

United States Department of the Interior
National Park Service**National Register of Historic Places Registration Form**

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of PropertyHistoric name: Waimalu Stream BridgeOther names/site number: Waimalu Stream Bridge, Waimalu Stream Eastbound Bridge & Waimalu Stream Westbound Bridge

Name of related multiple property listing:

(Enter "N/A" if property is not part of a multiple property listing)**2. Location**Street & number: Kamehameha Highway and Waimalu StreamCity or town: Pearl City State: Hawaii County: HonoluluNot For Publication: ☐ Vicinity: ☐**3. State/Federal Agency Certification**

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ___ statewide X local

Applicable National Register Criteria:

X A ___ B ___ C ___ D

Signature of certifying official/Title:

Date

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official:

Date

Title :

State or Federal agency/
bureau or Tribal Government

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4. National Park Service Certification

I hereby certify that this property is:

- ☐ entered in the National Register
☐ determined eligible for the National Register
☐ determined not eligible for the National Register
☐ removed from the National Register
☐ other (explain:) _____

Signature of the Keeper

Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

- Private: ☐
Public – Local ☐
Public – State ☒
Public – Federal ☐

Category of Property

(Check only **one** box.)

- Building(s) ☐
District ☐
Site ☐
Structure ☒
Object ☐

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Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
_____	_____	buildings
_____	_____	sites
<u>2</u>	_____	structures
_____	_____	objects
<u>2</u>	<u>0</u>	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions

(Enter categories from instructions.)

Transportation/Road-related
(Vehicular) Bridge

Current Functions

(Enter categories from instructions.)

Transportation/Road-related
(Vehicular) Bridge

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7. Description

Architectural Classification

(Enter categories from instructions.)

Other, Bridge

Materials: (enter categories from instructions.)

Principal exterior materials of the property: FOUNDATION: Concret; WALLS: Concrete
(parapets & stanchions)

Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The Waimalu Bridge was originally built in 1936 as a two-lane, two-direction reinforced concrete girder bridge to cross the Waimalu Stream. Post-war-time activities made the capacity of Kamehameha Highway and this single bridge inadequate, so that in 1945 a second adjacent, parallel bridge was constructed and each of the two structures then carried traffic in a single, opposing directions. The structural design of the 1936 and 1945 bridges are not the same, showing the changes in technology over different eras, though both employed a reinforced concrete girder bridge design.

Parapet design of both the 1936 and 1945 bridge are similar, using concrete with cross-shaped voids and have concrete stanchions at the ends. Both the 1936 and the 1945 bridges have their years of completion and the bridge names inscribed on concrete stanchions. There is only one major visible difference between the two bridges: the 1936 bridge has at-grade shoulders for pedestrian traffic, while the 1945 bridge has grade-separated concrete pedestrian sidewalks. Moreover, in plan view the 1936 stanchions are curved away from traffic, while the 1945 stanchions are straight.

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In 1966, both the 1936 and 1945 bridges were widened to add a third lane using stringer multi-beam design, with pre-stressed concrete.¹ The addition of the new lane required the demolition of the outboard walkways and parapets of each bridge. The 1966 parapet design features a concrete lower section, topped with two horizontal cylindrical metal rails. The concrete end stanchions are simple rectangular forms with year built (1966) and name inscriptions. The 1966 alterations left only the center parapets, walkways, and stanchions of the 1936 and 1945 bridges. The condition of the bridge is good. The 1966 bridge expansions and surrounding urbanization has affected the integrity of the bridge structures.

¹ National Bridge Inventory Database, Waimalu Bridge, on website nationalbridges.com, accessed May 23, 2012.

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Narrative Description

Both reinforced-concrete three-lane bridges carry Kamehameha Highway across Waimalu Stream. Eastbound traffic travels on the makai bridge and the mauka bridge carries westbound traffic. Both bridges are about 143' long with a roadway approximately 40' wide. Each bridge has one or two concrete walkways, approximately 4' wide and about 4" higher than the roadway surface. The eastbound bridge has walkways along both its mauka (1936) parapet and along its makai (1966) edge, while the westbound bridge has a walkway only along its mauka (1966) parapet. The walkway along the 1936 parapet is now in the highway median and utilized by few pedestrians.

The inner parapet on each bridge is comprised of the original parapet and stanchions, from either 1936 (on the eastbound bridge) or 1945 (on the westbound bridge). This original (1936 and 1945) construction on each bridge includes the structure supporting the two traffic lanes adjacent to the original parapets. The 1966 widening increased the width of each bridge from two to three traffic lanes and built replacement walkways along the new parapets.

Eastbound Bridge (1936/1966)

This bridge has three eastbound lanes on an asphalt-surfaced roadway. The 1936 concrete parapet and stanchions are on the mauka side of this bridge. This parapet is 2'-10" high and about 143' long. The parapet has a top railing 1'-0" wide and 7" high, with 1½" stepped corners. Below the railing is a series of vertical concrete balusters (6" wide and 6" thick) that are typically spaced at 1'-7" on center. The sections of each parapet that are between the balusters are slightly thinner (4" thick) and each section was formed with a cross-shaped void. These voids are typical of concrete bridge design in Hawaii during the 1930s and 1940s and are commonly referred to as a Greek-cross shape.² Each cross void is 1'-3" high and 8" wide. The base of the 1936 parapet is 7" high and 10" thick along its full length. On the inboard side of the parapet is a walkway, 3'-0" wide and about 4" higher than the road pavement. The height differential results in a 4"-high concrete curb along the road.

The 1936 concrete end stanchions are 3'-3" high (measured from the roadway), 1'-9" thick, and about 6' long. In plan, they form an arc of a circle spanning about 45 degrees. One end of each stanchion squarely abuts the parapet and the stanchion curves out away from the roadway, presenting a curving face to the traffic lanes. Each stanchion has 1½" stepped corners, with a top surface that is 1'-3" wide. Typically, concrete bridges of this type and period have date and name inscriptions on their end stanchions, as is the case here. The east end stanchion has the date inscription "1936" in 3"-high block numbers. However, the west stanchion has an added wedge of concrete on its outer (road-facing) surface that anchors a steel W-beam guardrail, which extends along the roadway at the approach. This concrete wedge covers the name inscription on this stanchion.

² Heritage Center, School of Architecture, University of Hawai'i at Mānoa [hereafter Heritage Center], State of Hawai'i, Historic Bridge Inventory and Evaluation (Draft prepared for the State of Hawai'i, Department of Transportation, Highways Division) 2008. p. I-30.

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The 1966 parapet and end stanchions of the eastbound bridge are on its makai side. The lower part of the 1966 parapet has three concrete sections of slightly varying lengths, but all measuring 1'-2" thick and 1'-6" high. There is a horizontal line incised across each panel, at the height of 9". The upper section of the 1966 parapet is a metal railing composed of two horizontal cylinders supported by slightly curved rail posts. The 1966 drawings indicate that the railings can be either aluminum or steel. The bottom rail cylinder is 5" in diameter and the top rail is 3" in diameter. The posts are spaced about 7' apart along the length of the parapet, but are closer together near the expansion joints between parapet sections. These posts are bolted to the top surface of the lower concrete section. The 1966 end stanchions are rectangular concrete, 1'-2" thick, 3'-1" high, and 5'-0" long. Each has 1"-wide horizontal lines incised around its circumference at heights of 9" and 1'-6" above the walkway. The west stanchion is inscribed "Waimalu Stream Bridge 1966" in 3"-high block lettering. A steel W-beam guardrail, backed by an added grid of metal, runs along the mauka side of the walkway, to provide it protection from the traffic. A metal grid is also located on the outer side of the upper parapet railing.

The deck of the eastbound bridge shows the structural design of both the original 1936 bridge and the added 1966 traffic lane and walkway. The 1936 portion carries the two mauka lanes. It is board-formed concrete with five longitudinal girders and two supporting frames. Each reinforced-concrete frame is an inverted-U shape with two legs extending down into the streambed. Reinforced-concrete beams join each pair of legs and support the girders. The added 1966 portion carries the third lane and walkway on the makai side of the bridge. Its structure consists of two prestressed-concrete longitudinal girders; these are supported, in line with each of the 1936 frames, by three octagonal-cross-section concrete piles capped with a concrete beam. The bridge abutments are board-formed concrete, supported by complex pile foundations for the 1966 section. The exact design of the original 1936 abutments is not known, since drawings for that project were not located at the State of Hawai'i, Department of Transportation, Highways Division, Design Branch.

