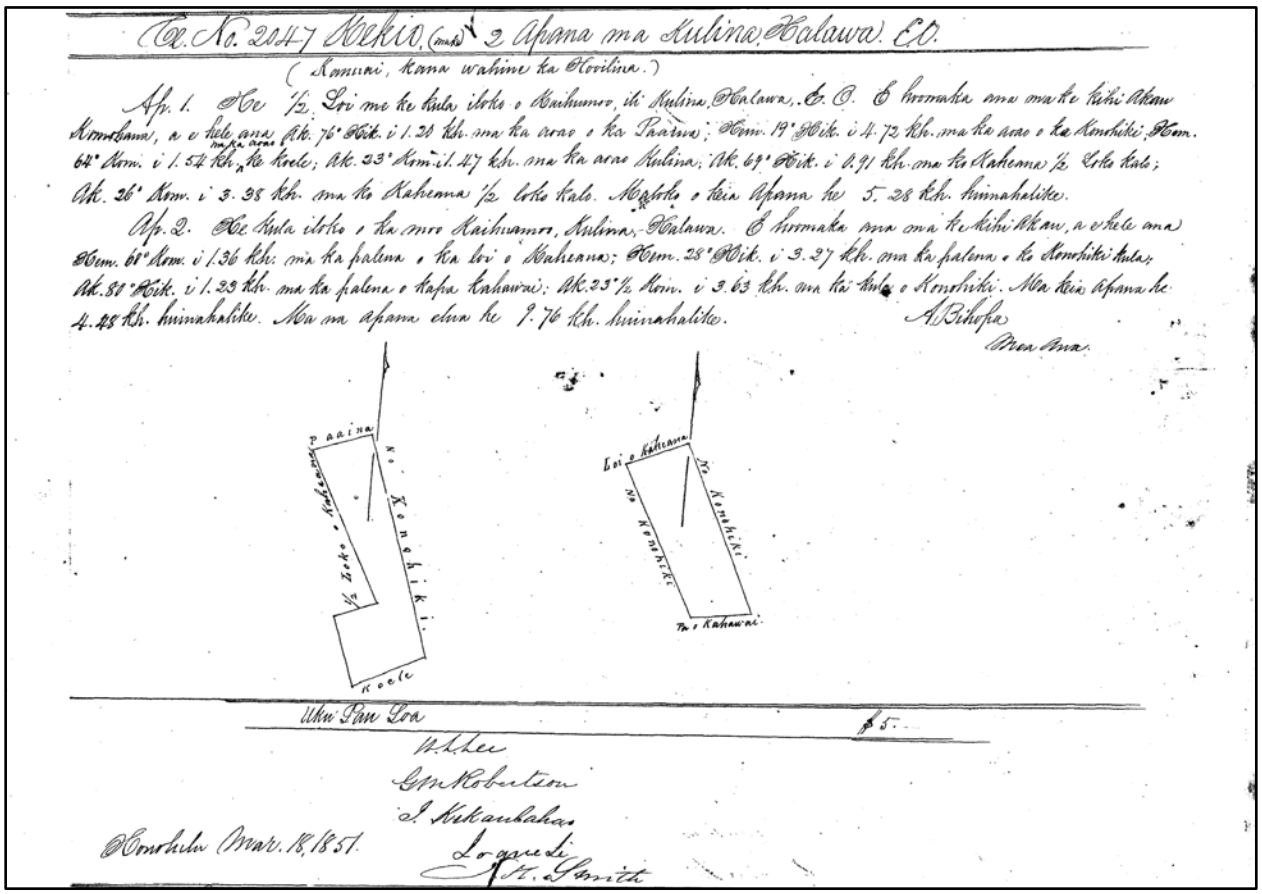
This is a land parcel of Kulina, in the land section of Kulina, Hālawa, Ewa, O‘ahu. Begin at the northwestern corner, and proceed 70º, 104.28 feet east at the boundary of the fenced land; from there go 12º south and 211.2 feet east upon the boundary of Kumupali. Proceed north 75º, east 9.9 feet and then proceed south 31º, east 165 feet upon the boundary of Kumupali. From there go south 24º, 243.54 feet east on the border of Kumupali, until reaching the boundary of the river. From there, upon the boundary of the river, proceed south 79º and west 201.3 feet. Then proceed north 31 1/2º, and west 246.84 feet upon the border of the fenced land. Proceed north 63º, and east 169.62 feet upon the boundary of the *kō‘ele*, land farmed for the chief. Then, proceed north 25º, west 153.78 feet upon one of the borders of the *kō‘ele*. Proceed south 56º, and west 58.74 feet upon one border of the *kō‘ele*. Then proceed south 15 1/2º and east 38.94 feet, then south 82º and west 31.68 feet upon the side of the *kō‘ele*. Then, proceed north 5º, west 192.06 feet upon the border of Manakapuaa until the corner. Then proceed north 22º, west 48.84 feet until the beginning corner. Within this land division is two acres and 135.96 square feet.

A. Bishop.

Surveyor

Total Cost $6.—
W.L. Lee
G.M. Robertson
J. Kekaulahao
Honolulu Mar. 18, 1851 John ‘Ī‘ī
J.H. Smith

LCA 2047 to Kekio



Cl. No. 2047 Kekio, (make) 2 Apana ma Kulina, Halawa. E.O.

(Kanuai, kana wahine Ka Hoolina.)

Ap.1 He 1/2 Loi me ke kula iloko o Kaihumoo, ili Kulina, Halawa, E.O. E hoomaka ana ma ke kihi akau Komohana, a e hele ana Ak. 76° Hik. i 1.20 kh. ma ka aoao o ka Paaina; Hem. 19° Hik. i 4.72 kh. ma ka aoao o ke Konohiki; Hem. 64° Kom. i 1.54 kh. ma ka aoao o ke koele; Ak. 23° Kom. i 1.47 kh. ma ka aoao Kulina; Ak. 69° Hik. i 0.91 kh. ma ko Kaheana 1/2 Loko kalo; Ak. 26° Kom. i 3.38 kh. ma ko Kaheana 1/2 loko kalo. Maloko o keia apana he 5.28 kh. huinahalike.

Ap. 2 He kula iloko a ka moo Kaihuamoo, Kulina, Halawa. E hoomaka ana ma ke kihi akau, a e hele ana Hem. 68° Kom. i 1.36 kh. ma ka palena o ka loi o Kaheana; Hem. 28° Hik. i 3.27 kh. ma ka palena o ko Konohiki Kula; Ak. 80° Hik. i 1.23 kh. ma ka palena o kapa Kahawai; Ak. 23 1/2 º Kom. i 3.63 kh. ma ka kula o Konohiki. Ma keia apana he 4.48 kh. huinahalike. Ma na apana elua he 9.76 kh. huinahalike. A.Bihopa

Mea Ana.

[Diagram in Original]

[Text in Diagram: *Paaina, No Konohiki, Koele, 1/2, Loko o Kaheana, Loi o Kaheana, No Konohiki, Pa o Kahauai, No Konohiki]*

Uku Pau Loa $5.—

W.L Lee

G.M. Robertson

J. Kekaulahao

Honolulu Mar. 18, 1851 Ioane Ii

J.H. Smith

Translation:

Cl. No. 2047 Kekio, (make) Two land divisions in Kulina, Hālawa. E.O.

(Kanuai, his wife, is the recipient.)

