WAIPILOPILO BRIDGE
Kamehameha Highway (Route 83) and Waipilopilo Stream
Hauula
Honolulu County
Hawaii

HAER HI-124
HAER HI-124

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
PACIFIC WEST REGIONAL OFFICE
National Park Service
U.S. Department of the Interior
333 Bush Street
San Francisco, CA 94104

HISTORIC AMERICAN ENGINEERING RECORD

WAIPILOPILO BRIDGE

HAER No. HI-124

Location: Kamehameha Highway (Rt. 83) and Waipilopilo Stream
Hauula
Honolulu County, Hawaii

U.S.G.S. Hauula, HI quadrangle 1992
7.5 Minute Series (Topographic) (Scale – 1:24,000) NAD83 datum.
Universal Transverse Mercator Coordinates: 04.612460.23906000

Lat./Long. Coordinates:
21° 36' 53.80" N
157° 54' 47.60" W

Adjacent to TMKs
[1] 5-4-002, 004, 011, and 017.

Date of Construction: 1932

Owner: State of Hawaii

Present Use: Vehicular bridge

Significance: Waipilopilo Bridge is significant for its association with the development of Route 83, Kamehameha Highway portion of the belt road that circles the Island of Oahu. The belt road was an important transportation improvement for Oahu and provided easier access to outlying communities.

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Date of Report: April 2015

DESCRIPTION:

The Waipilopilo Bridge is a concrete deck girder bridge with solid panel concrete parapets that carries two lanes of traffic on Kamehameha Highway (Rt. 83) over Waipilopilo Stream. The bridge is about 22'-0" in a single span between its concrete abutments. Parapets are about 25'-6" long and the roadway is about 23'-8" wide between the curbs at the base of the parapets. The area around the bridge is rural, with houses and open space. The highway south of the bridge runs near the seashore and a sand beach borders the road on the southeast. North of the bridge, the highway runs slightly inland enough for houses to line both sides of the road.

The parapets have curved end stanchions that are each about 3'-10" long and curved away from the roadway on an approximate 4'-10" radius. The stanchions have a low hipped top rail that is 10" high and 1'-3" wide. Below this is a 10" thick center section that is 1'-8" high and has recessed panels on the front and rear sides that measure about 2'-1" wide x 1'-2" high. The stanchion rests on a 1'-6" wide base that rises about 5" above the asphalt surface of the roadway to form a curb. All four end stanchions have added thrie-beam rails attached to their road-facing curved front panels by through bolts. This has nearly obscured the incised lettering on the front recessed panels, but by careful inspection between the beams, the inscriptions "1932" can be made out on the southeast and northwest stanchions, and the inscriptions "Waipilopilo" can be made out on the northeast and southwest stanchions.

The parapets between the end stanchions have a 1'-0" wide, 7" high low-hipped top rail with an 8" thick center section that is 1'-8" high. Each parapet is divided into three, 5'-10" wide sections by a narrow expansion joint. Between the expansion joints each section has a recessed panel on front and rear sides that measures about 5'-3" wide x 1'-1" high. The parapets between the end stanchions rest on the same 1'-6' wide base that extends as a continuation of the curb from the base of the stanchions.

The total thickness of the concrete deck of the bridge with its asphalt surfacing is about 10". The underside of the bridge deck has four longitudinal concrete beams on approximate 7'-6" centers. The beams are 1'-3" wide and about 2'-2" high. The concrete abutments are about 32'-0" wide and about 4'-6" high. Each abutment is supported on seven concrete piles which are about 1'-2" square. Concrete wing walls, typically 7' to 9' long, extend back at right angles at the ends of the abutments.

At the west side of the bridge there is an added wooden walkway attached to the outboard side of the upstream parapet. The walkway is supported by steel angle brackets bolted to the concrete of the bridge. The outboard edge of the walkway has a rail of vertical 4 x 4 wood posts on variable spacing of between 4'-8" to 5'-8" that are spanned by horizontal wood 2 x 6 and 2 x 10 boards. The decking of the walkway is longitudinal 2 x 10 boards.