Westbound Bridge (1945/1966)

This section of the bridge has three westbound lanes on an asphalt-surfaced roadway. The 1945 concrete parapet and stanchions are on the makai side of this bridge. This parapet is almost identical to the 1936 parapet described above; however, instead of having a walkway extending along its length, it has a 6"-high, 10"-wide concrete curb. Another difference is the 1945 concrete end stanchions are rectangular, not curved. The newer stanchions are similar in height and thickness, but shorter in length than the 1936 ones. The 1945 stanchions measure 3'-3" high, 1'-9" thick, and 3'-6" long. Each end stanchion has 1½" stepped corners and squarely abuts the parapet. The eastern stanchion has an added W-beam guardrail that is through-bolted to the stanchion. Although the guardrail partially conceals the name inscription, the letters "ALU" remain visible. The western stanchion has no added guardrail, so the date inscription ("1945" in 3"-high block numbers) is visible.

The 1966 parapet of this westbound bridge was constructed exactly like the 1966 parapet of the eastbound bridge (see description above). Unlike the 1966 eastbound parapet, the westbound parapet does not have an iron guardrail between the walkway and the traffic lanes.

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The deck of the westbound bridge shows the structural design of both the original 1945 bridge and the added 1966 traffic lane and walkway. The 1945 portion carries the two makai lanes of westbound vehicles. It is board-formed concrete with five longitudinal girders and two supporting frames (or piers, as labeled on the drawings). Each frame, or pier, consists of ten (five pairs) square-cross-section concrete piles, topped by a concrete pile cap, or beam, that carries the girders. The added 1966 portion carries the third lane and walkway on the mauka side of the bridge. This portion is supported, in line with each of the 1945 frames, by four octagonal-cross-section concrete piles topped by pile caps that carry the two longitudinal prestressed-concrete girders. The 1945 drawings show the piles for that part of the bridge are composites; the upper portions, labeled as concrete "Socket Piles," have wider bottom sections that fit over the lower "Untreated Timber Piles." The 1945 bridge abutments are board-formed concrete, supported by single lines of concrete-and-timber composite piles. The abutments at the 1966 widened section have a more complex pile foundation.

Site Information

The Waimalu Stream Bridge is located along an urban section of Kamehameha Highway that is fronted by small-scale businesses (typically one-story or two-stories), including the block-long Waimalu Shopping Center (built in 1963), various fast food restaurants, and some residences. Neal Blaisdell Park is adjacent to the southwest. The setting around the bridge has changed greatly since its 1936 and 1945 construction dates. In 1940 the area was primarily rural, with sugarcane fields, small farm plots, and vacant land occupying most of the frontage of Kamehameha Highway. Aerial photos from that period show a cluster of small lots with buildings west of the area that would become the future Blaisdell Park. Paakea Fishpond was then extant in Pearl Harbor at the mouth of Waimalu Stream. Later aerial photographs indicate that, by 1954, the area to the west had a higher density of buildings, and an area to the east near the present intersection of Kamehameha Highway and Kanuku Street had also been developed. Other aerial photographs indicate that, by 1962, large subdivisions were built mauka at Kanuku Street and Waimano Home Road, and by 1968, Pa'akea Fishpond was filled. Currently, commercial properties and residences line the highway in both directions, elevated rail running down the center of Kamehameha Highway with only a few exceptions – Sumida [watercress] Farm, Blaisdell Park, and Waiau Spring. The construction of the additional lanes and bridges in 1945 as well as the 1966 widening of this section of Kamehameha Highway (and all six bridges) accommodated or spurred the post-World War II development of housing and businesses along this corridor.

Integrity Assessment

The location of the property has not changed. The Waimalu Stream Bridge is on its original site and retains integrity of location.

The setting of the property has changed. When the 1936 bridge was constructed the area was rural, with only scattered buildings in the vicinity. Further development followed the construction of the 1945 bridge. Now the area is urban, with dense commercial development along Kamehameha Highway. The further close proximity of three differing parapet designs creates a confusing view of the bridge. Integrity of setting is not retained.

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The design, materials, and workmanship of the property are retained. Significant portions of the 1936 and 1945 bridges remain. These retain sufficient levels of the aspects of the form (design) and physical elements (materials), as well as retaining evidence of the skill (workmanship) employed in their construction, to allow the bridge to reflect its historic association. The historic character of the parapets and stanchions is still readily apparent. However, the 1966 additions to the bridges are quite different in the design of their structure, parapets, and stanchions. This contrast conveys the history of the area and its rapid post-statehood growth. The 1966 sections of the bridges are non-contributing features but do not obscure the design, materials, or workmanship of the historic bridge sections. The guardrail additions are minor detracting elements.

The feeling and association of the property are retained. The bridge expresses the historic sense of the time of its construction. The bridge is sufficiently intact to convey its association with the important highway improvements of that period.

The overall integrity of the property remains high, except for the setting.

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8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- ☒ A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ☐ B. Property is associated with the lives of persons significant in our past.
- ☐ C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ☐ D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

- ☐ A. Owned by a religious institution or used for religious purposes
- ☐ B. Removed from its original location
- ☐ C. A birthplace or grave
- ☐ D. A cemetery
- ☐ E. A reconstructed building, object, or structure
- ☐ F. A commemorative property
- ☐ G. Less than 50 years old or achieving significance within the past 50 years

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Areas of Significance

(Enter categories from instructions.)

Transportation

Period of Significance

1936 – 1970

Significant Dates

1936, 1945, 1966

Significant Person

(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder

William R. Bartels (designer of 1945 section)

Walker & Olund, Ltd. (contractor for 1936 section)

E. E. Black, Ltd. (contractor for 1945 section)

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Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Waimalu Bridge is significant at the local level under National Register Criterion A. Previous to the construction of Kamehameha Highway (of which the Waimalu Bridge is a part), the only overland road access to Pearl City was via old Government Road (modern Moanalua Road) which runs mauka and was a meandering and unsafe road. This Kamehameha alignment represented a regional road system designed for automobiles (not wagons) and its straight path greatly improved overland travel times and access. While Pearl City had been under development since the late 19th century, it was only after road transportation improved because of Kamehameha Highway that the town was able to complete build-out.

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Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

Context and Development History of These Bridges

There are two other related bridges along this segment of Kamehameha Highway, built under the same or similar series of project numbers – Kalauao Springs Bridge and Kalauao Stream Bridge. The Territory of Hawaii, with the aid of federal funds, was responsible for construction of the original Waimalu Bridge, Kalauao Springs Bridge, and Kalauao Stream Bridge in 1936-1937. Waimalu Bridge was part of Federal Aid Project (FAP) No. 9-F and the Kalauao Springs and Stream bridges were part of National Recovery Highway (NRH) Project No. NRH-9-C.³ In 1945, under Hawaii Project No. DA-WR 10 (3), three additional two-lane bridges were built parallel to the 1936 ones, and these new bridges all carried the westbound lanes. The 1966 Kamehameha Highway widening, FAP No. U-090-I (9), included an additional lane on the outboard sides of all six bridges.

Kamehameha Highway

Until 1936, Kamehameha Highway was the only road that provided passage across the ahupuaa (common Hawaiian term for land divisions that typically extend from the mountains to the sea) of Kalauao, Waimalu, Waiau, and Waimano, between the settlements at Aiea and Pearl City. The pre-1936 alignment of this highway ran east-west along a winding hillside route located on firmer ground, but not as level as the well-watered soils closer to Pearl Harbor. Part of Kamehameha Highway's pre-1936 route between Aiea and Pearl City is the present-day alignment of Moanalua Road. Today's section of Moanalua Road between Kalauao Stream and Moanalua Loop is a new straighter alignment; the pre-1936 Kamehameha Highway route meandered through the present Pearl Ridge Shopping Center and then followed Moanalua Loop.

Planning for the realignment of Kamehameha Highway in the area that included the Waimalu Bridge had been underway for a few years before NRH funds became available in 1933. Within that planned project, the highway section from Honolulu to Aiea had a higher priority, and the remaining section, from Aiea to Pearl City Junction, would be built "if financially possible."⁴ Two years later, this second-priority section, the part west of Aiea, still awaited funding. In 1935, Louis S. Cain, Superintendent of Public Works for the Territory of Hawaii, submitted a road plan to the U.S. Department of Roads that included the construction of an "additional unit of Kamehameha Highway beyond Aiea, approximately one mile" that was expected to cost \$148,000.⁵ In March 1937, the contract amount reported for construction of a longer highway segment (from "Aiea through Pearl City") was \$203,000.⁶

³ Superintendent of Public Works [hereafter, SPW], Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1936 (Honolulu: New Freedom Press) 1937. pp. 10 & 11.

⁴ "Hawaii Road Building Projects Selected," Honolulu Star Bulletin, June 24, 1933. p. 1.

⁵ "Cain Submits Road Plan to U.S. Officials," Honolulu Star Bulletin, May 3, 1935. p. 1.

⁶ "Cain Reveals Road Scheme for 5 Islands," Honolulu Star Bulletin, March 6, 1937. p. 1.

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On August 24, 1937, the new alignment of Kamehameha Highway between 'Aiea and Pearl City was dedicated.