Division One. This is 1/2 of an irrigated terraced garden with a field within Kaihumoo, land section of Kulina, Hālawa, E.O. Begin at the northwestern corner and proceed north 76º and east 79.2 feet at the boundary of the fenced land. Then proceed south 19º and east 311.52 feet upon the boundary of the *konohiki*, the land manager. Proceed south 64º and east 101.64 feet upon the boundary of the *kō ʻele*, the land farmed for the chief. Then, go north 23º and west 97.02 feet upon the boundary Kulina. Then proceed north 69º and east 60.06 feet upon Kaheana's 1/2 taro pond. Then proceed north 26º and west 223.08 feet upon Kaheana's 1/2 taro pond. Within this division there are 348.48 square feet.

Division Two. A field within the strip of land Kaihuamoo, Kulina, Hālawa. Begin at the northern corner and proceed south 68º and west 89.76 feet upon the border of the irrigated terraced garden of Kaheana. Then proceed south 28º and east 215.82 feet on the border of the field of the *konohiki.* Proceed north 80º and east 81.18 feet upon the boundary of the river, then go north 23 1/2 º and west 239.58 feet upon the field of the *konohiki*. In this division there are 295.68 square feet. Within the two divisions there are 644.16 square feet.

A. Bishop.

Surveyor.

Total Cost $5.

W.L. Lee

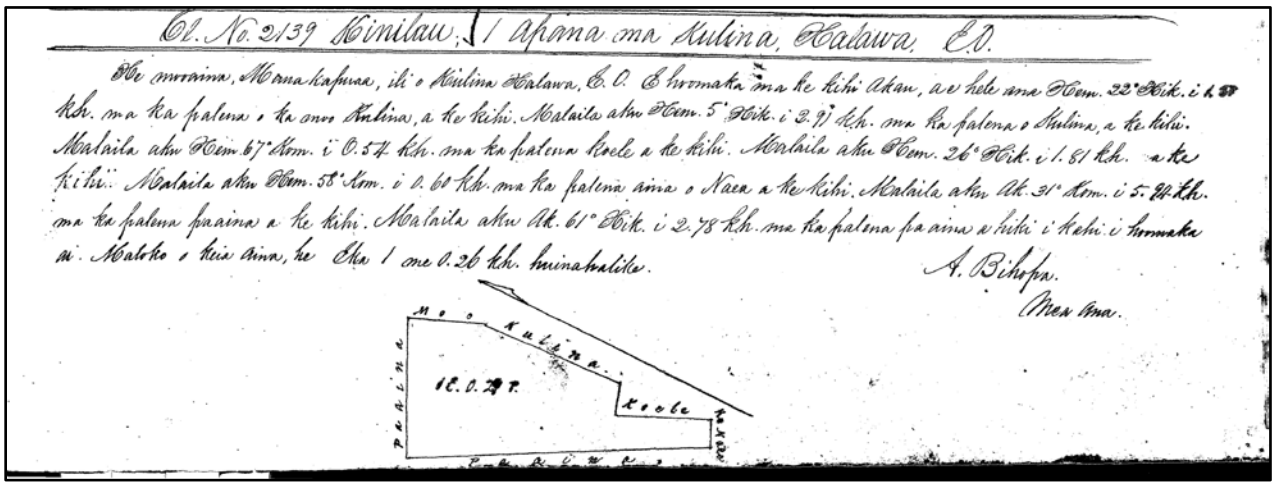
G.M. Robertson

J. Kekaulahao

Honolulu, Mar. 18, 1851 Ioane ʻĪʻī

J.H. Smith

LCA 2139 to Kinilau



Cl. No. 2139 Kinilau; 1 Apana ma Kulina, Halawa. E.O.

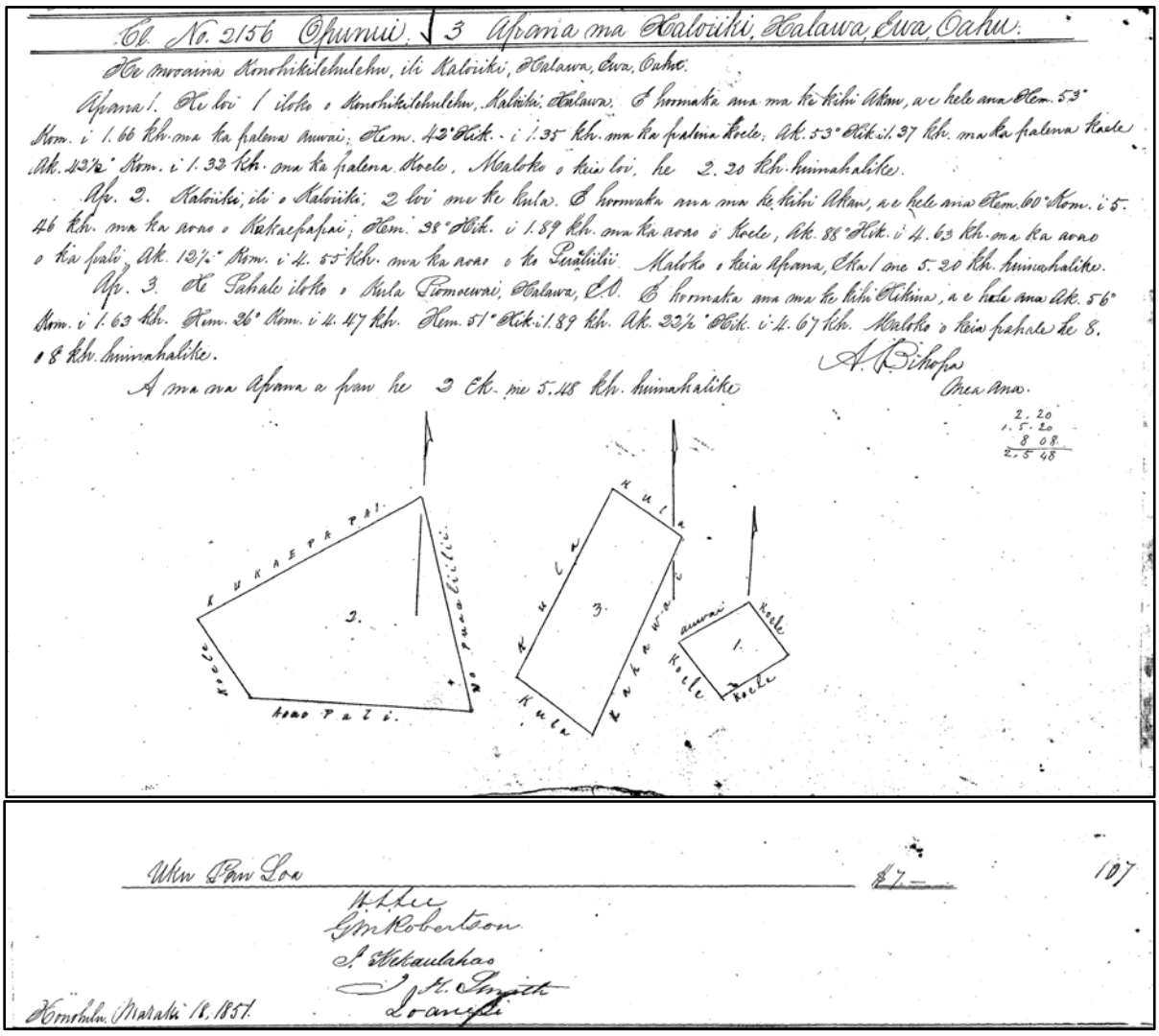
He mooaina, Manakapuaa, ili o Kulina Halawa, E.O. E hoomaka ma ke kihi Akau, a e hele ana Hem. 22º Hik. i 1.50 kh. ma ka palena o ka moo Kulina, a ke kihi. Malaila aku Hem. 5º Hik. i 2.91 kh. ma ka palena o Kulina, a ke kihi. Malaila aku Hem. 67º Kom. i 0.54 kh. ma ka palena koele a ke kihi. Malaila aku Hem. 26º Hik. i 1.81 kh a ke kihi. Malaila aku Hem. 58º Kom. i 0.60 kh. ma ka palena aina o Naea a ke kihi. Malaila aku Ak. 31º Kom. i 5.94 kh. ma ka palena paaina a ke kihi. Malaila aku Ak. 61º Hik. i 2.78 kh. ma ka palena pa aina a hiki i kahi i hoomaka ai. Maloko o keia aina, he Eka 1 me 0.26 kh. huinahalike. A.Bihopa
Mea Ana.