HISTORIC CONTEXT

Waipilopilo Bridge was one of seven bridges built under Federal Aid Project (FAP) No. 1D. This project consisted of the construction of about 5.1 miles of Kamehameha Highway (Rt. 83) extending south from near Adams Field in Kahuku to about Punaiki Gulch just south of Hauula. Included in FAP 1D were seven concrete bridges. Original plans for FAP 1D are dated April 1932 and were approved and signed by Lyman H. Bigelow, Hawaii Territorial Highway Engineer. The contract for FAP 1D was let to contractor Lincoln L. McCandless of Honolulu for $190,117.51 in fiscal year 1931-32 (July 1 to June 30). Construction was underway by June 30, 1932, and the last of the seven bridges in the contract was completed by the end of 1933.

Table 1: Concrete bridges built under FAP 1D.

Bridge Name	Location	FAP 1D Bridge # *	Total Span, Yr completed	National Bridge ID Number
Waipuhi	Papau Stream, 0.23 mi SE of Kukuna Road	14	22', 1932	003000830302186
Hauula	Hauula Stream, 0.06 mi SE of Kukuna Road	15	22', 1932	003000830302169
Muliwai	Maakua Stream, 0.21 mi SE of Hauula Homestead Road	15A	106', 1932	003000830302151
Waipilopilo	Waipilopilo Stream, 0.03 mi SE of Imua Place	16	22', 1932	003000830302112
Kaipaupau	Kaipaupau Stream, 0.01 mi SE of Pipilani Place	17	82', 1932	003000830302099
Laiemaloo	Koloa Stream, 0.10 mi N of Laie Beach Park	18	88', 1933	003000830301970
Laiewai	Kahawainui Stream, 0.17 mi NW of Naniloa Loop	21	88', 1933	003000830301785

*The column "FAP 1D Bridge #" shown the original identifier number for each bridge that was used on the original 1932 project plans.

The contract for FAP 1D called for the roadway to be asphalt-macadam paved, 20' wide with 6' shoulders. All seven bridges were specified to have a 24' wide roadway.

The approximate 5 mile length of FAP 1D was interrupted in two places where bridges were built under a separate project, FAP 1C. This project consisted of three concrete bridges and approaches that were built at Malaekahana Stream (adjacent to the north boundary of FAP 1D), Laieloa Stream (just north of Laie Point), and Laie Stream (Kokololio Gulch). FAP 1C was let to contractor Ralph E. Wooley for $33,133.86. The portion of Kamehameha Highway south of FAP 1D was built under FAP 1A, an approximate 9.27 mile section that extended to about present day Kualoa Beach Park.

In late 1931, Hawaii received a windfall federal road aid package that amounted to $1.5 million, that was authorized to construct 531 miles of roads in the Territory of Hawaii under a roadway plan devised by Lyman H. Bigelow. Part of this plan was the paving of five miles of road near Hauula, which would become FAP 1D.[1]

Contractor, Lincoln Loy McCandless

The contractor for the 1932 Waipilopilo Bridge,the other six bridges (shown in Table 1), and approximately five miles of road associated with FAP 1D, was Lincoln Loy McCandless. He was born on September 18, 1859 in Indiana County, Pennsylvania, the fifth of seven children.

[1] "Early Start on Federal Roads Here Expected." Honolulu Star-Bulletin. November 18, 1931. P. 1.

In 1867 his family relocated to Volcano, West Virginia, where his father, Thomas McCartney McCandless, speculated in the newly found petroleum reserves there. During the family's time in West Virginia, McCandless and his three brothers learned to drill wells. In late 1880, McCandless' older brother James, en route to the California oil fields, heard of the opportunity to drill water wells on Oahu, and shipped there in December. Brother John joined James McCandless in Hawaii in 1881 with a well boring outfit. John and James drilled wells for the next two years, purchasing a second boring outfit. In 1882 Lincoln L. McCandless arrived in Hawaii from West Virginia to join his two brothers in the well-drilling business. The McCandless brothers cashed in on the "craze for artesian wells" for the next several years in Hawaii.[2] Although the actual partnership of the brother's well drilling operations lasted until 1930, by about the 1890s, the brothers' business interests had diverged, and the well drilling operation was McCandless Brothers in name only. Only James remained active in well drilling while John ventured into other business interests and Lincoln began to diverge into ranching and construction. In 1893 each of the three McCandless brothers "took active parts in the overthrow of the Hawaiian monarchy."[3]

Lincoln L. McCandless, often known as L.L. or Link, began accumulating ranch lands shortly after he arrived in Hawaii, initially leasing acreage in Waimalu and Kalawao. One of his first construction projects was the 1907 office building (McCandless Building) at the corner of King and Bethel Streets in Honolulu that was built in conjunction with his brothers.