This new road passed over the three 1936 bridges, crossing Waimalu Stream, Kalauao Springs, and Kalauao Stream. The original 1937 Kamehameha Highway lanes are the present-day two inner lanes of the eastbound half of the highway. At the time of its opening the road was referred to as the "Aiea-Pearl City link of the new Kamehameha" Highway.⁷ This new section, measuring 3.16 miles long, was described as "virtually curve free" with "only two flat curves," compared to 23 curves in the pre-1936 alignment.⁸ The road project had been under construction since about February 1936, and had cost almost \$310,000. Because of the swampy ground conditions, when "constructing the highway it was necessary to lay a lumber mat of 265,00 board feet before putting in the rock sub-base."⁹

The portion of the new alignment of Kamehameha Highway, from Pearl City to what is now the junction at Ka'ōnohi Street, had been open since August 2, 1937.¹⁰ At that junction, traffic was routed onto old Kamehameha Highway, between there and Aiea, while construction was completed on the remaining portion of the new road. Chester R. Clarke built the portion of road that opened on August 2 (including the Waimalu Bridge). The 1937 report by the Superintendent of Public Works only lists "Chester R. Clarke" as the contractor, instead of a company name, which was more typical.¹¹ At the time of the construction, Clarke owned a ready-mix concrete plant and operated the Moanalua Quarry, near Red Hill. Clarke was a prominent business leader in Honolulu, who had moved to Hawai'i in 1923. He started many companies, including Clarke Transportation Co. (1925), Clarke & Rourke (general insurance business, 1938), Honolulu Paving Co. (1939), and Clarke-Halawa Rock Co. (1940).¹² The construction firm of Walker & Olund, Ltd. built the remainder of the new Kamehameha Highway segment toward Aiea (including the Kalauao Springs Bridge and Kalauao Stream Bridge).¹³ A few years later, that firm became Walker-Moody Construction Co., Ltd., a distinguished business still active in Hawai'i.¹⁴

Because drawings for the 1936 bridge were not located, its designer is not known. William R. Bartels, bridge engineer for the Hawaii Territorial Highway Department, designed the 1945 Waimalu Bridge. Bartels received his education and training in Germany and immigrated to Hawai'i in 1932 when he commenced working with the Highway Department; he continued his career there until his retirement in 1958.¹⁵ During that period, he was a prolific and versatile designer, responsible for large and sophisticated bridge construction projects in Hawai'i,

⁷ "Ceremony Will Open New Road," Honolulu Star Bulletin, August 23, 1937. p. 7.

⁸ "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.

⁹ "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.

¹⁰ "New Aiea Road Open August 20," Honolulu Star Bulletin, August 3, 1937. p. 5.

¹¹ SPW, Report to the Governor for the Year Ending June 30, 1937 (Honolulu: Porter Printing Company, Ltd.) [1937]. p. 42.

¹² "Chester R. Clarke Dies Here After Operation," Honolulu Advertiser, April 1, 1956. Clipping in pamphlet file at Hawaii State Library, Hawaii and Pacific Room.

¹³ "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.

¹⁴ "Company Showcase: Walker-Moody Construction Co., Ltd.," Building Industry, July 2011. p. 100.

¹⁵ "TH Honors 4 Veteran Employees," Honolulu Advertiser, July 1, 1958 article at the University of Hawaii, Hamilton Library, Honolulu Newspapers Clippings Morgue, on microfiche in Biography section, under: Bartels.

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including many tee-beam and rigid-frame concrete bridges. He also designed the nearby reinforced-concrete girder bridge (Kalauao Springs Bridge) and steel I-beam bridge (Kalauao Stream Bridge) along this stretch of Kamehameha Highway. Bartels' name appears on the original 1945 drawings of the Waimalu Bridge as the designer. He designed and checked these drawings, dated June 1945, with the aid of drafter Paul Yamashita. B. F. Rush, the Territorial Highway Engineer at the time, approved the drawings on June 18, 1945.

In 1945 Kamehameha Highway between 'Aiea and Pearl City was improved by the addition of two more traffic lanes, separated by a median from the 1937 two-lane highway. This allowed the 1945 lanes to be dedicated to westbound traffic and the 1937 lanes to carry eastbound vehicles. This improvement included the 1945 portion of the Waimalu Bridge, which the 1945 drawings show originally had matching parapets and stanchions on each side of the new roadway. This 1945 construction was carried out under Hawaii Project No. DA-WR 10 (3).¹⁶ According to the Superintendent of Public Works report after World War II:

During the war years, highway construction activities were limited to the building of new highways, which served as access to military and navy reservations and to those highways, which are part of the strategic network. . . . As most military and navy reservations are adjacent to and are served by the main public highways, large sums of Federal access money were spent on the latter with the result that all traffic has benefited by these improvements.¹⁷

The term "access money" was explained in the Superintendent of Public Works 1945 report, as 100% Federal funding for military access roads and "those highways which are part of the strategic network."¹⁸ At the end of the war in August 1945, "all proposed access road projects were dropped by the Federal Government . . . ; but access road projects under construction were allowed to continue to their completion."¹⁹ This widened part of Kamehameha Highway improved access between the main part of the Pearl Harbor Naval Base and its outlying activities near Pearl City Peninsula, Waipi'o Peninsula, and further west.

E. E. Black, Ltd. obtained two separate construction contracts in 1945 for the highway improvements near Aiea. The amount of their contract for the two new Kamehameha Highway westbound lanes was \$381,177.40; and their accepted bid for three new bridges (the 1945 Waimalu, Kalauao Springs, and Kalauao Stream bridges) along this corridor was \$139,207.50.²⁰ For most of the twentieth century, Everett Earl Black (b. 1889 – d. 1995) was a well-connected Hawai'i businessman, who was Honolulu Gas Company's president, a director of Castle & Cooke, and on the board of Hawaiian Gas Products, Inc., as well as owner of the contracting company.²¹ E. E. Black, Ltd. obtained many road and bridge contracts in Hawai'i, starting as

¹⁶ State of Hawaii, Department of Transportation, Highways Division, Design Branch, Project No. DA-WR 10 (3), "Plans of Three Bridges on Kamehameha Highway," Drawing 5157.1. June 18, 1945.

¹⁷ SPW, Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1946 [Honolulu: author.] [1946] p. 17

¹⁸ SPW, Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1945 [Honolulu: author.] [1945] p. 13.

¹⁹ SPW, Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1946 [Honolulu: author.] [1946] p. 17.

²⁰ Ibid.

²¹ Michael T. Holmes, *The Specter of Communism in Hawaii* (Honolulu: University of Hawaii Press) 1994.

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early as 1931.²² It continued to be an important construction firm in Hawai'i for most of the twentieth century. In the mid-1990s, a California-based corporation purchased the firm, and a few years later transferred its focus of operations to Guam.²³

In 1966, the State of Hawai'i, Department of Transportation carried out another improvement of this part of Kamehameha Highway, adding a third lane to both existing two-lane roadways. This was accomplished under FAP No. U-090-I (9). This widening project was in response to numerous complaints about traffic on this highway section. Reports of protests about "bumper-to-bumper Kamehameha Highway rush hour traffic past Pearl Harbor," date at least as early as 1964.²⁴ The third lane was added on the outer edge of each roadway. This resulted in the demolition of the outer parapets and stanchions of the 1936 and 1945 bridges, and the addition of the (extant) 1966 parapets, stanchions, and walkways on the outer edge of the new traffic lanes.²⁵

Kamehameha Highway in this section, while also important to the military, has always linked the 'Aiea and Pearl City civilian communities.

Honolulu Plantation Company, 'Aiea

Before the construction of the 1937 'Aiea – Pearl City link, most of the land around 'Aiea, especially mauka of Kamehameha Highway, was planted in sugarcane. This sugarcane land extended up to about the 500-foot elevation level. A portion of the land makai of the highway was also planted in sugarcane, but here it was typically interspersed with farm plots of various crops and scattered residences. These extensive sugarcane plantings were part of the field system of Honolulu Plantation Company (HPC), a company based in 'Aiea, which began in 1899 and which had about 6,500 acres under cultivation during the 1920s. HPC lands reached from Waimalu and Halawa Valley down past the Southeast Loch of Pearl Harbor, almost to Bishop Point and Fort Kamehameha at the harbor mouth, as well as east to 'Aiea. All HPC-cultivated land was leased, with non-contiguous parcels in the eastern section. The only fee-simple land owned by the company was at the mill, main camps, reservoirs, and pump sites.

HPC made its first harvest in 1901. The mill and main plantation community were centered at 'Aiea, about ½ mile inland from the mouth of 'Aiea Stream. In 1906 HPC added a sugar refinery to the mill and began producing refined sugar for use locally. HPC was the only producer in Hawai'i that refined its sugar; all other producers shipped their raw sugar out for refining elsewhere, usually to the California & Hawaiian Sugar Company refinery in Crockett, California. Most of the HPC-refined sugar was used in locally bottled soft drinks and by the pineapple canneries. HPC shipped to the mainland any refined sugar in excess of local demand.²⁶

²² SPW, Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1931 (Honolulu: Honolulu Star Bulletin) 1932. p. 28.