[Diagram in Original]
[Text in Diagram: *Moo Kulina, Koele, Ko Naea, Paaina, Paaina]*

Translation:

Cl. No. 2139 Kinilau; One land division in Kulina, Hālawa. E.O.
This is a land parcel, Manakapuaa, a subdivision of Kulina, Hālawa, E.O. Begin at the north corner, proceed south 22º and east 99 feet upon the border of the division Kulina until the corner. Then, proceed south 5º and east 192.06 feet upon the border of Kulina until the corner. From there, proceed south 67º and west 35.64 feet upon the border of the *kō‘ele*, the land farmed for a chief, until the corner. Then proceed south 26º, and east 119.46 feet until the corner. Then proceed south 58º and west 39.6 feet upon the boundary of the land Naea, until the corner. From there go north 31º and west 392.04 feet upon the boundary of the fenced land, until the corner. Then proceed north 61º and east 183.48 feet upon the boundary of the fenced land until the beginning corner. Within this land is one acre and 17.16 square feet. A. Bishop. Surveyor.

LCA 2156 to Opunui



Cl. No. 2156 Opunui; 3 Apana ma Kaloiiki, Halawa, Ewa, Oahu.

He mooaina Konohikilehulehu, ili Kaloiiki, Halawa, Ewa, Oahu.

Apana 1. He loi 1 iloko o Konohikilehulehu, Kaloiiki, Halawa. E hoomaka ana ma ke kihi akau, a e hele ana Hem. 53° Kom. i 1.66 Kh. ma ka palena auwai; Hem. 42° Hik. i 1.35 kh. ma ka palena koele; Ak. 53° Hik. i 1.37 kh. ma ka palena koele Ak. 42 1/2° Kom. i 1.32 k.h. ma ka palena koele. Maloko o keia loi, he 2.20 kh. huinahalike.

Ap. 2. Kaloiiki, ili o Kaloiiki, 2 loi me ke kula. E hoomaka ana ma ke kihi Akau, a e hele ana Hem. 60° Kom. i 5. 46 kh. ma ka aoao o Kakaepapai; Hem. 38° Hik. i 1.89 kh. ma ka aoao o Koele, Ak. 88 Hik. i 4.63 kh. ma ka aoao o ka pali Ak. 12 1/2° Kom. i 4.55 kh. ma ka aoao o ko Pualiilii. Maloko o keia apana, Eka 1 me 5.20 kh. huinahalike.

Ap. 3. He Pahale iloko o Kula Pomoewai, Halawa, E.O. E hoomaka ana ma ke kihi Hikina, a e hele ana Ak. 56° Kom. i 1.63 kh. Hem. 26° Kom. i 4.47 kh. Hem. 51° Hik. i 1.89 kh. Ak. 33 1/2° Hik. i 4.67 kh. Maloko o keia pahale he 8. 18 kh. huinahalike.

A ma ua Apana a pau he 3 Ek. me 5.48 kh. huinahalike

A. Bishop
Owner ana.

2. 20
1. 5. 20
8 08
5 48

Ulu Pau Loa

Honolulu Maraki 18. 1851.

Ap. 3. He Pahale iloko o Kula Piomoewai, Halawa, E.O. E hoomaka ana ma ke kihi Hikina, a e holo ana Ak. 56º Kom. i 1.63 kh, Hem. 26º Kom. i 4.47 kh. Hem. 51º Hik. i 1.89 k.h, Ak. 22 1/2º Hik. i 4.67. Maloko o keia pahale he 8.08 kh. huinahalike A.Bihopa.

A ma na Apana a pau he 2 Ek me 5.48 kh. huinahalike Mea ana.

[Diagram in Original]

[Text in Diagram: *Kukaepa Pai, No Puaaliilii, Aoao Pali, Koele, 2, Kula, Kula, Kula, Kahawai, 3, Auwai, Koele, Koele, Koele, 1]*

Uku Pau Loa $7.-

W.L. Lee

G.M. Robertson

J. Kekaulahao

J.H. Smith

Ioane Ii

Translation:

Cl. No. 2156 Opunui; Three land divisions in Kalo‘iiki, Hālawa, Ewa, O‘ahu.

The land parcel Konohikilehulehu, land section Kalo‘iiki, Ewa, O‘ahu.

Division One. There is one *lo‘i*, an irrigated terrace garden, within Konohikilehulehu, Kalo‘iiki, Hālawa. Begin at the north corner and proceed south 53º and west 109.56 feet upon the boundary of the irrigation ditch. Then proceed south 42º and east 89.1 feet upon the boundary of the *kō‘ele*, the land farmed for a chief. Then, north 53º and and east 90.42 feet on the boundary of the *kō‘ele.* Then proceed north 42 1/2º and west 87.12 feet upon the boundary of the *kō‘ele*. Within this *lo‘i* is 145.2 square feet.

Division Two. Kalo‘iiki, land section of Kalo‘iiki, with two *lo‘i,* and a field. Begin at the north corner and proceed south 60º and west 360.36 feet upon the boundary of Kakaepapai. Then proceed south 38º and east 124.74 feet upon the boundary of the *kō‘ele*. Then, north 88º and east 305.58 feet upon the boundary of the *pali* (Translator’s Note: lit. cliff, but could be a proper noun.) Then proceed north 12 1/2º and west 300.3 feet upon the the boundary belonging to Pualil‘ili‘i. Within this division is one acre and 343.2 square feet.