McCandless started in the construction business in 1911, when he partnered with John H. Wilson to offer bids to build segments of Oahu's belt road. Wilson, a road-builder who had taken up politics, had engineering experience and McCandless was able to bankroll the partnership. The business partnership dissolved in 1915, with McCandless taking all equipment and assuming the partners' liabilities.[4] McCandless remained in the road and bridge contracting business. In 1922 he completed over 9 miles of road (Farrington Highway) and ten bridges from Honouliuli Station toward Waianae, including the 22' span Farrington Highway Bridge over Palehua Stream. In 1927 he built the 42' span Honouliuli Bridge on Fort Weaver Road, and in 1930 he completed the 60' span Wailupe Bridge on Kalanianaole Highway.

Link McCandless became active in politics shortly after the overthrow of the Hawaiian monarchy, was elected Senator in the provisional government and advocated for Hawaiian annexation. After annexation he was elected to the Territorial Senate. He campaigned unsuccessfully several times to be elected Territorial delegate to U.S. Congress before gaining the seat in 1932.

SOURCES

A. Architectural Drawings:

Historic drawings for FAP 1D are available at the Hawaii Department of Transportation, Highway Division. Drawing set no. 4251. 1932.

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[2] James Sutton McCandless, *A Brief History of the McCandless Brothers and their part in the Development of Artesian Well Water in the Hawaiian Islands, 1880-1936*. (Honolulu: Privately published). 1936. P. 20.
[3] McCandless, *A Brief History*. 1936. P. 7-24.
[4] Bob Krauss, *Johnny Wilson. First Hawaiian Democrat.* (Honolulu: University of Hawaii Press). 1994. Pp. 108-115, 138.

B. Early Views:

No early views were located for this report.

C. Bibliography:

Hawaii Department of Public Works. *Annual Report to the Governor of the Territory of Hawaii by the Superintendent of Public Works*. Honolulu. Various years.

Hawaii Highway Planning Department, Territorial Highway Department. *Bridge Inventory for the Island of Oahu.* Hawaii Highway Planning Department, Territorial Highway Department. September 1950.

Honolulu Star Bulletin.

"Costly Road Faulty; Blame to be Fixed." June 30, 1913. P. 1.

"Road Progress in Hawaii is Told in Report." December 9, 1930. P. 3.

"Territory May Get $400,000 Road Fund Gift." December 16, 1930. P.1.

"A Million and Half Road Aid for Territory." November 17, 1931. P. 1.

"Early Start on Federal Roads Here Expected." November 18, 1931. P. 1.

Krauss, Bob. *Johnny Wilson, First Hawaiian Democrat*. Honolulu: University of Hawaii Press. 1994.

McCandless, James Sutton. *A Brief history of the McCandless Brothers and their part in the Development of Artesian Well Water in the Hawaiian Islands, 1880-1936*. Honolulu: Privately published. 1936.

MKE Associates LLC, and Fung Associates, Inc. *Hawaii State Historic Bridge Inventory and Evaluation*. Prepared for State of Hawaii Department of Transportation, Highways Division. November 2013.

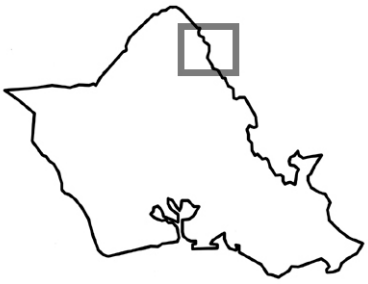
Thompson, Bethany. *Historic Bridge Inventory, Island of Oahu*. Prepared for State of Hawaii Department of Transportation, Highways Division. June 1983.