²³ Ronna Bolante, "Can Locals Compete?" Hawai'i Business, on website <http://www.hawaiiibusiness.com/Hawaii-Business/July-2002>, accessed February 20, 2013.

²⁴ "Pearl City Traffic Saddens Police, Too," Honolulu Star Bulletin, June 22, 1964. p. 3.

²⁵ State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), As Built Plans of Kamehameha Highway Widening, Drawing 1. July 22, 1965.

²⁶ William H. Dorrance, Sugar Islands, The 165-year Story of Sugar in Hawaii (Honolulu: Mutual Publishing LLC) 2000. p. 50.

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HPC was one of the very few sugar plantations in Hawai'i with a year-round water supply that was sufficient for its irrigation needs.²⁷ About 20 million gallons per day flowed to the surface at the two springs at Kalauao. HPC pumped this water to its upper fields for irrigation and for fluming, using less than half of the daily supply. The rest flowed into Pearl Harbor.

Although HPC had employee camps scattered about the plantation, 'Aiea was the hub and main settlement. HPC's refinery and its hospital formed a nucleus for the community of 'Aiea, which grew up around these facilities. By the mid-1920s, HPC had begun replacing former barracks-type housing facilities with single-family and duplex cottages. The newer cottages provided more privacy, and also had electricity, water, and kitchens in each unit. Individual kitchens were an improvement from the older barracks that had communal kitchens separated from sleeping quarters. In addition, the 1920s cottages were typically on 50' x 80' lots, which allowed space for gardens and fruit trees. The HPC community at 'Aiea also had churches, baseball fields, volleyball, basketball, and tennis courts, and a general store. Additionally, there was an assured milk supply for the plantation because HPC sponsored a private dairy.²⁸

Over the years, HPC lost much of its leased acreage; this included loss of some at Pearl Harbor, in 1907 for the naval base, and additional leased lands east of Bishop Point, in 1935 for Hickam Field. The military occupied other HPC sugarcane fields during World War II. One author states the military confiscation of HPC land led to its closure in 1947.²⁹ Another writer notes "post-war urban growth supplied the final blow."³⁰ After the plantation closed, O'ahu Sugar Company purchased most equipment and obtained leases on the remaining land. California & Hawaiian Sugar Company acquired the 'Aiea refinery and continued to refine sugar there until 1996, when local bottlers switched to corn syrup for sweetening.³¹

Pearl City Area

Pearl City was Oahu's first planned suburban development,³² initiated by Benjamin F. Dillingham in 1890. Dillingham started the O'ahu Railway & Land Company railroad line the year before, and created Pearl City by subdividing his land on the (Pearl City) peninsula and further mauka, in the area of Pearl City Junction, where Lehua Avenue (the subdivision's main access road) intersected the Government Road (future Kamehameha Highway). The railway link from Pearl City to Honolulu was a selling point for the development. Prices for subdivided lots sold at auction in November 1890 began at \$44 per lot.³³ Sales and population growth in the early decades were slow; in 1892, there were about 550 unsold lots remaining, out of 800.³⁴

²⁷ Jared G. Smith, *Plantation Sketches* (Honolulu: Advertiser Press) 1924. p. 132.

²⁸ *ibid.*, p. 138-39.

²⁹ Edward D. Beechert, *Working in Hawai'i, A Labor History* (Honolulu: University of Hawai'i Press) 1985. p. 304.

³⁰ William H. Dorrance, *Sugar Islands, The 165-year Story of Sugar in Hawai'i* (Honolulu: Mutual Publishing LLC) 2000. p. 50.

³¹ *Ibid.*

³² Jim Chiddix and MacKinnon Simpson, *Next Stop Honolulu, O'ahu Railway & Land Company 1889-1971* (Honolulu: Sugar Cane Press) 2004. p. 38

³³ Pearl City Library, *Pearl City: A Look at the Past: an oral history project* (Wahiawā: Wonder View Press) 1992. p. 70

³⁴ Jim Chiddix and MacKinnon Simpson, *Next Stop Honolulu, O'ahu Railway & Land Company 1889-1971*, 2004. p. 42.

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Up until 1920, the area was still a small settlement, despite the "City" in its name. Starting in the 1910s, some military families joined the peninsula's original residents.³⁵ The area was popular due to availability of inexpensive rentals, which appealed especially to non-commissioned officers, and because of its convenient location. Navy personnel (military or civilian) used small boats or ferry services, commuting by water to Ford Island and the main base at Pearl Harbor. Most of the Hawaiian, Chinese, and Japanese families in Pearl City worked small farming operations in taro, rice, bananas, and watercress. Another typical occupation for these families was as domestic help for their wealthier neighbors.³⁶ Affluent families, usually Caucasian, purchased most of the waterfront lots on Pearl City Peninsula and eventually put up weekend homes there, while maintaining primary residences in Honolulu.

During the 1920s and 1930s as automobiles became more common and roads were improved, the Pearl City area grew in population with residents who commuted to work in Honolulu. During World War II, the Navy gained control of all the Pearl City Peninsula land and developed it with a variety of facilities, few of which remain. The Navy condemned the Pearl City Peninsula land after the war and redeveloped it, mostly with military housing.³⁷ The growth trend in adjacent parts of Pearl City, next to and mauka of the peninsula, also continued, with housing "sprout[ing] in former agricultural areas" and displacing much of the small farm parcels and sugarcane land.³⁸ Along with this increase in housing, the establishment of businesses along Kamehameha Highway encouraged additional community growth.

By the late 1950s, Pearl City's growth mirrored national patterns of suburban development that were differentiated by a suburb's "age, socioeconomic status, activities, racial and ethnic composition, household composition, and relationship to central cities;" however, it was also "very unique" because the period of martial law during the war had a "profound impact on the transformation of the Pearl City area."³⁹ This was due to the confiscation of land and other property that affected Japanese farmers in the area, divesting them of their homes and sources of income. This re-apportionment of Pearl City land, along with "the influx of new populations from the mainland, active duty and civilian defense workers, meant new residents and new services for the area, and set the stage for the post war development that followed."⁴⁰ The end of many farming operations and the displacement of former residents "created somewhat of a social vacuum in the area" and allowed much of the post-war development, including several subdivisions built mauka of Kamehameha Highway.⁴¹ The fee simple titles that were available for these lots were a powerful motivator for families looking to own a home in the 1950s. This, combined with the demolition and redevelopment of low and moderate income neighborhoods in and adjacent to downtown Honolulu in the late 1950s and early 1960s helped to redistribute housing to areas further from downtown Honolulu, including Pearl City where the new residents

³⁵ Ann Yoklavich, Historic American Buildings Survey (HABS), U.S. Naval Base, Pearl Harbor, Pearl City Peninsula, HABS No. HI-393 (Prepared for Commander Navy Region Hawaii) 2004. p. 3.

³⁶ Joyce Chinen, "The Suburbanization of Pearl City," The Pearl City Local History Project (Pearl City: Cultural Heritage Learning Center) 1994. p. 10.

³⁷ Ann Yoklavich, U.S. Naval Base, Pearl Harbor, Pearl City Peninsula, HABS No. HI-393, 2004. pp. 5-9.

³⁸ Joyce Chinen, "The Suburbanization of Pearl City," The Pearl City Local History Project, 1994. p. 11.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid., p. 12.

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were typically younger working-class families. Shopping centers and other facilities (both private and public) opened to serve the emerging community.

The construction of the H-1 Freeway in the late 1960s increased the opportunity for commuters, and created a surge in demand for housing that stimulated another phase of development. This included high-density housing and franchise retailing operations. In the same period, this development extended eastward along Kamehameha Highway into the adjacent Waiau and Waimalu areas.⁴²

Reinforced-Concrete Girder Bridges

Reinforced-concrete girder bridges are a type that was common in the early twentieth century. The character-defining features of this type include a monolithic deck and girder system and short spans (typically 15 to 40 feet).⁴³ This type, using cast-in-place concrete girders with reinforcing, replaced earlier concrete arch bridges, which had even more limited spans. This type of bridge was also a more economical choice than concrete arch bridges. From the 1910s through the 1940s, this type was customary in Hawai'i to span short distances. Generally, this type of bridge is eligible under Criterion A, as the historic context above presents, because they are "representative of important public works projects initiated by the Territorial ... government ... constructed at important crossings along a major transportation route or belt road."⁴⁴

The 1936 and 1945 portions of the Waimalu Bridge were relatively short-span, narrow (two-lane) bridges that used cast-in-place reinforced-concrete girders. The portions of the bridges added in 1966 used prestressed girders.⁴⁵ A nationwide bridge study notes this combination of bridge types was used for a few widening projects.⁴⁶

Conclusion

The Waimalu Bridge complex is eligible locally for the National Register of Historic Places under Criterion A (Events) as it was a contributing element to the development of a regional road network that facilitated development in the Pearl City area.