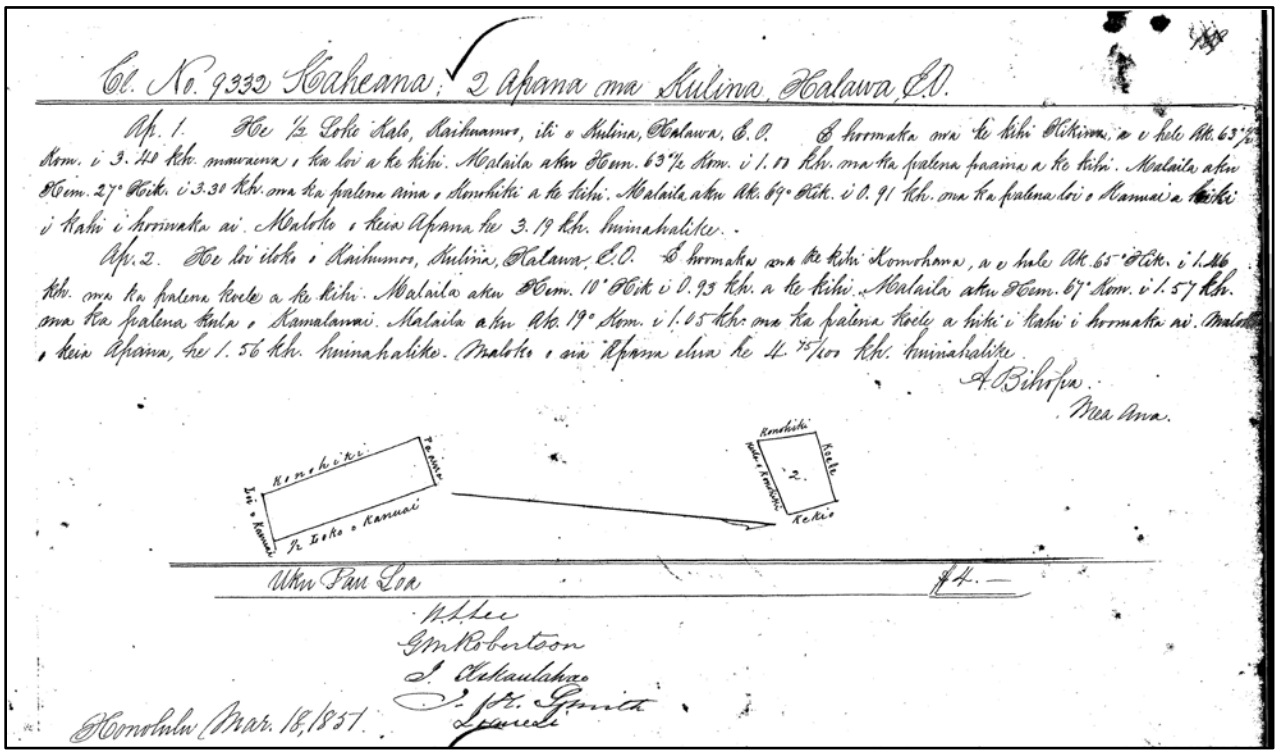
Division Three. A house lot within the field Piomoewai, Hālawa, E.O. Begin at the eastern corner and proceed north 56º and west 107.58 feet, then south 26º and west 295.02 feet, then south 51º and east 124.74 feet, then north 22 1/2º and east 308.22 feet. Within this house lot is 533.28 square feet. A. Bishop. Surveyor.

The combined divisions have two acres and 361.68 square feet.

Total Cost $7.

W.L. LeeG.M. Robertson
J. Kekaulahao
Honolulu, Mar. 18, 1851 J.H. Smith
Ioane ‘Ī‘ī

LCA 9332 to Kaheana



Cl. No. 9332 Kaheana; 2 Apana ma Kulina, Halawa, E.O.

Ap.1. He 1/2 Loko Kalo, Kaihuamoo, ili o Kulina, Halawa, E.O. E hoomaka na ke kihi Hikina a e hele Ak. 63 ½ Kom. i 3.40 kh mawaena o ka loi a ke kihi. Malaila aku Hem. 63 1/2° Kom. i 1.00 kh.ma ka palena paaina a ke kihi. Malaila aku Hem. 27° Hik. i 3.30 kh. ma ka palena aina o Konohiki a ke kihi. Malaila aku Ak. 69° Hik. i 0.91 kh. ma ka palena loi o Kanuai a hiki i kahi i hoomaka ai. Maloko o keia Apana he 3.19 kh huinahalike.

Ap.2. He loi iloko o Kaihumoo, Kulina, Halawa, E.O. E hoomaka ma ke kihi Komohana, a e hele Ak.65°Hik. i 1.46 kh ma ka palena koele a ke kihi. Malaila aku Hem.10° Hik i 0.93 kh a ke kihi. Malaila aku Hem. 67° Kom. i 1.57 kh ma ka palena kula o Kamalanai. Malaila aku Ak. 19° Kom. i 1.05 kh ma ka palena koele a hiki i kahi i hoomaka ai. Maloko o keia Apana, he 1.56 kh huinahalike. Maloko o oia Apana elua he 4. 75/100 kh. huinahalike.

A Bihopa

Mea Ana

[Diagram in original]

[Text in diagram: *Konohiki, Pa aina, 1/2 Loko o Kanuai, Loi o Kanuai, Konohiki, Koele, Kekio, Kula o Konohiki,2]*

Uku Pau Loa $4.—

W.L.Lee

GM Robertson

J. Kekaulahao

J.H. Smith

Ioane Ii

Honolulu Mar 18,1851

Translation:

Cl. No. 9332 Kaheana; 2 divisions in Kulina, Hālawa, E.O.

Division One. 1/2 taro pond, Kaihuamo‘o, land parcel of Kulina, Hālawa, E.O. Begin at the east corner and proceed north 63 1/2º and west 224.4 feet between the *lo‘i*, irrigated terraced garden, until the corner. Then proceed south 63 1/2º and west 66 feet upon the boundary of the fenced land until the corner. Then proceed south 27º and east 217.8 feet upon the boundary of the land of the land manager, until the corner. Then proceed north 69º and east 60.06 feet upon the border of the *lo‘i* of Kanuai, until the beginning corner. Within this division is 210.54 square feet.

Division Two. A *lo‘i* within Kaihumo‘o, Kulina, Hālawa, E.O. Begin at the western corner and proceed north 65º and east 96.36 feet until the boundary of the *kō‘ele*, the land farmed for a chief, until the corner. Then proceed south 10º and east 61.38 feet until the corner. Then proceed south 67º and west 103.62 feet upon the border of the field of Kamalanai. Then proceed north 19º and west 69.3 feet upon the boundary of the *kō‘ele* until the beginning corner. Within this division is 102.96 square feet. Within these two divisions is a total of 313.5 square feet. A. Bishop. Surveyor.

Total Cost $4.

W.L. Lee

G.M. Robertson

J. Kekaulahao

Honolulu, Mar. 18, 1851 J.H. Smith

Ioane ‘Ī‘ī

Appendix B Data on Excavations in the Immediate Vicinity adapted from the Sroat et al. 2012 AIS study

Transit Corridor Excavations (E24 and E25) along Kamehameha Highway Just NW of the Stadium (Sroat et al. 2012:169–175)

Trench:	E24
Length:	6 meters
Width:	0.8 meters
Maximum Depth:	3.3 meters
Orientation:	156°-336°
Water Table	3.3 meters below surface
Base of Fill Sediments	2.4 meters below surface
LCA #	2102

Trench E24 is located along Kamehameha Highway just southeast of the Moanalua Freeway overpass (Figure 111). The trench is within the former land boundary of LCA #2102. Land use for this LCA is documented as *lo‘i, kula*, fishpond, and house lot. The trench is located in a road cut. The land surface rises ~6 meters to the north of the road and is fairly level along the southern end of the road as it descends to the harbor. According to an HDOT construction drawing for the development of Kamehameha Highway in 1933, Trench E24 is located northwest of a hospital (the former Honolulu Plantation Hospital) and partially within a dirt road leading to the railroad depot to the southwest (refer to Figure 100). During construction the road surface in this area was elevated and graded ~3-9 feet (~0.91-2.74 m) above the 1933 ground surface (as profiled at the median of the highway) (refer to Figure 101).The utility line consists of a gas line 2 meters to the southwest running parallel to the trench.

The stratigraphy encountered for Trench E24 consisted of the asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), asphalt surface (Stratum IIa), gravelly clay fill (Stratum IIb), and natural silty clay loam (Stratum III) (Figure 112, Figure 113, Table 25). Based on a lack of structure, angular basalt gravel inclusions, and abrupt lower boundary Stratum IIb consisted of fill material. The underlying Stratum III contained formative structure indicative of natural sediment. A wet-screened 5.0 L sample of Stratum III (265-270 cmbs) yielded several waterworn gravels, small charcoal fragments (0.5 g), a small coral branch, several angular basalt cobbles, and 6 organic filaments. As the charcoal fragments were not encountered within a feature, but rather floated generally within the stratigraphy, and no evidence of agricultural land usage was observed, the stratum appeared to be charcoal-enriched alluvial sediment. No cultural deposits associated with LCA #2102 were identified.