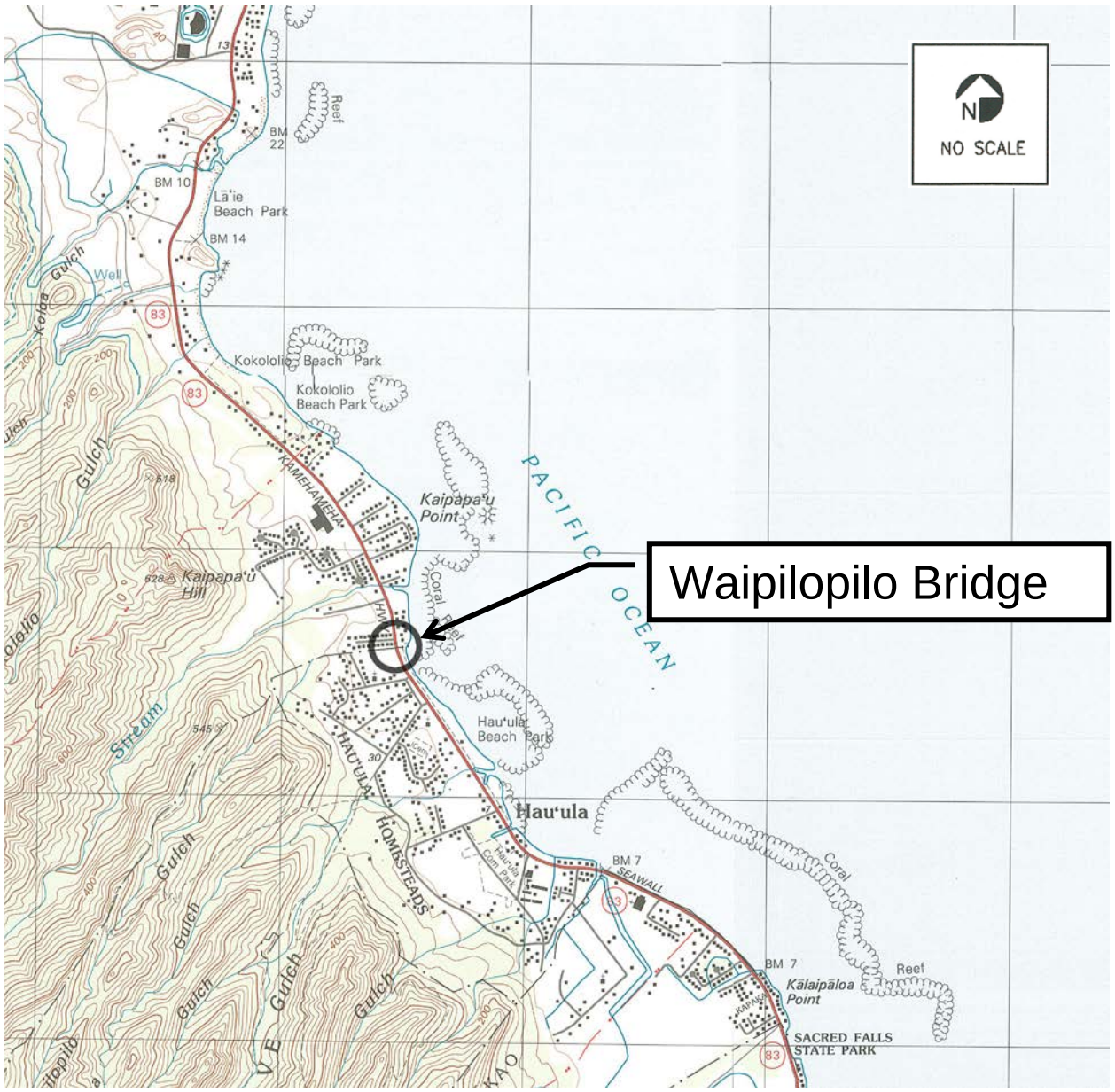
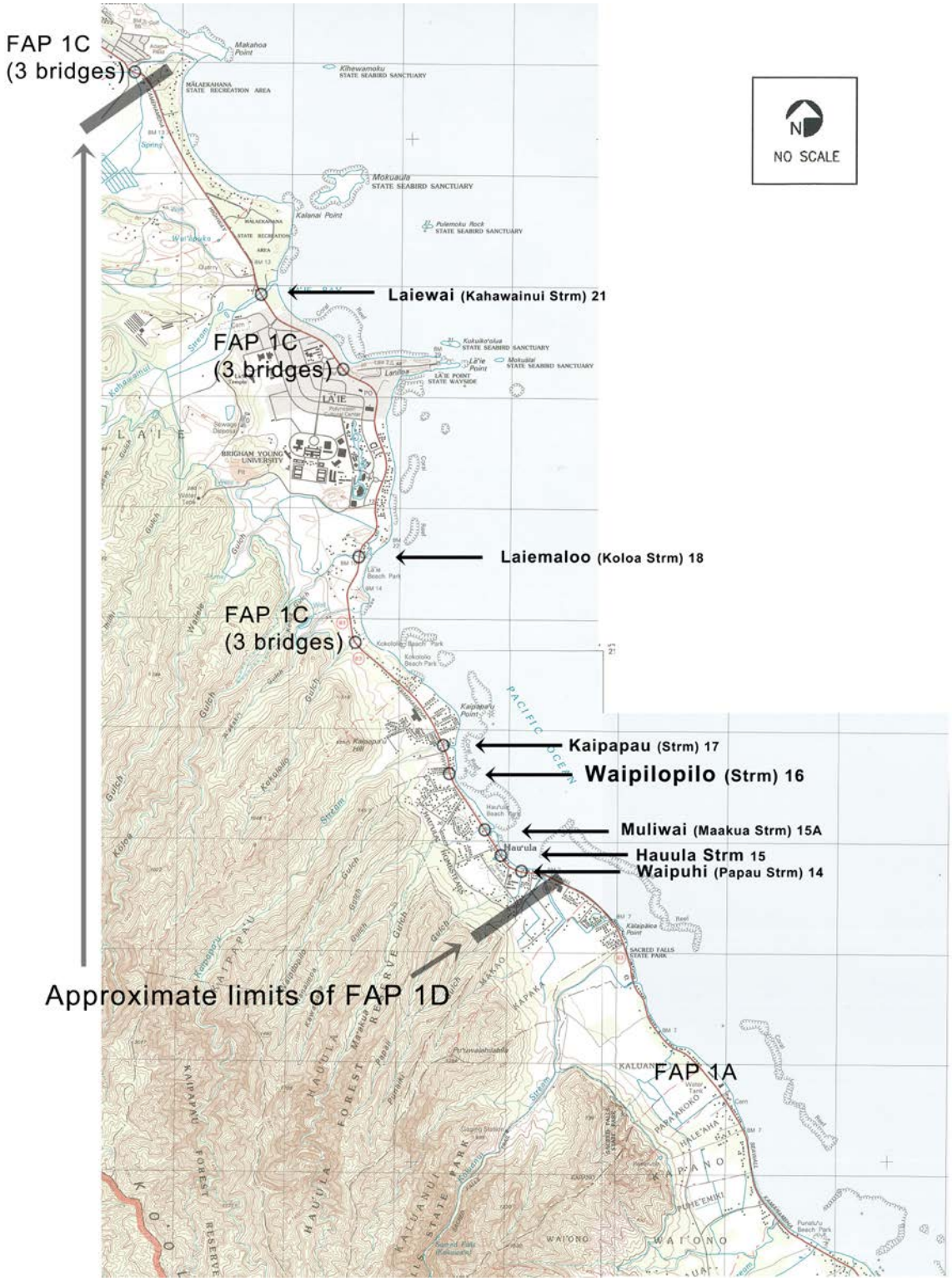
PROJECT INFORMATION

This HAER documentation was produced in advance of a project to widen and lengthen the Waipilopilo Bridge, resulting in either its replacement or major rehabilitation. Hawaii State Historic Preservation Division has determined that the bridge is eligible for the National and Hawaii State Register of Historic Places in a letter dated October 6, 2011 (Log 2011.2252, Doc 1109MA08). Federal involvement in this project stems from Federal Aid Project, Permit # BR-083-1(57), which was issued for this project.

This report was researched and written by Dee Ruzicka of Mason Architects, Inc., Honolulu, Hawaii. Archival photographs were taken by David Franzen of Franzen Photography, Inc., Kailua, Hawaii.

Location map.





Map showing FAP 1D project area and locations of all 7 FAP 1D bridges. Also shown are the 3 FAP 1C bridges. *Map: composite of USGS 1:24,000 topographic maps of Kahana, HI (1992), Hauula, HI (1992), and Kahuku, HI (1998).*