⁴² Ibid., p. 13.

⁴³ Parsons Brinckerhoff and Engineering and Industrial Heritage, A Context for Historic Bridge Types, NCHRP Project 25-25, Task 15. (Prepared for the National Cooperative Highway Research Program) October 2005. p. 3-93.

⁴⁴ Heritage Center, State of Hawai'i, Historic Bridge Inventory and Evaluation, Draft, 2008. pp. I-71 & I-72.

⁴⁵ State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), Waimalu Stream Bridge Widening, Drawing 73. June 1965.

⁴⁶ Parsons Brinckerhoff and Engineering and Industrial Heritage, A Context for Historic Bridge Types, October 2005. p. 3-93

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9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form.)

Architectural Drawings and Early Views

No drawings or early photographs of the original 1936 bridge were located for this form.

The 1945 and 1966 construction drawings are electronic files (scans) located in the database at State of Hawai'i, Department of Transportation, Highways Division, Design Branch: 1945 Project – Hawaii Project No. DA-WR 10 (3) dated June 18, 1945; 1966 Project – FAP No. U-090-I (9) dated July 22, 1965.

Historic maps and aerial photos are located in the collection of the Hawai'i State Archives. Aerial photos in the collection of the Hawai'i State Archives were created under contract for the Hawaii Territorial/ State Land Use Bureau. An early photograph of Kamehameha Highway in the Pearl City area is located at the Hawai'i State Archives in the Superintendent of Public Works Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1937. This photo was created by the Territorial Department of Public Works, or under contract for the department.

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"Allotment to Hawaii Roads is Agreed On." August 3, 1933. p. 1.

"\$2,631,000 To Be Spent For Island Roads." August 16, 1933. p. 1.

"Moses Akiona is Low Bidder on Puuloa Road." November 10, 1933. p. 1.

"Cain Submits Road Plan to U.S. Officials." May 3, 1935. p. 1.

"Cain Reveals Road Scheme for 5 Islands." March 6, 1937. p. 1.

"New Aiea Road Open August 20." August 3, 1937. p. 5.

"Ceremony Will Open New Road." August 23, 1937. p. 7.

"Aiea Highway Link Dedicated." August 25, 1937. p. 6.

"Pearl City Traffic Saddens Police, Too." June 22, 1964. p. 3.

"Waiau-Aiea Link of H-1 Set to Open." December 15, 1970. p. F-6.

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Smith, Jared G. Plantation Sketches, A Record of Hawaiian Industries as They Appeared to an Itinerant Journalist in 1923: published in the Columns of the Advertiser. Honolulu: Advertiser Press. 1924.

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Newspaper articles on W.R. Bartels are available at the University of Hawai'i at Mānoa, Hamilton Library, Honolulu Newspapers Clippings Morgue, on microfiche in Biographical section under: Bartels. Various Dates.

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Previous documentation on file (NPS):

☐ preliminary determination of individual listing (36 CFR 67) has been requested
☐ previously listed in the National Register
☐ previously determined eligible by the National Register
☐ designated a National Historic Landmark
☐ recorded by Historic American Buildings Survey # _____
☒ recorded by Historic American Engineering Record # HI-116
☐ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

☐ State Historic Preservation Office
☒ Other State agency
☐ Federal agency
☐ Local government
☐ University
☐ Other
Name of repository: Hawaii DOT, Highways Div. Design Branch

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acres of Property Less than one acre

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates

Datum if other than WGS84: _____

(enter coordinates to 6 decimal places)

1. Latitude:	Longitude:
2. Latitude:	Longitude:
3. Latitude:	Longitude:
4. Latitude:	Longitude:

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Or

UTM References

Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

- | | | |
|-------------|-----------------|-------------------|
| 1. Zone: 04 | Easting: 608600 | Northing: 2365250 |
| 2. Zone: | Easting: | Northing: |
| 3. Zone: | Easting: | Northing: |
| 4. Zone: | Easting : | Northing: |

Verbal Boundary Description (Describe the boundaries of the property.)

The boundary of Waimalu Bridge is defined by the outer limits of the structures, enclosed by a rectangle measuring approximately 150' x 115' that includes the superstructure and abutments of both the eastbound and westbound bridges.

Boundary Justification (Explain why the boundaries were selected.)

The boundary of the property includes all historic features of the bridges that are named Waimalu Bridge.

11. Form Prepared By

name/title: Lorraine Minatoishi, PhD, AIA, President
organization: Minatoishi Architects
street & number: 1003 Bishop Street, Suite 1975
city or town: Honolulu state: Hawaii zip code: 96813
e-mail LM@mahawaii.com Natalie@mahawaii.com
telephone: (808)942-7474
date: March 4, 2020

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Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

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Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property:

City or Vicinity:

County:

State:

Photographer:

Date Photographed:

Description of Photograph(s) and number, include description of view indicating direction of camera:

1 of ____.

Paperwork Reduction Act Statement: This information is being collected for nominations to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.). We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

Estimated Burden Statement: Public reporting burden for each response using this form is estimated to be between the Tier 1 and Tier 4 levels with the estimate of the time for each tier as follows:

Tier 1 – 60-100 hours
Tier 2 – 120 hours
Tier 3 – 230 hours
Tier 4 – 280 hours

The above estimates include time for reviewing instructions, gathering and maintaining data, and preparing and transmitting nominations. Send comments regarding these estimates or any other aspect of the requirement(s) to the Service Information Collection Clearance Officer, National Park Service, 1201 Oakridge Drive Fort Collins, CO 80525.

Waimalu Bridge
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Additional Information

Figure #	Name	Description
1	USGS Map	USGS Map showing location of property
2	USGS Map	USGS Map showing location of property
3	Historic Map	Historic Map showing location of property
4	Historic Photo	Historic photo showing location of property
5	Historic Photo	Historic photo showing location of property
6	Historic Document	Historic Document - Drawing