Figure 158. Photograph of the location of Trench E24, view to the northwest

Figure 159. Photograph of the southwest wall profile of Trench E24, view to the northwest

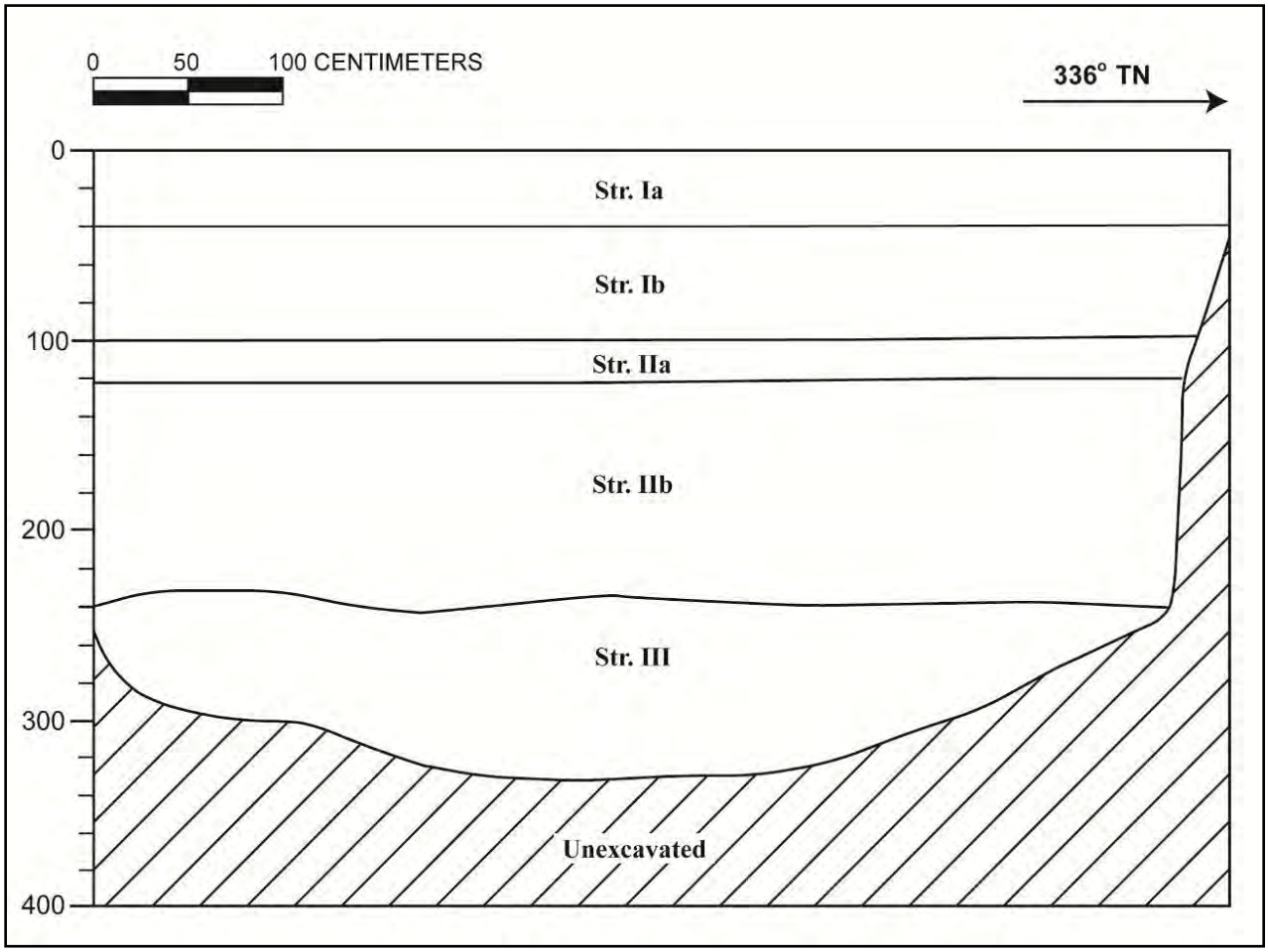


Figure 160. Profile of the west wall of Trench E24

Table 28. Stratigraphic Description for Trench E24

Stratum	Depth (cmbs)	Description of Sediment
Ia	0-40	Asphalt; Kamehameha Highway road surface; abrupt, smooth lower boundary
Ib	40-100	Fill; crushed coral base course; clear, smooth lower boundary
IIa	100-125	Asphalt or rock tar and mud conglomerate; buried road or driveway surface
IIb	125-240	Fill; 10 YR 5/3 (brown); gravelly clay; structureless, single grain; moist, firm consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; no roots; contains angular basalt cobbles
III	240-330 (BOE)	Natural; 10 YR 4/2 (dark grayish brown); silty clay loam; weak, medium, crumb structure; moist, friable consistency; slightly plastic; terrigenous

		origin; lower boundary not visible; no roots; sterile sediment

Trench E25

Trench:	E25
Length:	6 meters
Width:	0.8 meters
Maximum Depth:	1.9 meters
Orientation:	163°-343°
Water Table	N/A
Base of Fill Sediments	1.51 meters below surface
LCA #	N/A

Trench E25 is located along Kamehameha Highway south of ‘Aiea Cemetery (Figure 114). The trench is situated in a road cut ~6 meters below the ground surface of the cemetery and level with the ground surface to the south of the highway. According to an HDOT construction drawing for the development of Kamehameha Highway in 1933, Trench E25 is located at the northern boundary of ‘Aiea Cemetery (refer to Figure 100). During construction the road surface in this area was cut and graded ~24 feet (~7.32 m) below the 1933 ground surface (as profiled at the median of the highway) (refer to Figure 101). Figure 100 also notes that 414 graves within ‘Aiea Cemetery were located within the right-of-way of the highway (see also discussion in Section 8.4). No utilities were marked near the trench location. However, while conducting ground penetrating radar, CSH documented a sewer trench which ran perpendicular across the eastern end of the trench.

The stratigraphy encountered for Trench E25 consisted of the asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), two fill layers associated with the sewer line (Stratum IIa and IIb), sandy silt loam fill (Stratum IIc), clay loam fill (Stratum IId), crushed coral fill (Stratum IIe), asphalt and basalt gravel fill (Stratum IIf), gravelly clay loam fill (Stratum IIg), and natural basalt bedrock (Stratum III) (Figure 115, Figure 116, Table 26). The natural sediment encountered was a C-horizon of basalt bedrock, which was overlain by two episodes of road development. This area appeared severely impacted by road construction within the twentieth century, which effectively removed all natural sediments atop the basalt bedrock (refer to Section 8.4). No cultural deposits associated with ‘Aiea Cemetery were identified.

Figure 161. Photograph of the location of Trench E25, view to the northwest

Figure 162. Photograph of the west wall profile of Trench E25, view to the northwest

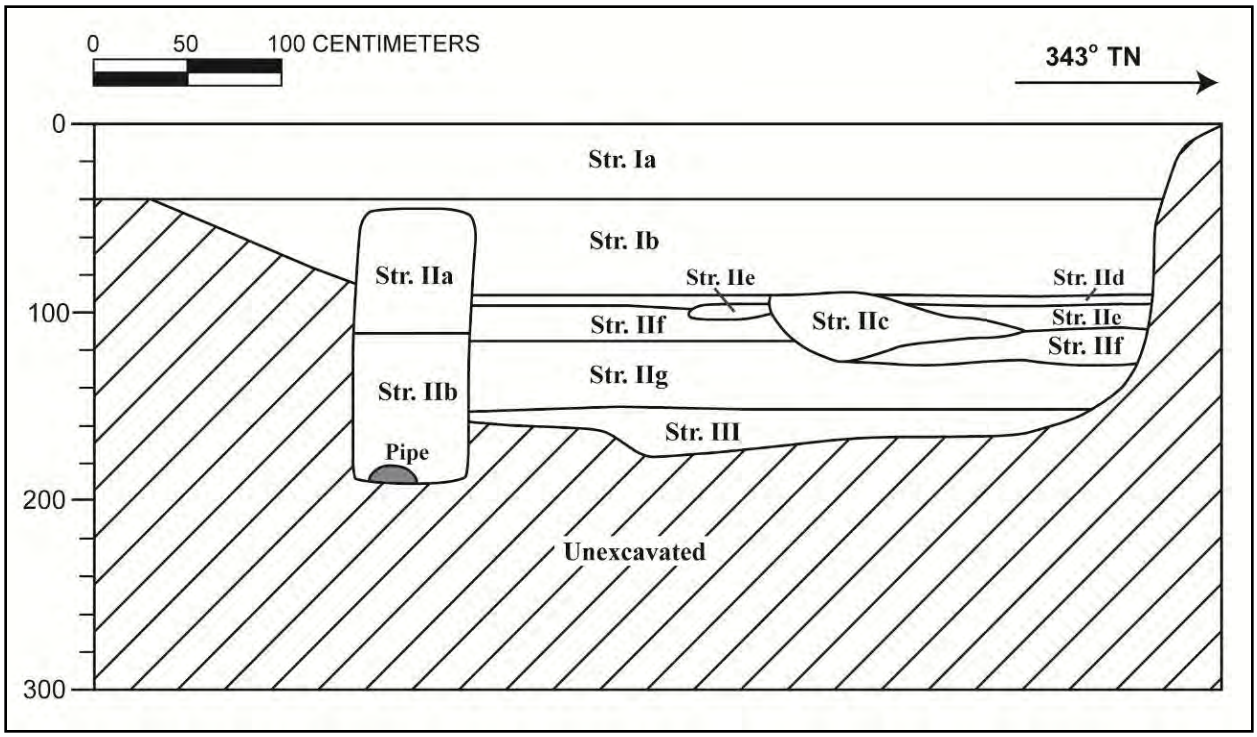


Figure 163. Profile of the west wall of Trench E25

Table 29. Stratigraphic Description for Trench E25

Stratum	Depth (cmbs)	Description of Sediment
Ia	0-40	Asphalt; Kamehameha Highway road surface; abrupt, smooth lower boundary
Ib	40-90	Fill; crushed coral base course; clear, smooth lower boundary
IIa	45-110	Fill: 10 YR 3/2 (very dark grayish brown); gravelly silt loam; structureless; dry, loose consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; no roots; fill associated with sewer line
IIb	110-190	Fill; crushed coral; lower boundary not visible; fill around sewer line
IIc	90-125	Fill; 10 YR 3/3 (dark brown) with 40 % coral gravel; sandy silt loam; weak, fine, crumb structure; dry, weakly coherent to moist, very friable consistency; non-plastic; terrigenous and marine origin; clear, irregular lower boundary; no roots

IId	90-95	Fill; 10 YR 3/3 (dark brown); clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; no roots
IIe	95-110	Fill; crushed coral fill; clear, smooth lower boundary
IIf	95-129	Fill; asphalt and basalt gravel pieces; clear, smooth lower boundary; buried road surface

Aloha Stadium Station Excavations (from Sroat et al. 2012:191–200)

The following provides a description of the stratigraphy observed within three test trenches excavated in the Aloha Stadium Transit Station project area. Trenches AS (Aloha Stadium) 1 and AS3 are within the boundaries of the Park and Ride Facility, while Trench AS2 is located within the footprint of the Aloha Stadium Transit Station (Figure 164). The topography of the project area is level and a large parking lot is currently within the project boundaries.

Trench AS1

Trench:	AS1
Length:	6 meters
Width:	0.75 meters
Maximum Depth:	1.3 meters
Orientation:	122°-302°
Water Table	N/A
Base of Fill Sediments	1.15 meters below surface
LCA #	N/A

Trench AS1 is located in the northeastern section of the proposed Park and Ride facility (Figure 165). The stratigraphy encountered for Trench AS1 consisted of the parking lot asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), two clay loam fill layers (Strata IIa-IIb), and two gravelly sandy silt layers (Strata IIIa-IIIb). Stratum IIb evidenced an abrupt lower boundary, indicative of fill material. Stratum III contained inclusions of vesiculated, well-rounded basalt pebbles and cobbles associated with fluvial transport. The inclusions are highly weathered and appear to be in-situ. These layers may indicate a localized, variable energy, fluvial environment that predates any historic development (Figure 165, Figure 166, Figure 167, and Table 30). The wavy upper boundary of Stratum IIIa indicates that the trench area was not graded prior to the deposition of fill materials.

A wet-screened 2.0 L sample of Stratum IIa (85 cmbs) yielded water-rounded basalt gravel. A 3.0 L sample of Stratum IIIa (115 cmbs) yielded fine to coarse basaltic sand. No cultural deposits were identified within this trench.