Figure 1: USGS Map showing location of property

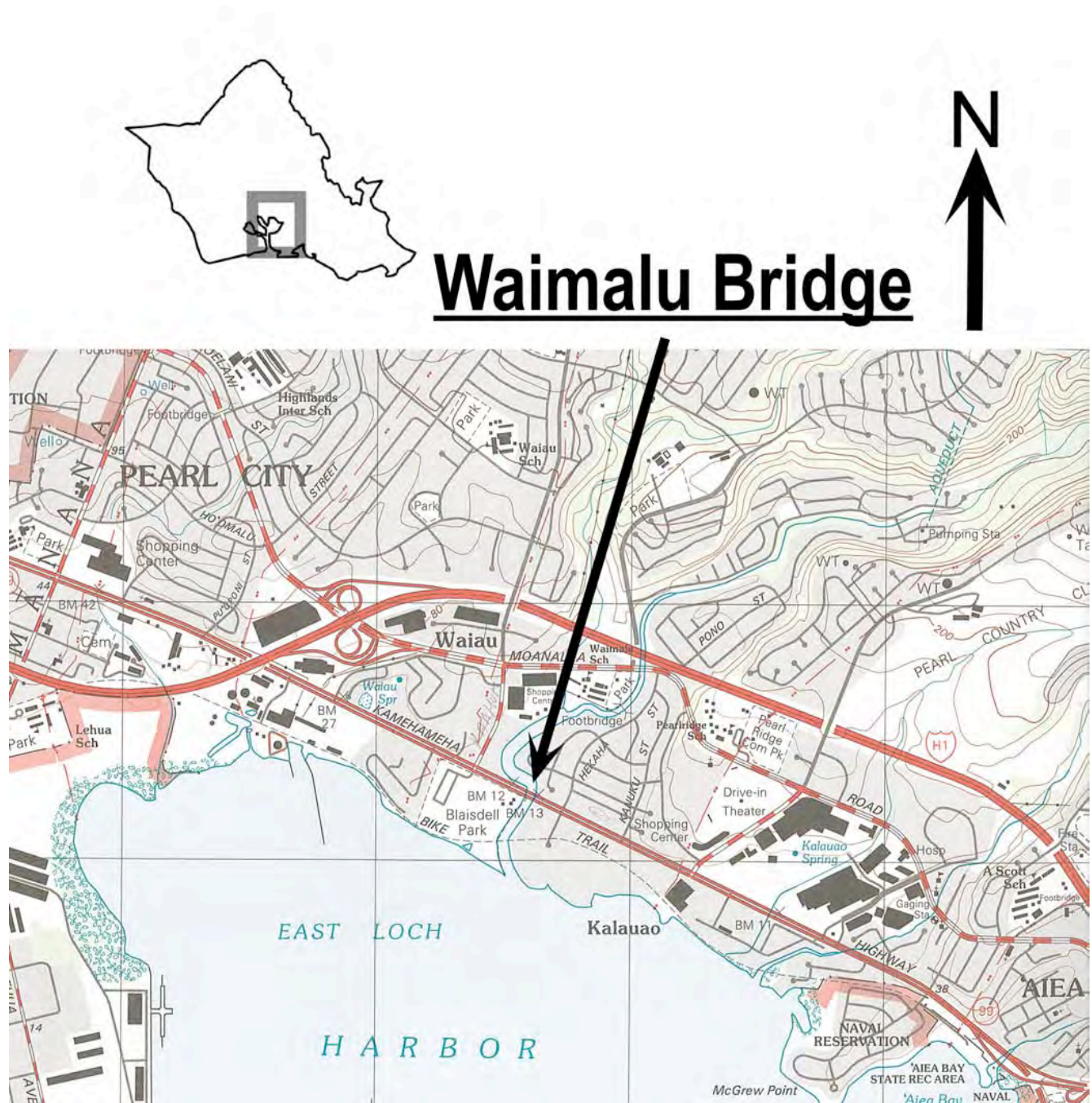


Figure 2: USGS Map showing location of property

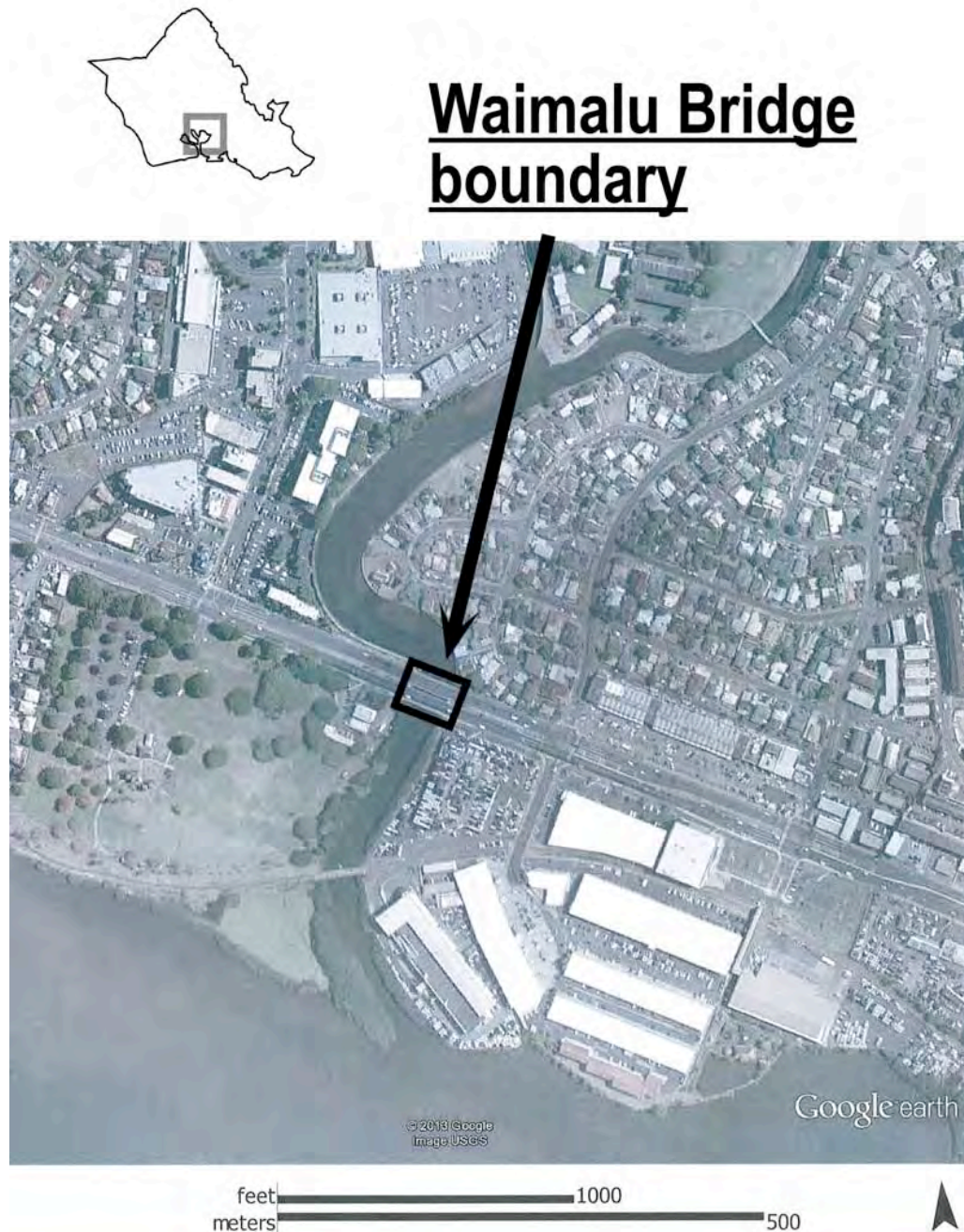


Figure 3: Historic Map showing location of property