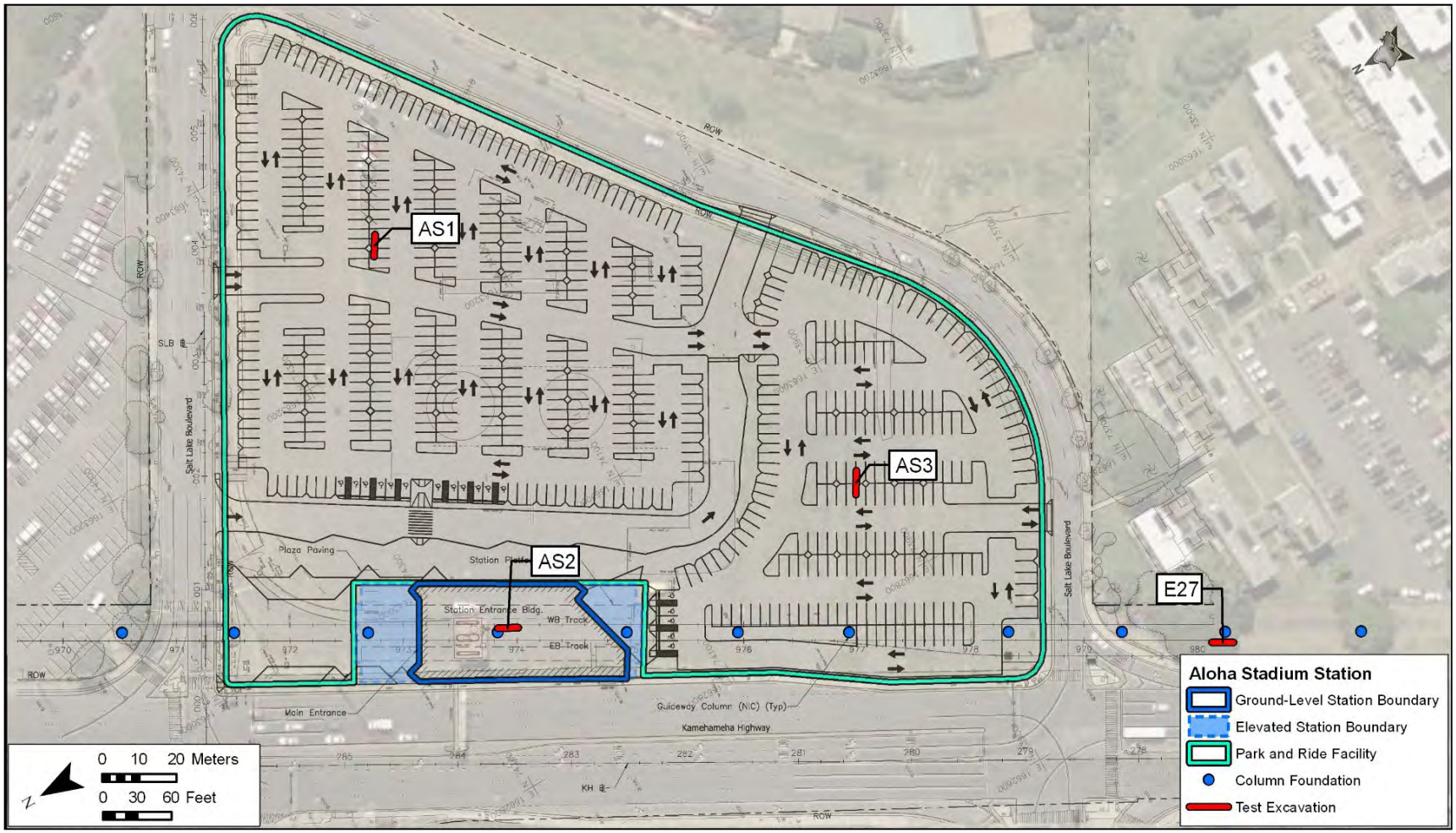


Figure 164. Test trench locations for the Aloha Stadium Station and Park and Ride project area

Figure 165. Photograph of Trench AS1, located in the northeastern region of the proposed Park and Ride facility, showing general overview, view to the southeast

Figure 166. Photograph of the southeast wall profile of Trench AS1, view facing southeast

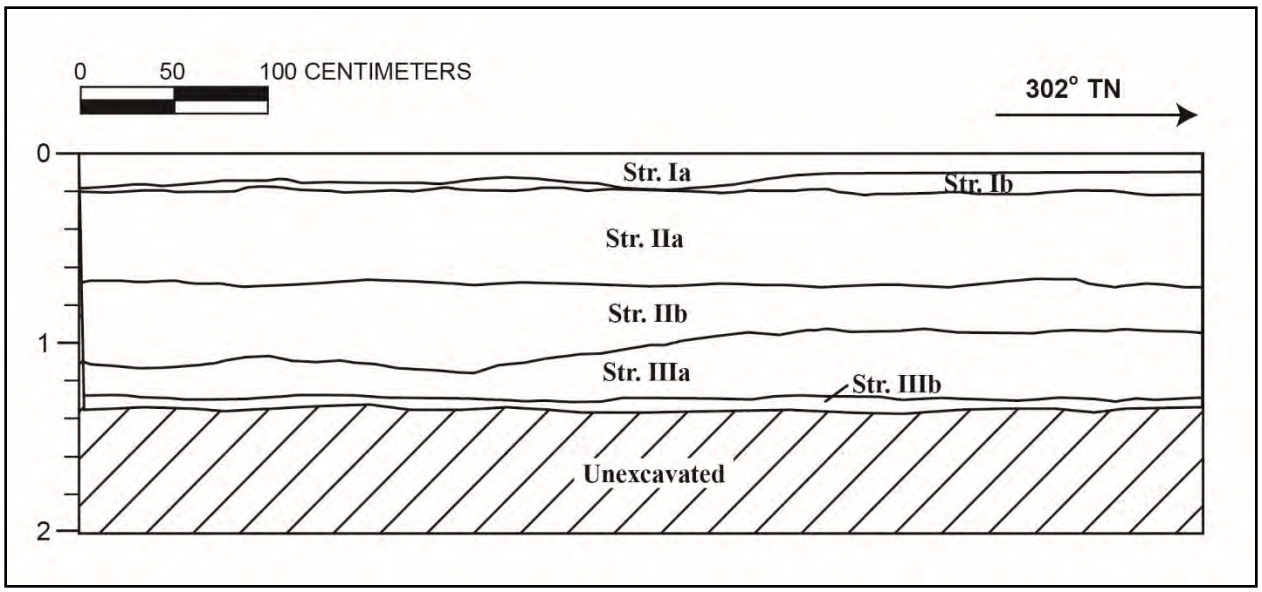


Figure 167. Profile of the southeast wall of Trench AS1

Table 30. Stratigraphic Description for Trench AS1

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt; parking lot surface; very abrupt, smooth lower boundary
Ib	10-20	Fill; crushed coral base course; very abrupt, smooth lower boundary
IIa	20-70	Fill; 7.5 YR 3/4 (dark brown); clay loam; structureless; moist, firm consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; no roots visible; graded clay fill
IIb	70-115	Fill; 10 YR 4/1 (dark grey) with abundant mottles of 10 YR 4/4 (dark yellowish brown); silty clay loam; structureless; moist, firm consistency; slightly plastic; terrigenous origin; abrupt, wavy lower boundary; no roots observed
IIIa	95-130	Natural; 10 YR 4/3 (brown); gravelly sandy silt; structureless; dry, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; no roots observed; pebble to medium cobble inclusions
IIIb	130-139	Natural; 10YR 4/3 (brown); gravelly sandy silt; structureless; dry, loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; no roots observed; pebble to medium cobble inclusions; similar to IIIa but with a higher degree of cementation

Trench AS2

Trench:	AS2
Length:	6 meters
Width:	0.75 meters
Maximum Depth:	1.8 meters
Orientation:	150°-30°
Water Table	N/A
Base of Fill Sediments	0.45 meters below surface
LCA #	N/A

Trench AS2 is located within the footprint of the Aloha Stadium Transit Station project area (see Figure 164, Figure 168). The stratigraphy encountered for Trench AS2 consisted of the parking lot asphalt road surface (Stratum Ia), crushed coral base course (Stratum Ib), natural clay loam (Stratum II), and gravelly sandy silt (Stratum III). Based on the formative structure within Stratum II, this layer likely consisted of natural sediment. Stratum II corresponded with the description of the Waipahu soil series described for this area by the USDA (Foote et al. 1972, also see Figure 6). The underlying Stratum III contained inclusions of vesiculated, well-rounded basalt pebbles and cobbles associated with fluvial transport, similar to Stratum III within Trench AS1. The inclusions are highly weathered and appear to be in-situ. These layers may indicate a localized, variable energy, fluvial environment that predates any historic development (Figure 169, Figure 170, Figure 171, and Table 31).

A 2.0 L sample of Stratum II (65-80 cmbs) was collected, wet-screened through fine mesh, and yielded a small number of very fine sand-sized basalt particles. No cultural deposits were encountered within this trench.

Figure 168. Photograph of Trench AS2, showing general overview, view to the northeast

Figure 169. Photograph of Trench AS2, showing the profile wall, view facing northeast

Figure 170. Photograph of Trench AS2, showing the profile wall, view facing southeast

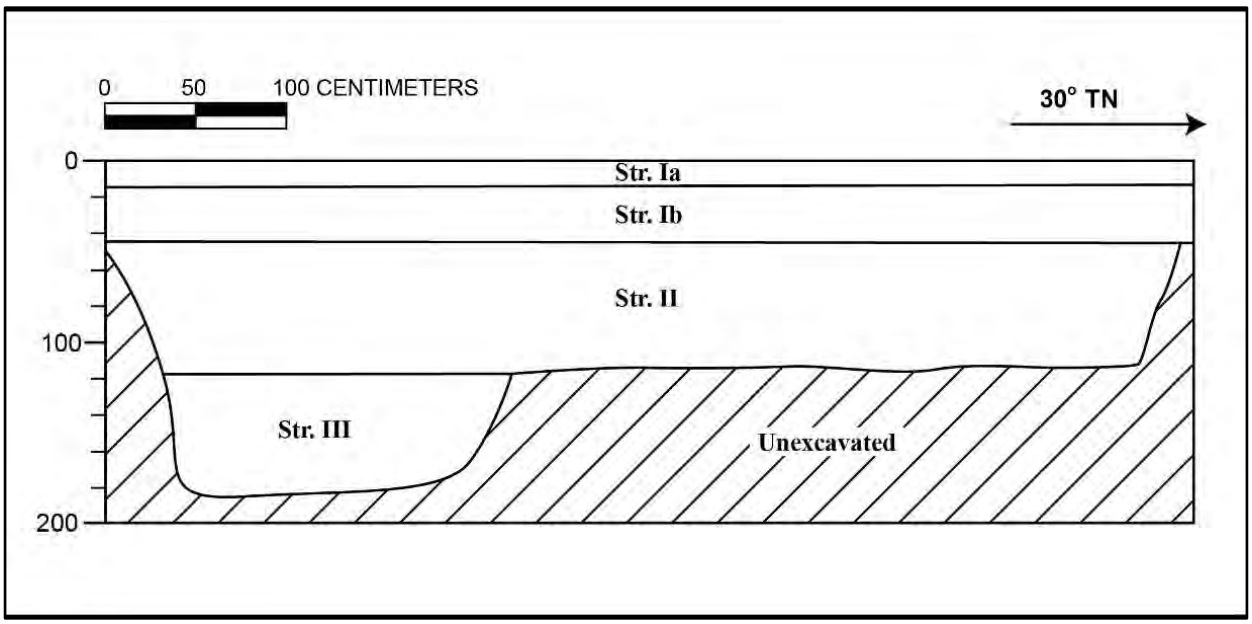


Figure 171. Profile of the southeast wall of Trench AS2

Table 31. Stratigraphic Description for Trench AS2

Stratum	Depth (cmbs)	Description
Ia	0-17	Asphalt; parking lot surface; very abrupt, smooth lower boundary
Ib	17-45	Fill; crushed coral base course; very abrupt, smooth lower boundary
II	45-114	Natural; 10 YR 4/4 (dark yellow brown); clay loam; moderate, very fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; no roots visible
III	114-187	Natural; 10 YR 2/2 (very dark brown); gravelly sandy silt; weak, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; lower boundary not visible; no roots observed; well-rounded pebble and cobble inclusions

Trench AS3

Trench:	AS3
Length:	6.2 meters
Width:	0.75 meters
Maximum Depth:	1.7 meters
Orientation:	123°-303°
Water Table	N/A
Base of Fill Sediments	0.30 meters below surface
LCA #	N/A

Trench AS3 is located in the southwestern section of the proposed Park and Ride facility (see Figure 164, Figure 172). The stratigraphy encountered for Trench AS3 consisted of two soil and gravel fill layers (Strata Ia and Ib), two natural clay loam layers (Strata IIa-IIb), and a natural clay loam layer with decomposing basalt inclusions (Stratum III) (Figure 173, Figure 174, Table 32). Stratum IIa contained distinct structure and a wavy lower boundary, indicative of natural sediment, although some amount of disturbance at the upper boundary was evident by small inclusions of sediment from Stratum IIb. Strata IIa and IIb were consistent with the description of the Makalapa soil series described for this area by the USDA (Foote et al. 1972, also see Figure 6). Bulk samples of Strata IIa (30-50 cmbs) and IIb (60-85 cmbs) were collected and wet-screened through fine mesh. Stratum IIa yielded fine to coarse basalt sand and fine roots. Stratum IIb similarly yielded very fine to coarse basalt sand and fine roots. No cultural deposits were encountered within this trench.

Figure 172. Photograph of Trench AS3, showing general overview, view to the southwest

Figure 173. Photograph of south wall profile of Trench AS3, view facing south

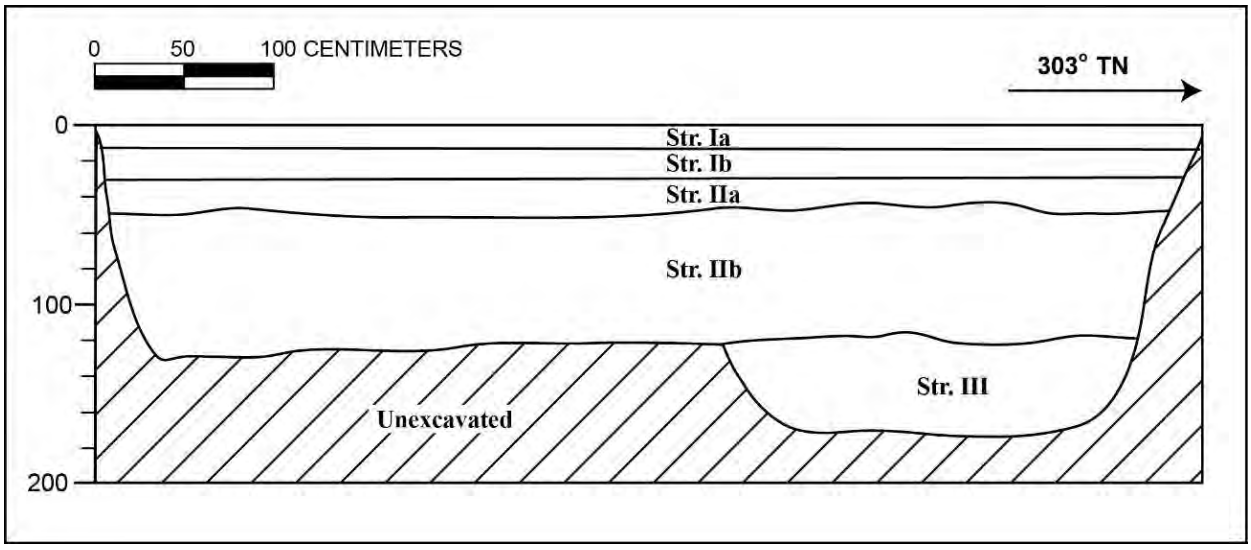


Figure 174. Profile of the south wall of Trench AS3

Table 32. Stratigraphic Description for Trench AS3

Stratum	Depth (cmbs)	Description
Ia	0-10	Fill; 10 YR 3/3 (dark brown); gravelly silt; weak, very fine, crumb structure; dry, weakly coherent consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; many fine roots; top soil and gravel layer
Ib	10-30	Fill; 10 YR 3/6 (dark yellowish brown); sandy silt; weak, very fine, crumb structure; dry, slightly hard consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; few fine roots; top soil; inclusions of scattered coral and gravel
IIa	30-45	Natural; 10 YR 3/2 (very dark grayish brown); clay loam; moderate, very fine, blocky structure; dry, hard consistency; slightly plastic; terrigenous origin; clear, wavy lower boundary; few fine roots; evidence of disturbance from the importation of fill layers
IIb	45-130	Natural; 10 YR 3/2 (very dark grayish brown); clay loam; moderate, very fine, blocky structure; moist, very firm consistency; plastic; terrigenous origin; clear, smooth lower boundary; few fine roots; sterile
III	120-170	Natural; 10 YR 4/4 (dark yellowish brown); clay loam; moderate, fine, blocky structure; moist, very firm consistency; plastic; terrigenous origin; lower boundary not visible; no roots visible; natural layer with decomposing basalt inclusions