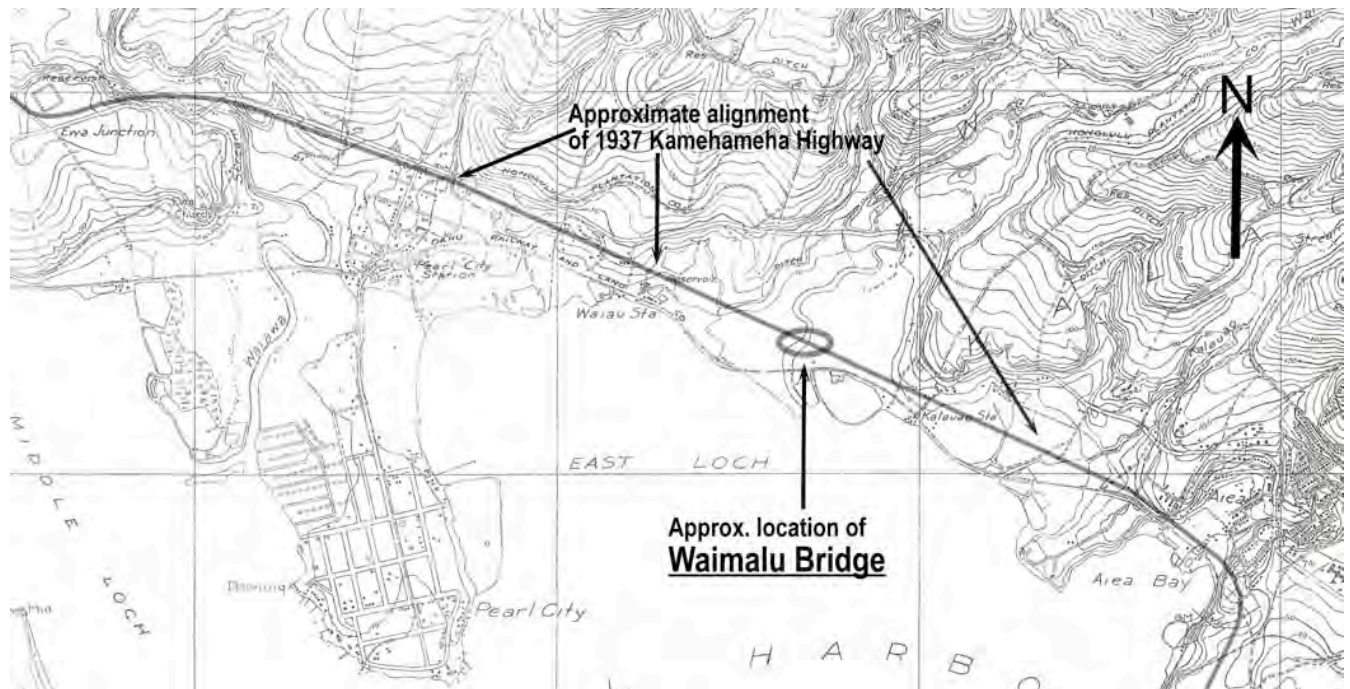


Figure 4: Historic photo showing location of property

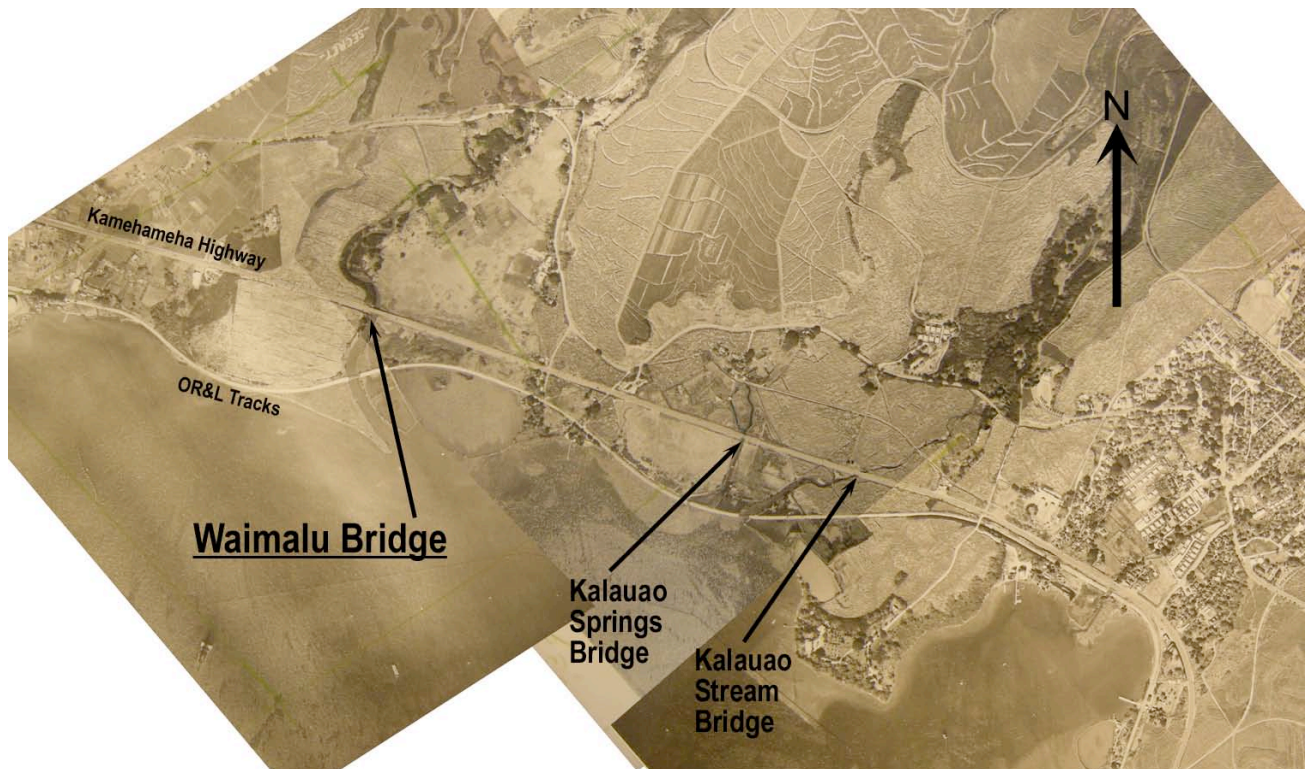


Figure 5: Historic photo showing location of property

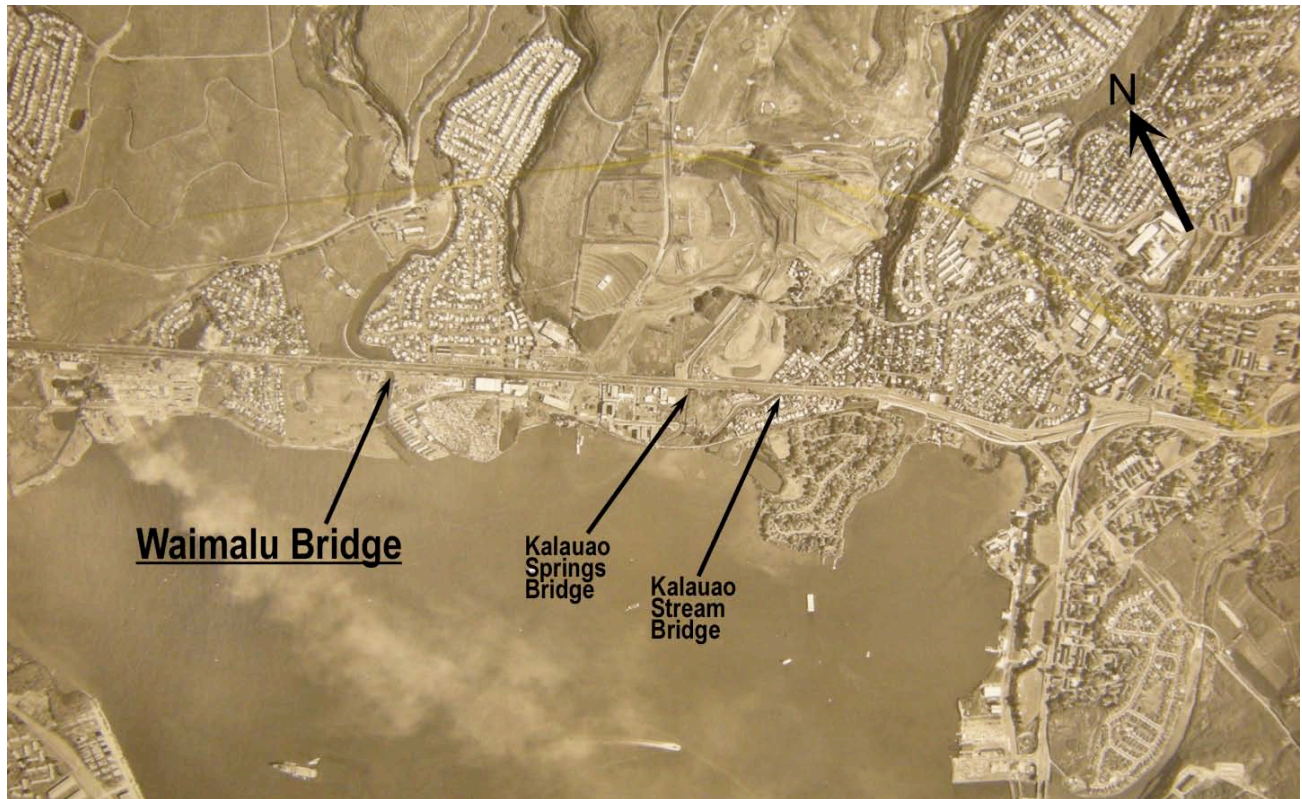
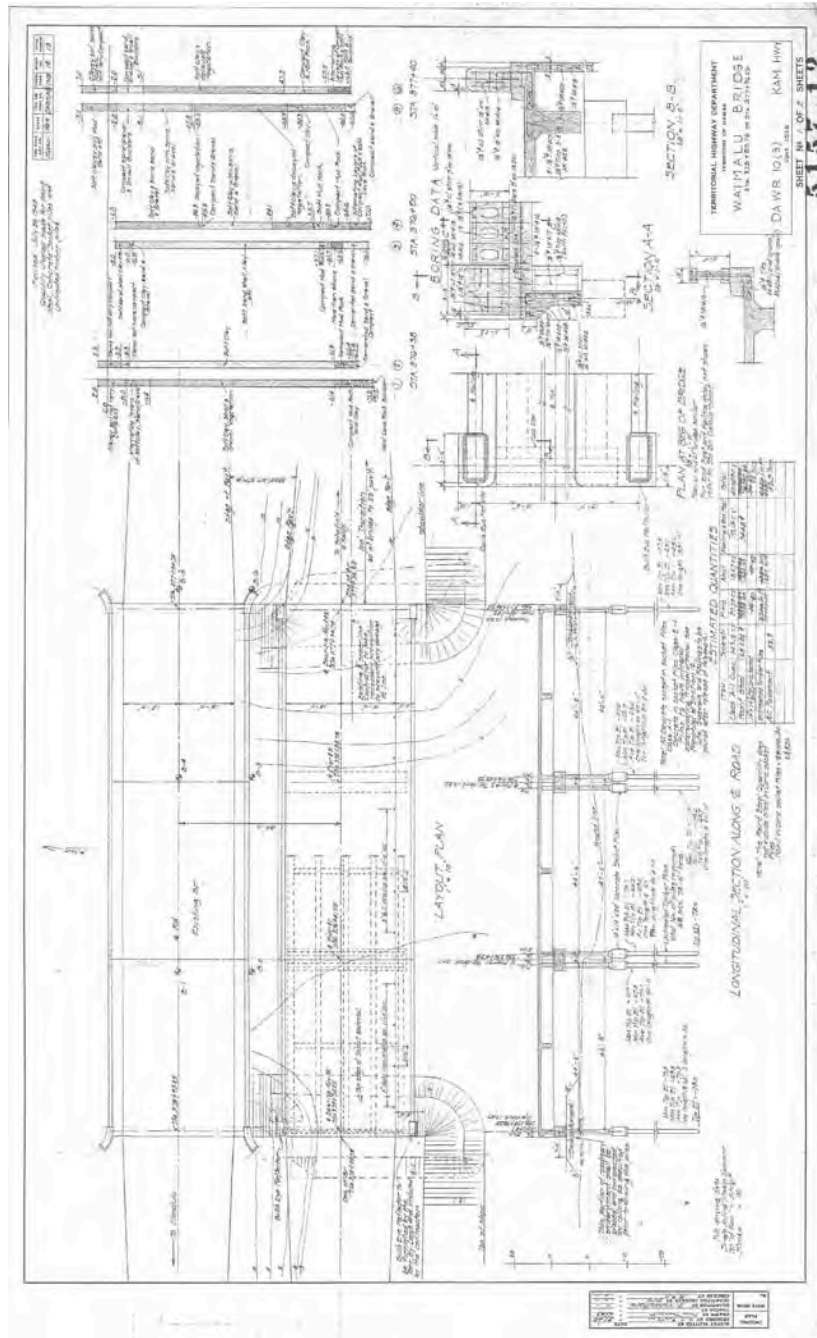


Figure 6: Historic Drawing

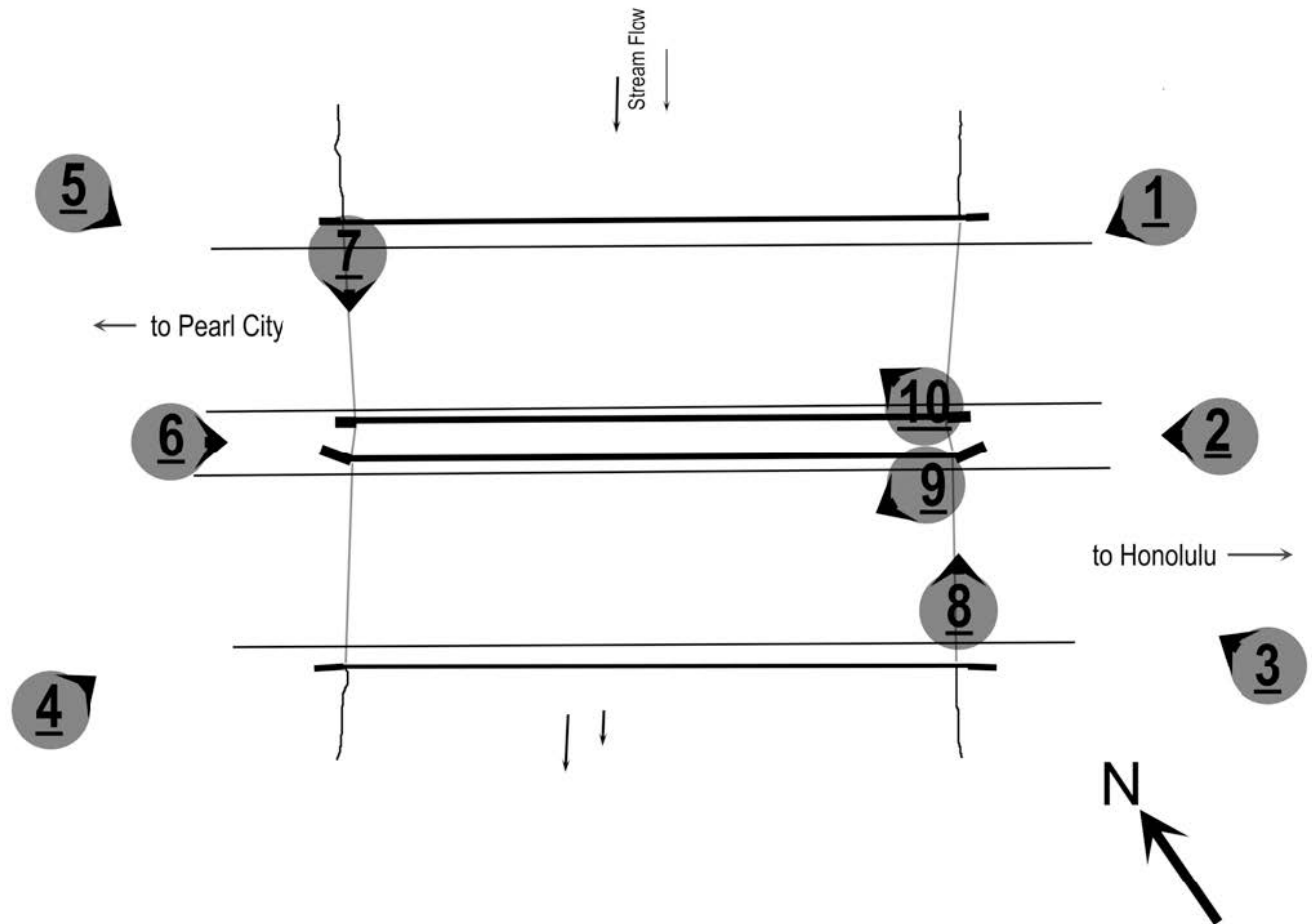


Photo#	File Name	Description
1	HI_Honolulu_WaimaluStreamBridge_0001	Overview of Waimalu Bridge, with westbound bridge on right, camera facing west.
2	HI_Honolulu_WaimaluStreamBridge_0002	Overview showing the median with eastbound lanes on left and westbound lanes on right, camera facing northwest
3	HI_Honolulu_WaimaluStreamBridge_0003	Overview with eastbound bridge on left, camera facing northwest.
4	HI_Honolulu_WaimaluStreamBridge_0004	Overview showing the approach to eastbound bridge, camera facing east.
5	HI_Honolulu_WaimaluStreamBridge_0005	Overview of westbound bridge, with portion of eastbound bridge's 1936 parapet visible, camera facing southeast
6	HI_Honolulu_WaimaluStreamBridge_0006	Detail of median, showing the space between 1945 parapet (left) and 1936 parapet (right), camera facing southeast
7	HI_Honolulu_WaimaluStreamBridge_0007	Detail of westbound bridge's 1945 parapet and stanchion with scale device (one-foot increments), camera SW
8	HI_Honolulu_WaimaluStreamBridge_0008	Detail of eastbound bridge's 1936 parapet and stanchion with scale device (one-foot increments), camera NE
9	HI_Honolulu_WaimaluStreamBridge_0009	Deck of Waimalu Bridge, showing the 1936 frame at center, added 1966 piles at far left, and 1945 substructure at right, camera facing west.
10	HI_Honolulu_WaimaluStreamBridge_0010	Deck of westbound bridge's 1945 substructure and 1966 piles, camera facing north

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Waimalu Bridge
Name of Property

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Photo: 1 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Overview of Waimalu Bridge, with westbound bridge on right, camera facing west.
Camera Facing: W



Waimalu Bridge
Name of Property

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Photo: 2 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Overview showing the median with eastbound lanes on left and westbound lanes on right
Camera Facing: NW



Waimalu Bridge
Name of Property

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Photo: 3 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Overview with eastbound bridge on left, camera facing northwest.
Camera Facing: NW



Waimalu Bridge
Name of Property

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Photo: 4 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Overview showing the approach to eastbound bridge, camera facing east.
Camera Facing: E



Waimalu Bridge
Name of Property

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Photo: 5 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Overview of westbound bridge, with portion of eastbound bridge's 1936 parapet visible, camera facing
Camera Facing: SE



Waimalu Bridge
Name of Property

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Photo: 6 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Detail of median, showing the space between 1945 parapet (left) and 1936 parapet (right), camera facing
Camera Facing: SE



Waimalu Bridge
Name of Property

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Photo: 7 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Detail of westbound bridge's 1945 parapet and stanchion with scale device (one-foot increments),
Camera Facing: SW



Waimalu Bridge
Name of Property

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Photo: 8 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Detail of eastbound bridge's 1936 parapet and stanchion with scale device (one-foot increments), camera
Camera Facing: NE



Waimalu Bridge
Name of Property

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Photo: 9 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Deck of Waimalu Bridge, showing the 1936 frame at center, added 1966 piles at far left, and 1945 substructure at right, camera facing west.
Camera Facing: W



Waimalu Bridge
Name of Property

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Photo: 10 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Deck of westbound bridge's 1945 substructure and 1966 piles,
camera facing north
Camera Facing: N



Waimalu Bridge
Name of Property

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Photo: 11 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Deck of westbound bridge's 1945 substructure and 1966 piles,
camera facing north
Camera Facing: N



Waimalu Bridge
Name of Property

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Photo: 12 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Deck of westbound bridge's 1945 substructure and 1966 piles,
camera facing north
Camera Facing: N



Waimalu Bridge
Name of Property

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County and State

Photo: 13 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Deck of westbound bridge's 1945 substructure and 1966 piles,
camera facing north
Camera Facing: N



Waimalu Bridge
Name of Property

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Photo: 14 of 14
Name of Property: Waimalu Stream Bridge
City or Vicinity: Pearl City
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: Deck of westbound bridge's 1945 substructure and 1966 piles,
camera facing north
Camera Facing: N

